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Datasheet for the decision of 11 July 2019

Case Number: T 0638/16 - 3.3.06

Application Number: 08745036.7

Publication Number: 2262949

IPC: D21H19/44

Language of the proceedings: EN

Title of invention:
PAPER COATING OR BINDING FORMULATIONS AND METHODS OF MAKING AND USING SAME

Patent Proprietor:
BASF SE

Opponents:
Synthomer Deutschland GmbH
OMNOVA Solutions Inc.

Headword:
Dextrose equivalent/BASF

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no) - effect not made credible within the whole scope of claim - closest prior art

Decisions cited:
T 0835/00, T 0698/10

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 0638/16 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 11 July 2019

Appellant: (Opponent 1)	Synthomer Deutschland GmbH Werrastrasse 10 45768 Marl (DE)
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Respondent: (Patent Proprietor)	BASF SE Carl-Bosch-Strasse 38 67056 Ludwigshafen am Rhein (DE)
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Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 26 January 2016 maintaining European Patent No. 2262949 in amended form.**

Composition of the Board:

Chairman	J.-M. Schwaller
Members:	S. Arrojo
	C. Heath

Summary of Facts and Submissions

I. Appeals were filed by opponents 1 and 2 (from now on respectively "appellant 1" and "appellant 2") against the decision of the opposition division to maintain European patent Nr. 2 262 949 on the basis of the 1st auxiliary request filed with letter dated 10 January 2014, claim 1 of which request (from now on "main request") reads:

"A paper coating or binding formulation, comprising: an aqueous polymer dispersion comprising a copolymer obtained by polymerization of an unsaturated monomer and a carbohydrate derived compound having a dextrose equivalent (DE) of 10 to 35; and a tetrasulfonate-based fluorescent whitening agent."

II. With their grounds of appeal the appellants objected to the claims as maintained under Articles 56 and 83 EPC.

III. In its reply the patentee (from now on "respondent") requested to reject these appeals or, auxiliarly, to maintain the patent on the basis of auxiliary request 1, corresponding to auxiliary request 2 filed with letter dated 10 January 2014 during opposition proceedings, claim 1 of which corresponds to that of the main request with a restricted dextrose equivalent (DE) range of *"15 to 20"*.

The respondent further submitted a test report (D14) and requested not to admit the objections raised under Article 83 EPC.

IV. With letter dated 23 January 2018 appellant 1 submitted further arguments as well as two new documents (D15 and D16).

V. Following the board's preliminary opinion that both requests then on file complied with the requirements of Article 83 EPC but not with those of Article 56 EPC, the respondent filed two new sets of claims as auxiliary requests 2 and 3 with a letter dated 13 May 2019, with claim 1 of auxiliary request 2 reading:

"1. A method of improving the whitening properties of paper; comprising:
providing an aqueous polymer dispersion comprising a copolymer obtained by polymerization of an unsaturated monomer and a carbohydrate derived compound having a dextrose equivalent (DE) of 10 to 35;
mixing the aqueous polymer dispersion with a tetrasulfonate-based fluorescent whitening agent to produce a paper coating or binding formulation; and
applying the formulation as a coating to paper."

Claim 1 of auxiliary request 3 corresponds to that of auxiliary request 2 with a restricted dextrose equivalent (DE) range of *"15 to 20"*.

VI. Appellant 2 requested not to admit auxiliary requests 2 and 3 as late filed and submitted a declaration by Dr. Triantafillopoulos (D17), and appellant 1 announced that it would not attend the oral proceedings.

VII. At the oral proceedings, the discussion focused on assessing compliance of claim 1 of the above requests with the requirements of Article 56 EPC in view of document D2 (US 5 705 563) as closest prior art and of documents D4 (Blankophor Brochure, 1989, BAYER AG), D10 (Handbook of Book Paper and Board) and D12 (Brochure "Ciba Tinopale in coating"). The admissibility of auxiliary requests 2 and 3 was also discussed.

VIII. After closure of the debate, the final requests of the parties were as follows:

The appellants (appellant 1 in writing) requested to set aside the decision and to revoke the patent.

The respondent requested that the appeals be dismissed and that the patent be upheld in the amended form maintained by the opposition division or, auxiliarly, on the basis of one of the sets of claims according to auxiliary request 1 (corresponding to auxiliary request 2 filed with letter dated 10 January 2014), or auxiliary request 2 or 3 filed with letter dated 13 May 2019.

