

EUROPEAN PATENT OFFICE
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 705

DATE: AUGUST 1, 2019

PROJECT MP0413

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

<u>Action</u>	<u>Subclass</u>	<u>Group(s)</u>
DEFINITIONS:		
Definitions New:	H04N	13/10, 13/106, 13/111, 13/122, 13/128, 13/139, 13/156, 13/161, 13/178, 13/183, 13/189, 13/194, 13/20, 13/211, 13/214, 13/218, 13/232, 13/239, 13/246, 13/254, 13/261, 13/275, 13/30, 13/302, 13/305, 13/307, 13/31, 13/312, 13/317, 13/32, 13/322, 13/327, 13/334, 13/337, 13/339, 13/341, 13/344, 13/346, 13/349, 13/354, 13/356, 13/359, 13/361, 13/363, 13/365, 13/366, 13/368, 13/383, 13/385, 13/388, 13/393, 13/395, 13/398
Definitions Modified:	H04N	13/00

No other subclasses/groups are impacted by this Notice of Changes.

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)

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2. A. DEFINITIONS (New)

Insert: The following new Definitions.

H04N 13/10

Definition statement

This place covers:

Device-independent processing of stereoscopic or multi-view image signals.

H04N 13/106

References

Limiting references

This place does not cover:

Multi-view video sequence encoding

H04N 19/597

H04N 13/111

Special rules of classification

Attention should be paid to the word "transformation": here a new virtual image is generated starting from one or more already existing stereoscopic images, e.g. by interpolation. In contrast new computer-generated stereoscopic images not derived from existing images are classified in [H04N 13/275](#).

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H04N 13/122

Definition statement

This place covers:

Modification of image signals to enhance the viewer's perception of the 3D effect. Such modification may include:

- Addition of depth cues such as defocusing, colouring, shadows
- Geometric correction or warping
- Left/right or temporal crosstalk reduction

Relationships with other classification places

If the content is not modified, this group is not relevant.

If the 3D impression is improved by horizontally shifting one of the images with respect to the other, or by modifying the depth map, then the document should be classified in H04N13/128.

References

Limiting references

This place does not cover:

Adjusting depth or disparity	H04N 13/128
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H04N 13/128

Definition statement

This place covers:

Depth adjustment, e. g.:

- Control of disparity between L and R images

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- Processing of depth maps
- Non-linear processing of depth in order to adapt it to display features such as screen size

Relationships with other classification places

Reduction of depth parameters to reduce eye strain (fatigue) caused by flicker should be classified here and in [H04N 13/144](#), providing the depth parameters are controlled by the image signal and not by the display parameters.

If depth adjustment is obtained by acting only on device parameters, i.e. there is no stereoscopic image signal processing, the document should not be classified here but only in the relevant device groups, [H04N 13/20](#) and [H04N 13/30](#).

For example, if depth is adjusted by controlling the baseline (the physical distance between two cameras of a stereo camera), the adjustment should be classified in [H04N 13/239](#) in combination with [H04N 13/296](#).

H04N 13/139

Definition statement

This place covers:

Conversion of any kind of stereoscopic format into another one, e.g. from side-by-side to top-bottom or "2D+depth", or still to side-by-side but with a different size, resolution or frame rate.

Relationships with other classification places

The generation of stereoscopic signals from monoscopic source signals is classified in [H04N 13/261](#) or in relevant groups under [H04N13/20](#). Format conversion should be classified here only if it concerns stereoscopic (or multi-view) signals and if the conversion goes beyond the equivalent processing of monoscopic image signals.

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Standards conversion of monoscopic TV signals (e.g. PAL to NTSC), or the adaptation of signals to the display format of a display terminal, should be classified in H04N7/01.

H04N 13/156

Definition statement

This place covers:

The generation of stereoscopic (or multi-view) images from at least two source images, wherein the contents of both source images remain visible in the resultant mixed image, i.e. the generation of one image including the weighted sum of said two source images.

Relationships with other classification places

The reproduction of mixed stereoscopic images or mixed monoscopic and stereoscopic images, e.g. a stereoscopic image overlay on a monoscopic image background, is classified in [H04N 13/361](#).

Overlays such as subtitles and similar graphic images are to be classified in [H04N 13/183](#).

References

Informative references

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

Mixing monoscopic television image signals	H04N 5/265
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H04N 13/161

Definition statement

This place covers:

- Aspects of manipulating the structure of the stereoscopic video signal, i.e. how the different image signals which constitute a stereoscopic (or multi-view) image signal

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are encoded or combined in order to form a complete video signal, e.g. for storage or transmission.

- The separation of stereoscopic or multi-view image signals into their respective constituent (e.g. left and right) components.

"Multiplexing" and "demultiplexing" are to be interpreted in the general sense mentioned above, i.e. any manner of forming a stereoscopic image frame, stream or signal from e.g.

- left and right signals
- a 2D image and a depth image by arranging the components in a format having e.g.
 - alternate L/R frames or fields
 - side by side L/R images
 - top/down L/R images
 - main layer / enhancement layer
- component images having different resolutions

Relationships with other classification places

Aspects relating to the general encoding of stereoscopic or multi-view image signals are classified here. Prediction encoding to compress the image signal (e.g. using temporal or spatial prediction techniques) specially adapted for multi-view video sequences is classified in [H04N 19/597](#).

Further, attention should be paid to the term "image signal components" which is used in a strict sense. Non-image signal components are to be classified in [H04N 13/172](#) and subgroups thereof.

References

Limiting references

This place does not cover:

Prediction encoding specially adapted for multi-view video sequences	H04N 19/597
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H04N 13/178

Definition statement

This place covers:

Metadata concerning stereoscopic features included in a stereoscopic video stream or image file.

H04N 13/183

Definition statement

This place covers:

Details relating to subtitles or other OSD information, which are included in a stereoscopic video stream separate from the image(s), e.g. information describing how to merge subtitles with the main image, or how to avoid depth conflicts, depth interference etc.

H04N 13/189

Relationships with other classification places

This group is used to classify aspects concerning the recording of stereoscopic or multi-view image signals and the reproduction thereof. Recording of monoscopic video signals and monoscopic aspects of stereoscopic video signals is classified in H04N5/76.

H04N 13/194

Relationships with other classification places

This group is used to classify aspects relating to the transmission of stereoscopic or multi-view image signals. Such aspects are often quite close to the corresponding monoscopic ones, because once a stereoscopic video stream has been assembled, it is generally recorded or transmitted with monoscopic techniques. Transmission of monoscopic image signals is classified elsewhere in H04N, e.g. H04N 5/38, H04N 21/00 (for selective content distribution systems).

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H04N 13/20

Definition statement

This place covers:

- The generation of electronic image signals representative of stereoscopic or multi-view images.
- Computer-generated stereoscopic or multi-view image signals.
- Signal processing and control systems therefor.

Note:

The generated stereoscopic signals may be in any format, e.g. L + R, 2D +depth map, 3D + depth map. Note however that the devices which do not capture optical images (e.g. 3D scanners, time-of-flight cameras, rangefinders etc.) are not classified in [H04N 13/00](#): they are classified in the groups indicated here below.

Relationships with other classification places

Monoscopic plenoptic cameras generating a single viewpoint are classified in the relevant groups [H04N 5/225](#).

Plenoptic cameras / integral imaging cameras, which provide more than one viewpoint, are to be classified in [H04N 13/20](#), in particular in [H04N 13/282](#) if they provide more than two different geometrical viewpoints.

References

Informative references

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

Time-of-flight [TOF] cameras	G01S 17/08
Optical systems for producing stereoscopic or other three dimensional effects	G02B 27/22
Stereoscopic photography by sequential recording	G03B 35/02
Stereoscopic photography by simultaneously recording	G03B 35/08
3D scanners	G06F3/01
Depth or shape recovery	G06T 7/50
Generation of a depth map from stereoscopic image signals	G06T 7/593

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Calculation or rendering of a monoscopic view of a 3D graphics object	G06T 15/20
Generation of 3D graphical models or scenes	G06T 17/00
Manipulating 3D models or images for computer graphics	G06T 19/00
Television cameras	H04N 5/225
Arrangements of television cameras (not for capturing stereoscopic images)	H04N 5/247
Projection displays	H04N 5/74, H04N 9/31
Recording, including multiplexing another television signal	H04N 5/92, H04N 9/82
Video standards conversion	H04N 7/01,
Colour signal processing circuits	H04N 9/64
Video stream synchronization / multiplexing / packetization aspects	H04N 21/00
Video signal reformatting	H04N 21/4402, H04N 21/2343
Aspects concerning subtitles or other OSD information	H04N 21/488
Generation or processing of metadata	H04N 21/84

H04N 13/211

Definition statement

This place covers:

Alternate acquisition of images from different viewpoints, each image acquired at a different time.

H04N 13/214

Definition statement

This place covers:

Simultaneously capturing images from several geometrical viewpoints, each image having different spectral characteristics.

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H04N 13/218

Definition statement

This place covers:

Simultaneously capturing images from several geometrical viewpoints on different parts of the image pickup sensor.

H04N 13/232

Special rules of classification

This place covers:

Plenoptic cameras, i.e. lens array cameras for providing stereoscopic or 3D images, are classified here even if each lens of the fly-eye lens is placed on a different chip (the image sensor is considered to be one even if it is composite).

H04N 13/239

References

Limiting references

This place does not cover:

using three or more 2D image sensors	H04N 13/243
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H04N 13/246

Definition statement

This place covers:

Aspects relating to the control of a stereoscopic camera in order to obtain aligned images, i.e. images that only differ by a horizontal disparity, but that have no relative rotation, or other geometric distortion, there between.

