

EUROPEAN PATENT OFFICE  
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

**The following classification changes will be effected by this Notice of Changes:**

<u>Action</u>	<u>Subclass</u>	<u>Group(s)</u>
<b>SCHEME:</b>		
Symbols Deleted:	H04N	5/217, 5/2171, 5/2173, 5/2175, 5/2176, 5/2178, 5/225, 5/2251, 5/2252, 5/22521, 5/22525, 5/225251, 5/2253, 5/2254, 5/22541, 2005/2255, 5/2256, 5/2257, 5/2258, 5/2259, 5/228, 5/2283, 5/2286, 5/232, 5/23203, 5/23206, 5/232061, 5/23209, 5/23212, 5/232121, 5/232122, 5/232123, 5/232125, 5/232127, 5/232133, 5/23216, 5/23218, 5/23219, 5/23222, 5/23225, 5/23227, 5/23229, 5/23232, 5/23235, 5/23238, 5/23241, 5/232411, 5/23245, 5/23248, 5/23251, 5/23254, 5/23258, 5/23261, 5/23264, 5/23267, 5/2327, 5/23274, 5/23277, 5/2328, 5/23283, 5/23287, 5/2329, 5/23293, 5/232933, 5/232935, 5/232939, 5/232941, 5/232945, 5/23296, 5/23299, 5/235, 5/2351, 5/2352, 5/2353, 5/2354, 5/2355, 5/2356, 5/2357, 5/2358, 5/238, 5/243, 5/247, 5/332, 5/335, 5/3355, 5/341, 5/3415, 5/343, 5/345, 5/3452, 5/3454, 5/3456, 5/347, 5/349, 5/351, 5/353, 5/3532, 5/3535, 5/3537, 5/355, 5/35509, 5/35518, 5/35527, 5/35536, 5/35545, 5/35554, 5/35563, 5/35572, 5/35581, 5/3559, 5/357, 5/3572, 5/35721, 5/3575, 5/3577, 5/359, 5/3591, 5/3592, 5/3594, 5/3595, 5/3597, 5/3598, 5/361, 5/363, 5/365, 5/3651, 5/3653, 5/3655, 5/3656, 5/3658, 5/367, 5/3675, 5/369, 5/3692, 5/3694, 5/3696, 5/36961, 5/36963, 5/36965, 5/3698, 5/372, 5/37206, 5/37213, 5/3722, 5/3725, 5/3728, 5/374, 5/3741, 5/3742, 5/3743, 5/3745, 5/37452, 5/37455, 5/37457, 5/376, 5/3765, 5/378, 5/379
	H04N	9/04, 9/045, 9/0451, 9/04511, 9/04513, 9/04515, 9/04517, 9/04519, 9/04521, 9/0455, 9/04551, 9/04553, 9/04555, 9/04557, 9/04559, 9/04561, 9/04563, 9/07, 9/077, 9/083, 9/09, 9/093, 9/097, 9/10, 9/735
Symbols New:	H04N	9/01, 9/03

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<b><u>Action</u></b>	<b><u>Subclass</u></b>	<b><u>Group(s)</u></b>
	H04N	23/00, 23/10, 23/11, 23/12, 23/125, 23/13, 23/15, 23/16, 23/17, 23/20, 23/21, 23/23, 23/30, 23/40, 23/41, 23/43, 23/45, 23/50, 23/51, 23/52, 23/53, 23/531, 23/54, 23/55, 23/555, 23/56, 23/57, 23/58, 23/60, 23/61, 23/611, 23/617, 23/62, 23/63, 23/631, 23/632, 23/633, 23/634, 23/635, 23/64, 23/65, 23/651, 23/66, 23/661, 23/662, 23/663, 23/665, 23/667, 23/67, 23/671, 23/672, 23/673, 23/675, 23/676, 23/68, 23/681, 23/6811, 23/6812, 23/6815, 23/682, 23/683, 23/684, 23/6842, 23/6845, 23/685, 23/686, 23/687, 23/689, 23/69, 23/695, 23/698, 23/70, 23/71, 23/72, 23/73, 23/74, 23/741, 23/743, 23/745, 23/749, 23/75, 23/76, 23/80, 23/81, 23/811, 23/815, 23/82, 23/83, 23/84, 23/841, 23/843, 23/85, 23/86, 23/87, 23/88, 23/90, 23/95, 23/951, 23/955, 23/957, 23/958, 23/959
	H04N	25/00, 25/10, 25/11, 25/13, 25/131, 25/133, 25/134, 25/135, 25/136, 25/17, 25/20, 25/21, 25/30, 25/40, 25/41, 25/42, 25/44, 25/441, 25/443, 25/445, 25/447, 25/46, 25/47, 25/48, 25/50, 25/51, 25/53, 25/531, 25/532, 25/533, 25/534, 25/535, 25/57, 25/571, 25/573, 25/575, 25/58, 25/581, 25/583, 25/585, 25/587, 25/589, 25/59, 25/60, 25/61, 25/611, 25/615, 25/6153, 25/616, 25/617, 25/618, 25/62, 25/621, 25/622, 25/623, 25/625, 25/626, 25/627, 25/628, 25/63, 25/633, 25/65, 25/67, 25/671, 25/672, 25/673, 25/674, 25/677, 25/68, 25/683, 25/69, 25/70, 25/701, 25/7013, 25/702, 25/703, 25/704, 25/705, 25/706, 25/707, 25/708, 25/709, 25/71, 25/711, 25/713, 25/715, 25/72, 25/73, 25/74, 25/745, 25/75, 25/76, 25/766, 25/767, 25/768, 25/77, 25/771, 25/772, 25/773, 25/778, 25/779, 25/7795, 25/78, 25/79
Titles Changed:	H04N	5/14, 5/202, 5/213, 5/222, 5/30, 5/32, 5/33
	H04N	9/64, 9/67, 9/68, 9/69, 9/72, 9/73
Indents Changed:	H04N	9/11
Warnings New:	H04N	5/202, 5/30, 5/32, 5/33
	H04N	9/64, 9/67, 9/68, 9/69, 9/72, 9/73
	H04N	23/00, 23/10, 23/11, 23/20, 23/30, 23/80, 23/82, 23/83, 23/84, 23/85, 23/86, 23/87, 23/88, 23/90, 23/95, 23/951, 23/955, 23/957, 23/959, 23/958

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Action</u>	<u>Subclass</u>	<u>Group(s)</u>
	H04N	25/00, 25/10, 25/131, 25/20, 25/30, 25/40, 25/47, 25/50, 25/51, 25/53, 25/532, 25/533, 25/535, 25/60, 25/61, 25/616, 25/617, 25/618, 25/62, 25/621, 25/625, 25/626, 25/627, 25/628, 25/63, 25/633, 25/65, 25/67, 25/671, 25/68, 25/683, 25/69, 25/702, 25/703, 25/74, 25/745, 25/75, 25/772, 25/773, 25/779, 25/7795, 25/78
Notes Deleted:	H04N	5/335
<b>DEFINITIONS:</b>		
Definitions Deleted: (no frozen (F) symbol definitions should be deleted)	H04N	5/217, 5/225, 5/2251, 5/232, 5/23212, 5/232121, 5/232133, 5/23216, 5/23218, 5/23219, 5/23241, 5/23293, 5/232933, 5/23299, 5/235, 5/2356, 5/247, 5/332, 5/335, 5/341, 5/3415, 5/343, 5/345, 5/3452, 5/3454, 5/3456, 5/347, 5/349, 5/351, 5/353, 5/3532, 5/3535, 5/3537, 5/355, 5/35509, 5/35518, 5/35527, 5/35536, 5/35545, 5/35554, 5/35563, 5/35572, 5/35581, 5/3559, 5/357, 5/3572, 5/35721, 5/3575, 5/3577, 5/359, 5/3591, 5/3592, 5/3594, 5/3595, 5/3597, 5/3598, 5/361, 5/363, 5/365, 5/3651, 5/3653, 5/3655, 5/3656, 5/3658, 5/367, 5/3675, 5/369, 5/3696, 5/36961, 5/36963, 5/36965, 5/3698, 5/37213, 5/374, 5/3741, 5/3742, 5/3745, 5/37452, 5/37455, 5/37457, 5/376, 5/3765, 5/378, 5/379
	H04N	9/04515, 9/04553, 9/097, 9/10
Definitions New:	H04N	23/00, 23/11, 23/16, 23/17, 23/50, 23/60, 23/61, 23/611, 23/62, 23/63, 23/631, 23/65, 23/67, 23/671, 23/676, 23/695, 23/70, 23/743, 23/81, 23/843, 23/90, 23/95
		25/00, 25/10, 25/131, 25/20, 25/30, 25/40, 25/41, 25/42, 25/44, 25/441, 25/443, 25/445, 25/46, 25/47, 25/48, 25/50, 25/53, 25/531, 25/533, 25/534, 25/57, 25/571, 25/573, 25/575, 25/58, 25/581, 25/583, 25/585, 25/587, 25/589, 25/59, 25/60, 25/61, 25/615, 25/616, 25/617, 25/62, 25/621, 25/622, 25/623, 25/625, 25/626, 25/627, 25/628, 25/63, 25/633, 25/65, 25/67, 25/671, 25/672, 25/673, 25/674, 25/677, 25/68, 25/683, 25/70, 25/702, 25/703, 25/704, 25/705, 25/709, 25/713, 25/74, 25/75, 25/76, 25/766, 25/767, 25/77, 25/771, 25/772, 25/778, 25/779, 25/7795, 25/78, 25/79

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Action</u>	<u>Subclass</u>	<u>Group(s)</u>
Definitions Modified:	H04N	5/222, 5/30, 5/32, 5/33,
	H04N	9/64, 9/67, 9/68, 9/72, 9/73

**The following subclasses/groups are also impacted by this Notice of Changes (indicate subclasses/groups outside of the project scope, such as those listed in the CRL):**

*G02B, G03B, G06T, G06V, G11B, H01J, H01L, H04N, A61B, B60R, F16M, G01J, G01T, G06F, H03M, G08B, G08G, H04M*

**This Notice of Changes includes the following [Check the ones included]:**

1. CLASSIFICATION SCHEME CHANGES

- A. New, Modified or Deleted Group(s)
- B. New, Modified or Deleted Warning(s)
- C. New, Modified or Deleted Note(s)
- D. New, Modified or Deleted Guidance Heading(s)

2. DEFINITIONS

- A. New or Modified Definitions (Full definition template)
- B. Modified or Deleted Definitions (Definitions Quick Fix)

3.  REVISION CONCORDANCE LIST (RCL)

4.  CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

5.  CHANGES TO THE CROSS-REFERENCE LIST (CRL)

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

1. CLASSIFICATION SCHEME CHANGES

A. New, Modified or Deleted Group(s)

**SUBCLASS H04N - PICTORIAL COMMUNICATION, e.g. TELEVISION**

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be enclosed in { curly brackets }**</u>	<u>Transferred to#</u>
M	H04N 5/14	1	Picture signal circuitry for video frequency region (cameras or camera modules comprising electronic image sensors, or control thereof H04N 23/00)	
U	H04N 5/20	2	Circuitry for controlling amplitude response	
C	H04N 5/202	3	Gamma control (circuits for controlling camera response irrespective of the scene brightness H04N 23/82)	H04N 5/202, H04N 23/82
M	H04N 5/213	3	Circuitry for suppressing or minimising impulsive noise (for suppressing or minimising disturbance in image signal generation H04N 23/81)	
D	H04N 5/217	3	in picture signal generation {in cameras comprising an electronic image sensor, e.g. in digital cameras, TV cameras, video cameras, camcorders, webcams, or to be embedded in other devices, e.g. in mobile phones, computers or vehicles }	<administrative transfer to H04N 23/81>
D	H04N 5/2171	4	{Dust removal, e.g. from surfaces of image sensor or processing of the image signal output by the electronic image sensor }	<administrative transfer to H04N 23/811>
D	H04N 5/2173	4	{in solid-state picture signal generation }	<administrative transfer to H04N 25/60>
D	H04N 5/2175	5	{Suppression of excedentary charges, e.g. blooming, smearing (within the image sensor H04N 3/1556, H04N 3/1568)}	<administrative transfer to H04N 25/62>
D	H04N 5/2176	5	{Correction or equalization of amplitude response, e.g. dark current, blemishes, non-uniformity }	<administrative transfer to H04N 25/63>
D	H04N 5/2178	6	{by initial calibration, e.g. with memory means }	<administrative transfer to H04N 25/67>
M	H04N 5/222	1	Studio circuitry; Studio devices; Studio equipment (cameras or camera modules	

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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			comprising electronic image sensors, or control thereof H04N 23/00)	
D	H04N 5/225	2	Television cameras {; Cameras comprising an electronic image sensor, e.g. digital cameras, video cameras, camcorders, webcams, camera modules specially adapted for being embedded in other devices, e.g. mobile phones, computers or vehicles (constructional details of electronic still picture cameras or digital still picture cameras not peculiar to the presence or use of the electronic image sensor G03B)}	<administrative transfer to H04N 23/00>
D	H04N 5/2251	3	{Constructional details}	<administrative transfer to H04N 23/50>
D	H04N 5/2252	4	{Housings}	<administrative transfer to H04N 23/51>
D	H04N 5/22521	4	{Elements optimizing image sensor operations, e.g. EMF protection, heat transfer, moisture or dust}	<administrative transfer to H04N 23/52>
D	H04N 5/22525	4	{Electronic viewfinders}	<administrative transfer to H04N 23/53>
D	H04N 5/225251	5	{rotatable or detachable}	<administrative transfer to H04N 23/531>
D	H04N 5/2253	4	{Mounting of pick-up device, electronic image sensor, deviation or focusing coils}	<administrative transfer to H04N 23/54>
D	H04N 5/2254	4	{Mounting of optical parts, e.g. lenses, shutters, filters or optical parts peculiar to the presence or use of an electronic image sensor}	<administrative transfer to H04N 23/55>
D	H04N 5/22541	5	{Optical arrangements for light-field or plenoptic cameras}	<administrative transfer to H04N 23/957>
D	H04N 2005/2255	3	{for picking-up images in sites, inaccessible due to their dimensions or hazardous conditions, e.g. endoscope, borescope}	<administrative transfer to H04N 23/555 INV>
D	H04N 5/2256	3	{provided with illuminating means}	<administrative transfer to H04N 23/56>
D	H04N 5/2257	3	{Mechanical and electrical details of cameras or camera modules for embedding in other devices (mounting structure in mobile phone see H04M 1/0264; optical details G03B)}	<administrative transfer to H04N 23/57>
D	H04N 5/2258	3	{Cameras using two or more image sensors, e.g. a CMOS sensor for video and a CCD for still image (cameras having one image sensor for each colour H04N 9/045, H04N 9/09)}	<administrative transfer to H04N 23/45>
D	H04N 5/2259	3	{Means for changing the camera field of view without moving the camera body, e.g.	<administrative transfer to H04N 23/58>

CPC NOTICE OF CHANGES 1381

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			nutating or panning optics or image-sensors (picture signal generation using shifting image-sensors H04N 5/349; varying magnification, e.g. angle of view for cameras using only optical means G03B)}	
D	H04N 5/228	3	Circuit details for pick-up tubes	<administrative transfer to H04N 23/40>
D	H04N 5/2283	4	{Beam current control}	<administrative transfer to H04N 23/41>
D	H04N 5/2286	5	{during retrace periods, e.g. circuits for ACT tubes, leg suppression}	<administrative transfer to H04N 23/43>
D	H04N 5/232	3	Devices for controlling television cameras, e.g. remote control {; Control of cameras comprising an electronic image sensor} (H04N 5/235 takes precedence {; Mountings, adjusting means, or light-tight connections, for optical elements G02B 7/00)}	<administrative transfer to H04N 23/60>
D	H04N 5/23203	4	{Remote-control signaling for television cameras, cameras comprising an electronic image sensor or for parts thereof, e.g. between main body and another part of camera (distributing sync-signals to television cameras H04N 5/0733)}	<administrative transfer to H04N 23/66>
D	H04N 5/23206	5	{Transmission of camera control signals via a network, e.g. Internet}	<administrative transfer to H04N 23/661>
D	H04N 5/232061	6	{using Master/Slave camera arrangements for affecting the control of camera image capture, e.g. placing the camera in a desirable condition to capture a desired image}	<administrative transfer to H04N 23/662>
D	H04N 5/23209	5	{for interchangeable parts of camera involving control signals based on electric image signals provided by an electronic image sensor (interchangeably mounting lenses on cameras not involving a control signal based on electric image signals provided by a main electronic image sensor G03B 17/14)}	<administrative transfer to H04N 23/663>
D	H04N 5/23212	4	{Focusing based on image signals provided by the electronic image sensor}	<administrative transfer to H04N 23/67>
D	H04N 5/232121	5	{and on active ranging signals, e.g. using light or sound signals emitted toward objects}	<administrative transfer to H04N 23/671>
D	H04N 5/232122	5	{based on the difference in phase of signals}	<administrative transfer to H04N 23/672>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

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D	H04N 5/232123	5	{based on contrast or high frequency components of image signals, e.g. hill climbing method }	<administrative transfer to H04N 23/673>
D	H04N 5/232125	5	{adjusting depth of field during image capture, e.g. maximizing or setting range based on scene characteristics }	<administrative transfer to H04N 23/959>
D	H04N 5/232127	5	{setting of focusing region }	<administrative transfer to H04N 23/675>
D	H04N 5/232133	5	{Bracketing relating to the capture of varying focusing conditions }	<administrative transfer to H04N 23/676>
D	H04N 5/23216	4	{Control of parameters, e.g. field or angle of view of camera via graphical user interface, e.g. touchscreen }	<administrative transfer to H04N 23/62>
D	H04N 5/23218	4	{Control of camera operation based on recognized objects }	<administrative transfer to H04N 23/61>
D	H04N 5/23219	5	{where the recognized objects include parts of the human body, e.g. human faces, facial parts or facial expressions }	<administrative transfer to H04N 23/611>
D	H04N 5/23222	4	{Computer-aided capture of images, e.g. transfer from script file into camera, check of taken image quality, advice or proposal for image composition or decision on when to take image }	<administrative transfer to H04N 23/64>
D	H04N 5/23225	4	{Input of new or changed control program into camera control means }	<administrative transfer to H04N 23/617>
D	H04N 5/23227	4	{involving internal camera communication with the image sensor, e.g. synchronizing or multiplexing SSIS control signals }	<administrative transfer to H04N 23/665>
D	H04N 5/23229	4	{comprising further processing of the captured image without influencing the image pickup process (image processing in general G06T)}	<administrative transfer to H04N 23/80>
D	H04N 5/23232	5	{by using more than one image in order to influence resolution, frame rate or aspect ratio (providing high dynamic range image H04N 5/2355)}	<administrative transfer to H04N 23/951>
D	H04N 5/23235	5	{by using a single image in order to influence the resolution }	<administrative transfer to H04N 23/815>
D	H04N 5/23238	4	{Control of image capture or reproduction to achieve a very large field of view, e.g. panorama (panoramic or widescreen photography G03B 27/00)}	<administrative transfer to H04N 23/698>
D	H04N 5/23241	4	{Control of camera operation in relation to power supply }	<administrative transfer to H04N 23/65>
D	H04N 5/232411	5	{where power supply is reduced or conserved by affecting camera operations, e.g. sleep }	<administrative transfer to H04N 23/651>



CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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			mode, hibernation mode, power off or turning off selective parts of the camera }	
D	H04N 5/23245	4	{Operation mode switching of cameras, e.g. between still/video, sport/normal or high/low resolution mode }	<administrative transfer to H04N 23/667>
D	H04N 5/23248	4	{for stable pick-up of the scene in spite of camera body vibration (image-sensor selective scanning per se H04N 3/1562)}	<administrative transfer to H04N 23/68>
D	H04N 5/23251	5	{Motion detection }	<administrative transfer to H04N 23/681>
D	H04N 5/23254	6	{based on the image signal (analysis of motion by image processing in general G06T 7/20)}	<administrative transfer to H04N 23/6811>
D	H04N 5/23258	6	{based on additional sensors (cameras when not peculiar to the use or presence of the EIS G03B 2217/005)}	<administrative transfer to H04N 23/6812>
D	H04N 5/23261	6	{by distinguishing pan/tilt from motion }	<administrative transfer to H04N 23/6815>
D	H04N 5/23264	5	{Vibration or motion blur correction }	<administrative transfer to H04N 23/682>
D	H04N 5/23267	6	{performed by a processor, e.g. controlling the readout of an image memory }	<administrative transfer to H04N 23/683>
D	H04N 5/2327	6	{performed by controlling the image sensor readout, e.g. by controlling the integration time (controlling the image sensor readout in general H04N 5/345, H04N 5/353)}	<administrative transfer to H04N 23/684>
D	H04N 5/23274	7	{by controlling the scanning position, e.g. windowing (windowed readout of image sensor in general H04N 5/3454)}	<administrative transfer to H04N 23/6842>
D	H04N 5/23277	7	{by combination of a plurality of images sequentially taken }	<administrative transfer to H04N 23/6845>
D	H04N 5/2328	6	{performed by mechanical compensation (stabilization for imaging systems using optical elements in general s G02B 27/646; cameras when not peculiar to the use or presence of the EIS G03B 2205/0007)}	<administrative transfer to H04N 23/685>
D	H04N 5/23283	7	{with a variable apex prism }	<administrative transfer to H04N 23/686>
D	H04N 5/23287	7	{by shifting the lens/sensor position }	<administrative transfer to H04N 23/687>
D	H04N 5/2329	5	{Motion occurring during a rolling shutter mode }	<administrative transfer to H04N 23/689>
D	H04N 5/23293	4	{Electronic viewfinders }	<administrative transfer to H04N 23/63>
D	H04N 5/232933	5	{Graphical User Interface [GUI] s specifically adapted for controlling image capture or	<administrative transfer to H04N 23/631>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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			setting capture parameters, e.g. using a touchscreen }	
D	H04N 5/232935	6	{for displaying or modifying preview images prior to image capturing, e.g. variety of image resolutions or capturing parameters }	<administrative transfer to H04N 23/632>
D	H04N 5/232939	5	{for displaying additional information relating to control or operation of the camera }	<administrative transfer to H04N 23/633>
D	H04N 5/232941	6	{Warning indications }	<administrative transfer to H04N 23/634>
D	H04N 5/232945	6	{Region indicators or field of view }	<administrative transfer to H04N 23/635>
D	H04N 5/23296	4	{Control of means for changing angle of the field of view, e.g. optical zoom objective, electronic zooming or combined use of optical and electronic zooming (optical details of zoom lenses G02B 15/14; optical zooming only for cameras G03B 5/00)}	<administrative transfer to H04N 23/69>
D	H04N 5/23299	4	{Controlling the position of the camera for changing the field of view, e.g. panning, tilting or tracking of objects (TV type tracking systems G01S 3/7864; tracking movement of a target in burglar, theft or intruder alarms, using TV cameras G08B 13/19608)}	<administrative transfer to H04N 23/695>
D	H04N 5/235	3	Circuitry {or methods} for compensating for variation in the brightness of the object {, e.g. based on electric image signals provided by an electronic image sensor }	<administrative transfer to H04N 23/70>
D	H04N 5/2351	4	{Circuitry for evaluating the brightness variations of the object (within the image sensor H04N 5/351; photometry in general G01J 1/00)}	<administrative transfer to H04N 23/71>
D	H04N 5/2352	4	{Combination of two or more compensation controls }	<administrative transfer to H04N 23/72>
D	H04N 5/2353	4	{by influencing the exposure time, e.g. shutter (H04N 5/2352 takes precedence; within the image sensor H04N 5/353)}	<administrative transfer to H04N 23/73>
D	H04N 5/2354	4	{by influencing the scene brightness using illuminating means (H04N 5/2352 takes precedence)}	<administrative transfer to H04N 23/74>
D	H04N 5/2355	4	{by increasing the dynamic range of the final image compared to the dynamic range of the electronic image sensor, e.g. by adding correct exposed portions of short and long exposed images (image enhancement in	<administrative transfer to H04N 23/741>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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			general using more than one image G06T 5/50)	
D	H04N 5/2356	4	{Bracketing, i.e. taking a series of images with varying exposure conditions }	<administrative transfer to H04N 23/743>
D	H04N 5/2357	4	{Detection of flicker frequency or flicker suppression, e.g. due to fluorescent tube illumination }	<administrative transfer to H04N 23/745>
D	H04N 5/2358	4	{by influencing at least one of the pick-up tube voltages (H04N 5/2352 takes precedence)}	<administrative transfer to H04N 23/749>
D	H04N 5/238	4	by influencing the optical part of the camera, {e.g. diaphragm, intensifier, fibre bundle (H04N 5/2352 takes precedence)}	<administrative transfer to H04N 23/75>
D	H04N 5/243	4	by influencing the picture signal {, e.g. signal amplitude gain control (H04N 5/2352 takes precedence)}	<administrative transfer to H04N 23/76>
D	H04N 5/247	3	Arrangements of television cameras {(constructional details of cameras H04N 5/2251)}	<administrative transfer to H04N 23/90>
C	H04N 5/30	1	Transforming light or analogous information into electric information (scanning details H04N 3/00; cameras or camera modules comprising electronic image sensors, or control thereof H04N 23/00; circuitry of solid-state image sensors [SSIS] or control thereof H04N 25/00)	H04N 5/30, H04N 25/00
C	H04N 5/32	2	Transforming X-rays (cameras or camera modules for generating image signals from X-rays H04N 23/30; circuitry of SSIS for transforming X-rays into image signals H04N 25/30)	H04N 5/32, H04N 23/30, H04N 25/30
U	H04N 5/3205	3	{using subtraction imaging techniques }	
U	H04N 5/321	3	with video transmission of fluoroscopic images	
U	H04N 5/325	4	Image enhancement, e.g. by subtraction techniques using polyenergetic X-rays	
C	H04N 5/33	2	Transforming infrared radiation (cameras or camera modules for generating image signals from infrared radiation H04N 23/20; circuitry of SSIS for transforming infrared radiation into image signals H04N 25/20)	H04N 5/33, H04N 23/20, H04N 23/21, H04N 23/23, H04N 25/20, H04N 25/21
D	H04N 5/332	3	{Multispectral imaging comprising at least a part of the infrared region }	<administrative transfer to H04N 23/11 >

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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D	H04N 5/335	2	using solid-state image sensors [SSIS] (H04N 5/32, H04N 5/33 take precedence)	<administrative transfer to H04N 25/00>
D	H04N 5/3355	3	{with digital output of the sensor cell, e.g. dynamic RAM image sensors }	<administrative transfer to H04N 25/772>
D	H04N 5/341	3	Extracting pixel data from an image sensor by controlling scanning circuits, e.g. by modifying the number of pixels having been sampled or to be sampled	<administrative transfer to H04N 25/40>
D	H04N 5/3415	4	{for increasing the field of view by combining the outputs of a plurality of sensors, e.g. panoramic imaging (linear arrays using abutted sensors H04N 5/3692)}	<administrative transfer to H04N 25/41>
D	H04N 5/343	4	by switching between different modes of operation using different resolutions or aspect ratios, e.g. between still and video mode or between interlaced and non-interlaced mode	<administrative transfer to H04N 25/42>
D	H04N 5/345	4	by partially reading an SSIS array {, i.e. by outputting a number of pixels less than the number of pixels present on the image sensor}	<administrative transfer to H04N 25/44>
D	H04N 5/3452	5	{by reading contiguous pixels in one direction within a read portion of the array, e.g. without loss of resolution within the read portion, or every other field is skipped }	<administrative transfer to H04N 25/441>
D	H04N 5/3454	5	{by reading contiguous pixels in two directions within a read portion of the array, e.g. without loss of resolution in two directions, windowing or electronic zooming }	<administrative transfer to H04N 25/443>
D	H04N 5/3456	5	{by skipping some contiguous pixels within the read portion of the array, e.g. with loss of resolution, e.g. skipping or discarding pixels }	<administrative transfer to H04N 25/445>
D	H04N 5/347	4	by combining or binning pixels in SSIS	<administrative transfer to H04N 25/46>
D	H04N 5/349	4	for increasing resolution by shifting the sensor relative to the scene {, e.g. microscanning }	<administrative transfer to H04N 25/48>
D	H04N 5/351	3	Control of the SSIS depending on the scene, e.g. brightness or motion in the scene	<administrative transfer to H04N 25/50>
D	H04N 5/353	4	Control of the integration time {(circuitry for compensating for variation in the brightness	<administrative transfer to H04N 25/53>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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			of the object by influencing the exposure time H04N 5/2353}	
D	H04N 5/3532	5	{by controlling rolling shutters }	<administrative transfer to H04N 25/531>
D	H04N 5/3535	5	{with different integration times within the sensor }	<administrative transfer to H04N 25/533>
D	H04N 5/3537	6	{depending on the spectral component }	<administrative transfer to H04N 25/534>
D	H04N 5/355	4	Control of the dynamic range	<administrative transfer to H04N 25/57>
D	H04N 5/35509	5	{involving a non-linear response }	<administrative transfer to H04N 25/571>
D	H04N 5/35518	6	{being of the logarithmic type }	<administrative transfer to H04N 25/573>
D	H04N 5/35527	6	{with a response composed of multiple slopes }	<administrative transfer to H04N 25/575>
D	H04N 5/35536	5	{involving multiple exposures (combination of exposures for increasing the dynamic range H04N 5/235)}	<administrative transfer to H04N 25/58>
D	H04N 5/35545	6	{being simultaneously taken }	<administrative transfer to H04N 25/581>
D	H04N 5/35554	7	{with different integration times }	<administrative transfer to H04N 25/583>
D	H04N 5/35563	7	{with pixels having different sensibilities within the sensor, e.g. fast/slow pixels, pixels having different sizes }	<administrative transfer to H04N 25/585>
D	H04N 5/35572	6	{sequentially taken, e.g. using the combination of odd and even image fields }	<administrative transfer to H04N 25/587>
D	H04N 5/35581	7	{with different integration times, e.g. short and long exposures }	<administrative transfer to H04N 25/589>
D	H04N 5/3559	5	{by controlling the amount of charge storable in the pixel, e.g. modification of the charge conversion ratio of the floating node capacitance }	<administrative transfer to H04N 25/59>
D	H04N 5/357	3	Noise processing, e.g. detecting, correcting, reducing or removing noise	<administrative transfer to H04N 25/60>
D	H04N 5/3572	4	{the noise originating only from the lens unit, e.g. flare, shading, vignetting or "cos4" (suppressing or minimizing noise in picture signal generation H04N 5/217; correction of	<administrative transfer to H04N 25/61>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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			colour aberration from a lens H04N 9/04517)}	
D	H04N 5/35721	5	{involving a transfer function modeling the optical system, e.g. Optical Transfer Function [OTF], Phase Transfer Function [PhTF] or Modulation Transfer Function [MTF]}	<administrative transfer to H04N 25/615>
D	H04N 5/3575	4	{involving a correlated sampling function, e.g. correlated double or triple sampling }	<administrative transfer to H04N 25/616>
D	H04N 5/3577	4	{for reducing electromagnetic interferences, e.g. EMI reduction, clocking noise}	<administrative transfer to H04N 25/617>
D	H04N 5/359	4	applied to excess charges produced by the exposure, e.g. smear, blooming, ghost image, crosstalk or leakage between pixels	<administrative transfer to H04N 25/62>
D	H04N 5/3591	5	{for the control of blooming }	<administrative transfer to H04N 25/621>
D	H04N 5/3592	6	{by controlling anti-blooming drains }	<administrative transfer to H04N 25/622>
D	H04N 5/3594	6	{by evacuation via the output or reset lines }	<administrative transfer to H04N 25/623>
D	H04N 5/3595	5	{for the control of smearing, e.g. CCD being still exposed during the charge transfer }	<administrative transfer to H04N 25/625>
D	H04N 5/3597	5	{being the residual charges remaining after reading an image, e.g. ghost images or after images }	<administrative transfer to H04N 25/626>
D	H04N 5/3598	5	{applied when a phenomenon of inverted contrast occurs, e.g. eclipse phenomenon }	<administrative transfer to H04N 25/627>
D	H04N 5/361	4	applied to dark current	<administrative transfer to H04N 25/63>
D	H04N 5/363	4	applied to reset noise, e.g. KTC noise {related to CMOS structures }	<administrative transfer to H04N 25/65>
D	H04N 5/365	4	applied to fixed-pattern noise, e.g. non-uniformity of response	<administrative transfer to H04N 25/67>
D	H04N 5/3651	5	{for non-uniformity detection and correction }	<administrative transfer to H04N 25/671>
D	H04N 5/3653	6	{between adjacent sensors or output registers for reading a single image }	<administrative transfer to H04N 25/672>
D	H04N 5/3655	6	{by using a reference source }	<administrative transfer to H04N 25/673>
D	H04N 5/3656	7	{the reference source being based on the scene itself, e.g. defocusing }	<administrative transfer to H04N 25/674>
D	H04N 5/3658	6	{for reducing the column or line fixed pattern noise }	<administrative transfer to H04N 25/677>

## CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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D	H04N 5/367	5	applied to defects, e.g. non-responsive pixels	<administrative transfer to H04N 25/68>
D	H04N 5/3675	6	{by defect estimation performed on the scene signal, e.g. real time or on the fly detection}	<administrative transfer to H04N 25/683>
D	H04N 5/369	3	SSIS architecture; Circuitry associated therewith	<administrative transfer to H04N 25/70>
D	H04N 5/3692	4	{Line sensors }	<administrative transfer to H04N 25/701>
D	H04N 5/3694	5	{using abutted sensors forming a long line, e.g. for flat bed scanners }	<administrative transfer to H04N 25/7013>
D	H04N 5/3696	4	{SSIS architecture characterized by non-identical, non-equidistant or non-planar pixel layout, sensor embedding other types of pixels not meant for producing an image signal, e.g. fovea sensors or display pixels (Imager structures H01L 27/146)}	<administrative transfer to H04N 25/702>
D	H04N 5/36961	5	{the other type of pixels are pixels specially adapted for focusing, e.g. phase difference pixel sets }	<administrative transfer to H04N 25/704>
D	H04N 5/36963	5	{Details of pixels used only for dark current, e.g. dummy pixels or optical black pixels }	<administrative transfer to H04N 25/633>
D	H04N 5/36965	5	{the other type of pixels are pixels for depth measurement, e.g. RGBZ where Z is the depth pixel or embedded time-of-flight pixels (depth pixels used only for focusing H04N 5/36961)}	<administrative transfer to H04N 25/705>
D	H04N 5/3698	4	{Circuitry for controlling the generation or the management of the power supply }	<administrative transfer to H04N 25/709>
D	H04N 5/372	4	Charge-coupled device [CCD] sensors; Time delay and integration [TDI] registers or shift registers specially adapted for SSIS {(charge coupled imager structure H01L 27/148)}	<administrative transfer to H04N 25/71>
D	H04N 5/37206	5	{TDI registers or shift registers specially adapted for SSIS }	<administrative transfer to H04N 25/711>
D	H04N 5/37213	5	{Details of transfer/readout registers; Split readout registers and multiple readout registers }	<administrative transfer to H04N 25/713>
D	H04N 5/3722	5	using frame interline transfer [FIT]	<administrative transfer to H04N 25/715>
D	H04N 5/3725	5	using frame transfer [FT]	<administrative transfer to H04N 25/72>
D	H04N 5/3728	5	using interline transfer [IT]	<administrative transfer to H04N 25/73>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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D	H04N 5/374	4	Addressed sensors, e.g. MOS or CMOS sensors	<administrative transfer to H04N 25/76>
D	H04N 5/3741	5	{ comprising control or output lines sharing a plurality of functions, e.g. output or driving or reset or power lines }	<administrative transfer to H04N 25/766>
D	H04N 5/3742	5	{ Details of transfer or readout registers; split readout registers and multiple readout registers }	<administrative transfer to H04N 25/767>
D	H04N 5/3743	5	{ using TDI registers }	<administrative transfer to H04N 25/768>
D	H04N 5/3745	5	having additional components embedded within a pixel or connected to a group of pixels within a sensor matrix, e.g. memories, A/D converters, pixel amplifiers, shared circuits or shared components	<administrative transfer to H04N 25/77>
D	H04N 5/37452	6	{ comprising additional storage means (by controlling the amount of charges storable in the pixel H04N 5/3559) }	<administrative transfer to H04N 25/771>
D	H04N 5/37455	6	{ comprising A/D, V/T, V/F, I/T or I/F converters }	<administrative transfer to H04N 25/772>
D	H04N 5/37457	6	{ comprising amplifiers shared between a plurality of pixels, e.g. at least one part of the amplifier has to be on the sensor array itself }	<administrative transfer to H04N 25/778>
D	H04N 5/376	4	Addressing circuits	<administrative transfer to H04N 25/74>
D	H04N 5/3765	5	{ Timing or clock signal generating circuits }	<administrative transfer to H04N 25/745>
D	H04N 5/378	4	Readout circuits, e.g. correlated double sampling [CDS] circuits, output amplifiers or A/D converters	<administrative transfer to H04N 25/75>
D	H04N 5/379	4	{ Details of the architecture or circuitry being divided to different or multiple substrates, chips or circuit boards, e.g. stacked image sensors (line sensors H04N 5/3694) }	<administrative transfer to H04N 25/79>
U	H04N9/00	0	Details of colour television systems	



CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 9/01	1	Circuitry for demodulating colour component signals modulated spatially by colour striped filters by phase separation	
N	H04N 9/03	1	Circuitry for demodulating colour component signals modulated spatially by colour striped filters by frequency separation	
D	H04N 9/04	1	Picture signal generators	<administrative transfer to H04N 23/10>
D	H04N 9/045	2	{using solid-state devices (scanning of colour motion picture films H04N 9/11; Imager structures H01L 27/146)}	<administrative transfer to H04N 23/10>
D	H04N 9/0451	3	{characterized by colour imaging operations }	<administrative transfer to H04N 23/84>
D	H04N 9/04511	4	{by partially reading a SSIS to preserve the colour pattern with or without loss of information }	<administrative transfer to H04N 25/447>
D	H04N 9/04513	4	{to modify Gamut }	<administrative transfer to H04N 23/841>
D	H04N 9/04515	4	{Demaicing, e.g. interpolating colour pixel values (Computational demosaicing G06T 3/4015)}	<administrative transfer to H04N 23/843>
D	H04N 9/04517	4	{Correcting colour aberration of lenses }	<administrative transfer to H04N 25/611>
D	H04N 9/04519	5	{using transfer functions modeling the optical system, e.g. Optical Transfer Function [OTF], Phase Transfer Function [PhTF] or Modulation Transfer Function [MTF]}	<administrative transfer to H04N 25/6153>
D	H04N 9/04521	4	{Colour sequential image capture, e.g. using a colour wheel}	<administrative transfer to H04N 23/125>
D	H04N 9/0455	3	{Colour filter architecture (colour filters structurally associated with image sensors H01L 27/146)}	<administrative transfer to H04N 25/11>
D	H04N 9/04551	4	{Mosaic colour filter}	<administrative transfer to H04N 25/13>
D	H04N 9/04553	5	{including elements transmitting or passing infrared wavelengths}	<administrative transfer to H04N 25/131>
D	H04N 9/04555	5	{including elements transmitting or passing panchromatic light, e.g. white light }	<administrative transfer to H04N 25/133>
D	H04N 9/04557	5	{based on three different wavelength filter elements }	<administrative transfer to H04N 25/134>
D	H04N 9/04559	5	{based on four or more different wavelength filter elements }	<administrative transfer to H04N 25/135>

## CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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D	H04N 9/04561	6	{ using complementary colours }	<administrative transfer to H04N 25/136>
D	H04N 9/04563	4	{ colour separation based on photon absorption depth, e.g. full colour resolution obtained simultaneously at each pixel location }	<administrative transfer to H04N 25/17>
D	H04N 9/07	2	with one pick-up device only	<administrative transfer to H04N 23/12>
D	H04N 9/077	3	whereby the colour signals are characterised by their phase	<administrative transfer to H04N 9/01>
D	H04N 9/083	3	whereby the colour signals are characterised by their frequency	<administrative transfer to H04N 9/03>
D	H04N 9/09	2	with more than one pick-up device	<administrative transfer to H04N 23/13>
D	H04N 9/093	3	Systems for avoiding or correcting misregistration of video signals	<administrative transfer to H04N 23/15>
D	H04N 9/097	3	Optical arrangements associated therewith, e.g. for beam-splitting, for colour correction	<administrative transfer to H04N 23/16>
D	H04N 9/10	2	using optical-mechanical scanning means only (H04N 9/11 takes precedence)	<administrative transfer to H04N 23/17>
M	H04N 9/11	1	Scanning of colour motion picture films, e.g. for telecine	
C	H04N 9/64	1	Circuits for processing colour signals (H04N 9/77 takes precedence; camera processing pipelines for processing colour signals H04N 23/84)	H04N 9/64, H04N 23/84
C	H04N 9/67	2	for matrixing (camera processing pipelines for matrixing of colour signals H04N 23/85)	H04N 9/67, H04N 23/85
C	H04N 9/68	2	for controlling the amplitude of colour signals, e.g. automatic chroma control circuits (H04N 9/71, H04N 9/73 take precedence; camera processing pipelines for controlling the colour saturation of colour signals H04N 23/86)	H04N 9/68, H04N 23/86
C	H04N 9/69	3	for modifying the colour signals by gamma correction (controlling camera response for colour signals H04N 23/83)	H04N 9/69, H04N 23/83
C	H04N 9/72	2	for reinsertion of DC and slowly varying components of colour signals (camera processing pipelines for reinsertion of DC or slowly varying components of colour signals H04N 23/87)	H04N 9/72, H04N 23/87
C	H04N 9/73	2	Colour balance circuits, e.g. white balance circuits or colour temperature control (camera processing pipelines for colour balance H04N 23/88)	H04N 9/73, H04N 23/88

