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D E C I S I O N
of 18 September 1998

Case Number: T 0592/97 - 3.2.4

Application Number: 89905867.1

Publication Number: 0370094

IPC: A47G 9/00

Language of the proceedings: EN

Title of invention:
Thermoplastic material containing absorbent pad or other article

Patentee:
WEYERHAEUSER COMPANY

Opponent:
Mölnlycke AB

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 123 and 102(3)

Keyword:
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
T 0002/83; G 0010/91

Catchword:

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0592/97 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 18 September 1998

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 13 March 1997 revoking European patent No. 0 370 094 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: C. A. J. Andries
Members: R. E. Gryc
M. Lewenton

Summary of facts and submissions

I. The appellant (patent proprietor) lodged an appeal on 23 May 1997 against the opposition division's decision notified by post on 13 March 1997 revoking european patent no. 0 370 094.

The appeal fee was paid simultaneously and the statement setting out the grounds of appeal was filed on 23 July 1997.

II. An opposition was filed requesting revocation of the patent as a whole on the basis of Article 100(a) EPC. The opposition division held that lack of novelty (Article 54 EPC) of the subject-matter of Claim 1 prejudiced the maintenance of the patent having regard to the following documents:

E1: US-A-4 608 047

E2: US-A-4 737 404

E3: GB-A-2 135 892

E5: EP-A-0 301 491

The opposition division was also of the opinion that the subject-matter of Claim 1 lacks inventive step over the combined teachings of:

E6: EP-A-0 192 265 and

E7: EP-A-0 070 164.

III. In the statement of the grounds of appeal, the appellant (patentee) emphasized that the pad according to the invention comprises a thermobonded mixture of

thermoplastic fibers and other fibers including a densified edge margin which forms a barrier to substantially impede the leakage of liquid.

He contended that the peripheral heat seal provided between the cover and the back sheet of the sanitary napkin according to E1 cannot act as a barrier to liquid in the meaning of the patent in suit and that the joint between the cover and the second fibrous layer of the laminate according to E2 is made to function as the connecting means for the different layers and is nowhere described to function as a barrier to the liquid.

In E2 the ultrasonic energy used for bonding should be concentrated to the interface between the layers to be joined, while maintaining the fibrous structure within other portions of the edge margin so that it retains its ability to wick liquid, and is not a barrier in the meaning of the invention. Therefore, in his opinion, the subject-matter of Claim 1 of the patent in suit would be new over E1 and E2.

The appellant contended also that only thermoplastic fibers and no other fibers are described to be used for the absorbent layer of the pad according to E3 and that neither E3 nor E5 discloses that the fibers within the absorbent pad are thermobonded so that the subject of the contested patent should also be considered as new over E3 and E5.

As regards inventive step, the appellant contended that, in E7, it is not stated that liquid barrier properties are intended to be achieved, the kind of bonding is in no way able to achieve liquid barrier properties in the edge margin and it cannot be seen why a skilled person should wish to have barrier properties

on the margin.

The appellant alleged also that E6 does not teach to provide a barrier to liquid by densifying the thermobonded mixture of thermoplastic fibers and other fibers.

The appellant argued therefore that, even when combining the teaching of E7 and E6, a person skilled in the art would only learn how to form leak-tight edge margins by attaching the cover sheet to the back sheet outside the absorbent material and how to prevent leakage by avoiding that the compressed areas of absorbent material extend to the outer edge of the pad and transmit fluid thereto.

In reply, the respondent (opponent) pointed out that there is no support in the application as filed for interpreting the term barrier to mean a complete stoppage of liquid flow and that the expression "barrier" of Claim 1 can only be interpreted as "partial liquid barrier". The densified edge margin according to the invention should only impede the leakage of liquid from the pad and since the edge treatment in E2 will likewise impede the leakage of liquid, Claim 1 lacks novelty over at least E2.

The respondent further contended that the entire product disclosed in E1 is stabilised by thermobonding and sealed with a peripheral heat seal which hinders the leakage since E1 does not even suggest that the liquid could escape through the seal. The respondent was thus of the opinion that Claim 1 lacked novelty over E1 and, referring to his notice of opposition, he urged that Claim 1 lacked also novelty over both E5 and E6.

In terms of inventive step, the respondent stated that the problem when starting from E7 should be to find a means of impeding leakage of liquid from the article, that the skilled person would recognize from E6 that this can be attained by providing embossed areas in those regions across which leakage is desired to be impeded and that he would thus arrive at the subject-matter of Claim 1 without the exercise of inventive activity. For the respondent, the same argumentation remains valid by using E1 or document E4 (EP-A-0 235 854 cited during the opposition proceedings) instead of E6.

