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Datasheet for the decision
of 30 November 2006

Case Number:	T 0179/05 - 3.3.03
Application Number:	97117334.9
Publication Number:	0835885
IPC:	C08F 8/00
Language of the proceedings:	EN

Title of invention:
Water-swellable crosslinked polymer, production process therefor, and measurement method for pore volume of swollen crosslinked polymer

Patentee:
NIPPON SHOKUBAI CO., LTD.

Opponents:
Stockhausen GmbH & Co.KG
Kimberly-Clark Worldwide, Inc.

Headword:
-

Relevant legal provisions:
EPC Art. 83

Keyword:
"Sufficiency of disclosure - (no)"

Decisions cited:
T 0172/99

Catchword:
-

Case Number: T 0179/05 **-** 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 30 November 2006

Appellant 01: (Opponent 01)	Stockhausen GmbH & Co.KG Bäkerpfad 25 D-47805 Krefeld (DE)
Representative:	Herzog, Martin Kahlhöfer Neumann Herzog Fiesser Patentanwälte Postfach 10 33 63 D-40024 Düsseldorf (DE)
Appellant 02: (Opponent 02)	Kimberly-Clark Worldwide, Inc. 401 North Lake Street Neenah, Wisconsin 54956 (US)
Representative:	Beacham, Annabel Rose Frank B. Dehn & Co. St Bride's House 10 Salisbury Square London EC4Y 8JD (GB)
Respondent: (Patent Proprietor)	NIPPON SHOKUBAI CO., LTD. 1-1, Koraibashi 4-chome Chuo-ku Osaka-shi, Osaka-fu 541 (JP)
Representative:	Henkel, Feiler & Hänzel Patentanwälte Maximiliansplatz 21 D-80333 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office dated 24 November 2004 and posted 6 December 2004 rejecting the opposition filed against European patent No. 0835885 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: R. Young
Members: C. Idez
             E. Dufrasne

Summary of Facts and Submissions

I.   The grant of the European patent No. 0 835 885 in the
     name of Nippon Shokubai Co., Ltd, in respect of
     European patent application No. 97 117 334.9 filed on
     7 October 1997 and claiming priority of the Japanese
     patent application JP 27094996 filed on 14 October 1996
     was announced on 27 February 2002 (Bulletin 2002/09) on
     the basis of 11 claims.

     Independent Claims 1 to 5, and 8 to 11 read as follows:
     "1. A water-swellable crosslinked polymer, which has a
          total pore volume of pores with a pore size in
          gels of 5.1-27 nm of 60 v/v % or more relative to
          the entire amount of a physiological salt solution
          absorbed into the polymer, wherein the pore volume
          of pores with a pore size in gels of 5.1-27 nm (PV
          (5.1-27 nm)) is defined by a method comprising the
          following steps of:

          A. allowing a water-swellable crosslinked polymer
          (W1 g), which stands in an equilibrium state
          swollen with a physiological salt solution (W2 ml),
          to fall again into an equilibrium state by adding
          a physiological salt solution (W3 ml,
          concentration Ci %) of a thread-ball-shaped
          molecule with molecular diameter R to the polymer;
          and then filtering off the polymer as swollen with
          the physiological salt solution; and then
          measuring concentration Cf % of the thread-ball-
          shaped molecule in the resultant filtrate;
          B. defining PV (0-R) (ml/g) as PV (0-R) (ml/g) =
          $(W2+W3) [1-\{W3/(W2+W3)\} \times (Ci/Cf)]/W1$;

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C. determining PV (0-5.1 nm) and PV (0-27 nm) using a thread-ball-shaped molecule with R of 5.1 nm and a thread-ball-shaped molecule with R of 27 nm and

D. defining PV (5.1-27 nm) as PV (5.1-27 nm) = PV (0-27 nm) - PV (0-5.1 nm).

2. A water-swellable crosslinked polymer, which has a total pore volume of pores with a pore size in gels of 5.1-27 nm of 80 v/v% or more relative to the entire amount of an ion-exchanged water absorbed into the polymer, wherein the pore volume of pores with a pore size in gels of 5.1-27 nm (PVW (5.1-27 nm)) is defined by a method comprising the following steps of:

E. allowing a water-swellable crosslinked polymer (W1 g), which stands in an equilibrium state swollen with ion-exchanged water (W4 ml), to fall again into an equilibrium state by adding an ion-exchanged water solution (W5 ml, concentration Ci%) of a thread-ball-shaped molecule with molecular diameter R to the polymer; and then filtering off the polymer as swollen with the ion-exchanged water; and then measuring concentration Cf% of the thread-ball-shaped molecule in the resultant filtrate;

F. defining PVW (0-R) (ml/g) as PVW (0-R) (ml/g) = (W4+W5) [1-{W5/(W4+W5)}x(Ci/Cf)]/W1;

G. determining PVW (0-5.1 nm) and PVW (0-27 nm) using a thread-ball-shaped molecule with R of 5.1 nm and a thread-ball-shaped molecule with R of 27 nm; and

H. defining PVW (5.1-27 nm) as PVW (5.1-27 nm) = PVW (0-27 nm) - PVW (0-5.1 nm).

3. A water-swellable crosslinked polymer, which has
    an average pore size in gels of 10-30 nm and a
    standard deviation of 11.5 or less in pore size in
    gels when the polymer is swollen with ion-
    exchanged water, wherein the average pore size is
    defined by a method comprising the following steps
    of:
    I. allowing a water-swellable crosslinked polymer
    (W1 g), which stands in an equilibrium state
    swollen with ion-exchanged water (W4 ml), to fall
    again into an equilibrium state by adding an ion-
    exchanged water solution (W5 ml, concentration Ci%)
    of a thread-ball-shaped molecule with molecular
    diameter R to the polymer; and
    then filtering off the polymer as swollen with the
    ion-exchanged water; and then measuring
    concentration Cf% of the thread-ball-shaped
    molecule in the resultant filtrate;
    J. defining PVW (0-R) (ml/g) as PVW (0-R) (ml/g) =
    (W4+W5) [1-{W5/(W4+W5)}x(Ci/Cf)/W1;
    K. determining PVW (0-5.1 nm), PVW (5.1-9 nm), PVW
    (9-11.8 nm), PVW (11.8-27 nm), PVW (27-56 nm), and
    PVW (0-56 nm) using a thread-ball-shaped molecule
    with R of 5.1 nm, a thread-ball-shaped molecule
    with R of 9 nm, a thread-ball-shaped molecule with
    R of 11.8 nm, a thread-ball-shaped molecule with R
    of 27 nm, and a thread-ball-shaped molecule with R
    of 56 nm; and
    L. defining the average pore size as:

    average pore size = [2.55 x PVW (0-5.1 nm)
              + 7.05 x PVW (5.1-9 nm)
              + 10.4 x PVW (9-11.8 nm)
              + 19.4 x PVW (11.8-27 nm)

+ 41.5 x PVW (27-56 nm)]
/[PVW (0-56 nm)].

4.   A process for producing a water-swellable
      crosslinked polymer as claimed in claim 1,
      comprising the steps of subjecting a hydrophilic
      high molecule to a crosslinking reaction in an
      aqueous solution, wherein the crosslinking
      reaction is carried out in such a manner that the
      change in the concentration of a solid content
      falls within the range of ±30 %.

5.   A process for producing a water-swellable
      crosslinked polymer as claimed in claim 1,
      comprising the steps of subjecting a hydrophilic
      high molecule to a crosslinking reaction in an
      aqueous solution, wherein the crosslinking
      reaction is carried out in such a manner that the
      concentration of a solid content falls within the
      range of 2 to 40 %.

8.   A method for measuring a pore volume of pores with
      a specific range of size in a water-swellable
      crosslinked polymer as claimed in claim 1, which
      is swollen with a physiological salt solution,
      comprising the steps of:
      allowing said swellable crosslinked polymer
      (W1 g), which stands in an equilibrium state
      swollen with physiological salt solution (W2 ml),
      to fall again into an equilibrium state by adding
      a physiological salt solution (W3 ml,
      concentration Ci%) of a thread-ball-shaped
      molecule with molecular diameter R to the polymer;
      and then filtering off the polymer as swollen with

physiological salt solution; and then measuring
concentration Cf% of the thread-ball-shaped
molecule in the resultant filtrate; and
thereby determining volume PV (O-R) of
physiological salt solution, as absorbed into
pores having a size of O-R in a state swollen with
physiological salt solution, from the following
equation:

$$PV\ (O-R)\ (ml/g) = (W2+W3)\ [1-\{W3/(W2+W3)\}\ x\ (Ci/Cf)]/W1.$$

9. An absorbent article which comprises a water-
   swellable crosslinked polymer, wherein the water-
   swellable crosslinked polymer has a total pore
   volume of pores with a pore size in gels of
   5.1-27 nm of 60 v/v% or more relative to the
   entire amount of a physiological salt solution
   absorbed into the polymer, wherein the pore volume
   of pores with a pore size in gels of 5.1-27 nm
   (PV (5.1-27 nm)) is defined by a method comprising
   the following steps of:
   A. allowing a water-swellable crosslinked polymer
   (W1 g), which stands in an equilibrium state
   swollen with a physiological salt solution (W2 ml),
   to fall again into an equilibrium state by adding
   a physiological salt solution (W3 ml,
   concentration Ci%) of a thread-ball-shaped
   molecule with molecular diameter R to the polymer;
   and then filtering off the polymer as swollen with
   the physiological salt solution; and then
   measuring concentration Cf % of the thread-ball-
   shaped molecule in the resultant filtrate;

B. defining PV (0-R) (ml/g) as PV (0-R) (ml/g) = (W2+W3) [1-{W3/(W2+W3)}x(Ci/Cf)]/W1;

C. determining PV (0-5.1 nm) and PV (0-27 nm) using a thread-ball-shaped molecule with R of 5.1 nm and a thread-ball-shaped molecule with R of 27 nm and

D. defining PV (5.1-27 nm) as PV (5.1-27 nm) = PV (0-27 nm) - PV (0-5.1 nm).

10. An absorbent article which comprises a water-swellable crosslinked polymer, wherein the water-swellable crosslinked polymer has a total pore volume of pores with a pore size in gels of 5.1-27 nm of 80 v/v % or more relative to the entire amount of an ion-exchanged water absorbed into the polymer, wherein the pore volume of pores with a pore size in gels of 5.1-27 nm (PV (5.1-27 nm)) is defined by a method comprising the following steps of:

E. allowing a water-swellable crosslinked polymer (W1 g), which stands in an equilibrium state swollen with ion-exchanged water (W4 ml), to fall again into an equilibrium state by adding an ion-exchanged water solution (W5 ml, concentration Ci%) of a thread-ball-shaped molecule with molecular diameter R to the polymer; and then filtering off the polymer as swollen with the ion-exchanged water; and then measuring concentration Cf % of the thread-ball-shaped molecule in the resultant filtrate;

F. defining PVW (0-R) (ml/g) as PVW (0-R) (ml/g) [sic] (W4+W5) [1-{W5/(W4+W5)}x(Ci/Cf)]/W1;

G. determining PVW (0-5.1 nm) and PVW (0-27 nm) using a thread-ball-shaped molecule with R of

5.1 nm and a thread-ball-shaped molecule with R of 27 nm; and

H. defining PVW (5.1-27 nm) as PVW (5.1-27 nm) = PVW (0-27 nm - PVW (0-5.1 nm).

11.   An absorbent article which comprises a water-swellable crosslinked polymer, wherein the water-swellable crosslinked polymer has an average pore size in gels of 10-30 nm and a standard deviation of 11.5 or less in pore size in gels when the polymer is swollen with ion-exchanged water, wherein the average pore size is defined by a method comprising the following steps of:
I. allowing a water-swellable crosslinked polymer (W1 g), which stands in an equilibrium state swollen with ion-exchanged water (W4 ml), to fall again into an equilibrium state by adding an ion-exchanged water solution (W5 ml, concentration Ci%) of a thread-ball-shaped molecule with molecular diameter R to the polymer; and
then filtering off the polymer as swollen with the ion-exchanged water; and then measuring concentration Cf% of the thread-ball-shaped molecule in the resultant filtrate;
J. defining PVW (0-R) (ml/g) as PVW (0-R) (ml/g) = (W4+W5) [1-{W5/(W4+W5)}x(Ci/Cf)]/W1;
K. determining PVW (0-5.1 nm), PVW (5.1-9 nm), PVW (9-11.8 nm), PVW (11.8-27 nm), PVW (27-56 nm), and PVW (0-56 nm) using a thread-ball-shaped molecule with R of 5.1 nm, a thread-ball-shaped molecule with R of 9 nm, a thread-ball-shaped molecule with R of 11.8 nm, a thread-ball-shaped molecule with R of 27 nm, and a thread-ball-shaped molecule with R of 56 nm; and

L. defining the average pore size as:

average pore size = [2.55 x PVW (0-5.1 nm)

+ 7.05 x PVW (5.1-9 nm)

+ 10.4 x PVW (9-11.8 nm)

+ 19.4 x PVW (11.8-27 nm)

+ 41.5 x PVW (27-56 nm)]

/ [PVW (0-56 nm)]."

