Datasheet for the decision of 24 October 2011

Case Number: T 0863/08 - 3.3.07
Application Number: 02253690.8
Publication Number: 1266690
IPC: B01J 49/00, C02F 1/42, C08F 8/00, B01J 39/20
Language of the proceedings: EN
Title of invention: Preparation of weak acid cation exchange resins
Patent Proprietors: ROHM AND HAAS COMPANY
Opponents: LANXESS Deutschland GmbH
Headword: -
Relevant legal provisions:
EPC Art. 54, 56, 100(a)
EPC R. 103(1)(a)
Relevant legal provisions (EPC 1973): -
Keyword: "Novelty - document not available to the public"
"Inventive step - yes"
"Novelty - known use of known product"
"Reimbursement of appeal fees - substantial procedural violation (no)"
Decisions cited: -

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Catchword: -
Case Number: T 0863/08 - 3.3.07

DE C I S I O N
of the Technical Board of Appeal 3.3.07
of 24 October 2011

Appellants: LANXESS Deutschland GmbH
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Decision under appeal: Decision of the Opposition Division of the European Patent Office posted 6 March 2008 rejecting the opposition filed against European patent No. 1266690 pursuant to Article 101(2) EPC.

Composition of the Board:
Chairman: J. Riolo
Members: D. Semino
M.-B. Tardo-Dino
Summary of Facts and Submissions

I. The appeal of the opponents lies against the decision of the Opposition Division announced at the oral proceedings on 21 February 2008 to reject the opposition against European Patent 1 266 690. The granted patent comprised 11 claims, independent claims 1 and 11 reading as follows:

"1. A process for cleaning weak acid cation exchange resins comprising:
(a) converting a weak acid cation exchange resin, substantially in neutralized salt form, to a hydrogen-form weak acid cation exchange resin by regenerating with an acid regenerant; and
(b) contacting the hydrogen-form weak acid cation exchange resin with 1 to 15 kilograms of steam per kilogram of hydrogen-form weak acid cation exchange resin at a resin bed temperature of 100 to 180°C for a period of at least one hour."

"11. A method for treating water for use as drinking water comprising contacting water to be treated with a bed of weak-acid cation exchange resin that has been cleaned by (a) converting the weak acid cation exchange resin, substantially in neutralized salt form, to a hydrogen-form weak acid cation exchange resin by regenerating with an acid regenerant; and (b) contacting the hydrogen-form weak acid cation exchange resin with 1 to 15 kilograms of steam per kilogram of hydrogen-form weak acid cation exchange resin at a resin bed temperature of 100 to 180°C for a period of at least one hour."
II. A notice of opposition had been filed against the granted patent requesting revocation of the patent on the grounds of lack of novelty and lack of inventive step in accordance with Article 100(a) EPC. The opposition was *inter alia* supported by the following documents:

D2: DD-A-301 934  
D15: Betriebshandbuch Lewatit Betrieb, pages 1-29, 1998  
D18: Peter Meyers, "Applications of weak acid cation resin in waste treatment", presented at the AESF Conference, June 1999  
D27: Product information of Lewatit CNP LF WS by Miles

Roughly two months before the oral proceedings before the Opposition Division the opponents requested that two witnesses be summoned to the oral proceedings. According to that request, the witnesses should expose essential aspects regarding granted claim 11 and provide information about the further processing of a product identified as E287 by the company Brita GmbH.

III. The decision under appeal can be summarised as follows:

(a) There was no doubt that Lewatit CNP-LF (corresponding to the product identified as E287) was available to the public before the priority date of the patent in suit. The treatment of batch E287 or Lewatit CNP-LF at Brita was of no interest to the opposition, because that treatment would not have been available to the public. Therefore, there were no reasons for hearing the witnesses.
offered by the opponents, so that their request had to be refused.

(b) The process of granted claim 1 was novel with respect to any of D1, D2 and D3, since none of those documents disclosed a steam treatment of the ion exchange resin according to the claim.

(c) D15, which described the production process of batch E287, was a combination of several internal documents. Since it had not been shown or made credible by the opponents that the production process described in D15 was available to the public, it did not form part of the state of the art according to Article 54(2) EPC.

