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File Number: T 402/89 - 3.3.1
Application No.: 84 103 450.7
Publication No.: 0 123 913
Title of invention: Heat developable color photographic materials

Classification: G03C 1/02

D E C I S I O N
of 12 August 1991

Proprietor of the patent: FUJI PHOTO FILM CO., LTD.
Opponent: Agfa-Gevaert AG, Leverkusen

Headword:

EPC Article 64, 56, 69, 84 and 123(3) EPC; Rule 29(1) EPC

Keyword: "Inventive step (yes)"
"change of category - product to process"

Headnote



Case Number : T 402/89 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 12 August 1991

Appellant : FUJI PHOTO FILM CO., LTD.
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Decision under appeal : Decision of Opposition Division of the European
Patent Office of 14 March 1989 posted on
21 April 1989 revoking European patent
No. 0 123 913 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : K. Jahn
Members : F. Bauriedel
J. Stephens-Ofner

Summary of Facts and Submissions

I. European patent No. 0 123 913 was granted on 30 July 1986 on the basis of thirty-seven claims in response to European patent application No. 84 103 450.7 filed on 28 March 1984. Claim 1 reads as follows:

"A heat-developable color photographic material, comprising:

a support having thereon;

a light-sensitive silver halide;

a binder; and

a dye-providing substance capable of providing a mobile dye, when the silver haliodide is reduced to silver upon heating, in chemical relation to the reaction, characterised in that the silver halide is a mixed crystal silver haloiodide having a silver iodide content of 4 to 40 mole%".

II. Notice of opposition was duly filed requesting the revocation of the patent on the grounds that its subject-matter lacked novelty and did not involve any inventive step. In the course of the opposition proceedings the following documents were cited:

(1) DE-A-3 232 674

(2) US-A-4 021 240

(3) US-A-3 418 117

(4) DE-A-3 339 810

(5) T.H. James, The Theory of the photographic Process, 4th Edition (1977), page 4

(6) Research disclosure, June 1975, No. 13 452

(7) US-A-3 320 069

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III. By a decision of 14 March 1989 with written reasons posted on 21 April 1989 the Opposition Division revoked European patent No. 123 913. The decision was based on Claim 1, filed on 14 March 1989 as amended. This claim reads as follows:

"A process for the preparation of a heat-developable color photographic material comprising coating on a support

a light-sensitive mixed crystal silver haloiodide having a silver iodide content of 4 to 40 mole%;

a hydrophilic binder; and

a dye-providing substance capable of providing a mobile dye, when the silver haloiodide is reduced to silver upon heating, in chemical relation to the reaction,

characterised in that

the silver haloiodide has been prepared by a double jet mixing."

In the reasons given for the decision, the Opposition Division held that the above claim met the requirements of Article 123(3) EPC, but that its subject-matter did not involve an inventive step having regard to document (1), which disclosed a process for the preparation of a heat developable photographic material closely similar to the one claimed.

The only difference between the two processes was that in the claimed process silver haloiodide had to be prepared by double-jet mixing. They also held that document (5) did not contain a clear reference to such a mixing method, but that this was common practice in emulsion making.

Accordingly, the Opposition Division found that it would have been obvious to replace the single-jet method of document (1) by the known double-jet method, to achieve the claimed improvement in the characteristics of the photographic material, since it is mentioned in document (6) that this method of emulsion making may influence the curve-slopes, e.g. contrast, toe-shape, etc. of the emulsion. They also held that the same conclusion would have had to be drawn if document (2) was taken to represent the closest prior art, since this document disclosed the same features as document (1) except for the explicit reference to a hydrophilic binder without, however, the specific exclusion of such binders. They also held that the comparative tests filed on 31 January 1989 were not relevant.

