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Bezeichnung der Erfindung: Method for separating the filament bundle of
Title of invention: fibrous material
Titre de l'invention :

Klassifikation / Classification / Classement : B65 H 51/16, D04H 3/16

ENTSCHEIDUNG / DECISION

vom / of / du 28 March 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Toray Industries Inc.

Einsprechender / Opponent / Opposant :

Hoechst AG

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56

Schlagwort / Keyword / Mot clé :

"Inventive step (confirmed)"

Leitsatz / Headnote / Sommaire



Case Number : T 197/87 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 28 March 1990

Appellant :
(Opponent) Hoechst Aktiengesellschaft
 Zentrale Patentabteilung
 Postfach 80 03 20
 D-6230 Frankfurt am Main 80 (DE)

Representative :

Respondent :
(Proprietor of the patent) Toray Industries Inc.
 2, Nihonbashi Muromachi 2-chome Chuo-Ku
 Tokyo 103 (JP)

Representative :
 Kador, Klunker, Schmitt-Nilson, Hirsch
 Corneliusstr. 15
 D-8000 München 5 (DE)

Decision under appeal : Decision of Opposition Division of the European
 Patent Office dated 18 March 1987 rejecting
 the opposition filed against European patent
 No. 0 033 855 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : C.T. Wilson
Members : F. Brösamle
 J-C. Saisset

Summary of Facts and Submissions

- I. European patent No. 0 033 855 was granted with ten claims on the basis of European patent application 81 100 318.5 on 20 February 1985.

Claim 1 as granted reads as follows:

"1. A method for separating the filament bundle of a fibrous material (5,15,17) by ejecting the filament bundle from a nozzle (8,16) together with a fluid and collecting negatively charged separated filaments of said bundle on a collecting means (11) in sheet form (30), characterized in that the filaments are charged negatively after being ejected from said nozzle (8,16) by being projected against an impinging plate (10) being provided between said nozzle and said collecting means (11), the surface of which impinging plate (10) is made of a material which can charge surface potential of said fibrous material negatively upon impact of said fibrous bundle against said impinging plate (10)."

This Claim 1 is followed by dependent Claims 2 to 10.

- II. The patent was opposed on 19 November 1985 by the company Hoechst AG (Opponent/Appellant). The Opponent requested revocation of the patent on the grounds of Articles 52 to 57 and 100 EPC in the light of the following documents:

- (D1) US-A-3 319 309
- (D2) US-A-3 340 429
- (D3) "Statische Elektrizität bei der
Verarbeitung von
Chemiefasern" VEB Fachbuchverlag Leipzig
1963, p. 39

- (D4) US-A-3 511 625
- (D5) Ullmanns Encyclopädie der technischen Chemie, 4th Edition, Vol. 15, p. 547
- (D6) Römpps Chemie-Lexikon, Franckische Verlagshandlung, Stuttgart, 1974, p. 2121
- (D7) FR-A-1 580 328.

III. By its decision dated 18 March 1987 the Opposition Division rejected the opposition pursuant to Article 102(2) EPC, since the stated grounds were deemed to be not sufficient to allow Appellant's request to revoke the patent.

IV. The Appellant appealed against this decision on 9 May 1987 and paid the appeal fee on the same day. The Statement of Grounds of Appeal was filed by telex on 27 July 1987 and confirmed with letter of 24 July 1987, received on 28 July 1987.

In the Statement of Grounds of Appeal the Appellant argues that documents D1 and D2 anticipate the subject-matter of Claim 1 under Article 54 EPC and if the differing arrangement of the impinging plate within the arrangement for separating the filament bundle is taken into consideration at least under Article 56 EPC, since in D1 and D2 the impinging plate "8,13" would be a "charging surface" with which the fibrous material would be so in "brushing contact" that it is negatively charged by a triboelectric effect, whereby the filaments would spread after that charging surface before reaching the collecting surface "9".

Reference was also made to D3 and to

- (D8) DE-A-2 460 755

which latter document was cited for the first time in the Statement of Grounds of Appeal.

- V. The Proprietor (Respondent) contradicted the argument brought forward by the Appellant and pointed to the fact that the subject-matter of Claim 1 would work without any additional electrifying means in the form of ion guns as used in the apparatus of D1 and D2 and that from D1 and D2 it would not be known to charge filaments by frictional contact with an impinging plate negatively. He contends that the basic idea of the invention laid down in granted Claim 1 would be to apply the filaments to the impinging plate thereby giving a negative charge to them by impact with the impinging element. As far as D3 is concerned it is felt that it would not be known therefrom what material is positively or negatively charged or how the amount of charges would vary with the material and in combination with D8 the Respondent comes to the conclusion that no electrifying means for the filaments can be derived therefrom, since in D8 the filaments would be mechanically spread by a rotating body "3". To support his argument that the apparatus of D1 has nothing to do with the basic idea of Claim 1 reference is made to

(D9) US-A-3 163 753

to demonstrate that the "charge surface 13" serves a different purpose from that of the impinging plate of Claim 1.

