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Datasheet for the decision of 24 February 2025

Case Number: T 1350/22 - 3.5.04

Application Number: 18734505.3

Publication Number: 3646585

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Language of the proceedings: EN

Title of invention:
APPARATUS AND METHOD FOR GENERATING AN IMAGE

Applicant:
Koninklijke Philips N.V.

Headword:

Relevant legal provisions:
EPC Art. 84, 56, 111(1), 114(1)
RPBA 2020 Art. 13(2), 11

Keyword:
Claims - clarity - main request and first to third auxiliary requests (yes)
Inventive step - main request and first to third auxiliary requests (no)
Amendment after summons - exceptional circumstances (yes)
Remittal - special reasons for remittal (yes)

Decisions cited:
T 1241/17, T 1227/19

Catchword:

Europäisches Patentamt
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Beschwerdekammern

Boards of Appeal

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Case Number: T 1350/22 - 3.5.04

D E C I S I O N
of Technical Board of Appeal 3.5.04
of 24 February 2025

Appellant: (Applicant)	Koninklijke Philips N.V. High Tech Campus 52 5656 AG Eindhoven (NL)
Representative:	Philips Intellectual Property & Standards High Tech Campus 52 5656 AG Eindhoven (NL)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 27 January 2022 refusing European patent application No. 18734505.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair	B. Willems
Members:	A. Seeger
	B. Müller

Summary of Facts and Submissions

I. The appeal is against the examining division's decision to refuse European patent application No. 18 734 505.3, which was published as international patent application WO 2019/002061 A1.

II. The following document was cited in the decision under appeal:

D1: Lai-Man Po et al., "A new multidirectional extrapolation hole-filling method for depth-image-based rendering", 18th IEEE International Conference on Image Processing, 11 September 2011, pp. 2589-2592, XP032080200, DOI: 10.1109/ICIP.2011.6116194

III. The decision under appeal was based on the ground that the independent claims of the main request and the first to third auxiliary requests were not clear (Article 84 EPC).

IV. The applicant (appellant) filed notice of appeal. With its statement of grounds of appeal, the appellant filed claims according to first to third auxiliary requests. The claims of these requests were identical to the claims of the first to third auxiliary requests on which the decision under appeal was based. The appellant requested that the decision under appeal be set aside and that a European patent be granted on the basis of the claims of the main request or, alternatively, on the basis of the claims of one of the first to third auxiliary requests. It indicated a basis in the application as filed for the claimed subject-

matter and provided arguments to support its opinion that the claims met the requirements of Article 84 EPC.

V. The board issued a summons to oral proceedings and a communication under Article 15(1) RPBA. In that communication, the board expressed the following preliminary opinion.

(a) The examining division erred in its findings that the claims of the main request and first to third auxiliary requests pending at that time did not meet the requirements of Article 84 EPC.

(b) The subject-matter of claim 1 of the main request and first to third auxiliary requests did not involve an inventive step within the meaning of Article 56 EPC in view of the following documents which the board introduced *ex officio* into the appeal proceedings on the basis of Article 114(1) EPC:
D2: US 2014/0118509 Al
D3: US 2017/0004648 Al

VI. By letter dated 19 November 2024, the appellant filed fourth to tenth auxiliary requests and submitted its arguments as to why these auxiliary requests should be admitted into the appeal proceedings. Furthermore, the appellant provided a basis for the amendments in these auxiliary requests and brief arguments as to why the subject-matter thereof involved an inventive step in view of documents D2 and D3. Should these auxiliary requests not be admitted into the appeal proceedings, the appellant requested that the case be remitted to the department of first instance. Finally, the appellant informed the board "*that the Applicant for*

cost considerations is currently intending not to attend the Oral Proceedings".

VII. In a brief communication, the board invited the appellant to clarify whether it would adhere to what it was "*currently intending*", i.e. that it would not be attending the oral proceedings. If that was the case, the appellant was invited to withdraw its request for oral proceedings.