IV. Notice of Appeal was lodged against this decision on 20 June 1989, with payment of the prescribed fee. A Statement of Grounds of Appeal filed on 28 August 1989. In the course of the oral proceedings held on 12 August 1991, Appellant filed a series of new claims and argued essentially as follows:

(a) The experiments filed on 31 January 1989 showed that double-jet mixing provided an emulsion having the photographic characteristics of having a large difference between D-max and D-min, as well as a low D-min when the photographic material was heat-developed, compared with the same properties of an emulsion prepared by a single-jet method. This effect was not suggested by document (6) because the statements on page 47, right-hand column, lines 1-22 referred to different emulsion properties.

(b) Furthermore, the experiments filed on 31 January 1989 were based on a valid comparison. Since the emulsions

of the invention contain one mole of silver halide/kilogram, whereas the emulsions of Example 3 of document (1) contain 0.5 mole silver halide/kilogram it was necessary to use twice as much emulsion in the preparation of the prior art material in order to yield a valid comparison.

(c) Even if the teaching of document (2) were combined with that of document (7), this would not result in the claimed subject-matter. Thus, the photographic material of the patent in suit requires the use of a hydrophilic binder not a hydrophobic binder, e.g. polyvinylbutyral, employed in the heat developable materials described in document (2).

The Respondent has not filed an answer to the Statement of Grounds of Appeal, nor has he participated in the oral proceedings before the Board of Appeal.

VI. The Appellant (Patentee) requested (main request), that the decision under appeal be set aside, and that the patent be maintained on the basis of Claims 1 to 35 submitted in the course of oral proceedings, or on the basis (auxiliary request) of Claim 1 likewise submitted in the course of oral proceedings. The Respondent's (Opponent's) original written request that the appeal be dismissed remained standing in the appeal proceedings. The only independent claims of the Appellant's main request read as follows:

"1. A heat-developable color photographic material comprising a support having thereon:

a light-sensitive mixed crystal silver haloiodide having a silver iodide content of 4 to 40 mole%;

a hydrophilic binder;

an organic silver salt oxidizing agent; and

a dye-providing substance capable of providing a mobile dye, when the silver haloidide is reduced to silver upon heating, in chemical relation to the reaction,

characterised in that the silver haloiodide is a monodispersed silver halide having regular crystal form and almost uniform grain size and has been prepared by a controlled double jet mixing by maintaining a constant pAg in a liquid phase in which silver halide grains are formed."

"30. A method of forming a color image, comprising the steps of:

imagewise exposing a heat developable color photographic material according to any of Claims 1 to 29,

developing the imagewise exposed material by heating the material at a temperature of from 80°C to 250°C to release a hydrophilic diffusible dye; and

transferring the hydrophilic diffusible dye into an image receiving material."

At the conclusion of the oral proceedings the Board's decision to allow the appeal on the basis of the main request was announced.

Reasons for the Decision

- 1. The appeal is admissible.
- 2. In the course of the opposition proceedings the Patentee sought to amend Claim 1, by changing it from a product to a process claim for the preparation of the product. In dealing with the allowability under Article 123(3) EPC of this proposed amendment, the Opposition Division held (paragraph 2.2 of the Reasons for the decision) that: "since a product claim protects any process for the preparation of this product, this change of category to a particular process does not extend the protection conferred. Consequently, the new set of claims meets the requirements of Article 123(3) EPC".

At the outset of the oral proceedings in the appeal, and after some considerable discussion of the legal issues involved, the Patentee changed his main request for the above-mentioned process claim to one for a product claim, whilst maintaining his auxiliary request for a process claim for the preparation of the said product. The Opposition Division's above-quoted finding of law is therefore no longer relevant or necessary for deciding the issues in this appeal.

Nonetheless, the Board wishes to point out, as it did to the Patentee before he changed his main request, that a decision on the issue of the allowability of the proposed amendment that the Opposition Division had to deal with, would have been so difficult to reach, having regard to the absence of clear and consistent jurisprudence on the matter, that the Board would in all likelihood have referred the matter to the Enlarged Board. The Board's difficulties stem from the interpretation of the term "protection conferred" in Article 123(3) EPC compared with

the meaning of the term "rights conferred" under Article 64 EPC.

