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Datasheet for the decision of 27 April 2010

Case Number: T 0825/05 - 3.3.03

Application Number: 97947937.5

Publication Number: 0947549

IPC: C08L 1/00

Language of the proceedings: EN

Title of invention:
Highly absorbent composite compositions, absorbent sheets provided with the compositions, and process for producing the same

Patentee:
DSG International Limited

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 82, 84, 87, 123(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Amendments: extended subject-matter (no)"
"Priority validly claimed (no)"
"Novelty, inventive step and unity (yes)"

Decisions cited:
G 0002/98

Catchword:
-

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Case Number: T 0825/05 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 27 April 2010

Appellant: DSG International Limited
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 19 April 2005 refusing European patent application No. 97947937.5 pursuant to Article 97(1) EPC 1973.**

Composition of the Board:

Chairman: R. Young
Members: O. Dury
C.-P. Brandt

Summary of Facts and Submissions

I. European patent application No. 97947937.5, based on international application PCT/JP97/04606, filed on 15 December 1997 in the name of Japan Absorbent Technology Institute and further transferred to DSG International Limited, was published as No. EP 0 947 549 A1 on 6 October 1999 in Bulletin 1999/40. Priority from the following Japanese patent applications was claimed: P1: JP 33352096 (13 December 1996); P2: JP 12462397 (15 May 1997); P3: JP 19215997 (17 July 1997); P4: JP 21322297 (7 August 1997); P5: JP 31336897 (14 November 1997); P6: JP 32983097 (1 December 1997).

II. In the present decision, "EPC" refers to the revised text of the EPC 2000, the previous version is identified as "EPC 1973".

III. The application was refused by a decision of the examining division announced orally on 4 April 2005 and issued in writing on 19 April 2005 for lack of novelty pursuant to Art. 54 (3)-(4) EPC 1973, because the subject matter of claim 1 was anticipated by the disclosure of EP-A-0841156 (**D8**). The decision was based on a single **main request** consisting of claims 1-4 as filed during the oral proceedings of 4 April 2005 and comprising the following independent claims 1 and 3:

"1. An absorbent sheet comprising a liquid pervious supporting sheet (203) and an absorbent layer mainly consisting of an absorbent composite containing absorbent polymer particles and bonded on at least one surface of said supporting sheet, said absorbent layer forming a plurality of highly absorbing areas which have

higher absorbing capacity than the remaining areas and is distributed in a predetermined pattern on said liquid pervious supporting sheet, wherein the absorbent layer existing in said highly absorbing areas is thicker than the remaining areas and wherein said supporting sheet is a porous non-woven fabric having and has apparent density of 0.2 g/cm^3 or lower.

3. An apparatus of making an absorbent sheet comprising a plurality of nozzles (312) for applying a dispersion liquid slurry containing absorbent polymer particles in a band pattern on one surface of a liquid pervious supporting sheet (203) running continuously, and means having a mechanism for pulsating the flow of said dispersion liquid in the form of slurry for feeding said dispersion liquid to said nozzles (312)."

Claims 2 and 4 corresponded to dependent claims directed to elaborations of the absorbent sheet and of the apparatus according to claims 1 and 3, respectively.

IV. In its communication dated 20 January 2005 the examining division had introduced **D8** into the proceedings and had referred, in relation to novelty, to the following documents which were *inter alia* cited in the supplementary European search report:

D1: DE 4341443 C
D2: US-A-4025671
D3: EP-A-0719531
D8a: WO-A-9702946

D8a corresponds to the Japanese international application on which the Euro-PCT application D8 was

based. It was filed on 9 July 1996 i.e. before P1 and published on 30 January 1997 i.e. between P1 and P2.

V. On 15 June 2005 the applicant lodged an appeal against the decision of the examining division and simultaneously paid the prescribed fee. The Statement of Grounds of Appeal and a set of amended claims 1-4 were simultaneously filed by letter dated 17 August 2005.

VI. With a first communication dated 29 February 2008 the appellant was informed that the board could not identify whether the set of amended claims 1-4 filed together with the Statement of Grounds of Appeal corresponded to the main request or to an auxiliary request. The appellant was asked to clarify its requests.

