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D E C I S I O N
of 8 February 1994

Case Number: T 0884/91 - 3.4.2
Application Number: 81902997.6
Publication Number: 0064067
IPC: G02B 5/32, G03H 1/04
Language of the proceedings: EN

Title of invention:
Diffraction color and texture effects for the graphic arts

Patentee:
McGrew, Stephen Paul

Opponent:
01) GAO Gesellschaft für Automation und Organisation mbH
02) American Bank Note Holographics, Inc.
03) Holtronic Gesellschaft für Holographie und Elektro-Optik
mbH

Headword:
-

Relevant legal norms:
EPC Art. 54, 111, 123(2)(3)

Keyword:
Main request:
"Amendments - added subject-matter (no)"
"Novelty (yes)"
"Remittal to the first instance (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 0884/91 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 8 February 1994

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office dated 23 July 1991, written
decision posted on 13 September 1991 revoking
European patent No. 0 064 067 pursuant to
Article 102(1) EPC.

Composition of the Board:

Chairman: E. Turrini
Members: C. Black
B.J. Schachenmann

Summary of Facts and Submissions

I. The Appellant (Proprietor of the patent) lodged an appeal against the decision of the Opposition Division to revoke the European patent No. 0 064 067 (application No. 81 902 997.6).

The Opposition Division had *inter alia* considered the following documents:

(D15) Optical Engineering, September/October 1980, Vol. 19, No. 5, F.T.S. Yu et al., "One-step rainbow holography: recent development and application", pages 666 to 678, and

(D24) Optics Communications, Vol. 27, No. 3, December 1978, F.T.S. Yu et al., Archival storage of color films by rainbow holographic technique, pages 307 to 310.

The following further documents were considered by the Board:

(D20) Applied Optics, 15 January 1979, Vol. 18, No. 2, F.T.S. Yu et al., "Multiwavelength rainbow holographic interferometry", pages 212 to 218, and

(D29) Scientific American, October 1976, Vol. 235, No. 4, E.N. Leith, "White-light holograms", pages 80 to 95.

II. The Respondent II (Opponent II) did not file any submissions or requests during appeal proceedings.

With letter of 2 December 1993 the European Patent Office was informed that bankruptcy proceedings were instituted against the Respondent III (Opponent III). With letter of 20 December 1993 the receiver in bankruptcy withdrew the opposition.

III. Oral proceedings were held on 8 February 1994. The Respondents II and III, summoned to oral proceedings with the communication of 1 December 1993, did not appear.

The Appellant requested that the decision under appeal be set aside and the patent be maintained on basis of the following documents:

main request:

- single claim received during oral proceedings,
- description and drawings of the patent specification,

auxiliary request:

- single claim, description and drawings received during oral proceedings.

The Respondent I requested that the appeal be dismissed.

IV. The **single claim** according to the **Appellant's main request** reads as follows:

"A method for generating a diffractive graphical composition by recording interference patterns on at least one region of a photosensitive medium, forming said patterns as off-axis holograms by the interference between a reference wavefront and an object wavefront such that the object wavefront for said at least one

region has a relatively wide range of directions of incidence at each point on said region in a first axis and a relatively narrow range of directions of incidence at each said point in said region in an axis orthogonal to the first axis, that said object wavefront for said region is derived from a random diffuser which is not a hologram, without a lens being interposed between said diffuser (200) and said photosensitive medium (210)."
(The conjunction "and" at the end of the claim has been deleted by the Board.)

V. The Appellant *inter alia* argued as follows:

The single claim according to the main request meets the requirement of Article 123(2) EPC because the application as filed discloses the possibility of deriving the object wavefront from a random diffuser which is not a hologram as well as the disclaimer concerning the lens between the diffuser and the photosensitive medium. The protection conferred by the claim has not been extended (Article 123(3) EPC).

Moreover, the claimed method is novel (Article 54 EPC) with regard to the cited prior art, in particular with regard to the rainbow holographic method of Benton (see D29), requiring the production of a master hologram, and the one-step rainbow holographic method (see D20 and D15), requiring an imaging lens in place of the master hologram.

VI. The Respondent I *inter alia* argued as follows:

The single claim according to the main request contravenes Article 123(2) EPC because the skilled person, when reading the application as filed (see, in particular, Figures 1 and 2), understands that, if a diffuser is used in place of the master hologram, an

imaging lens must necessarily be used pursuant to the teaching of the known one-step rainbow holographic method (see D20 and D15). In this case, therefore, the presence of a lens between the diffuser and the photosensitive medium forms part of the implicit disclosure of the original application.

If the claim would be allowable under Article 123(2) EPC, it is admitted that its subject-matter would be novel with regard to the cited documents D29, D20 and D15.

Reasons for the Decision

1. The appeal is admissible.
2. *Appeal proceedings*
 - 2.1 The Respondent II (Opponent II) is party to the appeal proceedings pursuant to Article 107 EPC, even though he did not file any submissions or requests during appeal proceedings.
 - 2.2 The withdrawal of the opposition of the Respondent III (Opponent III) has, under established case law, no influence on the appeal procedure. Following T 0789/89 (unpublished), it results in the Respondent III's ceasing to be a party to the appeal proceedings as far as the substantive issues are concerned.

3. *Main request*

3.1 Allowability of the amendments (Article 123(2), (3) EPC)

3.1.1 The single claim refers to a method for generating a diffractive graphical composition. This corresponds to an object to be achieved by the invention as originally disclosed on page 4, lines 19 to 21.

