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Datasheet for the decision of 11 May 2007

Case Number: T 1401/05 - 3.4.02

Application Number: 97924339.1

Publication Number: 0973063

IPC: G03B 35/00

Language of the proceedings: EN

Title of invention:
Method and apparatus for producing three-dimensional image

Applicant:
Photo Craft Co., Ltd

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Main, auxiliary request - inventive step (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1401/05 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 11 May 2007

Appellant: Photo Craft Co., Ltd
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Toyonaka-shi,
Osaka 560 (JP)

Representative: Hoffman Eitle,
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 14 June 2005 refusing European application No. 97924339.1 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: A. Klein
Members: M. Rayner
B. Müller

Summary of Facts and Submissions

I. In a letter received by the Office on 24 October 2005, the applicant requested "re-establishment of rights (Article 122 EPC) into the term of two months for filing an appeal (Article 108 EPC)" against the decision of the Examining Division posted on 14 June 2005 to refuse European patent application No. 97 924 339.1. The applicant also paid the corresponding fee. At the same time it filed a Notice of Appeal, together with a statement of grounds, and paid the appeal fee.

II. According to an interlocutory decision of the present board dated 20.09.2006, the appellant's rights in connection with the filing of an appeal within the time limit of two months prescribed by Article 108 EPC were re-established.

III. European patent application number 97 924 339.1 relates to producing a three-dimensional image and in the proceedings before the examining division, reference was made to, amongst others, the following documents:-

D1 JP-A-08 009 422 (together with English abstract and machine translation into English thereof)

D5 JP-A-06 309 431 (together with English abstract thereof).

The machine translation of document D1 had been provided with the representative's letter of 11.04.2005. During oral proceedings before the examining division, the applicant’s representative informed the division

that the Japanese applicant considered the machine translation to be correct.

IV. According to the decision under appeal, the examining division was of the opinion that the subject matter of the independent claim 1 as presented to it could not be considered to involve an inventive step within the meaning of Article 56 EPC. The division considered obtaining two-dimensional image data, forming a first and second stereoscopic image and a composite all to be known from document D1, which document also discloses implicitly that the data is digital. Moreover, compressing two dimensional image data and disposing line shaped images on a recording medium disposed beneath lenticular lenses was obvious in view of the disclosure of document D5.

With reference to document D1, it is obvious that the second image is a planar image, because the background image is located far away from the foreground subject, for example a mountain or cloud. The skilled person knows there is no discernible parallax for such objects. The division also referred to the text in Paragraph 0025 of document D1 and the single background feed shown in Figure 1 thereof in support of its position. In the case shown in Figures 3 and 4 there being no parallax at a large distance, the device of document D1 would supply a planar background image even if a stereoscopic pair had been supplied originally.

V. The appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of the claims according to a main or auxiliary request presented with its letter of 11.04.2007. Oral

proceedings were requested on an auxiliary basis in the notice of appeal.

In the written grounds for appeal, the appellant concentrated on its view that the examining division found the skilled person would carry out the method of document D1 by supplying a planar background image for far away objects. This would result in a (smaller) stereoscopic image being mixed into a larger, planar background image. The subject matter appealed calls for the exact opposite because the planar second image is mixed into the (larger) first stereoscopic image. Thus the invention provides a stereoscopic background image such as a landscape and a planar foreground image such as a person mixed into this background. Therefore, it is easy to present photographs of people before aesthetically pleasing stereoscopic background images, thus providing an entire pseudo stereoscopic composite.

VI. Consequent to the auxiliary request of the appellants the board appointed oral proceedings. In a communication attached to the summons, the board informed the appellant that Figure 1 of the application shows a stereoscopic image including a large foreground person ice skating. The planar image, which is mixed, is that of a further skater backgrounding the stereoscopically imaged skater. In other words, the allegation that the invention provides a planar foreground image is in error.

In its argumentation, the appellant had introduced the concepts of "smaller" and "larger", without specifying where this is really justified by documents as filed.

There are references to "parts" of an image, but no indication is given whether they are large or small.

Moreover, the problem addressed by the application seemed rather to relate specifically to reducing data processing load, than generally to producing images with a pleasing background. This can be seen, for example, from the last sentence of the penultimate paragraph of the description, "a usual planar image obtained through the usual photographing is disposed at a part of an entire image, whereby an amount of image data to be processed can be reduced to a large extent."