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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D	H04N 9/735	3	{for picture signal generators }	<administrative transfer to H04N 23/88>
Q	H04N 23/00	0	<b>Cameras or camera modules comprising electronic image sensors; Control thereof</b>	H04N23/00, H04N23/95, H04N23/955, H04N23/958
Q	H04N 23/10	1	for generating image signals from different wavelengths	H04N 23/10, H04N 23/11, H04N 25/10, H04N 25/17
Q	H04N 23/11	2	for generating image signals from visible and infrared light wavelengths	H04N 23/11, H04N 25/131
N	H04N 23/12	2	with one sensor only	
N	H04N 23/125	2	{Colour sequential image capture, e.g. using a colour wheel}	
N	H04N 23/13	2	with multiple sensors	
N	H04N 23/15	3	Image signal generation with circuitry for avoiding or correcting image misregistration	
N	H04N 23/16	3	Optical arrangements associated therewith, e.g. for beam-splitting or for colour correction	
N	H04N 23/17	2	using opto-mechanical scanning means only	
N	H04N 23/20	1	for generating image signals from infrared radiation only	
N	H04N 23/21	2	from near infrared [NIR] radiation	
N	H04N 23/23	2	from thermal infrared radiation	
N	H04N 23/30	1	for generating image signals from X-rays	
N	H04N 23/40	1	Circuit details for pick-up tubes	
N	H04N 23/41	2	{Beam current control}	
N	H04N 23/43	3	{during retrace periods, e.g. circuits for ACT tubes or leg suppression}	
N	H04N 23/45	1	for generating image signals from two or more image sensors being of different type or operating in different modes, e.g. with a CMOS sensor for moving images in combination with a charge-coupled device [CCD] for still images	

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 23/50	1	Constructional details	
N	H04N 23/51	2	Housings	
N	H04N 23/52	2	Elements optimising image sensor operation, e.g. for electromagnetic interference [EMI] protection or temperature control by heat transfer or cooling elements	
N	H04N 23/53	2	of electronic viewfinders, e.g. rotatable or detachable	
N	H04N 23/531	3	{being rotatable or detachable }	
N	H04N 23/54	2	Mounting of pick-up tubes, electronic image sensors, deviation or focusing coils	
N	H04N 23/55	2	Optical parts specially adapted for electronic image sensors; Mounting thereof	
N	H04N 23/555	2	{for picking-up images in sites, inaccessible due to their dimensions or hazardous conditions, e.g. endoscopes or borescopes }	
N	H04N 23/56	1	provided with illuminating means	
N	H04N 23/57	1	Mechanical or electrical details of cameras or camera modules specially adapted for being embedded in other devices	
N	H04N 23/58	1	Means for changing the camera field of view without moving the camera body, e.g. nutating or panning of optics or image sensors	
N	H04N 23/60	1	Control of cameras or camera modules	
N	H04N 23/61	2	based on recognised objects	
N	H04N 23/611	3	where the recognised objects include parts of the human body	
N	H04N 23/617	2	Upgrading or updating of programs or applications for camera control	
N	H04N 23/62	2	Control of parameters via user interfaces	
N	H04N 23/63	2	by using electronic viewfinders	
N	H04N 23/631	3	{Graphical user interfaces [GUI] specially adapted for controlling image capture or setting capture parameters }	
N	H04N 23/632	4	{for displaying or modifying preview images prior to image capturing, e.g. variety of image resolutions or capturing parameters }	

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 23/633	3	{for displaying additional information relating to control or operation of the camera }	
N	H04N 23/634	4	{Warning indications }	
N	H04N 23/635	4	{Region indicators; Field of view indicators }	
N	H04N 23/64	2	{Computer-aided capture of images, e.g. transfer from script file into camera, check of taken image quality, advice or proposal for image composition or decision on when to take image }	
N	H04N 23/65	2	Control of camera operation in relation to power supply	
N	H04N 23/651	3	{for reducing power consumption by affecting camera operations, e.g. sleep mode, hibernation mode or power off of selective parts of the camera }	
N	H04N 23/66	2	Remote control of cameras or camera parts, e.g. by remote control devices	
N	H04N 23/661	3	Transmitting camera control signals through networks, e.g. control via the Internet	
N	H04N 23/662	4	{by using master/slave camera arrangements for affecting the control of camera image capture, e.g. placing the camera in a desirable condition to capture a desired image }	
N	H04N 23/663	3	for controlling interchangeable camera parts based on electronic image sensor signals	
N	H04N 23/665	2	{involving internal camera communication with the image sensor, e.g. synchronising or multiplexing SSIS control signals }	
N	H04N 23/667	2	Camera operation mode switching, e.g. between still and video, sport and normal or high- and low-resolution modes	
N	H04N 23/67	2	Focus control based on electronic image sensor signals	
N	H04N 23/671	3	{in combination with active ranging signals, e.g. using light or sound signals emitted toward objects }	
N	H04N 23/672	3	{based on the phase difference signals }	
N	H04N 23/673	3	{based on contrast or high frequency components of image signals, e.g. hill climbing method }	
N	H04N 23/675	3	{comprising setting of focusing regions }	

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 23/676	3	{Bracketing for image capture at varying focusing conditions}	
N	H04N 23/68	2	for stable pick-up of the scene, e.g. compensating for camera body vibrations	
N	H04N 23/681	3	{Motion detection}	
N	H04N 23/6811	4	{based on the image signal}	
N	H04N 23/6812	4	{based on additional sensors, e.g. acceleration sensors}	
N	H04N 23/6815	4	{by distinguishing pan or tilt from motion}	
N	H04N 23/682	3	{Vibration or motion blur correction}	
N	H04N 23/683	4	{performed by a processor, e.g. controlling the readout of an image memory}	
N	H04N 23/684	4	{performed by controlling the image sensor readout, e.g. by controlling the integration time}	
N	H04N 23/6842	5	{by controlling the scanning position, e.g. windowing}	
N	H04N 23/6845	5	{by combination of a plurality of images sequentially taken}	
N	H04N 23/685	4	{performed by mechanical compensation}	
N	H04N 23/686	5	{with a variable apex prism}	
N	H04N 23/687	5	{by shifting the lens or sensor position}	
N	H04N 23/689	3	{Motion occurring during a rolling shutter mode}	
N	H04N 23/69	2	Control of means for changing angle of the field of view, e.g. optical zoom objectives or electronic zooming	
N	H04N 23/695	2	Control of camera direction for changing a field of view, e.g. pan, tilt or based on tracking of objects	
N	H04N 23/698	2	for achieving an enlarged field of view, e.g. panoramic image capture	
N	H04N 23/70	1	Circuitry for compensating brightness variation in the scene	
N	H04N 23/71	2	Circuitry for evaluating the brightness variation	
N	H04N 23/72	2	Combination of two or more compensation controls	

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 23/73	2	by influencing the exposure time	
N	H04N 23/74	2	by influencing the scene brightness using illuminating means	
N	H04N 23/741	2	by increasing the dynamic range of the image compared to the dynamic range of the electronic image sensors	
N	H04N 23/743	2	Bracketing, i.e. taking a series of images with varying exposure conditions	
N	H04N 23/745	2	Detection of flicker frequency or suppression of flicker wherein the flicker is caused by illumination, e.g. due to fluorescent tube illumination or pulsed LED illumination	
N	H04N 23/749	2	{by influencing the pick-up tube voltages }	
N	H04N 23/75	2	by influencing optical camera components	
N	H04N 23/76	2	by influencing the image signals	
Q	H04N 23/80	1	Camera processing pipelines; Components thereof	H04N 23/80, H04N 23/90, H04N 23/95, H04N 23/951, H04N 23/955, H04N 23/957, H04N 23/958, H04N 23/959
N	H04N 23/81	2	for suppressing or minimising disturbance in the image signal generation	
N	H04N 23/811	3	{by dust removal, e.g. from surfaces of the image sensor or processing of the image signal output by the electronic image sensor }	
N	H04N 23/815	2	{for controlling the resolution by using a single image }	
N	H04N 23/82	2	for controlling camera response irrespective of the scene brightness, e.g. gamma correction	
N	H04N 23/83	3	specially adapted for colour signals	
N	H04N 23/84	2	for processing colour signals	
N	H04N 23/841	3	{to modify gamut }	
N	H04N 23/843	3	{Demosaiicing, e.g. interpolating colour pixel values }	
N	H04N 23/85	3	for matrixing	
N	H04N 23/86	3	for controlling the colour saturation of colour signals, e.g. automatic chroma control circuits	

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 23/87	3	for reinsertion of DC or slowly varying components of colour signals	
N	H04N 23/88	3	for colour balance, e.g. white-balance circuits or colour temperature control	
N	H04N 23/90	1	Arrangement of cameras or camera modules, e.g. multiple cameras in TV studios or sports stadiums	
N	H04N 23/95	1	Computational photography systems, e.g. light-field imaging systems	
N	H04N 23/951	2	by using two or more images to influence resolution, frame rate or aspect ratio	
N	H04N 23/955	2	for lensless imaging	
N	H04N 23/957	2	Light-field or plenoptic cameras or camera modules	
N	H04N 23/958	2	for extended depth of field imaging	
N	H04N 23/959	3	by adjusting depth of field during image capture, e.g. maximising or setting range based on scene characteristics	
N	H04N 25/00	0	Circuitry of solid-state image sensors [SSIS]; Control thereof	
N	H04N 25/10	1	for transforming different wavelengths into image signals	
N	H04N 25/11	2	Arrangement of colour filter arrays [CFA]; Filter mosaics	
N	H04N 25/13	3	characterised by the spectral characteristics of the filter elements	
N	H04N 25/131	4	including elements passing infrared wavelengths	
N	H04N 25/133	4	including elements passing panchromatic light, e.g. filters passing white light	
N	H04N 25/134	4	{ based on three different wavelength filter elements }	
N	H04N 25/135	4	{ based on four or more different wavelength filter elements }	
N	H04N 25/136	5	{ using complementary colours }	
N	H04N 25/17	2	Colour separation based on photon absorption depth, e.g. full colour resolution obtained simultaneously at each pixel location	
N	H04N 25/20	1	for transforming only infrared radiation into image signals	



CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 25/21	2	for transforming thermal infrared radiation into image signals	
N	H04N 25/30	1	for transforming X-rays into image signals	
Q	H04N 25/40	1	Extracting pixel data from image sensors by controlling scanning circuits, e.g. by modifying the number of pixels sampled or to be sampled	H04N25/40, H04N25/47
N	H04N 25/41	2	{Extracting pixel data from a plurality of image sensors simultaneously picking up an image, e.g. for increasing the field of view by combining the outputs of a plurality of sensors }	
N	H04N 25/42	2	by switching between different modes of operation using different resolutions or aspect ratios, e.g. switching between interlaced and non-interlaced mode	
N	H04N 25/44	2	by partially reading an SSIS array	
N	H04N 25/441	3	by reading contiguous pixels from selected rows or columns of the array, e.g. interlaced scanning	
N	H04N 25/443	3	by reading pixels from selected 2D regions of the array, e.g. for windowing or digital zooming	
N	H04N 25/445	3	by skipping some contiguous pixels within the read portion of the array	
N	H04N 25/447	3	by preserving the colour pattern with or without loss of information	
N	H04N 25/46	2	by combining or binning pixels	
N	H04N 25/47	1	Image sensors with pixel address output; Event-driven image sensors; Selection of pixels to be read out based on image data	
N	H04N 25/48	1	Increasing resolution by shifting the sensor relative to the scene	
Q	H04N 25/50	1	Control of the SSIS exposure	H04N 25/50, H04N 25/51
N	H04N 25/51	2	Control of the gain	
Q	H04N 25/53	2	Control of the integration time	H04N 25/53, H04N 25/532
N	H04N 25/531	3	by controlling rolling shutters in CMOS SSIS	
N	H04N 25/532	3	by controlling global shutters in CMOS SSIS	

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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Q	H04N 25/533	3	by using differing integration times for different sensor regions	H04N 25/533, H04N 25/535
N	H04N 25/534	4	depending on the spectral component	
N	H04N 25/535	4	by dynamic region selection	
N	H04N 25/57	2	Control of the dynamic range	
N	H04N 25/571	3	involving a non-linear response	
N	H04N 25/573	4	{ the logarithmic type }	
N	H04N 25/575	4	{ with a response composed of multiple slopes }	
N	H04N 25/58	3	involving two or more exposures	
N	H04N 25/581	4	acquired simultaneously	
N	H04N 25/583	5	with different integration times	
N	H04N 25/585	5	with pixels having different sensitivities within the sensor, e.g. fast or slow pixels or pixels having different sizes	
N	H04N 25/587	4	acquired sequentially, e.g. using the combination of odd and even image fields	
N	H04N 25/589	5	with different integration times, e.g. short and long exposures	
N	H04N 25/59	3	by controlling the amount of charge storable in the pixel, e.g. modification of the charge conversion ratio of the floating node capacitance	
Q	H04N 25/60	1	Noise processing, e.g. detecting, correcting, reducing or removing noise	H04N 25/60, H04N 25/61, H04N 25/611, H04N 25/615, H04N 25/6153, H04N 25/616, H04N 25/617, H04N 25/618, H04N 25/62, H04N 25/621, H04N 25/622, H04N 25/623, H04N 25/625, H04N 25/626, H04N 25/627, H04N 25/628, H04N 25/63, H04N 25/633, H04N 25/65,

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Type*</u>	<u>Symbol</u>	<u>Indent Level Number of dots (e.g. 0, 1, 2)</u>	<u>Title</u> <u>“CPC only” text should normally be enclosed in { curly brackets }**</u>	<u>Transferred to#</u>
				H04N 25/67, H04N 25/671 H04N 25/672, H04N 25/673, H04N 25/674, H04N 25/677, H04N 25/68, H04N 25/683, H04N 25/69
N	H04N 25/61	2	the noise originating only from the lens unit, e.g. flare, shading, vignetting or "cos <sup>4</sup> "	
N	H04N 25/611	3	Correction of chromatic aberration	
N	H04N 25/615	3	involving a transfer function modelling the optical system, e.g. optical transfer function [OTF], phase transfer function [PhTF] or modulation transfer function [MTF]	
N	H04N 25/6153	4	{for colour signals }	
N	H04N 25/616	2	involving a correlated sampling function, e.g. correlated double sampling [CDS] or triple sampling	
N	H04N 25/617	2	for reducing electromagnetic interference, e.g. clocking noise	
N	H04N 25/618	2	for random or high-frequency noise	
Q	H04N 25/62	2	Detection or reduction of noise due to excess charges produced by the exposure, e.g. smear, blooming, ghost image, crosstalk or leakage between pixels	H04N 25/62, H04N 25/621, H04N 25/622, H04N 25/623, H04N 25/625, H04N 25/626, H04N 25/627, H04N 25/628
N	H04N 25/621	3	for the control of blooming	
N	H04N 25/622	4	{by controlling anti-blooming drains }	
N	H04N 25/623	4	{by evacuation via the output or reset lines }	
N	H04N 25/625	3	for the control of smear	
N	H04N 25/626	3	Reduction of noise due to residual charges remaining after image readout, e.g. to remove ghost images or afterimages	
N	H04N 25/627	3	Detection or reduction of inverted contrast or eclipsing effects	

## CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 25/628	3	for reducing horizontal stripes caused by saturated regions of CMOS sensors	
Q	H04N 25/63	2	applied to dark current	H04N 25/63, H04N 25/633, H04N 25/67, H04N 25/671, H04N 25/672, H04N 25/673, H04N 25/674, H04N 25/677, H04N 25/68, H04N 25/683
N	H04N 25/633	3	by using optical black pixels	
N	H04N 25/65	2	applied to reset noise, e.g. KTC noise related to CMOS structures by techniques other than CDS	
Q	H04N 25/67	2	applied to fixed-pattern noise, e.g. non-uniformity of response	H04N 25/67, H04N 25/671, H04N 25/672, H04N 25/673, H04N 25/674, H04N 25/677, H04N 25/68, H04N 25/683
N	H04N 25/671	3	for non-uniformity detection or correction	
N	H04N 25/672	4	between adjacent sensors or output registers for reading a single image	
N	H04N 25/673	4	by using reference sources	
N	H04N 25/674	5	based on the scene itself, e.g. defocusing	
N	H04N 25/677	4	for reducing the column or line fixed pattern noise	
Q	H04N 25/68	2	applied to defects	H04N 25/68, H04N 25/69
N	H04N 25/683	3	by defect estimation performed on the scene signal, e.g. real time or on the fly detection	
N	H04N 25/69	3	SSIS comprising testing or correcting structures for circuits other than pixel cells	
N	H04N 25/70	1	SSIS architectures; Circuits associated therewith	
N	H04N 25/701	2	Line sensors	
N	H04N 25/7013	3	{ using abutted sensors forming a long line }	
Q	H04N 25/702	2	SSIS architectures characterised by non-identical, non-equidistant or non-planar pixel layout	H04N 25/702, H04N 25/703, H04N 25/706, H04N 25/707, H04N 25/708
N	H04N 25/703	2	SSIS architectures incorporating pixels for producing signals other than image signals	
N	H04N 25/704	3	Pixels specially adapted for focusing, e.g. phase difference pixel sets	

## CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 25/705	3	Pixels for depth measurement, e.g. RGBZ	
N	H04N 25/706	3	Pixels for exposure or ambient light measuring	
N	H04N 25/707	3	Pixels for event detection	
N	H04N 25/708	3	Pixels for edge detection	
N	H04N 25/709	2	Circuitry for control of the power supply	
N	H04N 25/71	2	Charge-coupled device [CCD] sensors; Charge-transfer registers specially adapted for CCD sensors	
N	H04N 25/711	3	Time delay and integration [TDI] registers; TDI shift registers	
N	H04N 25/713	3	Transfer or readout registers; Split readout registers or multiple readout registers	
N	H04N 25/715	3	using frame interline transfer [FIT]	
N	H04N 25/72	3	using frame transfer [FT]	
N	H04N 25/73	3	using interline transfer [IT]	
Q	H04N 25/74	3	Circuitry for scanning or addressing the pixel array	H04N 25/74, H04N 25/779
Q	H04N 25/745	3	{Circuitry for generating timing or clock signals }	H04N 25/745, H04N 25/7795
Q	H04N 25/75	3	Circuitry for providing, modifying or processing image signals from the pixel array	H04N 25/75, H04N 25/78
N	H04N 25/76	2	Addressed sensors, e.g. MOS or CMOS sensors	
N	H04N 25/766	3	comprising control or output lines used for a plurality of functions, e.g. for pixel output, driving, reset or power	
N	H04N 25/767	3	Horizontal readout lines, multiplexers or registers	
N	H04N 25/768	3	for time delay and integration [TDI]	
N	H04N 25/77	3	Pixel circuitry, e.g. memories, A/D converters, pixel amplifiers, shared circuits or shared components	
N	H04N 25/771	4	comprising storage means other than floating diffusion	
Q	H04N 25/772	4	comprising A/D, V/T, V/F, I/T or I/F converters	H04N 25/772, H04N 25/773

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

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N	H04N 25/773	5	comprising photon counting circuits, e.g. single photon detection [SPD] or single photon avalanche diodes [SPAD]	
N	H04N 25/778	4	comprising amplifiers shared between a plurality of pixels, i.e. at least one part of the amplifier must be on the sensor array itself	
N	H04N 25/779	3	Circuitry for scanning or addressing the pixel array	
N	H04N 25/7795	3	{Circuitry for generating timing or clock signals }	
N	H04N 25/78	3	Readout circuits for addressed sensors, e.g. output amplifiers or A/D converters	
N	H04N 25/79	2	Arrangements of circuitry being divided between different or multiple substrates, chips or circuit boards, e.g. stacked image sensors	

\*N = new entries where reclassification into entries is involved; C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; T = existing entries with enlarged file scope, which receive documents from C or D entries, e.g. when a limiting reference is removed from the entry title; M = entries with no change to the file scope (no reclassification); D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed; U = entries that are unchanged.

NOTES:

- \*\*No {curly brackets} are used for titles in CPC only subclasses, e.g. C12Y, A23Y; 2000 series symbol titles of groups found at the end of schemes (orthogonal codes); or the Y section titles. The {curly brackets} are used for 2000 series symbol titles found interspersed throughout the main trunk schemes (breakdown codes).
- U groups: it is obligatory to display the required “anchor” symbol (U group), i.e. the entry immediately preceding a new group or an array of new groups to be created (in case new groups are not clearly subgroups of C-type groups). Always include the symbol, indent level and title of the U group in the table above.
- All entry types should be included in the scheme changes table above for better understanding of the overall scheme change picture. Symbol, indent level, and title are required for all types.
- “Transferred to” column must be completed for all C, D, F, and Q type entries. F groups will be deleted once reclassification is completed.
- When multiple symbols are included in the “Transferred to” column, avoid using ranges of symbols in order to be as precise as possible.
- For administrative transfer of documents, the following text should be used: “<administrative transfer to XX>”, “<administrative transfer to XX and YY simultaneously>”, or “<administrative transfer to XX, YY, ...and ZZ simultaneously>” when administrative transfer of the same documents is to more than one place.
- Administrative transfer to main trunk groups is assumed to be the source allocation type, unless otherwise indicated.
- Administrative transfer to 2000/Y series groups is assumed to be “additional information”.
- If needed, instructions for allocation type should be indicated within the angle brackets using the abbreviations “ADD” or “INV”: <administrative transfer to XX ADD>, <administrative transfer to XX INV>, or <administrative transfer to XX ADD, YY INV, ... and ZZ ADD simultaneously>.
- In certain situations, the “D” entries of 2000-series or Y-series groups may not require a destination (“Transferred to”) symbol, however it is required to specify “<no transfer>” in the “Transferred to” column for such cases.
- For finalisation projects, the deleted “F” symbols should have <no transfer> in the “Transferred to” column.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

- For more details about the types of scheme change, see CPC Guide.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

B. New, Modified or Deleted Warning(s)

**SUBCLASS H04N - PICTORIAL COMMUNICATION, e.g. TELEVISION**

<u>Type*</u>	<u>Location</u>	<u>Old Warning</u>	<u>New/Modified Warning</u>
N	H04N 5/202		Group H04N 5/202 is impacted by reclassification into group H04N 23/82. Groups H04N 5/202 and H04N 23/82 should be considered in order to perform a complete search.
N	H04N 5/30		Group H04N 5/30 is impacted by reclassification into group H04N 25/00. Groups H04N 5/30 and H04N 25/00 should be considered in order to perform a complete search.
N	H04N 5/32		Group H04N 5/32 is impacted by reclassification into groups H04N 23/30 and H04N 25/30. Groups H04N 5/32, H04N 23/30 and H04N 25/30 should be considered in order to perform a complete search.
N	H04N 5/33		Group H04N 5/33 is impacted by reclassification into groups H04N 23/20, H04N 23/21, H04N 23/23, H04N 25/20 and H04N 25/21. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 9/64		Group H04N 9/64 is impacted by reclassification into group H04N 23/84. Groups H04N 9/64 and H04N 23/84 should be considered in order to perform a complete search.
N	H04N 9/67		Group H04N 9/67 is impacted by reclassification into group H04N 23/85. Groups H04N 9/67 and H04N 23/85 should be considered in order to perform a complete search.
N	H04N 9/68		Group H04N 9/68 is impacted by reclassification into group H04N 23/86. Groups H04N 9/68 and H04N 23/86 should be considered in order to perform a complete search.
N	H04N 9/69		Group H04N 9/69 is impacted by reclassification into group H04N 23/83. Groups H04N 9/69 and H04N 23/83 should be considered in order to perform a complete search.
N	H04N 9/72		Group H04N 9/72 is impacted by reclassification into group H04N 23/87. Groups H04N 9/72 and H04N 23/87 should be considered in order to perform a complete search.
N	H04N 9/73		Group H04N 9/73 is impacted by reclassification into group H04N 23/88. Groups H04N 9/73 and H04N 23/88 should be considered in order to perform a complete search.
N	H04N 23/00		Group H04N 23/00 is impacted by reclassification into groups H04N 23/95, H04N 23/955 and H04N 23/958. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 23/10		Group H04N 23/10 is impacted by reclassification into groups H04N 23/11, H04N 25/10 and H04N 25/17. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 23/11		Group H04N 23/11 is incomplete pending reclassification of documents from group H04N 23/10. Group H04N 23/11 is also impacted by reclassification into group H04N 25/131. Groups H04N 23/10, H04N 23/11 and H04N 25/131 should be considered in order to perform a complete search.



CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<b><u>Type*</u></b>	<b><u>Location</u></b>	<b><u>Old Warning</u></b>	<b><u>New/Modified Warning</u></b>
N	H04N 23/20		Groups H04N 23/20, H04N 23/21 and H04N 23/23 are incomplete pending reclassification of documents from group H04N 5/33. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 23/30		Group H04N 23/30 is incomplete pending reclassification of documents from group H04N 5/32. Groups H04N 5/32 and H04N 23/30 should be considered in order to perform a complete search.
N	H04N 23/80		Group H04N 23/80 is impacted by reclassification into groups H04N 23/90, H04N 23/95, H04N 23/951, H04N 23/955, H04N 23/957, H04N 23/958 and H04N 23/959. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 23/82		Group H04N 23/82 is incomplete pending reclassification of documents from group H04N 5/202. Groups H04N 5/202 and H04N 23/82 should be considered in order to perform a complete search.
N	H04N 23/83		Group H04N 23/83 is incomplete pending reclassification of documents from group H04N 9/69. Groups H04N 9/69 and H04N 23/83 should be considered in order to perform a complete search.
N	H04N 23/84		Group H04N 23/84 is incomplete pending reclassification of documents from group H04N 9/64. Groups H04N 9/64 and H04N 23/84 should be considered in order to perform a complete search.
N	H04N 23/85		Group H04N 23/85 is incomplete pending reclassification of documents from group H04N 9/67. Groups H04N 9/67 and H04N 23/85 should be considered in order to perform a complete search.
N	H04N 23/86		Group H04N 23/86 is incomplete pending reclassification of documents from group H04N 9/68. Groups H04N 9/68 and H04N 23/86 should be considered in order to perform a complete search.
N	H04N 23/87		Group H04N 23/87 is incomplete pending reclassification of documents from group H04N 9/72. Groups H04N 9/72 and H04N 23/87 should be considered in order to perform a complete search.
N	H04N 23/88		Group H04N 23/88 is incomplete pending reclassification of documents from group H04N 9/73. Groups H04N 9/73 and H04N 23/88 should be considered in order to perform a complete search.
N	H04N 23/90		Group H04N 23/90 is incomplete pending reclassification of documents from group H04N 23/80. Groups H04N 23/80 and H04N 23/90 should be considered in order to perform a complete search.
N	H04N 23/95		Groups H04N 23/95, H04N 23/955 and H04N 23/958 are incomplete pending reclassification of documents from groups H04N 23/00 and H04N 23/80. All groups listed in this Warning should be considered in order to perform a complete search.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Type*</u>	<u>Location</u>	<u>Old Warning</u>	<u>New/Modified Warning</u>
N	H04N 23/951		Group H04N 23/951 is incomplete pending reclassification of documents from group H04N 23/80. Groups H04N 23/80 and H04N 23/951 should be considered in order to perform a complete search.
N	H04N 23/955		Group H04N 23/955 is incomplete pending reclassification of documents from group H04N 23/00. Groups H04N 23/00 and H04N 23/955 should be considered in order to perform a complete search.
N	H04N 23/957		Group H04N 23/957 is incomplete pending reclassification of documents from group H04N 23/80. Groups H04N 23/80 and H04N 23/957 should be considered in order to perform a complete search.
N	H04N 23/959		Group H04N 23/959 is incomplete pending reclassification of documents from group H04N 23/80. Groups H04N 23/80 and H04N 23/959 should be considered in order to perform a complete search.
N	H04N 23/958		Group H04N 23/958 is incomplete pending reclassification of documents from group H04N 23/00. Groups H04N 23/00 and H04N 23/958 should be considered in order to perform a complete search.
N	H04N 25/00		Group H04N 25/00 is incomplete pending reclassification of documents from group H04N 5/30. Groups H04N 5/30 and H04N 25/00 should be considered in order to perform a complete search.
N	H04N 25/10		Groups H04N 25/10 and H04N 25/17 are incomplete pending reclassification of documents from group H04N 23/10. Groups H04N 23/10, H04N 25/10 and H04N 25/17 should be considered in order to perform a complete search.
N	H04N 25/131		Group H04N 25/131 is incomplete pending reclassification of documents from group H04N 23/11. Groups H04N 23/11 and H04N 25/131 should be considered in order to perform a complete search.
N	H04N 25/20		Groups H04N 25/20 and H04N 25/21 are incomplete pending reclassification of documents from group H04N 5/33. Groups H04N 5/33, H04N 25/20 and H04N 25/21 should be considered in order to perform a complete search.
N	H04N 25/30		Group H04N 25/30 is incomplete pending reclassification of documents from group H04N 5/32. Groups H04N 5/32 and H04N 25/30 should be considered in order to perform a complete search.
N	H04N 25/40		Group H04N 25/40 is impacted by reclassification into group H04N 25/47. Groups H04N 25/40 and H04N 25/47 should be considered in order to perform a complete search.
N	H04N 25/47		Group H04N 25/47 is incomplete pending reclassification of documents from group H04N 25/40. Groups H04N 25/40 and H04N 25/47 should be considered in order to perform a complete search.
N	H04N 25/50		Group H04N 25/50 is impacted by reclassification into group H04N 25/51. Groups H04N 25/50 and H04N 25/51 should be considered in order to perform a complete search.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Type*</u>	<u>Location</u>	<u>Old Warning</u>	<u>New/Modified Warning</u>
N	H04N 25/51		Group H04N 25/51 is incomplete pending reclassification of documents from group H04N 25/50. Groups H04N 25/50 and H04N 25/51 should be considered in order to perform a complete search.
N	H04N 25/53		Group H04N 25/53 is impacted by reclassification into group H04N 25/532. Groups H04N 25/53 and H04N 25/532 should be considered in order to perform a complete search.
N	H04N 25/532		Group H04N 25/532 is incomplete pending reclassification of documents from group H04N 25/53. Groups H04N 25/53 and H04N 25/532 should be considered in order to perform a complete search.
N	H04N 25/533		Group H04N 25/533 is impacted by reclassification into group H04N 25/535. Groups H04N 25/533 and H04N 25/535 should be considered in order to perform a complete search.
N	H04N 25/535		Group H04N 25/535 is incomplete pending reclassification of documents from group H04N 25/533. Groups H04N 25/533 and H04N 25/535 should be considered in order to perform a complete search.
N	H04N 25/60		Group H04N 25/60 is impacted by reclassification into groups H04N 25/61-H04N 25/69. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/61		Groups H04N 25/61, H04N 25/611, H04N 25/615 and H04N 25/6153 are incomplete pending reclassification of documents from group H04N 25/60. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/616		Group H04N 25/616 is incomplete pending reclassification of documents from group H04N 25/60. Groups H04N 25/60 and H04N 25/616 should be considered in order to perform a complete search.
N	H04N 25/617		Group H04N 25/617 is incomplete pending reclassification of documents from group H04N 25/60. Groups H04N 25/60 and H04N 25/617 should be considered in order to perform a complete search.
N	H04N 25/618		Group H04N 25/618 is incomplete pending reclassification of documents from group H04N 25/60. Groups H04N 25/60 and H04N 25/618 should be considered in order to perform a complete search.
N	H04N 25/62		Group H04N 25/62 is incomplete pending reclassification of documents from group H04N 25/60. Group H04N 25/62 is also impacted by reclassification into groups H04N 25/621, H04N 25/622, H04N 25/623, H04N 25/625, H04N 25/626, H04N 25/627 and H04N 25/628. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/621		Groups H04N 25/621, H04N 25/622 and H04N 25/623 are incomplete pending reclassification of documents from groups H04N 25/60 and H04N 25/62. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/625		Group H04N 25/625 is incomplete pending reclassification of documents from groups H04N 25/60 and H04N 25/62. Groups

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Type*</u>	<u>Location</u>	<u>Old Warning</u>	<u>New/Modified Warning</u>
			H04N 25/60, H04N 25/62 and H04N 25/625 should be considered in order to perform a complete search.
N	H04N 25/626		Group H04N 25/626 is incomplete pending reclassification of documents from groups H04N 25/60 and H04N 25/62. Groups H04N 25/60, H04N 25/62 and H04N 25/626 should be considered in order to perform a complete search.
N	H04N 25/627		Group H04N 25/627 is incomplete pending reclassification of documents from groups H04N 25/60 and H04N 25/62. Groups H04N 25/60, H04N 25/62 and H04N 25/627 should be considered in order to perform a complete search.
N	H04N 25/628		Group H04N 25/628 is incomplete pending reclassification of documents from groups H04N 25/60 and H04N 25/62. Groups H04N 25/60, H04N 25/62 and H04N 25/628 should be considered in order to perform a complete search.
N	H04N 25/63		Group H04N 25/63 is incomplete pending reclassification of documents from group H04N 25/60. Group H04N 25/63 is also impacted by reclassification into groups H04N 25/633, H04N 25/67, H04N 25/671, H04N 25/672, H04N 25/673, H04N 25/674, H04N 25/677, H04N 25/68 and H04N 25/683. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/633		Group H04N 25/633 is incomplete pending reclassification of documents from groups H04N 25/60 and H04N 25/63. Groups H04N 25/60, H04N 25/63 and H04N 25/633 should be considered in order to perform a complete search.
N	H04N 25/65		Group H04N 25/65 is incomplete pending reclassification of documents from group H04N 25/60. Groups H04N 25/60 and H04N 25/65 should be considered in order to perform a complete search.
N	H04N 25/67		Group H04N 25/67 is incomplete pending reclassification of documents from groups H04N 25/60 and H04N 25/63. Group H04N 25/67 is also impacted by reclassification into groups H04N 25/671, H04N 25/672, H04N 25/673, H04N 25/674, H04N 25/677, H04N 25/68 and H04N 25/683. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/671		Groups H04N 25/671, H04N 25/672, H04N 25/673, H04N 25/674 and H04N 25/677 are incomplete pending reclassification of documents from groups H04N 25/60, H04N 25/63 and H04N 25/67. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/68		Group H04N 25/68 is incomplete pending reclassification of documents from groups H04N 25/60, H04N 25/63 and H04N 25/67. Group H04N 25/68 is also impacted by reclassification into group H04N 25/69. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/683		Group H04N 25/683 is incomplete pending reclassification of documents from groups H04N 25/60, H04N 25/63 and H04N 25/67. All groups listed in this Warning should be considered in order to perform a complete search.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<b>Type*</b>	<b>Location</b>	<b>Old Warning</b>	<b>New/Modified Warning</b>
N	H04N 25/69		Group H04N 25/69 is incomplete pending reclassification of documents from groups H04N 25/60 and H04N 25/68. Groups H04N 25/60, H04N 25/68 and H04N 25/69 should be considered in order to perform a complete search.
N	H04N 25/702		Group H04N 25/702 is impacted by reclassification into groups H04N 25/703, H04N 25/706, H04N 25/707 and H04N 25/708. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/703		Groups H04N 25/703, H04N 25/706, H04N 25/707 and H04N 25/708 are incomplete pending reclassification of documents from group H04N 25/702. All groups listed in this Warning should be considered in order to perform a complete search.
N	H04N 25/74		Group H04N 25/74 is impacted by reclassification into group H04N 25/779. Groups H04N 25/74 and H04N 25/779 should be considered in order to perform a complete search.
N	H04N 25/745		Group H04N 25/745 is impacted by reclassification into group H04N 25/7795. Groups H04N 25/745 and H04N 25/7795 should be considered in order to perform a complete search.
N	H04N 25/75		Group H04N 25/75 is impacted by reclassification into group H04N 25/78. Groups H04N 25/75 and H04N 25/78 should be considered in order to perform a complete search.
N	H04N 25/772		Group H04N 25/772 is impacted by reclassification into group H04N 25/773. Groups H04N 25/772 and H04N 25/773 should be considered in order to perform a complete search.
N	H04N 25/773		Group H04N 25/773 is incomplete pending reclassification of documents from group H04N 25/772. Groups H04N 25/772 and H04N 25/773 should be considered in order to perform a complete search.
N	H04N 25/779		Group H04N 25/779 is incomplete pending reclassification of documents from group H04N 25/74. Groups H04N 25/74 and H04N 25/779 should be considered in order to perform a complete search.
N	H04N 25/7795		Group H04N 25/7795 is incomplete pending reclassification of documents from group H04N 25/745. Groups H04N 25/745 and H04N 25/7795 should be considered in order to perform a complete search.
N	H04N 25/78		Group H04N 25/78 is incomplete pending reclassification of documents from group H04N 25/75. Groups H04N 25/75 and H04N 25/78 should be considered in order to perform a complete search.

\*N = new warning, M = modified warning, D = deleted warning

NOTE: The "Location" column only requires the symbol PRIOR to the location of the warning. No further directions such as "before" or "after" are required.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

C. New, Modified or Deleted Note(s)

**SUBCLASS H04N - PICTORIAL COMMUNICATION, e.g. TELEVISION**

<u>Type*</u>	<u>Location</u>	<u>Old Note</u>	<u>New/Modified Note</u>
D	H04N 5/335	In this group, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.	<u>Delete:</u> The entire Note.

\*N = new note, M = modified note, D = deleted note

NOTE: The "Location" column only requires the symbol PRIOR to the location of the note. No further directions such as "before" or "after" are required.

## 2. A. DEFINITIONS (New)

### H04N 23/00

#### Definition statement

*This place covers:*

Processes and apparatus related to the concept of electronic image capturing using an electronic image sensor and the related control and processing of the generated electronic image signals.

Image pickup devices using electronic image sensors [EIS], e.g. digital cameras, video cameras, TV cameras, CCTV cameras, surveillance cameras, camcorders, digital cameras embedded in mobile phones, aspects peculiar to the presence of EIS in electronic still cameras, digital still cameras, etc.

Electronic image capture by methods or arrangements involving at least the following step: the scanning of a picture, i.e. resolving the whole picture-containing area or scene into individual picture-elements and the derivation of picture-representative electric signals related thereto, simultaneously or in sequence, e.g. by reading an electronic solid-state image sensor [SSIS] pickup device (e.g. CCD or CMOS image sensor) as electronic image sensor converting optical image information into said electrical signals.

In colloquial speech, said step is frequently formulated as, e.g. capturing a video sequence, digital photographing, etc.

Concerning cameras:

- video cameras, TV cameras (e.g. in studios), CCTV cameras, surveillance cameras, camcorders; constructional and mechanical details related to such cameras even when not peculiar to the presence of the EIS, e.g. housings;
- arrangements/methods for image capture using an electronic image sensor (EIS), i.e. (i) sensor read-out; (ii) processing or use of electrical image signals from the EIS for the generation of camera control signals;
- for controlling the EIS or its read-out for, e.g. exposure, scene selection for auto focusing, or electronic image enhancement or processing of image signals captured by the EIS, e.g. white balance, electronic motion blur correction, noise suppressing;
- for controlling other camera functions, e.g. exposure, shaking by influencing optical parts of the camera, focusing;

DATE: JANUARY 1, 2023

PROJECT RP11902

- in-camera image processing, e.g. correction of lens distortion, defect pixel correction, noise suppression, removal of motion blur, improving the dynamic range of the final image;
- electronic viewfinders, control of image pickup devices based on information displayed by the electronic viewfinder;
- electrical and mechanical aspects of camera modules using electronic image sensors and related constructional details as in webcams or mobile phones;
- remote control of cameras peculiar to the EIS, e.g. affecting their operation, or being based on a generated image signal;
- adaptations peculiar to the presence or use of an EIS, the transmission, recording or other use of electrical image data and related circuitry, e.g. mounting of EIS, integrated cleaning system for the EIS, dust mapping, cooling of the EIS, controlling the operation of the EIS by external input signals;
- cameras wherein the inventive contribution lies in the interaction of features covered above with those covered by G03B, e.g. switch-over between electronic motion-blur correction of electronic viewfinder during focusing and optical motion-blur correction of the lens during exposure, electronic-motion blur correction of the electronic image signal based on output signals of additional sensor or interaction between mechanical shutter and electronic control of the charge accumulation period of the EIS;
- applications concerning studios and image capturing devices that cannot be classified in lower groups such as camera operation in general, like in studio or for TV events, processing for simulating film look, virtual studio, virtual depth image, video assist system, other studio equipment, e.g. prompter.

