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Datasheet for the decision of 21 September 2016

Case Number: T 0773/12 - 3.3.01

Application Number: 02723055.6

Publication Number: 1354009

IPC: C09D125/10, D21H19/58, C09D113/02

Language of the proceedings: EN

Title of invention:
BIMODAL AQUEOUS POLYMER DISPERSIONS

Patent Proprietor:
Dow Global Technologies LLC

Opponents:
BASF SE
Synthomer Deutschland GmbH

Headword:
Bimodal dispersions/DOW

Relevant legal provisions:
EPC Art. 56
RPBA Art. 13

Keyword:
Inventive step - auxiliary request 2 (no)
Late-filed requests A and B - admitted (no)

Decisions cited:

Catchword:

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Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0773/12 - 3.3.01

D E C I S I O N
of Technical Board of Appeal 3.3.01
of 21 September 2016

Appellant: (Opponent 2)	Synthomer Deutschland GmbH Werrastrasse 10 45768 Marl (DE)
Representative:	Müller Schupfner & Partner Patent- und Rechtsanwaltspartnerschaft mbB Schellerdamm 19 21079 Hamburg (DE)
Respondent: (Patent Proprietor)	Dow Global Technologies LLC 2040 Dow Center Midland, MI 48674 (US)
Representative:	Beck Greener Fulwood House 12 Fulwood Place London WC1V 6HR (GB)
Party as of right: (Opponent 1)	BASF SE 67056 Ludwigshafen (DE)
Representative:	BASF IP Association BASF SE ZRX-C6 67056 Ludwigshafen (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 3 February 2012 concerning maintenance of the European Patent No. 1354009 in amended form.**

Composition of the Board:

Chairman	A. Lindner
Members:	M. Pregetter
	L. Bühler

Summary of Facts and Submissions

I. European patent No. 1 354 009 was filed as patent application number 02723055.6, based on the international application published as WO2002/070615.

The patent was granted with claims 1-21. Among the seven independent claims are claims 1, 15 and 19 which read as follows:

claim 1:
"An aqueous dispersion of polymer particles having at least two separate maxima of the particle size distribution, wherein the two maxima are in the range from 13 to 50 nm and from 90 to 140nm, respectively, and the weight ratio of the small particles to the large particles is from 10/90 to 40/60, and wherein the solids content is higher than 55 percent."

claim 15:
"The process for the preparation of the dispersion according to any of Claims 1 to 8 wherein the small particles are generated in the presence of the large particles during the emulsion polymerization of the desired monomers."

claim 19:
"Use of the dispersion of any of Claims 1 to 8 or formulation of any of claims 9 to 13 for coating paper."

II. The following documents, cited during the opposition and appeal proceedings, are referred to below:

(1) DE 3 415 453 A1
(4) CA 2 135 450 A1

III. The present appeal lies from the interlocutory decision of the opposition division on the amended form in which the patent could be maintained.

The decision was based on auxiliary request 2, filed during oral proceedings before the opposition division on 15 December 2011.

The sole independent claim 1 of auxiliary request 2 reads as follows:
"A process for the preparation of an aqueous bimodal dispersion of polymer particles, the dispersion having large-size polymer particles and small-size polymer particles, with two separate maxima of the particle size distribution, wherein the two maxima are in the range from 13 to 50 nm and from 90 to 140 nm, respectively, wherein the small particles are generated in the presence of the large particles during the emulsion polymerization of the desired monomers, so as to produce the said aqueous dispersion of polymer particles with a weight ratio of the small particles to the large particles of from l0/90 to 40/60, and a solids content higher than 55 percent."

IV. The opposition division considered that the subject-matter of auxiliary request 2 fulfilled the requirements of Articles 84, 123(2) and (3) EPC. Sufficiency of disclosure and novelty were acknowledged. The subject-matter of auxiliary request 2 was found to be inventive. The opposition division considered documents (1), (4), and (10) as potential closest prior art documents in view of various problems in the field of paper coatings.

V. The appellant (opponent 2) lodged an appeal against this decision. In its statement of grounds of appeal, the appellant disputed the analysis and conclusions of the opposition division with respect to sufficiency, novelty and inventive step.

