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Bezeichnung der Erfindung: Photographic elements containing aryloxy substituted
Title of invention: photographic couplers
Titre de l'invention :

Klassifikation / Classification / Classement : G03C 7/32

ENTSCHEIDUNG / DECISION

vom / of / du 9 October 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Eastman Kodak Company

Einsprechender / Opponent / Opposant :

Fuji Photo Film Co., Ltd.

Stichwort / Headword / Référence : Photographic Element/KODAK

EPÜ / EPC / CBE Art. 54(1), 56, 114(2)

Schlagwort / Keyword / Mot clé :

"Novelty (affirmed)" - "Inventive step (affirmed)" -
"Late filed submission of a totally fresh line of
argument (admitted by way of exception)"

Leitsatz / Headnote / Sommaire



Case Number : T 215/88 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 9 October 1990

Appellant : Eastman Kodak Company
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Decision under appeal : Decision of the Opposition Division of the European
Patent Office dated 10 February 1988, posted on
22 March 1988, revoking European patent
No. 0 080 355 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : K.J.A. Jahn
Members : R. Spangenberg
J. Stephens-Ofner

Summary of Facts and Submissions

- I. The appeal lies from a decision of the Opposition Division revoking European patent No. 80 355, granted in respect of European patent application No. 82 306 197.3 filed on 22 November 1982 and claiming priority of 23 November 1981 from a prior application in the United States of America, on the basis of seven claims relating to photographic elements comprising improved aryloxy substituted dye-forming photographic couplers.
- II. This decision, which was delivered orally on 10 February 1988, with written reasons posted on 22 March 1988, was based on an amended Claim 1 and Claims 2 to 7 as granted. In considering the following documents:

- (1) Research Disclosure, August 1980, pages 339 and 340.
- (2) Research Disclosure, July 1981, pages 268 and 269,
and
- (3) US-A-4 248 962,

the Opposition Division concluded that document (1), representing the closest state of the art, disclosed a photographic element comprising a coupler which would, in a first step, form a diffusible yellow dye and, in a second step, a non-diffusible cyan image dye and that it was an obvious consideration that the first (yellow dye forming) reaction with oxidised developing agent had a greater reactivity than the following (cyan dye forming) reaction. A skilled person wishing to solve the technical problem of increasing the reactivity of couplers in photographic elements would have had no difficulties in using couplers which showed no ballast group in the part of the molecule reacting in the second step, but did show one in the dye-forming part of the first reaction step, thus producing a yellow ballasted image dye on first coupling with oxidised

developing agent. The subject-matter of the patent in suit was therefore held obvious. It was further held that not more than one obvious step needed to be taken in order to arrive at subject-matter claimed by the patent in suit, starting from document (3) as closest prior art.

IV. On 20 May 1988 the Appellant (the patent proprietor) appealed against this decision and paid the appropriate fee. The Statement of Grounds of Appeal was received on 19 July 1988. Oral proceedings took place on 9 October 1990. In his written submissions and during the oral proceedings, the Appellant inter alia referred to

(4) US-A-3 933 501

(5) GB-A-1 077 874

(6) Mees and James, The Theory of the Photographic Process (3rd edition, 1966), pages 382-396

(9) US-A-4 824 773 (published 25 April 1989).

On 7 February 1990 he further filed an amended Claim 1 reading as follows:

"A photographic element comprising a support bearing a photographic silver halide emulsion layer and, incorporated in the emulsion layer or a layer adjacent thereto, a two-equivalent dye-forming coupler consisting of a ballasted dye-forming coupling group substituted in its coupling position with an aryloxy group having ortho to the oxygen atom a group which contains a polarizable carbonyl, sulfonyl or phosphinyl moiety and which is free of photographic dye groups and photographic reagent groups."