IV. Oral proceedings took place on 18 September 1998.

At the beginning of the oral proceedings the appellant refused the introduction of a new ground for opposition (i.e. Article 100(c) EPC) in accordance with opinion G 10/91 (see OJ EPO 1993, 420).

During the oral proceedings the appellant filed a main request and an auxiliary request based respectively on two different amended set of claims.

Regarding the interpretation to be given to the term "barrier" used in Claim 1 the appellant pointed out that the functions of the densified edge margin forming said barrier were clearly defined in the description of the application as originally filed as to strengthen the article, to help retain the absorbent materials in place and to minimize (not avoid) leakage.

He specified also that the term "core" should be interpreted as the main absorbing element of a composite article being formed from a mixture of thermoplastic fibers in combination with absorbent but non thermoplastic fibers.

The appellant compared the subject-matter of the amended Claims 1 filed during the oral proceedings with the state of the art disclosed in each of the opposed documents and arrived at the conclusion that none of them either discloses or even gives a hint to combine all the features of the claims as according to the invention.

He contended also that the combination of features according to Claim 1 of the auxiliary request was not shown in the cited references, nor could a person skilled in the art obtain sufficient informations from these references for achieving such a combination without an inventive step.

The appellant acknowledged that the basic idea of using a thermobonded mixture of different sorts of fibers directly as finished product and not, as usual, as raw material was already disclosed in E7, however he disputed that a barrier formed in the thermobonded mixture to substantially impede leakage in combination with a surrounding lower density edge forming a soft edge were also described in said document.

The respondent contradicted the allegations of the appellant and put forward in particular that the discrete barrier made by the bonding of the layers all around the edges of the pad represented on Figures 5 to 7 of E7 affects (impedes) necessarily the transmission of fluid out of the pad through said barrier. According to him, the problem of the skilled person starting from E7 was the general well known problem of "edge leakage" and more particularly to further impede liquid migration through the incomplete line of bonding of the pad disclosed in Figures 5 to 7. He took the view that the skilled person starting from E7 and faced to these problems would find the solution according to the

invention either in E3, that teaches to utilise fused lines which are continuous in nature, or in E6 that, according to him, clearly describes that to bond absorbent layers of a pad by means of embossed areas can result in destruction of the capillaries in said areas and impede transmission of fluid.

The respondent alleged also that the very edge of the napkin represented on Figure 7 of E7 must be soft in the meaning of the invention and that the skilled person would have a priori no reason to renounce to said advantage by compressing the very edge of the pad.

At the end of the oral proceedings, the appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main or the auxiliary request both filed during the oral proceedings.

The respondent requested that the appeal be dismissed.

V. Independent Claims 1 respectively of the main and auxiliary requests read as follows:

- **Main request:**

"Absorbent article in the form of a single-layer pad or a core of a composite article (102, 118, 199, 203, 211, 230) comprised of a thermobonded mixture of thermoplastic fibers and other absorbent non-thermoplastic fibers, the article having a field and a densified peripheral edge margin (136, 150, 200, 204, 210) along at least a section of the article, characterised in that the peripheral edge margin (136, 150, 200, 204, 210) of fibrous material is densified by ultrasonic or adhesive bonding or thermosetting or heat sealing such that the margin (136, 150, 200, 204, 210)

forms a barrier to liquid along at least a section of the article, to substantially impede the leakage of liquid from the pad through the edge margin thereof."

- **Auxiliary request:**

"Absorbent article in the form of a single-layer pad or a core of a composite article (102, 118, 199, 203, 211, 230) comprised of a thermobonded mixture of thermoplastic fibers and other absorbent non-thermoplastic fibers, the article having a field and a densifled peripheral edge margin (136, 150, 200, 204, 210) along at least a section of the article, characterised in that the peripheral edge margin (136, 150, 200, 204, 210) of fibrous material is densified by ultrasonic or adhesive bonding or thermosetting or heat sealing such that the margin (136, 150, 200, 204, 210) forms a barrier to liquid along at least a section of the article, to substantially impede the leakage of liquid from the pad through the edge margin thereof, the densified edge margin (136) being bounded at least in part by an edge (184) of the article which is of lower density than the densified edge margin, the lower density edge (184) being slightly outside the densified edge margin (136) to form a soft edge."

Reasons for the decision

1. *Admissibility*

The appeal is admissible.

2. *Main request*

2.1 Modifications of Claim 1 (Article 123 EPC)

In the first line of Claim 1 as granted, the designation of the subject-matter of the invention has been modified to read: "Absorbent article in the form of a single-layer pad or a core of a composite article...".