VIII. By letter dated 22 November 2024, the appellant withdrew its request for oral proceedings.

IX. In response, the board cancelled the oral proceedings.

X. According to the file, the appellant's final requests are that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request or on the basis of the claims of the first to third auxiliary requests as filed with the statement of grounds of appeal, or on the basis of the claims of the fourth to tenth auxiliary requests as filed by letter dated 19 November 2024, or, alternatively, should the fourth to tenth auxiliary requests not be admitted into the appeal proceedings, that the case be remitted to the examining division.

XI. Claim 1 of the main request reads as follows:

"An apparatus for generating an image, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties

for at least one part of the scene for at least one viewpoint;
a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
characterized by further comprising:
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region."

XII. Claim 1 of the first auxiliary request reads as follows (features added compared with claim 1 of the main request are underlined):

"An apparatus for generating an image, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;

a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene, the first viewpoint in the scene being at least one of a position from which the scene is viewed and an the orientation of a view from a given view position;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
characterized by further comprising:
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region."

XIII. Claim 1 of the second auxiliary request reads as follows (features added compared with claim 1 of the main request are underlined):

"An apparatus for generating an image for a virtual reality application, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;

a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
characterized by further comprising:
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region."

XIV. Claim 1 of the third auxiliary request reads as follows (features added compared with claim 1 of the main request are underlined):

"An apparatus for generating an image for a virtual reality application, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;
a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene, the first viewpoint in the scene being at least

one of a position from which the scene is viewed and an the orientation of a view from a given view position;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
characterized by further comprising:
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region."

XV. Claim 1 of the fourth auxiliary request reads as follows (features added compared with claim 1 of the second auxiliary request are underlined and deleted features are ~~struck through~~):

"An apparatus for generating an image, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;
a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;

a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
~~characterized by further comprising:~~
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
characterized by further comprising:
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region;
wherein the blur processor (109) is arranged to reduce a degree of blurring in at least part of the second region with respect to a degree of blurring in the transitional region."

XVI. Claim 1 of the fifth auxiliary request reads as follows (features added compared with claim 1 of the main request are underlined and deleted features are ~~struck through~~):

"An apparatus for generating an image, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;

a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
~~characterized by further comprising:~~
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
characterized by further comprising:
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region;
and in that the blur processor (109) is arranged to determine the degree of blurring for a pixel in response to a distance from a position of the pixel to a border of the transition area."

XVII. Claim 1 of the sixth auxiliary request reads as follows (features added compared with claim 1 of the main request are underlined and deleted features are ~~struck through~~):

"An apparatus for generating an image, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data

does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;
a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
~~characterized by further comprising:~~
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
characterized by further comprising:
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region;
and in that the extrapolator (107) is arranged to determine a low pass filtered image property for a plurality of areas of the first region proximal to the second region, and to set an image property for at least part of the second region in response to the low pass filtered image properties."

XVIII. Claim 1 of the seventh auxiliary request reads as follows (features added compared with claim 1 of the main request are underlined and deleted features are ~~struck through~~):

"An apparatus for generating an image, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;
a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
~~characterized by further comprising:~~
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
characterized by further comprising:
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region; and
a filter processor arranged to apply a global spatial filter to the image, a property of the spatial filter being dependent on a proportion of the image for which the 3D image does not comprise image data."

XIX. Claim 1 of the eighth auxiliary request reads as follows (features added compared with claim 1 of the

main request are underlined and deleted features are ~~struck through~~):

"An apparatus for generating an image, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;
a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
~~characterized by further comprising:~~
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
characterized by further comprising:
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region;
a render region processor (301) for determining a rendering mask for the image, the rendering mask being indicative of whether pixels of the image belong to the first region or not; and

a filter adapter (303) for determining a spatially varying filter characteristic for the image in response to the rendering mask; and wherein the blur processor is arranged to apply a spatial filter adopting the spatially varying filter characteristic to the rendered image."