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Relationships with other classification places

The so-called stereo (camera) calibration aspects wherein an already captured image pair is processed to determine and compensate the same above mentioned distortions are to be classified in [G06T 7/80](#) such aspects differing from the aspects classified in this group in that they do not "relate to the control of a stereoscopic camera".

H04N 13/254

Definition statement

This place covers:

Aspects relating to the use of light for obtaining a stereoscopic, e.g. illumination with structured light in order to capture depth, or illumination from different sides or with different colours to obtain left and right images

Relationships with other classification places

Normal illumination devices (flash or continuous illumination) are classified in [H04N 5/225](#) and if exposure aspects are involved, in [H04N 5/235](#). If structured illumination is used for measuring contours or curvatures, see [G01B 11/25](#).

References

Informative references

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

Laser ranging using the projection of structured light to facilitate image analysis for depth or shape recovery	G06T 7/521
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H04N 13/261

Definition statement

This place covers:

Devices obtaining a stereoscopic image from one or more existing monoscopic image.

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Relationships with other classification places

In this group the capturing conditions of the monoscopic images are unknown or irrelevant, whereas in [H04N 13/207](#) and subgroups stereoscopic images are generated from a camera controlled to provide images of different viewpoints, so that no "conversion" is necessary.

H04N 13/275

Definition statement

This place covers:

Systems using a computer for generating a stereoscopic image, e.g. a fully synthetic stereoscopic image from a CAD-type 3D object model.

Relationships with other classification places

The generation of a new image from a virtual viewpoint from existing stereoscopic images is covered in [H04N 13/111](#) and its subgroup.

H04N 13/30

Definition statement

This place covers:

- Devices for stereoscopic or multi-view electronic image signal display.
- Devices for electronic image signal display for generating different views of a scene according to the viewpoint location.
- Devices for electronic image signal display for generating different views for different viewers.
- Devices for electronic image signal display for generating a view visible only by a specific viewer.
- Devices for volumetric three dimensional electronic image signal display.
- Devices for pseudo-stereoscopic display systems. For example: wiggle stereoscopy or pseudo-stereo systems providing a three-dimensional effect by means of normal 2D image signals, by periodic oscillating motion of a 3D object.

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- Devices which generate different two-dimensional views in the vertical direction by using horizontally arranged parallax optic and displaying different images in the vertical direction.
- Electronic signal processing and control therefor. For example signal processors and controllers.
- for left/right synchronization, stereoscopic format conversion or depth adaptation
- for backlight control or electrical control of properties of a lenticular lens
- for providing different 2D images to different viewers (e.g. for use in vehicles)
- for devices which generate a two-dimensional "look around" effect, e.g. non-stereoscopic multi-view systems, when the user's position is tracked or when different images are displayed in the vertical direction on a display using a horizontally arranged parallax optic
- for controlling image flipping (or inverse image), caused by the noticeable transition between the viewing zones
- for controlling picket fence effect, a moiré-like artefact caused by the gaps between sub-pixels being magnified by the lenticular sheet, for example by use of a slanted parallax optic. (Blurring the boundaries between the viewing zones can increase the apparent number of views, broadening the observation angle of the pixels)
- for reducing of ghosting or crosstalk
- for controlling resolution loss of images with high perceived depth, for example by controlling the distance between the pixels and the array of lenticular lens elements,
- for controlling the stereoscopic image generation in dependence on the user position and orientation
- for controlling the stereoscopic image generation in dependence on the display position and orientation
- Constructional arrangements and manufacturing methods for stereoscopic display devices for example details related to colour pixel arrangement with respect to the parallax optic layout or shape of pixels, mechanical control of position of the parallax optic user interfaces for controlling or indicating the stereoscopic image display properties, like amount of displayed depth or

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switching between 2D/3D mode, and arrangements for improving the stereoscopic impression, e.g. by using an additional frame placed in front of the screen

References

Limiting references

This place does not cover:

Optical systems for producing stereoscopic or other three dimensional effects	G02B 27/22
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Informative references

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

Holographic volumetric displays	G03H 1/26
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Synonyms and Keywords

In patent documents, the expression "multi-view display" is often used as synonym for describing "privacy" displays, for example, multi-user displays displaying different pictures for different viewers wearing shutter glasses to select one of said pictures (this is also "privacy"), wherein said pictures may be 2D or 3D pictures. Such type of privacy displays are not multi-view displays for the purpose of this classification. However, these privacy display devices (which, for example, use an image separation optic, e.g. a parallax optic, a shutter or polarisation glasses for generating privacy images for a specific viewer) also fall under H04N 13/30.

In patent documents, the expression "Three dimensional (3D)" is often used with the meaning "stereoscopic". However, this expression has a broader meaning and encompasses for instance 2D images displayed with monoscopic depth cues, computer generated (CG) 3D models or stack of images arranged in depth direction (e.g. tomographic images).

H04N 13/302

Definition statement

This place covers:

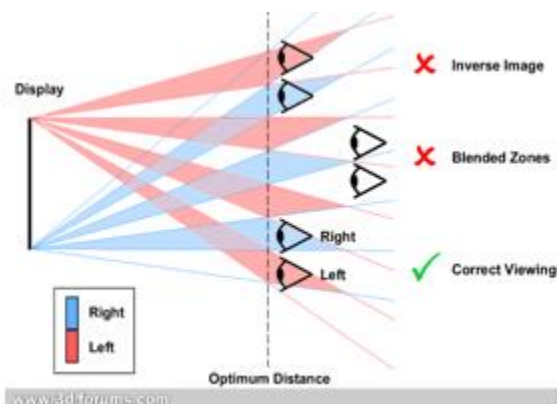
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Electronic signal processors and controllers specially adapted for driving and controlling of autostereoscopic displays, automultiscopic displays, integral imaging displays or privacy displays using a parallax generating optic which projects or displays different images to the left and right eyes, thus creating a sense of depth. The parallax generating optic may include:

- parallax barriers
- lenticular lenses
- an array of controllable light sources or a moving aperture or light source
- a fly-eye lens
- dual and multilayer devices that are driven by algorithms such as computed tomography and non-negative matrix factorization and non-negative tensor factorization to implement compressive light field displays; such devices are also called Content-Adaptive Parallax Barriers
- a varifocal lens or mirror.
- Constructional arrangements and manufacturing methods for autostereoscopic displays, automultiscopic displays, integral imaging displays or privacy displays, for example, details related to the colour pixel arrangement with respect to the parallax barrier, layout or shape of pixels or mechanical control of position of the lenticular lens.

Illustrative examples



(Autostereoscopic displays showing dependence on the user position - blended zones where the left and right images are seen with both eyes, inverse image zone where the left image is seen by the right eye)

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Relationships with other classification places

Volumetric displays and holographic displays are not autostereoscopic displays for the purpose of this group. Examples of relevant classification places for volumetric and holographic displays can be found under the informative references below.

References

Informative references

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

Devices or arrangements for the control of the intensity, colour, phase, polarisation or direction of light arriving from an independent light source, e.g. switching, gating, or modulating; Non-linear optics	G02F 1/00
Structural association of optical devices, e.g. polarisers, reflectors or illuminating devices, with the cell	G02F 1/335
Stereoscopic photography by sequential viewing	G03B 35/16
Stereoscopic photography by simultaneous viewing	G03B 35/18
Stereoscopic photography by simultaneous viewing using aperture or refractive resolving means on screen or between screen and eye	G03B 35/24
Holographic processes or apparatus using light, infra-red or ultra-violet waves for obtaining holograms or for obtaining an image from them	G03H 1/00
Constructional details related to the housing of computer displays	G06F 1/16
Advertising or display means	G09F 19/00
displaying different signs depending upon the view-point of the observer	G09F 19/14
involving the use of mirrors	G09F 19/16
Control arrangements or circuits to produce spatial visual effects, for example rotating displays;	G09G 3/00
Constructional details related to television receivers;	H04N 5/64
Volumetric display, i.e. systems where the image is built up from picture elements distributed over a volume	H04N 13/388

Special rules of classification within this group

The present group should be assigned when no explicit reference to the particular type of the autostereoscopic display device is disclosed and when the autostereoscopic display device is not defined in the subgroups.

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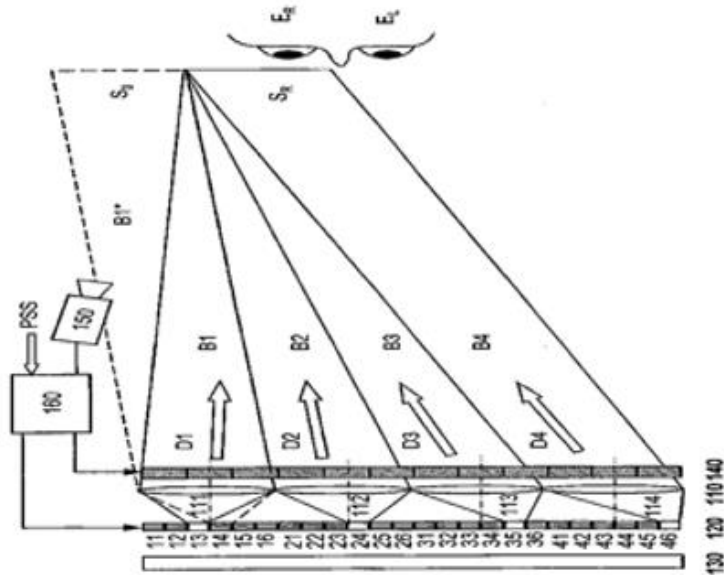
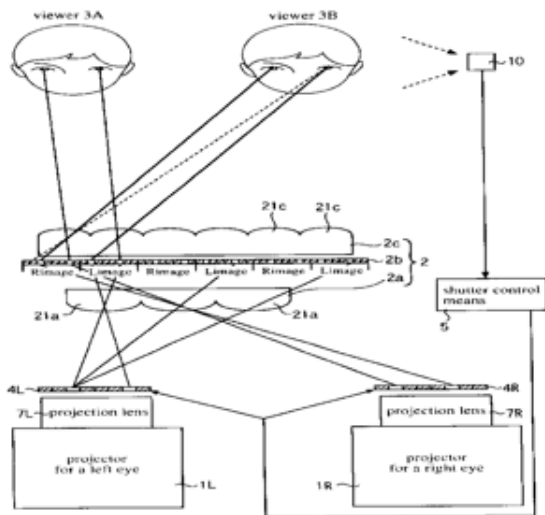


