

EUROPEAN PATENT OFFICE  
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 1246

DATE: JANUARY 1, 2022

PROJECT DP0242

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

<u>Action</u>	<u>Subclass</u>	<u>Group(s)</u>
<b>DEFINITIONS:</b>		
Definitions Modified:	H04N	13/00, 13/254, 13/275, 13/302, 13/307, 13/317, 13/32, 13/341, 13/349, 13/361, 13/363, 13/368, 13/398

**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)

## 2. A. DEFINITIONS (modified)

### H04N13/00

#### Definition statement

Replace: The existing Definition statement with the updated one below.

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; monoscopic to stereoscopic conversion; for stereoscopic image generation (including from a computer model); for stereoscopic displays (e.g. for left/right synchronisation, 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

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.

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- 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.

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

Replace: The LAST paragraph in the Relationships with other classification places section with the updated one below.

Volumetric displays are classified in H04N 13/388 and holographic displays are classified in G03H 1/26, whereas autostereoscopic displays are classified in H04N 13/302.

### **References**

#### **Informative references**

Replace: In the following row, replace the "z" with "s" so the text reads as follows:

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Video stream synchronisation / multiplexing /packetisation aspects	H04N 21/00
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Insert: The following new row to the Informative references table.

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
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### Glossary of terms

Replace: The existing Glossary of terms with the updated one below.

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 displays	A display device not requiring glasses to provide a stereoscopic effect to the viewer. 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 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; varifocal lenses or mirrors. It is noted that volumetric displays are classified in H04N 13/388 and holographic displays are classified in G03H 1/26, whereas autostereoscopic display are classified in H04N 13/302.
Multi-view	Providing more than two different views to one or more viewers according to their viewing position or direction; the views can be 2D or 3D

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Automultiscopic displays	This is a shorter synonym for the expression "multi-view autostereoscopic 3D display"
Volumetric displays	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 lenses	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 barriers	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 lenses	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.
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.

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Plenoptic cameras	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.
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### Synonyms and Keywords

Insert: The following new row to the Synonyms and Keywords table.

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

DMD	Digital Micromirror Device
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Replace: Everything under the Synonyms and Keywords table with the following:

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

- "3D" and "stereoscopic"
- "automultiscopic" and "multi-view autostereoscopic"
- "lenticular screen", "lenticular lens array" and "lenticular array"
- "plenoptic camera" and "light-field camera"

### H04N13/254

#### Definition statement

Replace: The existing Definition statement with the updated one below.

Aspects relating to the use of light for obtaining a stereoscopic image, 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

Insert: New last sentence so the paragraph reads as below:

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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](#). Procedures and apparatus for illuminating a scene in general, see [G03B 15/02](#).

## [H04N13/275](#)

### **Definition statement**

Replace: The word “image” with “images” so the Definition statement reads as below.

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

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

Insert: The new last sentence of the paragraph so the paragraph reads as below.

The generation of a new image from a virtual viewpoint from existing stereoscopic images is covered in [H04N 13/111](#) and its subgroup. 3D modelling for computer graphics [G06T 17/00](#).

## [H04N13/302](#)

### **Definition statement**

Replace: Replace all text AND the image in the Definition statement so it reads as follows.

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;