All the present application offers is using differing background without discernible parallax, which is a routine matter of choice for the skilled person. There is no support in the description, for example, for selecting certain intermediate distance images or a particular part of the subject image, nor any support for how such selections could be made.

VII. In reply to the communication of the board, the appellant submitted that Figure 1 of the present application shows a stereoscopic first image in which a comparatively smaller planar second image is mixed, as described in detail on page 5, last but one paragraph to page 6, second paragraph of the description. Concerning the findings in the communication attached to the summons, it would not be correct to assume that in the case shown in Figures 3 and 4 of document Dl no parallax is existent. If no parallax would be existent, then no stereoscopic image could be obtained. It is clearly indicated, for example in paragraph [0023] of document Dl that the image shown in Figure 4 has a

parallax corresponding to a short distance, and that the background has a parallax corresponding to a long distance. Contrary to the finding in the communication attached to the summons, it would moreover not be correct to assume that distant background without any discernable parallax results in a low processing demand. Regardless of whether the parallax is large or small (such that it would not be discernible), the processing demand would be the same, since for a stereoscopic image two separate images have to be processed. The present invention is based on the recognition that even if a planar image is mixed in a stereoscopic image, a pseudo stereoscopic image is obtained which to an observer looks like a stereoscopic image. The particular advantage achievable by the present invention is that the processing demand for a planar image is considerably less than that for a stereoscopic image. The prior art on file thus neither discloses nor suggests the above-indicated recognition on which the present invention is based, such that the subject-matter according to the present invention should be considered to involve an inventive step in view of the prior art.

VIII. During the oral proceedings, the appellant underlined that, according to the teaching of document D1, there are always two images taken. Assuming that these are replaced by a planar image is an argument based on hindsight. Moreover, a stereoscopic picture of, say Mount Fuji, does not mean that it is far away, just that it is background. Even in the example shown in document D1 (a mountain and a cloud), the viewer can see that the cloud is nearer than the mountain.

The representative showed a picture with a relatively smaller planar image in a stereoscopic image, such that planar photographed persons were both behind and in front of parts of a stereoscopic clawed hand. Although the persons were photographed in a planar way, they can appear stereoscopic in the whole picture owing to the effect of the larger stereoscopic image. The advantage is thus that the same stereoscopic image can be used when photographing different persons, each time only the different photograph concerned needs its own extra processing, whereas the stereoscopic part remains unchanged. Therefore, for instance, visitors to a public building can have a souvenir, a seemingly stereoscopic photograph, of their visit produced just from their planar photograph and the first stereoscopic image stored in advance.

It was not argued that features of claim 1 of the auxiliary request pertaining to more detail of how the image was formed are not present in document D5, a Japanese application of the appellant with similar Figures.

IX. The board members remarked that, in fact, what the appellant explained was indeed, in some ways, just the opposite of the teaching of document D1, because in that case, the person photographed is a stereoscopic image whereas the background can be planar. Thus the teaching of document D1 never avoids stereoscopic processing of the person to be shown in the picture. However, the wording of the claim did not bring this difference out. The board appreciated that the representative had tried to bring the difference out using the term "in advance" in the claim, but as the

board had indicated in the communication attached to the summons, there is no disclosure in the applications of how the image selections should be made, nor, consequently, is this claimed. The submissions, interesting though they were, were not therefore to the point.

X. Independent claims 1 of the main and auxiliary requests of the appellant are worded as follows:-

Main Request

"1. A method of forming a pseudo stereoscopic image comprising the steps of:
a.1) obtaining two-dimensional digital image data of a plurality of images having different parallaxes through stereoscopic photographing;
a.2) compressing said two-dimensional digital image data to a horizontal direction of lenticular lenses so as to obtain line-shaped images;
a.3) forming in advance a stereoscopic first image (101) by disposing said line-shaped images on a recording medium;
b) forming a planar second image (103);
c) mixing the planar second image (103) in the stereoscopic first image (101), thus forming a pseudo stereoscopic composite image (101, 103); and
d) forming the pseudo stereoscopic composite image (101, 103) as a composite image on a recording medium disposed beneath said lenticular lenses."