### **Relationships with other classification places**

Groups in G03B are to be considered when the following aspects are concerned:

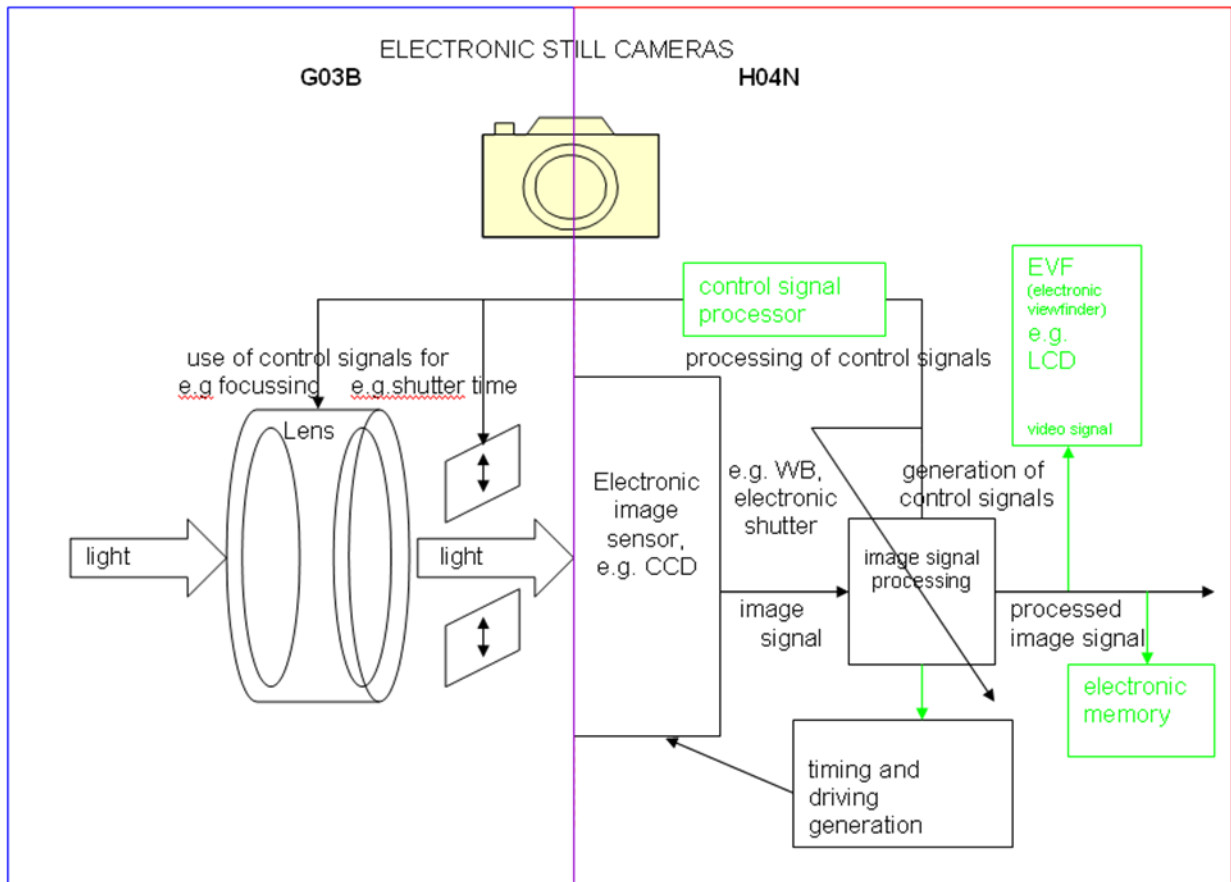
- apparatus/methods for taking photographs using light sensitive film for image capture, apparatus/methods for printing, for projecting or viewing images using film stock, photographic film or slides by optical means, e.g. mounting of optical elements, flashes and their related controls, e.g. exposure, focus, (opto-)mechanical motion blur (anti-shake), cooling, beam shaping;
- aspects of apparatus/methods for taking photographs using an electronic image sensor [EIS] for image capture, insofar as they correspond to those of said apparatus/methods for taking photographs using light sensitive film, i.e. insofar not peculiar to the presence or use of the EIS, e.g. mounting of optical elements or flashes,



and their related controls insofar as they are not peculiar to the presence or use of the EIS, e.g. exposure, focus, (opto-)mechanical motion blur correction (anti-shake);

- optical viewfinders;
- remote control of cameras insofar not peculiar to the EIS, e.g. not affecting their operation, or being based on a generated image signal;
- optical aspects of camera modules using electronic image sensors and related constructional details (e.g. lens actuators).

The following scheme is intended to illustrate the relationship between H04N and G03B:



**References**

**Application-oriented References**

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Camera adapted for vehicles	B60R 1/00
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DATE: JANUARY 1, 2023

PROJECT RP11902

Image or video recognition or understanding	G06V
Surveillance systems with alarm	G08B 13/194 - G08B 13/196
Mobile phones	H04M 1/00
Videophones	H04N 7/14
Closed circuit television system	H04N 7/18

### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Radiation diagnosis, diagnostic aspect of medical imaging devices	A61B, A61C
Pyrometry, measuring temperature	G01J 5/00
Measuring X-rays, gamma radiation	G01T 1/00
Optical systems	G02B
Apparatus or arrangements for taking photographs	G03B
Pattern recognition	G06K
Image processing in general, i.e. not being exclusively adapted to be used in an image pickup device containing an EIS or in studio devices or equipment	G06T
Editing of recorded image information	G11B 27/00
Associated working of recording or reproducing apparatus with TV camera or receiver in which the television signal is not significantly involved	G11B 31/006
Tubes	H01J
Solid state imaging devices, e.g. CMOS image sensors	H01L 27/146
Optical elements or arrangements associated with solid state imager structures	H01L 27/14625
CCD image sensors	H01L 27/148
Broadcasting	H04H
Mounting structure in mobile phones	H04M 1/0264
Intermediate information storage using still video cameras	H04N 1/2112

DATE: JANUARY 1, 2023

PROJECT RP11902

Video recording	H04N 5/76, H04N 9/76
Testing of cameras	H04N 17/00
Cameras used as input-only client peripherals for selective content distribution	H04N 21/4223
Circuitry of solid-state image sensors [SSIS] or control thereof	H04N 25/00

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Photography	the process of recording pictures by means of capturing light on a light-sensitive medium, e.g. silver halide based chemical or an electronic image sensor. Light patterns reflected or emitted from objects expose such a light sensitive medium during a timed exposure, usually through a photographic lens in a device known as a camera
Camera	a device capturing image information represented by light patterns reflected or emitted from objects, and exposing a light sensitive film or an electronic image sensor during a timed exposure, usually through an optical lens, and producing an image on a light sensitive film or an electrical image information signal respectively
Projector	a device displaying image information by projection of light patterns, usually through an optical lens, wherein the light patterns are generated by illuminating an image, e.g. film or slide, or by converting an electric image signal into an optical signal using an electronic spatial light modulator
EIS	Electronic image sensor: optoelectronic transducer, converting optical image information into an electrical signal susceptible of being processed, stored, transmitted or displayed
Additional sensor	a sensor, other than the electronic image sensor, used for controlling a camera
ESLM	Electronic spatial light modulator: optoelectronic transducer converting electric signals representing image information into optical image information
Record	a registration (e.g. of sound or images) in permanent form by optical or electrical means for later reproduction

DATE: JANUARY 1, 2023

PROJECT RP11902

**Synonyms and Keywords***In patent documents, the following abbreviations are often used:*

SSIS	Solid State Image Sensor
CCD	Charge-Coupled Device
APS	Active Pixel Sensor
CDS	Correlated Double Sensing
CMOS	Complementary Metal-oxide-semiconductor
CIS	CMOS Image Sensor
AE	Automatic Exposure control
FPN	Fixed Pattern Noise
NUC	Non-Uniformity Correction
HDR	High Dynamic Range
GUI	Graphics User Interface
AF	Autofocus
AFE	Analog Front End
AGC	Automatic Gain Control
DSP	Digital Signal Processor
ENG	Electronic News Gathering
PTZ	Pan Tilt Zoom
EVF	Electronic Viewfinder
OVF	Optical Viewfinder

*In patent documents, the following words/expressions are often used as synonyms:*

- "digital photography", "digital camera", "camcorder", "video camera", "still video", "camera" and "digital still camera"

DATE: JANUARY 1, 2023

PROJECT RP11902

**H04N 23/11****Definition statement***This place covers:*

Camera architectures:

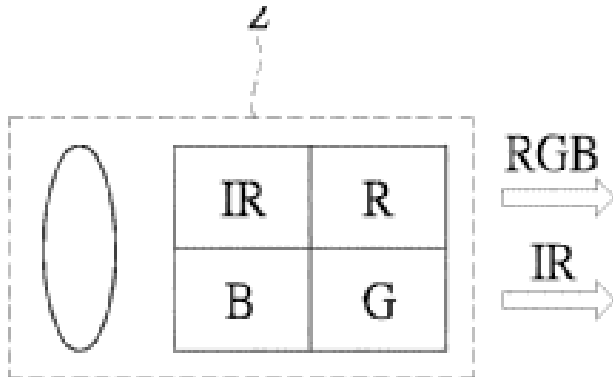
- for generation of colour signals by using switchable colour filters or light sources, or by using different image sensors;
- for generation of RGB; RGBIR; RGBW; RW; R+(N)IR, G+IR, B+IR, W+R signals;
- comprising visible and IR sensors;
- comprising partial IR filters;
- comprising visible light sensors without IR filter, i.e. a pixel captures both visible and IR light (Y+IR);
- comprising switchable IR filter, i.e. the pixels are controlled to capture either only the visible light (Y) or both visible and IR light (Y+IR);
- comprising multiple image sensors at least one of which is sensitive to IR light.

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Investigating the spectrum	<a href="#">G01J 3/28</a>
Imaging spectrometer	<a href="#">G01J 3/2823</a>
Arrangement of colour filter arrays [CFA] or filter mosaics characterised by the spectral characteristics of the filter elements, including elements passing infrared wavelengths	<a href="#">H04N 25/131</a>

**Special rules of classification**

Image sensors comprising visible light and IR light sensitive pixels and image sensors comprising pixels both visible and IR light (Y+IR) and IR light sensitive pixels (IR) are classified in group [H04N 25/131](#).



**H04N 23/16**

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Beam splitting or combining systems per se	<a href="#">G02B 27/10</a>
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**H04N 23/17**

**References**

**Limiting references**

*This place does not cover:*

Scanning of colour motion picture films, e.g. for telecine	<a href="#">H04N 9/11</a>
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**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Scanning by optical-mechanical means only, applicable to television systems in general	<a href="#">H04N 3/02</a>
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DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 23/50

### Definition statement

*This place covers:*

Constructional details of cameras or camera modules (housing, mounting of optical parts, mounting of image sensing part, other camera parts).

### Relationships with other classification places

Constructional details not peculiar to the presence or use of the EIS in electronic still picture cameras, digital still picture camera	G03B
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### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Optical systems	G02B
Tubes	H01J

## H04N 23/60

### Definition statement

*This place covers:*

Internal or external camera control for

- autofocusing operations;
- computer aided image capturing;
- application programs for camera control;
- detecting malfunction;
- face recognition aid;
- generating panoramic field of view;
- power saving or management;
- compensating shutter delay;
- changing the image capture speed;
- performing zoom operations;
- remote control;
- camera shake detection or correction.

Camera control using GUI (graphics user interface).

Camera control using remote control.

Camera control via network.

Camera control in different operation modes like viewfinder or playback mode, autofocus mode, video mode or still capture mode.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Mountings, adjusting means or light-tight connections, for optical elements	<a href="#">G02B 7/00</a>
Circuitry for compensating brightness variation in the scene	<a href="#">H04N 23/70</a>



DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 23/61

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Image or video recognition or understanding	G06V
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## H04N 23/611

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Recognition of human faces	G06V 40/16
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## H04N 23/62

### Definition statement

*This place covers:*

User interfaces to control camera parameters which can be separated from or integrated in the camera.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Graphical user interfaces [GUI] specially adapted for controlling image capture or setting capture parameters, e.g. touchscreens	H04N 23/631
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DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 23/63

### Definition statement

*This place covers:*

Camera viewfinders displaying image signals provided by an electronic image sensor and optionally displaying additional information related to control or operation of the camera.

### Relationships with other classification places

Optical viewfinders are classified in [G03B 13/02](#).

## H04N 23/631

### Definition statement

*This place covers:*

A graphical user interface, e.g. a touchscreen, which is integrated on an electronic viewfinder.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Control of parameters via user interfaces	<a href="#">H04N 23/62</a>
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DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 23/65

### Relationships with other classification places

Details of circuitry for controlling the generation or management of the power supply for a solid-state image sensor [SSIS] is classified in [H04N 25/709](#).

Details of energy supply or management for digital still cameras not peculiar to the electronic image sensor are classified in groups [G03B 7/26](#).

Details of energy supply or management for details classifiable under [G03B 17/00](#) (Details of cameras or camera bodies; Accessories therefor) are also classified in [G03B 2217/007](#).

## H04N 23/67

### Relationships with other classification places

Mounting of focusing coils are classified in [H04N 23/54](#).

Focusing aids not based on image signals provided by an electronic image sensor are classified in group [G03B 13/18](#).

Constructional details of means for focusing for cameras are classified in group [G03B 13/32](#).

## References

### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Generation of focusing signals, in general	<a href="#">G02B 7/28</a>
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## H04N 23/671

### Relationships with other classification places

Rangefinders coupled with focusing arrangements are classified in group [G03B 13/20](#).

DATE: JANUARY 1, 2023

PROJECT RP11902

**H04N 23/676****References****Informative References***Attention is drawn to the following places, which may be of interest for search:*

Bracketing for compensating for variations in the brightness	<a href="#">H04N 23/743</a>
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**H04N 23/695****References****Informative References***Attention is drawn to the following places, which may be of interest for search:*

TV type tracking system	<a href="#">G01S 3/7864</a>
Analysis of motion by image processing in general	<a href="#">G06T 7/20</a>
Determining position or orientation of objects by image processing in general	<a href="#">G06T 7/70</a>
Tracking of movement using TV cameras of a target in burglar, theft or intruder alarms	<a href="#">G08B 13/19608</a>

DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 23/70

### Definition statement

*This place covers:*

Circuitry for compensating for variation in the brightness of the object. For example, dynamic range increase, bracketing, use of brightness histograms or brightness compensation by controlling shutter, filter, gain or illumination means.

### References

#### Application-oriented References

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Control of the SSIS exposure	H04N 25/50
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#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Exposure control for film cameras or cameras using an additional sensor	G03B 7/00
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## H04N 23/743

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Bracketing for image capture at varying focusing conditions	H04N 23/676
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DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 23/81

### References

#### Application-oriented References

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Noise reduction or noise suppression involving solid-state image sensors	<a href="#">H04N 25/60</a>
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## H04N 23/843

### Definition statement

*This place covers:*

Demosaicing, i.e. interpolating colour pixel values, only if jointly performed in combination with pixel scanning, image readout or different video processing operations within the image sensor.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Computational demosaicing	<a href="#">G06T 3/4015</a>
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## H04N23/90

### Definition statement

*This place covers:*

Systems using several cameras.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Constructional details of cameras
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<a href="#">H04N 23/50</a>
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## H04N 23/95

### Definition statement

*This place covers:*

- Computational photography requires combination of optical light modulation and computational reconstruction for acquiring dimensions of the plenoptic function.
- Light field imaging systems for light field acquisition:
  - using array of cameras;
  - using single sensor with temporal, spatial or frequency-domain multiplexing;
  - temporal multiplexing with a programable aperture;
  - spatial multiplexing using an array of lens or prisms;
  - frequency multiplexing by placing heterodyne mask.
- Camera systems comprising: Different types of image sensors, sensors of different resolutions, sensors with different field of view or focus.
- Lensless imaging using:
  - coded aperture masks;
  - zone plates;
  - angle-sensitive pixels using diffraction gratings.
- Coded-aperture imaging.
- Extended Depth of Field Photography using:
  - focal stacks;
  - focal sweep (moving the camera during the exposure);
  - coded apertures.
- High speed imaging using:
  - multiple devices;
  - high speed illumination;
  - stroboscopic illumination;
  - synthetic shutter speed imaging.

DATE: JANUARY 1, 2023

PROJECT RP11902

### Relationships with other classification places

This group covers image pickup devices using electronic image sensors for computational photography.

Devices for acquisition of colour spectrum, which is one dimension of the plenoptic function are classified in group [G01J 3/00](#).

Pure image processing techniques used regardless of optical light modulation caused by the image pickup device are classified in groups [G06T 3/00](#), [G06T 5/00](#) and [H04N 23/80](#).

High dynamic range imaging and exposure bracketing are classified in groups [H04N 23/741](#) and [H04N 23/743](#), respectively.

High resolution imaging by shifting the sensor relative to the scene is classified in group [H04N 25/48](#).

### Informative references

Geometric image transformation in the plane of the image	<a href="#">G06T 3/00</a>
Image enhancement or restoration	<a href="#">G06T 5/00</a>



**H04N 25/00**

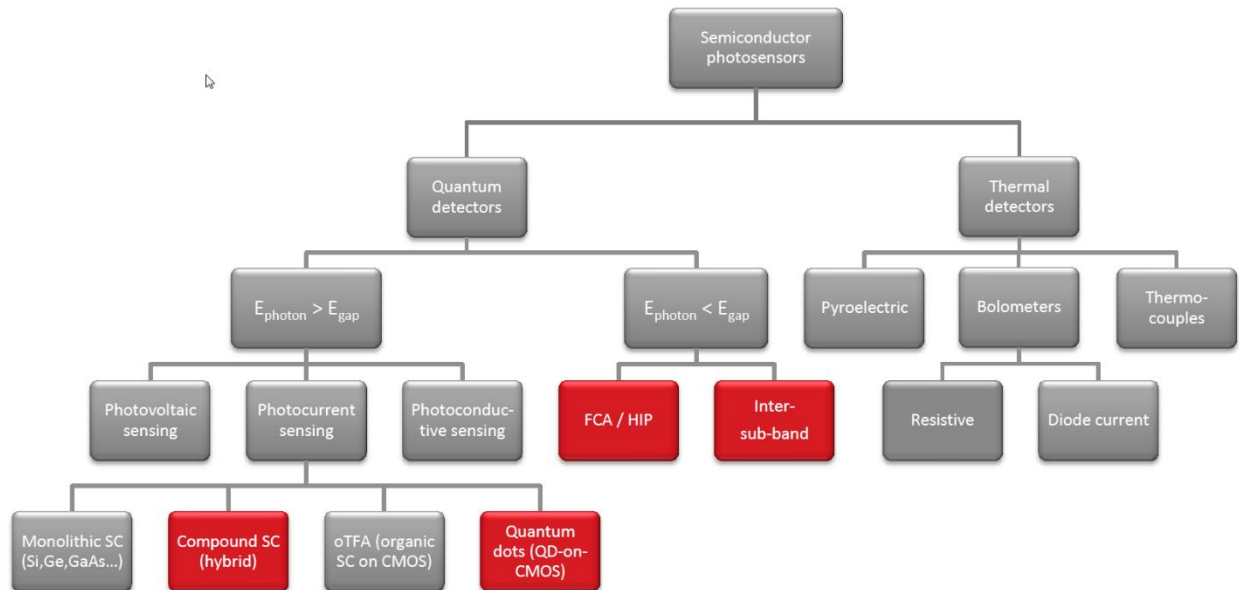
**Definition statement**

*This place covers:*

Circuitry and driving details of solid-state image sensors, in particular the circuitry and driving details of image sensors are directed to the following purpose and functions:

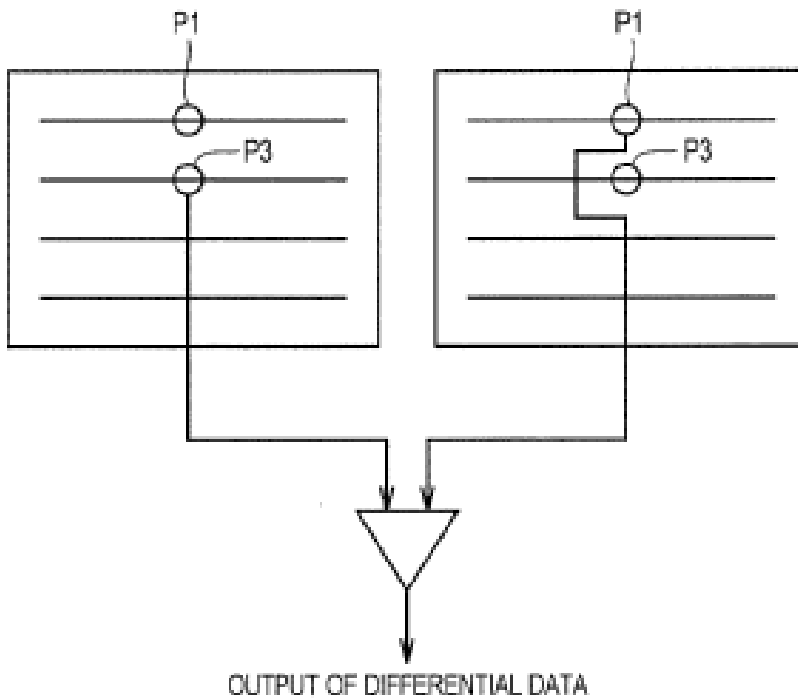
- reading out image data from the image sensor;
- performing image processing within the image sensor;
- control of exposure time by electronic shutter;
- noise removal;
- improvement of resolution;
- extension of dynamic ranges.

Solid-state image sensors encompass charge-coupled devices (CCDs), charge injection devices (CIDs), addressable photodiode arrays, Complementary Metal Oxide (CMOS) Image sensors, etc.



Solid-state image sensors normally capture and output image data as raw image. However, there are special image sensors that capture/process and output the image data. Details of such sensors are classified in the main group [H04N 25/00](#), for example:

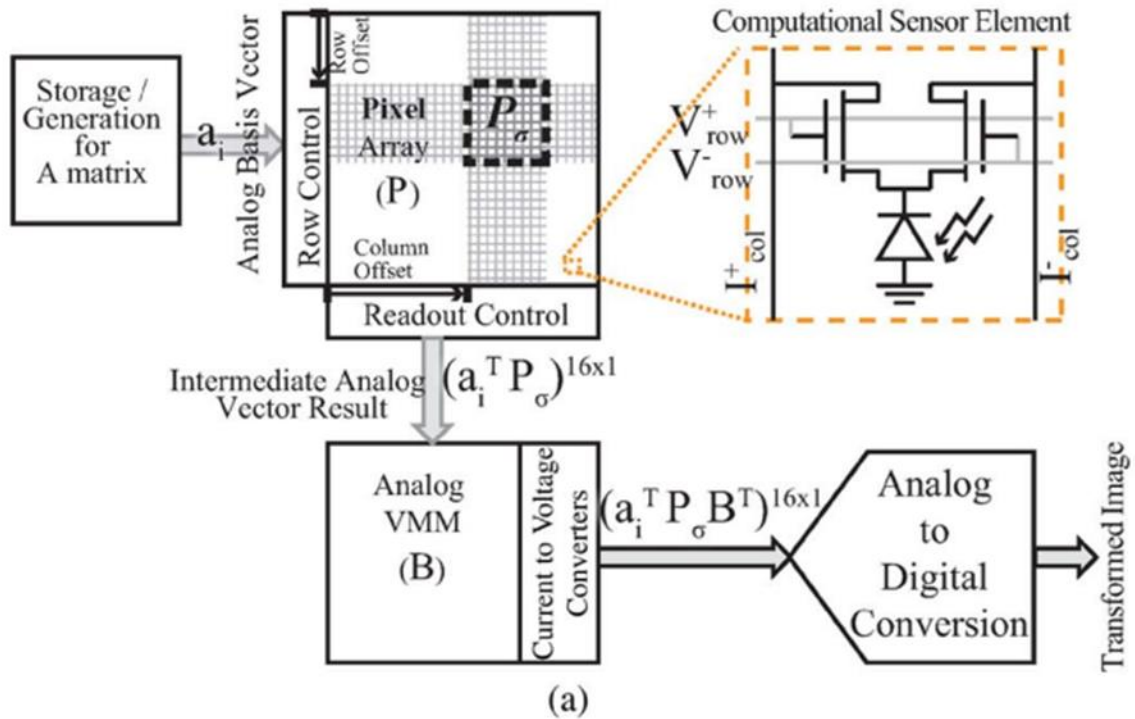
- image sensors having on-chip compression means for data rate reduction purposes, e.g. DCT, wavelet transformation in the sensor;
- image sensors having on-chip compression means for data rate reduction purposes by outputting differential data, like difference between two exposures or events detecting a predetermined change of the image signal or differences between neighbouring pixels;



- compressive sensing sensors, details of compressive sensing and sparse sampling group [H03M 7/3062](#);

DATE: JANUARY 1, 2023

PROJECT RP11902



- image sensors performing global operations like histogramming, sorting, region segmentation/labelling, convolution functions, character recognition, or detecting maximum/minimum level;
- image sensors with edge detection in the sensor, for detection difference between pixel signals in spatial domain, for spatial filtering;
- image sensors with motion or event detection in the sensor, i.e. detection change between pixel signals in time;
- image sensors comprising a dedicated temperature sensor or being controlled by the sensor temperature.

### Relationships with other classification places

While main group [H04N 25/00](#) is, inter alia, used for classifying electronic circuits of solid-state image sensors and their driving, control and readout, the groups in main group [H01L 27/00](#) are about technology details related to the implementation of the electronic circuits on a semiconductor chip.

### References

#### Informative References

DATE: JANUARY 1, 2023

PROJECT RP11902

*Attention is drawn to the following places, which may be of interest for search:*

Receivers for pulse based Lidars	G01S 7/486
Receivers for non-pulse based Lidars	G01S 7/4912
Computer systems using neural network models	G06N 3/02
Arrangements for image or video recognition	G06V 10/00
Imager structures consisting of a plurality of semiconductor or other solid-state components formed in or on a common substrate	H01L 27/146
Charged coupled imagers	H01L 27/148
Details of scanning heads	H04N 1/024
Scanning arrangements	H04N 1/04

### Special rules of classification

- Group [H04N 25/00](#) shall be assigned for solid state image sensors not classified in subgroups, for example:
  - SSIS with power optimisation
  - SSIS with processing time optimisation by using for example parallel processing circuitry
- In many cases it is useful to supplement an identified function covered in the groups [H04N 25/00](#) - [H04N 25/683](#) with a code corresponding to the sensor technology CCD/MOS covered in groups [H04N 25/71](#), [H04N 25/76](#) or [H04N 25/77](#). As an example, a dark current correction for CCD would be classified in group [H04N 25/63](#) and group [H04N 25/71](#).

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Image sensor	An image sensor is a sensor that detects and conveys the information that constitutes an image. An image sensor may do so by producing a signal that represents location-dependent attenuation of light (as the light passes through or reflects off a medium). The signal is an electric signal such as an electric voltage or current. The light an image sensor may detect is not limited to visible light, but can be electromagnetic radiation in other
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DATE: JANUARY 1, 2023

PROJECT RP11902

	wavelengths (e.g., infrared, ultraviolet, X-ray, gamma ray).
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## H04N 25/10

### Definition statement

*This place covers:*

- Architectures of colour filter arrays, e.g. arrangement of the colours in the colour filter array, number of the colours in the CFA, CFA comprising white or (N)IR pixels;
- Filter arrays characterised by the selection of Primary colours, complementary colours, other colours, e.g. emerald, panchromatic filters, elements with different spectral sensitivity for the same colour, e.g. G1 and G2;
- Elements passing: IR, RGB+IR, W+IR;
- Random arrangement of the colour filter elements;
- CFA characterised by the size of the periodically replicated pattern;
- CFA using repeating patterns with more than one element of the same colour adjacent to each other, e.g. Quad Bayer;
- Sensors for performing colour separation based on photon absorption depth;
- Circuitry of the sensor for performing colour imaging operations.

## H04N 25/131

### References

#### **Informative References**

*Attention is drawn to the following places, which may be of interest for search:*

DATE: JANUARY 1, 2023

PROJECT RP11902

Transforming only infrared radiation into image signals	<a href="#">H04N 25/20</a>
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**H04N 25/20****Definition statement***This place covers:*

Solid state image sensors and control thereof for near and far infrared [IR] cameras.

**References****Informative References***Attention is drawn to the following places, which may be of interest for search:*

Non-uniformity correction	<a href="#">H04N 25/60</a>
Radiation pyrometry	<a href="#">G01J 5/00</a>

**Special rules of classification**

In many cases it is necessary to add a code for an identified function or circuitry design covered in group [H04N 25/00](#).

**H04N 25/30****Definition statement***This place covers:*

Electronic circuitry of X-ray imaging detectors that directly or indirectly detect incident X-ray photons:

- current integrating detectors (CID) or energy integrating detectors (EID);
- photon counting detectors (PCD). Some X-ray PCDs rely on continuous time current monitoring and pulse counting implementation of photon counting. Each pixel typically contains a pulse shaping circuit along with a thresholding system connected to a counter;

DATE: JANUARY 1, 2023

PROJECT RP11902

- details of generating control signals based on data from the image sensor, like irradiation start/stop detection based on dummy readouts or form signals from specific pixels;
- operation and control of different sensor modes, like entering and control in sleep mode.

## References

### Application-oriented References

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Apparatus for radiation diagnosis	A61B 6/00
Investigation of materials using radiation	G01N 23/00
Nuclear Magnetic Resonance imaging systems	G01R 33/48
X-ray apparatus or circuits therefor	H05G 1/00

### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Measuring X-radiation, gamma radiation, corpuscular radiation or cosmic radiation	G01T 1/00
Measuring X-radiation, gamma radiation, corpuscular radiation or cosmic radiation with semiconductor detectors	G01T 1/24
Apparatus for taking X-ray photographs	G03B 42/02
X-ray photographic processes	G03C 5/16
Image data processing	G06T
Medical informatics	G16H
Collimators	G21K 1/02
X-ray tubes	H01J 35/00

### Special rules of classification

In many cases, it is necessary to add a code for an identified function or circuitry design covered in group [H04N 25/00](#).

When the X-ray sensor is described with details related to systems for measuring of X-ray radiation with semiconductor detectors, group [G01T 1/00](#) should be added, in particular, if details of circuitry for detecting, measuring or adapting the detected signal in order to get a correct signal, e.g. corrections for pile-up, for trapped charges, for dead-time, to determine energy or spatial corrections are described.

## H04N 25/40

### Definition statement

*This place covers:*

Details of extracting pixel data from an image sensor by controlling scanning circuits, for example:

- Scanning individual pixels or pixel regions.

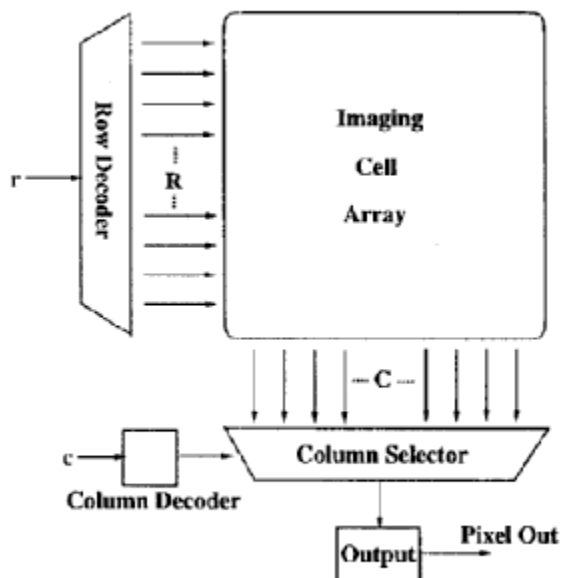


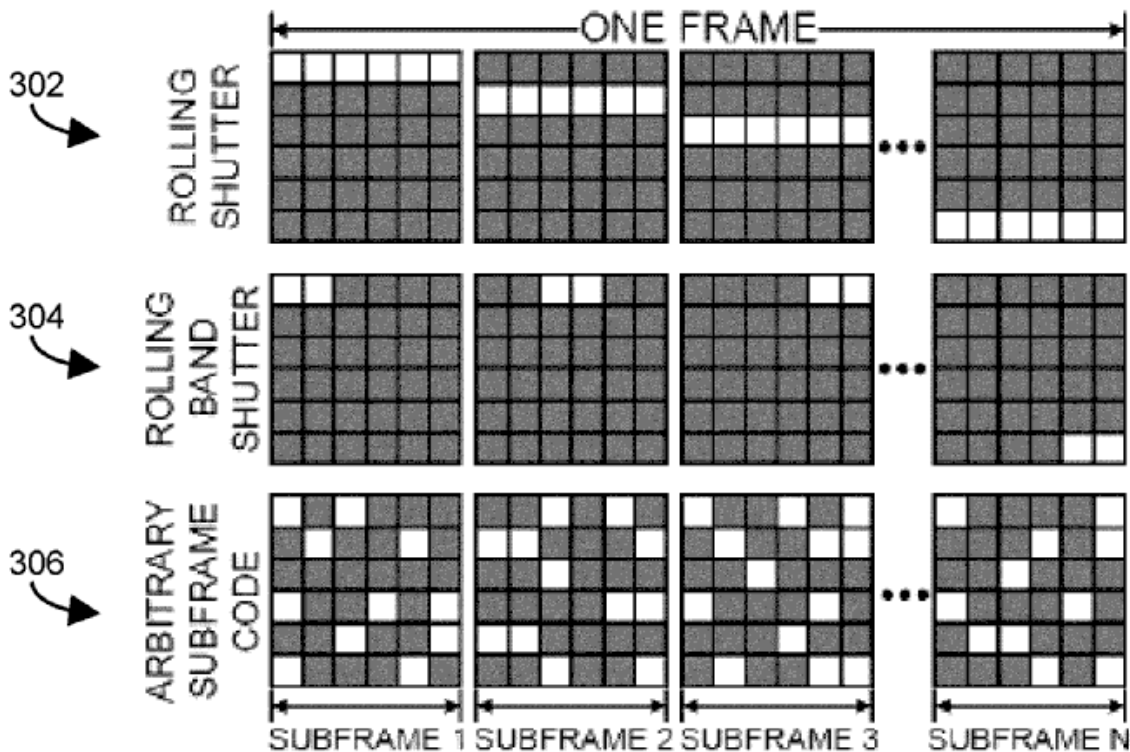
Figure 1: Random Access PD-array

- Using specific scanning sequences, like scanning in blocks, pyramidal, in different directions.



DATE: JANUARY 1, 2023

PROJECT RP11902



- Scanning and reading out data from a pixel while the pixel accumulates new charges or scanning or reading out data from a block, while the block processes the next data, normally additional storage elements like double buffers or parallel processing circuits are used, e.g. reading a pixel while the next exposure is running, reading out digital ADC data while the ADC is running the next conversion cycle, etc.
- Scanning for high-speed operations where number of frames are successively captured and stored in the sensor and then read out from the memories.
- Reading out more than one sensor:

for increasing the field of view by combining the outputs of two or more sensors, e.g. panoramic imaging;

having different imaging characteristics, e.g. exposure time, aperture size, gain, resolution or colour;

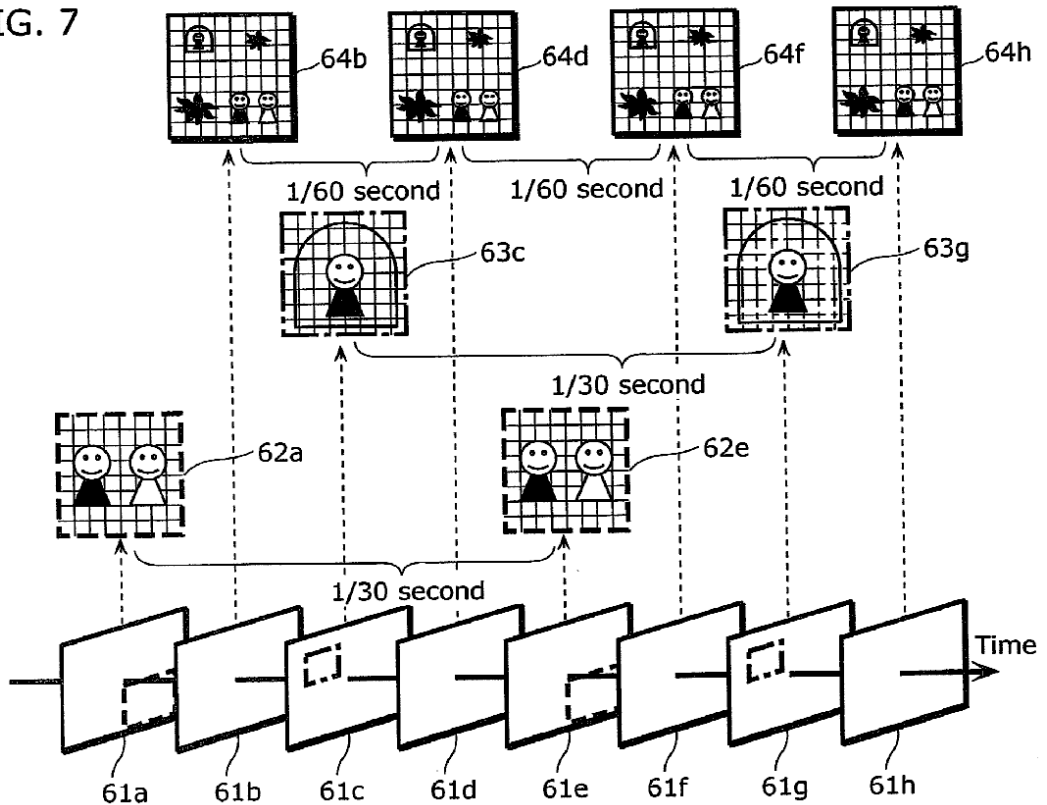
- For performing data compression:

by compressive sensing or sparse sampling;

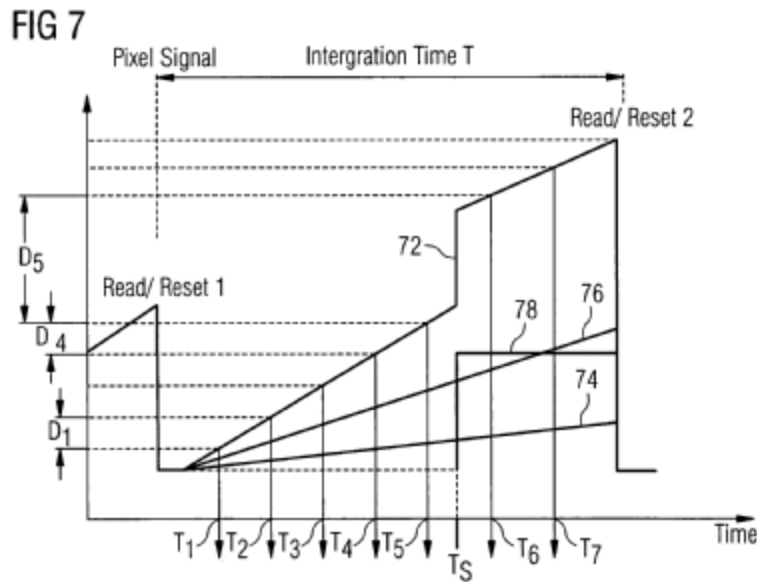
by DCT or wavelet transforms;  
by data differencing.

- By controlling the frame rate:  
of different regions of the image array;  
the regions being variable.

FIG. 7



- For extracting focusing pixel data.
- By non-destructive readout to read signals two or more times during the integration period of the pixel.



- For performing global operations, e.g. histogramming, sorting, region segmentation/labelling, convolution functions:
- for detecting maximum or minimum level.
- Adapted to implement artificial neural networks [ANNs].
  - For push broom scanning or together with relative movement.