Supports for this new designation can be found in the application as originally filed (see PCT application WO-A-89/10084, for example page 1, lines 6 to 9; page 6, lines 14 to 16; page 7, lines 27-28 or page 8, lines 25-26).

The unclear expression "other fibers" of the second line of Claim 1 as granted has been replaced by the following more complete and more specific expression: "other absorbent non-thermoplastic fibers".

A support is also to be found in the PCT application for example at page 1, lines 9 to 11; page 6, lines 6 to 8; page 7, lines 28 to 34 and page 8, lines 8 to 10.

Since these additions of features clarify and limit the protection conferred, no objection in application of Article 123 EPC can be made.

2.2 Interpretation of Claim 1

- In the light of the description of the originally filed PCT application, the expression "single-layer pad" newly introduced in the designation of the invention of Claim 1 has been interpreted as signifying implicitely that a thermobonded mixture

of different sorts of fibers is used directly as a finished product and not, as usual, as raw material.

The term "core" has been interpreted as referring more generally to the "main absorbing element" of a composite article.

These interpretations are based respectively on the following passages of the originally filed PCT application: page 6, lines 14 to 16 and 25-26; page 13, lines 7 to 18; page 15, lines 1-2; from page 15, line 30 to page 16, line 8 and also on the manufacturing method described from page 19, line 32 onward.

- the following phrase of line 4 of the granted claim:

"the peripheral edge margin (136, 150, 200, 204, 210) of fibrous material" should be interpreted as referring to the edge margin of the batt of thermobonded mixture used according to the invention to form either a single-layer pad or a core of a composite article (see for example: page 6, lines 16 to 24 and page 21, lines 11 to 13 of the PCT application), this phrase meaning implicitely that, with a composite article, it is the edge of the core itself and not the edge of the other layers envelopping the core which is densified.

- Also in the light of the description of the PCT application (see page 7, lines 2 to 5), it is clear that the expression "barrier to liquid" used in Claim 1 should be interpreted as a partial barrier which minimizes but does not avoid

leakage, the other functions of said barrier being also to retain the inner absorbent material and to strengthen the pad (see the PCT application for example on page 6, lines 33-34; page 7, lines 15 to 17; page 10, lines 15 and 16; page 16, lines 13-14; page 31, lines 33-34 and page 39, lines 3 and 4). It should be emphasized that the expressions: "a barrier to liquid" and "to substantially impede the leakage of liquid" imply a reduction to high degree and not simply a reduction.

2.3 Novelty (Article 54 EPC)

When examining novelty it should be borne in mind that a claimed subject-matter would lack novelty only if it were derivable as a whole directly and unambiguously from one document and that it is not justified arbitrarily to isolate parts of a prior art document from their context in order to derive therefrom a technical information which would be distinct from the integral teaching of the document.

The napkin according to E1 comprises three absorbent layers (18, 20, 22) forming the core in the meaning of the invention. However, there is no densified peripheral edge margin of fibrous material of said core forming a barrier to liquid. The seal 32, which is the only means capable of impeding the leakage of liquid, is located between the cover layer 24 and the barrier 26 and is not located in the absorbent layers forming the core (see E1: Figure 5).

The core of the fabric according to E2 (see E2: Figures 4 and 5) is formed by the plies of absorbent material 16 which are not provided with a densified peripheral edge margin. The only densified peripheral

seal of the fabric is made at the interface between the outer layers 18 and 20 (see E2: column 7, lines 3 to 23 and Figures 4 and 5).

The absorbent core of the pad according to E3 comprises a mixture of thermoplastic fibers and other fibers and is formed by folded layers, the "configuration" being maintained and stabilised by bonding. However, E3 does not describe that the mixture of fibers itself is thermobonded according to the invention. The panty liner of E4 is provided with a perimetrical seal 22 serving to join the laminae together (see E4: Figure 3 and page 9, lines 33-34). However the peripheral edge of the layer 25 of fibrous material forming the core itself does not appear to be densified (no fibrous core material between the laminae). Furthermore the layer is not formed as a "mixture" in the meaning of Claim 1.

E5 (which is an Article 54(3)(4)EPC document) relates to a sanitary napkin having a core made of loosely associated absorbent materials (see E5: column 6, lines 31 to 37) and not of a thermobonded mixture according to the invention. Moreover, the fluid sealing means is disposed around the periphery of the absorbent element forming the core and the fibrous material of the core is not densified so as to form therein a densified peripheral edge margin.