FIG. 1 (DE 103 39 076)

(Autostereoscopic displays using an array forming a moving aperture (120) and lenticular lens (110) placed behind the display should be classified in [H04N 13/305](#) in combination with [H04N 13/32](#))



(Autostereoscopic displays using an array of controllable light sources and lenticular lenses placed in front of and behind the display should be classified in [H04N 13/305](#) in combination with [H04N 13/32](#))

H04N 13/305

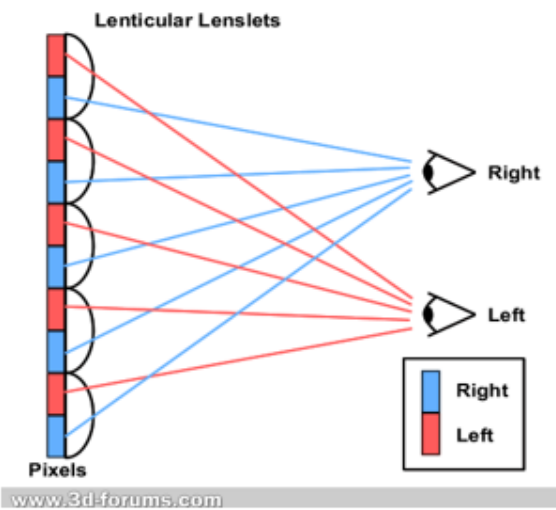
Definition statement

This place covers:

Electronic signal processors and controllers specially adapted for driving and controlling of autostereoscopic displays using lenticular lenses, as well as constructional arrangements and manufacturing methods for such autostereoscopic display devices.

Autostereoscopic displays using lenticular lenses are not limited to the cases where the lenticular lenses are arranged in front of the display only.

Illustrative examples



(Autostereoscopic displays using lenticular lenses placed in front of the display)

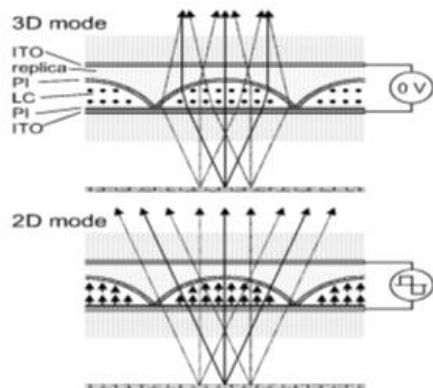
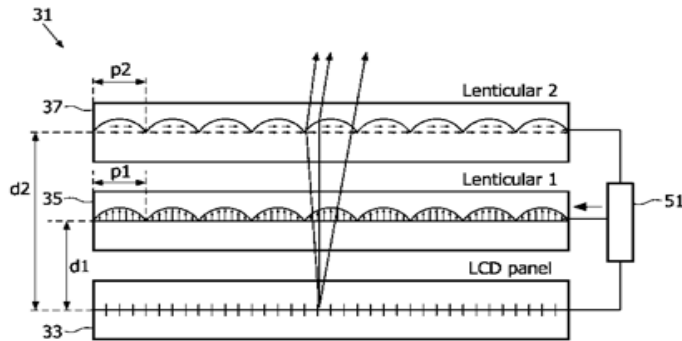


Fig. 2 Principle of active lenticular lens

(Electrical control of properties of the lenticular lens)

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(In the first mode, the light output directing function is provided by an array 35 that is closer to the display panel 33. This mode provides a limited amount of perceived depth, but high resolution, and is therefore suitable for use in a "monitor" application where high resolution is more important. In the second mode, the light output directing function is provided by an array 37 that is further from the display panel 33.)

Special rules of classification within this group

The present group should be assigned in combination with other groups of H04N13/00 for example:

a lenticular lens is used in combination with a moving aperture or controllable light sources	H04N 13/32
when the lenticular lens is used in combination with a parallax barrier	H04N 13/31
when the lenticular lens is slanted	H04N 13/317
when the autostereoscopic display is for multi-view display	H04N 13/349
when the user is tracked	H04N 13/366

Synonyms and Keywords

In patent documents, the expressions "lenticular" and "lens array" are often used as synonyms, although these terms may also be used for fly-eye lens arrays.

H04N 13/307

Definition statement

This place covers:

Volumetric or integral imaging displays that use a fly-eye lens array

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Integral imaging systems consisting of a two-dimensional (2D) lens array and display system. An elemental image on a 2D panel gives a different perspective to each elemental lens, as shown in the figure below. The lens array integrates the elemental images to form a 3D image with full parallax (horizontal and vertical) and an almost continuous view

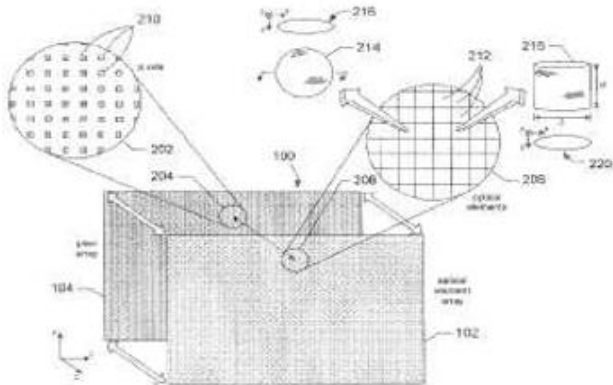
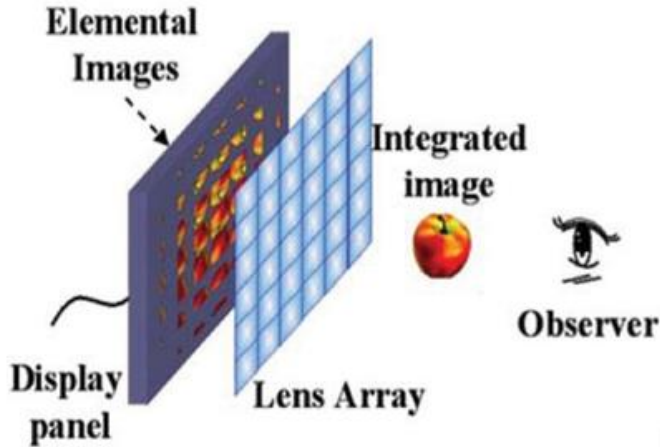
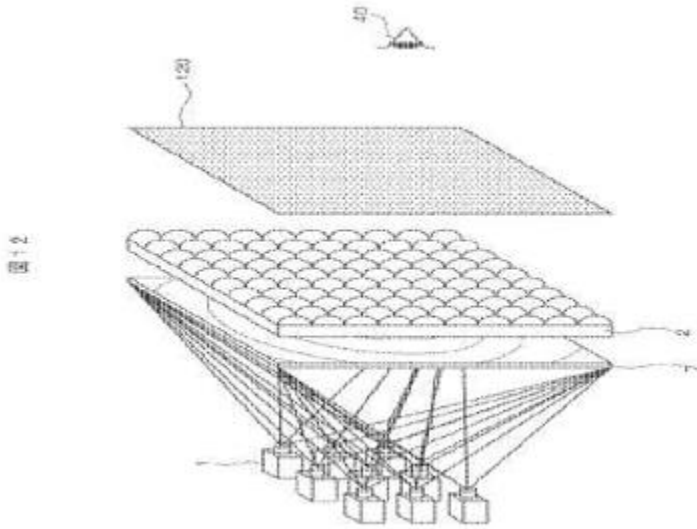


FIGURE 2

(A display comprises a pixel array (104) and an optical element array (102) disposed in close proximity to the pixel array. The pixel array is operated to display two or more images. The optical element array is configured and operated to direct each image to an associated viewing position, enabling a viewer to separately view each image from the respective associated viewing position.)

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(A naked eye stereoscopic display includes a plurality of projectors (1), a microlens array (2) for collecting light beams of an image projected from the projectors, and a diffuser panel for diffusing the light beams collected by the microlens array. Furthermore, the diffuser panel is arranged such that a virtual light collection point is formed among a plurality of light collection points of light beams by a plurality of microlenses constituting the microlens array.)

Special rules of classification within this group

The present group is the only group where integral imaging displays are classified.

Synonyms and Keywords

In patent documents, the expressions "microlens array", "lens array" and "fly-eye lens array" are often used as synonyms.

H04N 13/31

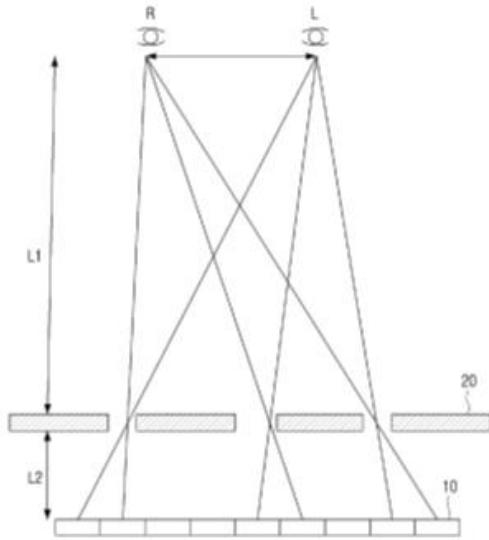
Definition statement

This group covers:

Autostereoscopic displays which use parallax barriers. A parallax barrier is a device placed in front of or behind an image source, such as a liquid crystal display, to allow it to show a stereoscopic image or multiscopic image without the need for the viewer to wear 3D glasses.