**References**

**Informative References**

Attention is drawn to the following places, which may be of interest for search:

Circuitry for scanning or addressing the pixel array	<a href="#">H04N 25/74</a>
Circuitry for scanning or addressing the addressed pixel array	<a href="#">H04N 25/779</a>

**Special rules of classification**

Groups [H04N 25/74](#) and [H04N 25/779](#) shall be assigned in combination with group [H04N 25/40](#) only if specific details of the scanning circuits are provided.

The readout operations in most of the cases influence the exposure time of the pixels. In such cases group [H04N 25/53](#) should be added only if details related to the control of the exposure time are disclosed.

## **H04N25/41**

### **Definition statement**

*This place covers:*

Arrangements and scanning details of image sensing units comprising plurality of image sensor arrays or panels, for example:

- compound image sensing units arranged to direct light from a different section of the field of view onto different image sensors or different image sensor regions;

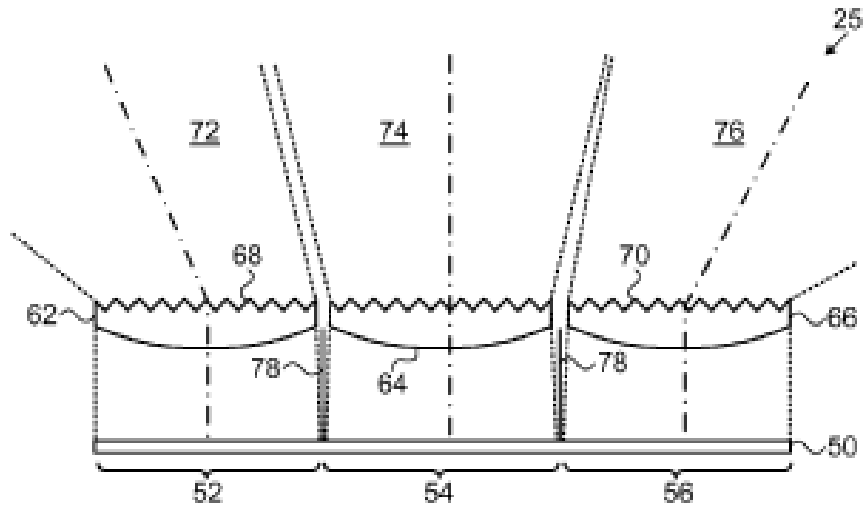


FIG. 3A

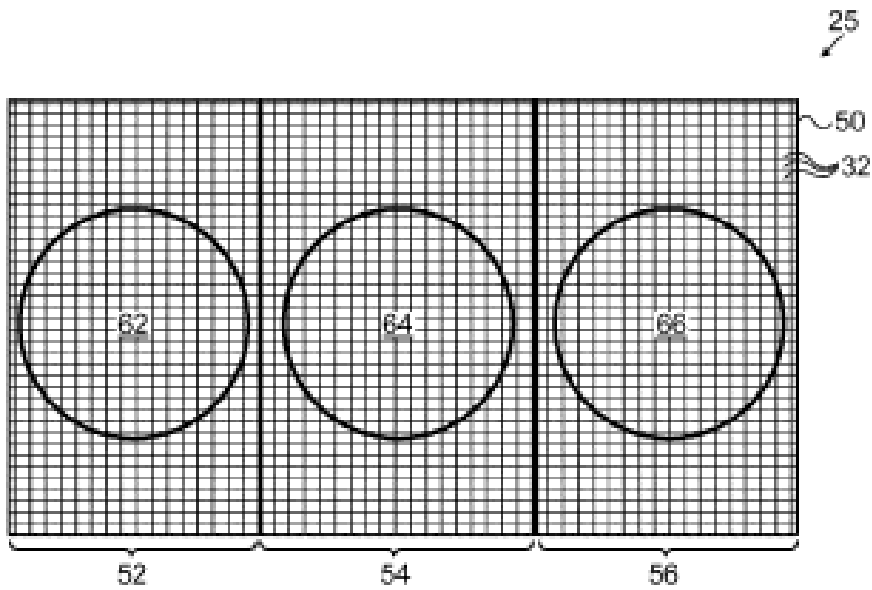


FIG. 3B

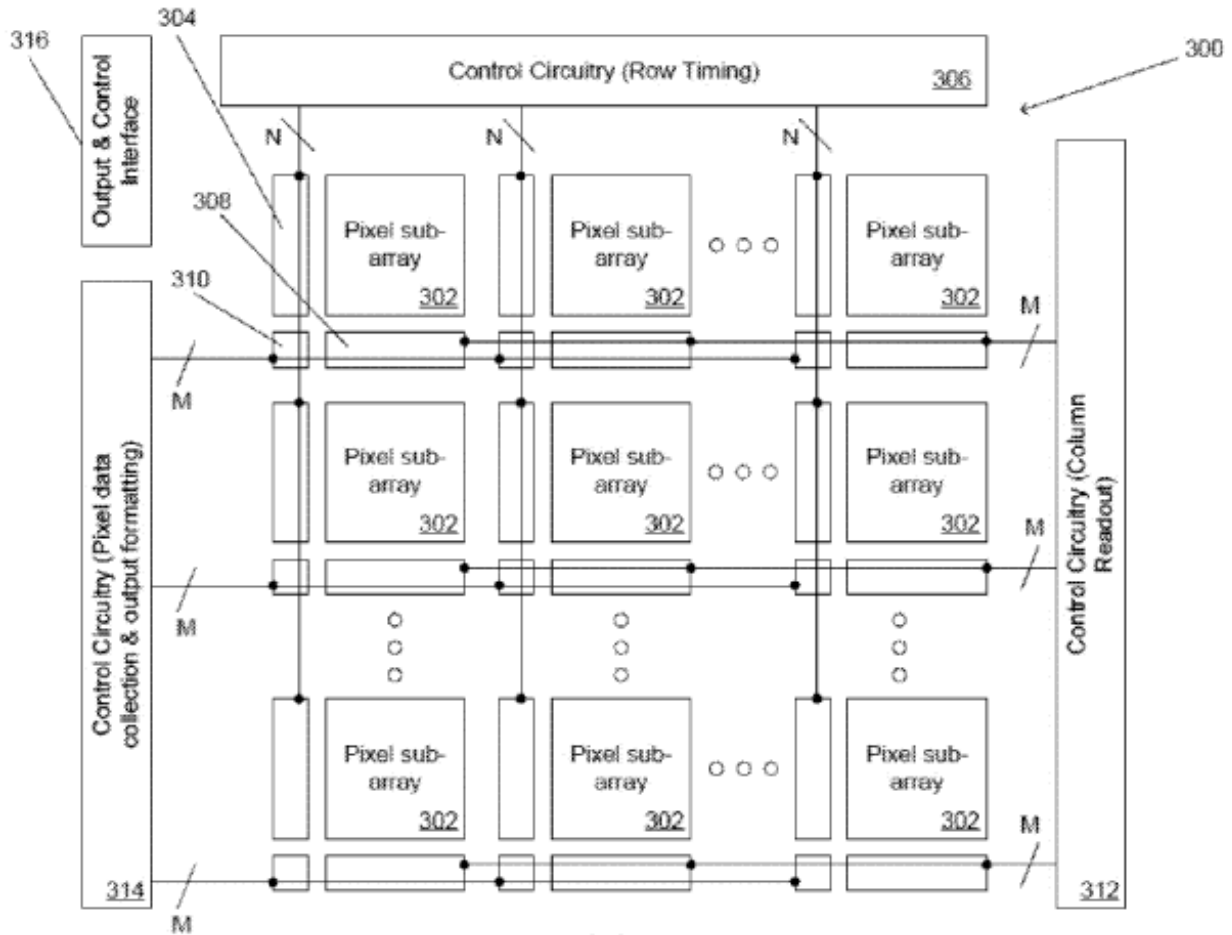
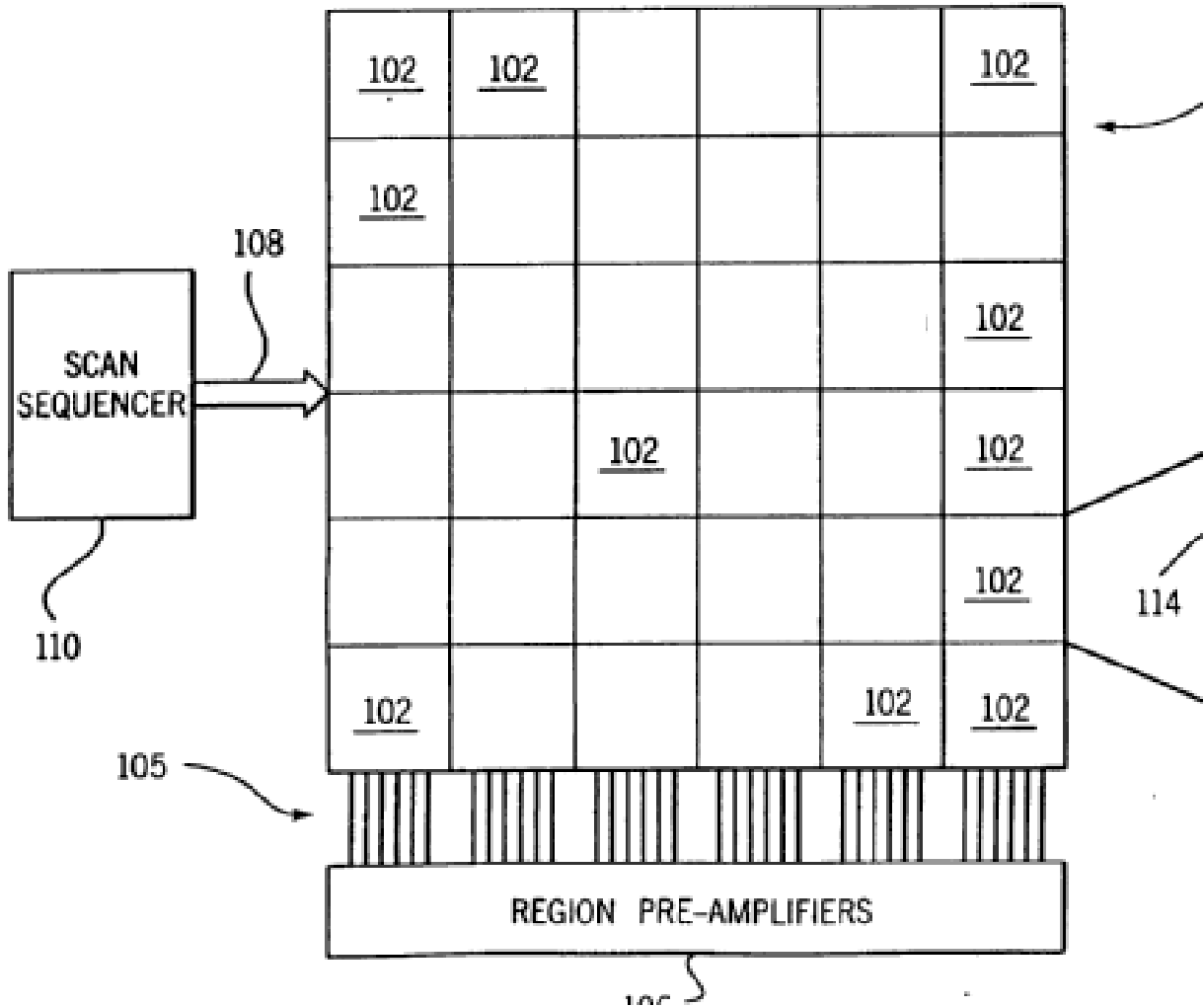
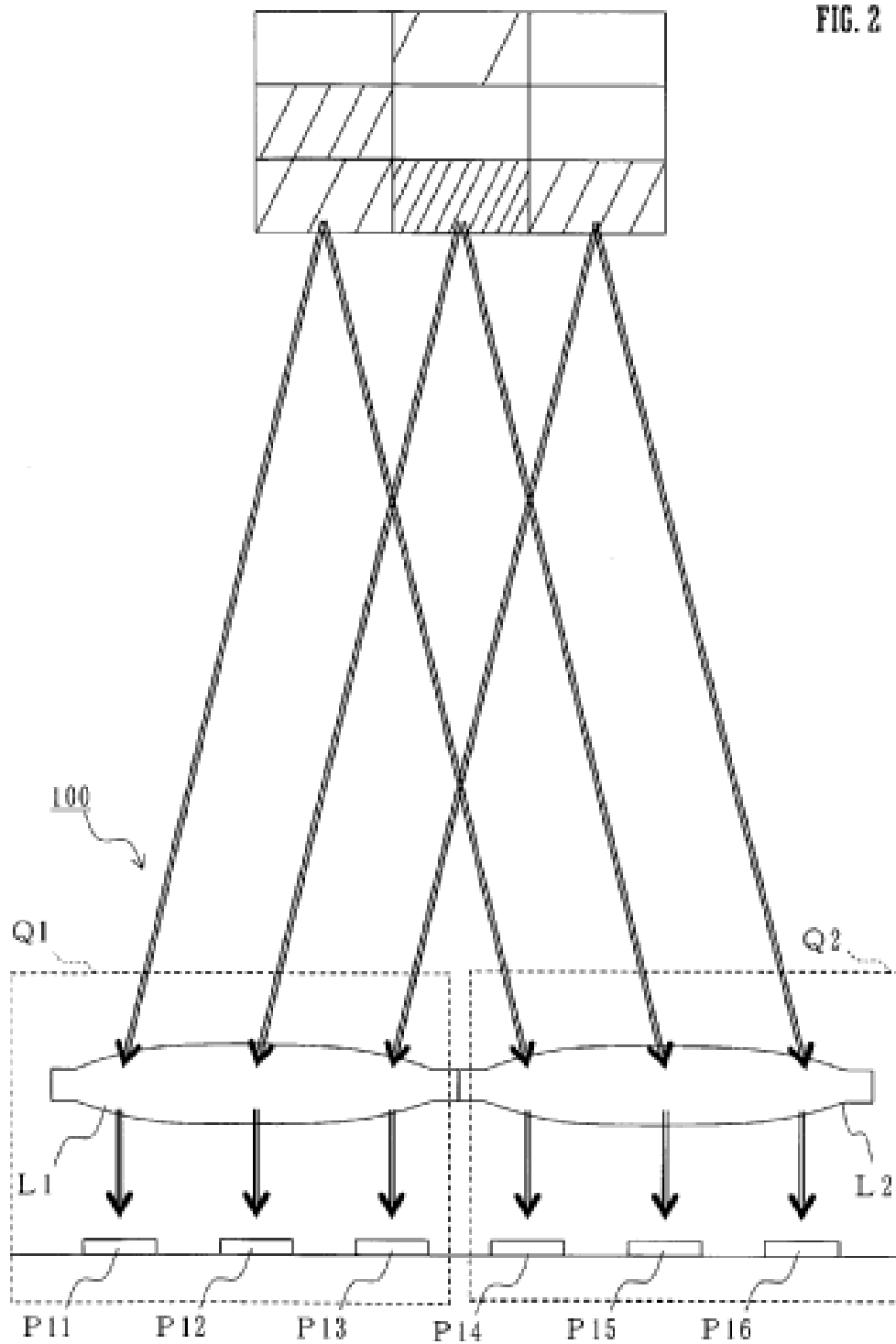


FIG. 3

- large X-ray image sensing unit realised by tessellating several sensor panels;



- image sensing units that form images of the same or at least partially overlapping photographic region upon each of a plurality of pixel regions;



- an imaging unit forms images of the same or at least partially overlapping photographic region upon each of a plurality of pixel regions wherein the pixels are offset at a fraction of the pixel pitch;



DATE: JANUARY 1, 2023

PROJECT RP11902

- details of correction and alignment between the image sensors and the respective optical systems by selective scanning of the image sensors;
- the image sensors may be not on the same plane or on the same chip and the optical system may comprise mirrors or prisms;
- the image sensors or the different image sensor regions have different imaging characteristics like exposure time, aperture size, gain, resolution;

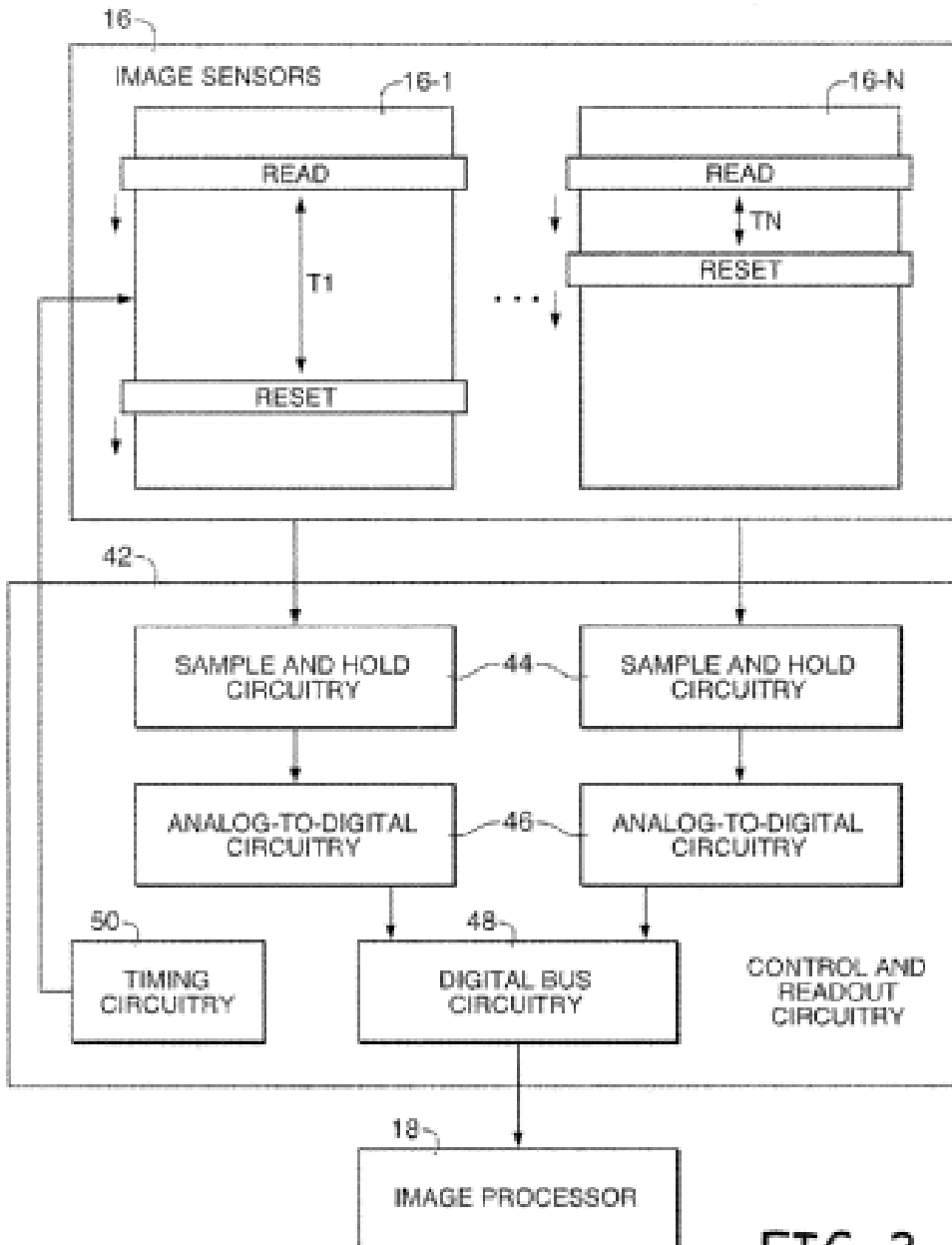


FIG. 3

- the image sensors or the different image sensor regions having different focal planes;
- the image sensors or the different image sensor regions having fields of view of different sizes;

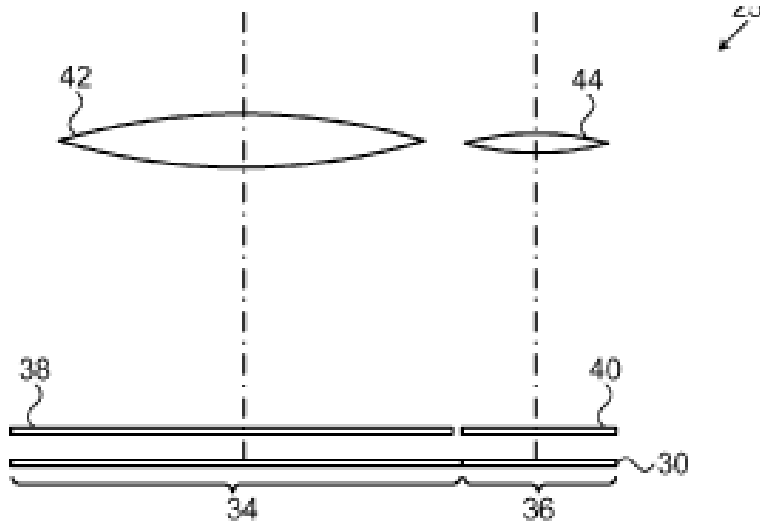


FIG. 2A

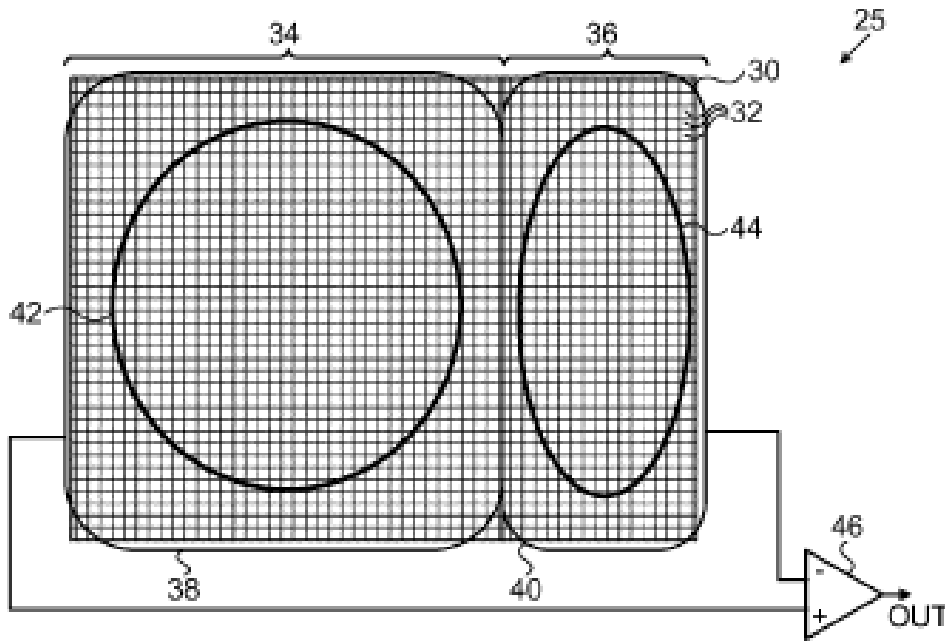


FIG. 2B

DATE: JANUARY 1, 2023

PROJECT RP11902

- the image sensors or the different image sensor regions have different resolution;
- the image sensors or the different image sensor regions have different colours and normally overlapping FOV;
- the image sensors or the different image sensor regions have different colours, one of which is for IR or for depth measurement;
- used in push broom scanning images.

## References

### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Modular detectors for measuring radiation intensity	<a href="#">G01T 1/243</a>
Constructional details of television cameras	<a href="#">H04N 23/50</a>
Cameras using two or more image sensors	<a href="#">H04N 23/45</a>
Linear arrays using abutted sensors	<a href="#">H04N 25/701</a>
Cameras or camera modules comprising electronic image sensors or control thereof for generating image signals from different wavelengths with multiple sensors	<a href="#">H04N 23/13</a>

### [H04N 25/42](#)

#### Definition statement

*This place covers:*

Image sensors comprising or being switchable between different readout modes like interlaced or non-interlaced mode, high- or low-resolution mode, etc.

One of the modes can be related to readout of specific pixels only, for example mode for reading out focusing pixels or exposure pixels.

The switching between different modes can be initiated, for example:

- upon change of the camera mode - auto exposure, auto focus, AWB, preview mode, video/still picture mode or

- upon scene parameters like motion or object detection.

### **Special rules of classification**

If the scanning mode is controlled in response to scene parameters, group [H04N 25/50](#) should be assigned as well.

### **H04N 25/44**

#### **Definition statement**

*This place covers:*

Partially reading an SSIS during one frame or sub-frame.

This group should be assigned for the cases, for example, where the image sensor performs:

- scanning different regions of an image sensor with variable resolution, i.e. the regions of the image have different resolutions.

FIG. 7A

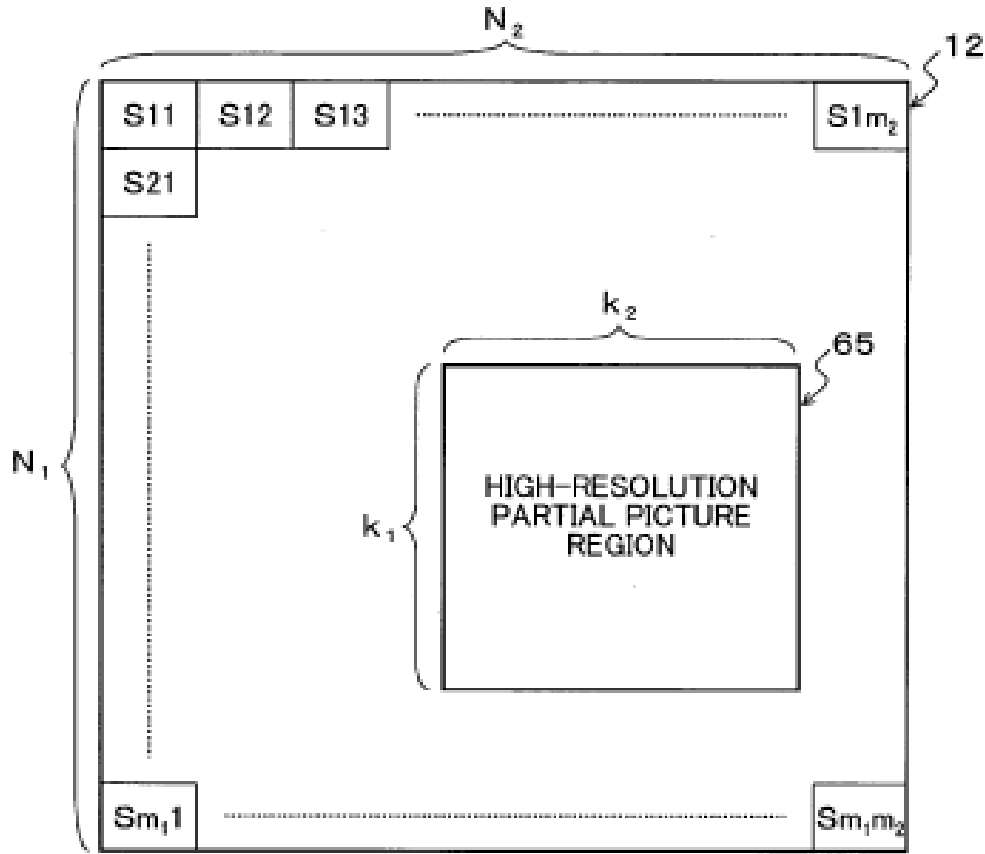
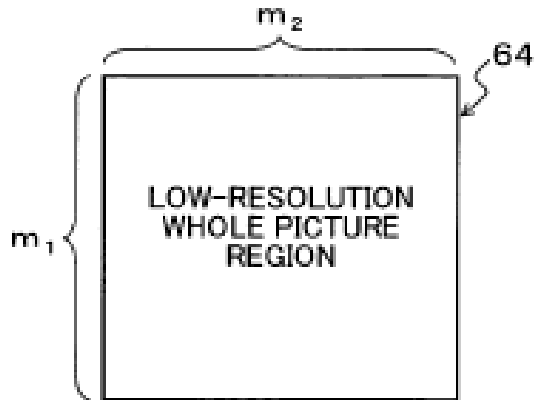


FIG. 7B



FIG. 7C



DATE: JANUARY 1, 2023

PROJECT RP11902

**Special rules of classification**

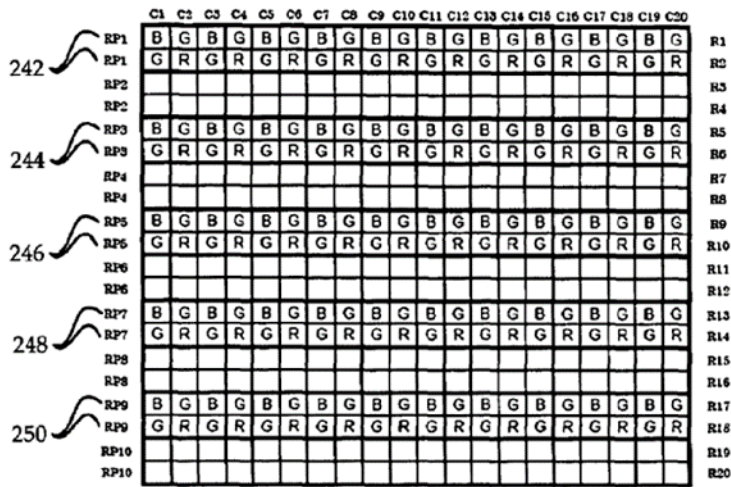
This group should be added in combination with group [H04N 25/621](#) if the invention is related to control of blooming of pixels that are not readout.

**H04N 25/441**

**Definition statement**

*This place covers:*

Scanning details for performing interlaced scanning or for reading only every Nth line of pixels in a frame.



**Special rules of classification**

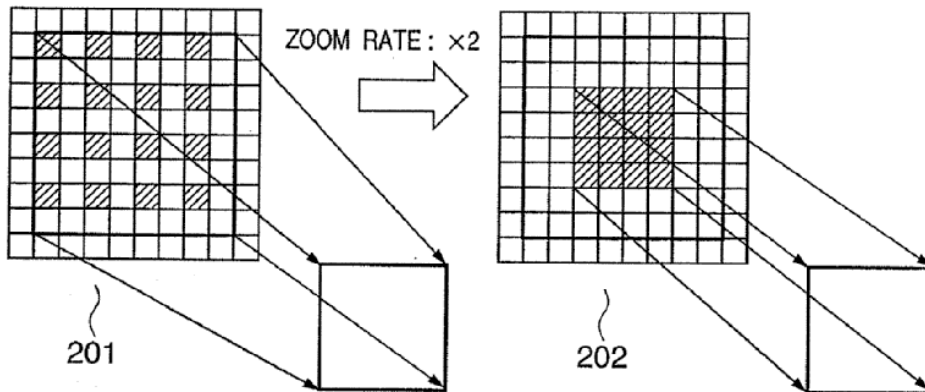
If the interlaced scanning is combined with binning of the neighbouring pixels, the group [H04N 25/46](#) shall be added as well. However, if all pixel signals are readout (provided to the column output lines or to the charge transfer lines of the CCD), and then some of these are added or binned, then only group [H04N 25/46](#) should be given.

**H04N 25/443**

**Definition statement**

*This place covers:*

Scanning details of image sensor for performing electronic zooming.



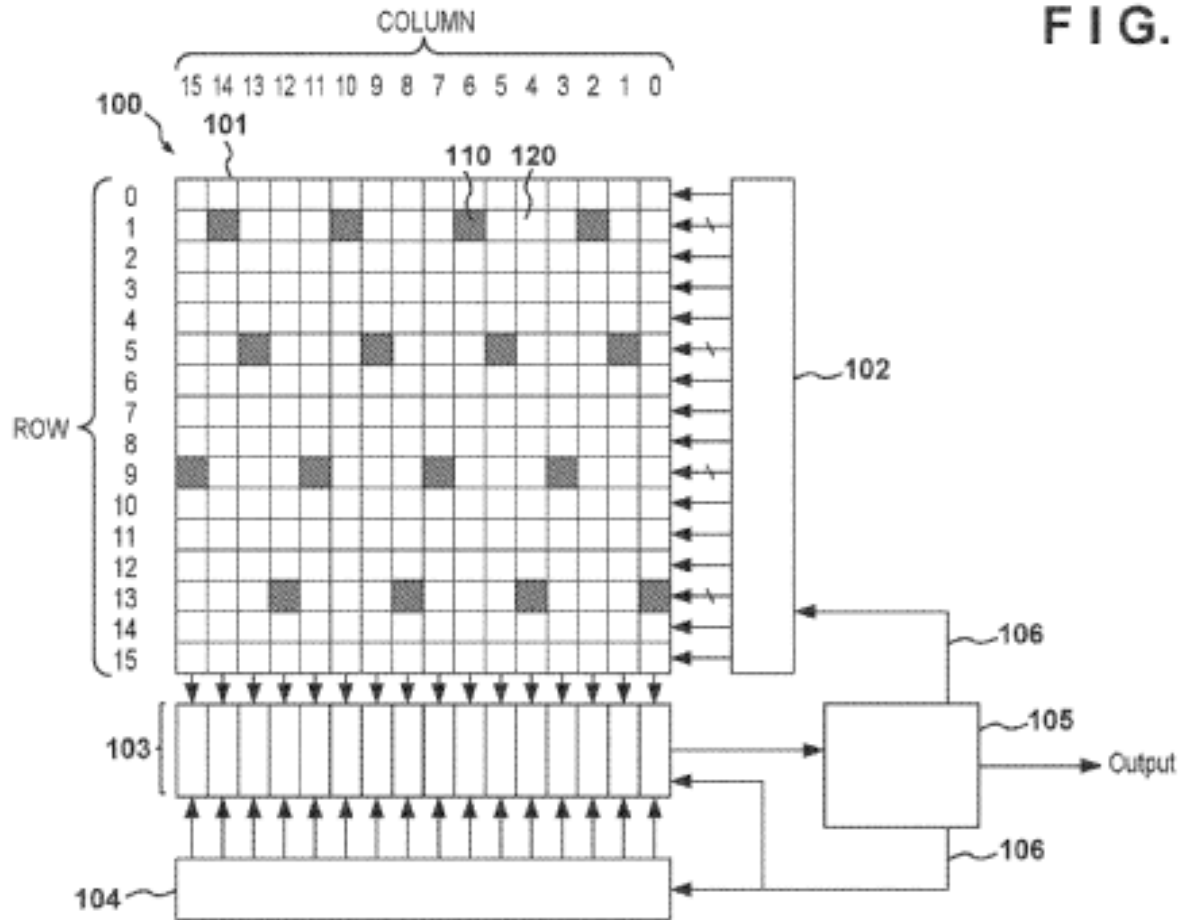
**H04N 25/445**

**Definition statement**

*This place covers:*

Scanning details for thinned-out reading of pixel signals.

**FIG. 1**





## H04N 25/46

### Definition statement

*This place covers:*

Binning charges in CCD sensors wherein:

- the colours of the colour filter array are preserved;
- the colours of the colour filter array are mixed;
- weighted addition or low pass filtering is performed.

Binning of charges or adding signals in CMOS sensors wherein:

- the colours of the colour filter array are preserved;
- the colours of the colour filter array are mixed;
- weighted addition or low pass filtering is performed.

Binning of charges in CMOS sensors wherein:

- charges of different photodiodes are added to a shared floating diffusion;
- a photodiode is connectable to a different shared floating diffusion.

Combining of pixel voltage or current signals in CMOS sensors wherein:

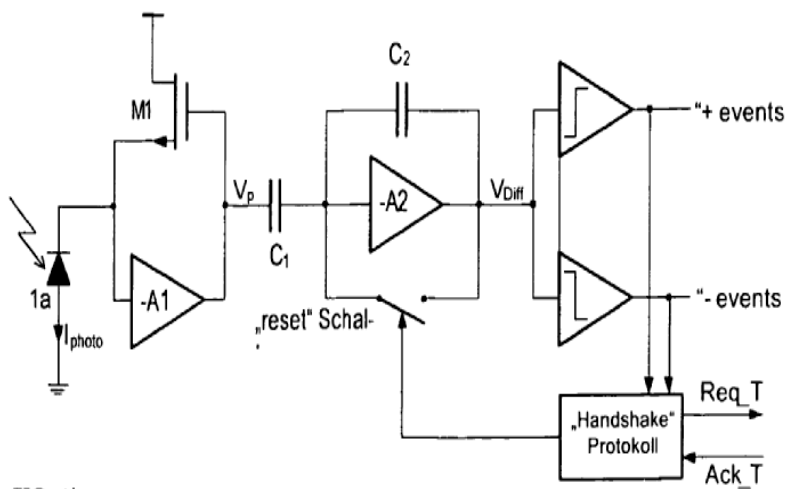
- the combining is implemented in the ADC – typically the counter or the memory of the ADC is arranged to perform addition of the pixel signals;
- the combining is implemented in a column amplifier;
- column processing analogue circuits are used to perform addition in h- or v-direction;
- summing of the currents of several source followers is used.

## H04N 25/47

### Definition statement

*This place covers:*

Dynamic vision sensors (DVS): scanning individual pixels or pixel regions based on image data, like based on detection of time events, level change or exposure level. The figure below shows an example of a pixel for such sensor.



DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 25/48

### Definition statement

*This place covers:*

Circuits and arrangements for increasing the resolution by shifting the sensor relative to the scene wherein:

- the micro-scanning or pixel shift is implemented by moving optical parts of the camera;
- the micro-scanning or pixel shift is implemented by moving the sensor;
- the resolution is increased in scanning devices by moving or exposing at subpixel positions;
- the resolution is increased by using the relative motion of the images captured caused by the camera shake.

## H04N 25/50

### Definition statement

*This place covers:*

Circuitry and means realised inside the sensor [SSIS] chip or even inside each pixel circuitry to control the exposure settings, e. g. rolling shutter, global shutter, exposure time, gain, etc.

### References

#### *Informative References*

*Attention is drawn to the following places, which may be of interest for search:*

Circuitry for compensating brightness variation in the scene
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H04N 23/70
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### Special rules of classification

If the scanning mode is controlled in response to scene parameters, then group [H04N 25/42](#) should be assigned as well.

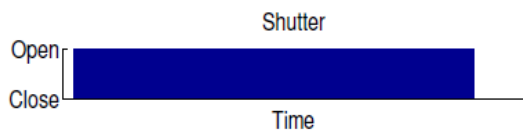
**H04N 25/53**

**Definition statement**

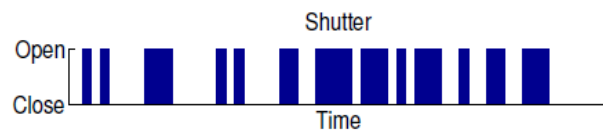
*This place covers:*

Details of control of the integration time, in particular:

- details of performing global shutter operations in an image sensor;
- details of performing rolling shutter operations in an image sensor;
- integration time control and synchronisation of the electronic shutter in combination with a light source;
- integration time control and synchronisation of the electronic shutter in combination with mechanical shutter control;
- integration time control and synchronisation of the electronic shutter in function of motion in the scene;
- coded exposure for flutter camera.



**Traditional Exposure**



**Coded Exposure**

**References**

**Informative References**

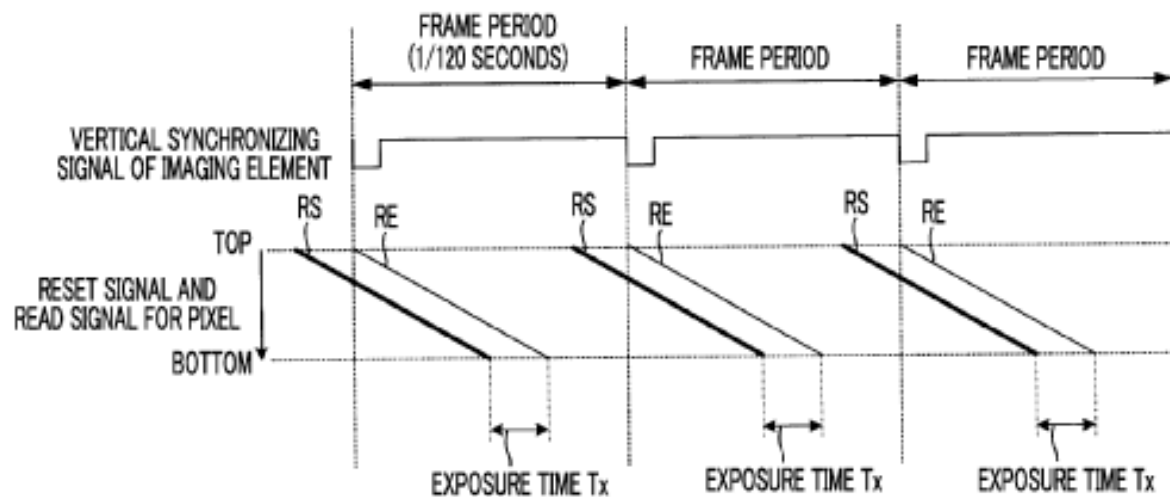
*Attention is drawn to the following places, which may be of interest for search:*

Control of camera brightness compensation by influencing the scene brightness using illuminating means	<a href="#">H04N 23/74</a>
Control of camera brightness compensation by influencing the optical part of the camera	<a href="#">H04N 23/75</a>

**H04N 25/531****Definition statement**

*This place covers:*

- Details of controlling rolling shutters.

