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**D E C I S I O N**  
**of 30 June 1994**

**Case Number:** T 0686/91 - 3.3.1

**Application Number:** 85308401.0

**Publication Number:** 0183467

**IPC:** G03C 1/87

**Language of the proceedings:** EN

**Title of invention:**

Base paper for photographic prints

**Patentee:**

James River Graphics Limited

**Opponent:**

Felix Schoeller Jr. GmbH & Co. KG

**Headword:**

Photobase/James River Graphics

**Relevant legal norms:**

EPC Art. 54(1), 56

**Keyword:**

"Novelty (yes), inventive step (yes)"  
"Determination of the technical problem"  
"Obvious to try (no)"

**Decisions cited:**

T 0020/81, T 0002/83, T 0076/83, T 0296/87

**Catchword:**

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**Case Number:** T 0686/91 - 3.3.1

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.1**  
**of 30 June 1994**

**Appellant:** Felix Schoeller Jr. GmbH & Co. KG  
(Opponent) Burg Gretesch  
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**Representative:** Rucker, Wolfgang, Dipl.-Chem.  
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**Respondent:** James River Graphics Limited  
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**Representative:** Archer, Philip Bruce  
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**Decision under appeal:** Interlocutory decision of the Opposition Division of the European Patent Office announced orally on 25 June 1991, with written reasons delivered on 16 July 1991, concerning maintenance of European patent No. 0 183 467 in amended form.

**Composition of the Board:**

**Chairman:** R. K. Spangenberg  
**Members:** P. P. Bracke  
J. A. Stephens-Ofner

## Summary of Facts and Submissions

I. European patent No. 0 183 467 was granted on 25 January 1989 on the basis of 17 claims in response to European patent application No. 85 308 401.0, filed on 19 November 1985, and claimed priority of 24 November 1984 from an earlier application in the UK. Following a notice of opposition filed against the grant of this patent the Opposition Division of the EPO announced orally on 25 June 1991 the decision to maintain the patent in amended form. This decision was delivered with written reasons on 16 July 1991 and was based on an amended set of 16 claims, the first of which read as follows:

"1. Resin coated photographic base paper comprising a substrate of paper carrying on its face side a composite coating comprising from 10 to 50 g/m<sup>2</sup> of an extruded first coating layer of a low density polyethylene or a blend of low density and high density polyethylenes containing at least 50% by weight of low density polyethylene, the first coating layer containing at least 5% by weight of opacifying pigment and, overlying the first coating layer and firmly bonded thereto, from 0.1 to 18 g/m<sup>2</sup> of an extruded second coating layer of a polymer having a stiffness modulus of at least 2.0 GPa."

Independent Claim 13 related to a method of making a resin coated photographic base paper as defined in Claim 1 substantially by coextrusion of the two polymer layers onto a paper substrate.

In the decision 11 documents were considered, of which the following remained relevant during the appeal proceedings:

- (2) GB-A-2 061 131
- (3) GB-A-1 339 045
- (9) Zeitschrift für wissenschaftliche Fotografie,  
Band 57, Heft 9 bis 12, 1963, pages 211 and 212
- (10) (Tappi, Vol. 56, No. 8, 1973, pages 112 to 116

II. The Opposition Division held that the subject-matter of the amended set of claims was novel. It further considered that none of the cited documents addressed the technical problem underlying the disputed patent, which was to increase the stiffness of a resin coated base paper for photographic prints, such as those disclosed e.g. in document (2). Therefore, none of the cited documents was held to provide an incentive to solve this problem by replacing the top coating layer of the known resin coated paper, which preferably consisted of polyethylene, optionally in combination with other hydrocarbon resins, by a polymer coating having an increased stiffness modulus of at least 2 GPa. Thus it was held that the subject-matter of the disputed patent also involved an inventive step.

III. On 6 September 1991 the Opponent filed an appeal against this decision and paid the appropriate fee. A statement of grounds of appeal was received on 31 October 1991. Oral proceedings took place on 30 June 1994.

IV. In the appeal proceedings the Appellant (the Opponent) additionally relied upon two further publications,

allegedly reflecting the common general knowledge in respect of the dependence of the overall stiffness of a composite sheet on the stiffness of the materials from which it is made, as well as upon several decisions of the Boards of Appeal of the EPO, in particular T 76/83 and T 296/87.

He submitted that in the decision under appeal the Opposition Division had failed to consider the common general knowledge of the relevant notional person skilled in the art concerned, which included the ability to calculate the overall stiffness of a composite sheet approximatively from the relative thickness and the stiffness modulus of the material used for each layer. He further argued that the technical problem addressed in the patent in dispute, i.e. that of increasing the stiffness of a resin coated photobase without unacceptably increasing its thickness, had not existed in reality, since it was not addressed in the available literature. The real technical problem was, in his opinion, merely to provide an alternative resin coated photobase, and the solution of it lay in applying a layer of polycarbonate as the top layer of the face side was obvious in the light of documents (2) and (9). He further argued that even if one would admit that the enhancement of the stiffness without increasing the thickness of a resin coated photobase was a realistic technical problem, it would have been obvious to try to solve it by replacing a part of the polyolefin coating by a polycarbonate layer, and the additional effect on the surface quality would have been found in any case by routine testing. Since the indication of the appropriate thickness of the coating layers as well as the other technical

features mentioned in Claims 3 to 12 required no more than routine adaptation in response to various commercial demands, and since the method of coextrusion used in Claims 13 to 16 was, in the light of document (10), a conventional method, the adaptation of which to the manufacturing of the photobases according to Claims 1 to 12 did not require inventive skill, he submitted that the subject-matter of all present claims was obvious. He also submitted that the particular limit of the stiffness modulus mentioned in the present Claim 1 did not relate to a technical teaching, but, instead, defined the technical problem of trying to find a suitable material. Thus this feature did not in his opinion distinguish the subject-matter of that claim from the prior art and therefore even the novelty of the photobase defined in Claim 1 was questionable in view of documents (2) and (3).

- V. The Respondent (the patent proprietor) submitted that the object of the disputed patent was not only to make a stiff paper base, but, in addition, to improve the gloss of the surface of that paper base by reducing the incidence of pitting. In his opinion this problem was clearly addressed to the paper expert, who was aware of the particular properties of paper which would have to be taken into account when it was envisaged to extrude plastics onto it. He did not dispute, however, that the relevant skilled person was able to calculate, at least approximatively, the overall stiffness of a resin coated photobase, if the thickness and the stiffness modulus of the resin of each layer was known. Nevertheless, so he submitted, those skilled in the art believed, at the priority date of the patent in dispute, that only polyolefins were suitable resins for

producing resin coated photobase. He also disputed that the extrusion of thin layers of stiff polymers, such as polycarbonate, was known and established technology at the relevant date, since not even the two main manufacturers of polycarbonate were able to advise the inventor, on his request, how to extrude thin polycarbonate layers. He further submitted the results of calculations which in his submission demonstrated that the increase of stiffness, obtained according to Tables 1 to 3 of the disputed patent, was higher than that expected from calculations based on common general knowledge. In particular, the incorporation of polycarbonate was found to have a dramatic effect. On the basis of these submissions he argued that a skilled person would not have envisaged to replace some of the resin used for coating by a stiffer material, such as polycarbonate. In addition, he argued that it would certainly not have been considered to arrange the stiffer layer on the top of the face side, as required by the patent in dispute, in the absence of the knowledge of the particular advantages of this arrangement set out in the patent in dispute.

VI. The Appellant requested that the decision under appeal be set aside and the patent be revoked.

The Respondent requested that the appeal be dismissed and the patent maintained on the basis of the text underlying the decision under appeal.

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

## Reasons for the Decision

1. The appeal is admissible.
2. The two documents filed by the Appellant during the appeal proceedings relate to common general knowledge which was no longer in dispute during the oral proceedings. Thus there is no need to consider these documents.
3. The Appellant questioned the novelty of the resin-coated base paper according to the present Claim 1 in respect of document (2). Claim 1 of this document relates to a photographic paper coated at least on the side destined to receive the photographic layer (in the specification of the patent in dispute and hereinafter called the "face side"), by two resin layers, arranged one on top of the other, wherein only the second layer, destined to come into contact with the photographic emulsion, contains stabilisers and/or anti-oxidants. The technical problem to be solved by this paper was the improvement of the adhesion of the resin coating on the base paper, which was found to be impaired by the presence of stabilisers in the coating. The technical teaching of this document accordingly does not require a particular stiffness of the resins used. It was not disputed by the Appellant that none of the coatings specifically considered in this document consisted of two layers wherein the resin material of the outer one had a stiffness modulus greater than 2 GPa. In particular, in Examples 1, 2, 3 and 5 specifically referred to by the Appellant, the top layer of the face side consists of pigmented high-pressure polyethylene

which, according to the specification of the patent in dispute, page 3, line 30, has a stiffness modulus of about 1, 2 GPa.

Similarly, document (3) relates to a paper support for a photographic emulsion having on its face side a coating consisting of two layers, wherein only the outer layer is pigmented. The only resin specifically mentioned for this coating is polyethylene, having a stiffness modulus well below 2 GPa, as mentioned above.

In the Board's judgment the lower limit of the stiffness modulus in the present Claim 1 is not a mere indication of a technical problem, but a parameter characterising the materials suitable for solving such a problem, namely that of the enhancement of the overall stiffness of a resin coated photographic base paper without unacceptably increasing its thickness, as can be deduced from the description, page 2, lines 34 to 55. The Appellant did not dispute that this parameter was common in the art and was available for a great number of resins. Therefore the Board holds that this parameter cannot be neglected for the purpose of determining the novelty of the subject-matter of the patent in dispute, as proposed by the Appellant. On the contrary, it is just this parameter which distinguishes that subject-matter from the state of the art disclosed in documents (2) and (3). The subject-matter of the present claims is therefore novel with respect to these documents.

4. Both parties agreed with the finding in the decision under appeal that document (2) should be considered as the closest state of the art, although it related to

the solution of a technical problem quite different from that addressed in the present patent specification, for the sole reason that it described a resin coated photobase wherein the resin coating consisted of two layers and had therefore among all cited documents the greatest number of technical features in common with the subject matter of the patent in dispute.

Nevertheless the Board observes that in the determination of the closest state of the art ex post facto considerations should be avoided. Therefore a document not mentioning a technical problem that is at least related to that derivable from the patent specification, does not normally qualify as a description of the closest state of the art on the basis of which the inventive step is to be assessed, regardless of the number of technical features it may have in common with the subject-matter of the patent concerned.

In the specification of the patent in dispute it is stated on page 2, lines 4 to 22 that a conventional base paper used for photographic prints typically comprises a high quality paper substrate (hereinafter called "raw paper base") which has a coating on one or both sides (hereinafter called "resin coated photobase"), which acts to provide a suitable physical base structure for the image carrying layer(s), usually in one or more layers of gelatin based photographic emulsion. According to page 2, lines 34 to 40 an important property of photobase is its stiffness, because the photographic printing paper eventually produced must not be too floppy, which is especially

important where large prints are intended for hand processing, as for example in enlargements, and for reducing the tendency of sensitised print paper, which has gelatin based photographic emulsion layer(s) on it, to curl. It is also stated there that in currently available resin coated photobase the major contribution to stiffness came from the paper rather than the resin coating, because the typical resin, viz. low density polyethylene (LDPE), used for coating raw photobase has relatively low stiffness.

It is further mentioned in the patent specification that the application of an additional stiff coating layer on the top of the face side of a resin coated photobase has the additional and unexpected advantage that it reduces the incidence of pitting as compared with that obtained with a pigmented LDPE monolayer (see page 5, line 64 to page 6, line 2). It can be seen from Example 3, in particular page 8, lines 38 to 44, that the reduction of pits results in a desirable increase of the gloss of the photobase. In addition the Respondent has pointed out during the oral proceedings that this reduction of pits improves the quality of colour prints obtained with printing papers produced from the resin coated paper base according to the patent in dispute, because any mixing of colour layers is avoided. These statements have not been disputed by the Appellant. The Board therefore accepts that they correctly reflect the relevant technical background. Since document (2) does not mention the above problem of insufficient stiffness, let alone the additional one of reducing the incidence of pitting, it does not reveal a state of the art closer to the subject-matter of the patent in dispute than that mentioned in the

patent specification. In the Board's judgment the appropriate closest state of the art on the basis of which the inventive step in the present case should be assessed is therefore a typical conventional resin coated photobase wherein the coating of at least the face side consists mainly of low density polyethylene (LDPE).

As already mentioned above, the technical problem derivable from the patent in dispute was to increase the stiffness and the surface quality of such a conventional resin coated photobase without unacceptably increasing its thickness.

It can be seen from the comparative data contained in Examples 1 to 3 of the patent specification (in respect of the improvement of the surface quality only Example 3) that this technical problem has indeed been solved. This fact was not disputed by the Appellant, who, however, submitted that, as a consequence of the fact that the above problem was not addressed in the prior art documents, it should be disregarded because it was unrealistic and artificial.

The Board cannot, however, agree with that submission, since it does not correspond to the need to determine the technical problem on an objective basis (see e.g. T 20/81, OJ EPO 1982, 217, point 3 of the reasons). This means that all technical advantages which a person skilled in the art would reasonably consider useful and which have been credibly achieved with respect to the relevant closest state of the art have to be taken into account. In the present case, the Appellant merely asserted that the technical problem derivable from the

patent specification was artificial and unrealistic, but did not give any good reason why a skilled person would not have considered that a possibility to adjust stiffness independently from the thickness, combined with the possibility to improve the surface quality of a conventional resin coated photobase, would be a desirable advantage. In contrast to the Appellant's submission, the Board finds that it follows from the statement that the suitable stiffness of the photobase predominantly depends on commercial demands, that a skilled person would indeed consider it worth-while to try to solve the above problem. The situation underlying decision T 76/83 of 21 March 1985 (not published in OJ EPO), referred to by the Appellant, was quite different. In that case it was not shown that an alleged additional technical problem was credibly solved and the Board did thus not consider it (see point 13 of the reasons).

However, for reasons similar to those set out in decision T 76/83 the calculations submitted by the Respondent during the appeal proceedings do not qualify as a basis for formulating a more specific technical problem than that formulated above on the basis of the facts derivable from the patent specification. On the one hand, these results demonstrate no more than that the increase in stiffness of the photobase obtained by incorporating a layer of polycarbonate is higher than what a skilled person would have estimated from a rough calculation on the basis of his common general knowledge. Nevertheless, the calculated values were not discouragingly low, so that a skilled person would not have concluded that there would be no realistic chance to solve the above technical problem. On the other

hand, in the absence of any comparison of polycarbonate with other stiff polymers, these results do not prove that the effect of polycarbonate is different from that of any other polymer of comparable stiffness. Nor had the subject-matter of the patent in dispute been limited to this specific material.

The solution for the above problem proposed in the patent in dispute consists essentially in applying, at least to the face side of a suitable raw paper base, a coating consisting of at least two layers, the top layer being relatively thin and consisting of a polymeric material having a stiffness modulus of at least 2 GPa whereas the inner layer consists predominantly of LDPE.

In the Board's judgment the person skilled in the art to whom the above technical problem is addressed would be familiar with the manufacturing of resin coated photographic base papers. This person would be aware of all known possibilities to apply polymeric layers onto paper and would therefore have known document (10), which describes the method of coextrusion in general terms for a wide variety of purposes, including the improvement of stiffness (see the abstract on page 112). However, the possibility of coextruding polycarbonate or another resin having a stiffness modulus of more than 2 GPa and LDPE onto paper, let alone any particular advantages of doing so, such as the possibility of improving the surface gloss by reducing the occurrence of "pitting", is not mentioned in that document.