The core of the absorbent pads of E6 is made of coform material i.e. an air formed mixture of stable fibers and melt blown continuous fibers (see E6: page 7, lines 16 to 18) interconnected solely by physical entrapment and mechanical entanglement, the mixed fibers of the core being not bonded to each other by

thermobonding as according to the invention. Moreover no densified peripheral edge margin of fibrous material in the meaning of the patent in suit is provided (see the figures of E6).

Indeed, although a section (36) of compressed absorbent is shown on Figure 2 of E6, it is clearly stated in the description of said document (see page 5, lines 8 to 12) that this compressed section will provide for more rapid transmission of fluid i.e. exactly the contrary to what is expected from a liquid barrier. Only the embodiment according to Figure 3, which is formed with an embossed area 40 that results in a complete destruction of the absorbent capillaries, is non porous (page 5, lines 12 to 25). Such a destruction of the capillaries cannot be compared with a densification in the meaning of the patent in suit.

The absorbent nonwoven fabric of E7 comprises a core made of a thermobonded mixture of thermoplastic fibers and other absorbent non-thermoplastic fibers as according to the absorbent article of Claim 1, however the elongate sonically bonded areas joining together the superimposed layers of the fabric disclosed in Figures 5 to 7 are oriented perpendicular to the edge of the fabric and placed side by side so as to form an outwardly oriented row of discrete bonds between said layers. Because of the unbonded interconnections between the bonds and also because of Figure 7 of E7 the core itself does not seem to be compressed or densified at the bonded areas, so that such a row cannot form a barrier in the meaning of the invention, even if a juxtaposition of bonded areas might affect the transmission of liquid out of the pad.

Therefore, none of the prior art documents filed during the proceedings discloses directly and unambiguously a

combination of all the features mentioned in Claim 1 and the Board considers that the subject-matter of Claim 1 is new in the meaning of Article 54 EPC.

2.4 The closest state of the art

The Board considers that the state of the art closest to the invention is the core 72 of the wound dressing 62 described in example 4 of E7 (page 15) and represented on Figures 5 to 7 of this document in so far as this absorbent article comprises all the features of the precharacterising portion of Claim 1 as well as a sonically bonded peripheral edge margin of fibrous material (see E7: page 16, lines 2-3 and Figures 5 to 7).

However, there is no explicit indication and it does not appear from Figure 7 of E7 that the bonding of the layers densifies the edge margin of the core 72, let alone that the margin forms a barrier to liquid since, even if they were effectively densified, the aligned bonded areas still form a discrete bonding along the edge of the core.

2.5 Problem and solution

When taking into account the aforementioned differences between the subject-matter of Claim 1 and the closest state of the art (see above section 2.4), the problem as determined objectively appears to improve the properties of the edge margin of the absorbent article described in example 4 of E7 as regards tear strength and liquid retention inside the perimeter of the margin.

The Board is satisfied that the measures described in the characterising portion of Claim 1 bring effectively a solution to said problem.

2.6 Inventive step (Article 56 EPC)

E7 concerns absorbent non-woven fabrics for use in catamenial devices, absorbent pads and bandages (see E7: page 1, lines 17 to 25) and E3 relates to an absorbent pad such as a sanitary napkin or the like (see for example E3: page 1, lines 5-8 and 44) i.e. E3 and E7 concern the same technical field and the same person skilled in the art.

When said skilled person would be faced with the problem of improving the strenght of the margin and lateral retention capability of the absorbent pad described in example 4 of E7, he could not ignore the general teaching of E3 concerning fluid migration protection and, in particular, the following statements:

- "it is known to form a fluid migration barrier utilizing fused lines which are continuous in nature" and "fused lines are particularly beneficial for fluid barrier purposes" (see E3: respectively page 1, line 65 and page 2, line 46).

  Since E3 specifies moreover (see E3: page 2, lines 1 to 3) that:

  "such lines can be particularly beneficial" and "this is in contradistinction to an irregular or space pattern which would not necessarily provide the more complete fluid migration barrier protection which is desirable",

the skilled person would find therein an adequate solution to the problem that precisely faces him with the fabric shown on Figures 5 to 7 of E7, i.e. the problem of leakage of liquid resulting from a "space pattern" which does not provide the "more complete fluid migration barrier protection" which he desired.

Therefore, the skilled person would arrive at the invention claimed in Claim 1 just by applying word for word the teaching of E3 to the fabric of E7 and without any inventive activity.