In his opinion, documents (4) and (5) should be regarded as the closest state of the art. The technical problem to be solved should be seen in providing an image-dye-forming coupler of the kind described in these documents having

better reactivity. It was shown by Tables I to V of the patent in suit that this problem was indeed solved. Citations (1) to (3) did not relate to coupler moieties of the claimed type. The couplers of document (1) and, similarly, those of document (2), required at least 6 equivalents of silver halide to form one molecule of image dye and were therefore specifically designed to obtain less image dye from a given amount of silver halide than conventional "two-equivalent couplers". This term was consistently used in the art, including the Respondent's own patent (document (9)) in the sense that only two equivalents of silver halide are consumed for the development of one molecule of image dye in the photographic element. It was therefore to be understood as having this meaning also in the patent in suit. Document (3) related to couplers which release a photographically useful group (PUG) and contained a timing group that delayed release of that PUG. While certain intermediates described in that document might be useful in the photographic element according to the patent in suit this usefulness was not disclosed or made apparent to a skilled person by the content of this document. Hence none of these documents could provide - without the benefit of hindsight - a suggestion as to how to modify the couplers according to documents (4) and (5) with a view to improving their reactivity.

More particularly, no suggestion could be derived from the known facts, that the reactivity of couplers could be increased by increasing the electron density at the coupling site, and that certain ortho-substituted aryloxy groups were less able to withdraw electron density from this site than the corresponding para substituted phenoxy groups, since the assessment of reactivity might also depend on the rate of anion formation at the coupling site. Moreover, the aryloxy group had to be capable of being

removed during the reaction with the oxidized developing agent. Nor could these effects be easily predicted on the basis of common general knowledge. Reference in this respect was also made to the fact that the relevant common general knowledge and the couplers to be improved were known for a long period of time during which the need for improving the reactivity has consistently existed. Nevertheless, those skilled in the art did not arrive at or consider the solution to this problem as offered by the patent in suit, until after its publication date.

- V. The Respondent introduced insufficient disclosure (Article 100(b) EPC) as a new ground of opposition, pointing out that the patent in suit comprised numerous couplers without improved reactivity, as could be seen from the comparative data in the description. Thus it was not possible, without undue experimentation, to identify whether the use of a given coupler fulfilling the structural requirement of Claim 1 will result in a photographic element with improved reactivity. Furthermore, it had been shown in the letter of 12 July 1987 that some couplers specifically mentioned in the patent in suit were six-equivalent couplers and not two-equivalent couplers, as alleged by the patent specification.

He further submitted that the term "ballasted dye-forming coupling group" could not be found in the patent specification or in the application as filed. At most, this term might have been mentioned in the description in context with specific substituents. In the Respondent's submission the Appellant had also failed to demonstrate that this feature was disclosed as being pertinent to the claimed invention and, therefore, Claim 1 did not meet the requirement of Article 123(2) EPC.

Regarding patentability, the Respondent argued that the claimed photographic elements were not novel with respect to document (3). Furthermore, he argued that at least the image-dye-forming couplers used in the photographic element as claimed lacked novelty with respect to that document. The technical problem as derivable from the patent in suit was not to improve the reactivity of the known couplers, but to provide couplers which yield an increased quantity of dye when subjected to development. It would have been obvious to look for such couplers amongst the class of two-equivalent couplers because these produce twice or three times as much dye per unit of silver halide than four-equivalent or six-equivalent couplers, a fact which was common general knowledge. Moreover, a person skilled in the art carrying out the development of a photographic element according to document (3) containing almost any one of the couplers specifically mentioned therein, would inevitably have realised the improved reactivity of these couplers including the PUG. It would then have been possible by only exercising the ordinary skill to find out that the ortho substituent in the aryloxy group was responsible for this effect. It would then have been immediately obvious to omit the PUG from these couplers, especially coupler #2, since it would have been clear that this group did no longer serve any useful purpose.

Starting from (1) as closest prior art it was only necessary to shift the ballast group from one part of the molecule to the other, since it was acknowledged by the Appellant that these couplers could be regarded as two-equivalent couplers. There being only two possibilities for locating the ballast groups, one of them being realised in (1), there was only one possibility left for a person skilled in the art wishing to make couplers with increased yield of image-dye. This view would have been strengthened by the disclosure in (4), column 18, lines 35/36 according

to which the ballasting groups can be placed on either the aryloxy position of the coupler or the yellow dye forming moiety of the coupler. The skilled person therefore would have been in a one-way street situation. Reference was made in this respect to the decision T 21/81 (OJ EPO, 1983, 15). Similar consideration would apply to document (2). Therefore, documents (4) and (5) did not represent the closest prior art and the comparative tests submitted by the Appellant were not relevant.

