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D E C I S I O N
of 15 March 1995

Case Number: T 0055/93 - 3.2.2

Application Number: 85300626.0

Publication Number: 0151033

IPC: A61F 13/15

Language of the proceedings: EN

Title of invention:

Method of and improved apparatus for making discrete airlaid
absorbent fibrous articles

Patentee:

THE PROCTER & GAMBLE COMPANY

Opponent:

Mölnlycke AB

Headword:

-

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (yes) - Combination invention"

Decisions cited:

T 0175/84, T 0037/85

Catchword:

-



Case Number: T 0055/93 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 15 March 1995

Appellant:
(Opponent)

Mölnlycke AB
S-405 03 Göteborg (SE)

Representative:

Kierkegaard, Lars-Olvo
H. Albihn Patentbyrå AB
P.O. Box 3137
S-103 62 Stockholm (SE)

Respondent:
(Proprietor of the patent)

THE PROCTER & GAMBLE COMPANY
301 East Sixth Street
Cincinnati
Ohio 45201 (US)

Representative:

Bottema, Johan Jan
Procter & Gamble GmbH
Patent Department
Sulzbacher Strasse 40-50
D-65824 Schwalbach am Taunus (DE)

Decision under appeal:

Interlocutory decision of the Opposition Division
of the European Patent Office dated 16 November
1992 concerning maintenance of European patent
No. 0 151 033 in amended form.

Composition of the Board:

Chairman: H. J. Seidenschwarz
Members: M. G. Noel
M. K. S. Aúz Castro

Summary of Facts and Submissions

I. In consequence of an opposition filed by the Appellant against the European patent No. 0 151 033, the Opposition Division decided in an interlocutory decision dated 16 November 1992 to maintain the European patent in amended form.

II. Independent apparatus and method claims read as follows:

"1. An airlaying apparatus (20) for making discrete absorbent fibrous articles (51) which apparatus includes a deposition chamber (24), a rotatable deposition drum (26) having a plurality of article formation cavities (27) therein disposed in circumferentially spaced relation about the periphery of said deposition drum (26) and wherein each of the cavities has side walls (62, 63, 64), and a foraminous bottom wall (30) secured to said side walls, means for directing air-entrained fibers towards a span of the drum (26) passing through said deposition chamber, and means for vacuum drawing the fiber-entrainment air through the foraminous bottom walls (30) of the cavities and exhausting it from the apparatus, characterised in that the apparatus comprises

(i) Scarfing means (31, 32) for removing fibers in excess of the quantity required to fill each said cavity to the level defined by the drum periphery; and

(ii) means for compacting said articles by a predetermined amount prior to discharging each article from its respective formation cavity, said means comprising a lugged cylinder (34) rotatable about an axis

disposed parallel to the axis of said rotatable drum in timed relation therewith, said cylinder having at least one lug (35) which is sized and configured to precipitate said compaction by progressive engagement with the fibers in each said cavity (27) in a rolling motion as said lugged cylinder (34) and said deposition drum (26) are rotated in timed relation."

- "2. A method of making discrete absorbent fibrous articles by deposition of an air entrained suspension of fibers in a succession of cavities disposed about the periphery of a rotatable drum type deposition apparatus, each said cavity being formed with solid side walls and a foraminous bottom wall disposed radially inwardly of said periphery comprising the steps of;
- (a) depositing air entrained fibers in a cavity so as to form a fibrous mass filling said cavity;
 - (b) withdrawing at least part of the fiber entrainment air by vacuum through said foraminous bottom wall; and
 - (c) discharging said mass of fibers from said cavity, characterised in that the method also comprises the steps of;
 - (d) overfilling said cavity with said fibers;
 - (e) continuously scarfing away the excess of said fibers to thereby form in each said cavity an uncompacted preform of a said article having the size and shape of said cavity and a radially outwardly facing surface defined by the periphery of said drum;
 - (f) contacting the radially outwardly facing surface of said fibrous mass in said filled cavity with a lug adapted to enter into

engagement with said cavity, said lug being supported on a cylinder adapted to rotate in timed relationship with said deposition drum, said lug compressing said fibrous mass radially inwardly in a progressive manner as said drum and said cylinder rotate; and
(g) discharging said compressed fibrous mass from each said cavity in a radially outward direction."