VI. In its reply dated 3 December 2012, the respondent (proprietor) requested that the decision of the opposition division should be upheld and provided arguments. Claims 1 to 11 which were filed as auxiliary request 2 during the oral proceedings before the opposition division on 15 December 2011 and which form the basis of the contested decision to maintain the patent in amended form constitute thus the respondent's main request.

VII. In a communication by the board dated 24 June 2016, sent as an annex to the summons to oral proceedings, certain aspects concerning inventive step were addressed. In particular the question was raised whether the problem as set out in paragraphs [0003] to [0007] of the patent in suit was solved over the whole scope of claim 1 of auxiliary request 2.

VIII. By letter dated 4 August 2016, the respondent filed auxiliary requests A and B and provided arguments for their admission into the proceedings. Furthermore, the respondent withdrew its request for oral proceedings and informed the board that it would not attend the oral proceedings.

Claim 1 of auxiliary request A reads as follows:
"The use for coating paper of an aqueous dispersion of polymer particles, wherein the aqueous dispersion of polymer particles is an aqueous bimodal dispersion of polymer particles, the dispersion having large-size

polymer particles and small-size polymer particles, with two separate maxima of the particle size distribution, wherein the two maxima are in the range from 13 to 50 nm and from 90 to 140 nm, respectively, wherein dispersion is produced by a process in which the small particles are generated in the presence of the large particles during the emulsion polymerization of the desired monomers, so as to produce the said aqueous dispersion of polymer particles with a weight ratio of the small particles to the large particles of from 10/90 to 40/60, and a solids content higher than 55 percent."

Claim 1 of auxiliary request B differs in that it furthermore defines the nature of the monomers.

IX. By letter dated 12 September 2016, the appellant requested to not admit auxiliary requests A and B into the proceedings, since they were late filed and contravened the principle of prohibition of *reformatio in peius*.

X. Opponent 1, party as of right, did not present any requests in writing.

XI. Oral proceedings were held before the board on 21 September 2016 in the presence of the appellant and of opponent 1, being a party as of right. The respondent was not represented, as announced by letter of 4 August 2016.

XII. The appellant's arguments, insofar as they are relevant to the present decision, may be summarised as follows: The closest prior art is document (4). On page 1, lines 6 to 15 various fields of application for the latex dispersion were discussed, paint and paper coating were

the most important applications disclosed in document (4). Document (4) aimed at finding an advantageous compromise between surface properties and bulk properties. Surface properties were explicitly linked to fine smooth appearance and good printability, bulk properties had to be read as relating to viscosity issues. The technical field and the problems addressed were thus the same as in the patent in suit. D4 described the mixing of latices A and B, each having solids contents of 50 % by weight, and using the blend in a paint composition having a solids content of 75 weight-%. The difference between claim 1 of the second auxiliary request and document (4) was the type of process for producing the bimodal latex having particles of the claimed size and size distribution. Claim 1 of the second auxiliary request defined that the small particles are generated in the presence of the large particles, wherein document (4) described that latices A and B were mixed. The high solids contents defined in the second auxiliary request could be seen to represent a desideratum. The objective technical problem was the provision of a latex dispersion that had improved properties for paper industry, i.e. providing dispersions having higher solids contents while avoiding viscosity problems. Guidance on how to achieve higher solids without having viscosity problems could be found in document (1), which specifically addresses this problem (page 6, line 24 to page 7, line 17). The person skilled in the art would combine the two documents, irrespective of the fact that document (1) related to different particle sizes. Achieving certain particle sizes was within the knowledge of the person skilled in the art.
Auxiliary requests A and B were not to be admitted into the proceedings, since they were late filed, involved a change of claim category, represented a shift to a

completely different subject-matter, contravened Rule 80 EPC in that they contained more dependent claims than the second auxiliary request, related to subject-matter that had been abandoned by the proprietor (now respondent) in opposition proceedings and furthermore violated the principle of prohibition of *reformatio in peius*, which had to be examined in analogy to Article 123(3) EPC.

