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D E C I S I O N
of 14 October 2004

Case Number: T 0873/02 - 3.2.6

Application Number: 95923814.8

Publication Number: 0767648

IPC: A61F 13/15

Language of the proceedings: EN

Title of invention:

Fluid transport webs exhibiting surface energy gradients

Patentee:

THE PROCTER & GAMBLE COMPANY

Opponent:

SCA Hygiene Products AB
McNeil-PPC, Inc.
Kimberly-Clark Worldwide, Inc.

Headword:

-

Relevant legal provisions:

EPC Art. 83, 84

Keyword:

"Clarity (no)"
"Sufficiency of disclosure (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0873/02 - 3.2.6

D E C I S I O N
of the Technical Board of Appeal 3.2.6
of 14 October 2004

Appellant: The Procter & Gamble Company
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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted 27 June 2002
revoking European patent No. 0767648 pursuant
to Article 102(1) EPC.**

Composition of the Board:

Chairman: P. Alting van Geusau
Members: G. L. De Crignis
R. T. Menapace

Summary of Facts and Submissions

- I. European Patent No. 0 767 648, granted on application No. 95923814.8, was revoked by the opposition division by decision posted on 27 June 2002 based on the finding that the subject-matter of claim 1 of the main request as well as that of auxiliary requests 1 to 3 lacked clarity (Article 84 EPC) and that there was an insufficiency of disclosure (Article 100(b) and 83 EPC).
- II. The appellant (patentee) filed a notice of appeal against this decision and paid the appeal fee on 20 August 2002. On 5 November 2002 the grounds of appeal were filed.
- III. On 27 February 2004 the board issued a summons to oral proceedings and communicated its preliminary opinion that the features of claim 1 relating to "a plurality of surface energy gradients on said first surface having an average spacing which is smaller than the average intercapillary spacing" appeared to lack clarity and that the question arose as to how such surface gradients could be determined because related information, which was necessary for carrying out the invention, appeared to be lacking in the patent in suit.
- IV. With letter of 4 October 2004 the appellant filed
- A1 affidavit of Mr Keith J. Stone including
- A2 Scanning Electron Microscopic pictures showing a film corresponding to the embodiments of figures 11 and 12 of the patent in question

V. Oral proceedings were held on 14 October 2004. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of one of the sets of claims filed on 14 September 2004 (main request and seven auxiliary requests). In order to render the amended sets of claims consistent with the description the appellant requested deletion of figure 7 and its related disclosure in paragraphs 0079 and 0080 as well as deletion of paragraph 0088 with respect to the main request and auxiliary requests 1 to 3. For auxiliary requests 4 to 7 the appellant requested deletion of figures 7, 8, 9 and 13 as well as of paragraphs 0079 to 0090, 0097 to 0100, 0161 and 0162 of the description.

The respondents requested dismissal of the appeal.

VI. Claim 1 of the patent according to the main request reads as follows:

"A web (80) having first (90) and second surfaces, said web including a plurality of fluid passageways in the form of capillaries placing said first (90) and second surfaces in fluid communication with one another, said web being characterized by:

a plurality of surface energy gradients on said first surface (90) having an average spacing which is smaller than the average intercapillary spacing, said surface energy gradients being defined by regions (98) which are adapted to exert a force on fluid contacting said first surface (90) such that said fluid will be directed toward said fluid passageways for transportation away from said first surface and in the direction of said second surface, said regions

comprising depositions of a low surface energy material which interface with surrounding regions of the web which are of a comparatively higher surface energy. "

- In claim 1 of the first auxiliary request the following feature is added to at the text of claim 1 as above:
"wherein said regions are discontinuously spaced".
- In claim 1 of the second auxiliary request the following feature is added to the text of claim 1 of the main request:
"and wherein said regions are concentrated near the first surface and decrease in frequency, with an increase in spacing, with increasing distance from said first surface".
- Claim 1 of the third auxiliary request was amended in that both additional features of the first and second auxiliary request were added to the text of claim 1 as in the main request.
- Claim 1 of the fourth to seventh auxiliary request was amended in that in the preamble the web was limited to "being a formed film of thermoplastic material". Otherwise, the fourth to seventh auxiliary requests correspond to the main request and first to third auxiliary requests, respectively.