VII. In its reply dated 11 June 2008 the appellant requested that a patent be granted on the basis of a single main request (claims 1-4) filed therewith and corresponding to the set of claims which was originally intended as the basis for the Statement of Grounds of Appeal. Independent claims 1 and 3 read as follows:

"1. An absorbent sheet comprising a liquid pervious supporting sheet (203) and an absorbent layer mainly consisting of an absorbent composite containing absorbent polymer particles, wherein
(i) said absorbent layer forms a plurality of highly absorbing areas which have higher absorbing capacity than the remaining areas,
(ii) the absorbent layer in said highly absorbing areas is thicker than the remaining areas,
(iii) said absorbent layer is distributed in a predetermined pattern on said liquid pervious supporting

sheet,
(iv) said supporting sheet is a porous non-woven fabric having an apparent density of 0.2 g/cm^3 or lower and
(v) said absorbent layer is bonded on at least one surface of said supporting sheet,
characterised in that
(vi) at least part of the surface of each of said absorbent polymer particles is covered with a hydratable fine fibers in the form of microfibril,
(vii) said absorbent polymer particles are bonded together by said hydratable fine fibers in the form of microfibril.

3. An apparatus for making an absorbent sheet according to claim 1, comprising a plurality of nozzles (312) for applying a dispersion liquid slurry containing absorbent polymer particles in a band pattern on one surface of a liquid pervious supporting sheet (203) running continuously, and means having a mechanism for pulsating the flow of said dispersion liquid in the form of slurry for feeding said dispersion liquid to said nozzles (312)."

Claims 2 and 4 corresponded to dependent claims directed to elaborations of the absorbent sheet and of the apparatus according to claims 1 and 3, respectively.

VIII. On 14 October 2009 the board issued a second communication and gave its provisional opinion that the valid main request did not fulfil the requirements of Art. 123 (2) EPC. The clarity of the claims was objected to in relation to the terms "layer", "absorbent polymer", "hydratable" and "microfibrils" and because some essential technical features of the invention were not

reflected by the independent claim 1. Furthermore, the subject matter of the independent claims 1 and 3 was considered as not unitary. Finally, novelty of claim 1 over example 9 of D8 was questioned.
In addition to these objections, the appellant was further requested to provide a translation of P1, which was necessary in order to examine the validity of the priority claimed and to determine whether D8a was a valid prior art under either Art. 54 (2) EPC or Art. 54 (3) EPC and Art. 54 (4) EPC 1973.

IX. With its reply of 11 December 2009 the appellant filed a new main request (claims 1-4) and the English translation of P1.

The appellant argued that the main request fulfilled the requirements of Art. 123 (2) EPC, Art. 84 EPC, Art. 82 EPC and Art. 54 EPC. Experimental evidence (sheets **E1 to E3** containing micrographs of various superabsorbers SAP made by Sanyo Chemical Industries, Ltd.) was simultaneously filed in order to demonstrate that the subject matter claimed was novel over D8. Finally, the appellant maintained that P1 could be acknowledged as priority for claims 1-4.

X. During a telephone consultation on 14 April 2010, the appellant was informed that claim 1 of the main request was not clear because the hydrating properties were not completely defined and because the claims were not limited to HFFM microfibrils according to the application as filed.

XI. With letter of 16 April 2010, the appellant filed a new **main request** (claims 1-4) comprising the following independent claims:

"1. An absorbent sheet comprising a liquid pervious supporting sheet (203) and an absorbent mainly consisting of an absorbent composite containing SAP particles, wherein
(i) said absorbent forms a plurality of highly absorbing areas which have higher absorbing capacity than the remaining areas,
(ii) the absorbent in said highly absorbing areas is thicker than the remaining areas,
(iii) said absorbent is distributed in a predetermined pattern on said liquid pervious supporting sheet,
(iv) said supporting sheet is a porous non-woven fabric having an apparent density of 0.2 g/cm3 or lower and
(v) said absorbent is bonded on at least one surface of said supporting sheet,
characterised in that
(vi) at least part of the surface of each of said SAP particles is covered with hydratable fibers in the form of microfibril HFFM exhibiting an hydrating property of 10 ml/g or higher when centrifuged at 2000 G for 10 minutes, wherein said hydrating property is calculated according to the formula: water retained = ml of precipitated volume/ g of Microfibrils;
(vii) said SAP particles are bonded one with each other and to the supporting sheet (203) by said microfibril HFFM and
(viii) said SAP particles are taken in a network of microfibrils HFFMs.