(d) Document D1, which was taken as the closest prior art, disclosed a steam treatment, which was accomplished on the sodium-form of the resin, only in the context of a purity test and not for cleaning purposes. Since D1 did not contain any information concerning the effect of the steam treatment on the functionality of the resin, which could be deteriorated by it, since the purity test showed the absence of impurities, so that no cleaning was necessary, and since there appeared to be a prejudice against performing the purity test on the hydrogen form of the resin, it would not have been obvious to apply the purity test for cleaning the resin in the hydrogen form. The process of granted claim 1 was therefore inventive with respect to document D1. The other documents on file did not lead to any different conclusion.
IV. The opponents (appellants) appealed that decision.

V. With the reply to the statement of grounds filed on 17 November 2008 the patent proprietors (respondents) submitted a set of claims as auxiliary request 1 in which claim 11 had been deleted, while claims 1 to 10 remained unchanged.

VI. In a communication sent in preparation to oral proceedings, the Board addressed inter alia the issue of novelty of claim 11 and mentioned D3 and D27 as documents, which are relevant in that respect.

VII. Oral proceedings were held on 24 October 2011 in the announced absence of the appellants. During the oral proceedings the respondents submitted an amended page 3 of the description adapted to the set of claims according to auxiliary request 1.

VIII. The arguments of the appellants (opponents) can be summarised as follows:

Novelty of claim 1

(a) Document D15 together with the evidence of a sale of the product whose production process was described therein took away the novelty of the subject-matter of claim 1. An accurate analysis of D15 showed that the steam treatment disclosed therein had been accomplished on the hydrogen form of the weak acid cation exchange resin, since the addition of sodium hydroxide was meant to neutralise the suspension and not to convert the resin in the sodium form.
Inventiveness of claim 1

(b) The production process disclosed in document D1, which was the closest state of the art, already solved the problem of the patent in suit, since it obtained a pure product free of organic impurities. It disclosed the conversion of the sodium form of the resin into the hydrogen form and also a steam treatment of the resin in the sodium form to test the purity of the product. The tests available in the patent in suit were not able to show any improvement for the claimed product, since they related to the removal of chloroform, which was not a contaminant for the resin and was not removed by it, since the purity of the product was dependent on the number of conversions from the hydrogen form into the sodium form and vice versa and not on the steam treatment and since the tests did not provide any data on the purity of the resin. Therefore, there was no evidence that the claimed method resulted in the reduction of the contaminants in the produced resin. In any case, even accepting the problem posed in the patent in suit, the skilled person, attempting to solve it, would inevitably perform the steam treatment disclosed in D1 with the hydrogen form of the resin, since he would know from D18 that the sodium form had double size with respect to the hydrogen form, so that it would be more convenient to treat the resin in the form with reduced volume, which implied the use of a smaller apparatus. In doing so, he would be able to compute the amount
of steam from the data in D1, which resulted in values falling within the range in the claim.

Novelty of claim 11

(c) The method of treating water for use as drinking water comprising contacting the water with a bed of weak acid cation exchange resin according to claim 11 could not derive its novelty from the fact that the known weak acid cation exchange resin used for treating water had undergone a steam cleaning treatment. A known use of a known product could not be new by virtue of a step of the product production process. The method of claim 11 was therefore not novel e.g. with respect to D27.

Reimbursement of the appeal fees

(d) The appellants had requested the Opposition Division to summon two witnesses to the oral proceedings. The Opposition Division had informed the parties one week before the oral proceedings that it was not necessary to hear the witnesses, since it was known without doubts that the product Lewatit CNP-LF from Bayer was available to the public before the priority date of the patent in suit. However, the appellants had explicitly said that the witnesses would make declarations relevant to claim 11. Indeed, they could have confirmed that they as employees of the company Brita and member of the public were aware before the priority date of the patent in suit that the product Lewatit CNP-LF from Bayer was steam
treated as according to the patent in suit during its production process. In view of this, the Opposition Division did not respect the right to be heard of the appellants by deciding not to summon the witnesses and committed a substantial procedural violation. Therefore, the appeal fees should be reimbursed.