**H04N 25/533****Definition statement**

*This place covers:*

Details of controlling the integration times of different regions of the image sensor wherein:

- the different regions can be predetermined;
- the different regions can be dynamically selected, for example, by exposure conditions, ROI, speed, user selection;
- the integration time is controlled for each pixel.

**Relationships with other classification places**

If the control of the integration times is related to extension of dynamic range, additional classification in group [H04N 25/57](#) should be considered.

DATE: JANUARY 1, 2023

PROJECT RP11902

#### H04N 25/534

##### **Definition statement**

*This place covers:*

Details of controlling the integration times depending on the colour of the pixel.

#### H04N 25/57

##### **Definition statement**

*This place covers:*

Details of controlling the dynamic range of the image sensor.

The dynamic range is the ratio of the light reflection from the brightest to the darkest point in the image, measured in densities (the logarithmic indication of the ratio) or in aperture steps (f-stops) (1 aperture step = approx. 0.3 densities).

The number of digital levels corresponding to a fixed number of (256) brightness levels is also a characteristic related to the dynamic range and it is derived from the Opto Electronic Conversion Function. The Opto Electronic Conversion Function [OECF] describes the property of the image sensor to convert the brightness of the scene into digital values.

#### H04N 25/571

##### **Definition statement**

*This place covers:*

- Image sensors comprising pixel circuits having a non-linear response;
- Driving and control thereof.

The non-linear response can be achieved in different ways, for example, by using a specific photodetector, by controlling the reset or the transfer gate driving signals, by controlling the gain or by using non-linear amplifiers.

### Relationships with other classification places

Details of the pixel circuits are classified in group [H04N 25/77](#).

Details of control of the charge storable in the pixel are classified in group [H04N 25/59](#).

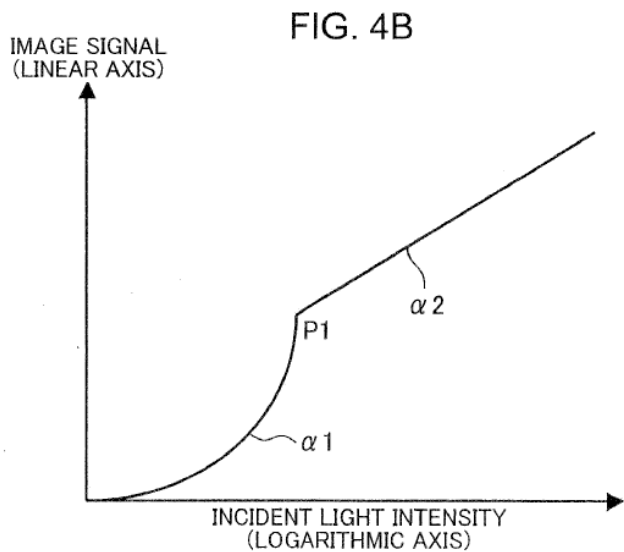
While group [H04N 25/58](#) is toward extending the dynamic range by using multiple exposures, group [H04N 25/571](#) is defining the response characteristic or (the Opto Electronic Conversion Function) of the sensor during a single exposure.

### [H04N 25/573](#)

#### Definition statement

*This place covers:*

- Image sensors comprising pixel circuits having a logarithmic characteristic;
- Image sensors comprising pixel circuits having a linear log characteristic;
- Driving and control thereof.



DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 25/575

### Definition statement

*This place covers:*

Image sensors comprising pixel circuits having multi-slope characteristics and driving and control thereof.

## H04N 25/58

### Definition statement

*This place covers:*

Details for driving and control of image sensors wherein the dynamic range is extended by multiple exposures. The term exposure is not limited to exposure time but rather specifies the overall amount of detected light, which further depends on the pixel size, pixel sensitivity, conversion gain, etc.

### References

#### *Informative References*

*Attention is drawn to the following places, which may be of interest for search:*

Combination of exposures for increasing the dynamic range	<a href="#">H04N 23/70</a>
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## H04N 25/581

### Definition statement

*This place covers:*

Image sensors and driving circuits therefor:

- provided with pixels for multiple exposures, like long- and short-time exposure pixels, high- and low-sensitivity pixels;



- wherein a pixel of the array is read out non-destructively several times within a frame to provide multiple exposures;
- wherein a pixel of the array is partially readout (partial charge transfer or charge skimming) during the exposure time.

**Relationships with other classification places**

While group H04N 25/533 is about control of exposure time in different regions of the image sensor, group H04N 25/583 is for the cases where the pixel signals of the long and short exposure pixels are combined in such a way that a new high dynamic range pixel signal is generated. Hence, if a partial or non-destructive readout is used only for setting the exposure period of the pixel, group H04N 25/533 should be assigned.

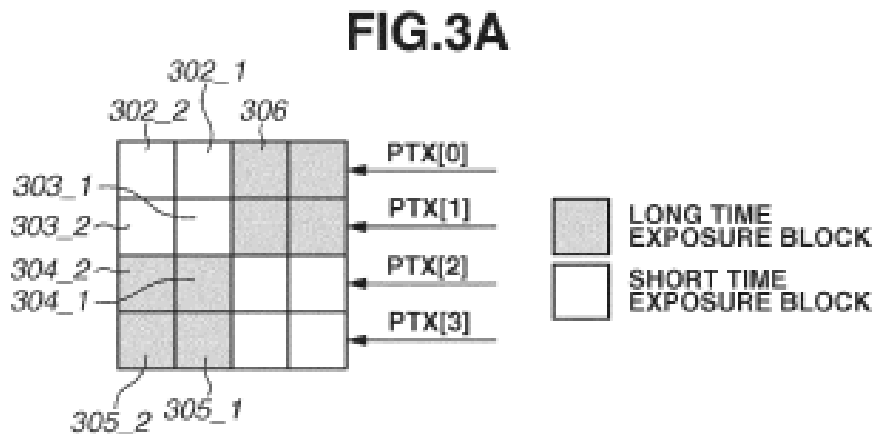
**H04N 25/583**

**Definition statement**

*This place covers:*

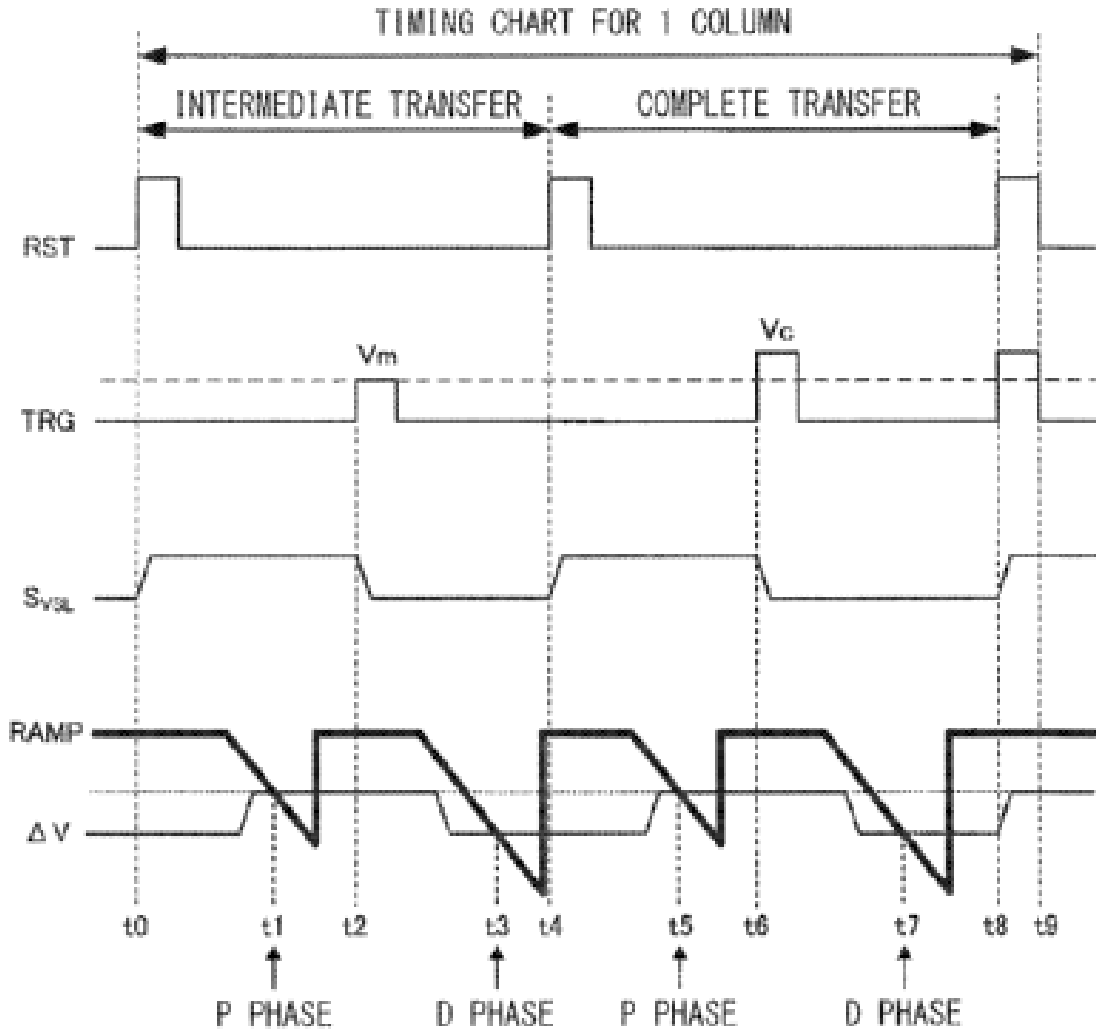
Image sensors and driving circuits therefor:

- provided with pixels for multiple exposures, such as long and short exposure time pixels;



- provided with a pixel that is read out non-destructively several times during the exposure period and the readout signals are used in combination to generate a high dynamic range signal;

- provided with a pixel that has a charge partially transferred to a storage node (charge skimming) during the exposure period, and the signals from the partial readout and at the end of exposure are used in combination to generate a high dynamic range signal.



## H04N 25/585

### Definition statement

*This place covers:*

Image sensors and driving circuits therefor comprising pixels having:

- different sensibilities,
- different sizes,
- different conversion gains

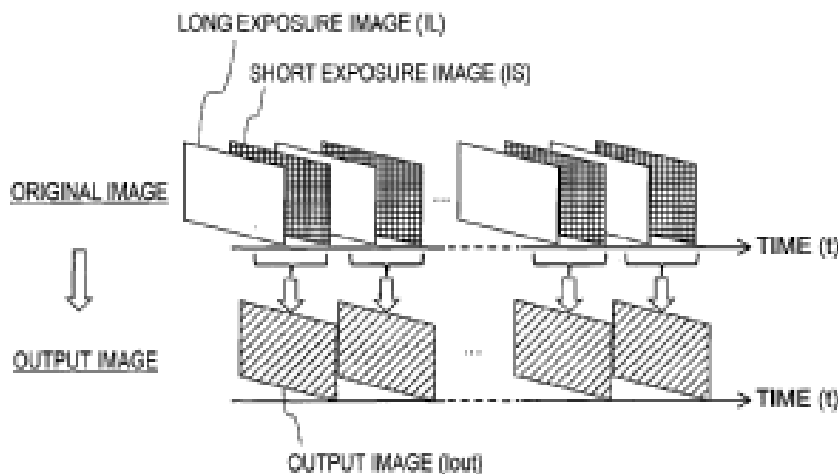
if the combination of the signals of these pixels are used to generate an HDR signal.

## H04N 25/587

### Definition statement

*This place covers:*

Driving and control of image sensors for sequentially taking multiple exposures for extending the dynamic range. The signals from the multiple exposures can be stored in the pixel or outside of the pixel array.



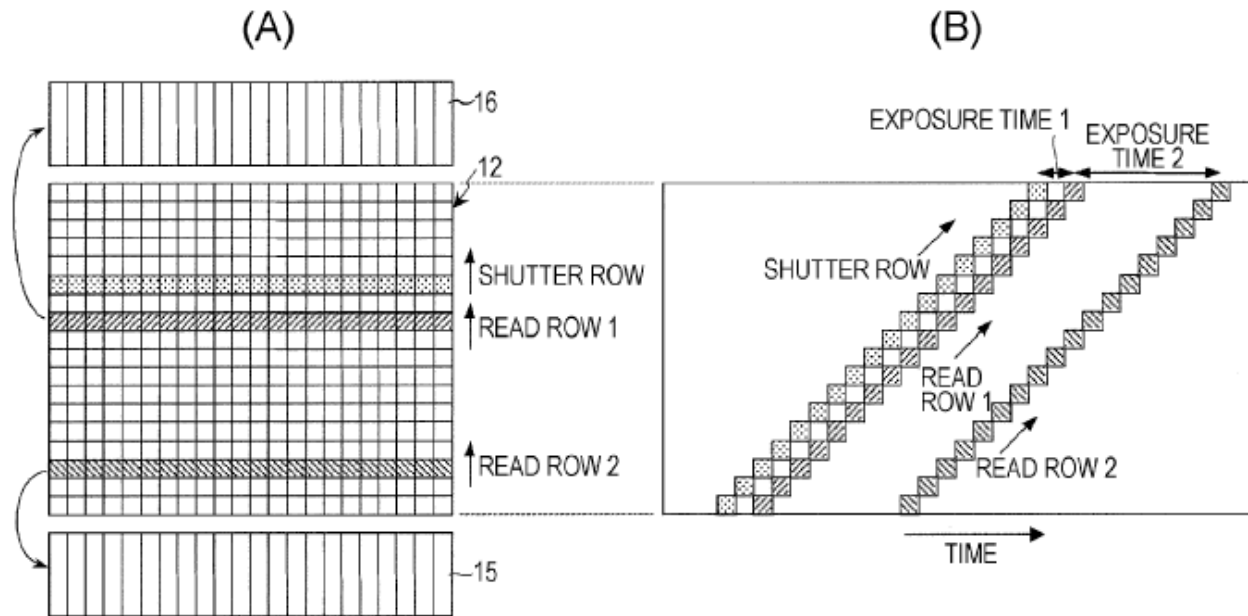
*Fig. 5*

H04N 25/589

**Definition statement**

*This place covers:*

Details of controlling the image sensor for sequentially capturing images with low and short integration times.

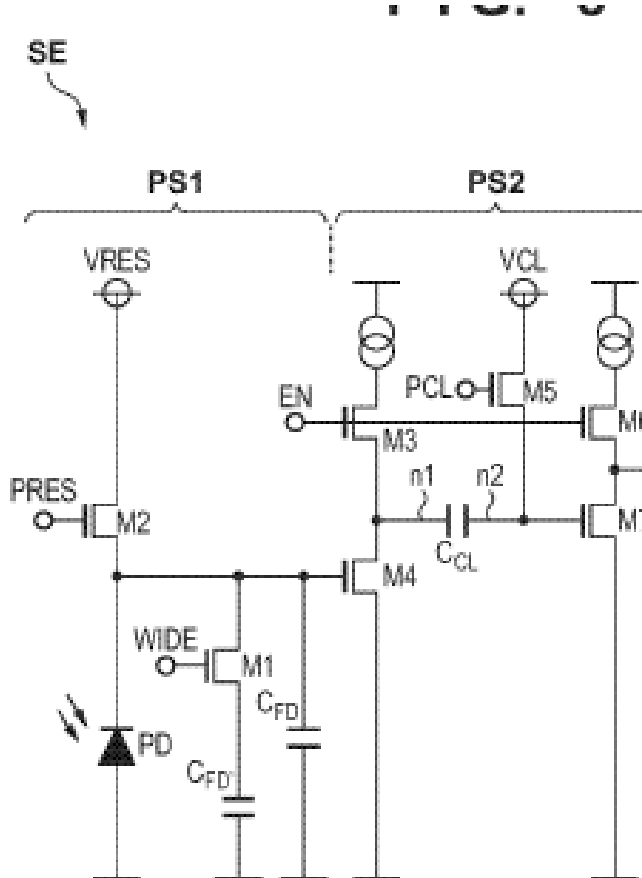


## H04N 25/59

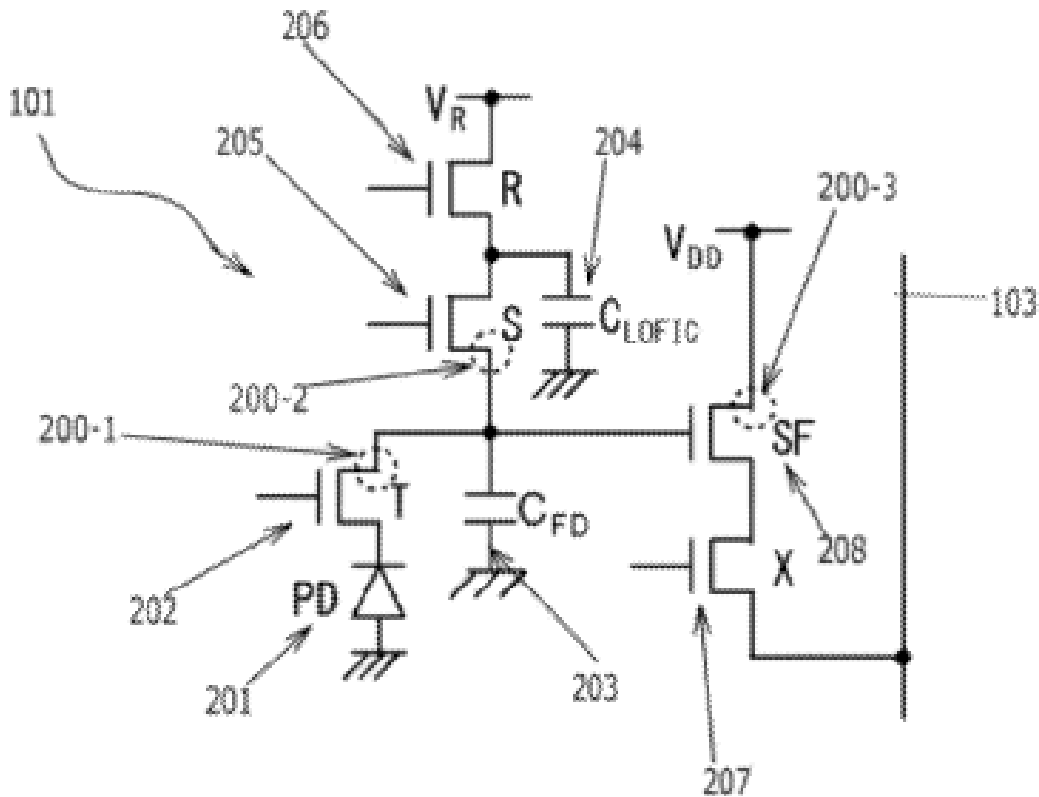
**Definition statement**

*This place covers:*

- Details related to image sensors comprising pixels that can modify the charge conversion ratio of the floating node. If a transfer gate is is used, the amount of electric charge generated in the photoelectric converter PD is not controlled, but rather the charge to voltage conversion ratio of the floating diffusion.



- Details related to image sensors comprising pixels which can store and read out overflow charges.



### Relationships with other classification places

If two or more photoelectric converters or two neighbouring pixels are connected together for performing binning, then group [H04N 25/46](#) should be assigned. However, if floating diffusions from different pixels are connected to one photoelectric converter, then group [H04N 25/59](#) should be assigned.

Details related to control of blooming are to be classified in group [H04N 25/621](#). If the voltage level of the transfer gate or of the reset gate is controlled, the amount of charge storable in the photoelectric converter will also be controlled. However, in this case group [H04N 25/571](#) only must be assigned.

## H04N 25/60

### Definition statement

*This place covers:*

- Noise processing circuits for reduction of random noise, line noise, high frequency noise, temporal noise caused by voltage drop of power supply or of driving circuits when implemented as part of the image sensor;
- Circuits for control of bandwidth of amplifiers or comparators implemented in the image sensor as far as related to the overall noise level of the image sensor;
- Noise processing circuits for reduction of optical crosstalk, light leakage, colour mixing and other noises originating from the components of the optical system associated with the image sensor;
- Noise processing circuits for reduction of frame-to-frame variations caused by the image sensor and not by external illumination variations;
- Image sensor noise characterisation, e.g. methods to derive parametric models to quantify different sensor noise types (such as readout noise or photo-shot noise) in the sensed image according to e.g. Gaussian, Poissonian or uniform probability distribution functions; methods to calibrate and obtain noise levels of sensor data for further use, for example in filtering applications.

### References

#### *Informative References*

*Attention is drawn to the following places, which may be of interest for search:*

Camera processing pipelines or components thereof for suppressing or minimising disturbance in the image signal generation	<a href="#">H04N 23/81</a>
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DATE: JANUARY 1, 2023

PROJECT RP11902

**H04N 25/61****Definition statement***This place covers:*

- Circuits for detecting and correcting flare;
- Circuits for detecting and correcting shading and vignetting;
- Circuits for detecting and correcting geometrical distortions.

**References****Informative References***Attention is drawn to the following places, which may be of interest for search:*

Image enhancement performing geometric correction	<a href="#">G06T 5/006</a>
Camera processing pipelines or components thereof for suppressing or minimising disturbance in the image signal generation	<a href="#">H04N 23/80</a>
Correction of chromatic aberration	<a href="#">H04N 25/611</a>

**Special rules of classification**

Although not always specific to SSIS, the noise/distortion produced by a lens is nevertheless classified in group [H04N 25/61](#) and not in group [H04N 23/80](#). This has been done to facilitate the search. Corrections of chromatic aberrations, which can also be related to lenses, are classified in group [H04N 25/611](#). All other noise suppression or disturbance minimisation in picture signal generation, e.g. in a camera having an EIS, should be classified in group [H04N 23/80](#).



## H04N 25/615

### Definition statement

*This place covers:*

Circuits for detecting and correcting noise originating only from the associated optical system involving a modelling of transfer functions.

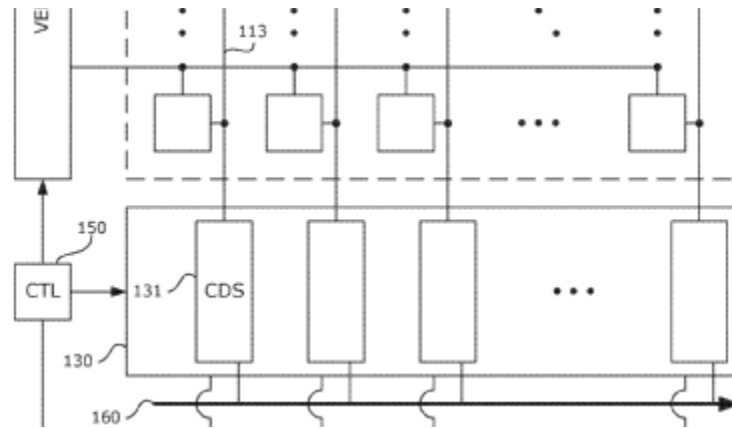
## H04N25/616

### Definition statement

*This place covers:*

Details of circuits for implementing:

- double sampling [DS] – these circuits compensate for offsets caused by the varying characteristics of pixel amplifiers (source followers);
- correlated double sampling [CDS] – these circuits further reduce the kTC (reset) noise;
- multiple sampling – multiple sampling of a reset signal and an image signal from a pixel is used to reduce or average the random noise;
- (correlated) double/multiple sampling function implemented in the analog domain, i.e. by using clamping circuits, or by using separate sampling capacitors for the reset signal and the image signal;
- (correlated) double sampling function implemented at least partially in the ADC;
- (correlated) double sampling function implemented in the digital domain;
- CDS circuits per pixel;
- Details of arrangement of the CDS circuit as part of the readout circuit;
- CDS arranged per column;



- CDS arranged at the output of the sensor.

### Relationships with other classification places

If the specific position of the CDS in the image sensor is to be classified, a respective SSIC architecture code from group [H04N 23/70](#) should be added.

Correlated double sampling is a noise reduction technique in which the reference voltage of the pixel (i.e. the pixel's voltage after it is reset) is subtracted from the signal voltage of the pixel (i.e. the pixel's voltage at the end of integration) at the end of each integration period, to cancel kTC noise (the thermal noise associated with the sensor's capacitance). Therefore, group [H04N 25/65](#) (reduction of kTC noise) should not be assigned if only CDS is used for kTC noise reduction.

### [H04N 25/617](#)

#### Definition statement

*This place covers:*

Circuits for detecting and reducing electromagnetic interferences and clocking noises.

The electromagnetic interferences can be caused by internal or external to the sensor noise sources, like motors for lens focusing or the like.

## H04N 25/62

### Definition statement

*This place covers:*

Circuits for detecting and reducing excess charges produced by the exposure.

## H04N 25/621

### Definition statement

*This place covers:*

- Circuits for control of blooming by resetting pixels that are not readout but are adjacent to pixels that are readout so as to prevent saturation of non-read pixels from effecting adjacent readout pixels;
- Circuits for sweeping out electric charges beforehand so as not to leak while one prior row is being exposed;
- Circuits for controlling pixels comprising a storage element for storing the overflow photo-charges, the stored overflow charge is used to extend the dynamic range of the image sensor;
- Evacuation of excess charges produced by the exposure via the output lines or the reset lines of addressed sensors.
- Active CMOS pixels sensors comprising a dedicated reset or overflow transistor directly connected to the photoelectric converter, such a pixel is known as a 5T pixel.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Partially reading an SSIS array	<a href="#">H04N 25/44</a>
Controlling the amount of charge storable in the pixel	<a href="#">H04N 25/59</a>

### **Special rules of classification**

Details related to image sensors comprising pixels that can store and read out overflow charges are to be classified in group [H04N 25/59](#).

#### **H04N 25/622**

##### **Definition statement**

*This place covers:*

Anti-blooming drains used in the CCD sensors.

#### **H04N 25/623**

##### **Definition statement**

*This place covers:*

- Evacuation of excess charges produced by the exposure via the output lines or the reset lines of addressed sensors.
- Active CMOS pixel sensors may comprise a dedicated reset or overflow transistor directly connected to the photoelectric converter. Such a pixel is known as a 5T pixel.

#### **H04N 25/625**

##### **Definition statement**

*This place covers:*

Circuits for control of smearing in CCD sensors – the smearing noise appears as vertical stripes in the image.

DATE: JANUARY 1, 2023

PROJECT RP11902

#### H04N 25/626

##### **Definition statement**

*This place covers:*

Circuits for reduction of residual charges.

#### H04N 25/627

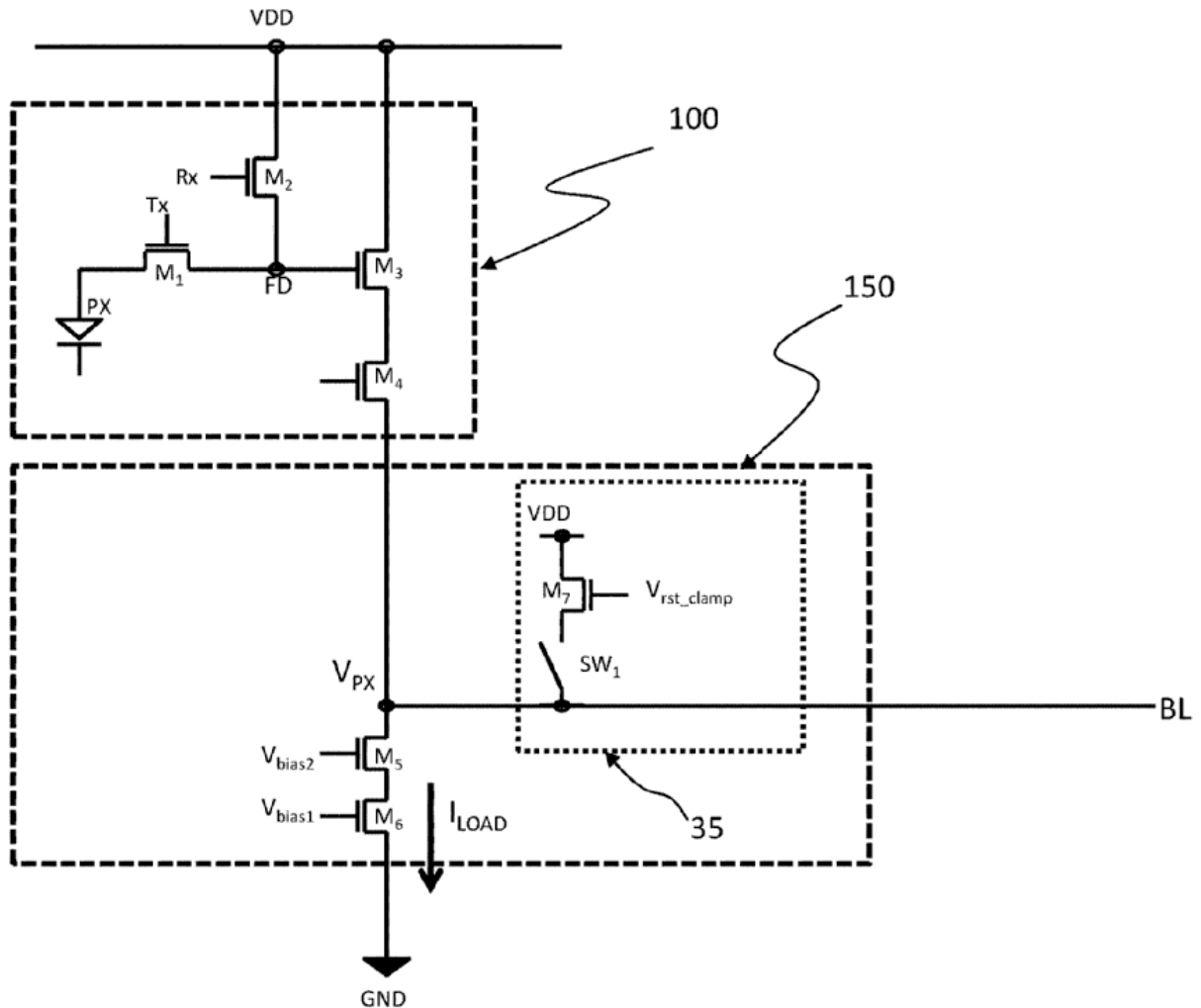
##### **Definition statement**

*This place covers:*

Circuits for detection and reduction of inverted contrast or eclipsing.

Eclipsing can occur when at least some pixels of the CMOS imager are exposed to strong light such as direct illumination from the sun. The strong light may cause electrons to spill over from the photodiode into the floating diffusion region, which results in an erroneous reset signal to be sampled (e.g. reset signals sampled during reset operations may exhibit voltage levels that are less than the desired reset level). Consequently, the pixel signal computed by column readout circuitry becomes an undesirably small value, the effect of which is manifested when an over-illuminated pixel appears dark while it should be bright.

A typical anti-eclipse circuit is configured to correct the voltage level of the reset signal by pulling the reset level up to a corrected voltage, thereby minimizing the eclipse effect.



### Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

- "eclipse", "darkening", "blackening", "dark defect", "black crush", "black sun", "dark sun", "black inversion", "white-black inversion", "black dot", "black grave", "black core", "black point", "tanning phenomenon", "sunspot phenomenon", "solar blackening", "blackening phenomenon", "spotlight blackening", "high-brightness darkening", "black depression", "black sinking", "high-intensity blackening".

DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 25/628

### Definition statement

*This place covers:*

Circuits for control of noise that appears as horizontal stripes in the image and is normally caused by voltage variations or coupling effects caused by sampling or resetting overexposed pixels. It is also called streaking, pseudo-smear or band-like pattern noise.



## H04N 25/63

### Definition statement

*This place covers:*

- Circuits for detection and reduction of dark current;
- Circuits performing dark frame subtraction that remove an estimate of the mean fixed pattern, but there still remains a temporal noise, because the dark current itself has a shot noise;
- Circuits using optical black pixels for dark current compensation;
- Circuits using optical black pixels provided for each pixel or group of pixels.

### Relationships with other classification places

The pattern of different dark currents can result in a fixed-pattern noise (group [H04N 25/67](#)). It is important to note that the nature of the dark current is caused by the charges generated in the detector when no outside radiation is entering the detector and only the fixed pattern noise caused by the dark current can be corrected or compensated.

The dark current is temperature, exposure and pixel size dependent.

DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 25/633

### Definition statement

*This place covers:*

Pixels for detecting only dark current.

## H04N 25/65

### Definition statement

*This place covers:*

Circuits for reduction of reset noise:

- by applying soft reset or combination of soft and hard reset;
- by feeding back the reset readout signal to the floating diffusion.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Involving a correlated sampling function, e.g. correlated double or triple sampling	<a href="#">H04N 25/616</a>
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## H04N 25/67

### Definition statement

*This place covers:*

Circuits for detection and reduction of fixed-pattern noise.



## H04N 25/671

### Definition statement

*This place covers:*

Circuits and arrangements for correcting and detecting of non-uniformity caused by sensor characteristics, for example

- different pixel characteristics – sensitivity, gain, offset, response curve;
- different characteristics of sampling circuits, amplifiers, ADCs used for different groups of pixels;
- the resistive or capacitive properties of long readout or control lines.

Circuits and arrangements for correcting and detecting of non-uniformity by

- using dummy pixels and/or dummy structures, not OB pixels for detecting offset variations;
- using correction circuits for correcting gain variations between pixels or groups of pixels;
- performing measurement of the gain variations;
- using correction circuits for correcting offset variations between pixels or groups of pixels;
- performing measurement of the offset variations.

Non-uniformity correction modes for

- measuring the gain responses of the pixels;
- measuring the offset responses of the pixels.

### Relationships with other classification places

There is a certain similarity between the circuits and methods for correcting dark current (group [H04N 25/63](#)) and for correcting offset non-uniformities of the pixels.

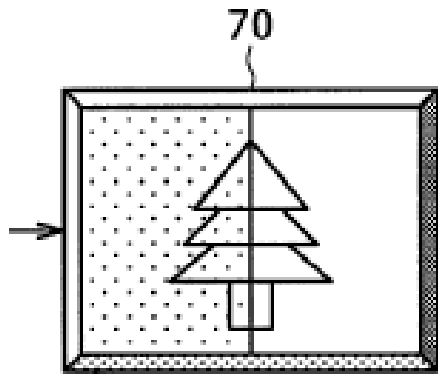
Since both can be temperature dependent, both can be corrected by using a dark frame.

#### H04N 25/672

##### **Definition statement**

*This place covers:*

Circuits and arrangements for correcting and detecting of non-uniformity between adjacent regions or output registers.



#### H04N 25/673

##### **Definition statement**

*This place covers:*

Circuits that use dedicated dummy pixels for detecting and correcting non-uniformity;

Circuits that use a reference voltage source;

Circuits that use a dark image of the scene.

DATE: JANUARY 1, 2023

PROJECT RP11902

#### H04N 25/674

##### **Definition statement**

*This place covers:*

Circuits that use information from the captured image for determining non-uniformity characteristics, e.g.:

- the scene information may be selected from expected uniform regions;
- the scene information can be defocused to generate uniform like scene;
- the scene can be captured by using pixel shifting, and the difference between the pixels that capture the same part of the scene can be used for detecting non-uniformity.

#### H04N 25/677

##### **Definition statement**

*This place covers:*

Details of reducing column or line fixed pattern noise. This noise is caused by different characteristics of column parallel circuits.

#### H04N 25/68

##### **Definition statement**

*This place covers:*

Circuits for correction of defects caused by:

- defects or non-responsive pixels;
- defects in column readout lines;
- defects in readout circuits;
- defects in the scanning circuits;
- defects in the control lines.

DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 25/683

### Definition statement

*This place covers:*

Details of circuits that detect defects such as non-responsive pixels on the fly by using the image signal.

## H04N 25/70

### Definition statement

*This place covers:*

Details of SSIS architecture.

## References

### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Imager structures, as devices consisting of a plurality of semiconductor or other solid-state components formed in or on a common surface, per se
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<a href="#">H01L 27/146</a>
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## H04N 25/702

### Definition statement

*This place covers:*

SSIS with

- non-planar (fovea) or curved pixel layout;
- non-identical or non-equidistant pixels distributed over the pixel array.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Imager structures	<a href="#">H01L 27/146</a>
Extending dynamic range with pixels having different sensibilities within the sensor	<a href="#">H04N 25/585</a>

## H04N 25/703

### Definition statement

*This place covers:*

SSIS comprising dedicated pixels or control thereof, e.g.

- pixels specially for white balance measuring;
- pixels for exposure or ambient light measuring;
- pixels for triggering an exposure period;
- pixels for edge detection;
- pixels for event detection, for motion or difference detection or for level detection;
- pixels for storing additional non-volatile information.

DATE: JANUARY 1, 2023

PROJECT RP11902

**H04N 25/704****Definition statement***This place covers:*

- SSIS comprising phase difference pixels.
- SSIS comprising only phase difference pixels – i.e. all pixels comprise more than one photodiode per micro lens. The photodiodes can have shared amplifiers or can be connected to different (shared) amplifiers.

**References****Application-oriented References***Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Focusing based on the difference in phase signals	<a href="#">H04N 23/672</a>
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**Informative References***Attention is drawn to the following places, which may be of interest for search:*

Systems for automatic generation of focusing signals using different areas in a pupil plane	<a href="#">G02B 7/34</a>
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**H04N 25/705****Definition statement***This place covers:*

- Pixels for depth measurement;
- Pixels for depth measurement using time of flight.

**References****Informative References***Attention is drawn to the following places, which may be of interest for search:*

Details of detection, sampling, integration or read-out circuits of lidar systems	<a href="#">G01S 7/4863</a> , <a href="#">G01S 7/4914</a>
Lidar systems for mapping or imaging	<a href="#">G01S 17/89</a>

Pixels specially adapted for focusing, e.g. phase difference pixel sets
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<a href="#">H04N 25/704</a>
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## [H04N 25/709](#)

### **Definition statement**

*This place covers:*

Details of circuitry:

- for controlling the power supply;
- for controlling the control signal levels;
- for controlling different bias and reference voltages;
- biasing circuits for adjusting or controlling the bias of the substrate or other circuitry.

## [H04N 25/713](#)

### **Definition statement**

*This place covers:*

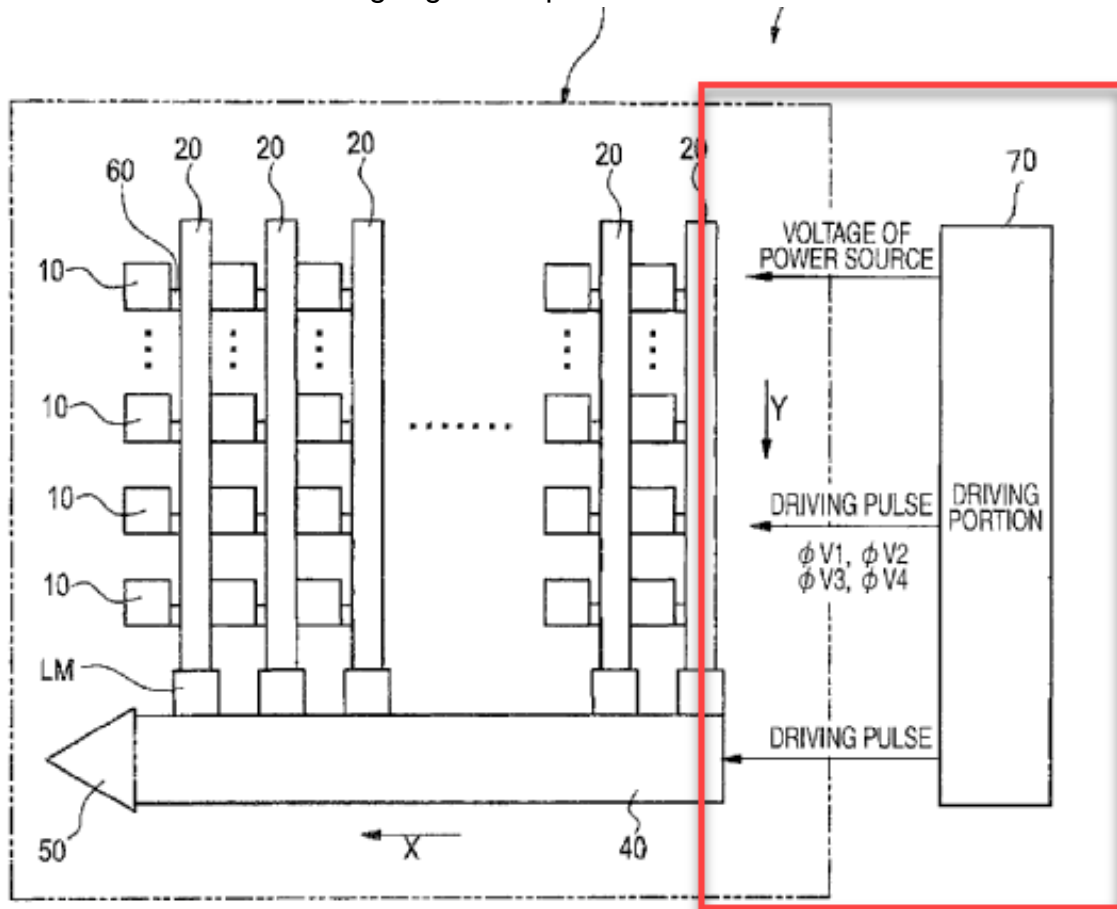
- Details of transfer registers.
- Details of readout registers:  
having for example changeable transfer direction;  
electron multiplying CCD.
- Split readout registers.
- Multiple readout registers:  
for readout in H and V directions;  
for reading out if different colours.