Only a few days before the oral proceedings, he submitted that it was already known from document (6), that in two-equivalent couplers the reactivity increased with increasing electron density at the coupling site. According to common general knowledge represented by two text book references, this electron density increased with decreasing acidity of the parent phenol of the coupling-off group, and therefore as a result of shifting a substituent of the type concerned from the para- to the ortho position. Thus, the increased reactivity of the couplers used according to the patent in suit in comparison with those known from document (5) was not surprising and it was, therefore, possible to solve the problem underlying the patent in suit by only applying the common general knowledge, i.e. without inventive activity.

VI. The Appellant requested as his main request that the decision under appeal be set aside and the patent maintained in amended form on the basis of Claim 1 filed on 7 February 1990 and Claims 2 to 7 as granted.

By way of auxiliary requests the Appellant wished to have considered as main claim any one of the Claims 2 to 7 as granted.

The Respondent requested that the appeal be dismissed.

At the end of the oral proceedings the decision of the Board to allow the appeal was announced.

Reasons for the Decision

1. The appeal is admissible.
2. Admissibility of the amendments

The amended Claim 1 meets the requirements of Article 123 EPC. It only differs from Claim 1 as granted in that the two-equivalent dye-forming coupler contains a "ballasted dye-forming coupling group".

This requirement is not literally derivable from the patent specification and the application documents as filed, but it is clearly implied by them. Thus, it is stated at the very beginning of the description, that "the invention relates to photographic elements containing non-diffusible couplers". The term "non-diffusible" implies that the coupler contains a ballast group, either in the aryloxy coupling-off group or in the dye-forming part. The process of subtractive colour formation is then briefly discussed as technical background of the claimed invention, specifically referring to the formation of image-dyes, i.e. non-diffusible and therefore, by way of implication, ballasted dyes. By this indication of the technical field to which the invention relates, the presence of a ballast group in the dye-forming part of the couplers present in the photographic elements according to the claimed invention is, in the Board's judgment, also implicitly disclosed. There is nothing in the remaining content of the patent specification, which in the relevant parts literally corresponds to the description as filed, that would support a different conclusion, since all more specific embodiments

of the invention described therein, especially the preferred dye-forming coupling groups comprised by the general formulae on pages 3 and 4, contain the ballast group R⁶, (see page 3, line 59, page 4, line 20 and line 32). Furthermore it is stated on page 9, lines 50 to 52 that "photographic elements of the invention" can be "processed to form a visible image dye". This again implies the presence of a ballast group in the dye-forming part of the coupler. Also the statement on page 3, line 40, according to which "any coupling group known in the art can be used" must be read in the context with the general formulae referred to above and cannot therefore be construed to relate to the presence and the position of a ballast group but rather to the dye-forming structural elements.

Thus, in the Board's judgment, the subject-matter of the present Claim 1 is not only a preferred embodiment of the application as filed and the patent as granted but, on the proper construction of the content of these documents, the only subject-matter disclosed therein.

3. Sufficiency of disclosure

The Respondent's submission that the disclosure of the patent in suit does not meet the requirements of Article 100(b) EPC was made not earlier than during the appeal proceedings, i.e. well after the expiry of the period of opposition. The arguments in support of this ground were not directed towards the feasibility of the claimed invention but only towards criticising the support for the presence of an advantageous effect over its whole scope (see Section V above), and were thus clearly related to the ground of lack of inventive step. Therefore, this submission must fail.

4. Construction of the term "two-equivalent-coupler"

It appears from the various submissions made by both parties during the opposition and appeal proceedings that the term "two-equivalent coupler" had been given different meanings by both parties. It is therefore necessary, before dealing with the grounds of opposition raised by the Respondent under Article 100(a) EPC, to establish the true meaning of this term.