3. An apparatus for making an absorbent sheet according to claim 1, comprising a plurality of nozzles (312) for applying a dispersion liquid slurry containing SAP particles in a band pattern on one surface of a liquid pervious supporting sheet (203) running continuously, and means having a mechanism for pulsating the flow of said dispersion liquid in the form of slurry for feeding said dispersion liquid to said nozzles (312)."

Claims 2 and 4 corresponded to dependent claims directed to elaborations of the absorbent sheet and of the apparatus according to claims 1 and 3, respectively.

XII. The appellant requested that the contested decision be set aside and that a patent be granted on the basis of claims 1-4 as filed by letter dated 16 April 2010 as sole request.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments: Art. 123 (2) EPC*

2.1 **Claim 1** is based on the combination of original claims 10, 12 and 23 of the application as originally filed with the following further amendments:

(a) the term "layer" (of the wording "absorbent layer mainly consisting of" according to original claim 10) is deleted in the part of the claim preceding point (i) as well as in each of the points (i), (ii), (iii) and (v);

(b) the term "SAP" is used instead of "absorbent polymer" in the part of the claim preceding point (i);

(c) the term "predetermined" is used instead of "desired" in point (iii);

(d) points (vi), (vii), and (viii) have been added as further requirements.

The board agrees to the combination of claims 10, 12 and 23 since, in the application as filed, claim 23 was dependent on "any of claims 8-21", which encompasses claim 12, and claim 12 was itself further dependent on "claim 10 or 11". The combination of these three claims does not extend beyond the content of the application as filed and is, thus, allowable.

Regarding amendment a):
According to the original description the absorbent layer is made from a slurry used to prepare the so-called absorbent composite consisting of SAP particles, HFFM microfibrils and optionally short-cut staple fibres (page 20, lines 20-25; page 21, lines 5-12). Said absorbent layer/absorbent composite is also taught in said passages as being either distributed evenly onto the whole surface of the supporting sheet or applied in an appropriate pattern onto the surface of the supporting sheet. Hence, these passages explain to the skilled reader that the "absorbent layer" referred to in claim 10 as filed is directly obtained from the slurry used to prepare the absorbent composite. Besides, the wording "an absorbent layer (…) is distributed in a desired pattern on said liquid pervious supporting

sheet" according to original claim 10 or according to original claims 16-17 is not understandable unless one follows the explanation given in the description that the absorbent layer represents the absorbent composite in any of its possible configuration, either as a continuum or as a pattern of discrete, mutually independent elements: original claims 16, 17, Figs. 14 and 81 (lateral bands), Figs. 16 and 45 (longitudinal bands), Fig. 17 (curved lines), Fig. 40 (dents), Fig. 47 (islands), and Figs. 55-56 (surface with hills and valleys) all show that the term "absorbent layer" in the sense of the application as filed is not limited to a uniform and evenly applied substance onto the whole surface of a supporting sheet but encompasses said substance being distributed in various patterns. These concrete examples would, thus, confirm the reader with its former interpretation of claim 10 in the light of claims 16-17.

The further requirement of claim 10 as filed that the "absorbent layer" is bonded on the supporting sheet is also satisfied by claim 1, which provides that the absorbent comprises SAP particles, which are bonded to the supporting sheet via the HFFM (see points (v) and (vii) of claim 1).

Finally, according to the Oxford English Dictionary the term "layer" is defined as "a thickness of matter spread over a surface" so that it does not imply a restriction regarding e.g. said thickness which would have rendered its deletion incompatible with the requirements of Art. 123 (2) EPC.