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(A display panel 10 and a parallax barrier 20)

Special rules of classification within this group

This group should always be assigned when the parallax barrier is a device placed in front of the image source.

This group should be assigned in combination with other groups of H04N13/30 for example:

a parallax barrier is used in combination with a moving aperture or controllable light sources	H04N13/32
when the user is tracked	H04N13/366

H04N 13/312

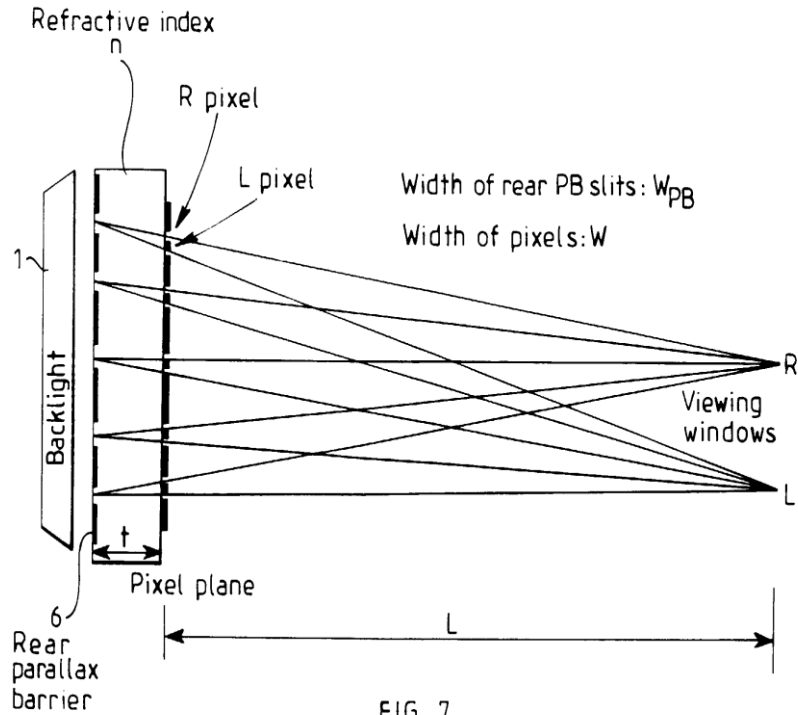
Definition statement

This group covers:

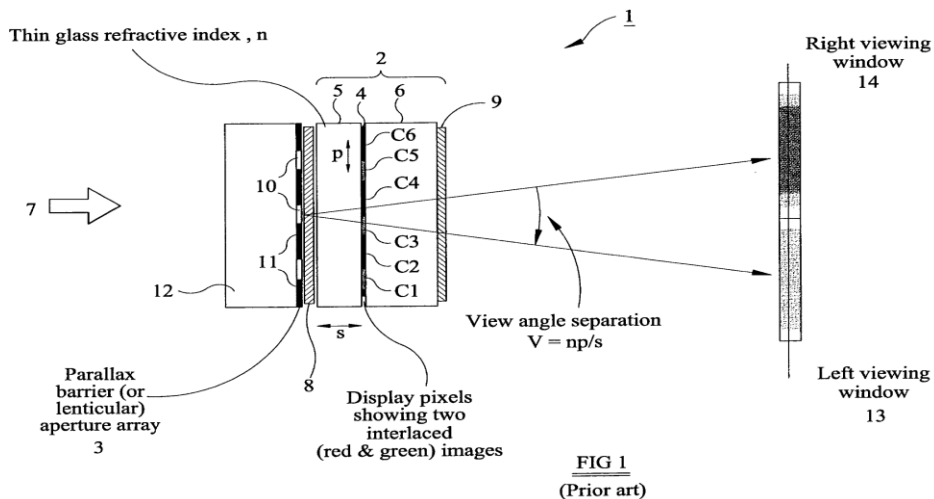
Autostereoscopic displays which use a parallax barrier behind an image source. If the parallax barrier is placed behind the LCD pixels, the light from a slit passes the left image pixel in the left direction, and vice versa. This produces the same basic effect as a front parallax barrier. In both cases the image displayed is column interlaced.

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(The parallax barrier slit is visible at the same horizontal position within each pixel (R pixel, L pixel) of one view (R, L)).



(Figure 1 shows two images displayed on the display layer 4, with the two images displayed on alternate columns of pixels; one image is displayed on pixel columns C1,

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C3, C5 and a second image is displayed on pixel columns C2, C4, C6. The image display device is illuminated by light 7 from a light source.)

Special rules of classification within this group

This group should be assigned always when the parallax barrier is placed behind the image source.

Optical masks which form part of a controllable light source should not be classified in the group, but in [H04N 13/32](#).

H04N 13/317

Definition statement

This group covers:

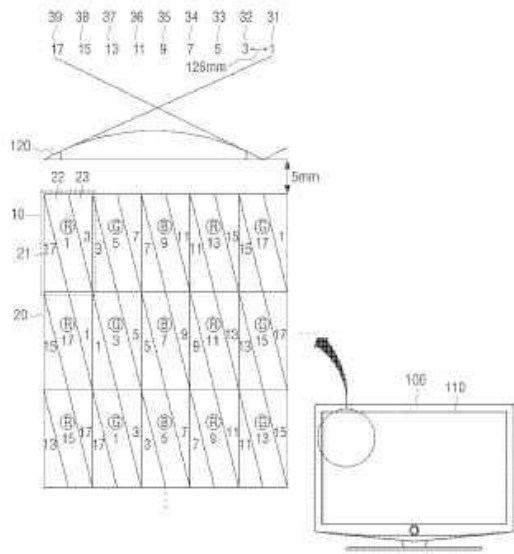
- Autostereoscopic displays where the parallax optic, for example a lenticular lens or parallax barrier is slanted with respect to the pixels matrix of the SLM.
- Autostereoscopic displays where the pixels or the pixel matrix is slanted with respect to the parallax optics.

In 1996, van Berkel proposed that the lenticular sheet could be placed at a slant over a standard LCD screen. This approach removes the picket fence effect, creates smooth transition between the views and at the same time balances the horizontal vs. vertical resolution of a view. Another solution with similar effects is called “wavelength-selective filter array”. Essentially, the filter is a slanted parallax barrier which covers the display and defines particular light penetration direction of each sub-pixel.

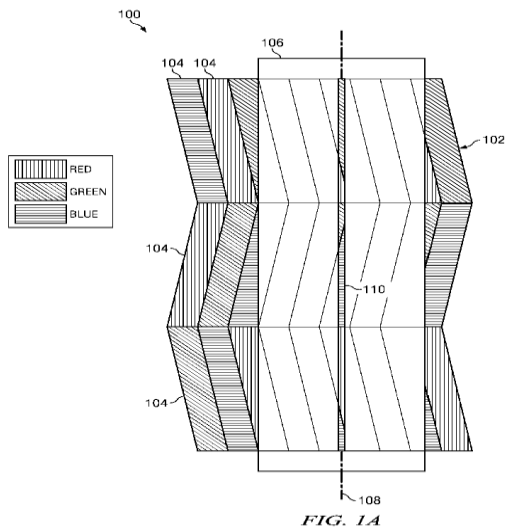
Illustrative examples

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(A display panel (10) which includes a plurality of pixels (21) arranged in a plurality of sub-pixels and displays an image frame; a viewing area separating unit (120) arranged in front of the display panel)



(The display system 100 comprises a pixel array 102 and lenses 106 disposed over the pixel array 102. In an embodiment, pixel array 102 may include pixels 104 that are slanted relative to the lenses 106.)

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Special rules of classification within this group

The present group should be assigned in combination with other groups of [H04N 13/30](#), for example:

Colour aspects of stereoscopic or multi-view image producers, e.g. for control or arrangement of colour sub-pixels	H04N 13/324
--	-----------------------------

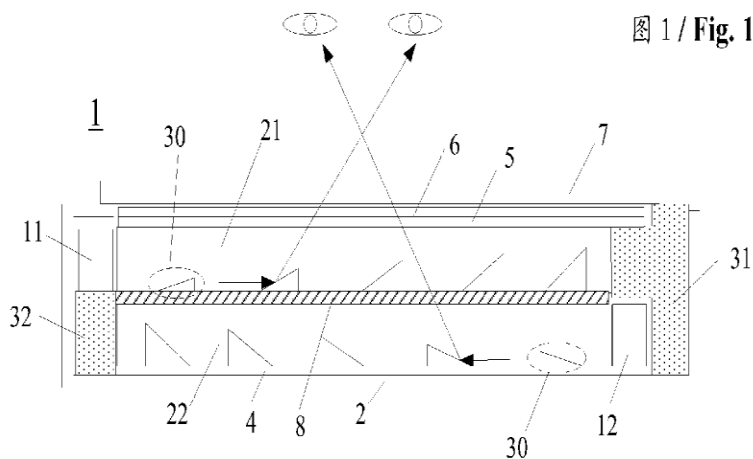
H04N 13/32

Definition statement

This group covers:

- Autostereoscopic displays using controllable light sources or arrangements, adjustment of which directs the light in different directions, so as to direct a displayed image (or portion thereof) toward a viewer's eye.
- Autostereoscopic displays in which the direction of the displayed image is manipulated by movement of apertures, by movement of light sources or by using optical masks that form part of a controllable light source.

Illustrative example



(The backlight module (1) comprises a first light guide plate (21) and a second light guide plate (22) which are stacked, and comprises a first light source (11) disposed

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opposite to the first light guide plate (21), and a second light source (12) disposed opposite to the second light guide plate (22).)