4.1 According to the basic text book (6), representing common general knowledge, a coupler having at its coupling position a substituent Z which is capable of being eliminated after the coupling step in the form of a compound HZ requires only two equivalents of silver halide (corresponding to one molecule of oxidised developing agent) for the formation of one molecule of dye (see page 390, right column, equations 17.5 and 17.7). The substituents Z specifically mentioned there are Cl and SO₃H and the molecules HZ formed therefrom are not capable of consuming further silver halide in subsequent reaction steps. If the substituent Z is an aryloxy group e.g. as shown in documents (4), (5) and (9), a phenol is formed in the elimination step which might in principle be itself a coupler (see document (6), table 17.2 on page 387 and the corresponding text on page 388). Nevertheless, in the patent in suit as well as in documents (5) and (9) such couplers are called "two-equivalent couplers" (see the patent in suit, page 2, lines 35 to 38, document (5), page 5, lines 27 to 31 and document (9), column 8, lines 1 to 4).

4.2 The Board infers from documents (5) and (9) on the one hand, and document (1), wherein other couplers, also containing aryloxy substituents at the coupling position, are called "six-equivalent couplers" (see the opening

paragraph and the formula on the top of the left column on page 340) on the other hand, that the question whether a given coupler is correctly called "two-equivalent" or "six-equivalent" depends on what actually happens during the development of the photographic element containing that coupler, and cannot be answered simply by looking at its chemical structure. This view is further confirmed by the comparison of coupler No. 5 according to the patent in suit with the fourth coupler of the phenol series in Table 17.2 of document (6), which is the phenol corresponding to the aryloxy coupling-off group of coupler No. 5. Nevertheless this coupler No. 5 produces more yellow dye than coupler No. C-6 (cf. the patent in suit, page 16, examples 9 and 10) having the acetamido substituent in the para position, i.e. the phenol "coupler" resulting from the development of coupler No. 5 obviously does not react itself as a coupler during development of the photographic element according to example 9 of the patent in suit. In these circumstances the term "coupler" cannot be attributed to this phenol, because it is only used in the art for moieties which actually form a dye during processing in a photographic element.

- 4.3 The Respondent's submission that those couplers used in the photographic elements according to the patent in suit which contain aryloxy coupling-off groups with a free para position would inevitably react further with oxidised developing agent, i.e. they would not be "two-equivalent couplers" within the common meaning of that term, and that, consequently this term should not be given its common meaning in the present Claim 1 are therefore not supported by the facts set out in the preceding paragraph. They are also not supported by the Respondent's letter dated 12 June 1987 (see Chapter II, paragraphs 1 to 3) since it can only be derived from that letter that the phenols released during development from certain couplers specifically mentioned in the patent in suit, including coupler No. 5,

are in principle themselves couplers and capable of reacting further with oxidised developing agent. This does not mean, however, that this further reaction takes place in the development of a photographic element under practical conditions. In his reply to the above letter the Appellant has affirmed only the correctness of the "reactions" shown in paragraph 2 of the Respondent's letter. However, the conclusions drawn in paragraph 3 were disputed, and it was denied that the second coupling step would take place in practice, since it was submitted that only the first coupling step was relevant in the photographic elements according to the patent in suit. Thus, the Respondent's submission that the Appellant himself has acknowledged that some couplers contained in the photographic elements according to the patent in suit are indeed "six-equivalent couplers" or that the "six-equivalent couplers" disclosed in document (1) are also "two-equivalent couplers" within the common meaning of this term is not well-founded.