Hence, it is concluded that it is derivable from the original disclosure as a whole that the amendment of "absorbent layer" into "absorbent" in claim 1 does not lead to an extension beyond the content of the application as filed. Besides, its deletion i) is required in order to resolve an inconsistency either within the claim (layer distributed in a desired pattern) or between the claims and the description (layer and independent island areas) and ii) reflects the true construction of the claims in the context of the specification.

Regarding amendment b):
The term "SAP" is clear since it corresponds to the abbreviation commonly used in the present technical field for "superabsorbent polymer". Besides, SAPs are always used as absorbent in the whole description and are defined on page 10, line 26 to page 11, line 14 of the application as filed. The amendment is, thus, allowable.

Regarding amendment c):
As already acknowledged by the examining division both terms "predetermined" and "desired" equally imply that something is known and aimed at beforehand and are, therefore, equivalent with regard to their technical meaning. The wording of claim 70 as originally filed, which uses both terms interchangeably, further confirms that the interpretation that both words are equivalent in the given context is in accordance with the original disclosure. The amendment is, thus, allowable.

Regarding amendment d):

Points (vi)-(viii) are derivable from the passages on page 32, lines 17-30 and page 37, lines 10-22, together with the requirement of hydrating properties recited from page 11, line 30 to page 12, line 3 as originally filed. The wording used clarifies in particular that the claims are limited to HFFM microfibrils as defined in the application as filed (page 3, lines 19-21 and page 11, line 15 to page 12, lines 28). The amendment is, thus, allowable.

2.2 **Claims 2-4** are derivable from the combination of the passages of the original disclosure identified above together with original claims 61, 87, and 88, respectively. Although claims 87 and 88 as filed did not formally refer to an apparatus for making an absorbing sheet according to any of the preceding claims, in particular according to claims 10, 12, and 23, the board considers that this combination is derivable from the application as filed taken in its whole. On the basis of the indication of broad generality related to the subject matter of present claim 3 given on page 6, lines 17-22 of the application as filed and in the absence of any statement in the description that the apparatuses disclosed are only suitable for making a specific, i.e. restricted, type of absorbent sheets, it is in particular evident that the apparatuses originally claimed are disclosed as being suitable for making any absorbent sheets according to the application as filed, including those of original claims 8-32.

2.3 The main request, thus, complies with the requirements of Art. 123 (2) EPC.

3. *Clarity*

The board is satisfied that, taking account of the amendments made, the main request fulfils the requirements of Art. 84 EPC.

4. *Priority*

The translation of the priority P1 provided by the appellant fails to disclose, *inter alia*, the following features of the independent claims of the main request:

- the combination of a liquid pervious supporting sheet (203) together with features (i), (ii), and (iv) according to claim 1;
- a plurality of nozzles (312) and means having a mechanism for pulsating the flow according to claim 3.

In application of Article 87 EPC as interpreted in G 2/98 (OJ EPO 2001, 413) it is decided that claims 1-4 are not entitled the claimed priority P1 because, failing to disclose the above identified features, P1 does not disclose the same invention as required by Article 87(1) EPC.

As a consequence, for the subject matter of claims 1-4:

- D8a is a valid prior art according to Art. 54 (2) EPC, since it was published on 30 January 1997, which is before the filing date of the present application (15 December 1997) and before each of P2 to P6 claimed as priority;
- D8 is a prior art according to Art. 54 (3) EPC and Art. 54 (4) EPC 1973 in as far as the contracting states DE, ES, FR, GB and IT are concerned (which are the states in common between D8 and the present

application), because D8 is a European patent application filed on 9 July 1996 i.e. before any of P2 to P6 and, thus, before the filing date of the present application, and it was published on 13 May 1998 i.e. after the filing date of the present application.

5. *Novelty*

5.1 Documents D8/D8a

Since D8a is a Japanese patent application, it is hereafter interpreted on the basis of D8, which is the corresponding European patent application, in English, published in accordance with Art. 158 (3) EPC 1973 (so-called Euro-PCT).

