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Datasheet for the decision of 19 October 2016

Case Number: T 0380/14 - 3.3.06

Application Number: 04783554.1

Publication Number: 1694915

IPC: D21H17/13, D21H19/32, D21H17/59

Language of the proceedings: EN

Title of invention:
Soft tissue hydrophilic tissue products containing polysiloxane and having unique absorbent properties

Patent Proprietor:
KIMBERLY-CLARK WORLDWIDE, INC.

Opponent:
SCA HYGIENE PRODUCTS AB

Headword:
Tissue treated with poysiloxanes blend / KIMBERLY-CLARK

Relevant legal provisions:
EPC Art. 52(1), 56
RPBA Art. 13(1), 13(3)

Keyword:
Admissibility of main request and auxiliary requests 1 to 5 into the proceedings (yes)
Inventive step - main request and auxiliary requests 1 to 5 (no) : improvement to be expected
Admissibility of auxiliary requests 6 and 7 into the proceedings (no): amended claims submitted at a late stage during oral proceedings

Decisions cited:

Catchword:

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Case Number: T 0380/14 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 19 October 2016

Appellant: (Opponent)	SCA HYGIENE PRODUCTS AB Patent Department 405 03 Göteborg (SE)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Respondent: (Patent Proprietor)	KIMBERLY-CLARK WORLDWIDE, INC. 401 North Lake Street Neenah, WI 54956 (US)
Representative:	Beacham, Annabel Rose Dehns St Bride's House 10 Salisbury Square London EC4Y 8JD (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 12 December 2013 concerning maintenance of the European Patent No. 1694915 in amended form.**

Composition of the Board:

Chairman	B. Czech
Members:	L. Li Voti
	S. Fernández de Córdoba

Summary of Facts and Submissions

I. The present appeal by the Opponent is from the decision of the Opposition Division concerning maintenance of European patent no. 1 694 915 in amended form.

II. The opposition had been filed on the grounds of, *inter alia*, lack of inventive step (Article 100(a) EPC), the documents cited in this respect including

D1: WO 99/37860 A;
D4: WO 02/066734 A2 and
D7: EP 0 347 154 A2.

III. The Opposition Division found in its decision that the amended claims according to the then pending auxiliary request 1 complied with all the requirements of the EPC.

Independent claims 1 and 7 held allowable by the Opposition Division read as follows:

"*1. A hydrophilic tissue sheet treated with a mixture of polysiloxanes, the mixture comprising a) at least one hydrophobic polysiloxane having a functional group capable of substantively affixing the polysiloxane to pulp fibers; and b) at least one hydrophilic polysiloxane having a functional group capable of substantively affixing the polysiloxane to pulp fibers; the tissue sheet having a polysiloxane content of about 0.4% to 6% by weight of dry pulp fibers; wherein the weight ratio of hydrophobic polysiloxane having a functional group capable of substantively affixing the polysiloxane to pulp fibers to hydrophilic polysiloxane having a functional group capable of substantively affixing the polysiloxane to*

pulp fibers is from about 1:4 to about 4:1; and wherein the functional groups capable of substantively affixing the polysiloxane to pulp fibers are amino functional groups."

"*7. A method of making a polysiloxane treated hydrophilic tissue sheet having a high level of polydialkylsiloxane comprising:*
a) blending a polysiloxane composition wherein the polysiloxane composition comprises a hydrophilic polysiloxane having a functional group capable of substantively affixing the hydrophilic polysiloxane to pulp fibers and a hydrophobic polysiloxane having a functional group capable of substantively affixing the hydrophobic polysiloxane to pulp fibers; and,
b) topically applying the polysiloxane composition to a tissue sheet, wherein the tissue sheet has a consistency of about 10% or greater, thereby providing a polysiloxane treated hydrophilic tissue sheet, wherein the polysiloxane treated hydrophilic tissue sheet has a polydialkylsiloxane content of about 0.2% or greater by weight of dry pulp fibers; wherein the functional groups capable of substantively affixing the polysiloxane to pulp fibers are amino functional groups."

IV. In its reasoning regarding inventive step, the Opposition Division considered that document D1 represented the closest prior art. However, the Opposition Division expressly held that the subject-matter of claim 1 also involved an inventive step when example 3 of D4 was taken as the closest prior art.

V. In its statement of grounds of appeal, the Appellant (Opponent) submitted *inter alia*, with respect to the claims held allowable by the Opposition Division, that

- document D4 (and not document D1) represented the closest prior art;
- the subject-matter of the independent product claim 1 was obvious in the light of the combination of document D4 with document D7;
- method claim 7 was broader than product claim 1; therefore, the subject-matter of the former was obvious for the same reasons.

VI. In its reply of 26 August 2014, the Respondent (Patent Proprietor) defended (as **main request**) the patent in the version held allowable by the Opposition Division (see III, *supra*), rebutting all the Appellant's objections. It emphasized *inter alia* that D1 (and not D4) was to be considered as the closest prior art for the assessment of inventive step. However, even if example 3 of D4 were considered as the closest prior art, it would not have been obvious to the skilled person to modify the product of such an example in a way leading to a product as claimed. Moreover, the prior art neither taught the particular combination of hydrophilic and hydrophobic amino-functional polysiloxanes to be used according to method claim 7, nor the topical application of a blend thereof to the tissue sheet. Therefore, method claim 7 also involved an inventive step.

The Respondent nevertheless also filed five sets of amended claims as auxiliary requests 1 to 5.

The respective claims 1 according to **auxiliary requests 1, 2, 4 and 5** differ from claim 1 according to the main request only insofar as they further specify the structural formulae of the hydrophobic and hydrophilic polysiloxanes having an amino functional group.

Claim 1 according to **auxiliary request 3** is identical to claim 1 according to the main request.