III. The Appellant (Opponent) lodged an appeal against the decision of the first instance on 14 January 1993, paid the appeal fee and filed a Statement of Grounds within the prescribed time limit.

In its written submissions the Appellant argued that the alleged invention was obvious having regard to the combination of the prior art documents:

- (6) US-A-4 005 957
- (2) GB-A-820 734
- (7) SE-B-325 003 (translation in English of page 5, second paragraph, submitted with the Appellant's letter of 3 January 1992).

In the Appellant's view, starting from document (6) which described an apparatus for forming fibrous pads having all the features contained in the pre-characterising portion of Claim 1, two independent, separate problems had to be solved for producing discrete articles having height structural integrity and good edge definition, i.e. the problems of

- (I) removing excess fibers from the overfilled cavities of the drum and
- (II) compressing the fibers remaining in the cavities.

These two problems had to be solved separately by structurally independent means. Scarfing means in the form of rollers adjustable relative to the drum periphery, for solving problem (I), were known from document (7) whereas compressing means in the form of lugged cylinders rotating in timed relation with the drum, for solving problem (II), were known from document (2). Since these means were not structurally interrelated, it was obvious to the person skilled in the art to study different documents in order to find a specific solution which, therefore, could be considered to be the result of a pure aggregation of means and steps known per se, since the combination thereof did not lead to any unexpected synergism.

IV. The Respondent (Proprietor of the patent) argued as follows:

The inherent problem addressed by the patent was primarily to provide an apparatus and a method for making discrete absorbent articles of uniform size, shape and mass for use in sanitary napkins and disposable diapers, i.e. having high structural integrity and good edge definition. Such uniformity was achieved by using moulds of fixed size and by controlling the fiber weight in each article. Since the scarfing means was an integral part of the apparatus necessary to achieve this uniform weight, the recital of the scarfing means together with the compacting means was not, therefore, an arbitrary statement of two unrelated features; both were needed to provide the solution to the stated problem. Moreover, no reasoning was given by the Opponent as to why it was obvious to combine the teaching of either document (7) or (2) with that of document (6). There was actually no point at which the teachings of these documents complemented each other.

- V. The Appellant requested that the decision under appeal be set aside and that the European patent be revoked.

The Respondent requested that the appeal be dismissed and that the patent be maintained as amended by the Opposition Division.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

The amendments of the claims and to the description in the course of the opposition proceedings are not open to formal objections since they are fairly supported by the original disclosure of the application as filed and are not such as to extend the protection.

The requirements of Articles 123(2) and (3) are thus satisfied.

3. *Novelty*

- 3.1 Document (6) represents the prior art closest to the invention. It describes an apparatus and a method of making discrete absorbent fibrous articles by deposition of an air entrained suspension of fibers in a succession of cavities 28 disposed about the periphery of a rotatable drum type deposition apparatus 24, each said cavity being formed with a foraminous concave bottom wall 30 arranged radially inwardly of said periphery. The method comprises the steps of depositing air entrained fibers in a cavity so as to form a fibrous mass within said cavity, withdrawing at least part of

the fiber entrainment air by vacuum through said foraminous bottom wall and discharging said mass of fibers from said cavity in a radially outward direction.

However, the side walls of the cavities are not solid but made of the same foraminous material as the bottom walls. Moreover, the fibrous layer incompletely fills each cavity (cf. column 4, lines 61 to 64) so that the expression "filling said cavity" according to the features (i) of Claim 1 and (a) of Claim 2 in suit, in the sense of depositing fibers in excess of the cavity's capacity, is not disclosed in document (6).