H04N 25/74

**Definition statement**

*This place covers:*

- Addressing circuits for CCD pixel arrays.
- CCD timing and clock generating circuits typically generate the vertical and horizontal sync signals VT, VH which determine the timing of vertical and horizontal scanning operations. A further driver circuit generates driving signals that force the CCD to transfer the information through the transfer registers. The parent group covers circuits for generating the driving signals and details related to the said driving signals or pulses.





DATE: JANUARY 1, 2023

PROJECT RP11902

### Relationships with other classification places

If the document does not provide any specific details related to the row scanning/addressing circuits but rather functionally describes details of performing different sensor readout operations, then group [H04N 25/40](#) only should be used for classification. Similarly, if the document specifies only functional details related to control of the exposure time, then group [H04N 25/50](#) and/or group [H04N 25/57](#) should be used for classification.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Arrangements for selecting an address in a digital store	<a href="#">G11C 8/00</a>
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### [H04N 25/75](#)

#### Definition statement

*This place covers:*

Readout circuits that are applicable to a CCD image sensor.

Readout circuits for CCD sensors arranged at the output of the sensor:

- CCD output stages like output buffers and source followers.
- CCD output stages which are column parallel, i.e. provided for each column.

### References

#### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

Amplifiers per se	<a href="#">H03F</a>
Analogue/digital conversion per se	<a href="#">H03M 1/00</a>

## H04N 25/76

### Definition statement

*This place covers:*

Circuits of and for driving, controlling addressed sensors.

There is a wide variety of addressed image sensors using different ways of transforming light to electrical current or voltage. The following aspects are classified in this group.

Active pixels sensors (APS):

- using photodiodes or two terminal semiconductor elements as photodetector;
- using Graphene Layer as photodetector;
- using Photo-conversion layer as photodetector;
- having pixels with small full-well capacity (200e-), high conversion gain (1 mV/e-), small pixel size (900 nm), e.g. QIS, Gigavision camera, binary pixels.

Passive pixel sensors:

- using photodiodes or two terminal semiconductor elements as photodetector;
- using bipolar transistors as photodetector;
- using charge injection devices (CID);
- charge modulation, static induction transistor (SIT) or base-stored image sensor BASIS;
- using CMOS-CCD structures;
- using diodes for (row) selection switches.

Bolometers used for far infrared imaging.

This group also covers addressed image sensors:

- comprising an additional frame memory;
- comprising testing structures;
- implemented within a display panel;
- providing specific details of the sensor input/output interfaces;

DATE: JANUARY 1, 2023

PROJECT RP11902

- providing details of partitioning of the signal processing circuits between the sensor and another chip;
- being a camera on chip.

## References

### References out of a residual place

*Examples of places in relation to which this place is residual:*

Detection or reduction of inverted contrast or eclipsing effects for reducing horizontal stripes caused by saturated regions of CMOS sensors	<a href="#">H04N 25/627</a>
--	-----------------------------

### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

CMOS imager structures	<a href="#">H01L 27/14643</a>
Charged coupled imagers per se	<a href="#">H01L 27/148</a>

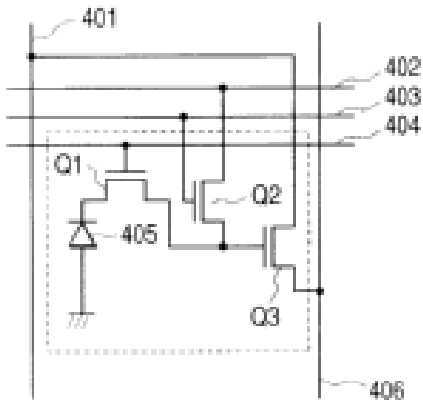
## [H04N 25/766](#)

### Definition statement

*This place covers:*

Details of control lines used for a plurality of control functions, for example:

- a control line used to control the transfer gate of one pixel and to control the reset gate of another one;
- a control line used as power line, pixel select line or column output line.

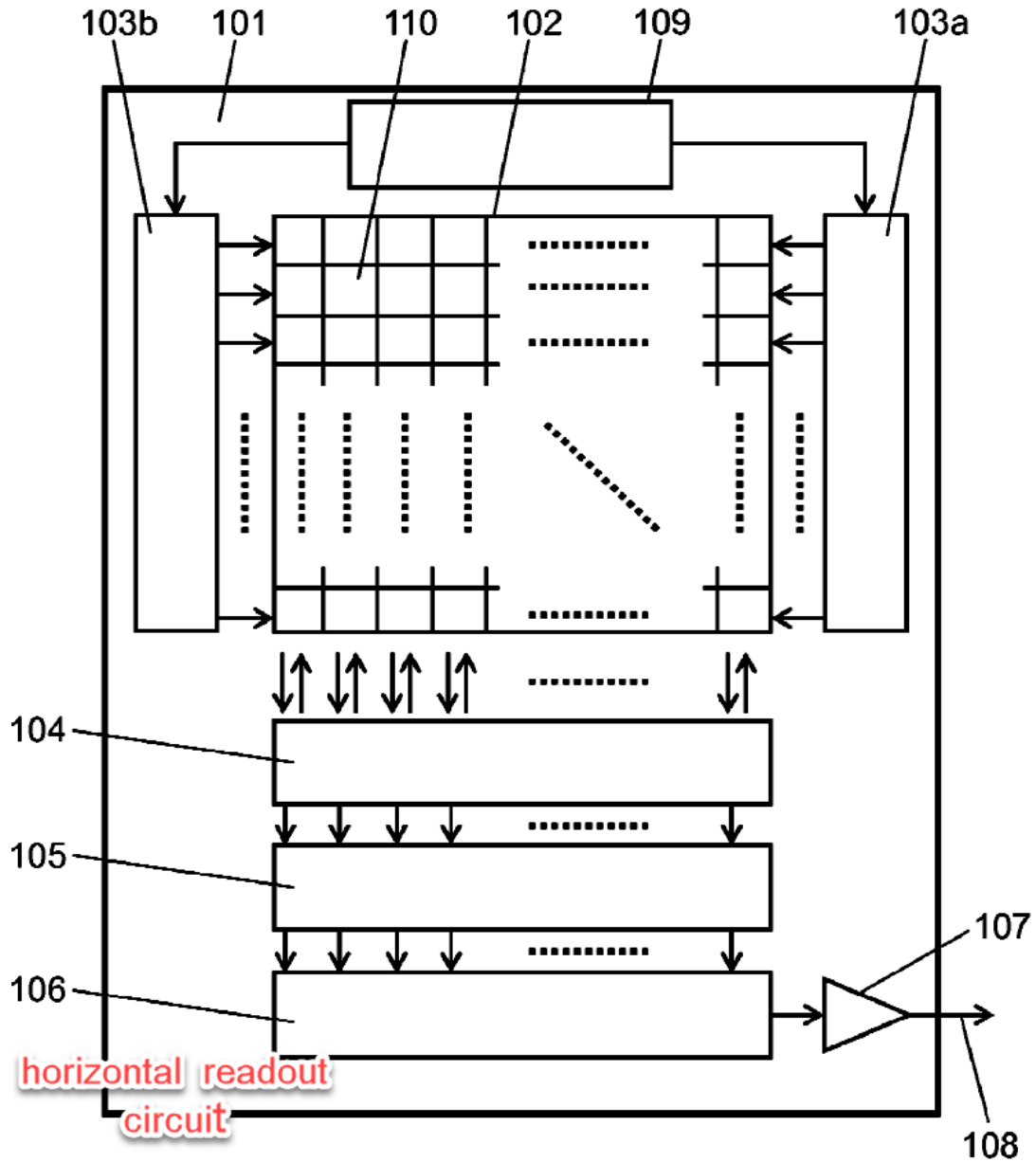


#### H04N 25/767

#### Definition statement

*This place covers:*

- Arrangements of a scanning circuit for generating control signals for a multiplexer or an arrangement of switches that connects the column lines of the sensor array to the sensor output. In contrast to the CCD sensors, the addressed type image sensors do not necessarily comprise transfer or readout registers that transfer the image signal to the output.

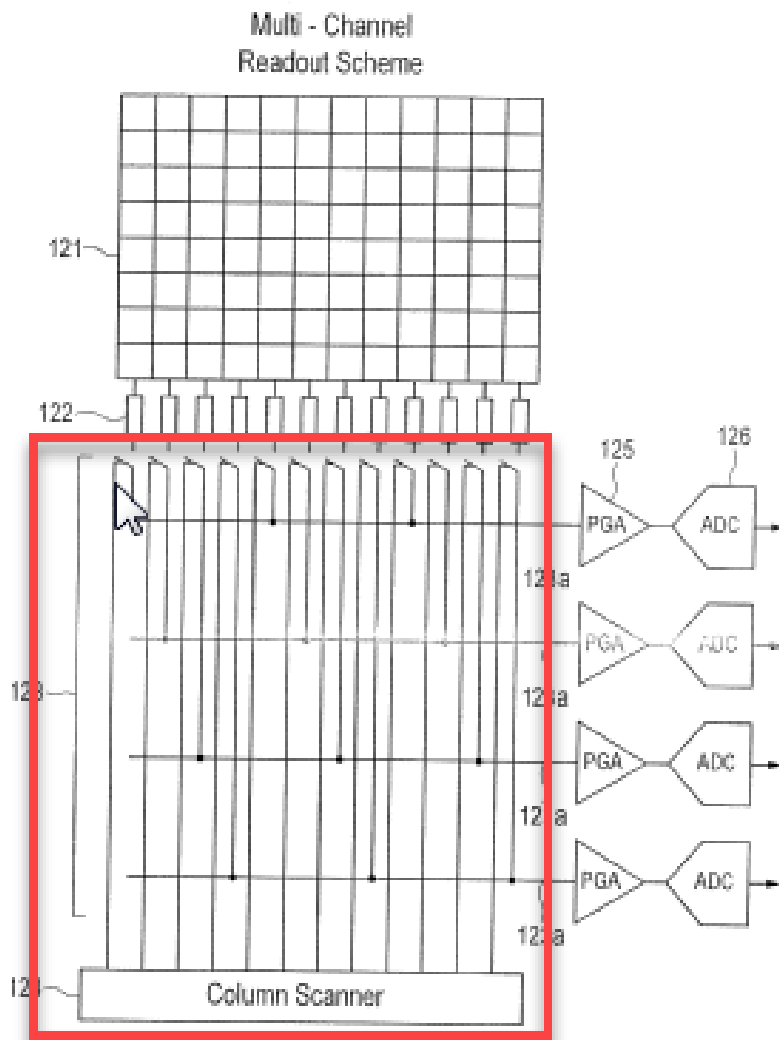


- Details of analogue (pixel signal) shift registers and scanning circuits thereof.
- Bucket-brigade type shift registers.
- Details of digital (signal) shift registers and scanning circuits thereof.
- Horizontal and vertical lines to read out the pixel array in x- and y- direction.
- Multiple horizontal readout lines for different sensor regions.

DATE: JANUARY 1, 2023

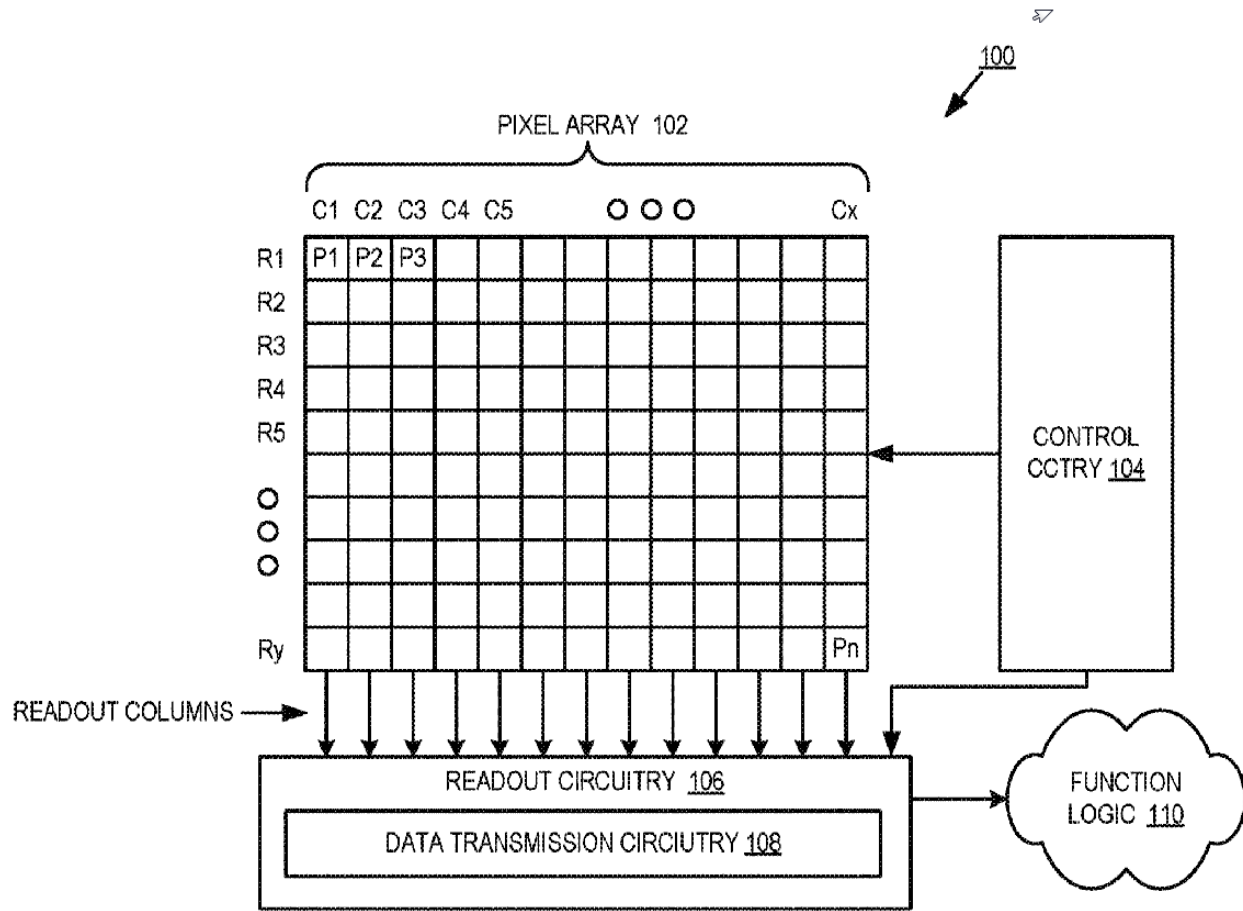
PROJECT RP11902

- Multiple horizontal readout lines for different colours.
- Details of multiplexer or switches for horizontal scanning used for performing horizontal binning between signals from different column lines.
- Details of multiplexer or switches for outputting signals from a column line to different readout line.



### Relationships with other classification places

Circuits like AD converters, correlated double sampling or amplifiers provided for each column are not part of the readout registers, but all these circuits can be part of a circuit called readout circuit. Details of column parallel AD converters, CDS circuits or column amplifier are to be classified in group [H04N 25/78](#). Group [H04N 25/767](#) shall be used for details as to how the data is transmitted to the output.



DATE: JANUARY 1, 2023

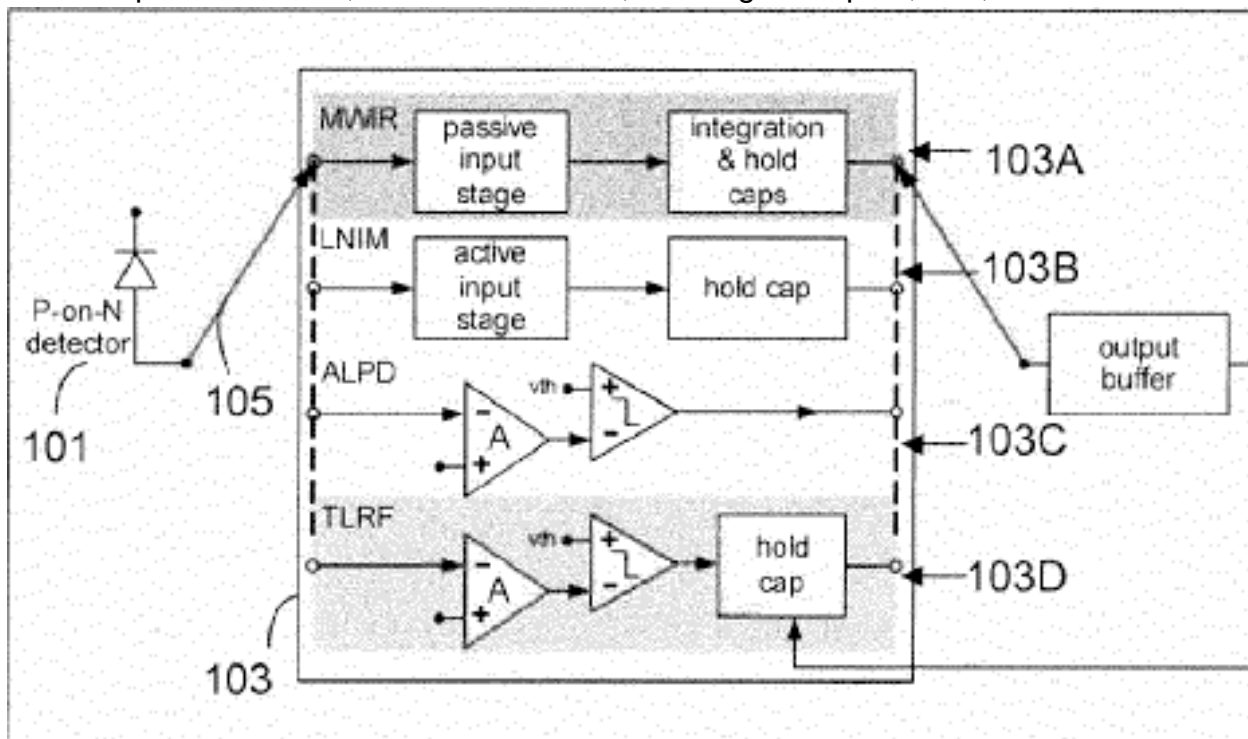
PROJECT RP11902

**H04N 25/77****Definition statement***This place covers:*

Details of pixel circuits and control thereof. Since the pixel circuits known as 3T, 4T, 5T or passive pixels are well known, these pixel structures as such are not classified in this group. However, if the invention is related to some specific properties of these well-known pixels, these pixels should be classified in this group.

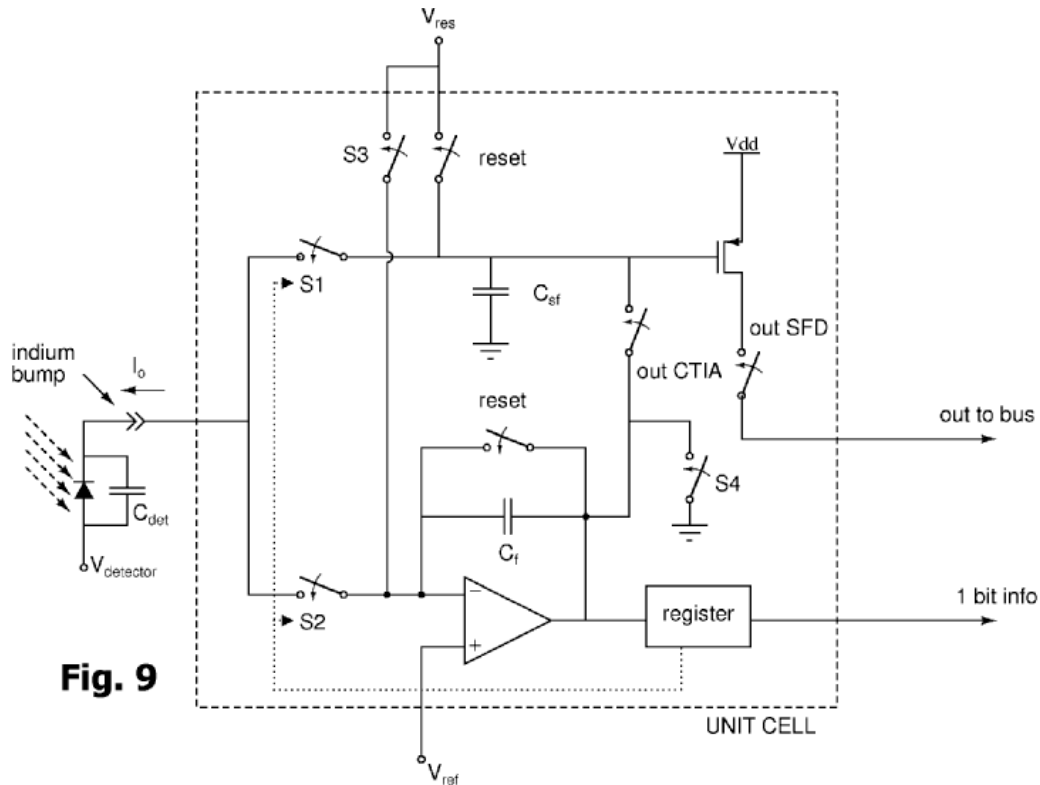
Pixels characterised by their mode of operation:

- pixels having different modes – e.g. a pixel configurable to work as TOF, as photon counter, as event detection, as integration pixel, etc.;



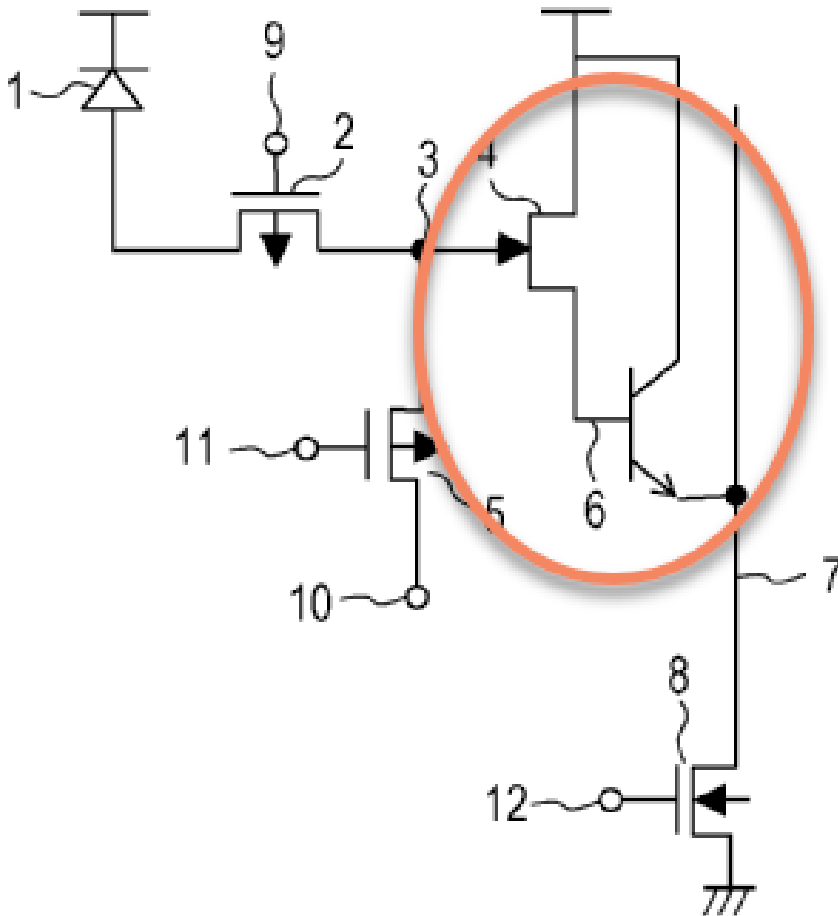
- pixels having different read-out modes.





Pixel details related to the pixel output interface. For example, pixels:

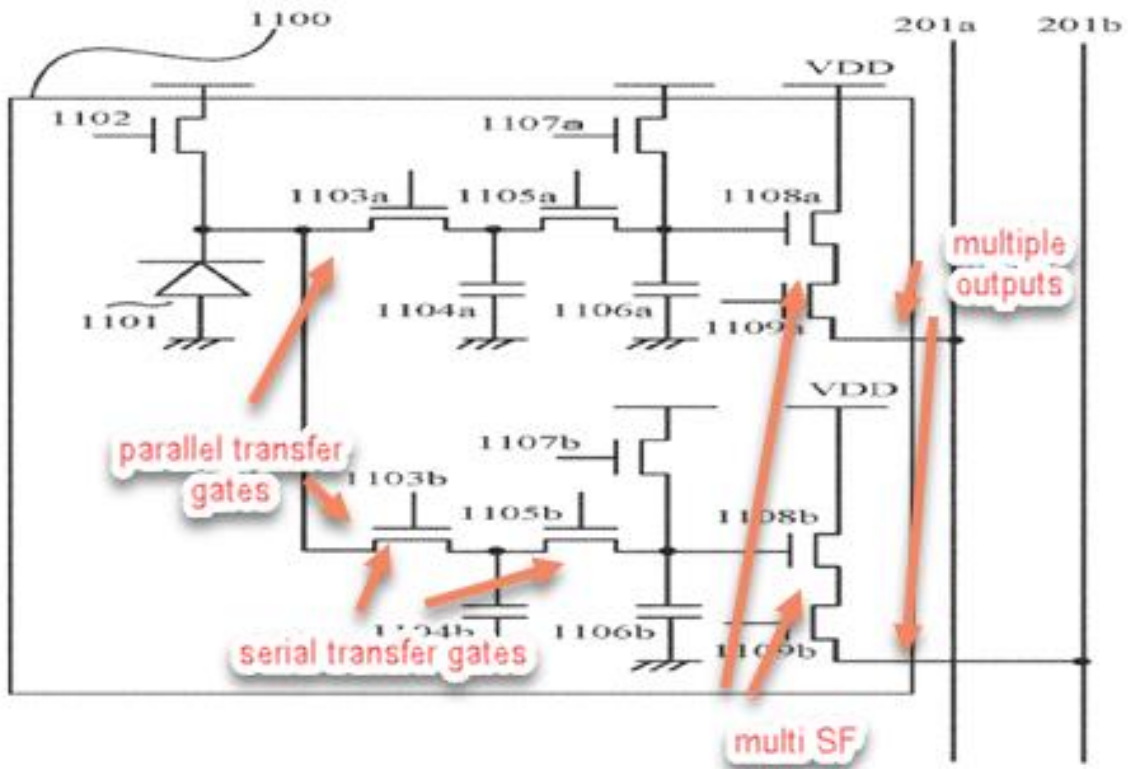
- having multiple outputs;
- having digital and analogue output;
- having passive and active output, i.e. pixels which can be read out as passive and active pixels.
- characterised by the type and the characteristics of the used amplifier. For example, pixels having specific details related to the source follower in the APS and of the source follower transistor, e.g. type of the SF transistor, load of the SF implemented in the pixel, control of the SF voltage;



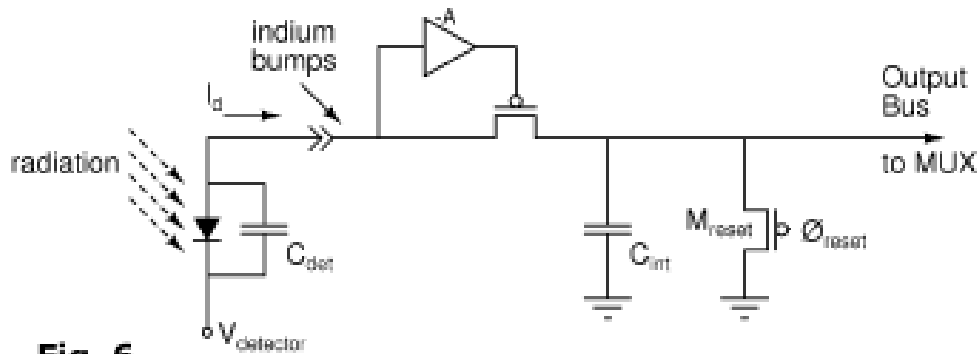
- multistage amplifier, e.g. two-stage source follower;
  - multiple source followers per pixels connected in parallel;
  - distributed amplifiers, i.e. pixels comprising only part of the amplifier, the remaining part is shared for a group of pixels or for a column of pixels;
  - CTIA or common drain amplifiers, not source followers.
- pixels characterised by the type and the characteristics of the charge transfer elements. For example, pixels:
    - with details of control of the transfer gate;
    - with details of transfer gate transistor: enhancement-, p- type;
    - with plurality of transfer gates connected in parallel;

with plurality of transfer gates serially connected.

Note: plurality of transfer gates for connecting additional storage means within the pixel are classified in group [H04N 25/771](#).



- having direct injection gate.



**Fig. 6**

- having charge multiplying portion.
- having time segregation structure for arrival time measuring.

- reading the photocurrent.

Pixels characterised by the type and the characteristics of the reset switch. For example, pixels:

- with reset level control;
- with details of the reset transistor: enhancement-, p- type.

Pixels comprising control circuits using signals from the neighbouring pixels, e.g. for control of pixel conversion gain or exposure time in function of the average signal value of the neighbouring pixels.

Pixels comprising capacitors for applying control signals (RST, SEL) through it.

### **Special rules of classification**

The sensor matrix defined in group [H04N 25/77](#) is not meant to include the associated circuits. An A/D converter in the readout circuit outside the matrix is classified in group [H04N 25/75](#) and not in group [H04N 25/772](#).

### **H04N 25/771**

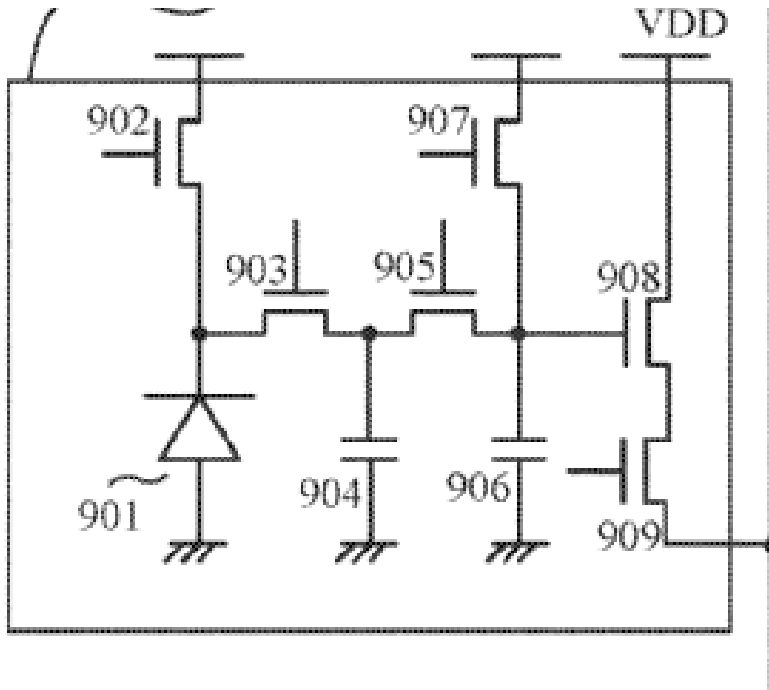
#### **Definition statement**

*This place covers:*

Pixel circuits comprising additional storage means, i.e. storage means other than the floating diffusion.

The storage means can be analogue storage means:

- in the charge domain;

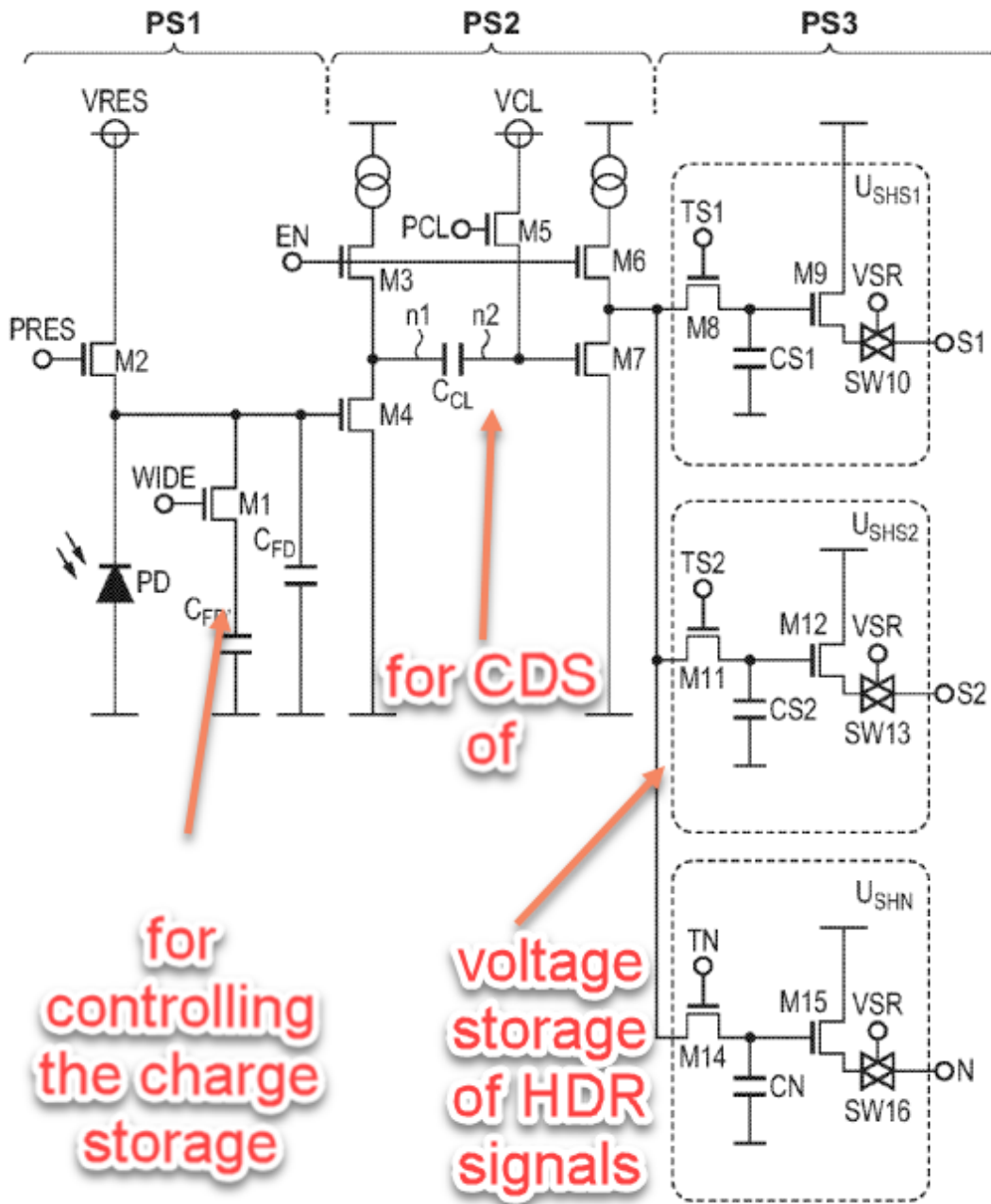


- in the voltage domain, i.e. after the source follower.

The storage means can be digital memories or non-volatile memories.

The storage means are used for different purposes. For example:

- for storing reset and exposure signals for performing CDS;
- for storing several exposure periods;
- for performing high frame rate imaging;
- for performing HDR imaging;
- for storing overflow charges during the exposure period;
- for storing non-destructive readout signals during the exposure period.



**Relationships with other classification places**

This group is not used for memories provided in the AD converters. Such pixels are classified in group [H04N 25/772](#).

DATE: JANUARY 1, 2023

PROJECT RP11902

**References****Informative References**

*Attention is drawn to the following places, which may be of interest for search:*

CDS performed in the pixel	<a href="#">H04N 25/616</a>
Extending dynamic range by controlling the amount of charge storable in the pixel	<a href="#">H04N 25/59</a>

**H04N 25/772****Definition statement**

*This place covers:*

Pixels or group of pixels comprising A/D, V/T, V/F, I/T or I/F converters. The converters should be at least partially implemented in the pixel array.

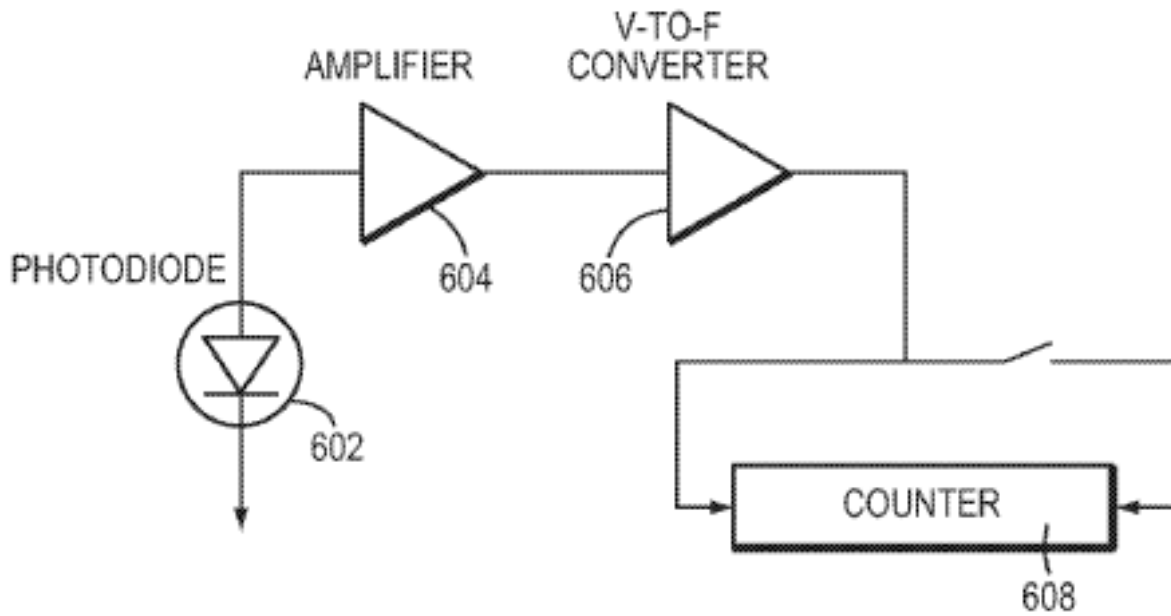
Stacked chip structures in which a pixel or a group of pixels is connected to an A/D converter implemented on a different chip.

This group does not cover image sensors in which a column of pixels is connected to an A/D converter.

A/D converters can be of any type and can be specifically designed for photoelectric pixel circuits and/or to work in combination with other pixel elements like transfer gates, reset gates, source followers, etc. A/D converters can be used to convert the image signal from the pixel to a digital value. A/D converters can be used to generate a digital value for controlling different characteristics of the pixel like its exposure time or sensitivity.

Some pixels circuits comprising converters provide an analogue and a digital output or a multiplexed digital and analogue output.

The converters convert current or voltage levels to signals with different frequency – current to frequency [I/F] converter or use voltage-controlled oscillator to perform voltage to frequency conversion [V/F].