XX. Claim 1 of the ninth auxiliary request reads as follows (features added compared with claim 1 of the main request are underlined and deleted features are ~~struck through~~):

"An apparatus for generating an image, the apparatus comprising:
a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;
a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
~~characterized by further comprising:~~
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
characterized by further comprising:

a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region;
a render region processor (301) for determining a rendering mask for the image, the rendering mask being indicative of whether pixels of the image belong to the first region or not; and
a filter adapter (303) for determining a spatially varying filter characteristic for the image in response to the rendering mask; and wherein the blur processor is arranged to apply a spatial filter adopting the spatially varying filter characteristic to the rendered image;
wherein the extrapolator (107) is arranged to:
generate a downscaled image in response to downscaling the first image;
generate a filtered downscaled image in response to applying a bilateral filter to the downscaled image, the bilateral filter being guided by the rendering mask;
generate a filtered upscaled image in response to upscaling the downscaled image; and
generate pixel values for the second region from the filtered upscaled image."

XXI. Claim 1 of the tenth auxiliary request reads as follows (features added compared with claim 1 of the main request are underlined and deleted features are ~~struck through~~):

"An apparatus for generating an image, the apparatus comprising:

a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint;
a view vector source (103) for providing a rendering view vector indicative of a first viewpoint in the scene;
a renderer (105) for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector, and the 3D image data comprising image data for the first region;
~~characterized by further comprising:~~
an extrapolator (107) for extrapolating the 3D image data into a second region of the first image, where the 3D image data does not comprise image data for the second region and the first and second regions are adjoining regions; and
characterized by further comprising:
a blur processor (109) for generating the image where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region;
a receiver (901) for receiving a target view vector indicative of a target viewpoint in the scene for the image;
a reference source (903) for providing a reference view vector indicative of a reference viewpoint for the scene;
and wherein the view vector source (103) is arranged to generate the rendering view vector indicative of a rendering viewpoint as a function of the user desired

viewpoint and the reference viewpoint for the scene and the view vector source (103) is arranged to determine the reference view vector in response to a border view vector indicative of a border between a part of the scene for which the 3D image data comprises image data and a part of the scene for which the 3D image data does not comprise image data."

Reasons for the Decision

1. The appeal is admissible.

2. Main request - objections under Article 84 EPC

2.1 Claim 1 contains the following features: "*a receiver for receiving a 3D image data for a scene ... a renderer for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint*".

2.2 The examining division held that 3D image data included image plus depth image data and image rendering included image rendering for a volumetric display for a user defined viewpoint.

The examining division objected that rendering image plus depth data for a volumetric display was not supported by the application as filed (see the decision under appeal, point 9.1).

2.3 As submitted by the appellant, a volumetric display is described at https://en.wikipedia.org/wiki/Volumetric_display as being a display device that forms a visual representation of an object in three physical dimensions, as opposed to the planar image of traditional screens that simulate depth through a

number of different visual effects (see the statement of grounds of appeal, page 6, second paragraph).

2.4 The board finds that the objection raised by the examining division is not justified for the following reasons.

Claim 1 defines an apparatus for generating an image. As further specified in claim 1, this image is a "*first image being for the first viewpoint*" and is rendered "*based on the 3D image data*". Hence, claim 1 specifies the rendering of an image for a particular viewpoint based on 3D image data. Claim 1 does not specify that this rendering is adapted to any kind of display type.

In contrast, rendering for a volumetric display means forming a visual representation of an object in three physical dimensions, e.g. by setting some voxels of a 3D space as transparent and others as opaque or luminous; it does not mean showing a planar image from a particular viewpoint.

2.5 Therefore, the person skilled in the art would not understand the rendering of an image for a particular viewpoint as defined in claim 1 to encompass rendering for a volumetric display.

2.6 Claim 1 contains the following features: "*a receiver (101) for receiving a 3D image data for a scene, the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint*".

2.7 The examining division held that these features might be understood as missing image data due to lossy transmission.

The examining division argued that this interpretation was not supported by the application as filed, in which the 3D image data intentionally did not provide the full coverage of the scene to limit the resources required to record, store or transmit the image data corresponding to the viewpoint (see the decision under appeal, point 9.2).

2.8 The board finds that this objection of the examining division is not justified for the following reasons.

Claim 1 specifies an apparatus comprising a receiver for receiving a 3D image data for a scene. The 3D image data is specified as providing an incomplete representation of the scene.