3.2 Therefore, the subject-matter of independent Claims 1 and 2 differ substantially from the teaching of document (6) by the succession of the following characterising steps of the method and the corresponding apparatus features for performing the method, namely:

- overfilling the cavity with fibers (features (d) of Claim 2 and (i) of Claim 1)
- scarfing away the fibers in excess of the quantity required to fill up said cavity (features (e) of Claim 2 and (i) of Claim 1)
- progressively compacting or compressing the fibrous mass in said cavity by means of a lugged cylinder rotated in timed relationship with the fibers deposition drum, prior to discharging the article resulting thereof (features (f) of Claim 2 and (ii) of Claim 1).

3.3 Document (2) describes a method and an apparatus for making structurally stabilized sanitary napkins, i.e. napkins which, if deformed, resist distortion and return to their original shape when externally applied forces

are removed. However, as shown and described with reference to the embodiment of Figure 38, the fibrous mass is not air entrained but deposited into the mould cavities 218 of the drum in the form of preformed individual cores 211 of fibrous material having predetermined dimensions and characteristics obtained in the previous stage of forming and cutting (cf. page 9, lines 32 to 70).

In the embodiment according to Figure 44, the fibers are collected in the cavities of moulds passing intermittently underneath a disintegrator of fibers flowing in an air stream. But the mould cavities are not part of a rotatable drum placed adjacent the disintegrator and the fibers are not collected accurately since they are not deposited in excess of the quantity required to fill up each cavity.

3.4 Document (7) describes an apparatus for making a continuous mat M or web of fibrous material having a desired thickness, from which final individual absorption napkins of appropriate lengths are produced in a subsequent cutting operation. However, the drum on which the continuous web is formed has no cavity.

3.5 Therefore, the disclosure of documents (2) and (7) come no closer to the subject-matter of the claims in suit than the disclosure of document (6). Since none of the cited documents reveals the combination of all features of these claims, their subject-matter must be regarded as novel within the meaning of Article 54(1) EPC.

4. *Problem and solution*

4.1 The technical problem set in the contested patent is to making discrete absorbent napkins having high structural integrity and good edge definition. By "integrity" it is

to be understood that the articles produced are consistent in terms of their composition and mechanical and absorbent properties. Therefore, the Board accepts the statement of the problem set out by the Respondent as the provision of absorbent articles of uniform size, shape and mass for use in sanitary napkins and disposable diapers, that is articles containing the same amount of material as well as identical physical dimensions.

4.2 This technical problem is solved by the combination of the essential features listed above in point 3.2 or more specifically by features (d) to (f) according to the claimed method or features (i) and (ii) according to the claimed apparatus.

4.3 Briefly, the drum cavities are filled up with fibers in excess of the full capacity of the cavities (overfilling) and the excess is removed from the drum periphery (scarfing); then the mass of fibers is compacted in the cavities (compacting) through the action of a lugged cylinder meshing with the corresponding cavities in a gear-like manner. It is clear that by combining the overfilling and scarfing operations, a complete and homogeneous filling of the cavities and thus the provision of an accurate and uniform dosage of fibers in each cavity can be achieved. The resulting articles are strictly uniform in dimensions and weight (eight gram **each**, according to the exemplary embodiment given in column 5, line 33). Structural integrity also is the result of the compacting operation (column 3, lines 56 to 63 and column 4, lines 17 to 20).

5. *Inventive step*

5.1 Document (2) discloses with reference to Figure 38 compacting means for compacting separate articles by a predetermined amount, prior to discharging them, which are substantially similar to those used in the contested patent. They comprise at least one lugged cylinder 223, 224 rotatable about an axis disposed parallel to the axis of the deposition drum 222 and adapted to rotate in timed relation therewith. The lugs are designed for progressively compressing the articles as they engage the respective drum cavities in a gear-like manner. However, the compression is applied to already pre-formed napkin elements of predetermined characteristics, with the view to structurally stabilize and finally conform the curvature of the napkin to the shape of the portion of the wearer's body, as illustrated on Figure 41 and 42 (see also from page 1, line 89 to page 2, line 12 and page 3, lines 10 to 17). Furthermore, in document (2), the cavities of the drum are not used to proportion the exact quantity and weight of fibers but simply as female or receiving portions of shaping moulds, the male portions of which are constituted by the lugs of the lugged cylinder. Therefore, the compacting means to be compared in document (2) and in the patent in suit have different functions and purposes and are also used in different arrangements.