- 4.4 Moreover, in the Board's judgment, the idea that the photographic elements according to the patent in suit should contain "six-equivalent couplers" as defined in document (1) is not in agreement with the overriding requirement of the subject-matter of the patent in suit to provide for photographic elements which, upon development, yield more image dye than previously known photographic elements already containing two-equivalent couplers. This requirement, which also applies to the Respondent's later patent (9), excludes any aryloxy coupling-off groups from consideration which would interfere with it, e.g. by consuming additional silver halide which would then not be available for image-dye formation.
- 4.5 As a result of these considerations the Board holds that, for the purpose of the construction of the true meaning of

the present Claim 1, the expression "two-equivalent coupler" should be understood in the sense submitted by the Appellant during the oral proceedings, i.e. as meaning a coupler which consumes only two equivalents of silver halide for the formation of one molecule of image dye in the photographic element, without any additional silver halide consumption during subsequent reactions in that element.

5. Novelty

The novelty of the subject-matter of Claim 1 has been disputed by the Respondent on the basis of document (3). This document relates inter alia to photographic elements containing couplers having an aryloxy coupling-off group substituted in the ortho position by a timing group linked to a photographically useful group (PUG), see e.g. coupler #2 in column 23. In this coupler the PUG is a development inhibitor, and in the Respondent's opinion this compound is not excluded from the claimed subject-matter by the proviso that the aryloxy groups of the couplers contained in the photographic elements according to the patent in suit must be "free of photographic dye groups and photographic reagent groups". However, in the Board's judgment, a development inhibitor is a "photographic reagent group". This finding is consistent with the disclosure of document (3), where it is stated that a photographic reagent is understood to be a moiety which upon release further reacts with components in the photographic element, such as a development inhibitor (column 5, lines 50 to 52). Thus, the disclosure of document (3) does not take away the novelty of the claimed subject-matter. The Board is further satisfied that none of the other documents discloses photographic elements having all the features set out in Claim 1 and since this was no longer disputed during the

appeal proceedings, it is not necessary to give detailed reasons for this conclusion.

6. Inventive step

6.1 Closest prior art

6.1.1 The patent in suit relates to photographic elements containing non-diffusible couplers (see page 2, line 1). According to the patent specification this is mature art and numerous couplers of this type are already known. A specific sub-group of these couplers is said to be the so-called "two-equivalent couplers" which "contain a substituent in the coupling position, known as coupling-off group, which is eliminated from the coupler following reaction with oxidised developing agent without requiring the action of an additional molecule of oxidised developing agent" (page 2, lines 35 to 38, after correction of an obvious clerical error). More specifically, the technical teaching of the patent in suit may therefore be regarded as related to photographic elements containing couplers which produce as much image-forming dye per equivalent of silver halide as possible. In this context, an image-forming dye is one which remains in the photographic layer and is not removed during the processing steps. This requires that the dye is ballasted and does not contain solubilising groups.

6.1.2 A group of couplers useful for this purpose is described in document (5), cited by the Appellant in the statement of grounds of appeal. This document relates to yellow-couplers of good reactivity (page 2, lines 42 to 49) and the coupling-off group can be an aryloxy or substituted aryloxy group (Claim 1). Consequently, this document may be regarded as representative for the relevant prior art already acknowledged in the patent in suit.

6.1.3 Having regard to the proper construction of the term "two-equivalent coupler" set out in paragraph 4 above, the couplers disclosed in documents (1) and (2) serve a quite different technical purpose. Document (1) describes polyfunctional couplers suitable for photographic elements. It is stated therein that it is sometimes desirable in colour photographic processes to use multi-equivalent couplers. For this purpose couplers are disclosed which consist of a soluble coupler the coupling position of which is substituted by the aryloxy moiety of a ballasted coupler (see couplers (1) and (2)). By the coupling process a diffusible dye is formed first in a coupling step requiring two equivalents of silver halide and a non-diffusible (ballasted) dye is subsequently formed in a coupling process requiring four equivalents of silver halide. Thus, a total of six equivalents of silver halide is consumed per molecule of image-forming dye (see page 339, left column, lines 8 to 4 from the bottom).

Document (2) describes "blocked" dye-forming cyan- and magenta-couplers, in which the aromatic or heteroaromatic hydroxy group necessary for the coupling step is blocked by a removable blocking group (see page 268, the formula in the right column and the corresponding definitions). This blocking group may be derived from a dye-forming soluble coupler, as it is exemplified by couplers I to VII. It is expressly stated that this soluble dye must be removed during processing (page 268, left column, lines 11 to 15). Consequently also this document does not belong to the specific technical field of the patent in suit.