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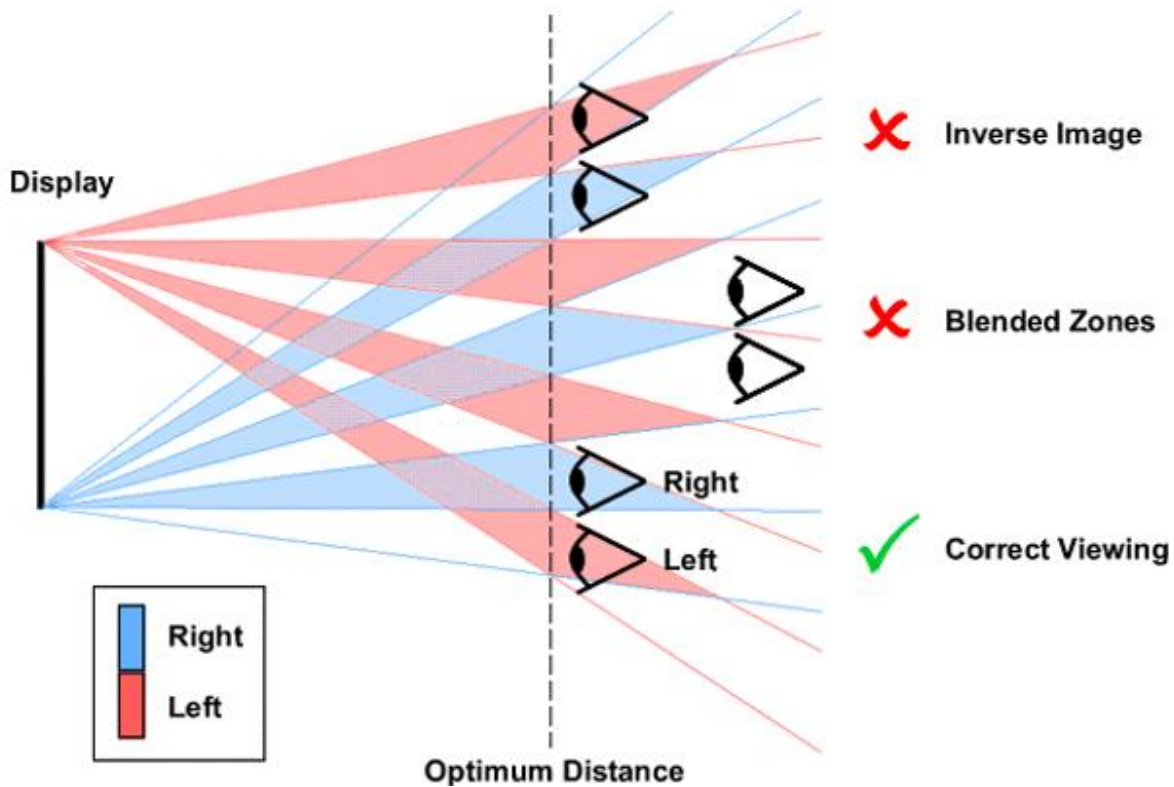
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- lenticular lenses;
- an array of controllable light sources or a moving aperture or light source;
- a fly-eye lens;
- dual and multilayer devices that are driven by algorithms such as computed tomography and non-negative matrix factorisation and non-negative tensor factorisation 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 and the right image is seen by the left eye)

**References**

**Informative references**

Replace: The Informative references table with the updated table below.

Constructional details related to television receivers	<a href="#">H04N 5/64</a>
Volumetric displays, i.e. systems where the image is built up from picture elements distributed over a volume	<a href="#">H04N 13/388</a>
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	<a href="#">G02F 1/00</a>

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Structural association of optical devices, e.g. polarisers, reflectors or illuminating devices, with liquid crystal display cells	G02F 1/1335
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