For these reasons, in view of the teaching of E3, the Board is convinced that to join the edges of the superimposed layers of the fabric represented on Figures 5 to 7 of E7 by means of fused seals which are continuous in nature appears to be no more than a constructive measure which does not involve the exercise of any skill or ability beyond that to be expected of the person skilled in the art.

Therefore the subject-matter of Claim 1 of the main request lacks inventive step within the meaning of Article 56 EPC and the appellant's main request has to be refused.

3. *Auxiliary request*

3.1 Modifications of Claim 1 (Article 123 EPC)

Claim 1 consists of the text of Claim 1 of the main request completed with the content of Claim 3 as granted and the following sentence:

"the lower density edge (184) being slightly outside the densified edge margin (136) to form a soft edge".

Since this sentence has counterparts in the PCT application originally filed (see the PCT application: for example page 12, lines 16 to 20 and Figure 12 or page 31, lines 17 to 28) and limits furthermore the scope of the claim, no objection is raised against this modification.

3.2 Interpretation of Claim 1, novelty and closest state of the art.

Since the wording of Claim 3 as granted and the text of the added sentence mentioned in section 3.1 above are clear, Claim 1 should be interpreted in the same way as Claim 1 of the main request (see section 2.2 above).

Also the argumentations given in sections 2.3 and 2.4 above in relation with novelty and the closest state of the art remain valid as regards the subject-matter of Claim 1, provided that it is acknowledged that it differs from the closest state of the art disclosed in E7, not only by the densification of the edge margin of the core in order to strengthen the margin and to form a barrier to liquid as according to Claim 1 of the main request, but additionally by the creation, on the core, of a boundary peripheral lower density edge forming a soft edge along at least a part of the densified edge margin.

3.3 Problem and solution

Accordingly, the aforementioned additional differences between the subject-matter of Claim 1 and the closest state of the art being taken into account, the problem as determined objectively appears to strengthen and

make tight the edge margin of the core of the pad shown on Figures 5 to 7 of E7 without reducing comfort. The Board is satisfied that the measures described in the characterising portion of Claim 1 bring a solution to said problem.

3.4 Inventive step (Article 56 EPC)

When examining inventive step, it should be assessed whether not only all the characteristics of the invention but also incitements to combine these characteristics in the manner of the invention can be found in the state of the art (see Decision T 2/83, OJ EPO 1984, 265).

3.4.1 In the present case, it should first be pointed out that the problem which the invention attempts to solve (see above section 3.3) has not been contemplated in anyone of the documents cited during the proceedings.

In the state of the art disclosed in E1 to E7, it can be found neither the idea nor a hint, a clue or an incitement for providing the main absorbing element of a pad at one and the same time with a densified margin and a soft edge.

In the prior art documents, the skilled person would be taught either to seal, instead of the core itself, the cover layers which extend beyond and envelop the very edge of the core (see for example E1: Figure 5, seal 32; E2: Figure 4, seal 18a-20a and E4: Figures 3-4, seal 22) or to fuse the very edge of the pad (see E3: page 2, line 15 and Figure 1).

Sealing by connecting only the cover layers to each other does not lead to the claimed solution. Furthermore E6 (see above section 2.3) could also not

guide the skilled person to the claimed solution, since it either suggested to provide for a more rapid liquid transmission (Figure 2) or to destruct the core (Figure 3). Both these solutions do not suggest densifying in the meaning of the patent in suit, let alone the combination densifying-soft edge as claimed.

When starting from the pad shown on Figures 5 to 7 of E7 and following the teaching of E3 in order to seal and strengthen the edge margin of the core, the skilled person is not incited and has a priori no reason to bound said strengthened margin by a lower density edge i.e. a soft edge which may on the contrary weaken the peripheral edge of the fibrous core.

For the aforementioned reasons, the Board considers that to modify the pad shown on Figures 5 to 7 of E7 in order to provide its fibrous core at one and the same time with a densified margin and a soft edge as claimed in auxiliary Claim 1 does not follow plainly and logically from the prior art and implies an inventive step within the meaning of Article 56 EPC.

3.4.2 With respect to the claimed absorbent article in the form of a single-layer pad no argument has been brought forward during the proceedings, so that, in view of the cited documents, the Board sees no reason to doubt the presence of an inventive step for that claimed alternative.

4. Therefore the invention as claimed in the auxiliary request can serve as a basis for the maintenance of the patent.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent with the following claims and a description and drawings to be adapted:

   - Claims 1 to 6 of the auxiliary request filed during the oral proceedings;

   - Claims 7 to 56 as filed with letter dated 23 July 1997 (defined therein as 2nd auxiliary request).

The Registrar: The Chairman:

N. Maslin C. Andries

R.G.