6.1.4 Document (3) relates to couplers which may be two-equivalent couplers containing in the coupling-off group a PUG which is released during development in a controlled manner (see e.g. formula III in column 8). Couplers containing such groups are not comprised by the patent in

suit (see paragraph 5 above). The technical purpose envisaged for the couplers of this document relates to the control of the release of the PUG (see column 2, lines 16 to 23).

6.1.5 In the Board's judgment, the statements in the patent specification defining the relevant state of the art and the new technical teaching in relation to it, i.e. the acknowledged existence of structurally closely related aryloxy substituted two-equivalent couplers and the importance of the ortho-substituents defined in Claim 1 for the reactivity of such couplers, cannot be ignored when determining the closest state of the art. In other words, it is not appropriate - as the Respondent submitted - to consider only the technical features of Claim 1 out of the context of their technical purpose. Thus, documents (1) to (3), though their subject-matter may also have a great number of technical features in common with the subject-matter of the patent in suit, do not qualify as closest state of the art. For these reasons, in the Board's judgment, document (5) represents the closest state of the art, as submitted by the Appellant.

6.2 Technical problem and solution

6.2.1 While it belongs to common general knowledge that two-equivalent couplers in general yield more image-dye per equivalent of available silver halide (see document (6)), the patent in suit states that there is room for improvement since they still do not yield the amount of dye theoretically possible (page 2, line 44). The technical problem underlying the patent in suit may therefore be seen in providing photographic elements containing couplers which yield an increased amount of image-dye.

- 6.2.2 The patent in suit also states (page 2, lines 39 to 46) that a common way to increase that yield is to use couplers with increased reactivity. Consequently, it is proposed to solve the existing problem by providing a group of couplers with enhanced reactivity containing a specific type of coupling-off groups, namely an aryloxy group having in the position ortho to the oxygen atom a group which contains a polarizable carbonyl, sulphonyl or phosphinyl moiety which is free of photographic dye groups or photographic reagent groups.
- 6.2.3 The Board accepts that the problem as hereinbefore defined is solved by this proposal, since the test results summarised in Tables I to IV consistently demonstrate that a great number of couplers having the appropriate ortho substituent give image-dyes of increased maximum density (D_{max}) and higher γ -values (slope of the straight portion of the densitometric curve) than do conventional couplers having the same substituents in the para-position. Thus, control coupler C-7 of Table III has the same p-sulfonylmethyl-phenoxy coupling-off group as the couplers according to Fig. 5 and 14 of document (5). In coupler No. 10 of Table III the sulfonylmethyl substituent is in the ortho-position. The comparison of D_{max} and γ shows that coupler No. 10 is better in both respects.
- 6.2.4 The above finding is not in conflict with the fact that not all of the couplers mentioned in Tables III and IV of the patent in suit produce higher D_{max} and/or γ -values than the best coupler according to the state of the art, i.e. coupler C-5 of Table III, since, according to the consistent jurisprudence of the Board, it is not sufficient merely to consider the improvement achieved over the best embodiment of the state of the art, irrespective of the structural similarity of the compounds being compared. Quite on the contrary, only such chemical entities qualify

for comparison, as are structurally as close as possible. Therefore, a comparison of couplers C-5 and e.g. coupler 5, having quite different types of substituents in the aryloxy groups, is not appropriate. On this basis, the Respondent's submission made with regard to Article 100(b) EPC and briefly dealt with in paragraph 3 above, must also fail.

