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Bezeichnung der Erfindung: Heat-developable color photographic materials  
Title of invention:  
Titre de l'invention :

Klassifikation / Classification / Classement : G03C 5/54

### ENTSCHEIDUNG / DECISION

vom / of / du 18 December 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /  
Titulaire du brevet :

Fuji Photo Film Co., Ltd

Einsprechender / Opponent / Opposant :

Agfa-Gevaert AG

Stichwort / Headword / Référence : Photographic material/FUJI

EPO / EPC / CBE Articles 54(1), 56, 123(2)

Schlagwort / Keyword / Mot clé :

"Novelty (yes, after amendment)" - "Inventive  
step (yes)"  
-"Identification of the closest state of the  
art"  
"Admissible amendment"

Leitsatz / Headnote / Sommaire



Case Number : T 267/88 - 3.3.1

**DECISION**  
of the Technical Board of Appeal  
of 18 December 1990

**Appellant :**  
(Proprietor of the patent) Fuji Photo Film Co., Ltd  
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**Representative :**  
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**Respondent :**  
(Opponent) Agfa-Gevaert AG, Leverkusen  
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**Representative :**

**Decision under appeal :** Decision of the Opposition Division of the European  
Patent Office dated 18 April 1988 revoking  
European patent No. 0 066 282 pursuant to  
Article 102(1) EPC.

**Composition of the Board :**

**Chairman :** K. Jahn  
**Members :** R. Spangenberg  
C. Holtz

## Summary of Facts and Submissions

- I. This appeal lies from the decision of the Opposition Division of the EPO dated 18 April 1988 revoking European patent No. 66 282, granted in response to European patent application No. 82 104 730.5 and comprising 24 claims.
- II. In the decision under appeal, which was based on the claims as granted, inter alia, the following documents were considered:

- (2) GB-A-2 058 383
- (3) US-A-3 457 075
- (4) EP-A-0 010 001
- (5) US-A-4 055 428
- (6) US-A-4 076 529
- (7) Research Disclosure 14433 (April 1976).

Document (2) was considered to represent the closest state of the art. The only difference in subject-matter between the patent in suit and this prior art was seen in the fact that the known photographic materials did not contain an organic silver salt oxidising agent. Having regard to the disclosure of document (3), relating to the in situ formation of the light sensitive silver halide in the presence of an organic silver salt oxidising agent, and document (7), relating to a photographic material comprising a light-sensitive silver halide (silver bromiodide) and silver behenate as an organic silver salt oxidising agent, the subject-matter of the patent in suit was held obvious, since it was routine work for a person skilled in the art to repeat the teaching of document (2) in the presence of an organic silver salt oxidising agent, e.g. as specified in document (7). The Opposition Division also held that Claim 9 was not in agreement with the requirements of Article 123(2) EPC.

- III. The appeal was filed on 20 June 1988 and the appropriate fee was paid at the same time. A Statement of Grounds of Appeal was received on 17 August 1988. In a communication dated 12 December 1990 the Board raised the question of novelty. Oral proceedings took place on 18 December 1990.
- IV. During the oral proceedings, the Appellant (the patent proprietor) submitted an amended set of 24 claims.

Independent Claim 1 reads as follows:

"A heat developable color photographic material, comprising a support made of a heat resistant high molecular weight compound having a glass transition temperature of 40 to 250°C capable of receiving a released dye and bearing a light-sensitive layer which comprises a light-sensitive silver halide; an organic silver salt oxidising agent; a dye releasing activator; a binder and a compound capable of reducing at least the organic silver salt oxidising agent in the presence of exposed silver halide when the photographic material is heated, characterized in that the compound capable of reducing the organic silver salt oxidizing agent is a dye releasing redox compound wherein the image forming dye moiety is stable to the dye releasing activator."

Independent Claim 2 differs from Claim 1 in that the heat-resistant high molecular weight compound is not itself the support but forms a layer on a support. The other claims are dependent on Claim 1 or 2. Claim 9 was amended to meet the objection under Article 123(2) EPC.

In the Appellant's opinion, the documents cited by the Opposition Division in support of their finding of lack of inventive step were not relevant. The object to be achieved with the photographic material according to the patent in suit was to form an image after exposure in the presence of a dye releasing redox compound in the absence of a silver halide developing agent. However, document (2) related to quite different technical subject-matter in that it disclosed the use of a silver halide developing agent in addition to a dye precursor in a silver dye bleach process.