References

Informative references

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

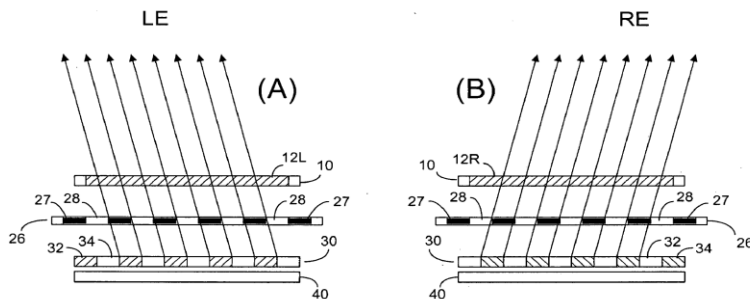
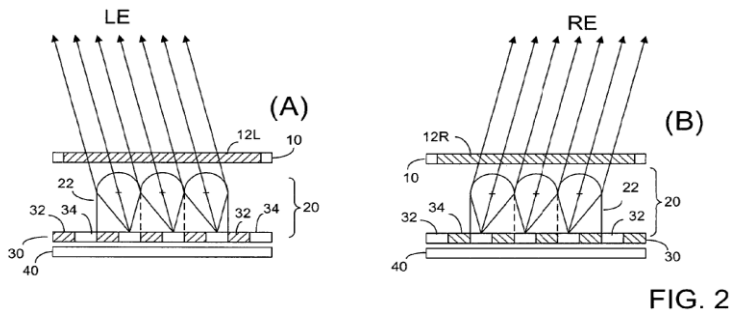
Light guides	G02B 6/00
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Special rules of classification within this group

Backlight modules commonly comprise lenticular lenses or parallax barriers. In such cases the present group should be assigned in combination with:

using a lenticular lens	H04N 13/305
using a parallax barrier	H04N 13/31

In these examples the lenticular lenses or parallax barriers are part of the backlight modules:



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(Fig. 2 and 4 show 3D display systems that use a lenticular lens 22 or a parallax barrier 26, along with a shutter plate, as a light directing device to allow a viewer's right eye to see a right image and the left eye to see a left image on a display panel. The right and left images are alternately displayed.

Although the parallax barrier 26 is placed behind the SLM 10, the [H04N 13/312](#) shall not be allocated, since it is a part of the illumination arrangement.)

Relationships with other classification places

Illumination arrangements using parallax barriers are classified in this group and not in [H04N 13/312](#).

H04N 13/322

Relationships with other classification places

Volumetric display systems where the image is built up from picture elements distributed over a volume are classified in [H04N 13/388](#).

H04N 13/327

Definition statement

This group covers:

- Colour or brightness adjustment with respect to the stereoscopic images when considering specific optical and constructional properties of a specific stereoscopic type display
- Geometric correction of stereoscopic images with respect to errors arising from the relative positions between the different optical elements, such as the pixels and the parallax optic;
- Mechanical or electrical change of properties or position of optical elements, such as the lenticular screen, to compensate for misalignments between the optical elements.

Calibration can be performed automatically or by the user when viewing a predetermined calibration or test image

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References

Informative references

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

Equalising the characteristics of different image components in stereoscopic images, e.g. colour balance	H04N 13/133
Improving the 3D impression of a stereoscopic image by modifying image signal contents	H04N 13/122

Special rules of classification within this group

This group should be always assigned in combination with a respective display type. For example, calibration of autostereoscopic displays should be classified in both H04N 13/302 and H04N 13/327.

H04N 13/334

Definition statement

This group covers:

- Stereoscopic displays using an anaglyph display method, e.g. by displaying the image for each eye using filters of different (usually chromatically opposite) colours, typically red and cyan. When viewed through "anaglyph glasses", wherein each lens comprises a corresponding colour filter, an integrated stereoscopic image is perceived by the viewer.
- Stereoscopic displays using a full colour anaglyph display method, in which different images represented by triplets of slightly different primary colours (e.g. RLGLBL and RRGRBR) are presented to the left and right eyes respectively and viewed through glasses with selective filters. This technique may also be referred to as 'wavelength multiplex visualization'.
- Stereoscopic displays using Pulfrich display method obtained from a light/dark filter arrangement.

An example of spectral multiplexing comprises simultaneously displaying left and right images separated by using glasses with different spectral characteristics

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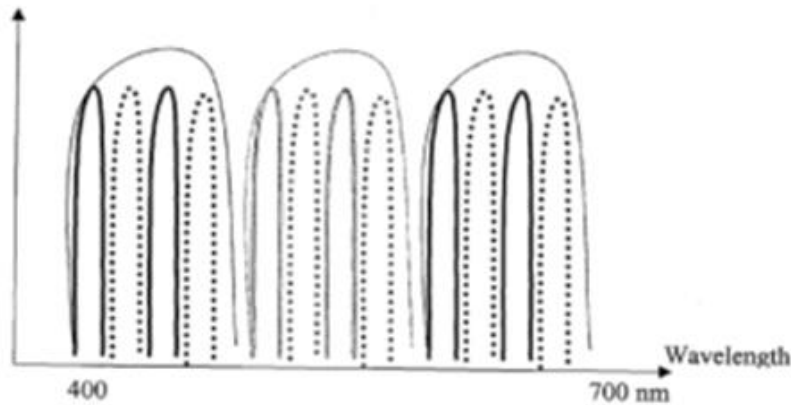


Fig. 6

In the example, the dotted lines represent the wavelengths seen by the left eye and the continuous lines represent those seen by the right eye. The left eye sees RGB image components of slightly different wavelengths than those seen by the right eye. When provided with the correct set of filters, e.g. Fabry-Perot filters, which let through light within limited, chosen ranges of wavelengths, the viewer will perceive a full colour stereoscopic image.

Reference

Informative references

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

Stereoscopic photography by simultaneous viewing using polarised or coloured light for separating different viewpoint images	G03B 35/26
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H04N 13/337

Definition statement

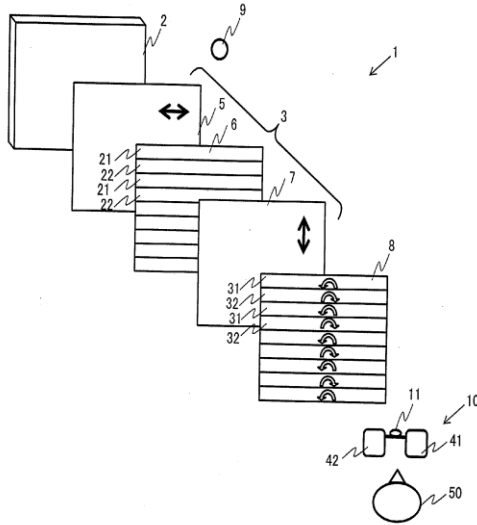
This group covers:

- Display systems which display stereoscopic images simultaneously or sequentially, each image presented by light of a different polarisation. Such systems conventionally require passive glasses having different polarising characteristics for each eye.

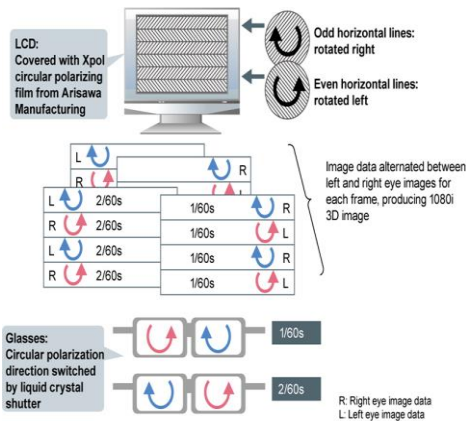
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- Display systems which display different images simultaneously or sequentially for different viewers wearing glasses having differing polarising characteristics. Viewers wearing differently polarised glasses see different displayed images (e.g. "privacy" displays).



An example of using polarisation multiplexing comprises simultaneously displaying left and right images which are separated by using glasses with different polarising characteristics



(Odd pixel lines (running horizontally) are rotated clockwise, and even pixels line counter-clockwise, using circular polarisation. Viewing glasses make it possible for the right eye to see only the odd lines, and the left only the even lines, again using polarising films, producing the 3D image.)

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Special rules of classification within this group

This group should not be assigned for shutter type displays which use polarisers in the glasses as part of the shutter system for completely blocking the light, but [H04N13/385](#).

However, this group should be assigned in combination with [H04N13/341](#) for cases when both eyes see an image, if polarisation alternating glasses are used.

References

Informative references

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

Stereoscopic photography by simultaneous viewing using polarised or coloured light for separating different viewpoint images	G03B 35/26
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H04N 13/339

Definition statement

This place covers:

Formation of a stereoscopic image by simultaneously displaying left and right images on different parts of a display and using glasses to optically recombine the stereoscopic image, e.g. with prisms or mirrors

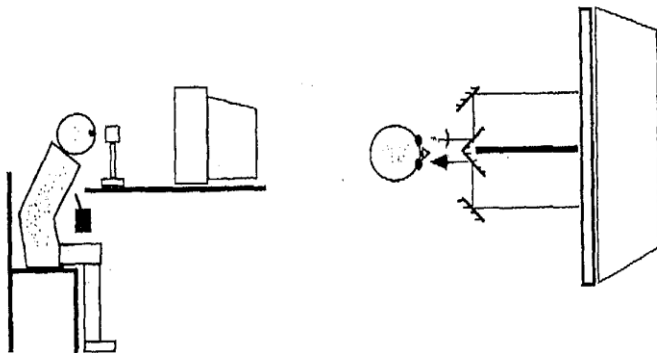


Figure 2. CRT viewed through a Wheatstone stereoscope (horizontal field of view 20°). Display resolution was 481×768 pixels per eye with 2D sub-pixel addressing (32 calibrated linear grey levels) to increase spatial resolution.