IX. The arguments of the respondents (patent proprietors) can be summarised as follows:

**Novelty of claim 1**

(a) Document D15 seemed to be a collection of extracts from the opponents' operational manuals. The information contained therein was intended for internal use and not available to the public. Evidence of a sale was not relevant because it could not provide any evidence of disclosure of the process by which the allegedly sold product was made. Therefore the novelty objection against claim 1 based on D15 or on the sale of the product produced therein should fail.

**Inventiveness of claim 1**

(b) Document D1 showed that the method of making weak acid cation exchange resins was known; however, the products of the prior art required extensive cleaning before they could be used in drinking water applications. The claimed process provided an improved cleaning process as shown by the worked examples in the patent in suit. The resin according to the invention allowed improved
removal of chloroform with respect to resins according to the state of the art, as represented by comparative resin 1, and also with respect to resin which had been steam treated, however with a sequence of conversion and cleaning steps different from the claimed ones (comparative resins 2 and 3). The improved removal of chloroform was an indirect proof of the improved purity profile, since it indicated that fewer impurities from the resin were adsorbed on the activated carbon used together with the resin in the tests. The skilled person, aiming at developing a process for the production of weak acid cation exchange resins with reduced content in contaminants would not be led to the claimed solution by the available prior art. D1 disclosed a steam treatment in the context of a purity test and not as a cleaning step. Moreover, that steam treatment was accomplished on the sodium form of the resin, which was the open form of the resin, as confirmed by D18, which disclosed that the volume of the resin in the sodium form was double the one of the resin in the hydrogen form. The skilled person would expect removal of contaminants to be more effective in an open form than in a closed one. The skilled person would therefore not take into consideration to accomplish cleaning in the hydrogen form, since it would be contrary to common physical sense to try to clean the resin in a form, which was more compact and less accessible. Even if the problem solved with respect to D1 were simply formulated as the provision of an alternative cleaning process, the proposed solution would not derive in
an obvious way from the available prior art in view of the same reasons.

Novelty of claim 11

(c) In relation to claim 11, it had not been proven "up to the hilt" that the claimed method for treating water for use as drinking water comprising contacting water with a bed of weak acid cation exchange resin cleaned by the method of claim 1 was publicly known or suggested before the priority date of the patent in suit. In particular, weak acid cation exchange resins prepared according to the method of claim 1 of the patent in suit were physically distinguishable from other weak acid cation exchange resins in their improved impurity profiles. This was illustrated, e.g., by the examples of the patent in suit in view of the improved performance results obtained by resins prepared according to the process of claim 1. The method of claim 11 was therefore novel in view of the improved impurity profile of the resin with respect to the disclosure of D3, for which the purity of the resin was unknown.

Reimbursement of the appeal fees

(d) The appellants filed their request that two witnesses be heard by the Opposition Division at a very late stage of the opposition procedure. They did not give detail of what the witnesses would say during the hearing and did not provide any written declaration from them. Therefore, the
Opposition Division was correct in not summoning the witnesses. The fact that the request was not repeated in appeal confirmed that what the witnesses would have said was not relevant for the outcome of the proceedings. The Opposition Division did not commit therefore a procedure violation. For those reasons, the appeal fees should not be reimbursed.

X. The appellants (opponents) had requested in writing that the decision under appeal be set aside and the European patent be revoked. They had further requested reimbursement of the appeal fees.

XI. The respondents (patent proprietors) requested that the appeal be dismissed or alternatively that the patent be maintained on the basis of claims 1-10 of auxiliary request 1 filed on 17 November 2008 and the description as granted except page 3 filed during the oral proceedings on 24 October 2011.
Reasons for the Decision

1. The appeal is admissible.

Main request

2. Novelty of claim 1

2.1 Novelty of claim 1 was challenged only with respect to the disclosure of document D15.

2.2 D15 is an operation manual concerning the production of Lewatit CNP LF. Since no evidence had been provided that the production process described therein had been made available to the public, the Opposition Division decided that it did not form part of the state of the art. No further evidence regarding availability to the public has been provided by the appellants in appeal proceedings.

2.3 There can be no doubt that D15 is a document which is meant for internal use, since the document is substantially a check list available to the operator of the production process which should be filled once the various steps of the process are accomplished. The confidentiality of the document is confirmed by the deletion of several data contained therein (see in particular pages 1 to 6).

