56
13

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D E C I S I O N
of 26 January 1996

Case Number: T 0456/93 - 3.2.5

Application Number: 87202661.2

Publication Number: 0277397

IPC: D04H 1/74

Language of the proceedings: EN

Title of invention:
Grow-mat for cultivating plants and a method for manufacturing same

Patentee:
Rockwool Lapinus B.V.

Opponent:
Isover Saint-Gobain "Les Miroirs"

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (no)"

Decisions cited:
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Catchword:
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Case Number: T 0456/93 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 26 January 1996

Appellant: (Opponent)
Isover Saint-Gobain "Les Miroirs"
Cedex 27
F-92096 Paris La Défense (FR)

Representative:
KUHEN, WACKER & PARTNER
Alois-Steinecker-Strasse 22
D-85354 Freising (DE)

Respondent: (Proprietor of the patent)
Rockwool Lapinus B.V.
Industrieweg 15
NL-6074 NH Melick-Herkenbosch (NL)

Representative:
Prins, Hendrik Willem
Arnold & Siedsma
Advocaten en Octrooigemachtigden
Sweelinckplein 1
NL-2517 GK Den Haag (NL)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office dated 5 March 1993 rejecting the opposition filed against European patent No. 0 277 397 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: G. Gall
Members: A. Burkhart
W. D. Weiß

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division rejecting the opposition against the patent No. 0 277 397.

Opposition was filed against the patent as a whole and based on Article 100(a) EPC.

The Opposition Division held that the grounds for opposition mentioned in Article 100(a) EPC did not prejudice the maintenance of the patent unamended, having regard to the following documents

KWP1(d2): JP-A-60/141217 and English translation thereof,
KWP2: US-A-2 785 728,
KWP3: GB-A-2 106 764,
KWP4(d1): JP-A-55/126438 and English translation thereof,
d3: Declaration under 37 C.F.R.1.132 by A. W. Knop et al. before the US Patent and Trademark Office, cited by the patent proprietor during the examination procedure, and
d4: GB-A-2 115 848.

II. The wording of the independent claims 1 and 9 of the patent in suit reads as follows:

"1. Elongated grow-mat (14, 19, 30, 31) for cultivating plants (25), cut from a layer (3, 8) of mineral fibres cross-linked to one another by a cured binding agent and heated with hydrophilic wetting agent, said fibres having a principal direction substantially extending in the lengthwise direction (X-axis) of said grow-mat (14,

19, 30, 31), characterized in that said fibres have a subsidiary direction substantially extending in the heightwise direction (Z-axis) of said grow-mat (14, 19, 30, 31)."

"9. Method for manufacturing a grow-mat (14, 19, 30, 31) for cultivating plants (25), comprising the forming of a layer (3, 8) from fiberised mineral flakes, in which layer (3, 8) are included a cured binder for cross-linking of the mineral fibres in said layer (3, 8) and a hydrophilic wetting agent to enable wetting of said mineral fibres with water, and the cutting of said layer (3, 8) to a grow-mat (14, 19, 30, 31), whereby said layer (3, 8) is cut such that a principal direction of said mineral fibres in said layer extends substantially in the lengthwise direction (X-axis) of the grow-mat (14, 19, 30, 31), characterized in that the cutting is performed such that a subsidiary direction of said fibres in said layer (3, 8) extends substantially in the heightwise direction (Z-axis) of said grow-mat (14, 19, 30, 31)."

III. The appellant argued in his Statement of Grounds of Appeal dated 15 July 1993, essentially as follows:

In a typical method for producing glass wool mats the fibres were collected on a conveyor in the form of horizontal layers, wherein the fibres had a principal fibre orientation (X-direction) in the lengthwise direction of the mats, a very important subsidiary fibre orientation in the widthwise direction of the production conveyor (Z-direction) and a less important further subsidiary fibre orientation in the heightwise direction (Y-direction).

The prior art grow mats according to exhibit A of document d3 which were produced in accordance with such a typical method, had therefore the same fibre orientation, as shown by the X, Y, Z-coordinates of exhibit A.

The subject-matter of claim 1 of the patent in suit was not novel with respect to the prior art grow mats according to exhibit A of document d3, since no discrimination between the transverse and heightwise direction, i.e. the other two directions perpendicular to the lengthwise direction, was given in claim 1 in the patent in suit.

Also the intermediate strips used in the process for producing cubes according to document d4 were novelty-destroying with respect to the subject-matter of claim 1 of the contested patent.

Furthermore, the grow mat according to claim 1 of the patent in suit did not involve an inventive step having regard to the prior art documents KWP3, KWP1(d2) and KWP4(d1), since these documents already taught that the transverse planar fibre orientation should be changed to a vertical planar fibre orientation in order to increase the compression strength and to obtain good rooting characteristics.