6.3 Obviousness of the solution

6.3.1 It follows from paragraph 6.1.3 above that documents (1) and (2) do not contain a hint towards the possibility that the amount of image-dye formed from the couplers known from document (5) will depend on the particular structure of the coupling-off group. Thus these documents cannot suggest to a skilled person to look for a solution of the existing problem by variation of the structure of that group. Contrary to the Respondent's submission such pointer towards the solution proposed by the patent in suit cannot be seen in the fact that these documents - selected with the benefit of hindsight - both contain coupling-off groups with ortho-substituents of the type claimed in the patent in suit, since these substituents are not selected with a view to improve the yield of the image-dye. In documents (1) and (2) these coupling-off groups form part of a well-known coupler structure, and become part of a coupling-off group only because the aromatic hydroxy groups of the parent couplers are substituted by another - soluble - coupler moiety, which has the function of a blocking group. Furthermore, these documents do not provide an incentive to modify the said blocking group by introducing into it a ballast group as it is stated by the Respondent, since such modification would be contrary to the intended purpose of these blocking groups and would therefore certainly not have been envisaged by a person skilled in the art.

6.3.2 Similar considerations apply to the couplers of document (3) containing a PUG. According to the introductory part of this document (column 1, line 51 to column 2, line 23) the PUG is attached to the coupling-off group since this group acts as a timing group thus improving the control of release of the PUG. The problem of releasing a PUG, however, is in no way related to the problem underlying the patent in suit, i.e. to improve the yield of image dye obtainable from two-equivalent couplers. There is, therefore, no reason derivable from that document why a person skilled in the art would have considered it with a view to solving that problem. Therefore, the Board is also unable to accept the Respondent's submission that a person skilled in the art repeating almost all of the examples described in document (3) would have immediately recognised that these PUG-containing couplers would be more reactive than conventional couplers and that it would have been no more than a matter of routine experimentation to find the reason therefor, i.e. the presence of the ortho substituent. In particular, the fact that it was admitted by the Appellant that the subject-matter of the patent in suit was also arrived at by the inventor of the PUG-containing couplers of document (3) starting from the observation of such an enhanced reactivity, does not mean that this mental process was a matter of routine, since it took this inventor, by definition a person of more than ordinary skill, about three years to do so. In the Board's judgment therefore this argument, which does not amount to more than a hindsight consideration based on the knowledge of the patent in suit, must fail.

6.3.3 It is true that document (3) discloses some couplers of the type used according to the patent in suit. However, these compounds are only used as chemical intermediates which are specifically designed to be linked to suitable PUGs. Even if a skilled person might have recognised that these

chemical intermediates have structures covered by the general disclosure of document (5) and could therefore be used as couplers in a photographic element, there is nothing in this document suggesting that they would perform better in this respect than the couplers specifically mentioned in document (5). Therefore, this disclosure could not provide an incentive to incorporate these chemical intermediates as couplers in a photographic element.

6.3.4 The Respondent's argument that the subject-matter of the patent in suit was obvious as well having regard to document (5), cited by the Appellant in his statement of grounds of appeal and, inter alia, common general knowledge, was put forward barely a few days before the oral proceedings in the appeal. It lies in the Board's discretion to disregard all late filed submissions and evidence (cf. Article 114(2) EPC). The overriding principle based on public interest that an Opponent's case should be fully presented in good time, so as to enable the Proprietor to see the case he will have to answer, should by now be well known to all practitioners before the EPO: cf. "General principles for opposition procedure in the EPO (OJ EPO 1989, 417), see in particular paragraphs 2 and 13. Cases such as T 182/89 (to be published, Headnote published 8 OJ EPO 1990) also afford a clear indication of the Board's approach to these matters, which is based on a fair balance between its inquisitorial power under Article 114(1) EPC, which by implication condones the relatively free filing of late submissions and evidence, and their role as impartial adjudicator of cases presented by the parties -in which it has the discretion (Article 114(2) EPC) to disregard all matters not submitted in due time, namely, at the earliest possible moment in all the circumstances of the case.

The Respondent was not able to give sufficient reasons for the extremely late submittal of a totally fresh line of argument based on document (5) not before more than two years after the first citation of that document. Such an unjustified delay may result in the Board disregarding the late filed submissions or admitting it into the proceedings with or without remittal to the first instance (Article 111(1) EPC) and with or without an apportionment of costs pursuant to Article 104 and Rule 63(1) EPC (cf. T 117/86, OJ EPO 1989, 401).