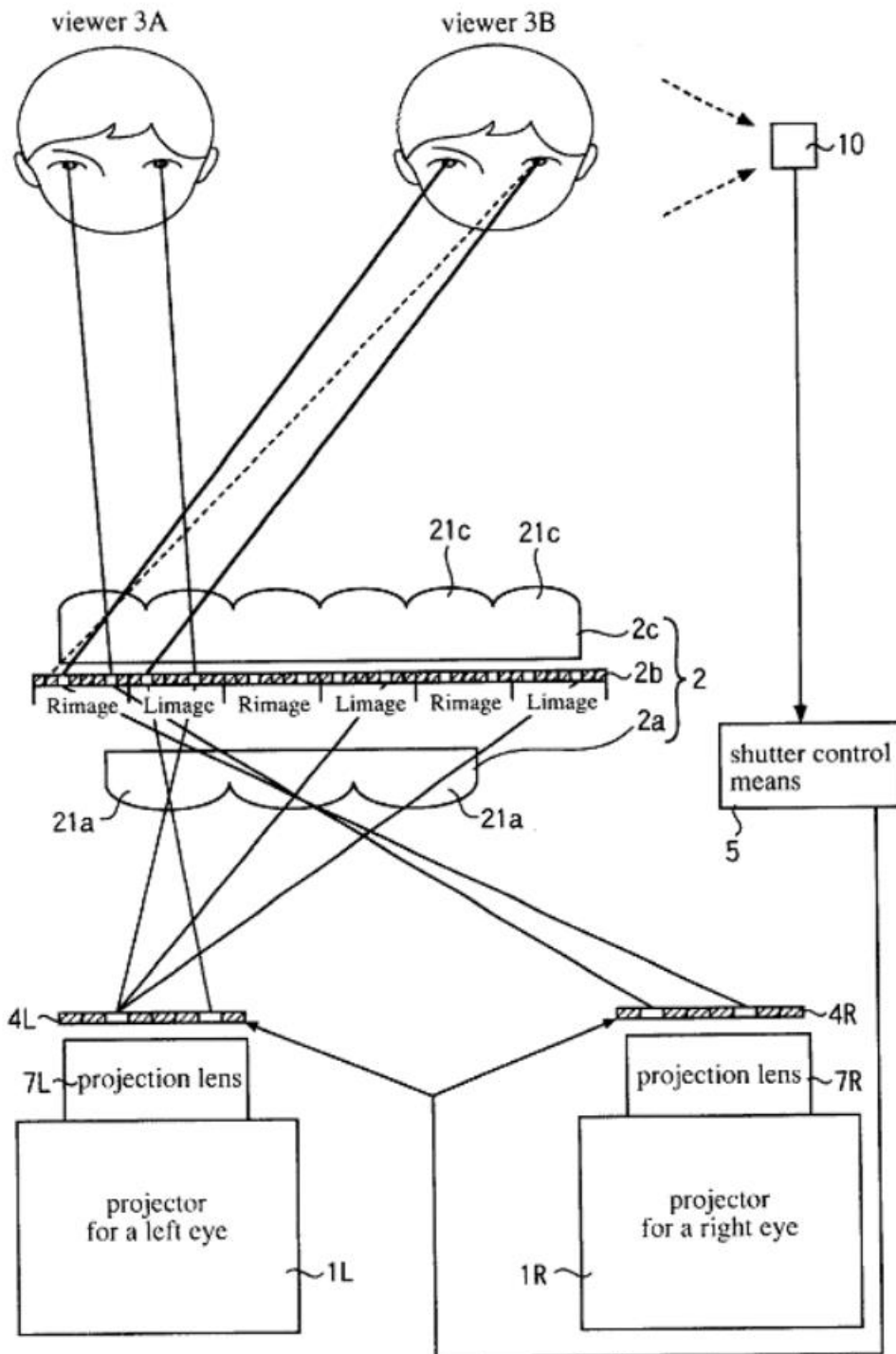
### Special rules of classification

Replace: The words “The present” with “This” so the Special rules of classification reads as follows.

Replace: All images in the Special rules of classification section.

This 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.