- VI. With its communication pursuant to Article 110(2) EPC dated 10 July 1989 the Board pointed to the document

(D10) US-A-3 338 992

which document is already mentioned in the patent specification, see column 1, line 63 to column 2, line 10,

and questioned if the subject-matter of Claim 1 would be inventive in view of D10 and D1/D2.

VII. The parties commented on the Board's provisional findings, whereby the Respondent defended Claim 1 essentially by emphasising the difference between an impinging plate against which the filaments hit and a friction plate which is only in rubbing contact with the filaments and by claiming a surprising unpredictable effect when using an impinging plate between the nozzle and the collecting means made from a material which is capable of charging fibrous material negatively upon impact. The Appellant, however, contended that the form and the location of the impinging plate would be obvious from D1 or D2.

VIII. In the oral proceedings held on 28 March 1990 both parties essentially only repeated former arguments as to the teachings of D1, D2, D3, D7, D8, D9 and D10.

The Appellant maintained his objection under Article 54 EPC and requested that the impugned decision be set aside and the attacked patent be revoked.

The Respondent requested the dismissal of the appeal and the maintenance of the patent as granted or by way of a first auxiliary request by incorporating a lead-based metal as the material of the impinging plate of Claim 1 or by way of a second auxiliary request which in addition to the first auxiliary request defines in Claim 1 that the impinging plate is slidable.

Reasons for the Decision

1. The appeal is admissible.

2. Claim 1 as granted is open to a formal objection, since its delimitation vis-à-vis the nearest prior art to be considered, i.e. D10, is not complete within the meaning of Rule 29(1)(a) and (b) EPC. Since however incomplete delimitation vis-à-vis the nearest prior art does not figure among the grounds of opposition pursuant to Article 100 EPC the Board raised no objection in this respect.

3. **Novelty**

3.1 From D10 a method for separating the filament bundle of a fibrous material is known in which the filament bundle is ejected from a nozzle together with a (driving) fluid and the filament bundle is charged by contacting the bundle with a material which can charge it negatively so that the fibrous material separates before it is collected in sheet form on a collecting means.

3.2 What is not known from D10 in the Board's view is that the contacting surface for the bundle is an impinging plate, which is provided between the nozzle and the collecting means so that upon impact of the filament bundle against the impinging surface the fibrous material is charged negatively. As a result of the foregoing the subject-matter of Claim 1 is novel with respect to this disclosure, though the Appellant denied this fact.

3.3 The method for separating the filament bundle of fibrous material according to the teaching of D10 is characterised basically in that the filaments are under tension when they are electrostatically charged, see column 3, lines 13 to 33 of D10.

According to Claim 1, however, the filaments at that stage are not under tension, since they freely escape from the nozzle "8". While in D10 the filaments are negatively charged by friction in that the filaments contact the throat "6" of the nozzle, this is done according to Claim 1 by impact in that the filaments impinge against the impinging plate "10". The charging elements, a throat of a nozzle or bar guides according to D10 and an impinging plate according to Claim 1, are completely different and this is also true for the charging effect, namely friction contact with no movement vector perpendicular to the contact surface according to D10 and impact against a plane surface under an angle according to Claim 1. These two fundamental differences between the teachings of D10 and of Claim 1 clearly prove that D10 is not a novelty destroying document so that any other contention is not supported by the facts.

- 3.4 The Respondent argued that D7 and D8 would be novelty destroying documents as well, since the spreading effect in his contention had its basis in a charging effect of the filaments when they hit the surface "4" according to D7 and "3" according to D8, which latter document is considered by the Board by applying its discretion under Article 114(1) EPC. Nothing in D7 or D8 teaches that the filaments after contacting the above-mentioned surfaces are charged at all and if so, are charged negatively so that they spread under this property. The Respondent himself has pointed to the document D3, see page 39, remark 1.2.1.3; from D3 it is known that filaments (non-conductors) are charged positively or negatively depending on the nature of the metal which they contact. This is, however, not the teaching of Claim 1, since there the contact metals have to be so chosen that the filaments are charged negatively. Even if from D7/D8 it would be known that filaments are electrically charged by contacting

metal surfaces and that they spread due to their charge, this teaching would not anticipate the teaching of Claim 1 since still two possibilities would have to be considered, since Claim 1 is restricted to filaments which are negatively charged. As a result D7/D8 are not novelty-destroying of the teaching of Claim 1 in the Board's finding. Any other interpretation of D7/D8 is the result of an inadmissible ex-post facto analysis.

3.5 The Respondent also brought forward the argument that D1/D2 would anticipate the preferred embodiment of the attacked patent, since in this preferred embodiment the filaments would be charged twofold, firstly by the plate "8,13" and secondly by the ion gun "14".