All of the advantages addressed by the patent in suit, i.e. good rooting characteristics, compression strength and bending strength, were a mere consequence of the fact that one of the principal (X-direction) or subsidiary direction (Z-direction) are in heightwise direction, and not that specifically the subsidiary direction was in heightwise direction.

The comparative tests presented in the patent in suit were not directed to grow mats according to document KWP1(d2) but to grow mats according to the prior art of exhibit A of document d3 having horizontal strata of fibres, and therefore, these comparative tests could not support an inventive step of the grow mat of claim 1 of the patent in suit over the grow mat known from document KWP1(d2).

IV. On 30 January 1995 the Board issued a communication to the parties, wherein it expressed its provisional opinion that the grow mat according to claim 1 of the patent in suit did not appear to involve an inventive step having regard to the teachings of documents KWP1(d2) and KWP4(d1), for essentially the reasons put forward by the appellant.

V. In a letter of reply dated 29 June 1995, the respondent (patent proprietor) argued essentially as follows:

Document KWP1(d2) was silent about any fibre direction other than the main direction, i.e. the moving direction of the collection conveyor, and that therefore, it was incorrect to state that the fibres of the grow mat of this document have also a subsidiary direction extending in the lengthwise direction.

The orientation of the fibres according to claim 1 of the contested patent resulted in an increase of the bending rigidity and in a compression rigidity which was about equal or at least not decreased relative to the prior art product, as could be seen from Tables 1 and 2 of the patent in suit.

The finding of the invention of the patent in suit, that by typically orientating the X-direction (main direction) and Z-direction (subsidiary direction) of the fibres the properties of the grow mat could be improved, was not suggested by the prior art.

VI. The appellant requested that the appealed decision be set aside and the patent be revoked, and, as an auxiliary measure, that oral proceedings be held.

VII. The respondent has not made a formal request. However, it can be concluded from the argumentation in the respondents letter of 29 June 1995 that he requests that the appeal be dismissed and the patent be maintained unamended.

Reasons for the Decision

1. *The subject-matter claimed in claim 1 of the patent in suit*

The subject-matter of claim 1 concerns a grow mat for cultivating plants, defined by the following features:

(a) it is of elongated shape,
(b) it is cut from a layer of mineral fibres,
(c) the mineral fibres are cross-linked to one another by a cured binding agent and
(d) treated with hydrophilic wetting agent,
(e) the fibres have a principal direction substantially extending in the lengthwise direction (X-axis) of the grow mat, and
(f) the fibres have a subsidiary direction substantially extending in the heigthwise direction (Z-axis) of the grow mat.

In claim 1 a distinction is made between the principal lengthwise direction and the subsidiary direction of the fibres. The lengthwise direction is indicated by the reference "X-axis" and the subsidiary orientation is indicated by the reference "Z-axis". The X-axis and the Z-axis are defined in the description and in Figure 1 of the patent in suit to be situated in planes parallel to the horizontal conveyor on which the layers of fibres are formed.

Therefore, claim 1 defines a grow mat, which is cut from the fibre layers formed on the conveyor and tilted through its longitudinal axis by 90° such that the layers of fibres formed on the conveyor (= the planes suspended by the X-axis and the Z-axis) are disposed vertically, with the principal X-direction of the fibres extending lengthwise and the subsidiary Z-direction extending heigthwise (see Figures 1 and 2 and corresponding parts of the description of the patent in suit).

In the patent in suit (see column 5, line 4 to column 5 line 10) and in document d3 it is expressed that the grow mat according to claim 1 has better rooting characteristics and a better bending rigidity with respect to a prior art grow mat, wherein the layers of fibres are disposed in horizontal planes, with the principal direction of the fibres extending lengthwise and the subsidiary direction of the fibres extending widthwise of the mat (see exhibit A of document d3).

2. *Novelty of the subject matter of claim 1*

The subject-matter of claim 1 differs

from the subject-matter disclosed in document KWP1(d2) by thé aforementioned features (e) and (f),

from the subject-matter disclosed in document KWP2 by the feature "grow mat" and the aforementioned features (e) and (f),

from the subject-matter disclosed in document KWP4(d1) by the feature "mineral fibres" and the aforementioned features (c) and (d),

from the subject-matter disclosed in document KWP3 by the aforementioned features (a), (e) and (f),

from the prior art grow mats shown in exhibit A of document d3 by the aforementioned feature (f), and

from the subject-matter disclosed in document d4 by the aforementioned features (a), (e) and (f).

Therefore, the subject-matter of claim 1 of the patent in suit is novel with respect to the prior art under consideration.