Firstly, the Board accepts that Article 123(3) EPC applies to all amendments, including amendments involving a change of category (cf. G 2/88, paragraph 3.2 of the Reasons). Secondly, the Board accepts that in applying Article 123(3) EPC, it is necessary to decide whether or not the totality of the claims before amendment in comparison with the totality of the claims after amendment extends the "protection conferred". Thirdly, it is clear to the Board that a distinction needs to be drawn between the "protection conferred", meaning a definition in terms of technical features of the scope of legal protection conferred in the light of Articles 69 and 84 as well as Rule 29(1) EPC on the one hand, and the rights conferred upon the patent proprietor under Article 64(1) EPC. As was pointed out in the above-cited decision, paragraph 3.3 of the Reasons, the term "protection conferred" is more a definition of what is being protected, whilst the term "rights conferred" relates more to the manner of protecting what has been conferred, and therefore comprehends what acts of third parties constitute infringement as well as the remedies which are available in respect of any infringement that has been established (e.g. damages, injunctions etc).

Having regard to the above-mentioned general considerations, it follows that in deciding upon the allowability of the change of category amendment that was (but no longer is) at issue in this case, it would have been necessary to compare the extents of protection respectively conferred by the original product and the notionally amended process claims. In this context it is generally accepted as a principle underlying the EPC that a valid claim to a product per se confers protection to

that product regardless of the process by which it is produced. In other words, a product claim per se confers protection to all processes for making that product and it therefore appears to follow that an amendment of such a product claim to one for a particular (described) process for making that product cannot extend "the protection conferred" and must therefore always be allowable under Article 123(3) EPC.

Nonetheless, the Board finds it difficult to avoid the conclusion that a change of category of the above kind, (but not of the kind that was dealt with in the above-cited decision of the Enlarged Board), does involve a change in the very essence of what is sought to be protected, by elevating a formerly ancillary feature (the described process) into the invention the subject-matter of the European patent which was originally directed at the product itself. Furthermore, the Board finds it difficult in this case (as the Enlarged Board did not in the above-cited case where a different type of amendment was at issue) to separate the twin linked concepts of "protection conferred" on the one hand and "rights conferred" on the other insofar as the latter involves, as was explained previously, the determination of what acts of third parties constitute infringement. This leads to the further difficulty that the rights conferred by a European patent are, by virtue of Article 64(1) EPC, identical to those conferred by the national laws of the Contracting States. Taking the case of the type of amendment here under consideration, in some Contracting States a process claim (for the preparation of the product the subject of the original claim) would only be infringed if all the individual technical stages of the claimed process were carried out. In other Contracting States, however, the carrying out of some, or even only one of the plurality of claimed stages may already constitute an

infringement of such a process claim. On this legal basis, an amendment from a product claim that extended protection to all the processes for making the claimed product, to a claim for making that product by the (described) process would clearly extend the protection conferred by the European patent and therefore contravene Article 123(3) EPC, because the unamended product claim would not be infringed by carrying out anything other than all the stages of any process yielding that product, whilst the amended process claim could, on this basis, be held to be infringed, by carrying out some or even one of its stages.

It is perhaps worth mentioning that the self-same conclusion, albeit for different reasons, was drawn by the author of a paper given in September 1988 to a meeting of European Patent Judges, and subsequently published in the June 1989 edition of GRUR International on page 460 (point 5.5).

In these circumstances the making of a meaningful, let alone a definitive comparison of the respective scopes of "protection conferred" by the two sets of claims is clearly impossible. No such difficulty was of course encountered by the Enlarged Board in the above-cited case, which concerned a change of category from a compound or composition claim to one directed to the use of such a compound or composition.