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References

Limiting references

This place does not cover:

Stereoscopic displays using polarisation multiplexing, for simultaneously displaying left and right images	H04N 13/337
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H04N 13/341

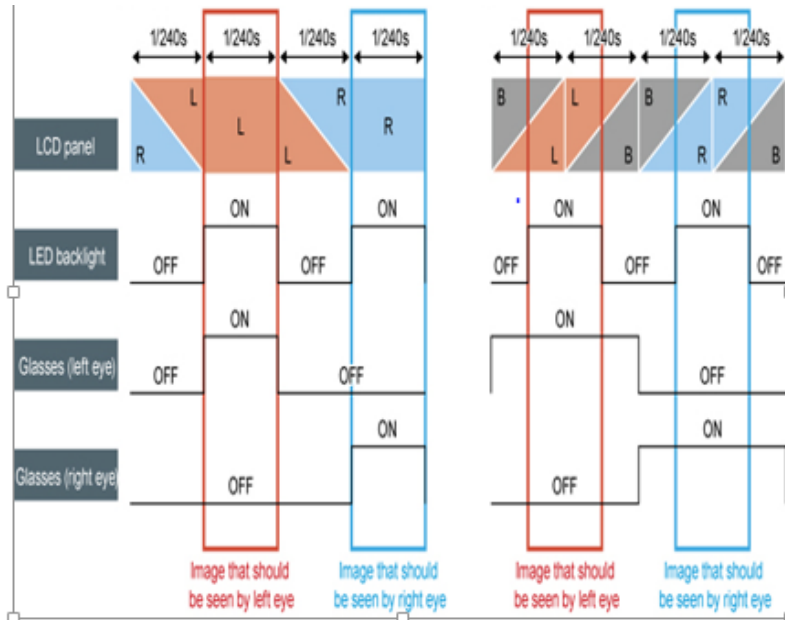
Definition statement

This place covers:

- Formation of a stereoscopic image by alternately displaying left and right images separated in time and by using glasses, e.g. with shutters, alternately to block the right and left eye
- Shutter type display systems using a frame sequential method of displaying 3D images. Full high-definition (HD) images are alternated between left and right eyes each frame, using glasses with synchronised liquid crystal shutters alternately to block left and right eye vision.
- Frame sequential methods of displaying 3D images when the optical properties, such as colour filtering or polarisation characteristics, of each lens of the shutter glasses are alternated with each frame, i.e. active glasses
- Shutter type display systems using frame sequential method of displaying different pictures for different viewers wearing shutter glasses to select one of said pictures ("privacy"), wherein said pictures are 2D or 3D pictures

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(Timing diagrams showing synchronization between the LCD panel, the LED backlight and the Glasses of Shutter type stereoscopic displays)

References

Informative references

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

Frame sequential stereoscopic displays using passive glasses	H04N 13/337 , H04N 13/334
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H04N 13/344

Definition statement

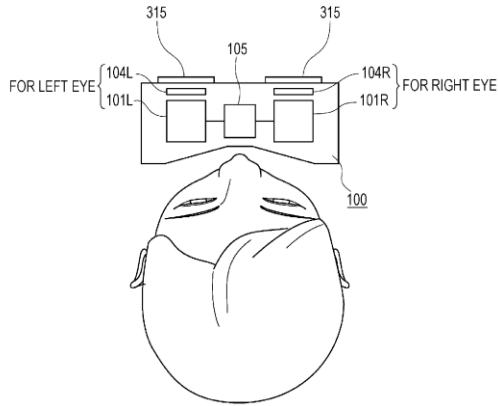
This place covers:

- head-mounted displays for stereoscopic viewing
- head-mounted displays specially adapted for augmented reality systems

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- head-mounted displays comprising viewer tracking for generating look around images



(The head-mounted display 100 illustrated has display panels 104L and 104R for the left eye and the right eye at a side surface facing a face of a user.)

References

Informative references

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

Optical head-up displays	G02B 27/01
Manipulating 3D images for computer graphics, e.g. for virtual reality (VR) or augmented reality (AR) display	G06T 19/00

Special rules of classification within this group

This group maybe assigned in combination with several further groups if the head mounted display is used for example in augmented or mixed reality systems or if the user position is tracked. For example:

Stereo video generation from a 3D object model, e.g. computer-generated stereoscopic image signals	H04N 13/275
Mixing stereoscopic image signals	H04N 13/156

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H04N 13/346

Definition statement

This place covers:

- 3D display arrangements which use a semi-transparent mirror or prism for optically mixing or separating left and right images.

Special rules of classification within this group

This group should normally be assigned in combination with a respective display type, for example:

Volumetric display with depth sampling	H04N 13/395
stereoscopic displaying with polarisation multiplexing, for simultaneously displaying left and right images	H04N 13/337

H04N 13/349

Definition statement

This place covers:

- Multi-view displays which simultaneously or sequentially display multiple (three or more) viewpoints (perspectives or views) of the same scene in different directions (zones, lobes, cones) with respect to the optical axis of the display in order to generate a look-around effect (motion parallax) when the user moves around the display. The viewpoints (views) are displayed irrespective of whether the viewer is tracked or not.
- Multi-view displays which simultaneously or sequentially display multiple (three or more) viewpoints of different scenes in different directions (zones, lobes, cones), for example for privacy displays. The viewpoints (views) are displayed irrespective of whether the viewer is tracked or not.
- Multi-view displays that display three or more viewpoints (perspectives or views) of one or more scene) in different directions (zones, lobes, cones) with respect to the optical axis of the display.

References

Limiting references

This place does not cover:

Autostereoscopic displays using fly-eye lenses	H04N 13/307
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Informative references

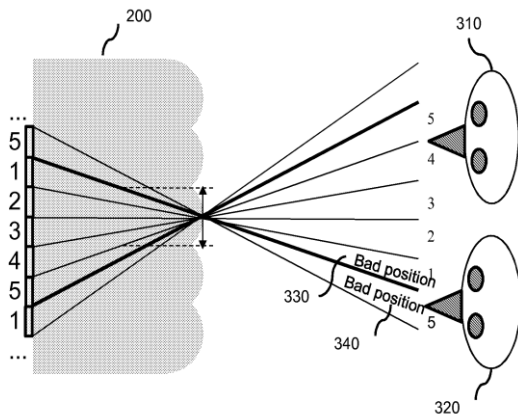
Attention is drawn to the following places, which may be of interest for search:

Volumetric displays	H04N 13/388
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Special rules of classification within this group

This group should normally be assigned in combination with a respective display type, which is normally of autostereoscopic type.

The definition "without viewer tracking" does not mean that such display systems do not include viewer tracking. Some displays can include viewer tracking, e.g. for preventing image flipping.



The term "multi-view" is also used for privacy display devices which display different video content to different viewers. Such displays however are not necessarily multi-view displays if they cannot generate multiple (three or more) viewpoints and cones irrespective of whether the viewer is tracked or not. For example, one type of privacy displays (similar to an autostereoscopic display) displays (only) two different views in two different directions. Such a privacy display does not fall into the above definition for Multi-view displays and should be not classified in H04N13/349.

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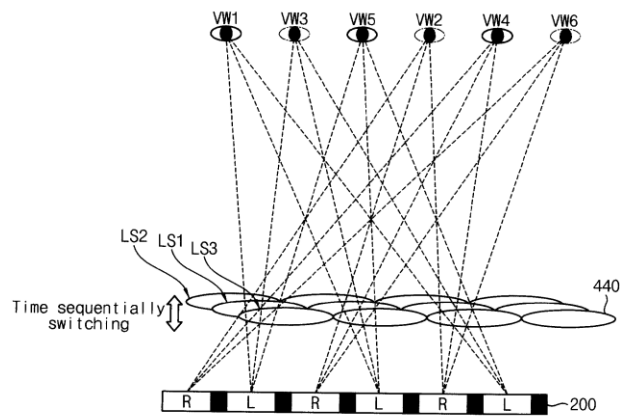
The generation of multiple viewpoints (look around or motion parallax effect) of a scene according to the viewer position is classified in H04N13/117 or H04N13/279. The displaying of such viewpoints on a display to simulate a look around effect does not mean that the display is multi-view. Therefore, such stereoscopic systems should be not classified in H04N13/349 if they do not comprise a multi-view display as defined above.

H04N 13/354

Definition statement

This place covers:

Sequential display of different images for different viewpoints at different time intervals. By controlling the display with a sufficiently high frame rate, viewers at different viewpoints will see different content, depending upon their position.



(A first lens structure LS1 emits two viewpoint images displayed on the display panel 200 to viewpoint positions VW1, VW2, during the first interval of the frame. Then, the second lens structure LS2 emits two viewpoint images displayed on the display panel 200 to viewpoint positions VW3, VW4, during the second interval of the frame.)

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H04N 13/356

Definition statement

This place covers:

Stereoscopic displays that are selectively switchable between a monoscopic (2D) mode and a stereoscopic (3D) mode.

The change in mode may be effected by electrically or mechanically modifying the properties of the display device or by change of the image content - for example:

- by switching off the parallax optic
- by removing the parallax optic
- by controlling the shutter glasses
- by displaying the same image in a stereoscopic display mode

Special rules of classification within this group

This group should be always assigned in combination with groups representing the respective display type.