VII. In a further letter dated 01 July 2015 the Appellant reiterated *inter alia* that
- example 3 of document D4 indeed qualified as closest prior art;
- the product disclosed in this example differed from that of claim 1 at issue only in terms of the weight ratio of hydrophilic to hydrophobic amino-modified polysiloxanes (referred to herein below as "polysiloxane weight ratio"); and
- the examples contained in the patent in suit, when compared to the closest prior art, did not show any improvement attributable to the selected polysiloxane weight ratio.

Therefore, the Appellant maintained that the subject-matter of claim 1 according to main request lacked an inventive step and that the subject-matter of the independent product claims according to the auxiliary requests 1 to 5 lacked an inventive step for the same reasons.

The same conclusion applied to method claim 7 according to the main request, which did not even contain a limitation as regards the polysiloxane weight ratio. In particular, no improvement had been made credible across the entire ambit of the claim, and topical application of hydrophilic and hydrophobic amino-modified polysiloxanes was common in the art.

The subject-matters of the independent method claims according to the auxiliary requests 1 to 5 lacked an inventive step for the same reasons.

VIII. Oral proceedings before the Board were held on 19 October 2016, in the course of which the Respondent filed two further amended sets of claims as auxiliary requests 6 and 7, both sets comprising method claims only.

Claim 1 according to the **auxiliary request 6** is identical to claim 7 of the main request (wording under III, *supra*).

Claim 1 according to **auxiliary request 7** differs from claim 1 of auxiliary request 6 insofar as it requires additionally that "*the polysiloxane composition is applied to the tissue sheet as a blend of neat fluids*".

IX. Final requests

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

The Respondent requested that the appeal be dismissed or, in the alternative, that the patent be maintained on the basis of one of the sets of claims filed as auxiliary requests 1 to 5 with letter of 26 August 2014, or on the basis of one of the sets of claims filed as auxiliary requests 6 and 7 during oral proceedings before the Board.

X. The **Appellant**'s arguments of relevance here can be summarised as follows.

Main request - Inventive step - Claim 1

- The goal to be achieved by the invention according to the patent in suit was indicated in paragraph [0014].

- Document D4 represented the closest prior art since it concerned similar goals, namely the provision of a tissue sheet having very good softness and hydrophilicity. In particular, example 3 of D4 described the preparation of a sheet of this type, comprising hydrophilic and hydrophobic aminofunctional polysiloxanes of the type required according to claim 1 at issue.

- Document D1 was not a suitable starting point for the evaluation of inventive since it concerned the provision of a tissue sheet having good softness but only limited hydrophilicity.

- If the wording ("*treated with*") of claim 1 at issue were to be interpreted as requiring that a blend of the amino-modified hydrophilic and hydrophobic polysiloxanes was to be topically applied to a tissue sheet, which sheet had not to be necessarily completely formed and dried, the distribution of these polysiloxanes in the final product would not necessarily differ from that obtained by a process as described in example 3 of D4, wherein one polysiloxane was added to the pulp fibres before the formation of the tissue sheet and the other one was topically applied later on.

- This consideration was confirmed by the patent in suit itself, which taught that a tissue sheet according to the invention could be prepared by applying the siloxane blend topically and/or by adding it to fibres/ pulp before the formation of the tissue web.

- The sheet of example 3 of D4 thus differed from that of claim 1 at issue only insofar as the polysiloxane weight ratio was about 1:12, i.e. outside the range of

about 1:4 to about 4:1 defined in claim 1.

- The patent in suit did not contain any comparison with respect to the closest prior art, represented by example 3 of D4. Moreover, the comparative examples of the patent in suit did not convincingly show that an improved hydrophilicity upon ageing could be achieved by selecting a polysiloxane weight ratio within the range of claim 1 at issue.

- Due to the higher polysiloxane weight ratio, only the improved softness, compared to the product of example 3 of D4, was credible.

- However, it was well known in the art, as indicated in the acknowledgement of the prior art in the patent in suit, and as also taught by D7, that hydrophobic polysiloxanes provided softness and that the softness of a tissue sheet could be improved by choosing more hydrophobic polysiloxanes. Hence, it would have been obvious to the person skilled in the art to increase the amount of hydrophobic polysiloxanes used in example 3 of D4 in order to improve softness of the tissue described.

- Therefore, the subject-matter of claim 1 at issue lacked an inventive step.

Auxiliary requests 1 to 5 - Inventive step - Claim 1

The same reasoning applied to the identical claim 1 according to auxiliary request 3. Moreover, since the hydrophilic and hydrophobic polysiloxanes contained in the product of example 3 of D4 belonged to the structural formulae specified in the respective claims 1 of auxiliary requests 1, 2, 4 and 5, the same

reasoning also applied to claim 1 according to these auxiliary requests.

Auxiliary requests 6 and 7 - Admissibility

- There was no reason justifying the filing of additional auxiliary claim requests at such a late stage of the oral proceedings.

- In fact, all the arguments exchanged during the oral proceedings were known to the Respondent from the written phase of the appeal procedure and even from the first instance proceedings.

- Moreover, claim 1 according to the auxiliary request 7 contained an additional technical feature the relevance of which had not been discussed previously. Preparing a suitable reaction to this auxiliary request during oral proceedings was not possible.

- The auxiliary requests 6 and 7 should thus not be admitted into the proceedings.

XI. The **Respondent**'s counter-arguments of relevance here can be summarised as follows.

Main request and auxiliary request 1 to 5 - Inventive step - Claim 1

- The wording "*tissue sheet treated with a mixture of polysiloxanes*" in claim 1 had to be understood as requiring that the claimed product was obtained by topically applying a blend of the amino-modified hydrophilic and hydrophobic polysiloxanes to a tissue sheet which needed not to be completely formed and dried at this point.

- D1 concerned the same goal as the present invention, i.e. the use of blends of polysiloxanes to impart balanced properties to a tissue product, and thus represented the closest prior art.