Reasons for the Decision

1. Main request - Article 56 EPC

The board has come to the conclusion that the main request does not comply with the requirements of Article 56 EPC for the following reasons:

1.1 The patent in suit intends to solve the problems associated to the use of carriers or activators in paper coating and binding formulations. In particular, the patent indicates (paragraph [0003]) that such carriers/activators, which are conventionally used to enhance the brightening effects of whitening agents, undesirably increase the viscosity of the coating and the associated costs. From this starting point, the patent proposes solutions to decrease the viscosity and the costs of the formulation without negatively affecting the performance of the whitening agent, and in particular indicates (paragraph [0009]) that the use of copolymers derived from an unsaturated monomer and a

carbohydrate derived compound having a dextrose equivalent (DE) of 10-35 surprisingly maintains the brightening effect of whitening agents even in the absence of carriers/activators, thereby reducing the viscosity and the cost of the formulation.

1.2 Closest prior art

1.2.1 Document D1 relates (see column 3, lines 16-20) to a method for brightening an aqueous coating slip that contains at least one latex binder and at least one synthetic co-binder (i.e. a carrier/activator) different therefrom comprising treating the coating slip with an optical brightener.

Document D2 relates (see column 2, line 47; column 11, lines 18-21 and 32-35) to aqueous polymer dispersions to be used as binder for paper coatings for the purpose of improving the stability and rheological properties of the coating as well as the resistance of the resulting paper. In particular, document D2 describes (see example 2) a binder coating composition for paper comprising a copolymer "D23", which is made by mixing sugared starch "01910" having a dextrose equivalent of 11-14 (see table in column 11 of D2) with "feed 1" comprising unsaturated monomers (see D2, column 13, lines 1-5 and column 16, lines 54-67). The copolymer is said to provide a favourable flow behaviour which proves to be particularly advantageous when the polymer dispersion is used as a size coat binder, since it "enables the binder to penetrate into the interstices between the abrasive particles" (see D2, column 11, lines 18-21) and "when employed as binder for paper coating (...) give(s) paper increased wet and dry pick resistance" (see D2, column 11, lines 32-35). The composition in example 2 further comprises "Blankophor

® PSG", a disulfonate-based whitening agent, and does not include any further carrier or activator.

1.2.2 The Board has concluded that document D2 (in particular example 2) represents the closest prior art, because it relates to the same technical field (i.e. binders for paper coating compositions), it includes a copolymer as defined in claim 1, it does not include any carrier or activator and, as it is the case in the claimed invention, one of the purposes of adding said copolymer is to improve the flowability (i.e. to decrease the viscosity) of the composition.

1.2.3 The respondent argued that document D2 could not be regarded as the closest prior art because, unlike document D1, it did not address the problem of improving or maintaining the performance of whitening agents. Consequently, document D1 would be a more appropriate closest prior art.

1.2.4 As a reminder, the selection of the closest prior art involves the following two steps (see CLBoA section I.D.3):

a) the document should be technically close to the underlying invention, and

b) it should be the most promising springboard to arrive at the claimed subject-matter.

Criterion a) represents an exclusion filter to prevent the use of technically unreasonable starting points, and generally implies discarding those documents which do not belong to the same or a similar technical field, and/or which do not solve the same or similar technical problems as the underlying invention.

Criterion b), on the other hand, represents a selection step which involves choosing the document (among those not discarded in the first step) with the most technical features in common with the invention and/or which requires the least structural modifications in order to arrive to the claimed subject-matter.

1.2.5 In the present case, D2 relates to the same technical field, solves at least one of the technical problems of the invention (i.e. to decrease the viscosity) and anticipates the feature (i.e. the copolymer) which is presented as the solution to the other technical problem solved by the invention (i.e. to improve/ maintain the brightening performance of the whitening agent). While document D2 omits that this latter problem is solved by the presence of the copolymer, disqualifying it as the closest prior art solely on this basis, as the respondent proposes, is not considered to be the correct way to proceed.

1.2.6 As stated in **T 0698/10**, reason 3.4, the closest prior art needs not disclose the same technical problem as the invention, in particular not the same objective technical problem, since this step is subsequent to the determination of the closest prior art. However, in cases of doubt the formulation of the objective technical problem might be used as a secondary indicator of the technical closeness between a document and an invention. In particular, as explained in **T 0835/00**, reason 4.4, an objective technical problem which is alien to the disclosure of the selected document and its objectives generally indicates that this document was not an appropriate selection from a technical point of view. In other words, if a document differs from the invention in a way which leads to a problem which is completely unrelated to the disclosure

of that same document, this could be seen as an indicator that the selection of that document and the subsequent determination of the problem solved might have been influenced by the knowledge of the invention (i.e. hindsight).

1.2.7 Applying this test to the present case and in view of the fact that the reformulated objective technical problem when starting from D2 is that of finding an alternative composition, it is clear that this document should not be discarded as closest prior art in the above-mentioned first step for selecting the closest prior art.