3. *Inventive step of the subject-matter of claim 1*

The document KWP1(d2) discloses an elongated grow mat for cultivating plants, which is cut from a layer of mineral fibres bound together by a cured binding agent and treated with hydrophilic wetting agent. With respect to the production method of the glass fibre layer structure the translation of document d2 states on page 4, last paragraph to page 5, line 9 that the fibres

are molten and manufactured in well-known steps into fibres, that the fibres are collected by continuously moving the fibre collection surface of a belt conveyor in one direction and that thus a mat shaped assembly is formed the fibres of which are disposed mainly in the moving direction of the fibre collection surface.

This production method corresponds to the collecting method on the first conveyor belt 2 shown in Figure 1 and described in column 4, lines 7 to 12 of the patent in suit.

Since the patent in suit - like document KWP1(d2) - is silent about the use of a specific fiberising apparatus (see the remark in column 4, lines 8 and 9 of the patent in suit "...fiberised in a fiberising apparatus (not shown)..."), it must be assumed that both in the method of document KWP1(d2) and in the method of the patent in suit a conventional fiberising apparatus is used, which creates a veil of fibres falling onto the collecting conveyor, which fibres are collected on the conveyor in a random arrangment within horizontal layers of fibres, the fibres having a widthwise direction and a lengthwise direction with respect to the moving direction of the conveyor. Due to the movement of the conveyor the fibres are disposed to a greater extent in the moving (lengthwise) direction than in the widthwise direction.

Therefore, the fibre layer structure according to Figures 1 or 2 of document KWP1 has a fibre orientation with a principal direction substantially extending in the lengthwise direction and a subsidiary direction substantially extending in the widthwise direction.

In the process of document KWP1(d2) a grow mat is cut from the fibre layer structure according to Figures 1 or 2 (see cross-section A-A of Figure 2) and rotated by 90° (see Figures 1 to 3 and claims 1 and 3, and page 8, first paragraph of the translation), such that the transverse planar fibre orientation is changed to a vertical planar fibre orientation, the planes of fibres intersecting the planting surface of the grow mat and the fibres within these vertical planes having a principal vertical heightwise direction and a subsidiary direction extending in the lengthwise direction.

Hence, the grow mat according to claim 1 of the contested patent differs from the grow mat disclosed in document KWP1(d2) only in the sense that the fibres are orientated to a greater extent in the lengthwise direction than in the heightwise direction.

This difference does not involve an inventive step, for the following reasons.

The advantages addressed by the patent in suit, i.e. good rooting characteristics and good mechanical properties, like compression strength and bending strength, are a consequence of the fact that the grow mat has a vertical planar fibre orientation, i.e. that the planar layers of fibres intersect the planting surface, as can be learnt from the teaching of document KWP4(d1), cf. Figures 1 and 2, and claim 1 and pages 2 and 3 of the translation.

Since in the grow mat according to KWP1(d2) a vertical planar fibre orientation is present, wherein the fibres within the vertical planes have both a heightwise and a

lengthwise direction, it must be assumed that this grow mat has good rooting and compression and bending characteristics similar to the respective characteristics according to claim 1 of the patent in suit.

The comparative tests presented in column 5 and 6 of the patent in suit are not appropriate to refute this assumption, because these tests are not directed to a grow mat having vertical planes of fibres according to document KWP1(d2) but to grow mats having horizontal planes of fibres according to the prior art shown in exhibit A of document d3. Hence, the comparative tests presented in the patent in suit cannot support an inventive step of the grow mat according to claim 1 of the patent in suit over the grow mat disclosed in document KWP1(d2).

The respondent has failed to refute the contention of the appellant and the Board that it would not create a practically appreciable difference with respect to rooting characteristics and bending and compression strength, if the grow mat known from KWP1(d2) would be modified in the sense that the fibres within the vertical planes are oriented to a greater extent in the lengthwise than in the heigthwise direction of the grow mat, as defined in claim 1 of the patent in suit.

Therefore, such a modification has to be considered as coming within the scope of the customary practice followed by a person skilled in the art.

The person skilled in the art is even led to such a modification by the disclosure of document KWP4(d1), which document shows a grow mat having vertical planar layers of fibres (see Figure 2). As the originally produced mat of Figure 1 of this document may be endless

(cf. page 4, last paragraph of the translation), it can be assumed that the arrow 1 depicted and Figures 1 and 2 of this document indicates the production direction (= direction of the fibre collecting conveyor). Consequently, it can also be assumed that the fibres within the vertical planar layers according to Figure 2 have a principal direction in the lengthwise direction of the grow mat and a subsidiary direction in the heigthwise direction of the grow mat.

Therefore, the subject-matter of claim 1 of the patent in suit does not involve an inventive step in the meaning of Article 56 EPC.

4. Since claim 1 is not allowable with respect to Articles 52(1) and 56 EPC, the patent cannot be maintained as granted and has to be revoked.

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:

A. Townend G. Gall