2.4 In view of this the Board has no reason to depart from the decision of the Opposition Division, that the document does not form part of the state of the art according to Article 54(2) EPC, since it has not been proven that it was available to the public. The fact
that a sale of the product may have taken place is in this case irrelevant, since it would not amount to a disclosure of the method of fabrication of the product.

2.5 As D15 does not form part of the state of the art, the objection of lack of novelty based on it must fail, so that it is not necessary for the Board to analyse the content of the document.

3. Inventive step of claim 1

3.1 Closest state of the art

3.1.1 The patent in suit relates to an improved process for the preparation of weak acid cation exchange resins and in particular concerns the cleaning of weak acid cation exchange resins derived from cross-linked poly(acrylonitrile) (paragraph [0001]).

3.1.2 All arguments in the appealed decision concerning lack of inventive step and all submissions on the issue by the parties consider as closest prior art document D1, which concerns an environmental-friendly process for the production of weak acid cation exchange resins by hydrolysis of cross-linked acrylonitrile bead polymers (column 1, lines 1-4), i.e. the same field as the patent in suit. The Board sees therefore no reason to take a different approach in the choice of the closest prior art.

3.1.3 D1 discloses a process for the preparation of a weak acid cation exchange resin by saponification of cross-linked acrylonitrile bead polymers with an alkaline saponification agent at high temperature, wherein the
bead polymer and the alkaline saponification agent are brought together only at the elevated temperature (claim 1).

3.2 In the single example of D1 (column 4 to column 6) the conversion of the resin obtained in the sodium form to the hydrogen form is accomplished through regeneration of the resin with 10% sulphuric acid followed by washing with water till complete neutralisation (column 5, lines 25-29). In order to analyse the purity of the product a purity test is accomplished, in which 1500 ml of the resin in the sodium form are suspended in 1000 ml of desalinated water and subjected to steam distillation for 5 hours, so that 200 ml of steam condensate are obtained per hour. During that test no organic compounds, specifically naphthalene, are detected (column 5, lines 37-46).

3.3 The process of granted claim 1 differs from the process of D1 in that it is the hydrogen form of the resin which is contacted with the appropriate quantity of steam at the desired temperature and for the desired time.

3.4 Problem solved

3.4.1 The problem addressed in the patent in suit is "to overcome the deficiencies of prior methods used to reduce the presence of contaminants from the manufacturing process in the final weak acid cation exchange resin while still relying on the conventional hydrolyses reactions of crosslinked polycarboxylate resin precursors to provide the desired weak acid cation exchange resin" (paragraph [0010]).
3.4.2 The process according to D1 has among others the advantage that the resulting weak acid cation exchange resins are practically free from low molecular weight organic compounds (unreacted monomers and non-polymerisable compounds contained in the monomers), i.e. are very pure, so that separate purification of the weak acid cation exchangers present after the hydrolysis is unnecessary (column 2, line 44 - column 3, line 4).

3.4.3 Thus, since D1 results in very pure resins with a low contaminant level, the question arises whether the claimed process provides a further improvement in the reduction of contaminants.

3.4.4 No comparison is available on file between the products of D1 and the products of the claimed process. In this respect, the allegation of the respondents that comparative resin 1 in the patent in suit is representative of the prior art according to D1 is of no relevance, since there is no evidence on file that the commercially available resin used as resin 1 (Bayer Lewatit™ CNP resin, see paragraph [0031] in the patent) was produced according to the method of D1 or corresponds to its example.

3.4.5 In the absence of comparative data, the presence of an improvement cannot be acknowledged. At the same time, it is physically credible that the treatment with steam allows the elimination of same contaminants.

3.4.6 Under such circumstances, therefore, the problem solved by the process of claim 1 with respect to the process
of D1 is that of providing an alternative process for the production of weak acid cation exchange resins with low content in contaminants.

3.5 Obviousness

3.5.1 It remains to be decided whether the skilled person starting from document D1 and looking for a solution to the posed problem would arrive in an obvious manner at the claimed process.