1.2.8 As to the second step for selecting the closest prior art, it is apparent that document D2, which discloses a formulation with the same copolymer as the underlying invention and with no carrier/activator, has more technical features in common with the invention and represents a more promising springboard than D1.

1.3 Solution and problem solved by the invention

1.3.1 The subject-matter of claim 1 differs from the disclosure of document D2 in that the whitening agent is tetrasulfonate-based (example 2 of D2 discloses a disulfonate-based whitening agent).

1.3.2 The respondent argued that in view of the test report D14, which compared formulations including disulfonate-based whitening agents (F1) and tetrasulfonate-based whitening agents (F2), it was clear that the formulation of the invention would provide a better brightening performance than the formulation in D2, in particular in the presence of UV radiation. The problem solved by the invention would therefore be that of

improving the brightening performance of the whitening agent.

1.3.3 The Board disagrees with this conclusion.

As argued by appellant 2, the test report D14 has a number of shortcomings and does not appear to provide strong evidence for the above conclusions of the respondent. In particular, the comparative example F1 differs from the formulation of the closest prior art (example 2 of D2) in the dextrose equivalent (18 in F1 vs 11-14 in D2) and in the whitening agent itself ("Leucophor AP" in F1 vs. "Blankophor PSG" in D2), which questions the relevance of these data for the underlying comparison between claim 1 and the formulation in D2. Furthermore, the differences observed between the delta brightness in F1 and F2 are rather small and D14 only discloses this single comparative point.

Document D4 (see figures 29, 30, 31 and 32), on the other hand, is considered to provide more detailed and useful information on the whitening performance of the different "Blankophor" whitening agents. In particular, the cited figures compare the whitening performance of "Blankophor P" (a preferred tetrasulfonate-based agent according to the patent in suit (see paragraph [0028])), "Blankophor PC" (a further tetrasulfonate-based agent), "Blankophor PSG" (the disulfonate-based agent used in example 2 of D2) and "Blankophor PSK" (a hexasulfonate-based agent) under different concentrations of $CaCO_3$, clay, starch, co-binder (i.e. carrier/activator) and of the whitening agent itself.

Lines A in figure 30 of D4 (i.e. formulations with no co-binder/carrier) appear to indicate that at lower

whitening agent concentrations, disulfonate-based "PSG" performs better than the tetrasulfonate-based "P" and "PC", whereas at higher concentration the "PC" performs equally good or even better than the "PSG". In figures 29 and 31, on the other hand, tetrasulfonate-based "P" appears to perform better than disulfonate-based "PSG". Furthermore, in figure 31 the tetrasulfonate based "P" is the best performer at low concentrations and the worst one at higher concentrations. All in all, there is no single agent that consistently outperforms the others in terms of whitening performance under any condition.

Thus, the Board cannot acknowledge any particular effect associated with the selection of a tetra-sulfonate based whitening agent, let alone one which would apply throughout the entire claimed range (i.e. note that claim 1 neither specifies the presence or absence of co-binder/carrier nor the concentration of any of the components).

1.3.4 Since there is no evidence in support of a technical effect associated with the selection of a tetrasulfonate-based whitening agent over the entire range claimed, the board concludes that the problem solved must be reformulated as providing an alternative paper coating or binding formulation to the one known from D2.

1.4 Obviousness

1.4.1 From D4 it is clear that disulfonate-based, tetrasulfonate-based and hexasulfonate-based whitening agents are commonly used in paper coating formulations and that, when looking for alternative compositions, the skilled person would select any of these known

agents in accordance with the underlying circumstances (e.g. presence or absence of carrier, costs, desired properties, components and concentrations of the coating, etc) and without exercising any inventive skills.

1.4.2 The respondent argued that even if the only problem solved by the invention was that of providing an alternative formulation, it would not be obvious for the skilled person to combine the disclosure of D2 with the teachings of D4 to arrive to the claimed invention. In particular, it would not be obvious to consider the teachings of D4 when starting from D2, because the latter did not provide any incentive for a skilled person to consider substituting the whitening agent in example 2. Furthermore, there would also be no reason to select a tetra-sulfonate based agent among all the different alternatives disclosed in D4.

1.4.3 The Board disagrees with this argumentation.

Since example 2 of document D2 discloses a binder for a paper coating comprising an optical brightener, there can be no doubt, as the respondent himself admitted, that the paper in example 2 is a white paper. Therefore, when solving the problem of providing alternative formulations, it is clear that one of the aspects which would be considered is that of testing different optical brighteners and that, in doing so, the disclosure of document D4 would be taken into account.