VII. In support of its requests the appellant argued essentially as follows:

It has been specified in claim 1 of each request that said web included "a plurality of fluid passageways in the form of capillaries" whereby only those fluid passageways formed capillaries which were in fluid

communication with the first and second surface of a web. This meant that figures 1, 2, 6, 7, 8, 10, 12 showed fluid passageways in the form of capillaries, namely the macro apertures 41, 71, 215, 330 and 340. The micro apertures 325 in figure 12 did not establish a direct fluid communication and thus did not fall under the definition for capillaries chosen in the preamble of the claim.

With respect to the feature "a plurality of surface energy gradients on said first surface (90) having an average spacing which is smaller than the average intercapillary spacing", being present in claim 1 of all requests, the text in column 16, lines 39/40 specified that each region generated a surface energy gradient at its boundary. Therefore, it was clear for the skilled person that for the determination of the spacing between two regions measurement between their boundaries was intended. Not each point of the boundary should be considered as being a separate gradient but the boundary as a whole.

A method to determine such spacing could be chosen without any restrictions since only the relation was claimed. It was only necessary to apply the same method for the determination of the average spacing of the regions and the average intercapillary spacing in order to verify the claimed difference. In principle, the shortest distance between the boundaries of the regions should have been taken but also the distance between the center of the regions, since only the relation of the spacing was relevant. Figure 6 demonstrated sufficiently clearly such regions and spacing.

In claim 1 of auxiliary requests 4 to 7 the limitation to a formed film of thermoplastic material allowed the individual distance (spacing) to be determined between the distinct apertures and consequently also the average spacing of the apertures as was demonstrated by the affidavit A1 and its attached SEM pictures A2. These SEM pictures corresponded to the embodiment of figures 11 and 12 of the patent in suit. The boundaries could be clearly identified and therefore, the skilled person could determine the spacing.

VIII. The arguments of the respondents were, in essence, as follows:

There was no clear information in the patent specification as to which passageways were capillaries and which were not. The definition in paragraph 0041 referred to certain broad requirements. However, in order to verify whether the requirements set out in paragraph 0041 were met, it would be necessary to specify a fluid since the Laplace equation which was used for identifying "capillarity" included the surface tension which is dependent on the applied liquid. No such liquid being defined, the term "capillaries" could not be linked to a specified structure.

This lack of clarity was highlighted by the affidavit filed. With reference to the main request and first to third auxiliary request the patent proprietor had definitely stated that only the macro apertures should be considered as capillaries since only they related to a direct fluid passageway between the first and second surface. In the affidavit filed by the patent proprietor it was explained that both the micro

apertures and the macro apertures were considered to form capillaries. The wording of claim 1 in the preamble only referred to those capillaries which linked the first and second surface so that a fluid communication could take place. The definitions given in paragraph 0041 for the term "capillary" with respect to the Laplace equation, the definitions given in paragraph 0027 for the term "fluid passageway" and the wording in claim 1 were not consistent.

Another question arose with respect to the nature of the gradients/regions. In paragraph 0040 of the specification the definition referred to all "discontinuities" falling within the definition of "gradient". According to paragraph 0039 the gradients could be continuous or discontinuous. According to the wording of claim 1 the gradients should be on the first surface and they were defined by regions. Hence, this disclosure implied that not only the boundaries of the regions should be considered as "surface energy gradients". This understanding was also supported by claim 2 of the main request which referred to the regions being discontinuously spaced which implied that claim 1 also covered continuous regions. The method to determine the average spacing of such continuous gradient or region was not apparent. All explanations by the patent proprietor referred to figure 6, which did not disclose a continuous region or gradient.