- D4, though also dealing with the preparation of a tissue product with balanced softness and absorbency, concerned mainly the use to this end of only one type of hydrophilic polysiloxanes. Example 3 of D4, the only example wherein two different polysiloxanes were used, represented an "accidental disclosure" and did not reflect the main teaching of D4. D4 contained no explanation for the joint use of a hydrophobic polysiloxane in example 3.

- D4 was thus less appropriate than D1 as starting point for the evaluation of inventive step.

- Even if example 3 of D4 were to be considered to represent the closest prior art, the examples of the patent in suit showed that tissue sheets according to claim 1 at issue had improved softness and superior hydrophilicity upon ageing.

- Since D4 did not contain any useful teaching concerning the use of the hydrophobic polysiloxane in its example 3, the person skilled in the art would not have been motivated to modify the amount of this polysiloxane in example 3 in a way leading to a tissue with a polysiloxane weight ratio as required by claim 1 at issue.

- Therefore, the person skilled in the art could only arrive at the claimed invention based on hindsight.

- The subject-matter of claim 1 according to the main

request thus involved an inventive step. The same conclusions applied also to claim 1 according to the auxiliary requests 1 to 5.

Auxiliary requests 6 and 7 - Admissibility

- The independent claims of the auxiliary requests 6 and 7 had already been pending before: claim 1 according to auxiliary request 6 corresponded to independent method claim 7 of the main request and claim 1 of auxiliary request 7 corresponded to dependent method claim 11 of the main request.

- The late filing of these requests during the oral proceedings was a consequence of the Board's decision to consider example 3 of D4 as the closest prior art and to consider that the subject-matter of the pending product claims thus lacked an inventive step, contrary to the findings of the Opposition Division based on D1 as the closest prior art.

- It was *prima facie* apparent that the new auxiliary requests, comprising only method claims, would lead to a different conclusion.

- The technical advantage obtained by means of the additional feature introduced into claim 1 according to auxiliary request 7 was expressly indicated in paragraph [0045] of the patent in suit.

- Such an amendment could thus have been expected by the Appellant.

- The auxiliary requests 6 and 7 were thus to be admitted into the proceedings.

Reasons for the Decision

Respondent's main request and auxiliary requests 1 to 5 - Admissibility into the proceedings

1. The Respondent's main request corresponds to the set of claims held allowable by the Opposition Division.

   Its admissibility is thus not at issue.

2. Auxiliary requests 1 to 5, filed in response to the Appellant's statement of grounds, comprise more limited product and/or method claims. Most limitations stem from dependent claims and can be seen as a reaction to the detailed reasoning given in the decision under appeal. The Appellant raised no objection regarding their admission into the proceedings.

   Neither does the Board see any reason for not admitting them into the proceedings.

Respondent's main request - Interpretation of claim 1

3. Claim 1 according to the main request concerns a "*hydrophilic tissue sheet ... **treated with a mixture** of polysiloxanes*" (emphasis added by the Board).

3.1 At the oral proceedings, the Respondent argued that the wording of claim 1 implied not only that the claimed tissue sheet had to comprise a mixture of polysiloxanes, but also that it had to be prepared by applying topically to the tissue sheet a blend of polysiloxanes, as expressly required, for example, according to independent method claim 7.

In the Respondent's view, claim 1 also encompasses tissues obtained by applying the blend of polysiloxanes to a tissue sheet which is not yet completely formed and still wet, and/or by applying polysiloxanes to the pulp fibres before formation of the tissue sheet.

3.2 The Appellant did not dispute this interpretation of claim 1 during oral proceedings.

3.3 The Board notes that this interpretation of claim 1 also finds support in the description of the patent in suit (see paragraphs [0044],[0047],[0062] and [0063])and thus bases thereon the following considerations regarding the obviousness of the claimed subject-matter.

Respondent's main request - Inventive step - Claim 1

4. The invention

4.1 The invention concerns a tissue sheet treated with a mixture of amino-modified hydrophilic and hydrophobic polysiloxanes (see claim 1).

4.2 With respect to the prior art, the following is stated in the description of the patent in suit (paragraphs [0011] and [0012]):

"*Hydrophobic polysiloxanes may be blended with the high molecular weight hydrophilic polysiloxanes ... to help mitigate the hydrophobicity issues associated with use of hydrophobic polysiloxanes.*"

"*Over time the hydrophilic polysiloxanes may migrate away from the hydrophobic polysiloxanes and with ageing the hydrophobicity of the pretreated tissue sheet and/*

or tissue product may increase significantly to the point where the pretreated tissue product may no longer be suited for its intended application."

"*Additionally, the hydrophilic polysiloxanes generally described in the art have no functional group to anchor themselves to pulp fibers. As a result, these polysiloxanes may be readily lost to process water in the event that the polysiloxane treated tissue sheet and/or tissue product is used as a source of broke for additional tissue making processes.*"

4.3 In view of the drawbacks of the prior art, the following (*inter alia*) is also stated in the patent in suit (paragraphs [0014] and [0015]):

"*there is a need for polysiloxane treated tissue sheets and/or tissue products having ... improved hydrophilic properties while still providing for softness enhancement ...*";

"*[t]here is a further need to have the pulp fibers retain their hydrophilicity when recycled or used in broke ...* ";

"*[t]here is an interest in creating polysiloxane pretreated tissue sheets and/or tissue products that have softness equivalent to softness created by hydrophobic polydialkylsiloxanes, yet have excellent hydrophilic properties even upon thermal ageing.*"

5. Closest prior art

5.1 Documents D1 and D4 have been cited by the parties as appropriate starting points for the evaluation of inventive step.

In the application of the problem-solution approach, the closest prior art is normally represented by a prior art document disclosing subject-matter conceived for the same purpose or aiming at the same objective as the claimed invention and being the most similar to the claimed subject-matter in terms of its features. In identifying the closest prior art, the Board thus considered the following.