The board agrees with appellant 2 in that, since the problem solved by the invention is merely the provision of an alternative composition, there is no need to justify the selection of one particular element within

a group of known alternatives. In any case, the board notes that the skilled person would find some incentives in D4 to substitute the disulfonate-based agent in example 2 of D2 with a tetrasulfonate-based alternative. For example, in page 65, point 3 of D4 it is indicated that when clay is part of the composition (as it is the case in example 2 of D2) the use of the tetrasulfonate-based "Blankophor P" is more convenient than that of the disulfonate-based "Blankophor PSG".

1.5 The board therefore concludes that the subject-matter of claim 1 at issue is obvious in view of the disclosure of document D2 taken in combination with the teachings of document D4, and so lacks inventive step under Article 56 EPC.

2. Auxiliary request 1 - Article 56 EPC

2.1 The Board has concluded that auxiliary request 1 does not comply with the requirements of Article 56 EPC.

2.2 Closest prior art, solution and problem solved

As in the main request, document D2 is regarded as the closest prior art.

Claim 1 differs from this document in that the coating formulation contains a tetrasulfonate-based whitening agent (as the main request) and, additionally, in that the copolymer is obtained from a carbohydrate derived compound having a dextrose equivalent (DE) of 15-20.

No argument or evidence has been submitted which would indicate that this restricted range provides any particular technical effect with respect to the broader dextrose equivalent range of 10 to 35 anticipated by

example 2 of document D2. The board must therefore conclude that the problem underlying the alleged invention is still that of providing an alternative composition.

2.3 Obviousness

2.3.1 Document D2 (see column 3, lines 42-45) indicates that the use of sugared starches having a dextrose equivalent of 10-20 in the compositions of that disclosure is particularly preferred. This disclosure anticipates the dextrose equivalent range in claim 1 at issue because the upper end-value 20 corresponds to that defined in this claim.

2.3.2 For the board, it is apparent that when searching for alternative compositions, the skilled person would consider substituting the copolymer in example 2 of D2 with one falling within the explicitly disclosed preferred range of dextrose equivalent of 10 to 20.

2.3.3 The respondent argued that there was no explicit or implicit link between the general disclosure in column 3 of D4 and the specific embodiment of example 2, and that, consequently, there would be no reason to consider modifying the dextrose equivalent of the starch used in that example.

2.3.4 The board disagrees with this argumentation.
As in the main request, when the problem solved is merely that of proposing an alternative composition, there is no need to justify the selection of known alternatives/embodiments, in particular when the latter are disclosed in the closest prior art itself.
Furthermore, this selection is all the more justified

by the fact that the range is the most preferred one in document D2.

2.4 In view of the above arguments and of those brought forward for the main request, the board has concluded that the subject-matter of claim 1 is rendered obvious by the combined disclosures of documents D2 and D4.

3. Auxiliary request 2 - Article 56 EPC

3.1 The Board has concluded that auxiliary request 2 does not comply with the requirements of Article 56 EPC.

3.2 Closest prior art, solution and problem solved

3.2.1 As in the main request, document D2 is regarded as the the closest prior art.

Claim 1 differs from this document in that the formulation contains a tetrasulfonate-based whitening agent, which corresponds to the difference observed with respect to claim 1 of the main request.

Since this request does not provide any additional technical difference, the same arguments and conclusions as brought forward for the main request apply to this request.

3.2.2 The respondent argued that the definition of "a method of improving the whitening properties of paper" further reinforced the idea that the problem solved by the invention would be that of improving the brightening performance of the whitening agent. Since document D2 was unrelated to this problem it should not be regarded as the closest prior art.

3.2.3 The board disagrees with this argumentation.

While it is true that notwithstanding issues of clarity, the definition of a result to be achieved in a method claim can potentially involve a technical restriction of its subject-matter, the use of a whitening agent in a composition (as it is the case in example 2 of D2 and in claim 1 of the main request) implies as such a desire to provide a formulation with a(n) good/improved/advantageous whitening performance. Thus, in the present case, claim 1 is not considered to imply any technical restriction going beyond the scope of claim 1 of the main request.

4. Auxiliary request 3 - Article 56 EPC

4.1 The board has come to the conclusion that auxiliary request 3 does not comply with the requirements of Article 56 EPC.

4.2 In view of the arguments and conclusions presented for auxiliary requests 1 and 2, it is clear that the definition of a dextrose equivalent of 10 to 20 in *"a method of improving the whitening properties of paper"* is also rendered obvious by the combined disclosures of documents D2 and D4.

5. Since none of the requests submitted by the respondent is considered to comply with the requirements of Article 56 EPC, there is no need to deal with the other issues raised by the appellants.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

M. Patin J.-M. Schwaller

Decision electronically authenticated