5.1.1 Claims 1-2: absorbent sheets

Example 9 on page 18 of D8 is an embodiment of an absorbing article according to Figure 18: it discloses an absorbent sheet comprising a porous non-woven supporting sheet (307) and an absorbent layer comprising the combination of a polymeric absorbent (502) located within each of the spaces of a porous layer (207) (see page 18, line 18 to page 19, line 2; page 11, lines 6-10; Fig. 18, page 44). The structure of the absorbing sheet of said Fig. 18 is, thus, very similar to that of Fig. 14 on file, which is illustrative of the present invention (see page 34, lines 1-2 of the application as filed). The polymeric absorbent used in said example 9 contains SAP in admixture with peat moss and acetate (page 18, line 42). The board considers that the combination of polymeric absorbent (502) and porous

layer (207), which is constituted of two distinct components, one of which having absorbing properties, is an "absorbent composite" as presently claimed. Fig. 18 of D8 shows that the absorbent sheet of example 9 also exhibits features (i), (ii), and (iii) of claim 1. Feature (v) of claim 1 is also fulfilled since the absorbent composite and the supporting sheets are bonded at the sintered points (407).

D8, however, does not specifically disclose the apparent density of the supporting sheet according to feature (v) presently claimed. There is no data on file which render plausible that this feature is implicitly disclosed in D8.

Besides, there is no evidence on file that the polymer absorbent used in example 9 of D8 is in the form of particles covered with HFFM as defined in features (vi)-(viii) of claim 1. The only teaching of D8 is that (502) is a polymeric absorbent (D8: page 11, lines 6-7) and that use is made in example 9 of a mixture of SAP (trademark IM-3000 of Sanyo Chem. Ind. Ltd.) and granulated composite comprising peat moss and acetate (D8: page 18, lines 42-43). In its reply of 11 December 2009, the applicant argued that IM-3000 is related to a product code of the SAP made by Sanyo and provided micrographs of five different SAP products presented as alternatives and evolutions belonging to the IM-3000 series. The applicant in particular maintained that IM-3000 is not in the form of a network of SAP particles and microfibrils but has a spherical shape or a flake shape. On the basis of this information and in the absence of evidence to the contrary the board

acknowledges that D8 does not clearly and unambiguously disclose features (vi)-(viii) of claim 1.

The same conclusions apply to D8a.

5.1.2 Claims 3-4: apparatus for making absorbent sheets

The only apparatuses suitable for making absorbent sheets according to claim 1 of the main request which are disclosed in D8 are those comprising a roller device as depicted in Fig. 15. Both documents D8 and D8a, thus, fail to disclose an apparatus comprising nozzles and/or a mechanism for pulsating the flow of slurry as recited in claim 3.

5.1.3 The subject matter of claims 1-4 is, thus, novel over D8 and D8a.

5.2 Document D3

D3 discloses thin absorbent sheets comprising hydrophilic fibres and thermally fusible bonding fibres or a strengthening assistant, and a superabsorbent polymer as defined e.g. in its independent claims 1 and 8. The sheets are characterised in that the superabsorbent polymer is not present on an absorbent surface of the absorbent sheet but distributed inside the absorbent sheet and is adhered and fixed to the fibres constituting the absorbent sheet (D3: claims 1 and 8; Figs. 1A, 1B, 3, 4, 6, 7, 9). D3 further provides a process for preparing absorbent sheets (claim 9; Figs. 2, 5, 8, 10 and 11).

D3, however, fails to disclose absorbent sheets comprising highly absorbing areas according to features (i)-(ii) and/or a predetermined pattern of absorbent according to feature (iii) and/or the combination of SAP and microfibrils HFFM as defined in features (vi), (vii) and (viii) of claim 1.

D3 further fails to disclose an apparatus suitable for making absorbent sheets and in particular characterised in that it comprises pulsating means as recited in claim 3.

The subject matter of claims 1-4 is, thus, novel over D3.

5.3 The board is further satisfied that none of the other documents cited in proceedings, and in particular none of the documents cited in either the international or in the supplementary European search reports, anticipates the subject matter of the main request.