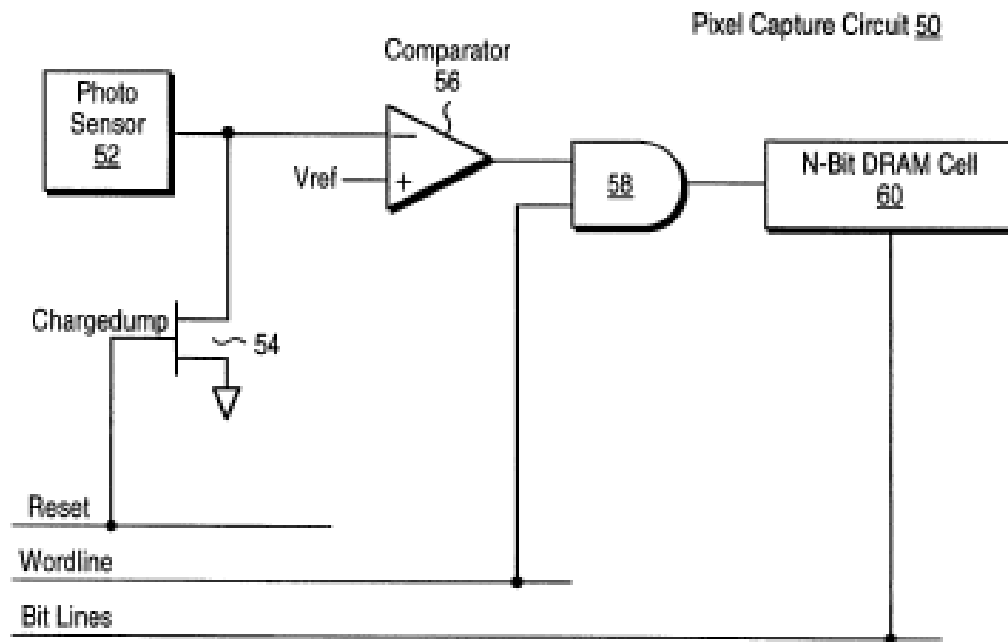


The converters convert the signal from the photo sensor to a time-dependent signal (V/T or I/T converter). These circuits are sometimes called ADC using pulse width modulation [PWM]. A comparator measures the duration of the exposure time needed for the pixel to reach a predetermined threshold. The duration of the pulse corresponds to the pixel level. The duration of the pulse can be converted to a digital value by using a counter or to analogue signal using a ramp signal.

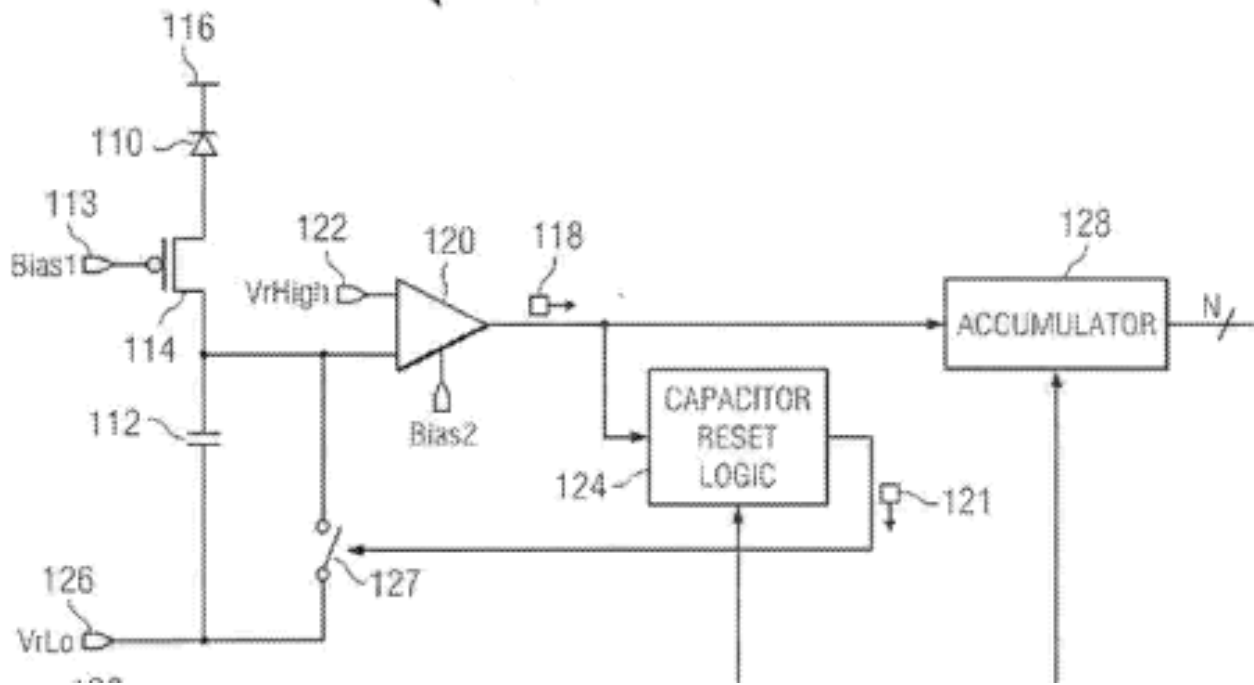


DATE: JANUARY 1, 2023

PROJECT RP11902



The converters are ADC converters that count the number of exposure periods. These circuits are sometimes also called voltage to frequency converters or ADC using pulse frequency modulation [PFM]. The duration of each exposure period is defined by a control circuit that determines when the signal from the photodiode reaches a predetermined threshold. The control circuit normally performs a reset operation and starts the new exposure period. Note that a part of or the entire control circuit can be implemented outside the pixel array.



The converters are part of photon counting pixels that generate one-bit signals corresponding to a detected photon, and the number of detected photons for a predetermined time is counted to provide a digital value (Details for such pixel circuits can be found in groups [G01T 1/247](#), [G01J 1/46](#) as a part of a radiation measuring system).

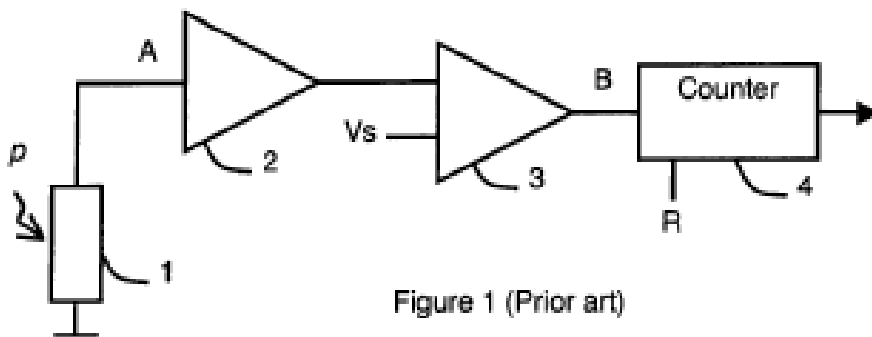


Figure 1 (Prior art)



DATE: JANUARY 1, 2023

PROJECT RP11902

The converters are single slope ADCs (Details of single slope ADCs as such can be found in group [H03M 1/56](#)).

The converters are flash type ADCs.

The converters are sigma delta ADCs.

## References

### Informative References

*Attention is drawn to the following places, which may be of interest for search:*

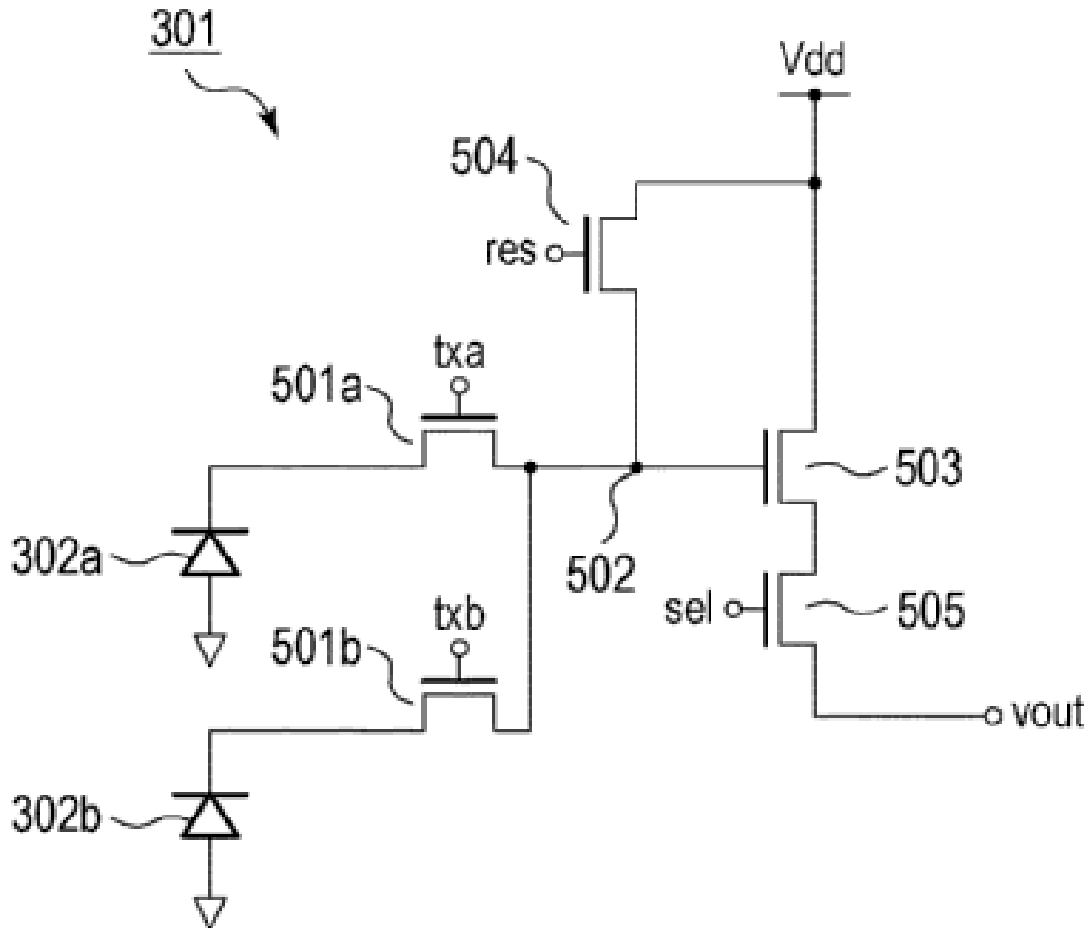
Electric circuits for photometry	<a href="#">G01J 1/44</a>
Detector read-out circuitry for measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation	<a href="#">G01T 1/247</a>
Analogue/digital converters	<a href="#">H03M 1/12</a>

## H04N 25/778

### Definition statement

*This place covers:*

Pixel structures in which multiple photodiodes are provided. Respective transfer gates are used to transfer the charges accumulated in the photodiodes to a floating diffusion, and the floating diffusion is connected to a gate of an amplifier transistor. The amplifier is implemented within the pixel array.



### Relationships with other classification places

Passive pixel sensors comprising a shared amplifier pro column are classified in group [H04N 25/76](#).

Active pixels sensors comprising column parallel amplifiers are classified in group [H04N 25/75](#).

### Special rules of classification

Typical examples for shared pixel structures used for different applications, which require additional CPC symbols

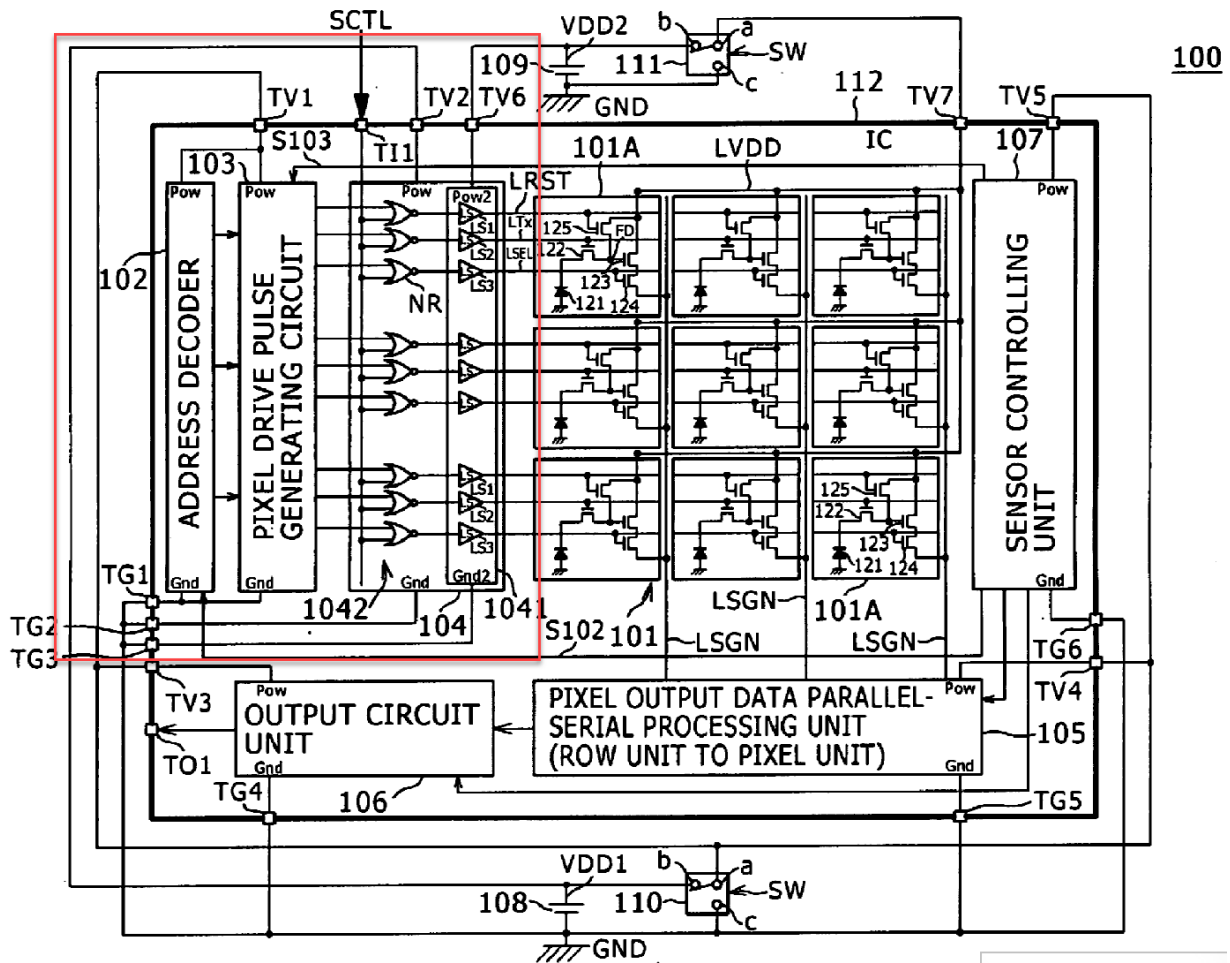
DATE: JANUARY 1, 2023

PROJECT RP11902

Shared photodiodes have different sensitivity	<a href="#">H04N 25/585</a>
Pixels specially adapted for focusing, e.g. phase difference pixel sets	<a href="#">H04N 25/704</a>
Charges of the shared photodiodes are binned in the floating diffusion	<a href="#">H04N 25/46</a>

**H04N 25/779****Definition statement***This place covers:*

- Addressed image sensors like CMOS image sensors are using row and column scanning or addressing circuits.
- The column scanning/addressing circuits are only used to provide row pixel data to the output of the sensor.
- The row scanning/addressing circuits, in addition to the row select signals, provide further control signals to the pixels such as transfer gate [TG] or reset [RST] signals.
- Details of scanning/addressing circuits for addressed image sensors;
- Details related to the electronic circuitry of the scanning circuits, multiple scanning circuits, details related to the generation of driving pulses for TG, RST, ROW SEL.



**Relationships with other classification places**

If the document does not provide any specific details related to the row scanning/addressing circuits but rather functionally describes details of performing different sensor readout operations, then group [H04N 25/40](#) only should be used for classification. Similarly, if the document specifies only functional details related to control of the exposure time, then group [H04N 25/50](#) and/or group [H04N 25/57](#) should be used for classification.

**References**

**Informative References**

Attention is drawn to the following places, which may be of interest for search:

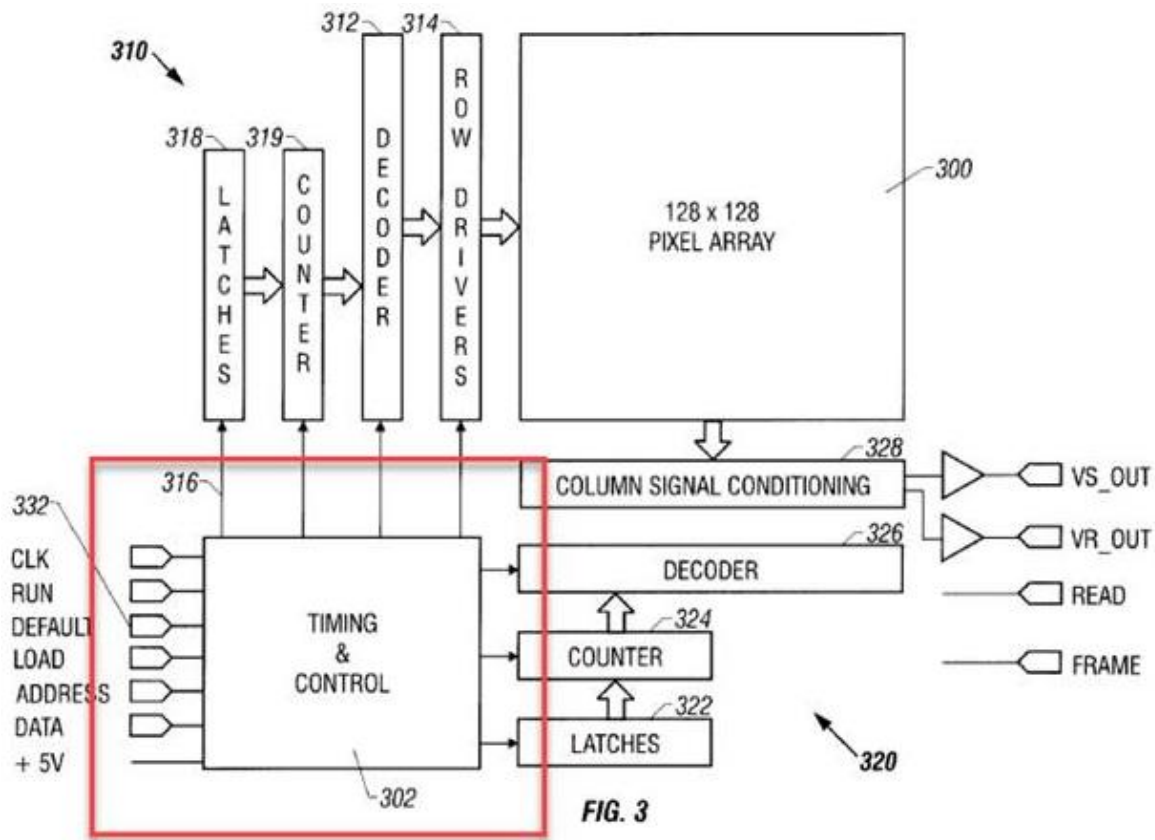
Arrangements for selecting an address in a digital store	<a href="#">G11C 8/00</a>
--	---------------------------

**H04N 25/7795**

**Definition statement**

*This place covers:*

Details of timing or clock signal generating circuits. These circuits drive the row electronics, the column electronics and control the readout of the pixel area.



## H04N 25/78

### Definition statement

*This place covers:*

Readout circuits for addressed image sensors defining details related to the column readout lines and the circuits associated with them. Although the readout lines are placed in the sensor array, they are a functional part of the readout circuits.

These details are, for example, readout arrangements with:

- several column read out lines per column of pixels;
- column lines connectable by switches to perform analogue signal averaging/binning;
- multiple column lines are multiplexed to be processed by common processing means, like CDS, ADC, buffers;
- column lines connectable to different processing means (CDS, ADC, buffers) to randomize the column pattern noise;
- column lines randomly connectable to different processing means (CDS, ADC, buffers) to randomize the column pattern noise;
- a column line being shared for pixels in a row;
- several storage capacitors per column used for CDS, binning, multi-frame storage, etc.;
- reset or clamping circuits connected to the column lines.

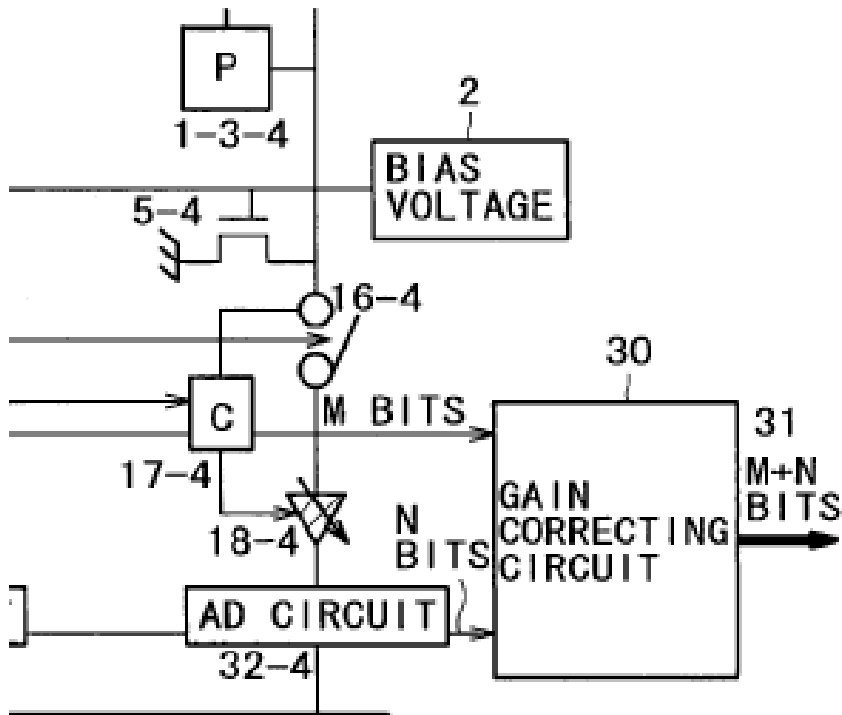
Details related to the load circuit, e.g. current source of the source follower and control thereof.

Details related to ADC circuits (ADC circuits as such – group [H03M 1/12](#)) used in sensor array readout circuits.

These details are for example, related to:

- ADC type, like single slope, flash, SAR, sigma-delta, ADC combined with the gain of a programmable gain amplifier (ADC of this type as such group [H03M 1/18](#));

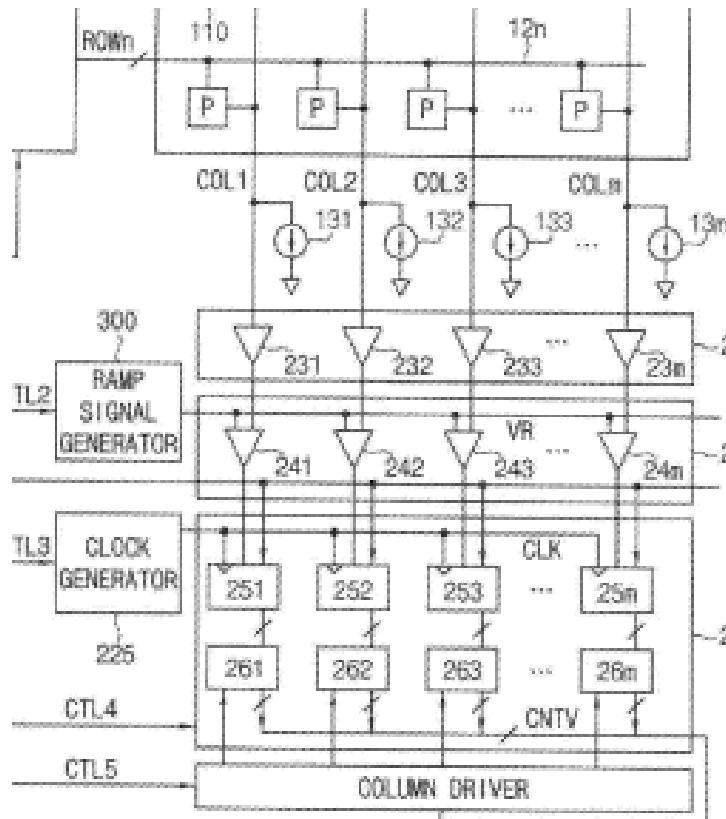




- ADC arrangement in the readout circuit;
- ADC arranged per-column or for group of columns;

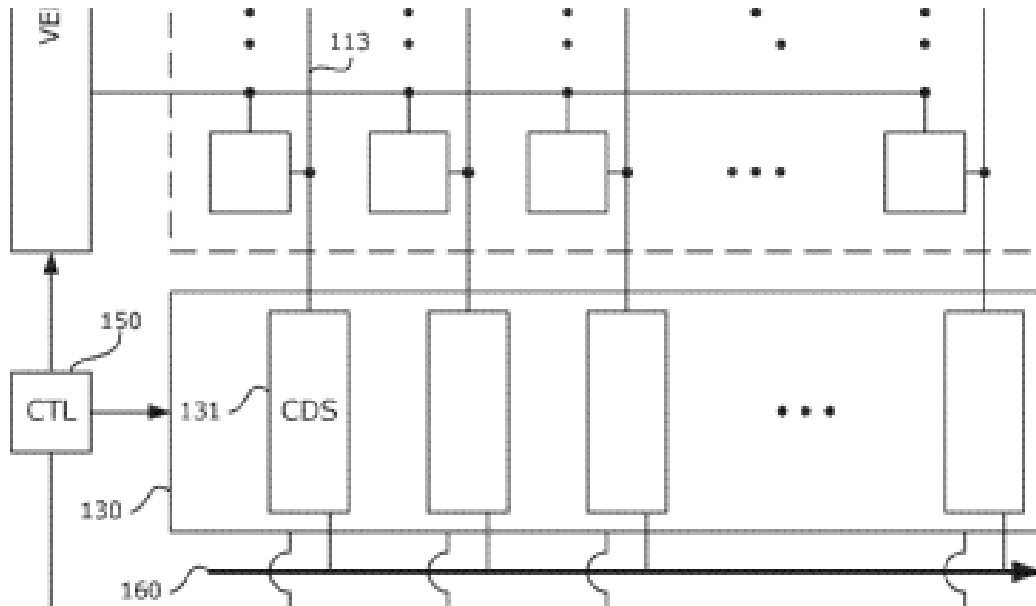
DATE: JANUARY 1, 2023

PROJECT RP11902



- ADC arranged at the output of the sensor;
- ADC ramp voltage generation - different slopes and directions, non-linear, ramp amplitude;
- Processing implemented in the ADC, like CDS, binning.
- Details related to output amplifiers:
  - CTIA amplifiers (normally used in passive image sensors);
  - Amplifiers with controllable gain GCA, PGA;
  - Amplifiers arranged per-column or for group of columns;
  - Amplifiers arranged at the output of the sensor.
- Details of arrangement of the CDS circuit as part of the readout circuit:

CDS arranged per column;



CDS arranged at the output of the sensor.

CDS circuits as such are classified in group [H04N 25/616](#).

## References

### Informative References

Attention is drawn to the following places, which may be of interest for search:

Amplifiers per se	<a href="#">H03F</a>
Analogue/digital conversion per se	<a href="#">H03M 1/00</a>

## [H04N 25/79](#)

### Definition statement

This place covers:

- Details of circuits and control thereof adapted for stacked image sensors and the like;
- Details of partitioning the image sensor functional blocks like pixel array, scanning circuits, readout circuits, memories between different stacked chips;

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

- Details of a pixel circuitry distributed between different layers;
- Details of ADC circuitry distributed between different layers;
- Details of specific control arrangements or control lines adapted for stacked sensors.

**References**

**Informative References**

*Attention is drawn to the following places, which may be of interest for search:*

Line sensors using abutted sensors forming a long line	<a href="#">H04N 25/7013</a>
--	------------------------------

## 2. A. DEFINITIONS (Modified)

### H04N 5/222

#### Definition statement

Replace: The existing Definition statement text with the following updated text.

Circuitry, devices and other equipment specially adapted to be used in television studio, e.g. for mixing images or generation of special effects.

Delete: The entire Relationships with other classification places section.

#### References

Insert: The following new Limiting references section.

#### Limiting references

*This place does not cover:*

Cameras or camera modules comprising electronic image sensors, or control thereof	H04N 23/00
---	------------

Delete: The entire Application-oriented references section.

Delete: The entire Informative references section.

Delete: The entire Glossary of terms section.

Delete: The entire Synonyms and Keywords section.

## H04N 5/30

### Definition statement

Replace: The existing Definition statement text with the following updated text.

Circuitry (electronic circuits) and driving of circuits other than solid state image sensors for transforming light into electric image information.

### References

#### Limiting references

Replace: The existing Limiting references table with the following updated table.

Scanning details	H04N 3/00
Cameras or camera modules comprising electronic image sensors or control thereof	H04N 23/00
Circuitry of solid-state image sensors [SSIS] or control thereof	H04N 25/00

Delete: The entire Glossary of terms section.

## H04N 5/32

### Definition statement

Replace: The existing Definition statement text with the following updated text.

X-ray imaging systems that directly or indirectly detect incident X-ray photons.

DATE: JANUARY 1, 2023

PROJECT RP11902

## References

### Limiting references

Replace: The existing Limiting references table with the following updated table.

Cameras or camera modules for generating image signals from X-rays	H04N 23/30
Circuitry of SSIS for transforming X-rays into image signals	H04N 25/30

Delete: The entire Application-oriented references section.

Delete: The entire Informative references section.

Delete: The entire Special rules of classification section.

## H04N 5/33

### Definition statement

Replace: The existing Definition statement text with the following updated text.

Image sensors other than solid state image sensors and control thereof for near and far infrared (IR) cameras.

## References

Insert: The following new Limiting references section.

DATE: JANUARY 1, 2023

PROJECT RP11902

**Limiting references***This place does not cover:*

Cameras or camera modules for generating image signals from infrared radiation	H04N 23/20
Circuitry of SSIS for transforming infrared radiation into image signals	H04N 25/20

Delete: The entire Informative references section.Delete: The entire Special rules of classification section.**H04N 9/64****Definition statement**Delete: From the 12<sup>th</sup> bullet of the Definition statement the phrase “or at electronic image capture level”, so that the bullet reads as follows.

- White balance control of the demodulated colour signal for display

**Relationships with other classification places**Replace: The existing Relationships with other classification places text with the following updated text.

With respect to colour or chrominance aspects, main group H04N 1/00 contains subject-matter relating to the following aspects:

- Aspects of apparatus/methods for controlling or correcting colour video signals originating from a scanned picture signal, e.g. facsimile, document, photo.
- Subclass G06T contains subject-matter relating to the following aspects: General purpose data processing of an image or enhancement of such image not particularly adapted to a motion video signal.
- Subclass H03D contains subject-matter relating to the following aspects: Demodulation of amplitude modulated signals.



DATE: JANUARY 1, 2023

PROJECT RP11902

**References****Limiting references**

Replace: The existing Limiting references table with the following updated table.

Circuits for processing the brightness signal and the chrominance signal relative to each other	H04N 9/77
Camera processing pipelines for processing colour signals	H04N 23/84

**Informative references**

Replace: The existing Informative references table with the following updated table.

Image processing, image enhancement	G06T
Amplitude demodulation	H03D
Colour picture communication system	H04N 1/46
Colour picture signal processing	H04N 1/56
Facsimile colour picture signal processing	H04N 1/60
Colour television signal testing	H04N 17/02

**H04N 9/67****References**

Insert: The following new Limiting references section.

**Limiting references**

*This place does not cover:*

Camera processing pipelines for matrixing of colour signals	H04N 23/85
---	------------

DATE: JANUARY 1, 2023

PROJECT RP11902

## H04N 9/68

### References

#### Limiting references

Insert: The following new row in the Limiting references table.

Camera processing pipelines for controlling the colour saturation of colour signals	<a href="#">H04N 23/86</a>
---	----------------------------

## H04N 9/72

### References

Insert: The following new Limiting references section.

#### Limiting references

*This place does not cover:*

Camera processing pipelines for reinsertion of DC or slowly varying components of colour signals	<a href="#">H04N 23/87</a>
--	----------------------------

## H04N 9/73

### References

Insert: The following new Limiting references section.

#### Limiting references

*This place does not cover:*

Camera processing pipelines for colour balance	<a href="#">H04N 23/88</a>
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CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

2. B. DEFINITIONS QUICK FIX

<b>Symbol</b>	<b>Location of change</b> (e.g., section title)	<b>Existing reference symbol or text</b>	<b>Action; New symbol; New text</b>
H04N 5/217	Definition		Delete the entire Definition.
H04N 5/225	Definition		Delete the entire Definition.
H04N 5/2251	Definition		Delete the entire Definition.
H04N 5/232	Definition		Delete the entire Definition.
H04N 5/23212	Definition		Delete the entire Definition.
H04N 5/232121	Definition		Delete the entire Definition.
H04N 5/232133	Definition		Delete the entire Definition.
H04N 5/23216	Definition		Delete the entire Definition.
H04N 5/23218	Definition		Delete the entire Definition.
H04N 5/23219	Definition		Delete the entire Definition.
H04N 5/23241	Definition		Delete the entire Definition.
H04N 5/23293	Definition		Delete the entire Definition.
H04N 5/232933	Definition		Delete the entire Definition.
H04N 5/23299	Definition		Delete the entire Definition.
H04N 5/235	Definition		Delete the entire Definition.
H04N 5/2356	Definition		Delete the entire Definition.
H04N 5/247	Definition		Delete the entire Definition.
H04N 5/332	Definition		Delete the entire Definition.
H04N 5/335	Definition		Delete the entire Definition.
H04N 5/341	Definition		Delete the entire Definition.
H04N 5/3415	Definition		Delete the entire Definition.
H04N 5/343	Definition		Delete the entire Definition.
H04N 5/345	Definition		Delete the entire Definition.
H04N 5/3452	Definition		Delete the entire Definition.
H04N 5/3454	Definition		Delete the entire Definition.
H04N 5/3456	Definition		Delete the entire Definition.
H04N 5/347	Definition		Delete the entire Definition.
H04N 5/349	Definition		Delete the entire Definition.
H04N 5/351	Definition		Delete the entire Definition.
H04N 5/353	Definition		Delete the entire Definition.
H04N 5/3532	Definition		Delete the entire Definition.
H04N 5/3535	Definition		Delete the entire Definition.
H04N 5/3537	Definition		Delete the entire Definition.
H04N 5/355	Definition		Delete the entire Definition.
H04N 5/35509	Definition		Delete the entire Definition.

## CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

H04N 5/35518	Definition		Delete the entire Definition.
H04N 5/35527	Definition		Delete the entire Definition.
H04N 5/35536	Definition		Delete the entire Definition.
H04N 5/35545	Definition		Delete the entire Definition.
H04N 5/35554	Definition		Delete the entire Definition.
H04N 5/35563	Definition		Delete the entire Definition.
H04N 5/35572	Definition		Delete the entire Definition.
H04N 5/35581	Definition		Delete the entire Definition.
H04N 5/3559	Definition		Delete the entire Definition.
H04N 5/357	Definition		Delete the entire Definition.
H04N 5/3572	Definition		Delete the entire Definition.
H04N 5/35721	Definition		Delete the entire Definition.
H04N 5/3575	Definition		Delete the entire Definition.
H04N 5/3577	Definition		Delete the entire Definition.
H04N 5/359	Definition		Delete the entire Definition.
H04N 5/3591	Definition		Delete the entire Definition.
H04N 5/3592	Definition		Delete the entire Definition.
H04N 5/3594	Definition		Delete the entire Definition.
H04N 5/3595	Definition		Delete the entire Definition.
H04N 5/3597	Definition		Delete the entire Definition.
H04N 5/3598	Definition		Delete the entire Definition.
H04N 5/361	Definition		Delete the entire Definition.
H04N 5/363	Definition		Delete the entire Definition.
H04N 5/365	Definition		Delete the entire Definition.
H04N 5/3651	Definition		Delete the entire Definition.
H04N 5/3653	Definition		Delete the entire Definition.
H04N 5/3655	Definition		Delete the entire Definition.
H04N 5/3656	Definition		Delete the entire Definition.
H04N 5/3658	Definition		Delete the entire Definition.
H04N 5/367	Definition		Delete the entire Definition.
H04N 5/3675	Definition		Delete the entire Definition.
H04N 5/369	Definition		Delete the entire Definition.
H04N 5/3696	Definition		Delete the entire Definition.
H04N 5/36961	Definition		Delete the entire Definition.
H04N 5/36963	Definition		Delete the entire Definition.
H04N 5/36965	Definition		Delete the entire Definition.
H04N 5/3698	Definition		Delete the entire Definition.
H04N 5/37213	Definition		Delete the entire Definition.
H04N 5/374	Definition		Delete the entire Definition.
H04N 5/3741	Definition		Delete the entire Definition.
H04N 5/3742	Definition		Delete the entire Definition.
H04N 5/3745	Definition		Delete the entire Definition.
H04N 5/37452	Definition		Delete the entire Definition.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

H04N 5/37455	Definition		Delete the entire Definition.
H04N 5/37457	Definition		Delete the entire Definition.
H04N 5/376	Definition		Delete the entire Definition.
H04N 5/3765	Definition		Delete the entire Definition.
H04N 5/378	Definition		Delete the entire Definition.
H04N 5/379	Definition		Delete the entire Definition.
H04N 9/04515	Definition		Delete the entire Definition.
H04N 9/04553	Definition		Delete the entire Definition.
H04N 9/097	Definition		Delete the entire Definition.
H04N 9/10	Definition		Delete the entire Definition.

**Notes:**

Use this Definitions Quick Fix (DQF) table to:

- Delete an entire definition
- Delete an entire section
- Change a reference symbol
- Delete a reference symbol
- Delete text in a References section
- Correct one error in spelling, article use, or verb tense

Otherwise, use the standard template.