(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](#))

**H04N13/307**

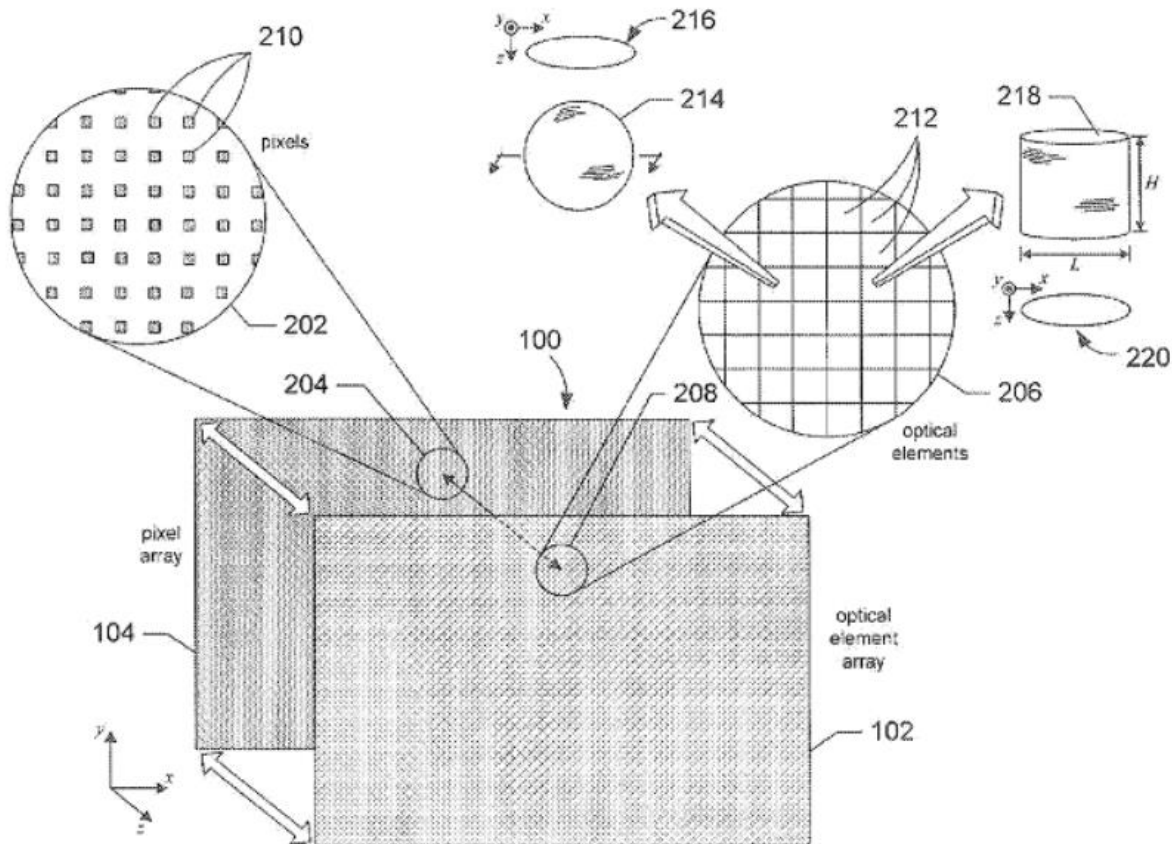
**Definition statement**

Insert: Periods at the ends of each paragraph so the Definition statement reads as follows.

Replace: The second and third images with the new images and associated text below.

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

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.