3. Main Request

Leaving aside the above legal considerations, there are no objections to the present claims under Article 123 EPC since their features result from Claims 1 and 9 in combination with page 6, lines 9 to 21 and page 61, lines 16 to 20 of the description as originally filed (corresponding to page 3, lines 21 to 26 and page 24,

lines 1 to 3 of the printed patent specification. Claim 30 is based on Claim 32 as originally filed and granted. The dependent claims all have their counterparts in the dependent claims originally filed and granted.

Turning to the sole remaining issue of the allowability of the claims the subject of the main request, it is clear that the patent in suit is essentially concerned with a heat-developable colour photographic material containing a dye providing a substance capable of providing a mobile dye upon heating, a hydrophilic binder and a mixed crystal haloiodide having a silver iodide content of 4 to 40 mole%. Such materials are known per se from document (1), which the Board accepts as the closest prior art. Example 12 of document (1), including all the references made therein to other examples, describes a heat developable colour photographic material which is characterised by:

- a dye-providing substance capable of providing a mobile dye upon heating (compounds VII-2, VII-4 and VII-12, in connection with page 13, line 20 to page 14, line 25);
- an organic silver salt oxidising agent (page 1, paragraph 1);
- a hydrophilic binder (assay 911, containing gelatin as described in Example 3);
- a light-sensitive mixed crystal silver haloiodide having a silver iodide content of 20 mole% (Assay 911 containing the emulsion of Example 3).

Referring to the last-mentioned feature it is not exclusively stated in document (1) that the emulsion is of the mixed-crystal type, but it is common general knowledge

that conventional silver halide emulsions with at least two halides are of the mixed-crystal type, unless particular measures are taken during emulsion making.

The only difference between this prior art and the claimed material is that the silver haloiodide of the claimed material has been prepared by a special double-jet mixing process not mentioned in document (1), whereas the silver haloiodide in Assay 911 of document (1) is prepared by single-jet method as described in Example 3.

4. The Appellant has provided evidence, in the form of comparative test-results filed on 31 January 1989, that a change from an emulsion prepared by a single-jet method as described in Example 3 of document (1), to a mono-disperse emulsion prepared by a double-jet mixing method (as claimed), yielded a larger difference between maximal and minimal density in the characteristic gradation curve. For example, this difference was 1.06 for the claimed material (C) which contained an emulsion prepared by double-jet mixing method, but was only 0.96 for the relevant prior art material containing an emulsion prepared by a single-jet mixing method. In connection with the lower values of D-min (0.22 for material (C) and 0.30 for material (b)), this resulted in a visible and desirable improvement in the colour density of the heat-developed colour papers, as shown in the filed samples. Materials (a) and (b) each contained 20 gms of silver halide emulsion prepared by single-jet mixing according to Example 3 of document (1) whilst materials (A) to (F) prepared by double-jet mixing each contained 10 gms of silver halide emulsion. This difference was necessary because the amount of silver halide contained in the prior art emulsion of Example 3 of document (1) was half mole per kilogram in contrast with one mole per kilogram in emulsion (A) to (F) according to page 30, line 36 of the patent in suit. The use of twice the amount of emulsion in

the prior art materials to be compared has been necessary in order to make the amount of silver halide in all materials equal for a valid comparison. In the Board's judgment these unchallenged statements are credible and are therefore accepted.

These results were confirmed by further experimental test-results submitted by the Patentee on 28 August 1989. The results of all these comparative tests have not been challenged by the Respondent in the appeal proceedings.

The comparative tests submitted by the Appellant on 31 January 1989 and on 28 August 1989 therefore represent a valid comparison with the closest prior art, and can be considered in the assessment of the technical problem underlying the patent in suit.