*Reminder: Never delete F symbol definitions.*

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

3. REVISION CONCORDANCE LIST (RCL)

<b>Type*</b>	<b>From CPC Symbol (existing)</b>	<b>To CPC Symbol(s)</b>
C	H04N 5/202	H04N 5/202, H04N 23/82
D	H04N 5/217	<administrative transfer to H04N 23/81>
D	H04N 5/2171	<administrative transfer to H04N 23/811>
D	H04N 5/2173	<administrative transfer to H04N 25/60>
D	H04N 5/2175	<administrative transfer to H04N 25/62>
D	H04N 5/2176	<administrative transfer to H04N 25/63>
D	H04N 5/2178	<administrative transfer to H04N 25/67>
D	H04N 5/225	<administrative transfer to H04N 23/00>
D	H04N 5/2251	<administrative transfer to H04N 23/50>
D	H04N 5/2252	<administrative transfer to H04N 23/51>
D	H04N 5/22521	<administrative transfer to H04N 23/52>
D	H04N 5/22525	<administrative transfer to H04N 23/53>
D	H04N 5/225251	<administrative transfer to H04N 23/531>
D	H04N 5/2253	<administrative transfer to H04N 23/54>
D	H04N 5/2254	<administrative transfer to H04N 23/55>
D	H04N 5/22541	<administrative transfer to H04N 23/957>
D	H04N 2005/2255	<administrative transfer to H04N 23/555 INV>
D	H04N 5/2256	<administrative transfer to H04N 23/56>
D	H04N 5/2257	<administrative transfer to H04N 23/57>
D	H04N 5/2258	<administrative transfer to H04N 23/45>
D	H04N 5/2259	<administrative transfer to H04N 23/58>
D	H04N 5/228	<administrative transfer to H04N 23/40>
D	H04N 5/2283	<administrative transfer to H04N 23/41>
D	H04N 5/2286	<administrative transfer to H04N 23/43>
D	H04N 5/232	<administrative transfer to H04N 23/60>
D	H04N 5/23203	<administrative transfer to H04N 23/66>
D	H04N 5/23206	<administrative transfer to H04N 23/661>
D	H04N 5/232061	<administrative transfer to H04N 23/662>
D	H04N 5/23209	<administrative transfer to H04N 23/663>
D	H04N 5/23212	<administrative transfer to H04N 23/67>
D	H04N 5/232121	<administrative transfer to H04N 23/671>
D	H04N 5/232122	<administrative transfer to H04N 23/672>
D	H04N 5/232123	<administrative transfer to H04N 23/673>
D	H04N 5/232125	<administrative transfer to H04N 23/959>
D	H04N 5/232127	<administrative transfer to H04N 23/675>
D	H04N 5/232133	<administrative transfer to H04N 23/676>
D	H04N 5/23216	<administrative transfer to H04N 23/62>
D	H04N 5/23218	<administrative transfer to H04N 23/61>
D	H04N 5/23219	<administrative transfer to H04N 23/611>
D	H04N 5/23222	<administrative transfer to H04N 23/64>
D	H04N 5/23225	<administrative transfer to H04N 23/617>
D	H04N 5/23227	<administrative transfer to H04N 23/665>
D	H04N 5/23229	<administrative transfer to H04N 23/80>
D	H04N 5/23232	<administrative transfer to H04N 23/951>
D	H04N 5/23235	<administrative transfer to H04N 23/815>
D	H04N 5/23238	<administrative transfer to H04N 23/698>
D	H04N 5/23241	<administrative transfer to H04N 23/65>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<b>Type*</b>	<b><u>From CPC Symbol (existing)</u></b>	<b><u>To CPC Symbol(s)</u></b>
D	H04N 5/232411	<administrative transfer to H04N 23/651>
D	H04N 5/23245	<administrative transfer to H04N 23/667>
D	H04N 5/23248	<administrative transfer to H04N 23/68>
D	H04N 5/23251	<administrative transfer to H04N 23/681>
D	H04N 5/23254	<administrative transfer to H04N 23/6811>
D	H04N 5/23258	<administrative transfer to H04N 23/6812>
D	H04N 5/23261	<administrative transfer to H04N 23/6815>
D	H04N 5/23264	<administrative transfer to H04N 23/682>
D	H04N 5/23267	<administrative transfer to H04N 23/683>
D	H04N 5/2327	<administrative transfer to H04N 23/684>
D	H04N 5/23274	<administrative transfer to H04N 23/6842>
D	H04N 5/23277	<administrative transfer to H04N 23/6845>
D	H04N 5/2328	<administrative transfer to H04N 23/685>
D	H04N 5/23283	<administrative transfer to H04N 23/686>
D	H04N 5/23287	<administrative transfer to H04N 23/687>
D	H04N 5/2329	<administrative transfer to H04N 23/689>
D	H04N 5/23293	<administrative transfer to H04N 23/63>
D	H04N 5/232933	<administrative transfer to H04N 23/631>
D	H04N 5/232935	<administrative transfer to H04N 23/632>
D	H04N 5/232939	<administrative transfer to H04N 23/633>
D	H04N 5/232941	<administrative transfer to H04N 23/634>
D	H04N 5/232945	<administrative transfer to H04N 23/635>
D	H04N 5/23296	<administrative transfer to H04N 23/69>
D	H04N 5/23299	<administrative transfer to H04N 23/695>
D	H04N 5/235	<administrative transfer to H04N 23/70>
D	H04N 5/2351	<administrative transfer to H04N 23/71>
D	H04N 5/2352	<administrative transfer to H04N 23/72>
D	H04N 5/2353	<administrative transfer to H04N 23/73>
D	H04N 5/2354	<administrative transfer to H04N 23/74>
D	H04N 5/2355	<administrative transfer to H04N 23/741>
D	H04N 5/2356	<administrative transfer to H04N 23/743>
D	H04N 5/2357	<administrative transfer to H04N 23/745>
D	H04N 5/2358	<administrative transfer to H04N 23/749>
D	H04N 5/238	<administrative transfer to H04N 23/75>
D	H04N 5/243	<administrative transfer to H04N 23/76>
D	H04N 5/247	<administrative transfer to H04N 23/90>
C	H04N 5/30	H04N 5/30, H04N 25/00
C	H04N 5/32	H04N 5/32, H04N 23/30, H04N 25/30
C	H04N 5/33	H04N 5/33, H04N 23/20, H04N 23/21, H04N 23/23, H04N 25/20, H04N 25/21
D	H04N 5/332	<administrative transfer to H04N 23/11 >
D	H04N 5/335	<administrative transfer to H04N 25/00>
D	H04N 5/3355	<administrative transfer to H04N 25/772>
D	H04N 5/341	<administrative transfer to H04N 25/40>
D	H04N 5/3415	<administrative transfer to H04N 25/41>
D	H04N 5/343	<administrative transfer to H04N 25/42>
D	H04N 5/345	<administrative transfer to H04N 25/44>
D	H04N 5/3452	<administrative transfer to H04N 25/441>
D	H04N 5/3454	<administrative transfer to H04N 25/443>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<b>Type*</b>	<b><u>From CPC Symbol (existing)</u></b>	<b><u>To CPC Symbol(s)</u></b>
D	H04N 5/3456	<administrative transfer to H04N 25/445>
D	H04N 5/347	<administrative transfer to H04N 25/46>
D	H04N 5/349	<administrative transfer to H04N 25/48>
D	H04N 5/351	<administrative transfer to H04N 25/50>
D	H04N 5/353	<administrative transfer to H04N 25/53>
D	H04N 5/3532	<administrative transfer to H04N 25/531>
D	H04N 5/3535	<administrative transfer to H04N 25/533>
D	H04N 5/3537	<administrative transfer to H04N 25/534>
D	H04N 5/355	<administrative transfer to H04N 25/57>
D	H04N 5/35509	<administrative transfer to H04N 25/571>
D	H04N 5/35518	<administrative transfer to H04N 25/573>
D	H04N 5/35527	<administrative transfer to H04N 25/575>
D	H04N 5/35536	<administrative transfer to H04N 25/58>
D	H04N 5/35545	<administrative transfer to H04N 25/581>
D	H04N 5/35554	<administrative transfer to H04N 25/583>
D	H04N 5/35563	<administrative transfer to H04N 25/585>
D	H04N 5/35572	<administrative transfer to H04N 25/587>
D	H04N 5/35581	<administrative transfer to H04N 25/589>
D	H04N 5/3559	<administrative transfer to H04N 25/59>
D	H04N 5/357	<administrative transfer to H04N 25/60>
D	H04N 5/3572	<administrative transfer to H04N 25/61>
D	H04N 5/35721	<administrative transfer to H04N 25/615>
D	H04N 5/3575	<administrative transfer to H04N 25/616>
D	H04N 5/3577	<administrative transfer to H04N 25/617>
D	H04N 5/359	<administrative transfer to H04N 25/62>
D	H04N 5/3591	<administrative transfer to H04N 25/621>
D	H04N 5/3592	<administrative transfer to H04N 25/622>
D	H04N 5/3594	<administrative transfer to H04N 25/623>
D	H04N 5/3595	<administrative transfer to H04N 25/625>
D	H04N 5/3597	<administrative transfer to H04N 25/626>
D	H04N 5/3598	<administrative transfer to H04N 25/627>
D	H04N 5/361	<administrative transfer to H04N 25/63>
D	H04N 5/363	<administrative transfer to H04N 25/65>
D	H04N 5/365	<administrative transfer to H04N 25/67>
D	H04N 5/3651	<administrative transfer to H04N 25/671>
D	H04N 5/3653	<administrative transfer to H04N 25/672>
D	H04N 5/3655	<administrative transfer to H04N 25/673>
D	H04N 5/3656	<administrative transfer to H04N 25/674>
D	H04N 5/3658	<administrative transfer to H04N 25/677>
D	H04N 5/367	<administrative transfer to H04N 25/68>
D	H04N 5/3675	<administrative transfer to H04N 25/683>
D	H04N 5/369	<administrative transfer to H04N 25/70>
D	H04N 5/3692	<administrative transfer to H04N 25/701>
D	H04N 5/3694	<administrative transfer to H04N 25/7013>
D	H04N 5/3696	<administrative transfer to H04N 25/702>
D	H04N 5/36961	<administrative transfer to H04N 25/704>
D	H04N 5/36963	<administrative transfer to H04N 25/633>
D	H04N 5/36965	<administrative transfer to H04N 25/705>
D	H04N 5/3698	<administrative transfer to H04N 25/709>



CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<b>Type*</b>	<b><u>From CPC Symbol (existing)</u></b>	<b><u>To CPC Symbol(s)</u></b>
D	H04N 5/372	<administrative transfer to H04N 25/71>
D	H04N 5/37206	<administrative transfer to H04N 25/711>
D	H04N 5/37213	<administrative transfer to H04N 25/713>
D	H04N 5/3722	<administrative transfer to H04N 25/715>
D	H04N 5/3725	<administrative transfer to H04N 25/72>
D	H04N 5/3728	<administrative transfer to H04N 25/73>
D	H04N 5/374	<administrative transfer to H04N 25/76>
D	H04N 5/3741	<administrative transfer to H04N 25/766>
D	H04N 5/3742	<administrative transfer to H04N 25/767>
D	H04N 5/3743	<administrative transfer to H04N 25/768>
D	H04N 5/3745	<administrative transfer to H04N 25/77>
D	H04N 5/37452	<administrative transfer to H04N 25/771>
D	H04N 5/37455	<administrative transfer to H04N 25/772>
D	H04N 5/37457	<administrative transfer to H04N 25/778>
D	H04N 5/376	<administrative transfer to H04N 25/74>
D	H04N 5/3765	<administrative transfer to H04N 25/745>
D	H04N 5/378	<administrative transfer to H04N 25/75>
D	H04N 5/379	<administrative transfer to H04N 25/79>
D	H04N 9/04	<administrative transfer to H04N 23/10>
D	H04N 9/045	<administrative transfer to H04N 23/10>
D	H04N 9/0451	<administrative transfer to H04N 23/84>
D	H04N 9/04511	<administrative transfer to H04N 25/447>
D	H04N 9/04513	<administrative transfer to H04N 23/841>
D	H04N 9/04515	<administrative transfer to H04N 23/843>
D	H04N 9/04517	<administrative transfer to H04N 25/611>
D	H04N 9/04519	<administrative transfer to H04N 25/6153>
D	H04N 9/04521	<administrative transfer to H04N 23/125>
D	H04N 9/0455	<administrative transfer to H04N 25/11>
D	H04N 9/04551	<administrative transfer to H04N 25/13>
D	H04N 9/04553	<administrative transfer to H04N 25/131>
D	H04N 9/04555	<administrative transfer to H04N 25/133>
D	H04N 9/04557	<administrative transfer to H04N 25/134>
D	H04N 9/04559	<administrative transfer to H04N 25/135>
D	H04N 9/04561	<administrative transfer to H04N 25/136>
D	H04N 9/04563	<administrative transfer to H04N 25/17>
D	H04N 9/07	<administrative transfer to H04N 23/12>
D	H04N 9/077	<administrative transfer to H04N 9/01>
D	H04N 9/083	<administrative transfer to H04N 9/03>
D	H04N 9/09	<administrative transfer to H04N 23/13>
D	H04N 9/093	<administrative transfer to H04N 23/15>
D	H04N 9/097	<administrative transfer to H04N 23/16>
D	H04N 9/10	<administrative transfer to H04N 23/17>
C	H04N 9/64	H04N 9/64, H04N 23/84
C	H04N 9/67	H04N 9/67, H04N 23/85
C	H04N 9/68	H04N 9/68, H04N 23/86
C	H04N 9/69	H04N 9/69, H04N 23/83
C	H04N 9/72	H04N 9/72, H04N 23/87
C	H04N 9/73	H04N 9/73, H04N 23/88
D	H04N 9/735	<administrative transfer to H04N 23/88>

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<b>Type*</b>	<b>From CPC Symbol (existing)</b>	<b>To CPC Symbol(s)</b>
Q	H04N 23/00	H04N 23/00, H04N 23/95, H04N 23/955, H04N 23/958
Q	H04N 23/10	H04N 23/10, H04N 23/11, H04N 25/10, H04N 25/17
Q	H04N 23/11	H04N 23/11, H04N 25/131,
Q	H04N 23/80	H04N 23/80, H04N 23/90, H04N 23/95, H04N 23/951, H04N 23/955, H04N 23/957, H04N 23/958, H04N 23/959
Q	H04N 25/40	H04N 25/40, H04N 25/47
Q	H04N 25/50	H04N 25/50, H04N 25/51
Q	H04N 25/53	H04N 25/53, H04N 25/532
Q	H04N 25/533	H04N 25/533, H04N 25/535
Q	H04N 25/60	H04N 25/60, H04N 25/61, H04N 25/611, H04N 25/615, H04N 25/6153, H04N 25/616, H04N 25/617, H04N 25/618, H04N 25/62, H04N 25/621, H04N 25/622, H04N 25/623, H04N 25/625, H04N 25/626, H04N 25/627, H04N 25/628, H04N 25/63, H04N 25/633, H04N 25/65, H04N 25/67, H04N 25/671, H04N 25/672, H04N 25/673, H04N 25/674, H04N 25/677, H04N 25/68, H04N 25/683, H04N 25/69
Q	H04N 25/62	H04N 25/62, H04N 25/621, H04N 25/622, H04N 25/623, H04N 25/625, H04N 25/626, H04N 25/627, H04N 25/628
Q	H04N 25/63	H04N 25/63, H04N 25/633, H04N 25/67, H04N 25/671, H04N 25/672, H04N 25/673, H04N 25/674, H04N 25/677, H04N 25/68, H04N 25/683
Q	H04N 25/67	H04N 25/67, H04N 25/671, H04N 25/672, H04N 25/673, H04N 25/674, H04N 25/677, H04N 25/68, H04N 25/683
Q	H04N 25/68	H04N 25/68, H04N 25/69
Q	H04N 25/702	H04N 25/702, H04N 25/703, H04N 25/706, H04N 25/707, H04N 25/708
Q	H04N 25/74	H04N 25/74, H04N 25/779
Q	H04N 25/745	H04N 25/745, H04N 25/7795
Q	H04N 25/75	H04N 25/75, H04N 25/78
Q	H04N 25/772	H04N 25/772, H04N 25/773

\* C = entries with modified file scope where reclassification of documents from the entries is involved; Q = new entries which are firstly populated with documents via administrative transfers from deleted (D) entries. Afterwards, the transferred documents into the Q entry will either stay or be moved to more appropriate entries, as determined by intellectual reclassification; D = deleted entries; F = frozen entries will be deleted once reclassification of documents from the entries is completed.

NOTES:

- Only C, D, F, and Q type entries are included in the table above.
- When multiple symbols are included in the “To” column, do not use ranges of symbols.
- For administrative transfer of documents, the following text should be used: “<administrative transfer to XX>”, “<administrative transfer to XX and YY simultaneously>”, or “<administrative transfer to XX, YY, ...and ZZ simultaneously>” when administrative transfer of the same documents is to more than one place.
- Administrative transfer to main trunk groups is assumed to be the source allocation type, unless otherwise indicated.
- Administrative transfer to 2000/Y series groups is assumed to be “additional information”.
- If needed, instructions for allocation type should be indicated within the angle brackets using the abbreviations “ADD” or “INV”: <administrative transfer to XX ADD>, <administrative transfer to XX INV>, or <administrative transfer to XX ADD, YY INV, ... and ZZ ADD simultaneously>.
- In certain situations, the “D” entries of 2000-series or Y-series groups may not require a destination (“To”) symbol, however it is required to specify “<no transfer>” in the “To” column for such cases.
- RCL is not needed for finalisation projects.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

4. CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 5/217		DELETE
H04N 5/2171		DELETE
H04N 5/2173		DELETE
H04N 5/2175		DELETE
H04N 5/2176		DELETE
H04N 5/2178		DELETE
H04N 5/225		DELETE
H04N 5/2251		DELETE
H04N 5/2252		DELETE
H04N 5/22521		DELETE
H04N 5/22525		DELETE
H04N 5/225251		DELETE
H04N 5/2253		DELETE
H04N 5/2254		DELETE
H04N 5/22541		DELETE
H04N 2005/2255		DELETE
H04N 5/2256		DELETE
H04N 5/2257		DELETE
H04N 5/2258		DELETE
H04N 5/2259		DELETE
H04N 5/228		DELETE
H04N 5/2283		DELETE
H04N 5/2286		DELETE
H04N 5/232		DELETE
H04N 5/23203		DELETE
H04N 5/23206		DELETE
H04N 5/232061		DELETE
H04N 5/23209		DELETE
H04N 5/23212		DELETE
H04N 5/232121		DELETE
H04N 5/232122		DELETE
H04N 5/232123		DELETE
H04N 5/232125		DELETE
H04N 5/232127		DELETE
H04N 5/232133		DELETE
H04N 5/23216		DELETE
H04N 5/23218		DELETE
H04N 5/23219		DELETE
H04N 5/23222		DELETE
H04N 5/23225		DELETE

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 5/23227		DELETE
H04N 5/23229		DELETE
H04N 5/23232		DELETE
H04N 5/23235		DELETE
H04N 5/23238		DELETE
H04N 5/23241		DELETE
H04N 5/232411		DELETE
H04N 5/23245		DELETE
H04N 5/23248		DELETE
H04N 5/23251		DELETE
H04N 5/23254		DELETE
H04N 5/23258		DELETE
H04N 5/23261		DELETE
H04N 5/23264		DELETE
H04N 5/23267		DELETE
H04N 5/2327		DELETE
H04N 5/23274		DELETE
H04N 5/23277		DELETE
H04N 5/2328		DELETE
H04N 5/23283		DELETE
H04N 5/23287		DELETE
H04N 5/2329		DELETE
H04N 5/23293		DELETE
H04N 5/232933		DELETE
H04N 5/232935		DELETE
H04N 5/232939		DELETE
H04N 5/232941		DELETE
H04N 5/232945		DELETE
H04N 5/23296		DELETE
H04N 5/23299		DELETE
H04N 5/235		DELETE
H04N 5/2351		DELETE
H04N 5/2352		DELETE
H04N 5/2353		DELETE
H04N 5/2354		DELETE
H04N 5/2355		DELETE
H04N 5/2356		DELETE
H04N 5/2357		DELETE
H04N 5/2358		DELETE
H04N 5/238		DELETE
H04N 5/243		DELETE
H04N 5/247		DELETE
H04N 5/332		DELETE
H04N 5/335		DELETE

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 5/3355		DELETE
H04N 5/341		DELETE
H04N 5/3415		DELETE
H04N 5/343		DELETE
H04N 5/345		DELETE
H04N 5/3452		DELETE
H04N 5/3454		DELETE
H04N 5/3456		DELETE
H04N 5/347		DELETE
H04N 5/349		DELETE
H04N 5/351		DELETE
H04N 5/353		DELETE
H04N 5/3532		DELETE
H04N 5/3535		DELETE
H04N 5/3537		DELETE
H04N 5/355		DELETE
H04N 5/35509		DELETE
H04N 5/35518		DELETE
H04N 5/35527		DELETE
H04N 5/35536		DELETE
H04N 5/35545		DELETE
H04N 5/35554		DELETE
H04N 5/35563		DELETE
H04N 5/35572		DELETE
H04N 5/35581		DELETE
H04N 5/3559		DELETE
H04N 5/357		DELETE
H04N 5/3572		DELETE
H04N 5/35721		DELETE
H04N 5/3575		DELETE
H04N 5/3577		DELETE
H04N 5/359		DELETE
H04N 5/3591		DELETE
H04N 5/3592		DELETE
H04N 5/3594		DELETE
H04N 5/3595		DELETE
H04N 5/3597		DELETE
H04N 5/3598		DELETE
H04N 5/361		DELETE
H04N 5/363		DELETE
H04N 5/365		DELETE
H04N 5/3651		DELETE
H04N 5/3653		DELETE
H04N 5/3655		DELETE

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 5/3656		DELETE
H04N 5/3658		DELETE
H04N 5/367		DELETE
H04N 5/3675		DELETE
H04N 5/369		DELETE
H04N 5/3692		DELETE
H04N 5/3694		DELETE
H04N 5/3696		DELETE
H04N 5/36961		DELETE
H04N 5/36963		DELETE
H04N 5/36965		DELETE
H04N 5/3698		DELETE
H04N 5/372		DELETE
H04N 5/37206		DELETE
H04N 5/37213		DELETE
H04N 5/3722		DELETE
H04N 5/3725		DELETE
H04N 5/3728		DELETE
H04N 5/374		DELETE
H04N 5/3741		DELETE
H04N 5/3742		DELETE
H04N 5/3743		DELETE
H04N 5/3745		DELETE
H04N 5/37452		DELETE
H04N 5/37455		DELETE
H04N 5/37457		DELETE
H04N 5/376		DELETE
H04N 5/3765		DELETE
H04N 5/378		DELETE
H04N 5/379		DELETE
H04N 9/01	H04N 9/01	NEW
H04N 9/03	H04N 9/03	NEW
H04N 9/04		DELETE
H04N 9/045		DELETE
H04N 9/0451		DELETE
H04N 9/04511		DELETE
H04N 9/04513		DELETE
H04N 9/04515		DELETE
H04N 9/04517		DELETE
H04N 9/04519		DELETE
H04N 9/04521		DELETE
H04N 9/0455		DELETE
H04N 9/04551		DELETE
H04N 9/04553		DELETE

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 9/04555		DELETE
H04N 9/04557		DELETE
H04N 9/04559		DELETE
H04N 9/04561		DELETE
H04N 9/04563		DELETE
H04N 9/07		DELETE
H04N 9/077		DELETE
H04N 9/083		DELETE
H04N 9/09		DELETE
H04N 9/093		DELETE
H04N 9/097		DELETE
H04N 9/10		DELETE
H04N 9/735		DELETE
H04N 23/00	H04N 23/00	NEW
H04N 23/10	H04N 23/10	NEW
H04N 23/11	H04N 23/11	NEW
H04N 23/12	H04N 23/12	NEW
H04N 23/125	H04N 23/10	NEW
H04N 23/13	H04N 23/13	NEW
H04N 23/15	H04N 23/15	NEW
H04N 23/16	H04N 23/16	NEW
H04N 23/17	H04N 23/17	NEW
H04N 23/20	H04N 23/20	NEW
H04N 23/21	H04N 23/21	NEW
H04N 23/23	H04N 23/23	NEW
H04N 23/30	H04N 23/30	NEW
H04N 23/40	H04N 23/40	NEW
H04N 23/41	H04N 23/40	NEW
H04N 23/43	H04N 23/40	NEW
H04N 23/45	H04N 23/45	NEW
H04N 23/50	H04N 23/50	NEW
H04N 23/51	H04N 23/51	NEW
H04N 23/52	H04N 23/52	NEW
H04N 23/53	H04N 23/53	NEW
H04N 23/531	H04N 23/53	NEW
H04N 23/54	H04N 23/54	NEW
H04N 23/55	H04N 23/55	NEW
H04N 23/555	H04N 23/50	NEW
H04N 23/56	H04N 23/56	NEW
H04N 23/57	H04N 23/57	NEW
H04N 23/58	H04N 23/58	NEW
H04N 23/60	H04N 23/60	NEW
H04N 23/61	H04N 23/61	NEW
H04N 23/611	H04N 23/611	NEW

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 23/617	H04N 23/617	NEW
H04N 23/62	H04N 23/62	NEW
H04N 23/63	H04N 23/63	NEW
H04N 23/631	H04N 23/63	NEW
H04N 23/632	H04N 23/63	NEW
H04N 23/633	H04N 23/63	NEW
H04N 23/634	H04N 23/63	NEW
H04N 23/635	H04N 23/63	NEW
H04N 23/64	H04N 23/60	NEW
H04N 23/65	H04N 23/65	NEW
H04N 23/651	H04N 23/65	NEW
H04N 23/66	H04N 23/66	NEW
H04N 23/661	H04N 23/661	NEW
H04N 23/662	H04N 23/661	NEW
H04N 23/663	H04N 23/663	NEW
H04N 23/665	H04N 23/60	NEW
H04N 23/667	H04N 23/667	NEW
H04N 23/67	H04N 23/67	NEW
H04N 23/671	H04N 23/67	NEW
H04N 23/672	H04N 23/67	NEW
H04N 23/673	H04N 23/67	NEW
H04N 23/675	H04N 23/67	NEW
H04N 23/676	H04N 23/67	NEW
H04N 23/68	H04N 23/68	NEW
H04N 23/681	H04N 23/68	NEW
H04N 23/6811	H04N 23/68	NEW
H04N 23/6812	H04N 23/68	NEW
H04N 23/6815	H04N 23/68	NEW
H04N 23/682	H04N 23/68	NEW
H04N 23/683	H04N 23/68	NEW
H04N 23/684	H04N 23/68	NEW
H04N 23/6842	H04N 23/68	NEW
H04N 23/6845	H04N 23/68	NEW
H04N 23/685	H04N 23/68	NEW
H04N 23/686	H04N 23/68	NEW
H04N 23/687	H04N 23/68	NEW
H04N 23/689	H04N 23/68	NEW
H04N 23/69	H04N 23/69	NEW
H04N 23/695	H04N 23/695	NEW
H04N 23/698	H04N 23/698	NEW
H04N 23/70	H04N 23/70	NEW
H04N 23/71	H04N 23/71	NEW
H04N 23/72	H04N 23/72	NEW
H04N 23/73	H04N 23/73	NEW



CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 23/74	H04N 23/74	NEW
H04N 23/741	H04N 23/741	NEW
H04N 23/743	H04N 23/743	NEW
H04N 23/745	H04N 23/745	NEW
H04N 23/749	H04N 23/70	NEW
H04N 23/75	H04N 23/75	NEW
H04N 23/76	H04N 23/76	NEW
H04N 23/80	H04N 23/80	NEW
H04N 23/81	H04N 23/81	NEW
H04N 23/811	H04N 23/81	NEW
H04N 23/815	H04N 23/80	NEW
H04N 23/82	H04N 23/82	NEW
H04N 23/83	H04N 23/83	NEW
H04N 23/84	H04N 23/84	NEW
H04N 23/841	H04N 23/84	NEW
H04N 23/843	H04N 23/84	NEW
H04N 23/85	H04N 23/85	NEW
H04N 23/86	H04N 23/86	NEW
H04N 23/87	H04N 23/87	NEW
H04N 23/88	H04N 23/88	NEW
H04N 23/90	H04N 23/90	NEW
H04N 23/95	H04N 23/95	NEW
H04N 23/951	H04N 23/951	NEW
H04N 23/955	H04N 23/955	NEW
H04N 23/957	H04N 23/957	NEW
H04N 23/958	H04N 23/958	NEW
H04N 23/959	H04N 23/959	NEW
H04N 25/00	H04N 25/00	NEW
H04N 25/10	H04N 25/10	NEW
H04N 25/11	H04N 25/11	NEW
H04N 25/13	H04N 25/13	NEW
H04N 25/131	H04N 25/131	NEW
H04N 25/133	H04N 25/133	NEW
H04N 25/134	H04N 25/13	NEW
H04N 25/135	H04N 25/13	NEW
H04N 25/136	H04N 25/13	NEW
H04N 25/17	H04N 25/17	NEW
H04N 25/20	H04N 25/20	NEW
H04N 25/21	H04N 25/21	NEW
H04N 25/30	H04N 25/30	NEW
H04N 25/40	H04N 25/40	NEW
H04N 25/41	H04N 25/40	NEW
H04N 25/42	H04N 25/42	NEW
H04N 25/44	H04N 25/44	NEW

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 25/441	H04N 25/441	NEW
H04N 25/443	H04N 25/443	NEW
H04N 25/445	H04N 25/445	NEW
H04N 25/447	H04N 25/447	NEW
H04N 25/46	H04N 25/46	NEW
H04N 25/47	H04N 25/47	NEW
H04N 25/48	H04N 25/48	NEW
H04N 25/50	H04N 25/50	NEW
H04N 25/51	H04N 25/51	NEW
H04N 25/53	H04N 25/53	NEW
H04N 25/531	H04N 25/531	NEW
H04N 25/532	H04N 25/532	NEW
H04N 25/533	H04N 25/533	NEW
H04N 25/534	H04N 25/534	NEW
H04N 25/535	H04N 25/535	NEW
H04N 25/57	H04N 25/57	NEW
H04N 25/571	H04N 25/571	NEW
H04N 25/573	H04N 25/571	NEW
H04N 25/575	H04N 25/571	NEW
H04N 25/58	H04N 25/58	NEW
H04N 25/581	H04N 25/581	NEW
H04N 25/583	H04N 25/583	NEW
H04N 25/585	H04N 25/585	NEW
H04N 25/587	H04N 25/587	NEW
H04N 25/589	H04N 25/589	NEW
H04N 25/59	H04N 25/59	NEW
H04N 25/60	H04N 25/60	NEW
H04N 25/61	H04N 25/61	NEW
H04N 25/611	H04N 25/611	NEW
H04N 25/615	H04N 25/615	NEW
H04N 25/6153	H04N 25/615	NEW
H04N 25/616	H04N 25/616	NEW
H04N 25/617	H04N 25/617	NEW
H04N 25/618	H04N 25/618	NEW
H04N 25/62	H04N 25/62	NEW
H04N 25/621	H04N 25/621	NEW
H04N 25/622	H04N 25/621	NEW
H04N 25/623	H04N 25/621	NEW
H04N 25/625	H04N 25/625	NEW
H04N 25/626	H04N 25/626	NEW
H04N 25/627	H04N 25/627	NEW
H04N 25/628	H04N 25/628	NEW
H04N 25/63	H04N 25/63	NEW
H04N 25/633	H04N 25/633	NEW

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>CPC</u>	<u>IPC</u>	<u>Action*</u>
H04N 25/65	H04N 25/65	NEW
H04N 25/67	H04N 25/67	NEW
H04N 25/671	H04N 25/671	NEW
H04N 25/672	H04N 25/672	NEW
H04N 25/673	H04N 25/673	NEW
H04N 25/674	H04N 25/674	NEW
H04N 25/677	H04N 25/677	NEW
H04N 25/68	H04N 25/68	NEW
H04N 25/683	H04N 25/683	NEW
H04N 25/69	H04N 25/69	NEW
H04N 25/70	H04N 25/70	NEW
H04N 25/701	H04N 25/701	NEW
H04N 25/7013	H04N 25/701	NEW
H04N 25/702	H04N 25/702	NEW
H04N 25/703	H04N 25/703	NEW
H04N 25/704	H04N 25/704	NEW
H04N 25/705	H04N 25/705	NEW
H04N 25/706	H04N 25/706	NEW
H04N 25/707	H04N 25/707	NEW
H04N 25/708	H04N 25/708	NEW
H04N 25/709	H04N 25/709	NEW
H04N 25/71	H04N 25/71	NEW
H04N 25/711	H04N 25/711	NEW
H04N 25/713	H04N 25/713	NEW
H04N 25/715	H04N 25/715	NEW
H04N 25/72	H04N 25/72	NEW
H04N 25/73	H04N 25/73	NEW
H04N 25/74	H04N 25/74	NEW
H04N 25/745	H04N 25/71	NEW
H04N 25/75	H04N 25/75	NEW
H04N 25/76	H04N 25/76	NEW
H04N 25/766	H04N 25/766	NEW
H04N 25/767	H04N 25/767	NEW
H04N 25/768	H04N 25/768	NEW
H04N 25/77	H04N 25/77	NEW
H04N 25/771	H04N 25/771	NEW
H04N 25/772	H04N 25/772	NEW
H04N 25/773	H04N 25/773	NEW
H04N 25/778	H04N 25/778	NEW
H04N 25/779	H04N 25/779	NEW
H04N 25/7795	H04N 25/76	NEW
H04N 25/78	H04N 25/78	NEW
H04N 25/79	H04N 25/79	NEW

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

\*Action column:

- For an (N) or (Q) entry, provide an IPC symbol and complete the Action column with “NEW.”
- For an existing CPC main trunk entry or indexing entry where the existing IPC symbol needs to be changed, provide an updated IPC symbol and complete the Action column with “UPDATED.”
- For a (D) CPC entry or indexing entry complete the Action column with “DELETE.” IPC symbol does not need to be included in the IPC column.
- For an (N) 2000 series CPC entry which is positioned within the main trunk scheme (breakdown code) provide an IPC symbol and complete the action column with “NEW”.
- For an (N) 2000 series CPC entry positioned at the end of the CPC scheme (orthogonal code), with no IPC equivalent, complete the IPC column with “CPCONLY” and complete the action column with “NEW”.

NOTES:

- F symbols are not included in the CICL table above.
- T and M symbols are not included in the CICL table above unless a change to the existing IPC is desired.

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

5. CROSS-REFERENCE LIST (CRL)

Scheme references impacted by this revision project

<u>Location of reference to be changed</u>	<u>Referenced subclass or group to be changed</u>	<u>Action; New reference symbol; New text</u>
G02B7/36	H04N5/23212	H04N 23/67
G02B23/2484	H04N5/232	H04N 23/60
G02B23/2484	H04N5/235	H04N 23/70
G02B27/646	H04N5/23248	H04N 23/68
G03B7/00	H04N5/238	H04N 23/75
G03B2205/0038	H04N5/23248	H04N 23/68
G06T5/002	H04N5/217	H04N 23/81
G06T5/002	H04N5/357	H04N 25/60
G06T5/002	H04N5/365	H04N 25/67
G06T5/003	H04N5/23264	H04N 23/682
G06T5/005	H04N5/367	H04N 25/68
G06T5/006	H04N5/3572	H04N 25/61
G06T5/006	H04N9/045	H04N 23/10
G06T5/007	H04N5/2355	H04N 23/741
G06T5/007	H04N5/2356	H04N 23/743
G06T5/009	H04N5/23229	H04N 23/80
G06T5/009	H04N5/235	H04N 23/70
G06T5/10	H04N5/23229	H04N 23/80
G06T5/10	H04N5/235	H04N 23/70
G06T5/10	H04N5/367	H04N 25/68
G06T5/20	H04N5/23229	H04N 23/80
G06T5/20	H04N5/235	H04N 23/70
G06T5/20	H04N5/367	H04N 25/68
G06T5/40	H04N5/23229	H04N 23/80
G06T5/40	H04N5/235	H04N 23/70
G06T5/50	H04N5/23229	H04N 23/80
G06T5/50	H04N5/235	H04N 23/70
G06V10/10	H04N5/232	H04N 23/60
G06V20/00	H04N5/232	H04N 23/60
G11B31/00	H04N5/225	H04N 23/00
H01J31/46	H04N9/07	H04N 23/12
H01L27/14609	H04N5/369	H04N 25/70
H04N1/624	H04N5/23219	H04N 23/611
H04N3/14	H04N5/335	H04N 25/00
H04N3/15	H04N5/335	H04N25/00
Warning		
H04N3/1568	H04N5/2175	H04N 25/62
H04N5/211	H04N5/217	H04N 23/81
H04N21/4223	H04N5/225	H04N 23/00

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

Definitions references impacted by this revision project

<u>Location of reference to be changed</u>	<u>Referenced subclass or group to be changed</u>	<u>Section of definition</u>	<u>Action; New reference symbol; New text</u>
A 61B1/04	H04N5/225	Informative references	H04N 23/00
A 61B1/042	H04N5/225	Informative references	H04N 23/00
B60R1/28	H04N5/232	Informative references	H04N 23/60
B60R11/04	H04N5/2257	Informative references	H04N 23/57
F16M	H04N5/225	Informative references	H04N 23/00
F16M11/42	H04N5/225	Informative references	H04N 23/00
G01J5/0805	H04N5/2254	Informative references	H04N 23/55
G01J5/53	H04N5/2173	Informative references	H04N 25/60
G01T1/295	H04N5/2173	Limiting references	H04N 25/60
G02B	H04N5/225	Informative references	H04N 23/00
G03B	H04N5/225	Application-oriented references	H04N 23/00
G03B	H04N5/232	Informative references	H04N 23/60
G03B	H04N5/235	Informative references	H04N 23/70
G03B	H04N5/335	Informative references	H04N 25/00
G03B3/10	H04N5/23212	Informative references	H04N 23/67
G03B13/02	H04N5/225	Informative references	H04N 23/00
G03B13/02	H04N5/232	Informative references	H04N 23/60
G03B13/36	H04N5/23212	Informative references	H04N 23/67
G03B30/00	H04N5/225	Informative references	H04N 23/00
G06F1/1613	H04N5/225	Limiting references	H04N 23/00
G06F3/005	H04N5/225	Informative references	H04N 23/00
G06T1/0007	H04N5/225	Limiting references	H04N 23/00
G06T5/00	H04N5/217	Informative references	H04N 23/81

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Location of reference to be changed</u>	<u>Referenced subclass or group to be changed</u>	<u>Section of definition</u>	<u>Action; New reference symbol; New text</u>
G06T5/00	H04N5/367	Informative references	H04N 25/68
G06T5/002	H04N5/217	Application-oriented references	H04N 23/81
G06T5/002	H04N5/357	Application-oriented references	H04N 25/60
G06T5/002	H04N5/365	Application-oriented references	H04N 25/67
G06T5/003	H04N5/23264	Application-oriented references	H04N 23/682
G06T5/005	H04N5/367	Limiting references	H04N 25/68
G06T5/006	H04N5/3572	Application-oriented references	H04N 25/61
G06T5/006	H04N9/045	Informative references	H04N 23/10
G06T5/007	H04N5/235	Application-oriented references	H04N 23/70
G06T5/009	H04N5/235	Application-oriented references	H04N 23/70
G06T5/20	H04N5/23229	Application-oriented references	H04N 23/80
G06T5/20	H04N5/367	Limiting references	H04N 25/68
G06T5/40	H04N5/235	Application-oriented references	H04N 23/70
G06T5/50	H04N5/23229	Application-oriented references	H04N 23/80
G06T5/50	H04N5/235	Application-oriented references	H04N 23/70
G06T7/00	H04N5/335	Application-oriented references	H04N 25/00
G06T7/80	H04N5/217	Informative references	H04N 23/81
G06T7/80	H04N9/045	Informative references	H04N 23/10
G08B13/196	H04N5/225	Informative references	H04N 23/00
G08G1/052	H04N5/232	Informative references	H04N 23/60
G11B15/00	H04N5/225	Limiting references	H04N 23/00
G11B25/00	H04N5/225	Informative references	H04N 23/00
G11B27/00	H04N5/225	Informative references	H04N 23/00
G11B31/00	H04N5/225	Informative references	H04N 23/00
H01J31/46	H04N9/07	Informative references	H04N 23/12
H01L27/00	H04N5/335	Informative references	H04N 25/00

CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Location of reference to be changed</u>	<u>Referenced subclass or group to be changed</u>	<u>Section of definition</u>	<u>Action; New reference symbol; New text</u>
H01L27/00	H04N5/335	Relationship	H04N 25/00
H01L27/146	H04N5/335	Informative references	H04N 25/00
H01L27/14609	H04N5/335	Informative references	H04N 25/00
H01L27/14609	H04N5/369	Informative references	H04N 25/70
H01L27/14812	H04N5/335	Informative references	H04N 25/00
H03M1/00	H04N5/335	Informative references	H04N 25/00
H04M1/0264	H04N5/225	Informative references	H04N 23/00
H04N1/00	H04N5/225	Informative references	H04N 23/00
H04N1/028	H04N5/225	Informative references	H04N 23/00
H04N1/2112	H04N5/225	Informative references	H04N 23/00
H04N1/32	H04N5/232	Informative references	H04N 23/60
H04N1/401	H04N5/2176	Informative references	H04N 25/63
H04N1/486	H04N9/04	Informative references	H04N 23/10
H04N1/486	H04N9/045	Informative references	H04N 23/10
H04N1/648	H04N9/045	Informative references	H04N 23/10
H04N3/02	H04N9/10	Application-oriented references	H04N 23/17
H04N3/14	H04N5/335	Limiting references	H04N 25/00
H04N5/76	H04N5/232	Application-oriented references	H04N 23/60
H04N5/76	H04N5/225	Informative references	H04N 23/00
H04N5/76	H04N5/225	Relationship	H04N 23/00
H04N5/772	H04N5/225	Informative references	H04N 23/00
H04N9/79	H04N5/232	Application-oriented references	H04N 23/60
H04N9/79	H04N5/225	Informative references	H04N 23/00
H04N9/79	H04N5/225	Relationship	H04N 23/00
H04N13/00	H04N5/225	Informative references	H04N 23/00
H04N13/00	H04N5/247	Informative references	H04N 23/90



CPC NOTICE OF CHANGES 1381

DATE: JANUARY 1, 2023

PROJECT RP11902

<u>Location of reference to be changed</u>	<u>Referenced subclass or group to be changed</u>	<u>Section of definition</u>	<u>Action; New reference symbol; New text</u>
H04N13/20	H04N5/225	Informative references	H04N 23/00
H04N13/20	H04N5/247	Informative references	H04N 23/90
H04N13/20	H04N5/225	Relationships with other classification places	H04N 23/00
H04N13/254	H04N5/225	Relationships with other classification places	H04N 23/00
H04N13/254	H04N5/235	Relationships with other classification places	H04N 23/70
H04N21/4223	H04N5/225	Limiting references	H04N 23/00

NOTES:

- The CRL tables above are used for changes to locations **outside** of the project scope. Changes to references in scheme titles or definitions **inside** the project scope will be reflected in the “scheme change” template or one of the “definition” templates.
- In addition to other changes proposed in the tables above, in the column titled “Referenced subclass or group to be changed,” **referenced** D symbols should indicate an action of “delete” or should indicate a replacement symbol and **referenced** F symbols should indicate a replacement symbol.
- When a reference is deleted, text related to that reference will also be deleted unless other references or a range of references associated with the same text remain.