XIII. The respondent's arguments, insofar as they are relevant to the present decision, may be summarised as follows:

The patent in suit aimed at providing a high solids polymer dispersion for use in paper coating. The claimed process permitted to obtain high solids coatings with improved viscosity properties at high shear rates without the need for further process steps. Document (4) taught to use only dispersions of solids contents below 50 weight %. For a person skilled in the art it would be obvious that increasing the solids contents to 55% or higher would result in very high viscosities and thus practically unusable dispersions. Document (1) concerned bimodal latex compositions having larger particles outside the range of the second auxiliary request. As could be seen in comparative example 3 of the patent in suit, such "larger" particles did not provide the combination of low viscosity at high shear, together with good water retention, which was required to coat high solids paper coating formulations at high speed. The respondent considered that the problem was solved over the whole scope of the second auxiliary request, since the formulation itself, which was the direct result of the claimed process, led to the favourable properties and thus solved the technical problem.

Auxiliary requests A and B were to be admitted into the proceedings. These requests were the direct response to particular concerns of the board which had been raised essentially for the first time in the communication of 24 June 2016. Also, these requests were clearly allowable on formal grounds.

XIV. The party as of right's arguments, insofar as they are relevant to the present decision, may be summarised as follows:
The party as of right started from document (4) as closest prior art and stressed the mentioning of surface properties, which were reflected by the terms "high water retention" and "good runability" in paragraph [0007] of the patent in suit. The difference between the closest prior art and the subject-matter of the main request was the replacement of the blending step by an *in situ* preparation step of the smaller particles. The objective technical problem was the provision of a process that allows for high solids contents and low viscosity of the dispersion. Document (1) related to an *in situ* process leading to high solids contents while allowing for low viscosity values (page 6, line 31 to page 7, line 2). It was thus obvious to apply the teaching of document (1) and thus reach the subject-matter of claim 1 of the second auxiliary request.
Concerning auxiliary requests A and B the party as of right considered them to be late filed, saw an abuse of procedure and considered that their admission would lead to a r*eformatio in peius*, since for industry the use of a dispersion had different implications than a process for preparing a dispersion.

XV. The appellant (opponent 2) and the party as of right (opponent 1) requested that the decision under appeal

be set aside and that the European patent No. 1354009 be revoked. They further requested that auxiliary requests A and B filed with letter dated 4 August 2016 not be admitted into the appeal proceedings.

The respondent (patent proprietor) requested that the appeal be dismissed (main request), or, alternatively, that the patent be maintained in amended form on the basis of one of auxiliary requests A and B filed with letter dated 4 August 2016.

XVI. At the end of the oral proceedings, the decision of the board was announced.

Reasons for the Decision

1. The appeal is admissible.

2. The oral proceedings before the board took place in the absence of the respondent who was duly summoned but chose not to attend, as announced with letter of 4 August 2016 (see points VIII and XI above). According to Article 15(3) of the Rules of Procedure of the Boards of Appeal (RPBA, see Supplement to OJ EPO 1/2013, 38 to 49), the board shall not be obliged to delay any step in the proceedings, including its decision, by reason only of the absence at the oral proceedings of any party duly summoned who may then be treated as relying only on its written case (see also Rule 115(2) EPC). Hence, the board was in a position to announce a decision at the conclusion of the oral proceedings, as foreseen by Article 15(6) RPBA.

3. *Main request (maintenance on the basis of claims 1 to 11 filed as second auxiliary request during the oral proceedings before the opposition division on 15 December 2011)*

Inventive step

3.1 The subject-matter of the patent in suit are dispersions of polymer particles having high-solids contents and low high-shear viscosities (paragraph [0001]). When used in paper coatings said formulations exhibit high water retention and good runability during application with a device such as a blade coater (paragraphs [0003]-[0007]). Additional applications, such as paints, impregnants and adhesive compositions are foreseen (paragraph [0023]).

Claim 1 of the second auxiliary request defines a process for the preparation of an aqueous bimodal dispersion of polymer particles having certain particle sizes, i.e. 13 to 50 nm for the smaller particles and 90 to 140 nm for the larger particles, and a certain particle size distribution, weight ratio of the small particles to the large particles of from 10/90 to 40/60, combined with a solids contents of higher than 55 percent. The process includes a step of generating the small particles in the presence of the large particles during the emulsion polymerisation of the desired monomers. The dispersions resulting from the process of claim 1 have high-solids contents and low high-shear viscosities.