The creation of the 3D image data and the transmission of the 3D image data to the receiver are outside of the scope of claim 1. With regard to the receiver, it is indistinguishable whether the representation is incomplete because it was incomplete from the start or whether it became incomplete during the transmission.

It is thus not justified to argue that claim 1 lacks support by the description because it does not specify that the 3D image data intentionally does not provide the full coverage of the scene. Such a feature would not limit the claimed apparatus.

2.9 The same conclusions as those set out under points 2.5 and 2.8 above apply *mutatis mutandis* to the corresponding independent claims 14 and 15, which

define a method of generating an image and a computer program product, respectively.

2.10 Since no other objections relating to a lack of support or clarity are apparent, the claims of the main request meet the requirements of Article 84 EPC.

3. First to third auxiliary requests - objections under Article 84 EPC

3.1 The examining division held that the independent claims of the first to third auxiliary requests did not meet the requirements of Article 84 EPC for the same reasons as those given for the independent claims of the main request (see the decision under appeal, points 11, 13 and 15).

3.2 Since the board finds that the objections raised by the examining division under Article 84 EPC against the independent claims of the main request are not justified (see point 2. above), the same applies to the corresponding objections against the independent claims of the first to third auxiliary requests.

3.3 Since no other objections relating to a lack of support or clarity are apparent, the claims of the first to third auxiliary requests meet the requirements of Article 84 EPC.

4. Main request - inventive step (Article 56 EPC)

4.1 Item V of the written opinion of the international searching authority contained a perfunctory statement that "[a]*t present, it appears that the set of claims is novel and inventive over the prior art D1*".

The claimed subject-matter was not examined for novelty or inventive step during the first-instance proceedings.

4.2 Contrary to the statement in the written opinion of the international searching authority, the board finds that the subject-matter of claim 1 of the main request does not involve an inventive step within the meaning of Article 56 EPC for the following reasons.

4.3 Document D2 discloses an apparatus for generating an image (see Figure 1: 101, paragraph [0058]: "*image processing unit 101 which is coupled to a display*" and paragraph [0064]: "*receiver 105 is coupled to an image generator 107 which is arranged to generate display images for the input sequences of images based on the 3D data and a rendering viewpoint*"), the apparatus comprising:

a receiver (Figure 1: "*Rx*" 105) for receiving a 3D image data for a scene (see paragraph [0060]: "*a receiver 105 which receives a video signal. The video signal comprises three-dimensional (3D) data for a sequence of images*", paragraph [0061]: "*the 3D data may simply comprise a plurality of (typically simultaneous) images that correspond to different viewpoints of the same scene*" and paragraph [0062]: "*the 3D data may be provided as image data together with depth data*"), the 3D image data providing an incomplete representation of the scene in that the 3D image data does not provide a description of the visual properties for at least one part of the scene for at least one viewpoint (see paragraph [0093]: "*required image data may simply not be available for image objects or areas that are de-occluded by the viewpoint change*")

a view vector source (see Figure 1: "*VPP*" 113) for providing a rendering view vector (see paragraph [0079]: "*viewpoint controller 113 determines the rendering viewpoint which is used by the image generator 107 to generate the output display images*" wherein the spatial coordinates of a viewpoint form a vector (according to paragraph [0112]: "*(x_C,y_C,z_C) (i.e. the ... viewpoint*")) indicative of a first viewpoint in the scene (see paragraph [0089]: "*viewpoint controller 113 can then determine the rendering viewpoint in response to the viewpoint of the viewer*")

a renderer (see Figure 1: "*Rend*" 107)for rendering a first region of a first image based on the 3D image data, the first image being for the first viewpoint indicated by the rendering view vector (see paragraph [0105]: "*viewpoint controller 113 of FIG. 1 tracks this movement and changes the displayed image to reflect the movement as illustrated in image 800 in FIG. 8*"), and the 3D image data comprising image data for the first region (see Figure 8: the side of the car)

an extrapolator for extrapolating the 3D image data into a second region of the first image(see Figure 8: the front of the car), where the 3D image data does not comprise image data for the second region (see paragraph [0106]: "*information required to display the front of the car correctly may not be available as it is not included in the input images corresponding to the central view*") and the first and second regions are adjoining regions (see paragraph [0106]: "*rendering algorithm will typically fill such an area by extrapolation, i.e. the neighboring areas will be extended into the new areas. However, if the scene*

contained any objects in this area, they would not be rendered in the view of FIG. 8 thereby resulting in rendering artifacts")