The dye precursor used in these documents was a so-called "shifted dye". If it were to be regarded as a dye-forming redox compound its dye-forming portion would not be stable against the base releasing compound which is the dye forming activator of the patent in suit. Therefore, the stability requirement now expressly mentioned in the independent claims was not met by the dye precursors according to document (2). During the oral proceedings it was confirmed that it was not intended to claim photographic elements containing a dye-releasing redox compound in which the dye-forming portion would change its colour when contacted with the dye forming activator ("shifted dye"). Moreover, the reference to document (3) in document (2) did not unambiguously imply the presence of substantial amounts of a light stable silver salt oxidising agent, such as silver behenate, in the photographic element of document (2), since it followed from the language used therein that this silver salt would be substantially completely converted in situ in the light sensitive silver halide. Thus, the photographic element according to the patent in suit differed from that disclosed in document (2) and was, therefore, novel.

Regarding inventive step, a person skilled in the art would not find an incentive in this document to modify the photographic materials disclosed therein in the way taught by the patent in suit, in particular by omitting the blocking group of the "shifted dyes". Since also document (7) related to a photographic material for use in a silver dye bleach process there was no reason to combine the teachings of documents (2) and (7) when looking for a photographic material for the purpose envisaged in the patent in suit.

The reference in document (2) to a photothermographic dye transfer process was not relevant either since it described the dye precursors suitable for such a process only by very vague expressions. No photographic element useful for such a process was disclosed in that document. The dye transfer materials disclosed in documents (4) to (6) were not designed for heat-development but for conventional treatment with a developing solution. Thus, the combination of the disclosure of these documents with that of document (2) in order to demonstrate the obviousness of the subject-matter of the patent in suit was based on hindsight.

- V. The Respondent (the Opponent) submitted that the disclosure of document (2), which represented the closest prior art, was not limited to a silver dye bleach process but also comprised a photothermographic colour diffusion process, and that the optional presence of a silver halide developing agent was not excluded by the patent in suit but, quite on the contrary, expressly mentioned therein. The presence of a light stable silver salt oxidising agent, such as silver behenate, while being not expressly taught by document (2), was implicitly disclosed therein by the reference document (3). Thus, neither the absence of a developing agent nor the presence of a silver salt

oxidising agent would distinguish the photographic elements according to the patent in suit from the disclosure in document (2). Thus, the novelty of the claimed subject-matter could only be admitted if it was clear that the expression "dye forming moiety" in Claims 1 and 2 would have another meaning than the expression "image forming dye" used on page 11, line 56 of the patent specification, since it was clear that the "image forming dye" obtained according to e.g. Example 8 of document (2), must also be stable to the base used for deblocking the auxochromic group. If, however, the expression "dye forming moiety" were to relate to the whole group released from the dye releasing activator, the novelty might be acknowledged but then the amendment of Claims 1 and 2 as granted would not meet the requirement of Article 123(2), since it would not have a clear basis in the application documents as filed.

Regarding inventive step, the Respondent submitted that a person skilled in the art would have combined the disclosure of documents (2) and (4) to (6) since document (4) was cited in document (2). It was also immediately obvious that the photothermographic dye transfer process disclosed in document (2) would not necessarily require the presence of a blocking group in the dye precursor. In the Respondent's opinion, a person skilled in the art would have been able to recognise that the dye precursor compound 1 disclosed on page 5 of document (2) would be suitable for the photothermographic silver bleach process as well as for the photothermographic dye transfer process described in general terms in that document. Since for the latter process there was no need for a blocking group, this could have been omitted from the dye precursor compound 1 and thereby a photographic element according to the patent in suit would have been obtained. Such a photographic element was thus obvious and, therefore, unpatentable.

VI. The Appellant requested that the patent be maintained with Claims 1 to 24 submitted during the oral proceedings.

The Respondent requested that the appeal be dismissed.

At the end of the oral proceedings, the decision of the Board was announced.

#### Reasons for the Decision

1. Having regard to the facts indicated in paragraphs I and III above, the appeal is admissible (Articles 106 to 108 EPC, Rule 64).

