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**Datasheet for the decision
of 17 August 2014**

Case Number: T 0486/10 - 3.3.05

Application Number: 02022934.0

Publication Number: 1302229

IPC: B01D39/16, B01D46/02

Language of the proceedings: EN

Title of invention:

Bag filters

Patent Proprietor:

TOYOBO CO., LTD.

Opponent:

Toray Industries, Inc.

Headword:

Bag filters/Toyobo

Relevant legal provisions:

EPC Art. 83, 100(b), 56

Keyword:

Sufficiency of disclosure - (yes)
Late-filed document - admitted (yes)
Inventive step - (yes)

Decisions cited:

T 1055/92, T 0204/83

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 0486/10 - 3.3.05

**D E C I S I O N
of Technical Board of Appeal 3.3.05
of 17 August 2014**

Appellant: Toray Industries, Inc.
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
29 December 2009 concerning maintenance of the
European Patent No. 1302229 in amended form.**

Composition of the Board:

Chairman G. Raths
Members: A. Haderlein
P. Guntz

Summary of Facts and Submissions

- I. The present appeal of the opponent (appellant) lies from the interlocutory decision of the opposition division according to which European patent No. 1 302 229 in amended form and the invention to which it relates were found to meet the requirements of the EPC. The patent in suit concerns a bag filter.
- II. In the notice of opposition reference was made *inter alia* to the following documents:
- D1: JP 2000-354714 and
English translation thereof
- D4: JP 6-39113 and
English translation thereof
- III. The opposition division found that the main request, i.e. the patent as granted, did not comply with the requirement of inventive step, but that the auxiliary request, filed at the oral proceedings before the opposition division, complied with the requirements of the EPC. In particular, the requirements of Article 123(2), (3) EPC, for sufficiency of disclosure and for inventive step starting from D4 as the closest prior art, were said to be complied with.
- IV. In its statement of grounds of appeal, the appellant requested that the decision under appeal be set aside and that the patent be revoked. Reference was made *inter alia* to D1, D4 and the following documents:
- D7: US 3,348,367
- A1 to A8: drawings.

- V. The parties were summoned to oral proceedings to be held on 18 July 2014.
- VI. By its letter dated 4 June 2014, the appellant informed the board that it would neither attend nor be represented at the oral proceedings.
- VII. On 17 June 2014, the respondent filed an auxiliary request.
- VIII. By a communication dated 3 July 2014, the parties were informed that the oral proceedings were cancelled.
- IX. Claim 1 of the main request, i.e. the auxiliary request on which the impugned decision was based, reads as follows:

"1. A bag filter comprising a felt material (2) with an areal density of 400g/m^2 or more, which felt material (2) is prepared by bonding a short fiber web composed mainly of polyarylene sulfide fibers with a scrim and is sewn into a cylindrical shape having a diameter of 120 mm to 380 mm, a margin to seam being 2% to 8% of the bag circumference, and at least five yarns of the scrim in either one of warp and weft directions being incorporated by sewing into the entire sewn portion of the margin to seam, wherein the sewn portion comprises at least three lines of sewing at an interval of 2 mm or more."

Claims 2 and 3 represent particular embodiments of the subject-matter of claim 1 on which they depend.

- X. The appellant's arguments are summarised as follows:

Sufficiency

The disclosure of the patent was insufficient, and the skilled person was not enabled to carry out the invention over the whole scope of claim 1.

The scope of claim 1 was very broad, encompassing a large number of different combinations as illustrated by Annexes A1 to A6, but not even the simplest combination, namely the superimposed seam as depicted in A2, was sufficiently disclosed. The patent in suit did not discuss whether it was sufficient that five yarns of all overlapping layers together were between the outermost and innermost sewing line or not.

Moreover, features were missing from the independent claim which were essential to avoid slip breakage. In particular, the fell seam as shown in A6 was in accordance with the independent claim, but it was questionable whether the technical effect of avoiding slip breakage was achieved by a fell seam as shown in A6.

Also, the amount of warps between the sewing lines and the end of the felt as well as the position of the at least three sewing lines in the margin to seam were essential features, as illustrated by annex A7. These features being absent from the independent claim, the invention was not sufficiently disclosed.

Also, Table 1 of the patent in suit contained a mistake which would add to the lack of sufficient disclosure.

Inventive step

Comparative example 1 of D4 was to be considered as the

closest prior art. The subject-matter of claim 1 differed therefrom in that at least five yarns of the scrim in either one of warp and weft directions were incorporated by sewing into the entire sewn portion of the margin to seam, wherein the sewn portion comprised at least three lines of sewing at an interval of 2 mm or more. The problem to be solved was to improve the strength and durability of the bag filter by avoiding slip breakage.

