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D E C I S I O N
of 13 February 1996

Case Number: T 0229/91 - 3.2.2

Application Number: 83103332.9

Publication Number: 0092699

IPC: B27N 3/00

Language of the proceedings: EN

Title of invention:

Blow line addition of isocyanate binder in fiberboard manufacture

Patentee:

THE CELOTEX CORPORATION

Opponent:

Bison-Werke Bähre & Greten GmbH & Co. KG
Emsland Spanplatten GmbH
Thiele, Günther

Headword:

-

Relevant legal provisions:

EPC Art. 54(2), 56

Keyword:

"Novelty (of main and first auxiliary request: no)"
"Inventive step (second auxiliary request: no)"

Decisions cited:

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Catchword:

-



Case Number: T 0229/91 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 13 February 1996

Appellant: Bison-Werke Bähre & Greten GmbH & Co. KG
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 11 March 1991
rejecting the opposition filed against European
patent No. 0 092 699 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: H. Seidenschwarz
Members: M. Bidet
J. Van Moer

Summary of Facts and Submissions

- I. European patent No. 0 092 699 was granted on the basis of European patent application No. 83 103 332.9 filed on 6 April 1983, claiming priority of 26 April 1982 based on US application No. 371 894.
- II. Three Opponents requested revocation of the patent for reasons of non-compliance with Article 100(a) EPC, in particular of lack of novelty and inventive step.
- III. By its decision given after the oral proceedings held on 28 January 1991, dispatched on 11 March 1991, the opposition division rejected the oppositions. It held that there was no document reporting a successful addition of an isocyanate binder in a blow line of a particle boardmaking machine before the priority date of the patent in suit, and that as the subject-matter of Claim 1 overcame a prejudice against such a feature, it was novel and involved an inventive step. The opposition division referred particularly to the following documents:
- D1: US-A-2 872 337.
- D3: Proceedings of the Fifteenth Washington State University International Symposium on Particleboard, 31 March to 2 April 1981, Pullman, Washington, Edited by Thomas M. Maloney, pages 255 to 264, "Polymeric Isocyanate for Medium Density Fiberboard", A. McLaughlin, W.J. Farrissey, Jr., L.M. Alberino, D.P. Waszeciak.
- D4: "Tendenzen der MDF-Plattenerzeugung", F. Lein 1978, pages 379 to 382, Holz als Roh- und Werkstoff.

D5: "Fortschritte der Spanplattentechnik" vom
H.J. Deppe und Kurt Ernst, Ausgabe 1973.

D7: AT-B-270 189.

D9: Proceedings of the Sixteenth Washington State
University International Symposium on
Particleboard, 30 March to 1 April 1982, Pullman,
Washington, Edited by Thomas M. Maloney, pages 269
to 276, "Resin Blending of MDF Fiber", Günter
Bücking.

D10: Proceedings of the Seventeenth Washington State
University International Symposium on
Particleboard, March 1983, Pullman, Washington,
Edited by Thomas M. Maloney, pages 263 to 282.

IV. Notices of appeal against that decision were filed on
16 March 1991 by appellant O3 (opponent O3), on 4 April
1991 by appellant O2 (opponent O2) and on 9 April 1991
by appellant O1 (opponent O1). The appeal fees were paid
on 18 March 1991, 4 April 1991 and 9 April 1991
respectively, and the statements setting out the grounds
of appeal were filed on 15 July 1991, 28 May 1991 and
18 July 1991 respectively.

Appellant O2 withdrew its appeal by letter of 20 July
1994.

V. In a communication issued on 1 March 1995, the Board
expressed the provisional opinion that the application
of isocyanate binders in the blow line behind the
refiner would seem to be obvious to a skilled person.

VI. Oral proceedings took place on 13 February 1996. The respondent (proprietor of the patent) maintained the amended Claims 1 according to main and first auxiliary requests filed with letter of 28 June 1995 and filed a second auxiliary request during the oral proceedings.