The method comprises the steps, disclosed in the application as filed, of recording interference patterns on at least one region of a photosensitive medium and forming said patterns as off-axis holograms by the interference between a reference wavefront and an object wavefront (see Claim 1 as well as page 5, line 29 to page 6, line 23), such that the object wavefront for said at least one region has a relatively wide range of directions of incidence at each point on said region in a first axis and a relatively narrow range of directions of incidence at each said point in said region in an axis orthogonal to the first axis (this feature describes the effect obtained when a mask is used - see page 8, lines 13 to 18 and page 10, lines 35, 36 - or a long, narrow horizontal strip of opal glass is used - see page 11, lines 14 to 31):

The object wavefront may be derived from a random diffuser which is not a hologram (see page 3, lines 23 to 26; page 8, lines 25 to 33; page 11, lines 14 to 17).

Moreover, a lens is **not** interposed between the diffuser and the photosensitive medium. Although this feature is not explicitly disclosed in the application as filed, it can nevertheless be inferred from Figure 2, which forms part of the disclosure and does not show any lens, considered in conjunction with the statement on page 8, lines 13 to 18, according to which the graphical

composition is formed "directly" on the photosensitive medium.

- 3.1.2 The Respondent I argues that the disclaimer "without a lens being interposed between said diffuser (200) and said photosensitive medium (210)" is not disclosed in the application as filed.

In his submission, Figures 1 and 2 of the patent in suit refer either to the known Benton's rainbow holographic method (see D29, page 94) involving two recording steps and requiring no lenses, in which case the plate 200 in Figure 2 represents the master hologram according to page 6, lines 10 to 13 and page 8, lines 13 to 16, or to the likewise known one-step holographic process (see D20 or D15), in which case the plate 200 in Figure 2 represents a random diffuser according to page 3, lines 23 to 26, page 8, lines 25 to 29 and page 11, lines 14 to 17.

Since the embodiment using the random diffuser in place of the hologram corresponds to the one-step rainbow holographic method known from D20 or D15, in which a master hologram is no more necessary but an imaging lens is used instead, the application as filed implicitly discloses a lens in the context of said embodiment.

The Appellant contests this point of view and stated during the oral proceedings that, unlike the known one-step method, good results could be achieved by the claimed and described method avoiding the use of a lens system, although substituting the diffuser for the master hologram.

The Board has no reason to doubt this statement which is in line with the example originally disclosed on page 11, lines 14 to 31. Moreover, by eliminating the

need for a lens system to convey an image to the holographic plate and shape the object wavefront, an object of the invention is achieved, namely to provide a method for generating a diffractive graphical composition without the need for the complex and expensive equipment normally associated with holography (see the original application, page 4, lines 24 to 28, as well as the letter of 12 January 1994, page 5, third paragraph).

3.1.3 Accordingly, Claim 1 has been amended in such a way that it does not contain subject-matter which extends beyond the content of the application as filed. The requirement of Article 123(2) is thus met.

3.1.4 As compared with Claim 1 as granted, Claim 1 according to the main request excludes the possibility, embraced by the granted claim, that the random diffuser is a hologram containing an indiscernible image. It is likewise limited by excluding the presence of a lens interposed between the diffuser and the photosensitive medium.

Accordingly, the protection conferred by the granted patent has not been extended and, thus, the requirement of Article 123(3) EPC is met.

3.2 Novelty (Article 54 EPC)

3.2.1 From D29 (see page 94) a rainbow holographic method is known, developed by S. Benton, which method involves two recording steps. A master hologram is first made from a real object with the conventional off-axis holographic technique. The real image of this hologram is then projected through a slit and used as the object wave in the construction of a second hologram. The result is a

transmission rainbow hologram that can be viewed with a white light source.

The one-step method according to Claim 1 thus differs from the Benton's method of D29 in that a random diffuser, which is not a hologram, is used in place of the master hologram.

- 3.2.2 An alternative method to obtain a rainbow hologram by a one-step process is known from D20 (see page 213). The optical system of this known one-step holographic process is characterised in that an imaging lens and a narrow slit are inserted between the recording plate and the object, the imaging lens being used in place of the master hologram.

The method according to Claim 1 thus differs from the one-step method of D20 in that no lens is interposed between the diffuser, from which the object wavefront is derived, and the photosensitive medium.

- 3.2.3 One-step rainbow holography is also known from D15 (see section II). An application of this technique is the archival storage of colour films (see section IV). According to the arrangement of Figure 9, a colour film strip containing the colour images to be recorded is back illuminated by a fine diffuser. The so illuminated film is then imaged by a lens through a narrow slit onto a plane close to the holographic film.

Therefore, the method according to Claim 1 differs from the one-step method of Figure 9 of D15 in that the object wavefront is derived from the diffuser and no lens is interposed between the diffuser the photosensitive medium.

3.2.4 The other prior art documents on file do not come closer to the claimed method than those cited above. In particular, D24 upon which the Opposition Division based its decision on lack of novelty, is by the same authors as D15 but contains less information which is relevant to the present decision. The Respondent moreover relied on D15 rather than D24 in the response to the grounds for the appeal.

Accordingly, the subject-matter of Claim 1 submitted as the Appellant's main request is novel within the meaning of Article 54 EPC.

3.3 Article 111 EPC

Considering that Claim 1 has been substantially amended on appeal and that the Opposition Division did not deal with the issue of inventive step, the Board, in order to maintain the parties' right to have examined their case by two instances, decides to remit the case to the Opposition Division, pursuant to Article 111(1) EPC, for further prosecution.

4. *Auxiliary request*

In view of the foregoing, it is not necessary to examine the auxiliary request.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of the documents according to the main request.

The Registrar:

The Chairman:

P. Martorana

E. Turrini