According to the prior art described in the patent in suit ([0005]), it was a commonly known possibility to enlarge the overlapped portion, i.e. the margin to seam, and to increase the strength of the sewn portion. By increasing the margin to seam it was obvious to the skilled person to increase the number of yarns of the scrim contained in the margin to seam.

Moreover, having five yarns in the margin to seam was only a matter of design which was evidenced in particular by D1. D1 disclosed an example wherein the scrim had 12 warps/inch and 10 wefts/inch (para. [0028]). On the assumption of a margin to seam of 8%, 38 yarns with an interval of 2.3 mm were incorporated in the margin to seam. It was thus indispensable that more than 5 warps were incorporated in the margin to seam. If the margin to seam included 38 warps with a distance between each other of 2.3 mm, the skilled person would position the sewing lines within an interval of more than 2 mm.

It was moreover a straightforward possibility for the skilled person to use more than two sewing lines in order to increase durability. Since both D1 and D4 concerned similar problems and the filter materials used in both documents had similar properties, the

skilled person would have combined the teachings of these documents and would have arrived at the claimed subject-matter without exercise of inventive step.

Also, the combination of D4 and D7 would lead to the subject-matter of claim 1. In particular, Figure 3 of D7 disclosed, as evidenced by Annex A8, three rows of stitching within the margin to seam, the sewing interval being not less than 3 mm, and at least seven warps being contained in the margin to seam.

The subject-matter of claim 1 thus did not involve an inventive step.

XI. The respondent's arguments are summarised as follows:

Sufficiency

The number of yarns in the entire sewn portion was defined in the claims. It was apparent from the examples that the claimed number of yarns was defined per layer. The amount of warps between the sewing line and the free end of the felt was not essential due to the presence of at least three sewing lines.

There were no errors in Table 1 since about 5% shrinkage of the felt in the width direction was observed after pressing, as was clear from paragraph [0033] of the patent in suit.

Also, the number of warps in sewing lines in Table 1 was expressed by an integer, meaning that the number of warps in sewing lines in Table 1 was an actually counted, i.e. observed, number of warps, and was not a calculated number.

Inventive step

D4 was the closest prior art.

Starting from D4, as could be seen from paragraph [0012] of the patent in suit the problem to be solved was to avoid slip breakage of the short fibres relative to the warp or weft yarns. Paragraph [0005] of the patent in suit referred to the knowledge of the inventor of the invention and not to prior art.

D1 did not disclose the features distinguishing the claimed subject-matter from the bag filter of D4. The only teaching derivable from D1 was that a shell stitch should be used in order to improve the sewn portion and to avoid its breakage.

Starting from D4, a skilled person would at most have set the lamination number to be plural for the purpose of improving durability so that the strength of the sewn portion of a filter cloth for the bag filter was increased.

Thus, the subject-matter of claim 1 involved an inventive step in view of a combination of D4 and D1.

The claimed subject-matter also involved an inventive step in view of a combination of D4 and D7. D7 did not disclose the features distinguishing the claimed subject-matter from the bag filter of D4.

In particular, in view of T 204/83 it was not permissible to extract a teaching concerning a dimension from Figure 3 of D7 since a dimension which could only be obtained from a measurement in a schematic drawing was not part of the disclosure unless

it was a construction drawing drawn to scale. Figure 3 of D7 should be read together with the description of D7. Figure 3 of D7 thus merely showed that the weaving density of the selvage was greater than that of the remainder of the cloth. The number of warps between the outermost sewing line and the innermost sewing line was not derivable from Figure 3.

Even if the skilled person combined the teachings of D4 and D7, he would not arrive at the subject-matter of claim 1. D7 taught that the overlap should be at least 1.9 cm. Thus, the skilled person would increase the overlap in D4, resulting in a bag filter having an inner diameter smaller than the required 120 mm. As a consequence, the subject-matter of claim 1 also involved an inventive step in view of a combination of D4 and D7.

XII. Requests

The appellant requested that the patent be revoked.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. Main request - sufficiency of disclosure

1.1 Requirements of Article 100(b) and 83 EPC

The patent must disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) and 83 EPC).

1.2 Issues raised by the appellant

The arguments brought forward by the appellant with respect to sufficiency of disclosure relate to

- (i) the breadth of the scope of claim 1,
- (ii) missing features, and
- (iii) errors in Table 1.