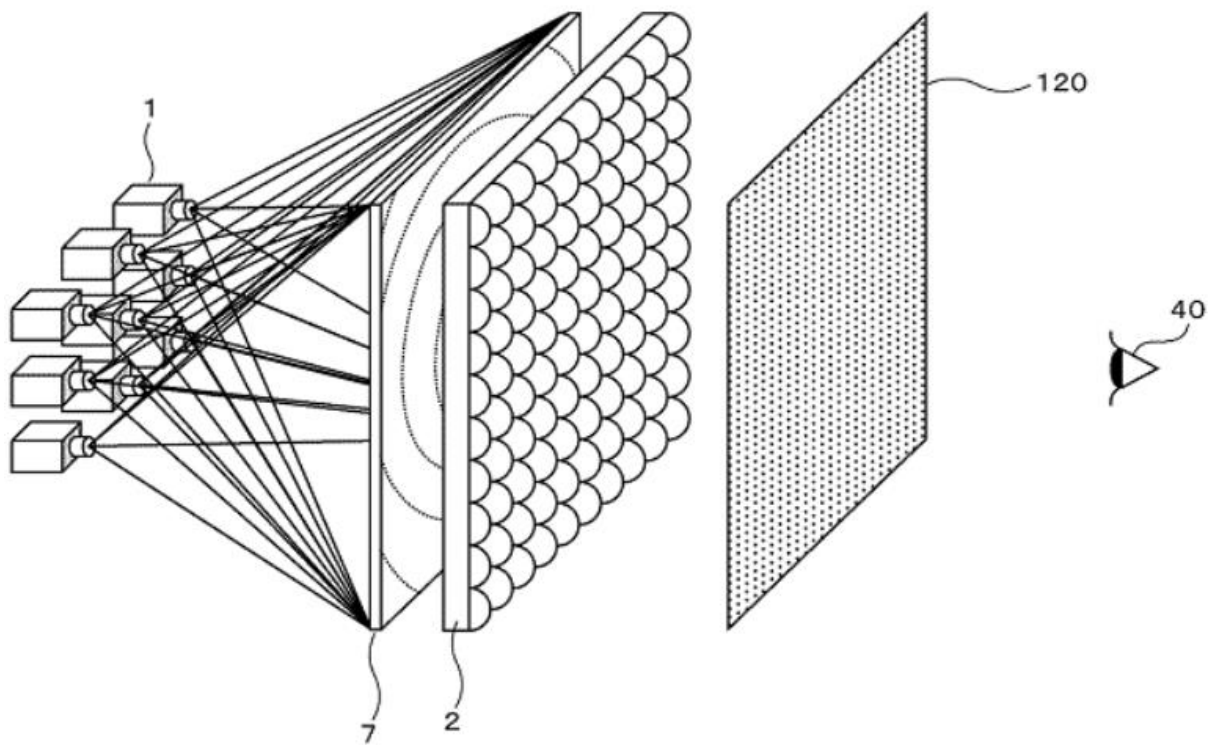
(A)

display comprises a pixel array (104) and an optical element array (102) disposed in

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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.)



(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 (120) 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

Replace: The words “The present” with the word “This” so the Special rules of classification read as follows.

This group is the only group where integral imaging displays are classified.

### **Synonyms and Keywords**

Replace: The existing Synonyms and Keywords section with the updated one below.

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

- "microlens array", "lens array" and "fly-eye lens array"