- 4.1 On the basis of this evidence, the Board sees the technical problem vis-à-vis document (1) in improving the colour density (i.e. achieving a larger difference between D-max and D-min), and at the same time also in achieving a low fog density (low D-min). This problem is solved by an employment of mono-dispersed silver halide having regular crystal form and almost uniform grain size, which has been prepared by a controlled double-jet mixing by maintaining a constant pAg in a liquid phase in which silver halide grains are formed. It is true that the preparation of such silver halide emulsions by controlled double-jet mixing is a common method in emulsion making, as was stated in the decision under appeal. In this way the contrast and toe shape of silverhalide emulsions are influenced. However, it has never been argued, nor is it known to the Board (Article 114(1) EPC) that this method was used with a view to improving the colour density, or to diminishing the colour fog characteristics of a heat developable colour-photographic material. Moreover, these improvements

achieved by employing a double-jet prepared silver haloidide emulsion, instead of using the emulsions of the prior art materials according to document (1), are not suggested by document (6) either. Thus, page 47, right-hand column, lines 1 to 22 of this document merely refers to contrast and toe shape of the gradation curve, which can be influenced by the employment of mono-dispersed silver halide. Since contrast and toe shape of the gradation curve are parameters that are not directly related to colour density, (difference between D-max and D-min), and colour fog (D-min), these statements in document (6) cannot suggest the use of silver haloidide emulsions prepared by double-jet mixing to solve the existing problem.

In document (2), column 3, lines 54 to 61, which relates to a heat developable colour photographic material, it is stated that the contained silver haloidide emulsions can be prepared by any of the well-known procedures in the photographic art, reference being made inter alia to document (7), which itself is concerned with sulphur group sensitised emulsions, and which may be prepared by a double-jet mixing method (cf. column 1, lines 62 to 68).

However, no connection can be seen between the advantages mentioned in document (7), column 3, lines 67 to 73 (diminished pressure desensitisation; high-forced development speed, speed to graininess advantage over other emulsions), and the particular achievements made in the course of solving the existing technical problem underlying the patent in suit. Consequently these statements do not provide any incentive to the skilled man to solve the above-mentioned technical problem.

Even if the above-mentioned technical problem were to be disregarded, an approach which was followed by the

Opposition Division, a combination of the teachings of documents (2) and (7) would still not result in the claimed photographic materials, which must contain a hydrophilic binder in their photographic coatings. In the judgment of the Board the only materials that are disclosed in document (2) are those whose photographic layers have been coated on a support from a non-polar organic solvent solution, and therefore need to contain a hydrophobic binder (see also column 9, lines 14 to 15 and the examples). According to these disclosures, polyvinyl alcohol as mentioned in column 9, lines 37 to 38, is not a hydrophilic polyvinyl alcohol, as usually used in the manufacturing of photographic materials, but is one with hydrophobic properties. Those types of polyvinyl alcohols are generally known, and are obtainable by a low-rate saponification of polyvinyl acetate. Therefore, a combination of the teachings of documents (2) and (7) would lead to a photographic material with light-sensitive layers essentially containing hydrophobic binders, rather than to the claimed photographic materials characterised by hydrophilic binders. In addition, documents (3), (4) and (5) give no hint as to the employment of mono-dispersed silver haloidide emulsions prepared by double-jet mixing.

It would therefore not have been obvious to use a mono-dispersed silver haloidide emulsion prepared by double-jet mixing method in heat-developable colour photographic materials according to document (1) to increase the colour density of these materials. Consequently, the choice of the photographic materials of Claim 1 involves an inventive step. The same conclusion applies to subject-matter of independent Claim 30, which relates to a method of forming a colour image based on the same inventive concept.

The subject-matter of the dependent claims are supported by the inventive step of the corresponding independent claims.

5. Since the photographic material according to the main request satisfies the requirements of Article 56 EPC the patent is maintained. The auxiliary request of the Appellant need not therefore be considered.

Order

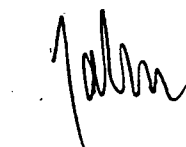
For these reasons, it is decided that:

1. The Opposition Division decision is set aside.
2. The case is remitted to the Opposition Division with the order to maintain the patent on the basis of Claims 1 to 35 submitted by way of main request in the course of oral proceedings.

The Registrar:


E. Gorgmajer

The Chairman:


K. Jahn