1.3 Breadth of the scope of claim 1

According to the appellant, the scope of claim 1 was very broad. The claim encompassed a large number of different combinations as illustrated by Annexes A2 to A6, but not even the simplest combination, namely the superimposed seam as depicted in A2, was sufficiently disclosed. In particular, the feature

"at least five yarns of the scrim in either one of warp and weft directions being incorporated by sewing into the entire sewn portion of the margin to seam"
(feature F)

was complied with if at least five yarns of all overlapping layers together were between the outermost and the innermost sewing line.

Although the respondent was of the opinion that the feature in question would necessarily need to be construed so as to refer to the yarns in one single layer, this question can remain open.

The reason for that is that, on the one hand, the skilled person could also rework the invention if claim 1 were construed as suggested by the appellant. This is evidenced by the drawings of annexes A2 to A6,

i.e. it is clear that the skilled person could rework the bag filters as depicted in these drawings.

On the other hand, it must be borne in mind that claim 1 also requires a minimum distance between the sewing lines of 2 mm, i.e. it requires an interval of at least 4 mm between the innermost and the outermost sewing line.

This means, for instance, that even if claim 1 were construed such that feature F also related to 2.5 warps in two superposed layers as depicted in the drawing in annex A2, the interval between the innermost and the outermost sewing line would need to be at least 4 mm.

The skilled person therefore can rework the invention in both cases, i.e. even if the

"at least five yarns of the scrim"

were considered to be those of all overlapping layers together between the outermost and the innermost sewing line.

For the board, the alleged breadth of claim 1 is therefore no bar to sufficiency of disclosure.

1.4 Missing features

Whether a feature which is allegedly essential for achieving an effect is missing from the independent claim is not a question of sufficiency but of Article 84 EPC (see T 1055/92 of 31 March 1994, reasons 4, third paragraph). This question may need to be dealt with when assessing the success of the solution over

the whole scope claimed (see 2.5 *infra*) under Article 56 EPC, but not under Article 83 EPC.

1.5 Errors in Table 1

A purported error in Table 1 of the patent in suit does not by any means constitute a bar to sufficiency of disclosure, since the information contained in Table 1 is not necessary to rework all the embodiments within the scope of claim 1.

As convincingly shown by the respondent, the number of warps reported in Table 1 of the patent in suit is the number obtained by visually inspecting the sewn portion. The increase in the number with respect to the theoretical calculation carried out by the appellant is explained by the 5% shrinkage due to pressing, as explicitly referred to in paragraph [0033] of the patent in suit.

1.6 It follows from the above that the requirements of sufficiency of disclosure are met.

2. Main request - inventive step

2.1 The invention concerns a bag filter which is continuously operated at high temperatures for a long period, such as in an incinerator for municipal refuse and industrial waste, to filter dust-containing gases (patent in suit, [0006]).

2.2 Such a bag filter is disclosed by document D4, which represents the closest prior art.

In particular, D4 discloses a bag filter comprising a felt material with an areal density of 400g/m² (see

paragraph [0028] of D4), which felt material is prepared by bonding a short fiber web composed mainly of polyphenylene sulfide fibers PPS ([0014] and [0027]) with a scrim and is sewn into a cylindrical shape having a diameter of 120 mm. The circumference being 37.7 cm (12 cm·3.14), the overlap being 1 cm, the margin to seam is $1/37.7 = 2.65\%$.

- 2.3 According to the patent in suit, the problem was to provide a bag filter which can endure use for a long period by improving the strength and durability of the bag filter (patent in suit, [0006]).

According to the respondent, as could be seen from the patent in suit ([0012], page 3, lines 39 to 40) the problem was also to avoid slip breakage.

- 2.4 As a solution to this problem, the patent proposes a bag filter according to claim 1 of the main request characterised in that at least five yarns of the scrim in either one of warp and weft directions are incorporated by sewing into the entire sewn portion of the margin to seam, wherein the sewn portion comprises at least three lines of sewing at an interval of 2 mm or more.

- 2.5 It needs to be examined whether the problem has been solved.

- 2.5.1 Improvement of strength and durability

Comparative example 3 can be considered representative for the bag filter according to the closest prior art since the number of sewing lines is below the claimed lower limit of 3 sewing lines and since the number of warps in the sewing lines is also below the claimed

lower limit of 5.

Comparative example 4 cannot be considered representative for the closest prior art, in particular because its number of sewing lines and its number of warps in the sewing lines are within the claimed ranges.

As can be concluded from a comparison of examples 1 to 3 with comparative example 4, the strength of the filter is substantially increased, i.e. the strength and durability of the bag filter are improved.