5.2 Document D1

5.2.1 D1 (page 1, lines 9 to 10 and 15 to 18) concerns the provision of a tissue product, treated with an amino-modified polysiloxane or its mixture with other modified polysiloxanes, which shows improved softness, controlled water repellency and absorbency sufficient to provide hand protection during use. The polysiloxanes used are thus able to provide (page 2, lines 5 to 7) "*a proper balance of hydrophilicity and hydrophobicity to the tissue surface in order to adequately delay liquid penetration, yet allow sufficient penetration to enable the inner portion of the tissue to absorb the liquid*". In particular, the treated tissue must have wet through times (the time it takes for a liquid to pass through the sample) of about 15 seconds or greater and a wet out area (the area on which the liquid has wicked in the x-y direction of the tissue) of about 2 square inches or greater (page 2, lines 21 to 22; page 6, lines 22 to 27; claim 1).

5.2.2 Therefore, the Board holds that this document, though concerning the improvement of the softness of a tissue product, is essentially concerned with the achievement of a controlled hydrophilicity as indicated by the compulsory relatively high wet through times. Moreover,

it does not disclose in its examples any amino-modified hydrophilic polysiloxane.

5.3 Document D4

5.3.1 D4 (page 1, lines 3 to 12) concerns the treatment of a tissue sheet with polysiloxanes in order to improve softness whilst having "*minimal negative impact on the absorbency or wettability of the tissue*". The treated tissues of D4 have a wet out time (the time it takes for a given sample to completely wet out when placed in water) of about 10 seconds or less (page 19, lines 1 to 6; claim 1).

5.3.2 Therefore, this document addresses explicitly both the improvement of the softness of a tissue product **and** the maintenance of excellent hydrophilic properties. The Board notes also that the wet out times of the products of D4 correspond to those of the preferred products of the patent in suit (see paragraph [0036] of the patent). Moreover, example 3 of D4 discloses a tissue comprising both hydrophilic and hydrophobic amino-modified polysiloxanes.

5.4 D4/example 3 is closest prior art

5.4.1 Neither D1 nor D4 addresses explicitly the retention of the hydrophilicity of the pulp fibers when recycled or used in broke, or the maintenance of excellent hydrophilic properties upon thermal ageing. However, document D4 discloses subject-matter conceived for a purpose having more similarity with the objectives of the claimed invention than D1.

5.4.2 Moreover, D4 discloses subject-matter which, in terms of its features (natures of product components) is more

similar to that of claim 1 at issue. More particularly, the most appropriate starting point for the evaluation of inventive step is, thus, the embodiment of D4 having most features in common with the subject-matter of claim 1 at issue. It is not in dispute that this embodiment is represented by the treated tissue sheet of example 3 of D4.

5.4.3 The Respondent's objection that example 3 of D4 should not be considered since it was a kind of "accidental disclosure" not representing the main teaching of document D4 does not convince the Board.

Example 3 is indeed the only example of D4 wherein a combination of two different amino-modified hydrophilic and hydrophobic polysiloxanes is used. Although D4 does not expressly indicate the reason for which the hydrophobic polysiloxane is added, the tissue product of example 3 is clearly an embodiment of the invention of D4 since the treated tissue displays all the features of claim 1 of D4 and has (page 24, lines 6 to 7) "*a silky, lotiony hand feel and a Wet Out Time of 4.8 seconds*.", i.e. an improved softness and "*minimal negative impact on the absorbency or wettability of the tissue*", in full accordance with the aim of the invention of D4.

Consequently, the Board cannot share the view of the Opposition Division and of the Respondent that taking example 3 of D4 as closest prior art would be based on hindsight and holds that this example is indeed the most appropriate starting point for the evaluation of inventive step.

5.5 Disclosure content of example 3 of D4

5.5.1 More particularly, example 3 of D4 undisputedly discloses (page 23, line 33 to page 24, line 6 in combination with page 22, lines 33 to 36) a hydrophilic tissue sheet prepared
- by adding a hydrophobic aminofunctional polydimethylsiloxane ("AF2340", a polysiloxane of type (a) according to claim 1 at issue) to the fibres prior to pulping before formation of the tissue sheet, and
- by applying to the formed tissue sheet, using a rotogravure coater, i.e. topically, a hydrophilic aminofunctional polysiloxane Wetsoft® CTW (a poysiloxane of type (b) according to claim 1 at issue).
The add-on level of the hydrophilic polysiloxane is 1.5% by weight of dry fibres, and that of the hydrophobic polysiloxane, as calculated by the Patent Proprietor in its letter of 11 May 2012 during opposition proceedings, is 0.12% by weight. The total content of polysiloxanes in the tissue sheet is thus of 1.62% by weight, i.e. within the range of 0.4 to 6% by weight defined in claim 1 at issue.

5.5.2 However, the polysiloxane weight ratio of this example is undisputedly less than 1:4, precisely 1:12.5, i.e. outside the range of "about 1:4 to about 4:1" according to claim 1 at issue.

5.5.3 Moreover, the requirement of claim 1 at issue (according to the Respondent's interpretation, point 3.1.1, *supra*) that the tissue sheet is obtained by treating it topically with a blend of such hydrophilic and hydrophobic polysiloxanes does not, for the Board, distinguish further the claimed product from that of example 3 of D4.