In the present case, despite strongly disapproving of the Respondent's conduct, the Board has decided to admit the late-filed matter, because the Appellant was clearly in the position to deal with it and expressed his wish to do so in the course of the oral proceedings in the appeal.

6.3.5 The Board is satisfied that the relevant common general knowledge is as follows:

According to the text book (6) the reactivity of a given coupler in dye formation is generally increased by increasing the electron density at the coupling site of the anion formed from that coupler, but also the process of anion formation (which is facilitated by electron withdrawing substituents) may become rate determining (see the paragraph bridging pages 390 and 391). This general rate law also applies for couplers being substituted at the coupling site by a coupling-off group (page 392, left column, second paragraph).

It is further generally known, and was admitted by both parties during oral proceedings, that electron withdrawing substituents decrease the electron density at the coupling site and that the ability to withdraw electrons for aryloxy substituents correlates with the acidity of the

corresponding phenols. Phenols having e.g. carbonyl or sulfonyl groups (generally known as -I, -M substituents) directly attached to the aryl nucleus in the position para to the oxygen atom are normally stronger acids than phenols having the same substituents in the ortho position.

6.3.6 However, the Board is also satisfied that this common general knowledge, when applied to the couplers disclosed in document (5) would not immediately have revealed to the person skilled in the art, how to improve the reactivity of these couplers, because the process of image dye formation is rather complex. Thus, depending on the exact nature of the rate determining step - anion formation or reaction of the anion with oxidised developing agent - the increase of the electron density at the coupling site might decrease or increase the reaction rate and steric effects would also have to be considered. Even if it could be expected that an increase of the electron density at the coupling site would increase the reaction rate, any structural modification to this effect might have been undesirable with respect to the removal of the coupling-off group from the intermediate leuco dye (see document (6), page 392, left column, second paragraph). Thus it was admitted by the Respondent during the oral proceedings that it was necessary to choose the aryloxy substituent not only with a view to increasing the electron density at the coupling site, but also with a view to facilitating the coupling-off step - and that one requirement could only be fulfilled at the expense of the other. It is evident, therefore, that the skilled person was not being faced with a simple and straightforward technical situation.

6.3.7 This finding is confirmed by taking into account the time which has passed between 1967, the year of publication of document (5) and the priority date of the patent in suit, (1981), and the fact that the relevant common general

knowledge (document (6), published 1966) was already available at the publication date of document (5). It can be inferred from the latter document, page 5, lines 33 to 50 that the couplers disclosed therein have already been designed with the intention to get the highest possible yield of image-dye per equivalent of silver halide. Nevertheless, ortho-substitution in the aryloxy group by the groups specified in Claim 1 has not been considered in this respect. Moreover, also for the similar couplers disclosed in document (4) high reactivity was clearly envisaged, see column 3, line 64 to column 4, line 8. In this document, published 1976, again the allegedly obvious beneficial effect of this ortho substitution was not recognised. Therefore those skilled in the art clearly bypassed the invention, and clearly overlooked this possibility of solving a long-standing problem for a considerable period of time. This constitutes, in the Board's judgment, strong circumstantial evidence pointing to the presence of an inventive step.

- 6.3.8 In summary, the Respondent may well have offered an explanation why the advantages indicated in the patent in suit have been obtained. However, the existence of such an explanation, given with the benefit of hindsight, is not in itself sufficient to demonstrate obviousness.
- 6.4 For these reasons, the Board holds that the subject-matter of Claim 1 involves an inventive step.
- 7. The subject-matter of Claims 2 to 7, relating to specific embodiments of the photographic elements according to Claim 1, derive their patentability from that of Claim 1. Therefore the Appellant's main request can be allowed.

Order

For these reasons, it is decided that:

1. The appeal is allowed.
2. The Opposition Division's decision is set aside.
3. The case is remitted to the Opposition Division with the order to maintain the patent on the basis of the Appellant's main request.

The Registrar:



M. Beer

The Chairman:



K.J.A. Jahn