2.5.2 Avoidance of slip breakage

As evidenced by examples 1 to 3 in comparison with comparative example 3 (see Table 1 of the patent in suit), the bag filters according to claim 1 break in their felt material and not in their sewn portion. Since in comparative example 3 slip breakage occurs and the broken part in examples 1 to 3 is the felt material and not the sewn portion, slip breakage is actually avoided in the examples according to the invention.

2.5.3 Missing features

(1) The appellant argued (albeit with respect to an alleged lack of sufficiency of disclosure) that essential features were missing from the claim.

For the board, as set out *supra* at 1.4, such an alleged absence of essential features is in fact an argument relevant for determining whether the problem was actually successfully solved over the whole range claimed.

(2) The appellant further argued that the amount of warps between the sewing lines and the end of the felt as well as the position of the "at least three sewing lines" in the margin to seam were also essential features.

The board does not accept this argument. This argument amounts to a mere allegation lacking substantiation since the appellant has not submitted any evidence showing that

- (a) a certain number of warps between the sewing lines and the end of the felt as well as
- (b) a certain position of the "at least three sewing lines" in the margin to seam were needed to successfully solve the problem.

Rather, it is credible that, independently of the position of the at least three sewing lines and independently of the width of the felt between the outermost sewing line and the end of the felt, strength and durability are improved over substantially the whole scope claimed.

2.5.4 Conclusion

The board thus concludes that the problem of improving the strength and durability of the bag filter and avoiding slip breakage has been credibly solved.

2.6 As to the question of obviousness, it needs to be examined whether it was obvious to

- (i) incorporate at least five yarns of the scrim in either one of warp and weft directions incorporated by sewing into the entire sewn portion of the margin to seam, wherein

(ii) the sewn portion comprises at least three lines of sewing at an interval of 2 mm or more.

2.6.1 The appellant argued that it was obvious to the skilled person to increase the number of yarns of the scrim contained in the margin to seam and that having five yarns in the margin to seam was only a matter of design.

The board cannot accept the appellant's argument. The question is not whether such a modification was "a matter of design" but rather whether it was obvious for the skilled person faced with the problem to be solved to actually modify the closest prior art such that it resulted in the proposed solution.

The appellant thus failed to show that there were hints towards the proposed solution in the prior art or that the skilled person's common general knowledge was sufficient to arrive at the proposed solution.

2.6.2 The appellant also argued that on the assumption of a margin to seam of 8%, 38 yarns with an interval of 2.3 mm were incorporated in the margin to seam. It referred to the example described in paragraph [0028] of D1.

The board fails to see any disclosure concerning the margin to seam in D1. Thus, D1 is silent on at least the number of warps included in the margin to seam. The sole teaching that can be derived from D1 in this respect is "to adopt a stronger sewing method, from this point shell stitch is desirable" (see D1, [0017]). So there is no useful basis in D1 which could be used to arrive at the proposed solution. Hence there is also

no incentive to combine D1 with D4.

- 2.6.3 The appellant further argued that the interval between the lines of sewing in Figure 3 of D7 is "not less than 3 mm". Therefore, the proposed solution was obvious in view of a combination of D4 and D7.

The board does not agree with this argument. As correctly pointed out by the respondent, it is established case law that dimensions obtained merely by measuring a diagrammatic representation in a document do not form part of the disclosure (T 204/83 of 24 June 1985, reasons 6 and 7). Figure 3 is such a diagrammatic representation.

Likewise, in D7 the number of warps and wefts contained between the two outer sewing lines is not disclosed due to the diagrammatic character of Figure 3 of D7. Figure 3 only illustrates that the density of warps and wefts contained between the sewing lines is higher than that of the felt material. An absolute number of warps or wefts cannot be considered to be disclosed in Figure 3 of D7.

Hence, the combination of the teachings of D4 and D7 would also not have led the skilled person to the subject-matter of claim 1.

- 2.6.4 According to the appellant it was known to enlarge the overlapped portion.

For the board, the question of whether or not it was known to enlarge the overlapped portion, i.e. the margin to seam, in order to increase the strength of the sewn portion can be left open, since the solution to the problem to be solved does not reside in an

enlargement of the overlapped portion.

- 2.6.5 No further documents were cited in support of the objection of lack of inventive step.
- 2.7 The board thus concludes that the requirements of inventive step set forth in Article 56 EPC are complied with for the subject-matter of the sole independent claim 1.

The subject-matter of claims 2 and 3 derives its patentability from that of claim 1, on which said claims depend.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



C. Vodz

G. Rath

Decision electronically authenticated