In fact, it is not in dispute that according to the patent such a topical treatment may occur on the still wet tissue. As convincingly argued by the Appellant during oral proceedings, under these conditions the polysiloxanes will necessarily spread across the tissue sheet. This is also not in dispute, and even expressly confirmed by the patent in suit itself (paragraph [0044], page 9, lines 53 to 54 and page 10, lines 7 to 10) reading (emphasis added by the Board):

"*The topical application of the polysiloxane composition to the tissue sheet can be done via any method known in the art including but not limited to:*
...
- Impregnation of the wet tissue sheet with a solution or slurry, wherein the polysiloxane composition penetrates a significant distance into the thickness of the wet tissue sheet, such as about 20% or more of the thickness ..., including ***completely penetrating the wet tissue sheet throughout the full extent of its thickness.***"

Therefore, for the Board, claim 1 encompasses embodiments wherein the distribution of the polysiloxanes within the tissue sheet is such that it cannot be distinguished from the distribution of polysiloxanes obtained when carrying out the preparation method of example 3 of D4, wherein the hydrophobic polysiloxane is added to the pulp fibres before formation of the sheet and the sheet is then topically treated with the hydrophilic polysiloxane (in emulsion form).

5.5.4 Summarising, claim 1 at issue encompasses embodiments which only differ from the tissue product of example 3 of D4 in terms of the polysiloxane weight ratio.

6. Technical problem according to the Respondent

The Respondent submitted that the technical problem solved by the invention in the light of the closest prior art (*supra*) consisted in the provision of a tissue sheet having improved softness and hydrophilicity upon ageing.

7. The solution

As a solution to said technical problem the patent in suit proposes a tissue product according to the amended claim 1 at issue, which is characterised in particular in that the polysiloxane weight ratio is "*from about 4:1 to about 1:4*".

8. Alleged success of the claimed solution

8.1 The Respondent did not dispute during oral proceedings that also in the tissue product of example 3 of D4 the polysiloxanes would be substantially affixed to the fibres and that the pulp fibers would retain their hydrophilicity when recycled or used in broke.

8.2 It is also not in dispute that the patent in suit does not contain any direct comparison with the tissue product of example 3 of document D4, wherein the polysiloxane weight ratio is 1:12.5, i.e. less than the the minimum of about 1:4 prescribed by claim 1 at issue.

8.3 The Respondent relied, however, on some of the experimental data contained in the patent in suit which are analysed hereinafter.

8.3.1 **Table 1** of the patent (paragraph [0125]) lists the wet-

out times for different treated tissue sheets, the wet-out time being (paragraph [0113], page 20, lines 2 to 5) the time, measured in seconds, necessary for the tested sample to become completely saturated (with water) and representing the rate of absorbency of the sample.

As explained in the text preceding the table (page 22, lines 30 to 32) "*[t]hese results indicate the utility of using an aminofunctional polyether polysiloxane in conjunction with an aminofunctional polydialkylsiloxane to enhance the hydrophilicity of the tissue sheet and/ or tissue product.*"

The tested products are obtained (page 21, lines 40 to 41 and page 22, lines 27 to 29) by treating a single-ply, three-layered uncreped throughdried bath tissue sheet (the outer layers being made of eucalyptus fibres and the inner layer of softwood pulp fibres) with **AF-21**, an aminofunctional hydrophobic polysiloxane, **EXP-2076**, a non-aminofunctional polyetherpolysiloxane, **Wetsoft CTW**, the aminofunctional hydrophilic polyether polysiloxane also used in example 3 of D4, or with blends of these polysiloxanes.

In particular, examples 5 and 6 concern tissue products according to claim 1 treated respectively, with a blend comprising equal amounts of the two polysiloxanes **AF-21** and **Wetsoft CTW**, or of the three polysiloxanes **AF-21**, **EXP-2076** and **Wetsoft CTW**. The measured (unaged) wet-out time is of 5.3 seconds for the sample of example 5 and of 4.9 seconds for the sample of example 6. The tissue product treated only with **Wetsoft CTW** (example 3) has a wet out time of 5.0 seconds.

The Board remarks in this respect that the treated

tissue product of example 3 of D4, which has a tissue sheet composition similar to that of examples 1 to 6 of the patent in suit (D4, page 23, lines 33 and 34, in combination with page 21, lines 25 to 26) but a lower weight ratio of aminofunctional hydrophobic polysiloxane **AF2340** (also mentioned explicitly in the patent in suit as a suitable hydrophobic polysiloxane: page 7, lines 21 to 22) to aminofunctional hydrophilic polysiloxane **Wetsoft CTW**, has a wet-out time of 4.8 seconds.

From these data it can be gathered that, as regards the unaged hydrophilicity in terms of unaged wet-out time, there is no substantial difference between a tissue according to claim 1 at issue (examples 5 and 6 of the patent) and that of example 3 of D4. The tissue of D4/ example 3 is even slightly more hydrophilic than those of examples 5 and 6 and (even) that of example 3, treated with hydrophilic polysiloxane **Wetsoft CTW** only.

The Board concludes that table 1 does not show any technical advantage of the subject-matter of claim 1 at issue as compared to the closest prior art.

8.3.2 **Table 3** (paragraph [0129]) presents a comparison of initial wet out time (**IWOT**) with aged wet out time (**AWOT**) after 10 days (**10D**) and after 20 days (**20D**) at 130°F (54.4°C) of tissue products obtained by treating the same single ply tissue sheet tested in examples 1 to 6 with, respectively, the aminofunctional polyetherpolysiloxane **Wetsoft CTW** only or with a blend consisting of equal amounts of **Wetsoft CTW**, the hydrophobic aminofunctional polydimethylpolysiloxane **AF-23** and the non-amino polyetherpolysiloxane **Wetsoft 648** (page 23, lines 17 to 18 and 21 to 26). As explained in the text preceding the table (page 23,

lines 25 to 26), these comparisons are supposed to "*demonstrate the improvement in wettability of the blends vs. the aminofunctional polyetherpolysiloxane alone*".

According to this table a tissue product treated at 2% or 1% add-on level with **Wetsoft CTW** alone (examples 7 and 8, respectively) has, respectively, the following IWOT, AWOT-10 and AWOT-20 expressed in seconds: **3.9, 9.4 and 15.1** (example 7) and **4.0, 7.4 and 12.4** (example 8).