4.4 The subject-matter of claim 1 therefore differs from the disclosure of document D2 in that the former further specifies that the defined apparatus for generating an image comprises a blur processor for generating the image, where generating the image comprises applying a spatially varying blurring to the first image, and where a degree of blurring is higher in a transitional region between the first region and the second region than for an internal area of the first region.

4.5 A technical effect of this blur processor is to obfuscate the rendering artefacts caused by extrapolation (see the description, page 4, lines 22 to 26: "*the degradation effect typically associated with extrapolation may be substantially reduced .. blurring of the transition region may in particular reduce the perceptual impact*").

4.6 The objective technical problem may thus be formulated as to obfuscate rendering artefacts caused by extrapolation.

4.7 Faced with this problem, the person skilled in the art would have considered document D3 because it deals with the technical field of filling "holes", i.e. regions in a 3D image for which no information in the 3D image data is available due to a change of a view vector, by extrapolation (see D3, paragraph [0085]: "*a hole-filling strategy that instead generates pixel values for the missing pixels based on some features of the warped image. For example, the embodiment of the system*

illustrated in FIG. 10 fills in pixel values by propagating pixels outward from the boundaries of the warped image into the regions with holes").

4.8 Document D3 solves the problem formulated above by blurring the "holes" and any pixels nearby (see D3, paragraph [0086]: "*transformation on the pixels of regions with holes, or on any pixels near to these regions, to achieve a desired blurring effect. For example, instead of a simple averaging, a Gaussian blur filter may be employed*", and paragraph [0019]: "*blur transformations may be applied to pixels in the holes or near the holes to reduce these artifacts*").

By applying these features to an image processing unit according to document D2, the person skilled in the art would have directly arrived at the subject-matter of claim 1.

In the terms of claim 1, the pixels near the "holes" in document D3 are in the transitional region between the first region (outside the "holes") and the second region (the "holes").

A spatially varying blurring is applied where a degree of blurring is higher in the transitional region than for an internal area of the first region. The internal area of the first region corresponds to the pixels further away from the "holes" for which no blurring is applied (and thus the degree of blurring is lower, i.e. zero).

A corresponding situation is set out in the description, page 20, lines 17 to 19: "*no filtering may be applied within the first region ... and intermediate*

filtering may be applied within the transitional region".

4.9 The appellant did not submit any written counter-arguments to the reasoning the board put forward in its preliminary opinion (see points 4.3 to 4.9 of the communication under Article 15(1) RPBA and the appellant's letter dated 19 November 2024). Furthermore, the appellant withdrew its request for oral proceedings, and therefore it is relying only on its written submissions.

4.10 Therefore, the board finds that the subject-matter of claim 1 does not involve an inventive step within the meaning of Article 56 EPC.

5. First auxiliary request - inventive step (Article 56 EPC)

5.1 Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the former further specifies "*the first viewpoint in the scene being at least one of a position from which the scene is viewed and an orientation of a view from a given view position*".

5.2 Document D2 discloses this additional feature in paragraph [0088]: "*The viewer viewpoint estimate may in some cases be the same as the position information*", and in paragraph [0090]: "*when the user moves his head in one direction, the image objects of the presented images are moved in the presented image to reflect the changes in viewpoint*".

5.3 The appellant did not submit counter-arguments in this regard (see point 4.9 above).

5.4 Therefore, the board finds that the subject-matter of claim 1 of the first auxiliary request lacks inventive step within the meaning of Article 56 EPC for the same reasons as those set out under point 4. above with respect to claim 1 of the main request.