2. Amendments:

The amendment of Claims 1 and 2 introduced during the oral proceedings is based on the description as filed, page 13, lines 13 to 19 and page 37, line 19 to page 38, line 5. In the Board's judgement it is immediately apparent from this disclosure, which is also present in the patent as granted (see page 4, line 60 to page 5, line 4 and page 11, lines 56 to 62), that the dye releasing redox compound of the patent in suit consists of a reducing group and a dye portion, and that, therefore, the characteristics required for the "image forming dye" are necessarily also applicable to the "image forming dye moiety" of the said dye releasing redox compound. This interpretation is supported by the fact that nowhere in the patent specification or in the application as filed is reference made to an "image forming dye moiety" which differs from the resulting "image forming dye" in any other respect than by a chemical bond to the reducing group. Therefore, the amendment satisfies the requirement of Article 123(2) EPC



and, since it does not extend the scope of protection of the patent as granted, also that of Article 123(3) EPC.

3. Novelty:

- 3.1 With respect to novelty, from the cited prior art document (2) is most relevant since it discloses the photographic element having the greatest number of technical features in common with the photographic element according to Claim 1 of the patent in suit (see e.g. page 5, lines 17 to 23 and Example 8). Moreover, in the Board's judgement the disclosure of this document further comprises an alternative embodiment (page 3, lines 55 to 57) in which the light-sensitive silver halide is prepared in situ, e.g. as described in document (3). In this document, the content of which is, therefore, incorporated in that of document (2) by reference, relates to a method of preparing the light-sensitive silver halide on the surface of a light-stable silver salt, such as silver behenate, by exposing the latter to the vapours of a halogen acid. This is the only method of preparing a "light-sensitive silver halide" in situ which is described in that document (see column 3, line 4 to column 4, line 22). Consequently, the Board does not share the Appellant's opinion that, in the context of document (2), the expression "in situ preparation" would mean a complete conversion of the light-stable silver salt into the light-sensitive silver halide. Consequently, a photographic element having the features set out on page 5, lines 17 to 23 and comprising a light-stable oxidising silver salt, in addition to the light-sensitive silver halide, is comprised by the disclosure of document (2).

- 3.2 The presence of a developing agent is an essential requirement of the photographic element according to

document (2). Such a developing agent is not expressly mentioned but nevertheless not excluded from Claim 1 of the patent in suit; moreover, it is present in the preferred embodiment of Claim 19. Therefore, in contrast to the Appellant's submission, the claimed subject-matter is not distinguished from that disclosed in document (2) by the absence of a developing agent.

3.3 However, the dye precursors disclosed in document (2) all contain as an essential feature a blocked auxochromic hydroxyl group, which is deblocked during heat development by a base released from a base releasing agent (see Claim 1). This base releasing agent is chemically identical with the "dye releasing activator" of the patent in suit. Consequently, the "dye precursors" disclosed in document (2), especially that of Example 8, cannot meet all requirements of the "dye releasing redox compounds" of the patent in suit since they are not stable against the "dye releasing activator". For this reason, the subject-matter of Claim 1 is novel with respect to the disclosure of document (2).

4. Inventive step:

4.1 The fact that document (2) had to be considered as the most relevant document with respect to novelty does not automatically mean that this document is the closest prior art also with respect to inventive step, since a great similarity of the technical features of a claimed invention and a piece of prior art may be of a rather incidental nature if, as it is the case here, the prior art in question is not concerned with a similar technical problem and does not relate to the same specific technical field as the claimed invention.

In contrast to the approach to the question of novelty of a claimed composition, where only technical features have to be compared and the intended technical purpose is only relevant insofar as it functionally defines such technical features, relative to the question of inventive step where it is not to be decided whether a person skilled in the art could have modified the known composition but whether he would have done so in the expectation of a technical benefit, the expectation to solve a stated technical problem may be the only incentive for such modification. In such a situation, therefore, the problem to be solved by such a modification cannot be disregarded, since this would result in an inadmissible ex-post-facto analysis of the prior art.

- 4.2 The patent in suit relates to a heat-developable colour photographic material comprising a dye-releasing redox compound, the dye forming portion of which is stable, i.e. does not change its colour, during development.

Such photographic materials are known, see e.g. documents (5), (6) and (7).

Documents (5) and (6) relate to processes wherein a developing solution is used instead of heat development and a diffusible dye is released from a non-diffusible precursor during processing (see the abstracts), and document (7) relates to a heat-processable photographic material for use in a silver dye bleach process. In such a process the dye image is provided by imagewise bleaching a uniformly coloured sheet by the action of silver formed from a light sensitive silver halide after development. The bleaching requires the presence of an additional activator layer or a separate activator sheet (see the opening paragraph).