As the Respondent clearly pointed out, this teaching is not laid down in the attacked Claim 1, since there no ion gun is prescribed. The objection under Article 54 EPC has therefore no basis if only for that reason. In the Board's assertion it is, however, not even justified vis-à-vis the not claimed, preferred embodiment laid down in the attacked patent. The reason is that the ion gun "14" of D1/D2 needs two poles, one negative pole, constituted by the source "35", and one positive pole constituted by the plate "8,13". The elements "8,13" of D1/D2 are therefore nothing more than a pole of the ion gun formed as a guiding element to deflect the filaments from their horizontal direction towards the collecting means and it is not correct to interpret these elements as an "impinging plate" in the meaning of Claim 1. Consequently "8,13" cannot be considered to form means for charging filaments by contact negatively as in the case of Claim 1. D1/D2 are insofar irrelevant, if correctly interpreted.

3.6 D9 is to be disconsidered, since this document is not relevant, Article 114(2) EPC.

3.7 Summarising, the Board comes to the conclusion that the method for separating the filament bundle of fibrous material according to Claim 1 is novel, Article 54 EPC.

4. The assessment of inventive step leads to the following result:

4.1 The subject-matter of Claim 1 is basically characterised by an impinging plate which is arranged between the nozzle and the collecting means. The effect of this impinging plate is a deflection of the filaments, whereby the impact of the filaments upon the impinging plate, which is chosen of a material which can charge the filaments negatively, leads to a negative charge of the latter so that the filaments thereafter spread under this influence. It is immediately clear that an increase of filament velocity leads to an increase as far as the impact upon the impinging surface is concerned.

4.2 Starting therefore from the teaching of D10 from 1967, at which time the velocities of the filaments were still moderate, it is essential that according to the teaching of Claim 1 an increase of the filament velocity is accompanied by a better charging effect, whereas the tendency of the charging effect according to the arrangements foreseen in D10 is opposite, since in D10 the contact time between the filaments and the metal surface which is in frictional contact therewith is decreased as the filament velocity increases so that the filaments obviously are less charged in this specific case. Considering what has been said above under 3.1 to 3.3 D10 does not lead a person skilled in the art to the subject-matter of Claim 1.

4.3 Under 3.4 and 3.5 it is set out that D1, D2, D3 and D7/D8 relate to different subject-matter, which does not make use of an impinging plate which is made from a material which can charge filaments upon impact negatively. The teachings of D1 and D2 are based on the use of an ion gun to charge filaments which thereafter spread. The teaching of D3 has nothing to do with the teaching of Claim 1; D3 represents only the theoretical background of the "triboelectric effect" which per se is not claimed in Claim 1. D7 and D8, if correctly read by a skilled person not knowing the teaching of Claim 1, teach that filaments can be spread mechanically, if they are brought into contact either with an oscillating surface (D7) or with a rotating surface (D8), without making use of a charge-spreading effect as in Claim 1.

4.4 Due to the fact that the relevant prior art is based on different effects when the problem has to be solved that filaments have to be evenly spread, it is clear to the Board that even the combined teaching of these documents would not lead a skilled person to the teaching of Claim 1. The teaching of Claim 1 has therefore to be considered as comprising an inventive step in the meaning of Article 56 EPC.

5. The above findings under 4.4 are completely backed up by the comparative tests as set out in the attacked patent itself, see Table 1 with tests 1 to 18, and in addition those reported with letter of 31 January 1990 and carried out by the Respondent, which on the one hand demonstrate the superiority of an impinging plate in comparison with a mere nozzle throat or bar guides and which on the other hand demonstrate that even if lead is used in the prior art method as the material for charging the filaments, the results in view of the surface potential and the width of the coiled web obtained are poor. If, however, an

impinging plate and materials such as ceramic or zinc or copper as its contact surface are chosen, then better results are obtained compared with lead and a nozzle throat, see tests 5, 6, 8 and 9 of Table 1 of the attacked patent and tests 12 to 14 of Respondent's letter of 30 January 1990. It has to be accepted therefore that the teaching of Claim 1 leads to an unpredictable, surprising effect, which is a further indication for the existence of an inventive step.

This result is not brought into question by the way in which the comparative tests were carried out, even though at first sight the long tube following the nozzle in tests 3 to 17 appears to be somewhat strange. Studying, however, the situation of D10 closer it is obvious that there again a long tube "19" is foreseen after the electrifying throat or bar guides, see Fig. 3 and 5 or see reference sign "5" in Fig. 11, 15 and 16 of D10, so that the Board comes to the conclusion that the results of the comparative tests have to be considered as relevant, since the distance between the tube and the collecting means is still 600 mm so that the filaments have enough time to spread before they reach the collecting means.

6. Since the main request (patent in its granted form) is acceptable, the two auxiliary petitions need no further consideration although it should be pointed out that these comprise further features which could clearly distinguish their teachings from the prior art, i.e. a lead-based impinging plate and its moveability, to distribute any wear thereof.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar:



S. Fabiani

The Chairman:



C.T. Wilson

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