The tissues treated in accordance with claim 1 at issue with the three-component polysiloxane blend at 2% or 1% add-on (examples 9 and 10) have, instead, the following IWOT, AWOT-10 and AWOT-20 values: **4.8, 4.1 and 4.3** (example 9) or **3.8, 3.8 and 3.6** (example 10).

From these results it can be concluded that a treated tissue according to claim 1 (examples 9 and 10) has better aged wet out times and thus a better hydrophilicity upon ageing than one treated with the hydrophilic amino-modified polysiloxane alone (examples 7 and 8).

However, the Board remarks that this table does not contain any comparison with a product similar to that of example 3 of D4, i.e. comprising a combination of two (hydrophilic and hydrophobic) aminofunctional polysiloxanes of the type used in the patent in suit. Moreover, the table does also not contain any comparison with a tissue treated with a binary blend of amino-modified hydrophilic and hydrophobic polysiloxanes only, i.e. not comprising as third polysiloxane component a further hydrophilic non-amino polysiloxane. Tissues treated with binary mixtures of

two amino-modified hydrophilic and hydrophobic polysiloxanes are, however, encompassed by and specifically recited in claim 1.

Therefore, for the Board, the very good results reported in table 3 are not necessarily attributable to other (e.g. binary) polysiloxane mixtures than the ternary mixtures used according to examples 9 and 10.

Hence, the results of table 3, although showing a technical improvement for a very specific embodiment falling within the ambit of claim 1, do not make plausible and credible that a similar improvement in terms of hydrophilicity upon ageing would be obtained for all the conceivable embodiments encompassed by claim 1 according to the main request, including tissues treated with a binary mixture of hydrophilic and hydrophobic aminofunctional polysiloxanes.

8.3.3 **Table 4** (Examples 14 - 21) (paragraph [0133] of the patent, page 24, lines 3 to 4) is supposed to "*demonstrate the superiority of the aminofunctional polyether polysiloxane/hydrophobic aminofunctional polyalkylsiloxane blend for both retention of the polysiloxane and maintenance of hydrophilicity through broke repulping.*"

It is not in dispute that the product of the closest prior art comprising both aminofunctional hydrophilic and hydrophobic polysiloxanes has (implicitly) a comparable retention and maintenance of hydrophilicity through broke repulping (see 8.1, *supra*). Hence, the only values of table 4 possibly indicating an unexpected technical improvement are the initial drop test time values (the time in seconds for a water drop to completely be absorbed by the sample: page 20, lines

20 to 21) and the drop test time values after ageing for one hour at 85°C (page 24, lines 21 to 22) for handsheets prepared from various treated tissue sheets.

Products according to claim 1 at issue are represented by examples 19 to 21, wherein the poylsiloxane blends used consist of a hydrophilic aminofunctional polysiloxane **Wetsoft CTW** and a hydrophobic aminofunctional polysiloxane **DC-8175** at weight ratios of 70:30 (example 19), 50:50 (example 20) and 30:70 (example 21), respectively. The only comparative examples of relevance are examples 17 and 18, example 17 concerning a product treated with **Wetsoft CTW** alone and example 18 concerning a product treated with **DC-8175** alone.

The values of initial and aged drop test, respectively, for these examples are the following:

example 17: **0 and 4** seconds (100% hydrophilic polysiloxane);
example 19: **2 and 3** seconds;
example 20: **7 and 15** seconds;
example 21: **10 and 135** seconds;
example 18: **11 and › 180** seconds (100% hydrophobic polysiloxane).

From these results it is immediately apparent that by reducing the content of hydrophilic polysiloxane the drop test values become worse, i.e. hydrophilicity is reduced. For the Board, this is not surprising considering the reduced amount of hydrophilic polysiloxane.

The Respondent submitted, however, that the reduction in hydrophilicity corresponding to the increased amount

of the hydrophobic polysiloxane (example 21 having a weight ratio of hydrophobic to hydrophilic of 70:30) would be surprising since the hydrophilicity was still maintained within acceptable limits, i.e. below 180 seconds, the value for 100% hydrophobic polysiloxane being above 180 seconds (example 18). Moreover, the value obtained for the weight ratio of hydrophobic to hydrophilic of 30:70 (example 19) was also surprising since it was similar to that obtained for example 17 (100% hydrophilic polysiloxane).

The Board remarks, however, that example 17 was carried out on a repulped single-ply, three-layered uncreped tissue with outer layers made of eucalyptus fibres and the inner layer made of softwood pulp fibres as prepared in examples 1 to 6 (see page 24, lines 9 to 10 and point 8.3.1, *supra*), whilst examples 18 to 21 were carried out on a repulped fully bleached eucalyptus pulp fibre tissue sheet (see page 24, lines 11 to 13). Therefore, the results in terms of hydrophilicity measured on these very different substrates are not comparable. Example 17 is thus not comparable with examples 18 to 21.

Therefore, table 4 merely shows the foreseeable effect that by increasing the amount of hydrophobic polysiloxane the hydrophilicity of the tissue is reduced both initially and upon ageing in the sequence of increasing hydrophobicity (from example 19 to examples 20, 21 and 18). Moreover, the table does not contain any comparison with respect to the closest prior art or with a product comprising both amino-functional hydrophilic and hydrophobic polysiloxanes at a weight ratio outside the range specified in claim 1 at issue.

Therefore, the Board holds that it cannot be deduced from table 4 that the decrease in hydrophilicity upon ageing is surprisingly low across the whole ambit of claim 1 encompassing weight ratios of aminofunctional hydrophilic and hydrophobic polysiloxanes in the range from about 4:1 to about 1:4.