On the other hand, documents (2) and (4) exclusively relate to photographic elements of a different type, namely containing so-called "shifted dyes" which change their colour during processing.

- 4.3 In contrast to this prior art, the patent in suit relates to a photographic material capable of producing a dye image by heat-processing (i.e. without using a developing liquid) and without a bleaching step. In this photographic element a silver image is formed by exposure. Then the dye-releasing redox compound which may be structurally identical with the azo dyes used in Example 2 of document (7) is oxidised by the oxidising silver salt, optionally via a conventional developing agent such as 1-phenyl-3-pyrazolidone (see the patent specification, page 21, lines 18 to 28). The oxidised dye-releasing redox compound which can be the oxidised form of the azo dyes according to document (7), Example 2, then reacts with the "dye releasing activator", i.e. a base such as that used as deblocking agent in Example 8 of document (2). By this reaction a diffusible dye is released and transferred to a receiving layer forming a dye image therein.

Thus, none of the cited documents can be regarded as particularly closely related to the subject-matter of the patent in suit.

The technical problem underlying the patent in suit may, therefore, be seen, as set out in the patent in suit (see page 3, lines 28 to 61 and 39 to 44), in providing an improved photographic material which contains a stable dye forming moiety and is suitable for easily forming a clear colour image by a simple procedure.

According to the patent in suit it is proposed to solve this problem by providing photographic materials having the features indicated in Claims 1 and 2.

It is clear from the patent specification, in particular Examples 1 to 8, that this problem has thereby been effectively solved. This fact has not been contested by the Respondent.

- 4.4 As already set out in paragraph 4.2 above, the cited prior art documents relating to photographic materials containing dyes which are stable during processing, do not relate to photographic elements suitable for obtaining dye-images according to a simple process such as it can be performed with the photographic materials according to the patent in suit, but require either a developing solution or an additional activator sheet or layer for performing a silver dye bleach process.

Thus, with a view to solving the problem set out in the preceding paragraph, there was no incentive to modify the known photographic materials in such a manner as to make them suitable for obtaining clear dye images by simple heat processing without a bleaching step.

- 4.5 The Board considers it rather doubtful whether a person skilled in the art would have looked for useful suggestions on how to solve the above technical problem in document (2) which only concerns the use of "shifted dyes" which are not related to this technical problem, and, additionally, as the preferred embodiment, refers to a silver dye bleach process, i.e. just the type of processing of a photographic material which, according to the patent in suit, should be avoided because it is too complicated. If, however, a person skilled in the art had investigated this document, he would have found only general statements relating to

photographic materials suitable for a dye transfer process involving heat development comprising a large number of different options. Thus, on page 2, lines 36 to 37, it is stated that certain classes of the described image dye precursors are useful in photothermographic materials in which the resulting image dye upon processing is transferred to an image receiver. According to page 2, lines 31 to 35, useful image dye precursors may be selected from those disclosed in three patent documents, one of them being document (4) disclosing, inter alia, "shifted dyes" comprising a so-called "monitoring group", i.e. a structural element which, in the presence of an alkaline processing composition (i.e. a developing solution) and, as a function of silver halide development, is responsible for a change in mobility of the dye. One type of such a "monitoring group" is the 1-hydroxy-2-carboxamido-4-aminosulfonyl-naphthyl group also present in the dye used in Example 8 of document (2) in a photographic material suitable for being developed in a silver dye bleach process. This group is structurally identical with a preferred reducing group in the dye releasing redox compound to be used in the photographic element according to the patent in suit (see page 5, formulas I and IV). The useful image dye precursors of document (2) can be initially mobile and rendered immobile as a function of silver halide development or can be initially immobile and rendered mobile in the presence of the base released as a function of heating and as a function of silver halide development. In such compounds the monitoring group can be a ballasted carrier moiety which is cleaved from the dye in the presence of the base and as a function of silver halide development (page 2, lines 42 to 48). On page 7, lines 39 to 55 it is further stated that a typical photothermographic material comprises a support having thereon, in sequence, a first layer comprising, in binder,

a photosensitive silver salt in reactive association with a developing agent, a dye precursor with a blocked auxochromic hydroxyl group as described above, and an activating concentration of a heat-sensitive base release agent, and a second layer acting as an image receiving layer. No evidence is available to the effect that this general description is in fact sufficient for providing a photographic material suitable for obtaining a clear stable colour image by simple heat processing, even in the presence of a "shifted dye".