6. Second auxiliary request - inventive step (Article 56 EPC)

6.1 Claim 1 of the second auxiliary request differs from claim 1 of the main request in that the former further specifies an apparatus for generating an image "*for a virtual reality application*".

6.2 According to the description, page 2, lines 7 to 15: "*In typical virtual reality experiences, right eye and left eye view images may continuously be generated for e.g. a virtual headset to match the movement and change of orientation by the user*".

6.3 The same setting is disclosed in document D2, paragraph [0090]: "*as the viewer moves his head, the rendered images can be dynamically and continuously adapted to reflect the current position of the user ... the tracking of the viewer's head movements may provide a perception of the display being a window through which a real three dimensional scene is scene* [sic]".

6.4 The appellant did not submit counter-arguments in this regard (see point 4.9 above).

6.5 Therefore, the board finds that the subject-matter of claim 1 of the second auxiliary request lacks inventive step within the meaning of Article 56 EPC for the same

reasons as those set out under point 4. above with respect to claim 1 of the main request.

7. Third auxiliary request - inventive step (Article 56 EPC)

7.1 Claim 1 of the third auxiliary request differs from claim 1 of the main request in that the former further specifies the features quoted under points 5.1 and 6.1 above.

These features are disclosed by document D2 as set out under points 5.2 and 6.3 above.

7.2 The appellant did not submit counter-arguments in this regard (see point 4.9 above).

7.3 Therefore, the board finds that the subject-matter of claim 1 of the third auxiliary request lacks inventive step within the meaning of Article 56 EPC for the same reasons as those set out under point 4. above with respect to claim 1 of the main request.

8. Fourth to tenth auxiliary requests - admittance (Article 13(2) RPBA)

8.1 The fourth to tenth auxiliary requests were filed after notification of the communication under Article 15(1) RPBA. These auxiliary requests therefore constitute amendments within the meaning of Article 13(2) RPBA.

8.2 The board introduced documents D2 and D3 in its communication under Article 15(1) RPBA and raised a new objection relating to a lack of inventive step based on these documents. In response to this communication, the appellant filed the fourth to tenth auxiliary requests

with the aim of overcoming this new objection. The board considers this to represent exceptional circumstances within the meaning of Article 13(2) RPBA.

The board thus admits the fourth to tenth auxiliary requests into the appeal proceedings in exercise of its discretion under the aforementioned provision.

9. Remittal of the case for further prosecution (Article 111(1) EPC and Article 11 RPBA)

9.1 Contrary to the findings of the examining division, the independent claims of the main request and the first to third auxiliary requests are clear (Article 84 EPC), as set out under points 2. and 3. above. However, the subject-matter thereof does not involve an inventive step within the meaning of Article 56 EPC (see points 4. to 7. above). Consequently, the decision under appeal cannot be upheld.

9.2 Under Article 111(1) EPC, the board may either proceed with the examination of the application or remit the case to the department responsible for the decision under appeal for further prosecution. Article 11 RPBA provides that the board should not remit a case for further prosecution unless special reasons present themselves for doing so.

9.3 In view of the following facts, the board considers that special reasons as per Article 11 RPBA are indeed present.

(a) The requirement of Article 56 EPC was not assessed in the examination proceedings.

(b) A cursory search for the subject-matter of the independent claims of the main request and the first to third auxiliary requests resulted in documents D2 and D3, which rendered the subject-matter of these claims obvious.

(c) The subject-matter of claim 1 of the fourth to tenth auxiliary requests specify further details regarding the amount of blurring in a transition between a first region and a second region. To examine these further details, a search beyond the cursory one will be necessary, which is the responsibility of the department of first instance (see also T 1241/17, Reasons 7.6 and 9, and T 1227/19, Reasons 6.1 and 6.4).

9.4 In view of the above, the case is remitted to the examining division for further prosecution, as also requested by the appellant (albeit under the condition that the fourth to tenth auxiliary requests were not admitted into the appeal proceedings).

9.5 Since the appellant withdrew its request for oral proceedings, the decision can be taken without holding oral proceedings.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution.

The Registrar: The Chair:

K. Boelicke B. Willems

Decision electronically authenticated