8.3.4 **Table 5** (paragraph [0135]) shows *inter alia* that a tissue sheet treated, in accordance with claim 1, with a ternary blend of equal amounts of aminofunctional polyether polysiloxane **Wetsoft CTW**, hydrophobic aminofunctional polydimethylpolysiloxane **AF-23** and non-amino polyetherpolysiloxane **Wetsoft 648** (example 22, page 25, lines 25 to 27) has better softness than a tissue sheet treated only with **Wetsoft CTW** (example 20, page 25, line 23) in terms of Softness Rank (A vs. C) and Stiffness Rank (A vs. C).

Even though this table does not comprise a comparison with the closest prior art the Appellant did not dispute that a product according to claim 1 at issue would implicitly show better softness than that of example 3 of document D4 because of the greater weight ratio of hydrophobic polysiloxane to hydrophilic polysiloxane required by claim 1. Therefore, there is no need to discuss the results of table 5 in further detail.

8.4 The Board thus concludes that the experimental data reported in the patent in suit do not convincingly show that the alleged improvement in hydrophilicity upon ageing is achieved across the entire ambit of claim 1 at issue. The only credible and undisputed technical advantage obtained by the claimed subject-matter, as compared to the closest prior art (tissue of D4/example 3) is an improvement in softness.

9. Reformulation of the technical problem

Therefore, the technical problem in the light of D4, example 3 has to be reformulated in less ambitious terms and it may be seen in the provision of a hydrophilic tissue sheet having improved softness.

10. Success of the claimed solution

In the light of the description of the patent in suit, and in particular, of the data presented in example 22, the Board is satisfied that this less ambitious technical problem is indeed successfully solved by the tissues according to claim 1 at issue. This was not in dispute.

11. Obviousness of the solution

11.1 As already explained (points 5.5.2 and 5.5.4, *supra*) the product of example 3 of D4 differs from the subject-matter of claim 1 at issue only in that its polysiloxane weight ratio is less than about 1:4, precisely 1:12.5.

11.2 Thus it remains to be evaluated if it would have been obvious to the skilled person, seeking to solve the (reformulated) technical problem (9, *supra*), to increase the amount of hydrophobic polysiloxane in the product of example 3 of D4 up to a polysiloxane weight ratio within the range of from about 1:4 to about 4:1.

11.3 It was common general knowledge at the priority date of the patent in suit that hydrophobic polysiloxanes may be used to impart softness to a tissue sheet (see e.g. the patent in suit, page 2, lines 23 to 31). Accordingly, the degree of softness imparted by a

polysiloxane increases as the hydrophilicity of the (substituted) polysiloxane decreases (i.e. as its hydrophobicity increases: patent in suit, page 3, lines 6 to 7). This is also expressly mentioned in D7 (see e.g. page 7, lines 2 to 4).

11.4 Therefore, the Board holds that the person skilled in the art, reading D4, would have considered that not only the hydrophilic aminofunctional polysiloxane (as explicitly indicated on page 1, lines 9 to 12 of this document) contained in the tissue sheet of example 3, but also the hydrophobic aminofunctional polysiloxane contained therein, contributes to the softness of the tissue sheet.

11.5 Hence, the possibility of gradually increasing the content of the tissue in hydrophobic aminofunctional polysiloxane whilst still maintaining an excess of the hydrophilic aminofunctional polysiloxane component, on which the invention of D4 is mainly focused, would immediately occur to the person skilled in the art seeking to increase the softness of the final product.

11.5.1 The product of example 3 contains 1.5% by weight of hydrophilic polysiloxane and 0.12% of the hydrophobic polysiloxane (5.5.1, *supra*). By merely increasing the amount of hydrophobic polysiloxane from 0.12% to 0.4% by weight the person skilled in the art would, accordingly, obtain a tissue sheet comprising the two polysiloxanes in a weight ratio above the lower limit of about 1:4 prescribed by claim 1.

11.5.2 The Board is convinced that the skilled person would have expected that such a gradual increase of the amount of the hydrophobic polysiloxane would result in improved softness without sacrifying the very good

hydrophilicity provided by the substantially greater amount of hydrophilic polysiloxane component contained in the tissue.

11.5.3 In view of common general knowledge concerning the impact on softness of hydrophobic polysiloxanes mentioned above, even the absence in document D4 of any explicit explanation regarding the purpose of the addition of the hydrophobic polysiloxane component would not have deterred the skilled person from increasing the amount of this component in a tissue as described in example 3 of D4.

11.6 The Board thus concludes that the subject-matter of claim 1 according to the main request does not involve an inventive step (Articles 52(1) and 56 EPC).

11.7 The Respondent's main request is thus not allowable.

Respondent's auxiliary requests 1 to 5 - Inventive step

12. Claim 1 according to auxiliary request 3 being identical to claim 1 of the main request, the former is objectionable for lack on inventive step for the same reasons (11.5.3, *supra*) as the latter.

Auxiliary request 3 is thus not allowable.

13. The respective claims 1 according to **auxiliary requests 1, 2, 4 and 5** differ from claim 1 according to the main request only insofar as they further specify the polysiloxanes components by indicating the structural formulae of the hydrophobic and hydrophilic polysiloxanes having an amino functional group.

13.1 It is not in dispute that the hydrophilic and

hydrophobic polysiloxanes contained in the product of example 3 of D4 fall under the structural formulae specified in the respective claims 1 of auxiliary requests 1, 2, 4 and 5.

13.1.1 Therefore, the respective claim 1 according to each of the auxiliary requests 1, 2, 4 and 5 does not comprise any feature further distinguishing the claimed subject-matter from the product representing the closest prior art, i.e. the product described in D4/example 3.

13.1.2 Accordingly, the conclusions concerning inventive step drawn with respect to claim 1 of the main request apply analogously to the respective claim 1 according to each of auxiliary requests 1, 2, 4 and 5.