The determination of the average spacing of the gradients would only be possible when the actual position of the gradients could be established. Nowhere was it explained in the patent specification how the spacing should be determined. Column 16, lines 39/40

referred to "each region generates a surface energy gradient at its boundary." In combination with the wording of the claim "the surface energy gradients being defined by regions" this did not render invalid the definitions given in paragraphs 0039 and 0040 with respect to continuous or discontinuous gradients.

The same was true for the determination of the "average intercapillary spacing" which could only be made when the capillaries were identified.

OIII further raised an objection under Article 83 EPC with reference to the feature "regions which are adapted to exert a force on fluid contacting said first surface such that said fluid will be directed toward said fluid passageways for transportation away from said first surface and in the direction of said second surface". Paragraph 0063 referred to such movement but it was not explained how the movement was achieved in view of the fact that there was no hydrophobicity gradient in any specific direction. In any case, the movement depended also on the surface tension (hydrophobicity) of a fluid.

OI additionally submitted that there was no enabling disclosure as to how to manufacture and obtain the claimed web. Paragraphs 150 to 155 as well as the examples neither disclosed how the silicone coating applied led to the claimed functions nor whether this silicone coating was applied as a continuous or discontinuous coating.

OII also raised objections under Article 123(2) EPC with respect to the amendments in the second, third,

sixth and seventh auxiliary request. The subject-matter added at the end of claim 1 of these requests was considered to introduce a non-disclosed generalization, since the basis for this amendment in the application as originally filed referred only to the embodiments of figures 9 (page 25, lines 11 to 22) and figure 12 (page 27, lines 3 to 15) and were not applicable to all webs.

Reasons for the Decision

1. The appeal is admissible.
2. *Subject matter common to claim 1 of all the appellant's requests*
 - 2.1 All main claims include a first feature according to which "the web including a plurality of fluid passageways in the form of capillaries placing said first and second surfaces in fluid communication". The main claims of all requests further specify that a plurality of surface energy gradients which themselves are defined by regions have an average spacing which is smaller than the average intercapillary spacing.
 - 2.2 As regards the meaning of these features it is to be noted that in the description embodiments are specified in the form of an apertured nonwoven, a woven or hybrid woven/nonwoven, a formed film web, microapertured, macroscopically expanded and/or apertured formed films, nonwoven/film/nonwoven composites, composite structures as well as polymeric foam materials (paragraphs 0089 to 0100) and therefore capillaries formed by these web

structures are covered by claims 1 of the main request and auxiliary requests 1 to 3.

- 2.3 Claim 1 of auxiliary requests 4 to 7 is limited to a web being a formed film of thermoplastic material leading to a more restricted meaning of the capillaries.

3. *Sufficiency of disclosure*

- 3.1 An objection was raised regarding the nature of the capillaries and how their average intercapillary spacing should be determined.

The various figures shown in the patent in suit refer to different web types already mentioned under point 2.2 above. The definition applied to "capillaries" forms the decisive aspect for the assessment of whether the apertures represent "capillaries" within the meaning of the patent in suit and consequently whether it is possible to arrive with the required certainty at consistent results when trying to determine an "average intercapillary spacing".

Paragraph 0041 of the patent in suit limits the meaning of "capillary" to passageways "in accordance with the principles of capillarity generally represented by the Laplace equation". From the parameters of this equation it follows that capillarity is dependent on surface tension, contact angle and the internal radius of the capillary. Considering that the main claims of all requests are not limited to webs for absorbing bodily or water-based fluids, other fluids with different surface tensions and contact angles are also embraced.

3.2 With respect to the main request and auxiliary requests 1 to 3 all web structures identified under paragraph 2.2 above are included. Particularly with respect to nonwoven fibrous webs, foam materials and various composite structures, information is lacking as to how the different capillaries should be identified for determining their average spacing. Figures 8, 9 and 13 do not enable the skilled person to define the individual capillaries of nonwoven structures, even less of foam materials and composite structures. The appellant's contention that only the macro apertures 41, 71, 215, 330 and 340 disclosed in figures 1, 2, 8 and 12 represented "capillaries" within the meaning of the patent cannot be followed because of the relevant disclosure in the patent which generally relates "capillaries" to the Laplace equation. On the one hand, the three criteria of the Laplace equation cannot be valid for a combination of all the macro apertures specified above with all conceivable liquids; and on the other hand, the small interstices between the nonwoven fibrous filaments also form passageways for fluid communication between the two surfaces. Therefore, the skilled person could not define in a clear and reliable manner which apertures represented capillaries within the meaning of the patent in suit and thus a determination of the "intercapillary spacing" was not possible either. Already for this reason the main and auxiliary request 1 to 3 do not meet the requirements of Article 83 EPC.