H04N 13/359

Definition statement

This place covers:

Details relating to the switching of the display between monoscopic and stereoscopic modes, e.g.:

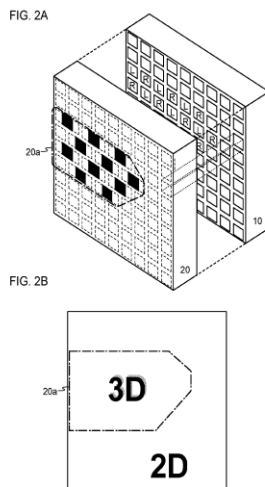
- Synchronisation between the displayed image and the time of switching off the parallax barrier or the shutter glasses
- Control of backlight level or brightness in 2D mode and in 3D mode
- The display of warning messages before switching to 2D mode
- Switching to 2D mode upon detection of a specific event, like detection of user fatigue, or that a user's position is not suitable for stereoscopic viewing

H04N 13/361

Definition statement

This place covers:

- Displays capable of simultaneously displaying both monoscopic and stereoscopic video content
- Image display control, e.g. determining the position at which a parallax barrier should be activated to display a stereoscopic image upon a monoscopic image background



(Among the plurality of pixel regions included in the display panel 10, in the pixel region in which the user views an image through a region 20a in the light-blocking panel 20, a 3D image (L) for the left eye and a 3D image (R) for the right eye are displayed, whilst 2D images are displayed in the pixel regions other than the region.)

Relationships with other classification places

Generating mixed monoscopic and stereoscopic images when the mixing is performed irrespective of the display type is not covered by this group.

Examples of classification places which may be relevant for search, e.g. mixing a stereoscopic GUI or subtitles with a stereoscopic or monoscopic image, can be found in the informative references below.

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References

Informative references

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

Mixing stereoscopic image signals	H04N 13/156
Subtitles or other on-screen display [OSD] information, e.g. menus	H04N 13/183

Special rules of classification within this group

This group should be always assigned in combination with a respective display type, for example:

for autostereoscopic displays	H04N 13/302
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H04N 13/363

Definition statement

This place covers:

Stereoscopic display systems using projection devices.

References

Limiting references

This place does not cover:

Volumetric displays	H04N 13/388
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Informative references

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

Stereoscopic photography by simultaneous viewing using two or more projectors	G03B 35/20
Stereoscopic photography by simultaneous viewing using single projector with stereoscopic-base-defining system	G03B 35/22

Special rules of classification within this group

This group should be always assigned in combination with a respective display type, for example:

projection devices for autostereoscopic displays	H04N 13/302
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H04N 13/365

Definition statement

This place covers:

- Stereoscopic or multi-view display systems using micromechanical devices, e.g. MEMS mirror devices or DMD based spatial light modulators (SLMs)

H04N 13/366

Definition statement

This place covers:

Different aspects of viewer tracking for control of stereoscopic systems, for example:

- adjusting the viewing zones of an autostereoscopic display
- adjusting the depth according to a user's position or orientation
- generating different perspectives
- controlling the image capturing process, e.g. adjusting the camera separation between real (or virtual) cameras used for image generation
- determining user fatigue
- performing geometrical corrections, e.g. vertical parallax
- switching the display between 2D and 3D mode

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- rotating the display toward the viewer
- generating motion parallax
- adjusting depth parameters or for crosstalk cancellation

This group also covers display systems which detect the presence of a viewer in front of the display, e.g. by detecting that the shutter glasses are switched on.

References

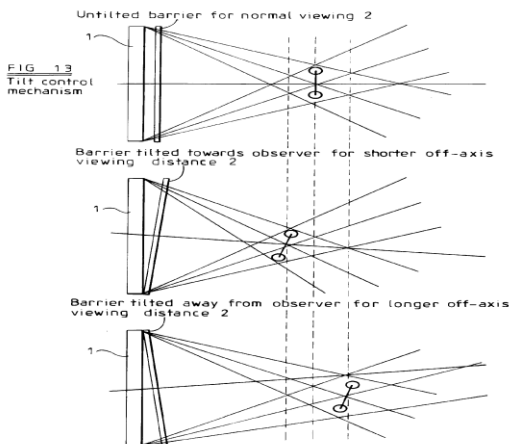
Informative references

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

Input arrangements or combined input and output arrangements for interaction between user and computer, for example viewer tracking for gesture recognition	G06F 3/01
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Special rules of classification within this group

This group should be assigned in combination with a group for the respective display type, when specific properties of the display device are controlled, e.g. when the parallax optic is moved as a function of the user position:



(Control of the parallax barrier as a function of the user position)

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This group should be assigned in combination with groups under H04N 13/20 for respective stereoscopic picture signal generators when specific properties of the picture signal generator (e.g. camera base line distance, convergence point, zoom or orientation) are controlled as a function of the viewer position with respect to the display screen.

This group should be assigned in combination with groups under H04N 13/10 for respective stereoscopic image processing, when specific image signal properties are controlled as a function of the viewer position.

H04N 13/368

Definition statement

This place covers:

- Generation of respective viewing zones for multi-viewer autostereoscopic displays
- Providing different perspectives to different viewers depending on their positions
- Providing different images to different viewers upon detection of multiple users (e.g. for privacy purposes)
- Adjusting viewing zones of multi-view image displays when viewed by several viewers

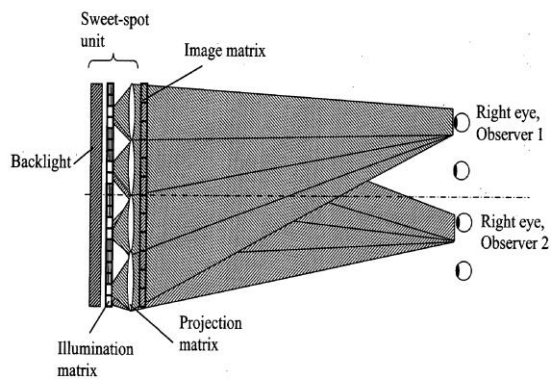


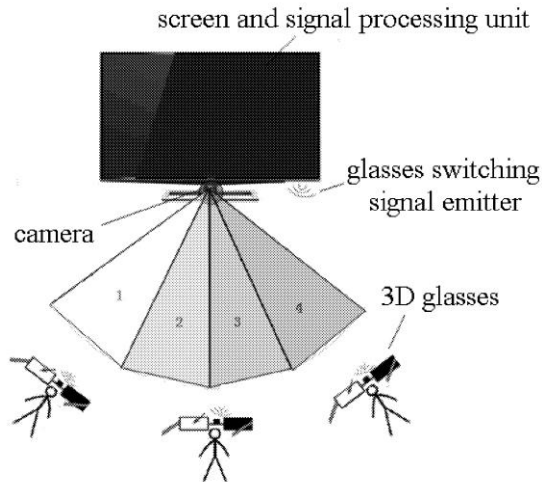
Fig. 5

(A multi-user autostereoscopic display)

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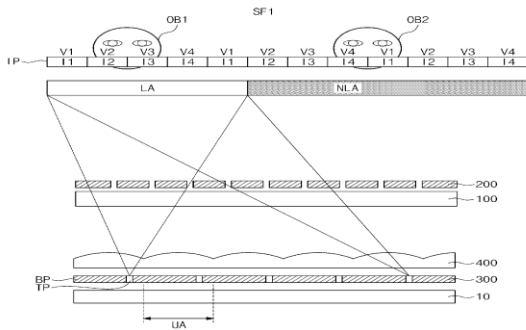
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(Stereoscopic display for providing different perspective to different user depending on their position)



(Stereoscopic display for providing different perspective to different user depending on their position)

Fig. 2A



(

(A multi-view image display when viewed by several viewers)

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H04N 13/383**References****Informative references**

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

Input arrangements or combined input and output arrangements for interaction between user and computer, e.g. eye tracking input arrangements	G06F 3/01
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H04N 13/385**Definition statement**

This group covers:

- Temporally multiplexed displays

Relationships with other classification places

Polarisation multiplexing displays, using time alternating display of left and right images and passive polarising glasses, are classified in H04N13/337.

Autostereoscopic displays, using an array of controllable light sources or a moving aperture or light source when the left and right images are alternately displayed in time, are classified in H04N13/32.

References**Limiting references**

This group does not cover:

Autostereoscopic displays using time-variant parallax barriers	H04N 13/315
Stereoscopic displays for viewing with the aid of special glasses or head-mounted displays [HMD], using temporal multiplexing	H04N 13/341

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Special rules of classification within this group

This group should be always assigned in combination with a respective display type.

H04N 13/388

Definition statement

This group covers:

Display devices forming a visual representation of an object in 3D.

The volumetric display creates 3D images by the selective emission, scattering, or relaying of illumination from defined points within the 3D viewing volume.

Relationships with other classification places

Neither holographic nor multi-view displays should be classified in this group.

Most volumetric 3-D displays create 3-D imagery visible to the unaided eye. However, other displays not relying upon additional viewing aids (e.g. glasses) should be classified in their relevant groups. For example, autostereoscopic displays are classified in H04N 13/302, whilst multi-view displays are classified in H04N 13/349.

References

Informative references

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

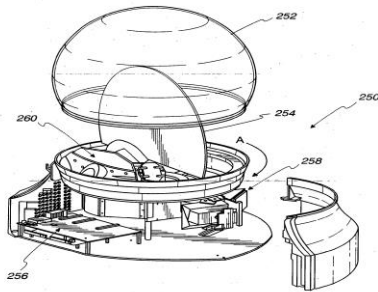
Holographic processes or apparatus using light for obtaining images from holograms	G03H 1/00
Autostereoscopic displays	H04N 13/302
Multi-view displays	H04N 13/349

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H04N 13/393**Definition statement***This group covers:*

Volumetric displays wherein image content is displayed upon, and synchronised with, the position of a moving surface such that the viewer perceives a 3D volume. Examples include swept-volume displays in which a 3D object is decomposed into 2D slices which are sequentially displayed or projected upon a rotating planar surface. If the rate of sequential display and corresponding surface rotation are sufficiently high, the human eye perceives a displayed 3D volume, due to persistence of vision.

Fig. 2b

(The volumetric 3D display includes a transparent enclosure 252, a projection screen 254, rasterization electronics 256, a projection engine 258, and relay optics 260.)