VII. Claim 1 according to main request reads as follows:

"In a process of producing a synthetic board from cellulosic material and a binder wherein

- (a) said cellulosic material is subjected to the action of steam under pressure and refined to hot and wet fibers in a pressurized digester-refiner apparatus (10, 11) having a blow apparatus which comprises a blow line (12)
- (b) said hot and wet fibers are partially dewatered, in a dryer
- (c) said partially dewatered fibers are formed into a mat, and
- (d) said mat is subjected to heat and pressure to form said synthetic board, the improvement characterized by comprising applying an organic polyisocyanate binder to said hot and wet fibers from said refining step (a) in said blow line (12)."

Claim 1 according to the first auxiliary request corresponds to Claim 1 of the main request in which the wording "as a water emulsion" has been added in feature (d) after the words "applying an organic polyisocyanate binder".

Claim 1 according to the second auxiliary request recites the features of Claim 1 of the first auxiliary request in which the wording "which is a polyphenylpolyisocyanate" has been added in feature (d) between the words "applying an organic polyisocyanate binder" and "as a water emulsion."

VIII. In writing and during the oral proceedings the parties argued as follows:

1. According to the appellants, the subject-matter of Claims 1 of main and auxiliary requests was not novel with respect to the content of the disclosure of document D3, since, first the indication of a blow line in this document automatically represented for the skilled person a well-known concept as regards the equipment usually available and this equipment included a blow line for mixture of the binder with the fibers provided at the outlet of the refiner as it was generally known for example from document D1, and secondly the addition of polyisocyanate binder in a blow-line as well as its addition "as a water emulsion" was clearly disclosed.

As to the second auxiliary request, the appellants referred to document

D27: "Highlights: Isobind 100; A Self-Releasing Isocyanate Binder for Reconstituted Wood Products" The Donald S. Gilmore Laboratories, D.S.G. Report No. 19 D-19 10.80

and argued that the additional feature related to a selection of a particular polyisocyanate which was not explicitly disclosed by document D3. However, such a selection did not involve an inventive step. Furthermore, there was nothing in the description of the patent in suit which could support any particular technical advantage. Therefore, the subject-matter of Claim 1 according to this request did not involved an inventive step.

2. The respondent argued, that the addition of a binder was always a problem and when it was carried out it was only to bind the fibers at the outer surface of the mat, and not to bind the fibers within the mat obtained according the process disclosed by document D1. The binder added via a blow line according to document D3 was not an isocyanate, and furthermore it was added to bind the fibers at the surface of the mat and not within the mat. The reason was that isocyanates are highly reactive, and nobody would have taken the risk of adding isocyanate at the outlet of the refiner where the high temperature and moisture content would have accelerated curing of the resin with the consequence that the binder would have cured prematurely and built up in the blow line. Furthermore, the addition of isocyanate as an emulsion - as in the first auxiliary request - would have certainly accelerated the curing step within the blow line because of a higher moisture content.

According to the teaching of document D3, - dealing inter alia with the problem of resin spotting - there was no possibility of duplicating the blow line method in the laboratory, so that there was no disclosure in this document of a blow line or of an addition of polyisocyanate. As to the structure of the equipment, the respondent denied that the provision of a blow-line implicitly and directly called for the presence of a refiner, a dryer and a press as known in document D1. This was an unreasonable interpretation of the content of document D1. The subject matter of the Claims 1 was therefore novel.

The specific selection of a polyphenylpolyisocyanate according to Claim 1 of the second auxiliary request was novel with respect to the teaching of document D3 and permitted a very effective binding resulting in a build up free process.

IX. The appellants requested that the decision under appeal be set aside and that the European patent No. 0 092 699 be revoked.

The respondent requested that the appeal be dismissed and that the patent be maintained on the basis of

- as main request, Claim 1 filed on 28 June 1995 and Claims 2 to 8, description and figure as granted;
- as first auxiliary request, Claims 1 and 4 filed on 28 June 1995 and Claims 2, 3 and 5 to 8, description and figure as granted;
- as second auxiliary request, Claims 1 and 3, filed at the oral proceedings, Claims 2 and 5 to 8 renumbered 4 to 7, description and figure as granted.