3.2 The appellant has, *inter alia*, identified document (4) as closest prior art document. The respondent has discussed the disclosure of document (4), but has not commented on its choice as closest prior art document.

Document (4) relates to latex media for coating compositions, such as paper-coating compositions, paint compositions, textile compositions, wood-coating compositions, adhesive compositions, pressure-sensitive adhesive compositions or coating compositions for cement mortar (page 1, lines 2 to 15). It aims at providing latex media having an advantageous compromise between bulk properties and surface properties (page 2, lines 7 to 10). Consequently, document (4) concerns the same technical fields and addresses similar problems as the patent in suit. Thus, the board considers that document (4) represents the closest prior art.

3.3 Document (4) defines in claim 1 a bimodal dispersion of polymer particles having one particle population (latex A) with a particle size in the range of 100-500 nm and another particle population (latex B) with a particle size in the range of 5-40 nm. The weight ratio of latex A to latex B is 100 parts by weight of latex A to 0.1-100 parts by weight of latex B. The particle sizes and the weight ratio overlap to a great extent with the values defines in claim 1 of the second auxiliary request. The bimodal dispersion comprising latex A and latex B of document (4) is obtained by blending latex A and latex B, the latex blend having solids contents of approximately 50 % (example 3, page 23, lines 5 to 11).

3.4 Claim 1 of the second auxiliary request (4) differs from document (4) by requiring that the small particles are generated in the presence of the large particles when preparing the dispersion having a bimodal particle size distribution and by the solids contents.

3.5 The board notes that claim 1 of the second auxiliary request defines a process for the preparation of a

dispersion. As can be seen from document (4), bimodal dispersions having the required particle sizes and particle size distributions are suitable for several applications. Document (4) describes several of these applications. Paper coating is listed, but so are several other, different, applications (page 1, lines 2 to 15). The board has addressed the issue of a possible restriction of claim 1 to a certain application in its communication pursuant to Article 15(1) RPBA. The respondent argued that the "formulation itself" represents the solution to the problem as defined in paragraph [0007] (confer letter dated 4 August 2016, page 1, paragraph 5). According to the respondent the intended particular use renders the novel formulation/ composition, which is the direct result of the claimed process, allowable. The respondent has stressed the advantages of high solids contents for paper coating. The respondent has however not provided any arguments which specific technical feature of claim 1 of the second auxiliary request links its subject-matter exclusively to the use for paper coating. Also, the board can see no such link. Consequently, the board comes to the conclusion that the subject-matter of claim 1 of the second auxiliary request is not restricted to the technical field of paper coating.

The problem to be solved has thus to be formulated in a general way, taking into account the whole scope of claim 1 and cannot be restricted to a certain application such as paper coating.

3.6 The problem to be solved lies in the provision of a process for the preparation of an aqueous bimodal dispersion of polymer particles which allows for high solids contents while having manageable viscosity properties.

3.7 The board is satisfied that the problem is solved by the process defined in claim 1 of the second auxiliary request in view of general considerations and in view of the examples figuring in the patent in suit.

3.8 It remains to be investigated whether the proposed solution would be obvious to the skilled person in the light of the prior art.

The appellant's attack with respect to inventive step relied on the combination of documents (4) and (1). Document (1) relates to bimodal polymer dispersions and a method for preparing them. It does not specify specific applications of said dispersions. It is the explicit aim of document (1) to provide polymer dispersions (latices) having high solids contents and low viscosity. This is achieved by a bimodal or polydisperse particle size distribution obtained *in situ* during the step of polymerisation (page 6, line 32 to page 7, line 2).

In particular, document (1) teaches that blending processes that need to be followed by concentration steps can be replaced by a process wherein the bimodal dispersion is prepared by a further step of adding surfactants or by a further step of seeding during the polymerisation (page 7, lines 2 to 17).

Document (1) defines a process for emulsion polymerisation of a latex dispersion characterised by one of the following process steps, to be carried out after 40 to 60 % by weight conversion of the initial reaction mixture: (a) addition of a micelles-forming surfactant, or (b) addition of seed particles. The polymerisation reaction is then continued until the

desired particle sizes of the then bimodal latex dispersion are achieved (claim 1). A latex according to the teaching of document (1) is defined in claim 9, having a solids content of 58 to 65 weight % and comprising 65 to 85 weight % of particles having a diameter of 1700 to 3000 Å (i.e. 170 to 300 nm) and 35 to 15 weight % of particles having a diameter of 300 to 1000 Å (30 to 100 nm). The process of document (1) leads thus to a bimodal polymer dispersion having a high, i.e. above 55 percent by weight, solids content. Although the particle size of the large particles of document (1) is outside the range as defined in claim 1 of the second auxiliary request, a person skilled in the art, when reading claim 1 of document (1), realizes that other particle sizes may be achieved according to the same principle.

Document (1) thus directly addresses the provision of high solids dispersions having low viscosity properties. Starting from document (4), the person skilled in the art looking for a process to increase the solids content of a bimodal polymer dispersion would thus consult document (1). By applying the process steps defined in document (1) to the teaching of document (4), the person skilled in the art is led directly to a process as claimed in claim 1 of the second auxiliary request.

The subject-matter of claim 1 of the second auxiliary request is thus obvious in view of the combination of documents (4) and (1).

3.9 The respondent's arguments in support of inventive step do not hold for the following reasons:
The respondent has focused his line of argumentation on the provision of a process to prepare paper coating

formulations with high water retention and good runability. However, the subject-matter of claim 1 of the second auxiliary request is not limited to a process to be used solely in the technical field of paper coating (see point 3.5 above). Comparative example 3, cited by the respondent for effects linked to particle sizes, is not relevant for the present evaluation, since the closest prior art in the form of document (4) does not differ in respect to the particle sizes.

3.10 Consequently, the second auxiliary request is rejected for lack of inventive step of the subject-matter of claim 1.

4. *Admission of auxiliary requests A and B*

4.1 Auxiliary requests A and B were filed at an advanced stage of the proceedings after oral proceedings had been arranged. The respondent argued that these requests constitute an immediate reaction to the board's communication accompanying the summons to oral proceedings.

4.2 According to the Rules of Procedure of the Boards of Appeal (RPBA), appeal proceedings in *inter partes* cases are based on the statement of grounds of appeal and the reply/replies of the other party/parties (Rule 12(1) RPBA). New submissions (requests, facts or evidence) are not entirely precluded; their admission, however, is at the discretion of the boards (Article 114(2) EPC and Article 13(1) RPBA). This discretion has to be exercised appropriately, requiring the boards to consider all relevant factors, taking into account the specific circumstances of the case. Examples of

criteria to be taken into consideration by the boards when exercising their discretion are *inter alia* the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy. These criteria are not exhaustive, and the boards have also considered aspects such as the reasons for the new submission or the extend of the amendments.

4.3 Both auxiliary requests, A and B, contain a single independent claim defining the use of an aqueous dispersion of polymer particles for coating paper, whereas the second auxiliary request, until then the only request on file, defines a process for preparation.

The filing of auxiliary requests A and B constitutes a change of claim category from "process" to "use" which leads to a considerable shift in subject-matter. This change of claim category introduces considerable complexity to the case. While a process claim focuses on the process steps, i.e. steps linked to a certain activity, the use claim defines the purpose or aim intended for a certain composition. Due to the shift in subject-matter, these requests necessitate a completely new discussion. Moreover, since the respondent was not present at the oral proceedings and had not, in its submission of 4 August 2016, provided a complete analysis of inventive step for the new subject-matter of auxiliary requests A and B, the board would have been put in the position to make up for the respondent's failure to make a complete case with respect to its new requests.

4.4 In view of the above, the board, when exercising its discretion on the admission of late filed requests,

decided not to admit auxiliary requests A and B (Article 114(2) EPC and Article 13 RPBA).

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. Schalow A. Lindner

Decision electronically authenticated