3.5.2 D1 does not disclose a cleaning step by steam treatment, but only a purity test with steam, which is not part of the production process, but serves to check the content in organic impurities of the product. Moreover, that test is accomplished on the sodium form of the resin and not on the hydrogen one.

3.5.3 On the basis of that disclosure, the skilled person would have no reason to take into consideration a cleaning step based on a steam treatment, nor to perform this step on the hydrogen form of the resin.

3.5.4 The disclosure of D18 that, when a hydrogen form weak acid cation exchange resin is converted to the sodium form, it practically doubles in size, because it swells to accommodate the larger ions (D18, page 3, left column, second paragraph), does not lead to a different conclusion. That disclosure must be taken on its face value and cannot be interpreted to mean more than it actually discloses, as alleged by the parties. It neither says that it is preferable to accomplish any treatment of the resin on the hydrogen form, because it has a smaller volume, as supported by the appellants.
(since the choice will depend on the kind of treatment), nor does it indicate that a cleaning treatment should be accomplished on the sodium form, because it is swollen, as alleged by the respondents (since the effectiveness in removal of impurities will depend on various properties of the resin and not just on its volume). For these reasons, the cited passage of D18 cannot provide any additional information to the skilled person, as far as the cleaning of the resin is concerned.

3.5.5 No other prior art document has been cited by the appellants which could provide any hint to the claimed solution of the posed problem.

3.5.6 For these reasons, the process for cleaning weak acid cation exchange resins of granted claim 1 involves an inventive step with respect to the available prior art.

4. **Novelty of claim 11**

4.1 Granted claim 11 relates to a method for treating water for use as drinking water comprising contacting water to be treated with a bed of weak-acid cation exchange resin that has been cleaned by step (a) and (b) as in granted claim 1, namely a conversion step from a resin in the salt form to a resin in the hydrogen form and a steam treatment step.

4.2 The claim concerns therefore a method of use of a product which is defined by some steps of its method of production, i.e. by product-by-process features. While the product as such and its use define specific features of granted claim 11, this is not the case for
the steps of the method of production of the product, which are not steps of the method of use, but are there only to attempt to define the product which is used.

4.3 Document D3 belongs to the state of the art according to Article 54(3) EPC, as agreed by all parties. It discloses a method of preparation of weak acid cation exchange resins (paragraph [0026]) and the use of the obtained resins for the preparation of drinking water, in particular for removing cations and hardness from drinking water, e.g. in household filters (paragraph [0032]).

4.4 D3 discloses therefore the same method of use as granted claim 11 of weak acid cation exchange resins. A difference between the subject-matter of granted claim 11 and the disclosure of D3 may lay, if at all, only in the product which is used.

4.5 According to the case law (Case Law of the Boards of Appeal, 6th edition 2010, II.B.6.2), for a product defined by its method of manufacture novelty can be established only if evidence is provided that modification of the manufacturing method with respect to the prior art resulted in other products, in other word evidence that the distinguishing process features necessarily imply product features, which allow to distinguish the product from the products of the prior art.

4.6 The weak acid cation exchange resins according to D3 are preferably prepared by a method comprising polymerizing unsaturated aliphatic nitrites with di- or polyvinyl ethers to give bead polymers, subjecting the
bead polymer to alkaline hydrolysis, subjecting the hydrolyzed bead polymers to ion-exchange from the salt form (preferably sodium form) into the hydrogen form by dilute mineral acid, purifying the hydrogen form of the bead polymers with water in an autoclave and classifying the bead polymers into desired particle size ranges in a column (paragraph [0026]). Example 2 (paragraphs [0050]-[0054]) exemplifies specific process conditions including detail of the autoclave cleaning (5 hours at 150°C).

4.7 The respondents submitted that the weak acid cation exchange resins used in the method of claim 11 have by virtue of the specific cleaning method (i.e. steam cleaning instead of autoclave water cleaning of the hydrogen form of the resin) a different impurity profile with respect to those of the prior art, so that they are characterised by an improved purity. However, no measurement of impurity level is available for the resins cleaned according to the method of the patent in suit, nor for the resins produced and cleaned according to D3. Moreover, no comparative tests with a product according to D3 are present in the patent. In the absence of a proof and of any specification of a corresponding product feature in the claim, it cannot be accepted that the resins cleaned according to the method of the patent in suit have a different impurity level than those of D3.