On the contrary, document (2) does not provide any guidance to a person skilled in the art how to select "certain classes of dye precursors" suitable for obtaining a photographic material designed for a photothermographic diffusion transfer process among the numerous possibilities comprised by formula (I) on page 1. Contrary to the Respondent's submission, there is no pointer towards the dyes disclosed in document (4), which is only mentioned together with two other documents as disclosing generally useful dye precursors without indicating whether the respective photographic materials shall be designed for silver dye bleaching or for diffusion transfer. Moreover, document (4) itself comprises a large number of suitable dyes among which a further selection was necessary to arrive at a dye precursor fulfilling the structural requirements of a dye releasing redox compound according to the patent in suit.

It is true that the "especially useful photothermographic material of the invention" according to document (2), page 5, lines 17 to 23 comprises a "dye precursor" which only differs from a "dye releasing redox compound" according to the patent in suit by the presence of a blocking group which shifts the colour of the dye moiety. However, it is not stated there that this material is

especially useful for a diffusion transfer process. Rather it follows from the subsequent text (page 5, lines 24 to 32) that this material forms part of a preferred material for performing a silver dye bleach process. This view is further confirmed by Example 8 describing such a material in more detail. Thus, in the Board's judgement, a person skilled in the art would not have recognised this information as relating to a specific embodiment of the material useful for a diffusion transfer process previously described in general terms.

Moreover, the only purpose of the presence of a base releasing compound (identical with the "dye releasing activator" of the patent in suit) indicated in document (2) is the deblocking of the auxochromic group, i.e. the "shifting" of the dye. The Respondent's submission at oral proceedings, that a base releasing agent is also required for activating the developing agent, is unsupported and, in the Board's judgement, not convincing, even though it has not been expressly contested by the Appellant. The reason for this finding is that, on the one hand, document (7) discloses a heat-developable photographic material quite similar to that of document (2), the main differences being that it does not contain a "shifted dye" and, at the same time, no base releasing agent, which is nowhere mentioned in document (7), including specific examples, in spite of the fact that the same developing agent is used as in document (2). On the other hand, if a base releasing agent would be an essential constituent of the photographic material of document (7) according to common general knowledge, and its presence would have to be implied even if it is not mentioned (an assumption which is very unlikely in the light of the three detailed working examples), then document (7) would destroy the novelty of the photographic element of the patent in suit since the absence of that "base releasing agent" (or "dye releasing



activator") is the only technical difference between the two photographic materials. During the oral proceedings, however, the Respondent has expressly acknowledged novelty also with respect to that document (see paragraph V above), a statement which is in conflict with the above submission.

Thus, relying on the cited documents, the Board holds that a base releasing agent is not an essential constituent of a heat-developable photographic material differing from that disclosed in document (2), by the absence of the "shifted dye". Therefore, a person skilled in the art considering to modify this known photographic material by employing an "unshifted" instead of the "shifted" dye would have had no good reason to retain the base releasing agent which would have no longer served a useful purpose, as can be learned from document (7).

Thus, in the Board's judgement, the technical teaching of the patent in suit, namely the specific combination of a selected class of "dye precursors", which is not comprised by those mentioned in document (2), with a reactive association of a light-sensitive silver halide and a light-stable oxidising silver salt and a base release agent is not foreshadowed by these general statements neither with a view to solving the above technical problem nor with a view to serving any other useful technical purpose.

The Respondent was, therefore, unable to demonstrate that a skilled person without knowing the patent in suit, i.e. without the benefit of hindsight, would have arrived at the subject-matter of the patent in suit. Thus, the requirement of Article 56 is met.

5. The above considerations also apply to the subject-matter of the independent Claim 2 which comprises the same

essential technical features and only differs in that the functions of the support and the receiving layer are separated. The dependent Claims 3 to 24 relate to specific embodiments of the independent claims and derive their patentability from these claims.

### 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 with the order to maintain the patent on the basis of Claims 1 to 24 submitted during the oral proceedings.

The Registrar:

  
M. Kiehl

The Chairman:

