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**Datasheet for the decision
of 20 November 2006**

Case Number: T 0863/05 - 3.4.02

Application Number: 96116990.1

Publication Number: 0763781

IPC: G03F 7/09

Language of the proceedings: EN

Title of invention:
Antihalation compositions

Patentee:
SHIPLEY COMPANY INC.

Opponent:
Clariant Verwaltungsgesellschaft mbH

Headword:
-

Relevant legal provisions:
EPC Art. 52(1), 54, 56

Keyword:
"Novelty and inventive step (yes)"

Decisions cited:
G 0009/91

Catchword:
-



Case Number: T 0863/05 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 20 November 2006

Appellant: SHIPLEY COMPANY INC.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 28 April 2005
revoking European patent No. 0763781 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: A. G. Klein
Members: F. J. Narganes-Quijano
C. Rennie-Smith

Summary of Facts and Submissions

- I. The appellant (patent proprietor) has lodged an appeal against the decision of the opposition division revoking European patent No. 0 763 781 (based on application No. 96 116 990.1).
- II. The opposition filed by the respondent (opponent) against the patent to the extent of claims 1 to 10 and claims 17 to 19 as granted was based on the grounds of lack of novelty and of inventive step (Article 100(a) together with Articles 52(1), 54 and 56 EPC) in respect of the invention defined in claims 1 to 10, and on the ground of insufficiency of disclosure (Article 100(b) EPC) in respect of the invention defined in claims 17 to 19.

In its decision the opposition division held that the invention defined in claims 17 to 19 as granted was sufficiently disclosed (Article 100(b) EPC) but that the subject-matter of claim 1 as granted was not novel (Articles 52(1) and 54(2) EPC) over the disclosure of document

D1 : US-A-4413052,

and in particular over the composition disclosed in example 4 of the document.

In view of this finding and of the then sole request of the patent proprietor that the opposition be dismissed and the patent be maintained as granted, the opposition division decided to revoke the patent as a whole pursuant to Article 102(1) EPC.

III. Oral proceedings were held before the Board on 20 November 2006 in the presence of the parties.

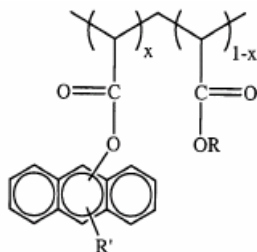
The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the set of claims amended according to the main or the auxiliary request together with the respective amended description filed with its letter of 19 October 2006.

The respondent requested that the appeal be dismissed.

At the end of the oral proceedings the Board gave its decision.

IV. The wording of claim 1 amended according to the main request of the appellant reads as follows:

" 1. An antihalation coating composition comprising a polymer resin binder having anthracene units therein and a crosslinker compound capable of causing a thermally-activated crosslinking reaction of the resin binder, said resin binder conforming to the formula:



where x is the mole fraction of anthracene ester units in the polymer and varies between 0.1 und [sic] 1.0, R is hydrogen or alkyl and R' is a member selected from

the group consisting of hydrogen, alkyl, halo and alkoxy."

Dependent claims 2 to 9 all refer back to claim 1.

Independent claims 10 and 12 and dependent claims 11 and 13 to 17 of the main request all define subject-matter that was not opposed.

The wording of independent claim 18 of the main request reads as follows:

" 18. A method for forming a relief image on a substrate, said method including the steps of:
 applying on the substrate a layer of an antihalation coating composition comprising a resin binder having anthracene units therein and a crosslinker compound capable of causing a thermally-activated crosslinking reaction of the resin binder, or a layer of the antihalation coating composition of any one of claims 1 to 9, and
 applying over said antihalation composition layer a layer of a photoresist composition comprising a resin binder and a radiation sensitive component."

Dependent claims 19 and 20 refer back to claim 18.

The wording of the claims amended according to the auxiliary request is not relevant to the present decision.

V. The arguments of the appellant in support of its requests are the following:

In view of the structural formula and the mole fractions specified in claim 1, the expression "conforming to the formula" is clear and excludes additional pendant groups differing from those given in the formula specified in the claim. In particular, for $x = 1$ the polymer is a homopolymer of anthracene ester units only.

The claim requires a crosslinker compound capable of causing a thermally activated crosslinking reaction of the polymer defined in the claim and containing anthracene groups. This feature is not derivable from the disclosure of document D1. The document requires photo-polymerisation and photo-curing of the composition and further specifies the possibility of thermally curing the resulting material by means of epoxide groups; however, the polymer defined in claim 1 does not contain epoxide groups and, in addition, document D1 fails to disclose thermally curing components other than epoxide-containing components. For the same reasons, there is no teaching in document D1 that would suggest the claimed composition, the document does not even mention the antihalation and the adherence properties of coatings formed with the claimed composition.

VI. The arguments of the respondent in support of its request are the following:

It is not clear in claim 1 of the main request whether the expression "conforming to the formula" is to be interpreted as "consisting of", i.e. as excluding other components, and consequently the amendments to the claim are not admissible.

The amendments to claim 1 render the claimed composition novel over the composition of example 4 of document D1. However, the claimed composition is still anticipated by the disclosure of document D1. In particular, the disclosure of document D1 in column 4, line 65 to column 5, line 24 together with column 12, lines 26 to 38 anticipates the claimed homopolymer, i.e. the polymer defined in the claim for $x = 1$. Furthermore, the formulation of the claim does not exclude the presence in the composition of epoxide resins as those disclosed in document D1 (column 14, lines 14 to 25) and, in addition, document D1 already discloses the use of amine-based thermal crosslinkers (column 16, lines 8 to 19) as also specified in paragraph [0018] of the patent specification and in granted claim 7. The amine-based thermal crosslinkers are described in document D1 as heat-curing agents for epoxide resins but they are at the same time effective as thermal crosslinkers for the binder resin having anthracene units therein. Thus, since the patent specification does not describe the mechanism of crosslinking that is actually performed in the composition, neither the patent specification nor the claimed subject-matter excludes the crosslinking reaction process specified in column 14, line 14 *et seq.* and column 15, line 65 *et seq.* of document D1.

As regards inventive step, the patent fails to specify examples of the intended use of the composition, and the technical problem solved by the claimed composition can only be seen in providing alternative compositions. It is a matter of routine, however, to modify the compositions of document D1 by changing the components.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request - Amendments*

2.1 Claim 1 amended according to the main request is based on claims 1 and 3 as granted and on the passage on page 4, line 17 *et seq.* of the patent specification as well as on the corresponding parts of the application as originally filed. Dependent claims 2 to 9 correspond to claims 2 and 4 to 10 as granted, respectively.

The respondent has objected to the amendment in claim 1 relating to the resin binder "conforming to the formula" specified in the claim as being unclear and therefore not admissible. However, the objected expression was already contained in claim 3 as originally filed (Article 123(2) EPC) as well as in claim 3 as granted. In addition, the combination of claims 1 and 3 as granted does not result in the formulation of the resulting amended claim being unclear as argued by the respondent since the fact that the resin binder "conforms to" the specified formula excludes the possibility that the resin binder might conform to a different formula, or to the same formula but with relative mole fractions different from those specified in the claim, as actually supported by the passage on page 4, lines 17 to 39 of the patent specification (Article 84 EPC). Accordingly, the objections raised by the respondent in support of the non-admissibility of the amendments to claim 1 do not convince the Board.

- 2.2 The subject-matter of claims 10 to 17 of the main request corresponds to that of claims 11 to 16 as granted, whereby the claims have been appropriately amended to take account of the fact that claims 11 to 16 as granted referred back to claims 1 to 10 as granted and the subject-matter of these claims has been amended during the appeal proceedings.
- 2.3 Claims 18 to 20 of the main request correspond to claims 17 to 19 as granted appropriately amended to take account of the amendments to claim 1 as granted to which the granted claims referred back.
- 2.4 The description has been amended during the appeal proceedings to make it consistent with the amended set of claims of the main request (Article 84 and Rule 27(1) (c) EPC).
- 2.5 The Board is therefore satisfied that the amendments made to the patent according to the appellant's main request are admissible (Rule 57a EPC) and comply with the formal requirements of the EPC, and in particular with those set forth in Articles 84, 123(2) and (3) EPC.

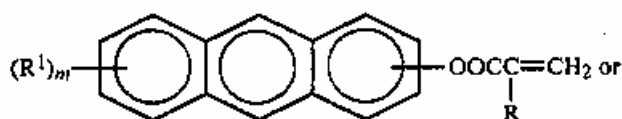
3. *Main request - Claims 1 to 9*

3.1 Novelty

It has not been disputed by the parties that example 4 of document D1 fails to disclose a polymer as claimed and that, consequently, the amended claim 1 overcomes the reasons on which the opposition division based its finding of lack of novelty.

During the oral proceedings, however, the respondent objected that the claimed composition is still anticipated by the disclosure of document D1, and in particular by the polymer disclosed in column 4, line 65 *et seq.* together with column 12, lines 26 to 38 and by the crosslinking reaction process disclosed in column 14, lines 14 to 25 and column 15, line 65 to column 16, line 19. This line of argument of the respondent in support of lack of novelty of the claimed composition does not convince the Board for the following reasons:

Document D1 discloses the photo-polymerisation of compounds having anthracene units (column 4, line 63 to column 5, line 35) and specifies in columns 5 to 12 a series of alternative anthracene compounds that may be used in the photo-polymerisation reaction. Among these alternatives, document D1 specifies in column 12, lines 26 to 38 esters of the general formula



where R denotes a hydrogen atom or a methyl group, R¹ denotes a chlorine or bromine atom, a methyl group or a nitro group, and m is zero, 1 or 2 (column 12, lines 53 and 54 together with column 5, lines 15 to 18). These esters are exposed to actinic radiation so that the esters are photo-polymerized but the resulting polymeric compound still remains photo-crosslinkable (column 4, line 65 to column 5, line 25). According to the submissions of the respondent, the photo-

polymerisation of these esters would result in photo-crosslinkable homopolymers constituted by repeating units satisfying the formula specified in claim 1 for $x = 1.0$. This view has not been contested by the appellant.

However, as stressed by the appellant, claim 1 requires a crosslinker compound capable of causing a thermally-activated crosslinking reaction of the resin binder conforming to the formula specified in the claim. Thus, independently of the question raised by the respondent of whether or not the formulation of claim 1 also encompasses compositions having, in addition to those expressly specified in the claim, thermally crosslinkable epoxide components such as those specified in document D1 (column 14, lines 14 to 29 and column 15, line 65 *et seq.*), the question arises whether document D1 contains a clear and unambiguous disclosure of the provision in the composition of a crosslinker compound capable of thermally crosslinking the homopolymer referred to above as required by the express formulation of claim 1.

The disclosure of document D1 in column 4, line 63 to column 14, line 13 is confined to the photo-polymerisation and to the subsequent photo-crosslinking reaction of the different alternative compositions disclosed in the document. Then, in column 14, lines 14 to 25 and in column 15, line 65 to column 16, line 18 the document specifies that additional crosslinking may be achieved by thermal curing through epoxide groups, and the document discloses two alternative embodiments, namely a first embodiment in which the composition includes a photo-polymerisable compound having in the

same molecule both a group as previously specified and a 1,2-epoxide group, and a second alternative in which an epoxide resin is included in the composition before photo-polymerisation. In the first alternative, however, the resulting resin binder would not be constituted by a polymer as claimed. As regards the second alternative, it cannot be excluded that a homopolymer as claimed is formed after photo-polymerisation of the composition which already includes the epoxide resin; nonetheless, there is no clear and unambiguous disclosure that the crosslinker agent to be incorporated in the composition for causing thermal-crosslinking of the epoxide resin would also additionally cause thermal-crosslinking of the homopolymer binder resin that has been previously photo-polymerised and photo-cured.

The submission of the respondent that some of the thermal crosslinker agents listed in document D1 for causing thermal-crosslinking of the epoxide resins (column 16, lines 8 to 18), and in particular those of the amine-based type also considered in paragraph [0018] of the patent specification and in claim 7 as granted (now dependent claim 6), would not only cause photo-crosslinking of the epoxide resins but also inherently and inevitably photo-crosslinking of the homopolymer is not disputed by the Board. However, this submission is not sufficient to conclude that the claimed composition is anticipated by the disclosure of document D1 since such a conclusion would require a line of reasoning relying on

- first, the selection from among all the alternative components disclosed in columns 5 to 12 of the esters mentioned above and conforming to the claimed formula,

- second, the selection of the second of the alternative photo-crosslinking processes disclosed in the document and referred to above and

- third, the selection, from among the crosslinker agents listed in the document for causing thermal-crosslinking of the epoxide resins, of those agents that would also additionally cause thermal-crosslinking of the homopolymer.

Thus, in the absence of an express or at least implicit disclosure or clear teaching in document D1 towards the selection and the subsequent combination of the particular alternatives specified above, the line of reasoning of the respondent that the combination of specific ones of the alternatives disclosed in document D1 would inherently result in the claimed composition falls outside the ambit of the assessment of lack of novelty within the meaning of Article 54(1) EPC.

The Board concludes that document D1 fails to clearly and unambiguously disclose the composition defined in claim 1. Accordingly, claim 1 as well as dependent claims 2 to 9 appendant thereto define novel subject-matter (Article 52(1) and 54 EPC) over the documents considered during the proceedings.

3.2 Inventive step

Document D1 addresses the problem of avoiding the use of organic solvents in coating compositions (column 1, lines 25 to 35) and fails to address the primary technical problem considered in the patent in suit, i.e. the provision of compositions for forming coatings having predetermined antihalation and adhesion

properties (claim 1 and paragraphs [0005] to [0010] of the patent specification). Thus, there is no reason *a priori* why the skilled person would have considered the disclosure of document D1 as a starting point when considering the problem of providing compositions for coatings having specific antihalation and adhesion characteristics. In addition, as already stated in the penultimate paragraph of point 3.1 above, there is no disclosure or teaching in document D1 towards the specific combination of the features of the composition defined in claim 1 and, more particularly, towards the thermal crosslinking reaction of a polymer containing anthracene groups but no epoxide group as claimed. Consequently, in the absence of any other pertinent disclosure or teaching in the prior art, the respondent's submissions that the skilled person seeking alternative compositions to those disclosed in document D1 would have considered, from among the alternatives disclosed in document D1, the specific combination of alternatives that would have resulted in the claimed subject-matter fails to persuade the Board.

The Board concludes that the subject-matter of claim 1 and that of dependent claims 2 to 9 involves an inventive step (Articles 52(1) and 56 EPC) over the prior art considered during the proceedings.

4. *Main request - Claims 10 to 17*

The subject-matter of claims 10 to 17 of the main request corresponds to the subject-matter of claims 11 to 16 as granted, the claims having been amended only to preserve the subject-matter actually defined in the respective granted claims (see point 2.2 above). In

addition, claims 11 to 16 as granted were not opposed. Accordingly, apart from the formal admissibility of the amendments referred to above and required to take account of the amendments made to claim 1 as granted (point 2.2 above), claims 10 to 17 of the appellant's main request are not open to examination in the present opposition appeal proceedings (G 9/91 OJ EPO 1993, 408).

5. *Main request - Claims 18 to 20*

The subject-matter of claims 18 to 20 of the main request corresponds to that of claims 17 to 19 as granted, the claims having been amended only for formal reasons (point 2.3 above). In addition, claims 17 to 19 as granted were opposed only on the grounds for opposition under Article 100(b) EPC. In the decision under appeal, however, the opposition division concluded that the patent discloses the invention as defined in claims 17 to 19 as granted in a manner sufficiently clear and complete within the meaning of Articles 100(b) and 83 EPC, and this finding was not contested by the respondent during the present appeal proceedings. In addition, the Board has no reason for departing from the opposition division's view in this respect.

Accordingly, the Board concludes that the grounds for opposition under Article 100(b) EPC invoked by the respondent with regard to claims 17 to 19 as granted do not prejudice the maintenance of the patent as amended according to the main request of the appellant.

6. In view of the above conclusions and considerations, the Board concluded during the oral proceedings that

the patent as amended according to the appellant's main request and the invention to which it relates met the requirements of the EPC and that consequently the patent was to be maintained as amended according to the main request (Article 102(3) EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent in amended form on the basis of the following documents:
 - claims 1 to 20 of the main request dated 19 October 2006,
 - pages 2 to 7 of the description amended according to the main request dated 19 October 2006, and
 - the figure as granted.

The Registrar:

The Chairman:

E. Görgmaier

A. G. Klein