4.8 For these reasons, the product cleaned according to the method of the patent in suit is not distinguishable from the product produced and cleaned according to the method of D3, so that the method of treating water by means of such a product according to granted claim 11
has no distinguishing feature with respect to the
method disclosed in D3 and is therefore not novel.

4.9 It is further noted that according to the case law
(Case Law, supra, I.C.4.1.4) a specific degree of
chemical purity constitutes a new element imparting
novelty to a known product only under exceptional
circumstances (e.g. the purity cannot be achieved by
conventional purification methods), which in the
present case have neither been discussed, nor proven by
the respondents. In any case, since an improved purity
of the product cleaned according to the method of the
patent in suit cannot be acknowledged (see point 4.7 in
particular), it is not necessary for the Board to
analyse whether the exceptional circumstances apply or
not.

Auxiliary request 1

5. Auxiliary request 1 contains only granted process
claim 1 together with granted claims 2 to 10 dependent
thereon, while granted method claim 11 has been deleted.

5.1 Novelty and the presence of an inventive step have been
acknowledged for the process of claim 1 (see points 2
and 3 above) and no other objection has been raised by
the appellants against the claims of this request.

5.2 The amended description differs from the granted one
only in that paragraph [0012], which corresponds to
deleted claim 11, has been deleted. This amendment
cannot therefore give rise to any objection. The fact
that the appellants was deliberately not present at the
oral proceedings, where the amendment to the
description was filed, cannot be taken as a break of their right to be heard, since the amendments corresponds exactly to what could reasonably be expected in view of the claims of auxiliary request 1 (which were filed with the reply to the statement of grounds) and also in view of Article 15(3) of the Rules of Procedure of the Boards of Appeal.

Reimbursement of the appeal fee

6. According to Rule 103(1)(a) EPC it is a precondition for the reimbursement of the appeal fee that the appeal is allowable, i.e. that the Board allows the request of the appellants. In the present case, the Board allows the request of the appellants that the decision be set aside, and, even if it does not allow the one that the patent be revoked, at least decides that it is maintained in amended form. According to the case law (Case Law, supra, VII.E.17.2) the fact that the appeal is allowed only in part is not an impediment to the refund, so that the precondition is considered as fulfilled in the present case. It remains therefore to be established whether a substantial procedural violation took place.

6.1 The appellants offered two witnesses as further evidence to support their case well beyond the nine months opposition period and only after oral proceedings had been summoned. Moreover, with their offer they did not provide any detail of the additional evidence the witnesses were supposed to provide, but only generically indicated that the witnesses should expose essential aspects regarding granted claim 11 and
provide information about the further processing of a product identified as E287 by the company Brita GmbH.

6.2 In appeal they alleged that it was known to the witnesses that the product Lewatit CNP-LF was steam treated according to the procedure in the patent in suit. However, during appeal proceedings they did not request to hear the witnesses, nor submitted any declaration from them.

6.3 The Board is of the opinion that the appellants were not able to show either during opposition or during appeal proceedings that the hearing of the witnesses could have any bearing on the decision. The generic indications which accompanied the request in opposition did not put the Opposition Division in the position to understand the relevance of the evidence which the witnesses could provide. Similarly, the arguments presented in appeal and the fact that the request to hear the witnesses was not repeated in appeal did not put the Board in the position to evaluate whether the hearing of the witnesses could indeed have an impact on the decision. Actually, the lack of the request in appeal showed that the hearing did not have such an impact in the appellants' view.

6.4 Accordingly, in the absence of a causal link between the alleged procedural violation and the decision of the Opposition Division, the Board can only come to the conclusion that the procedural violation, if any, was not a substantial one.

6.5 On this basis, the request of reimbursement of the appeal fees must be rejected.
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 on the basis of claims 1-10 of auxiliary request 1 filed on 17 November 2008 and the description as granted except for page 3 filed during oral proceedings on 24 October 2011.

3. The request for reimbursement of appeal fee is rejected.

The Registrar

The Chairman

S. Fabiani

J. Riolo