### **H04N13/317**

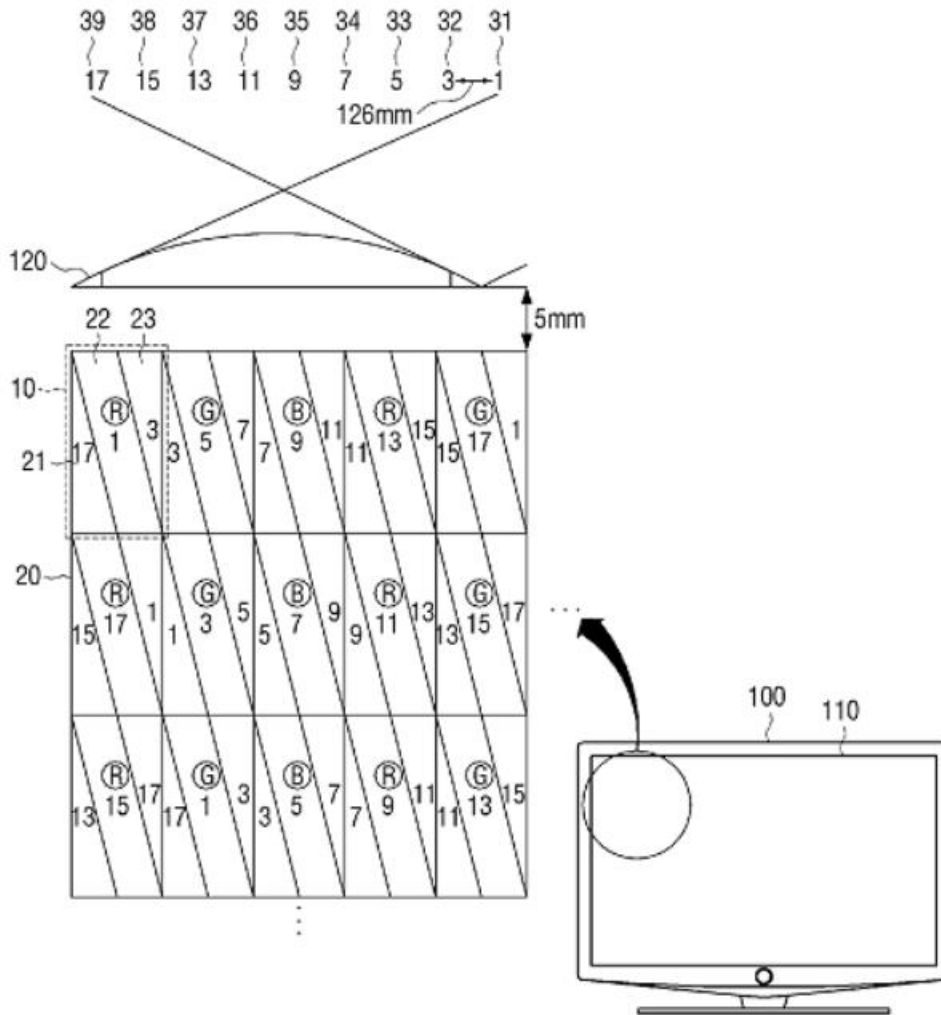
#### **Definition statement**

Delete: The bullets from the first two bullet items so they are now regular paragraphs as shown below.

Replace: The first image with the updated image and associated text below.

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.



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

**Special rules of classification**

Replace: The words “The present” with the word “This” as shown below.

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



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Colour aspects of stereoscopic or multi-view image producers, e.g. for control or arrangement of colour sub-pixels	<a href="#">H04N 13/324</a>
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## H04N13/32

### Definition statement

Delete: The bullets from the first two bullet items so they are now regular paragraphs as shown below.

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.

### Special rules of classification

Replace: The existing text with the updated text below so the Special rules of classification text reads as below.

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

Replace: The existing images with the updated one and associated text below.