Auxiliary Request

"A method of forming a pseudo stereoscopic image comprising the steps of:
a) forming and storing a stereoscopic first image (101) in advance, wherein first image data is formed in such a manner that two-dimensional digital image data for n pieces of images having different parallaxes is compressed to a horizontal direction of the lenticular lenses to obtain n line-shaped images each having a width of AD/n and the n line-shaped images are formed at every unit width of the lenticular lenses wherein AD represents a width of the image, and the line- shaped images are disposed on a recording medium based on a projection angle fort the lenticular lenses;
a.l) obtaining two-dimensional digital image data of a plurality of images having different parallaxes through stereoscopic photographing;
a.2) compressing said two-dimensional digital image data to a horizontal direction of lenticular lenses so as to obtain line-shaped images;
a.3) forming a stereoscopic first image (101) by disposing said line-shaped images on a recording medium;
b) forming a planar second image (103);
c) mixing the planar second image (103) in the stereoscopic first image (101), thus forming a pseudo stereoscopic composite image (101, 103); and
d) forming the pseudo stereoscopic composite image (101, 103) as a composite image on a recording medium disposed beneath said lenticular lenses."

XI. At the end of the oral proceedings, the board gave its decision.

Reasons for the Decision

1. The appeal is admissible.

2. Prior art

2.1 As can be seen from the English language Abstract and Figures, document D1 concerns a stereoscopic image output device for providing a stereoscopic photographic using a desired background easily in a short time. An object 3 is photographed by video cameras 1 and 2 for left and right eyes, and a foreground image signal is formed from respective signals corresponding to the left eye and the right eye by a foreground image signal processor 7. At a key signal generating circuit 9, a key signal is extracted from the foreground image signal, and this key signal is supplied to a changeover switch 13 for image signal composition. Based on the key signal, the changeover switch 13 for image signal composition makes a stereoscopic image signal from the foreground image signal from the foreground image processor 7 and a background image signal from a background image supplying device 16. The figures show a mountain and a cloud as background. The obtained stereoscopic image signal is supplied to a video printer 15 and can be obtained as the three-dimensionally visual stereoscopic photograph or the like.

The board observes that the machine translation of document D1 has been accepted as accurate by the appellant and the board itself has no reason to challenge its accuracy. Nevertheless, the board is

reluctant to rely on the translation, which has apparent grammatical errors, other than in a corroborative way, to that which is already compatible with the disclosure of the Abstract and drawings. For example, on the question of the background image, one can perhaps refer to paragraph 0009, stating that the background image signal may be compounded to the picture signal with two independent channels corresponding to the solid image used as the object for left eyes and a parallax for right eyes or one channel. In a similar vein, and as pointed out by the examining division, paragraph 0025 recites that although the signal corresponding to a solid image was used as background signal, it is not limited to this, the two same photographs are put in order, and the object for left eyes and the effectiveness same also as a background for right eyes are acquired.

2.2 As can be seen from its English language Abstract, document D5 relates to obtaining a clear and high quality stereoscopic picture by means of a general and inexpensive equipment by excluding an optical adverse effect from a three-dimensional (3D) stereoscopic picture through a lenticular lens and forming a linear image. Plural images having different parallax are prepared for plotting a stereoscopic picture and these images are treated as digital data by a computer. Work for digitally reducing n 2D images plotted correspondingly to the width W of a lenticular lens to 1/n in the direction parallel to the lens and successively arranging and outputting n piece of compressed images correspondingly to the width of the lenticular lens is repeated in each lens. In order to recognize a picture as a stereoscopic picture,

calculation for shifting a position only by tan theta found out from the projection angle theta of each lenticular lens is executed so that different 2D images having different parallax are respectively converged upon right and left eyes to arrange a linear image.

2.3 Both document D1 and document D5 concern stereoscopic imaging, the latter being the only document named as relevant prior art in the application under appeal. While document D5 discloses the features claimed in a1 to a3 of claim 1 of the main request, in the procedure before the first instance and in the proceedings before the board, document D1 has nevertheless been taken as closest prior art, the logical reason for this being the provision of a first (i.e. the foreground) and second (i.e. the background) image in the teaching of this document.

3. Patentability

3.1 Claim 1 of the main request refers to forming a pseudo stereoscopic image. In practice, this means no more than that a planar image is mixed in a stereoscopic image, the latter image being formed in advance.