Reasons for the Decision

1. The appeal is admissible
2. *Amendments*

Claim 1 according to the main request has been amended with regard to Claim 1 of the patent as granted to indicate that a dryer is used to partially dewater the wet fibers. A dryer reducing the moisture of the fibers is disclosed in the description of the application as filed in the paragraph bridging the pages 6 and 7 and in page 11, lines 30 to 32 which corresponds in the patent in suit with column 5, lines 1 to 15 and column 8, lines 37 to 39.

The organic polyisocyanate binder being added as a water emulsion according to the single amendment in Claim 1 according to the first auxiliary request is disclosed in Claim 4 of the application as filed and of the patent in suit.

The third amendment relating to the particular isocyanate according to Claim 1 of the second auxiliary request being a polyphenylpolyisocyanate is disclosed in Claim 3 of the application as filed and of the patent in suit.

Since the amendments are supported by the description as originally filed and also reduce the scope of the protection, there are no objections under Articles 123(2) or (3) EPC to the amended Claims.

3. *Novelty of main request and first auxiliary request*

Document D3 relates to polymeric isocyanate (PMDI) for medium density fiberboard. MDF products are reconstituted wood boards for which a binder system is used during manufacture. The current binder for MDF is urea-formaldehyde (UF-binder) which could provide exterior grade properties. However, processing conditions would have to be modified and manufacturing cost would increase.

An alternative binder is the PMDI which cures in the same temperature range and the same press time as a UF-binder. The PMDI-binder may be applied neat or as an emulsion. For the experiments reported in document D3, the PMDI-binder "Upjohn's Isobind 100" is used, which is one of the preferred polyisocyanates referred to in the description of the patent in suit (see column 6, lines 31 to 36). This PMDI-binder is used under processing conditions that are suitable for most of today's MDF-plants, because the most desirable avenue toward the ability to produce a potential exterior grade product is the utilization of existing equipment and processing conditions available in MDF-plants currently using a UF-binder (see sections: "Abstract" and "Introduction"). According to the section "Result and Discussion" (see sentences one and two), during the processing of MDF, some manufacturers add the binder via blow line addition.

Document D3, therefore, discloses not only the addition of a UF-binder but also of a PMDI-binder in the blow line of an existing plant during the process of producing a MDF.

At the time of the Fifteenth International Symposium as reflected in document D3, it was known that equipment of existing plants included blow lines which permitted the addition of a binder before or after the dryer thus providing the processing conditions for producing fiberboards (see e.g. document D1 already cited in the description of the patent in suit).

From this follows that addition of a PMDI-binder before the dryer - i.e. after the refining step - in a blow line is disclosed in document D3.

Hence the subject-matter of the Claims 1 according to the main and the first auxiliary requests is not novel within the meaning of Article 54(2) EPC.

4. *Second auxiliary request*

With regard to Claim 1 according to the second auxiliary request, proposing a polyphenylpolyisocyanate as polyisocyanate binder, it is noticed that this product is not cited in document D3. This particular product is selected from a large range of other organic polyisocyanates containing two or more isocyanate groups which are used alone or in combination as binders to be introduced into the blow line (see description of the patent in suit, column 6, line 1 to column 7, line 18). Since these products, in particular their characteristics and their chemical reactions are well known to the skilled person, the selection of any one of these products lies within the usual practice of the skilled person. The description of the patent in suit does not mention any advantage of this particular binder compared to the other binder systems, nor a contribution of this feature to the state of the art.

The subject matter of Claim 1 according to the second auxiliary requests does not involve an inventive step as required by Article 56 EPC.

7. Therefore the patent in suit cannot be maintained.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:



S. Fabiani

The Chairman:



H. Seidenschwarz

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