13.2 The Respondent's auxiliary requests 1 to 5 are thus not allowable either.

Respondent's auxiliary request 6 - Admissibility

14. Auxiliary request 6 was filed at the oral proceedings, only after the Board had indicated that it considered the subject-matter of the respective claims 1 according to the main request and auxiliary requests 1 to 5 did not involve an inventive step in the light of example 3 of D4, taken as the closest prior art.

14.1 The Respondent submitted that this new request was only filed at such a late stage of the proceedings because it had been surprised by the decision of the Board not to follow the decision under appeal as regards the document to be considered as representing the closest prior art, i.e. by considering example 3 of D4 as closest prior art (and not D1).

14.1.1 The Board notes, however, that the Appellant had repeatedly contested the decision of the Opposition Division in this respect and had insisted on example 3 of D4 being taken as closest prior art throughout the written appeal proceedings (see e.g. statement of grounds, page 7, point 6.1; letter of 1 July 2015, page 3, second full paragraph), as it already did during opposition proceedings (see minutes of the oral proceedings of 7 November 2013, point 7.1).

Moreover, the Opposition Division, though ultimately considering D1 as closest prior art (see impugned decision, page 7, point 6, lines 13 to 15), also dealt with inventive step taking, for the sake of argument, document D4/example 3, as the closest prior art (impugned decision, page 8, line 16 and following).

14.1.2 The appropriateness of example 3 of D4 as closest prior art was thus one of the issues controversially debated at the hearing before the Opposition Division and in the written appeal procedure. The Board thus holds that the Respondent had to foresee that the Board could decide differently from the Opposition Division in this respect, and that the Respondent cannot claim to have been taken by surprise by such a decision.

14.1.3 Therefore, the Board holds that such a request, supposed to render moot objections based on D4/example 3 as closest prior art, could and should have been filed earlier in these proceedings, at the latest at the outset of the appeal proceedings, in reply to the Appellant's statement of grounds.

14.2 The Respondent also argued that this request should be admitted despite its late filing since

- claim 1 of this request was identical to independent method claim 7 according to the main request and its allowability of which had already been addressed in writing by both parties;
- its discussion during oral proceedings would not amount to the introduction of a fresh case;
- the new claim 1 would overcome at first sight the objections brought against claim 1 according to the main request.

14.2.1 However, it was not *prima facie* apparent to the Board why claim 1 according to auxiliary request 6 would overcome inventive step objections based on considerations brought forward in connection with claim 1 of the main request in the light of D4/example 3 but also applicable to the method claim at issue. Indeed, claim 1 at issue of auxiliary request 6 is directed to a method for the preparation of a product which is defined in broader terms than the product according to claim 1 according to the main request, since claim 1 at issue does not require any specific weight ratio of hydrophilic to hydrophobic polysiloxane, and which was objected by the Appellant based on the considerations regarding also product claim 1 according to the main request.

14.2.2 Therefore, for the Board, this request does not *prima facie* overcome the pending objections, i.e. it is not at first sight clearly allowable.

14.3 Taking into account all the above aspects, the Board decided, exercising its discretion under Article 13(1), (3) RPBA, not to admit auxiliary request 6 into the proceedings.

Respondent's auxiliary request 7 - Admissibility

15. The Respondent's justification for the filing of this request at a very late stage of the proceedings was essentially the same as the one given with respect to auxiliary request 6 (point 14.1, *supra*).

Hence, considerations as set out under points 14.1.3 and 14.2.2, *supra*, also apply to auxiliary request 7.

16. Moreover, claim 1 according to this request comprises the additional feature requiring that "*the polysiloxane composition is applied to the tissue sheet as a* ***blend of neat fluids***" (emphasis added by the Board).

16.1 This feature was already contained in claim 11 according to the main request, but since it was never incorporated in an independent claims before, its possible relevance regarding the issue of inventive step had not been previously addressed in these *inter partes* proceedings.

16.2 The Board does not accept the Respondent's argument that such an amendment could have been expected by the Appellant for the mere reason that the description of the patent addressed a technical advantage obtained by means of said additional feature, the relevant passage (paragraph [0045] of the patent) reading as follows:

"... *it has been surprisingly found that when applied under certain conditions, specifically when applied as a neat fluid, the polysiloxane blends of the present invention may show improved hydrophilicity over the hydrophilic polysiloxane alone. While not wishing to be bound by theory it is hypothesized that when combined as neat fluids the viscosity of the polysiloxane blend*

is increased substantially. The increased viscosity of the polysiloxane blend causes reduced spreading of the silicone across the surface and less tendency of the polysiloxane to reorient under thermal ageing conditions. Hence, such polysiloxane blends may actually show improved hydrophilicity over even the hydrophilic polysiloxane."

16.2.1 In this respect, the Board holds that had the Respondent ever intended to rely on such specific technical advantage in support of its case, it should have filed correspondingly amended claims at the earliest possible point in time, in any case long before the oral proceedings before the Board, in order to give the adverse party an adequate opportunity to react.

16.2.2 Therefore, the Board accepts that the Appellant was not in a position to prepare a technically sound and well-reasoned reaction to such an amended claim without an adjournment of the oral proceedings.

16.2.3 For the sake of completeness, the Board remarks also that, contrary to the allegations of the Respondent, the amended method claim 1 does not, at first sight, appears to clearly overcome the pending inventive step objection, if only because the invoked technical advantage does not seem to have been made credible in comparison to the method of the closest prior art, which also involves the use of hydrophilic and hydrophobic polysiloxanes which both comprise amino functional groups.

16.3 Taking into account all the above aspects, the Board, exercising its discretion under under Articles 13(1)

and (3) RPBA, decided not to admit auxiliary request 7 into the proceedings either.

Conclusion

17. None of the Respondent's claim requests is both admissible into the proceedings and allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

D. Magliano B. Czech

Decision electronically authenticated