It is true that this person skilled in the art **could** fairly expect, on the basis of its common general knowledge, that the partial problem of increasing the stiffness of a resin coated photobase without unacceptably increasing its thickness **could** in principle be solved by incorporating a layer of a stiffer polymer in the coating (see e.g. the specification of the patent in dispute, page 4, lines 54 to 59). This was admitted by the Respondent during the oral proceedings. The Board is further satisfied that the determination of the lower limit of the stiffness modulus characterising the stiffer polymers suitable for the desired enhancing of the overall stiffness of photobase follows mainly from commercial considerations and routine experimentation, as submitted by the Appellant (see also the specification of the patent in dispute, page 3, lines 27 to 29 in combination with page 3, line 54 to page 4, line 2). It was further admitted that the paper expert would have hesitated to provide a layer of a stiff polymer in direct contact with the base paper, since he would expect adhesion problems. Nevertheless, both parties agreed that at least two possible positions remained, namely on the top of either the face side, destined for receiving the light sensitive coating, or the opposite side (called "wire side" in the patent specification) of the base paper. In addition, the Appellant has not disputed the Respondent's submission that in order to retain the conventional basis for the application of the light sensitive photographic layer(s) it would rather have been reasonable to consider applying any additional coating destined to enhance the overall stiffness of

the photobase on the wire side, which is less sensitive to surface quality.

It is further true that the resin coated photobase defined in the present Claim 1 consists of materials already known in the art of manufacturing resin coated photobase in different combinations, as submitted by the Appellant. Thus, the use of polycarbonate, the preferred material used for the top layer of the face side according to the disputed patent, is described in document (9) as the sole coating of raw paper base for the purpose of reducing the shrinking of the photobase during photographic processing (see the paragraph bridging pages 211 and 212), whereas LDPE is acknowledged in the patent specification as the conventional coating material (see page 2, line 39). The principle of multilayer coating is known e.g. from document (2) for the purpose of improving the adhesion of the coating to the raw paperbase (see page 1, left column, lines 50 to 58).

In the Board's judgment, however, the common general knowledge and the cited documents are at the most sufficient to demonstrate that a person skilled in the art **could** have provided a resin coated photobase as defined in the present Claim 1, namely having the additional layer of the stiff polymer **on the face side**. However, since it is necessary in order to demonstrate obviousness to show that the skilled person **would** have combined and arranged these known materials with a view to solving the properly defined technical problem (see also T 2/83, OJ EPO 1984, 265), and since the technical problem to be considered here, i.e. that of stiffness of photobases **and** the avoidance of "pitting"

was, as admitted by the Appellant, not addressed in the cited documents, the person skilled in the art would not have derived any suggestion from these documents which could assist it in the attempt to solve this technical problem.

In addition, it was in the present case not "obvious to try" to apply a thin layer of e.g. polycarbonate to a resin coated photobase on its face side, as submitted by the Appellant with reference to decision T 296/87 (OJ EPO 1990, 195). It follows from point 8.4.1 of the reasons of this decision that in the case to be decided there it was common general knowledge that in cases of biologically active organic compounds which exist in the form of racemates one enantiomer is usually more active than the other. Therefore it was held to be obvious that a skilled person would separate the two enantiomers and perform a routine test in order to provide a compound of greater activity than the racemate. In the present case, however, the common general knowledge and the cited documents were totally silent in respect of the possibility to reduce the incidence of pitting and thereby to improve the surface quality of a resin coated photobase by application of a thin layer of a polymer having a stiffness modulus greater than 2 GPa.

The Board therefore concludes that the solution of the present technical problem according to the present Claim 1 was not obvious in the light of the cited state of the art and the relevant common general knowledge.

5. The method Claim 13 as well as Claims 2 to 12 and 14 to 16 which depend on either of the two independent claims

derive their patentability from that of Claim 1. The patent can therefore be maintained on the basis of the text underlying the decision under appeal.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Spangenberg