3.3 In claim 1 of auxiliary requests 4 to 7 the web is limited to a formed film. According to the expert opinion A1 both the macro- and the micro- apertures should be considered as capillaries. This may be

correct, where, as in a film, the individual apertures can be identified. However, in the present case only those apertures which define a fluid communication between the first and the second surface of the web can be taken into account for determining the average intercapillary spacing. As already set out for webs in general, such a differentiation depends on whether a fluid communication from one surface to the other is provided, and on the geometry (diameter, length) of the capillaries and last, but not least, on the surface tension of the fluid, as is apparent from the Laplace equation referred to in the patent in suit. No such conditions being specified, such a differentiation is not possible.

- 3.4 The patent proprietor considered the determination of the intercapillary spacing of the formed film to be straight forward in that the capillaries in the film could easily be identified as was apparent from the colour pictures (A2) attached to the affidavit A1. However, although this might be feasible with flat films, it is not possible to identify the boundaries of the holes forming the capillaries for the macro-apertures where, as in the present case, they are disclosed in a three-dimensional uneven distribution, For the boundaries of the micro-apertures the same problem persists because these micro-apertures extend as unstable "flappy" tubes from the film surface. There is no instruction whatsoever, as to whether the shortest or any other conceivable distance should be taken for the determination of the average intercapillary spacing. The skilled person is therefore left without any guidance as to how to determine the average intercapillary spacing due to both the

uncertainty over which apertures represent "capillaries" and the lack of indication of how the distance between the highly irregular apertures forming the capillaries should be determined.

3.5 In other words, with respect to claim 1 of each request, the skilled person is unable to identify the "capillaries" as well as to determine the "average intercapillary spacing". It follows, therefrom, that the decision under appeal, in which the opposition division came to the same conclusion, cannot be set aside.

3.6 As a matter of completeness the Board notes that the same deficiency applies with respect to the determination of the average spacing between the plurality of surface energy gradients, said surface energy gradients being defined by regions.

3.6.1 The subject-matter according to the main request as well as to the second, fourth and sixth auxiliary request is not limited to the regions which are discontinuous. With respect to the surface energy gradients it is stated in the patent specification that they can exist as a continuous gradient or as discontinuous gradients (paragraph 0039). For continuous gradients forming the surface energy gradients there is no explanation, and also the appellant failed to submit any explanation during the oral proceedings, as to how to determine an average spacing of these gradients. Hence, the disclosure is also insufficient in this respect.

3.6.2 The subject-matter of the first and third, fifth and seventh requests is limited to the regions which are discontinuously spaced. Therefore, the discontinuous surface energy gradients could be understood as being represented by the boundaries of the silicone coating drops applied which are represented by the white patches on the SEM pictures (A2). The patches are, however, highly irregular so that the determination of the average spacing (of each point) of the boundaries of the patches is practically impossible.

3.7 Apart from that, no information is available in the patent or apparently elsewhere, as to how to establish with the required certainty the relation of the surface energy gradients and the average intercapillary spacing. For the reason set out above with respect to the determination of "capillaries", also the "surface gradients" remain indefinite in the context of the patent. It may well be, that the requirements of Article 83 EPC may be met where, eg. provided there is an even distribution of droplets representing the surface energy gradients which are very small in comparison with evenly distributed capillaries and provided, both droplets and capillaries are in a well-defined regular pattern. However, nothing of this sort is present in the disclosure of the patent-in-suit.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

M. Patin

P. Alting van Geusau