H04N 13/395**Definition statement***This group covers:*

Volumetric displays in which the 3D image volume is decomposed into a series ('stack') of constituent 2D image planes, each of which is displayed individually, for example by separate display units or by changing the depth of focus of the image projection optics. When the 2D image planes are viewed together, or in rapid succession, the viewer perceives a 3D volume.

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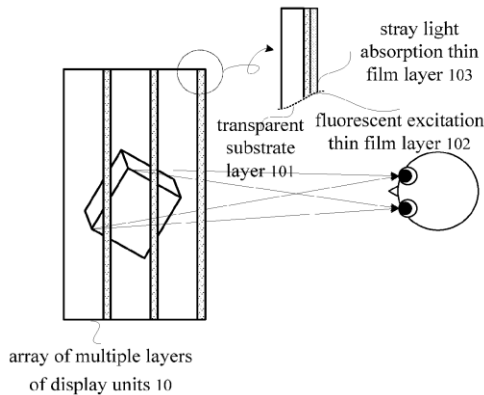


Fig.3

(The 3D display apparatus comprises an array of multiple layers of display units comprising at least two layers of display units 10)

H04N 13/398

Definition statement

This group covers:

- Synchronisation between left and right images output to a display
- Synchronisation between a temporally varying parallax optic and the corresponding image signal provided to the display
- Synchronisation between shutter glasses and the image display period of a shutter display
- Controlling the position of a parallax optic in order to change the depth resolution
- Controlling a display to switch between different modes of operation
- Controlling shutter glasses to switch off when not in use
- Controlling the display timing, backlight or shutter glasses in order to reduce crosstalk
- Controlling the synchronisation protocols between shutter glasses and display
- Controlling the number of generated views depending upon user selection or upon the number of detected viewers
- User interfaces for controlling stereoscopic display properties.

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Special rules of classification within this group

This group should normally be assigned in combination with a respective display type, for example:

Synchronisation or control aspects for autostereoscopic displays	H04N 13/302
Control arrangements or circuits to produce spatial visual effects, for example rotating displays	G09G 3/00

When classifying in this group, classification in [G09G 3/00](#) should also be considered, particularly if aspects of synchronisation or control are present, which relate to the type of display panel (e.g. whether it is an LCD, an OLED, etc.).

2. A. DEFINITIONS (modified)

H04N 13/00

Definition statement

Replace: The existing Definition statement text with the following.

This group covers:

Systems that generate stereoscopic or multi-view signals from cameras, or provide stereoscopic or multi-view signals to displays. It also covers electronic signal processing aspects of such systems.

Examples:

- Stereoscopic and multi-view electronic image pick up devices (video cameras, digital still cameras)
- Stereoscopic and multi-view display devices
- Electronic signal processors
- for stereoscopic signal processing
- for monoscopic to stereoscopic conversion
- for stereoscopic image generation (including from a computer model)
- for stereoscopic displays (e.g. for left/right synchronization, stereoscopic format conversion or depth adaptation)
- for displays providing different 2D images to different viewers (e.g. for use in vehicles)
- for devices that generate a two-dimensional "look around" effect, e.g. non-stereoscopic multi-view systems (see however exclusions here below).
- Devices generating a real 3D image, i.e. an image having a volume (volumetric displays)
- Pseudo-stereoscopic systems

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Systems in which the viewer's eyes do not see different images, but which may provide a pseudo-stereoscopic effect, are classified in H04N 13/00. The effect must go beyond that provided by the mere display of a 3D object on a 2D screen (like in a CAD system).

Example: Wiggle stereoscopy: pseudo-stereo systems providing a three dimensional effect by means of normal 2D image signals, by periodic oscillating motion of a 3D object.

Multi-view systems:

- Systems providing different 2D or 3D views of the same scene to one or more viewers according to the viewpoint location (called "look around" effect)
- Systems providing different 2D or 3D views of different scenes to different viewers (called "privacy" systems)

These systems are classified in [H04N 13/00](#) if they provide said views simultaneously or at least at a sufficiently high frame rate so as to be simultaneously viewed by the viewers.

However, multi-view systems wherein said 2D views are provided to a viewer one at a time, e.g. by user selection, are not classified in [H04N 13/00](#), because they are actually normal 2D systems although the viewpoint can be selected at will.

Examples of multi-view devices falling under [H04N 13/00](#):

- "look-around" display systems including displays in which a lenticular lens provides different views of a common scene from different viewing positions
- "privacy" display systems including displays in which a parallax barrier provides different views of different scenes to different viewers in 2D or 3D (for example in a vehicle, wherein on a common screen the driver is watching GPS while the passenger is watching a movie)
- Multi-user displays displaying different pictures for different viewers wearing shutter glasses to select one of said pictures (this is also "privacy"), wherein said pictures are 2D or 3D pictures.

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Relationships with other classification places

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

Subgroups under H04N 5/00 and H04N 7/00 relate to the basic monoscopic video aspects from which corresponding stereoscopic aspects are derived.

Classification and search in these sections is therefore to be considered every time no specifically stereoscopic aspects are present.

Analysis of video signals to perform real time control of a stereoscopic video cameras, or to identify the image transmission format to drive a stereoscopic display, is classified in H04N 13/00.

Ordinary 2D displays arranged to display solid objects, e.g. in a CAD system, are sometimes called 3D displays. Such displays allow the viewer to rotate 3D objects to see them from any direction. Such displays are not classified in H04N 13/00. This is because a viewer sees the same picture with both eyes and because, if there is more than one viewer, all viewers see the same picture. The manipulation of 3D models or images for computer graphics is covered by G06T 19/00.

Volumetric displays and holographic displays are not autostereoscopic displays for the purpose of this classification

References

Delete: The entire Application-oriented references section.

Informative references

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

Replace: The existing Informative references table with the following.

Optical systems	G02B 27/00
Stereoscopic photography	G03B 35/00
Image processing or generation in general	G06T 7/00

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Calculation or rendering of a monoscopic view of a 3D graphics object	G06T 15/20
Generation of 3D graphical models or scenes for digital data transmission as such	G06T 17/00
Television cameras	H04N 5/225
Arrangements of television cameras	H04N 5/247
Projection displays	H04N 5/74, H04N 9/31
Video standard conversion	H04N 7/01
Colour signal processing circuits	H04N 9/64
Video stream synchronization / multiplexing /packetization aspects	H04N 21/00
Video signal reformatting	H04N 21/4402 H04N 21/2343
Aspects concerning subtitles or other OSD information	H04N 21/488
Generation or processing of metadata	H04N 21/84

Delete: The entire Special rules of classification section.

Glossary of terms

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

Replace: The existing table with the following.

Stereoscopic	Providing (exactly) two different views, one for the left eye and one for the right eye
2D	Two dimensional
3D	Three dimensional, sometimes also used to mean stereoscopic
Autostereoscopic display	A display device not requiring glasses to provide a stereoscopic effect to the viewer. An autostereoscopic display uses a parallax generating optic which projects or displays different images to the viewer, thus creating a sense of depth. The parallax-generating optic may include, for example, parallax barriers, lenticular lenses, an array of

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	<p>controllable light sources or a moving aperture or light source, fly-eye lenses, dual and multilayer devices that are driven by algorithms to implement compressive light field displays; such devices are also called Content-Adaptive Parallax Barriers, and varifocal lenses or mirrors.</p> <p>It is noted that volumetric displays and holographic displays are not autostereoscopic displays for the purpose of this classification.</p>
Multi-view	Providing three or more different views to one or more viewers according to their viewing position or direction; the views can be 2D or 3D
Automultiscopic display	This is a shorter synonym for the expression "multi-view autostereoscopic 3D display"
Volumetric display	A device generating a "solid" image, i.e. not an image on the surface of a display, but one having a real depth, for example by projecting 2D image slices at different planes within a viewing volume. Such systems have been considered to fall within the definition of stereoscopic systems because the viewer's eyes perceive two different pictures.
Lenticular lens	An array of thin cylindrical lenslets (normally less than 1mm wide) placed vertically in front of, or behind a display or light modulator in order to generate optically directive views in autostereoscopic displays or cameras
Parallax barrier	An array of opaque strips and thin slits arranged to occlude portions of a displayed image in left and right viewing regions. The slits are spatially arranged to ensure that the left/right image portions are only visible in the corresponding left/right viewing regions for which they are intended. The parallax barrier may be provided by a static physical layer in which the slits are precisely positioned, or electronically generated on an adaptive intermediate LCD layer. The parallax barrier may also be adjacent to camera circuitry for image collection.
Fly-eye lens	An array of very small bidimensional lenses (typically circular / hemispherical) placed in front of a display, light modulator or image sensor like a normal lenticular lens, providing bidimensional parallax

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Pseudo-stereoscopic	Relating to stereoscopic or 3D visual effects obtained without sending different views to the viewer's eyes. The same term is sometimes used to denote the effect whereby the left and right images are seen by the wrong eyes, due to viewing from an unsuitable position in front of an auto-stereoscopic display.
Integral imaging	A technique of image capture or display which uses a fly's eye or a lenticular lens in front of the image sensor/display in order to capture/display images with parallax
Plenoptic camera	A camera, normally non-stereoscopic, using a technique allowing focusing after image capture, by means of a lenticular lens array combined with a plurality of (small) image sensors. A plenoptic camera is also known as a light-field camera.

Synonyms and Keywords

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

Replace: The text that follows the table with the following.

In patent documents "3D" and "stereoscopic" are sometimes used as synonyms:

In patent documents the terms "automultiscopic" and "multi-view autostereoscopic" are sometimes used as synonyms.

The terms "lenticular screen", "lenticular lens array" and "lenticular array" are used as synonyms.

The terms "plenoptic camera" and "light-field camera" are used as synonyms.