5.4 Therefore, the main request meets the requirements of Art. 54 EPC.

6. *Inventive step*

The inventive merit will be assessed according to the problem-solution approach, which involves the following steps: establishing the closest prior art, determining the technical problem arising therefrom which the invention addresses and successfully solves, and examining the obviousness of the claimed solution to this problem in view of the state of the art.

6.1 Claims 1-2: absorbent sheets

D3 is considered as closest prior art since it also aims at providing thin absorbent sheets exhibiting stable absorption properties (D3: page 2, lines 5-6; page 3, lines 8-10 and 14-16) as the present application (page 1, lines 5-12).

The subject matter claimed differs from D3 at least through features (i), (ii), (iii), (vi), (vii) and (viii).

The objective problem solved is to provide further absorbent sheets having stable absorption properties. Examples 9 and 10 (pages 69-72) taken in combination with the teaching on page 51, lines 22-29, render plausible that the above identified objective problem was indeed solved. These examples are illustrative of the subject matter claimed since, according to the present application, the term "particles" includes flakes as used in example 9 (see page 11, lines 11-15).

The concepts underlying the inventions of D3 and of the present application are, however, so different, that the skilled person starting from D3 as closest prior art would have had no motivation to modify the absorbent sheet of D3 so as to arrive at the subject matter of claim 1. D3, in particular, does not deal with microfibrils HFFM and does not disclose absorbent materials of varying thickness: it could, thus, not have led to the solution provided in claim 1.

Hence, the subject matter of claims 1-2 is not obvious and may be acknowledged an inventive merit.

6.2 Claims 3-4: apparatus for making absorbent sheets

Considering that the apparatus claimed should be suitable for making an absorbent sheet as claimed, the closest prior art should be an apparatus for making such sheets. Said apparatus should in particular be suitable for making a sheet having a specific pattern of an absorbing material on its surface. The closest prior art is, thus, considered to be represented by D8a.

The apparatus claimed differs from those of D8a (see in particular Fig. 15) in that it comprises a plurality of nozzles (312) and means having a mechanism for pulsating the flow of slurry for feedings said nozzles.

The objective problem solved is the provision of alternative apparatus suitable for making absorbent sheets in particular characterised by features (i) to (iii) according to claim 1.
Figs. 61-73 together with page 47, line 2 to page 52, line 7 of the application as filed and the examples making reference to these passages render plausible that this problem was indeed solved.

The apparatus used in D8a is, however, completely different from those claimed since it is based on a roller device (Fig. 15). D8a does not disclose any system comprising nozzles and mechanisms for pulsating the flow of a slurry as presently claimed.

The other documents directed to apparatuses for making sheets with a pattern coated thereon are D1 and D2, which do not deal with absorbing sheets, absorbent

slurry, or pulsating mechanisms as claimed. None of these documents would have motivated the skilled person to modify the teaching of D8a so as to arrive at an apparatus as claimed in order to provide an apparatus suitable for making an absorbent sheet.

Therefore, the subject matter of claims 3-4 is inventive.

6.3 The board is, thus, satisfied that the main request fulfils the requirements of Art. 56 EPC.

7. *Unity*

The apparatus of independent claim 3 is suitable, i.e. specially adapted, for making absorbent sheets as defined in independent claim 1, which are novel and inventive. The subject matters claimed in the main request are, thus, so linked as to form a single general inventive concept, the latter being represented by the absorbent sheets according to claim 1. The board, thus, agrees that the requirements of Art. 82 EPC are met.

8. The main request contains various and lengthy amendments. In order to ensure that the description be properly adapted under Rule 42(1)(c) EPC to the claims thus amended, the board exercises its discretion under Art. 111(1) EPC by remitting the case to the department of first instance.

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 grant a patent on the basis of the main request (claims 1 to 4) filed with letter dated 16 April 2010, and after any necessary consequential amendment of the description (pages 1-90 as published) and of the drawings (Figs. 1-91 as published).

The Registrar: The Chairman:

E. Goergmaier R. Young