3.2 It is of course true that not only a foreground image but also a not too distant background image can be stereoscopic. However, in the case of a far distant object, such as a mountain or a cloud, the distance between the photographing cameras relative to the distance to the mountain or cloud is so small that no discernible parallax exists in the background, i.e. a planar image is formed. Even should a skilled person attempt to make stereoscopic images of such far distant

objects, the examining division is therefore correct in stating that it would immediately be noticed there is no discernible parallax at all. The board considers the last paragraph of section 2.1 above to corroborate this view.

The board therefore reached the view that document D1 teaches mixing a stereoscopic image and a planar image to form a composition, i.e. the features of claim 1 of the main request down to and including feature (a1), except the explicit recital of "digital", feature (a3) except for the reference to "in advance", feature (b), feature (c) and feature (d) except for the reference to the lenticular lenses. Whether a foreground subject is photographed before or after the background is obviously a matter for a customer, either the customer tells the photographer to photograph a preferred background later or he takes a pleasing background which is already available. It is obvious to store either image according to the prevailing circumstances.

3.3 What is not disclosed in document D1 is the detailed forming of the stereoscopic image as claimed in features (a2) and using the lenticular lenses as claimed in feature (d) of independent claim 1 according to the main request. However, the compression step and forming of images using lenticular lenses is generally known, and in particular is known from document D5, where even the stereoscopic image shown is just the same as that used in the application.

3.4 There can be no inventive step considered to be involved just in forming a stereoscopic image as instructed by document D1 according to a method as

known from document D5. The subject matter of claim 1 of the main request does not therefore satisfy Article 56 EPC.

4. Turning to the arguments in support of the appeal, the problem for the appellant is that claim 1 of the main request is not limited to the subject matter upon which some arguments for patentability bear, especially in relation to just how the various parts of the composite image are selected and to saving processing.

4.1 For example, in the arguments the concepts of "smaller" and "larger" are introduced, but as pointed out in the communication attached to the summons, it is not specified where this is really justified by documents as filed. The drawing shows a skater 103 of a size less than the remainder of the picture, but the description gives no teaching about this. In particular, no such teaching is given in page 5, last but one paragraph to page 6, second paragraph of the description. There are references to "parts" of an image in the description generally, but no indication is given whether they are large or small. Moreover, the claim contains no reference to smaller or larger.

4.2 As can be seen from section 3 above, the board is not persuaded by the argument that far distant objects have discernible parallax. The consequence is that the image of far distant objects is obviously not stereoscopic, i.e. a planar image is formed. Moreover, since there is no parallax in the far distant objects, the processing load is self evidently less for these parts of the image, no hindsight is needed to realise this. Thus, were the problem addressed by the claimed invention to

be reducing processing of a stereo image, then the solution provided by the invention - have a planar part - is also provided by the far distant objects in document D1.

4.3 Paragraph 0023 of document D1 contains the remark that "a solid image as shown in drawing 4… has… a background has the parallax of a long distance". Drawing 4 includes a mountain and cloud. Generally, backgrounds do not have to be far distant and can thus be stereoscopic. However, it is so obviously part of the knowledge of a skilled person that far distant objects have no discernible parallax, that only this can be meant by parallax of a long distance, the board does not accept that any hindsight is necessary to realise this. Thus even taking picking out paragraph 0023 of document D1 rather than taking a more balanced overall view does not persuade the board on inventive step.

4.4 It is, of course, true that an observer can often judge whether two far distant objects (say a mountain or cloud) are relatively nearer or further away. This judgement is based, for example, on experience of relative size or upon one object obscuring the view of the other. It is not based on parallax. Therefore, the board is not persuaded by this approach that a far distant object has discernible parallax.

4.5 On the question of reducing processing, the appellant does have a point, that when only a planar subject has to be processed, the stereoscopic background staying the same for a number of changing planar subjects, there is a processing advantage. However, such subject

matter is not to be found in the claim. Therefore, the argument cannot persuade the board as to inventive step.

5. The subject matter of the independent claim according to the auxiliary request differs from that of the main request by inclusion of further features relating to forming and storing the stereoscopic image. In view of the disclosure of document D5 from which these features can be derived as was not disputed by the appellant, these further features cannot, correspondingly to the reasoning in section 3.3 above, be considered to contribute to an inventive step.

6. The board therefore concluded that neither the main nor the auxiliary request could be considered directed to subject matter involving an inventive step. Thus in neither case were the requirements of Article 56 EPC satisfied.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar The Chairman

M. Kiehl A. G. Klein