Document (7) discloses high speed rotatable means (pin cylinder 32) for removing fiber material in excess. To this end, the distance of the pin cylinder is adjustable to a desired value with respect to the drum periphery 2 so that a continuous mat M of uniform thickness is produced. But contrary to the patent embodiment in which scarfing rolls 31, 32 must contact the outer surface of the drum to scarf away any fibers still present at the

drum periphery, the pins 34 of the pin cylinder used in document (7) have to be maintained at a distance from the drum as the latter has no cavities. Otherwise, the mat of fiber material would not exist any more. Although the rolls used in both embodiments generally perform the same function of scarfing away fibers in excess from a predetermined surface level, they are, however, used in different arrangements and for different purposes and, therefore, they do not play the same role in the combination.

5.2 In an attempt to arrive at the claimed subject-matter, the skilled person would have had to combine three documents (6), (7) and (2), respectively. However, the combination would result from an ex-post facto analysis of these documents since, starting from document (6) in which separated articles are made from a suspension of fibers, the skilled person had, prima facie, no reason to take means possibly suitable from documents (7) and (2) but used for other purposes and in other arrangements, with a view to successively scarfing and compressing within the context of the present patent. Since the specific problem of making compressed articles having characteristics and properties which are rigorously uniform was not the subject of any of the cited documents, their combination at the time the invention was made was hardly to be expected.

Even in the unlikely event that the skilled person were led to combine the teachings of these three documents, their simultaneous consideration would be insufficient to arrive at the claimed subject-matter. As seen in above point 3.1, the method according to document (6) indicates that the cavities should be incompletely filled, which inevitably leads to difficulties in controlling the exact amount of fibers deposited in the cavities. That is clearly contrary to the principle

followed by the present invention and would generally deter the skilled person from overfilling the cavities as a first step.

As to document (2), no conclusion can be drawn from the examination of Figure 38 on the exact filling rate of the cavities, before compression.

- 5.3 The Appellant's argument according to which the alleged invention should be regarded as a mere aggregation of solutions of two independent partial problems which are not interrelated is not accepted by the Board.

This reasoning could only stand if the primary and more general problem such as defined in point 4.1 above were already known and solved by the prior art. Consideration of the remaining partial problems would then be justified. In the present case, not only the primary problem underlying the patent in suit cannot be found nor derived from the prior art documents but also the claimed features complement each other and are all equally necessary to the production of uniform articles having high structural integrity. Hence, these features are functionally linked together, which is the very characteristic of a combination invention (see point 4.3 above).

By limiting its investigation to the structural relationship of apparently independent means for performing the different process steps, the Appellant failed to consider also their functional relationship which, in the present case, results in the claimed method based on the sequence of the three steps of overfilling, scarfing and compacting, and in the claimed apparatus from the specific arrangement of the means considered as a whole, for performing the preceding steps.

It is of no consequence whether, in a combination invention, possibly all features are already known per se, separately (T 37/85, OJ EPO 1988, 86). It is wrong to select on the basis of a plurality of partial problems to be solved, the respective constructional means used in the apparatus combination, or the steps of the method worded in terms of functional features, which by working together provide a solution to the problem taken as a whole. The non-obviousness of a combination claim turns on the simultaneous application of all its features (T 175/84, OJ EPO, 1989, 71).

- 5.4 In view of the above, in the Board's judgment, the subject-matter of both apparatus and method Claims 1 and 2 is not rendered obvious by the cited prior art and therefore involves an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:



S. Fabiani

The Chairman:



H. Seidenschwarz

Handwritten:
R.S.
18.3.95