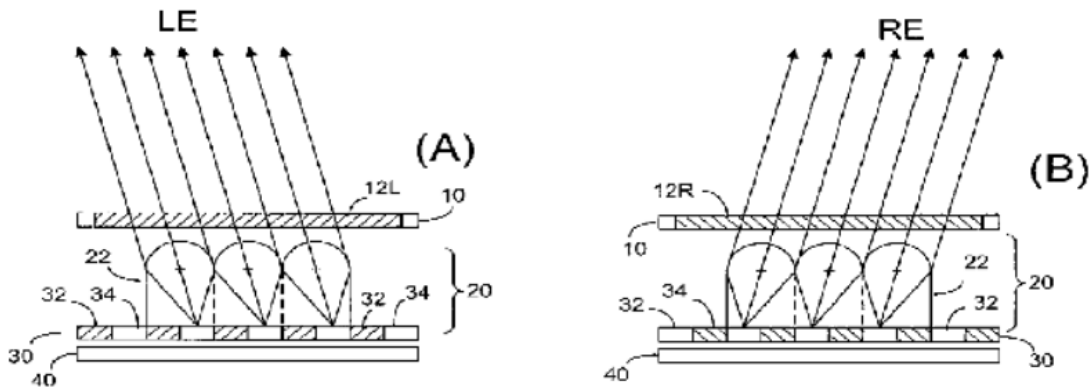


FIG. 2

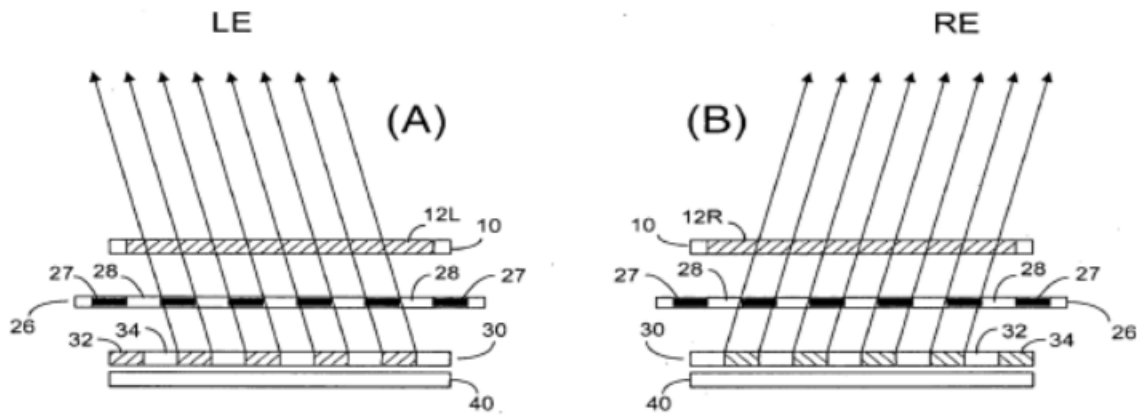


FIG. 4

(Fig. 2 and 4 show 3D display systems that use a lenticular lens 22 or a parallax barrier 26, along with a shutter plate 30, 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 spatial light modulator [SLM] 10, H04N 13/312 shall not be allocated, since it is a part of the controllable illumination arrangement.)

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## H04N13/341

### Definition statement

Delete: The bullets in the Definition statement so that it now reads as follows.

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.

Replace: The text associated with the image with the updated text below.

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

### References

#### Informative references

Replace: The associated symbols with the updated ones shown below.

Frame sequential stereoscopic displays using passive glasses
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H04N 13/334, H04N 13/337
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## H04N13/349

### Definition statement

Replace: The existing Definition statement with the updated and re-formatted one below.

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.

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, but not for the creation of the multi-view effect as such.

### Special rules of classification

Replace: All of the text in the Special rules of classification section with the updated text below. DO NOT DELETE IMAGE.

The generation of multiple viewpoints (look around or motion parallax effect) of a scene according to the viewer position is classified in H04N 13/117 for the image signal processing aspects or in H04N 13/279 for the image signal generation aspects. 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 H04N 13/349 if they do not comprise a multi-view display as defined above.

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

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 [H04N 13/349](#).

## **H04N13/361**

### **Definition statement**

Replace: Only the TEXT of the Definition statement with the updated text below. DO NOT DELETE IMAGE.

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 selectively 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.)

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## H04N13/363

### References

#### Informative references

Insert: The following new reference into the Informative references table.

Projection displays	H04N 5/74, H04N 9/31
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## H04N13/368

### Definition statement

Replace: ALL text in the Definition statement with the updated text below. DO NOT DELETE IMAGES.

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.

(A multi-user autostereoscopic display)

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

(A multi-view image display when viewed by several viewers, with backlight 10, light emitting area control unit 300 with barrier part BP and transparent slit part TP, directional control unit 400 with a lenticular lens, display unit 100 with a plurality of color pixels, liquid crystal barrier panel as viewpoint generating unit 200 and image plane IP which includes an illumination area LA and a non-illumination area NLA.)

## H04N13/398

### Definition statement

Delete: The bullets from the Definition statement so that the Definition statement now reads as below.

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 shutter type 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.