Claims 6 and 7 were process claims directed to elaborations of the subject-matter claimed in Claims 4 and 5.

II.   Two Notices of Opposition were filed against the patent, as follows:

(i) by Stockhausen GmbH & Co. KG (Opponent I), on 27 November 2002 and
(ii) by Kimberly Clark Worldwide, Inc. (Opponent II), on 27 November 2002.

Both Opponents requested the revocation of the patent on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC), and of insufficient disclosure (Article 100(b) EPC).

These objections were supported *inter alia* by the following documents:

Dl: Dextran Fractions; Amersham Biosciences data file 18-1153-41 AA, 2001-11;
D2: US-A-4 090 013;
D4: US-A-5 230 958;
D7: Declaration of Joy Holgerson, dated November 22, 2002;

D8:   Declaration of Hoa Wilhelm, dated November 26,
2002;

D9:   Martin M. Chui et al, "Measurement of the Porous
Microstructure of Hydrogels by Nuclear Magnetic
Resonance" Journal of Colloid and Interface Science,
Vol. 174, 1995, pages 336-344;

D10: WO-A-95/12632;

Dl1: EP-B-0 105 634; and

Dl3: Declaration of Michael Niemeyer, dated 27 November
2002.

III.   By a decision announced orally on 24 November 2004 and
issued in writing on 6 December 2004, the Opposition
Division rejected the oppositions.
According to the decision of the Opposition Division,
the grounds of opposition raised by the Opponents did
not prejudice the maintenance of the patent as granted.
According to the decision the subject-matter of the
granted claims met the requirements of Article 83 EPC,
since the examples clearly indicated how to obtain a
water swellable crosslinked polymer having a total pore
volume falling within the meaning of the claims, and
since the method for determining the pore volume of
pores was completely reported in Claims 1 and 3. The
Opposition Division did not accept the arguments of the
Opponents that it was impossible to determine the pore
volume according to the method disclosed in the patent
in suit with precision and accuracy, since the tests
carried out by the Opponents having been carried on a
commercial product (Favor 880) and not on a polymer
resulting from the examples of the invention were not
an exact repetition of the specific embodiments
indicated in the opposed patent.

According to the decision the subject-matter of the claims was novel over documents D2, D4, D9, D10, and D11. Furthermore, according to the decision, it had not been shown by the Opponents that the prior use of the product Favor 880 (cf. D13) complied with the requirements of the claims of the disputed patent.

Concerning inventive step, it was held that none of the cited documents suggested that the use of polymer having a total pore volume with a pore size in gels as indicated in Claims 1 to 3 would result in an improvement of the absorbency as shown by the examples. Furthermore, the method of measuring the pore volume according to Claim 8 had not been disclosed nor suggested by the cited documents.

IV.   Notices of Appeal were filed on 4 February 2005 by Appellant I (Opponent I) and on 9 February 2005 by Appellant II (Opponent II) with simultaneous payment of the prescribed fee.

V.   With its Statement of Grounds of Appeal filed on 15 April 2005, Appellant II submitted the following documents:

        D17: Graph showing the maximal concentration of Dextran (thread-ball shaped molecule) in the filtrate as a function of the swelling capacity of the polymer; and

        Annex 2: Test Data for samples prepared according to D2.

        It also presented arguments concerning insufficiency of disclosure which may be summarized as follows:

(i.1) It had been held in the decision under appeal that the opposed patent satisfied the requirements of Article 83 EPC since it contained examples of the synthesis of polymers which allegedly satisfied the requirements of the test procedures set out in Claims 1 to 3.

(i.2) Claims 1 to 3 however were not limited to the particular swellable polymers synthesized in the Examples.

(i.3) During the opposition procedure, both Opponents had submitted test data demonstrating that the tests referred to in the claims did not produce meaningful results in relation to the prior art product Favor 880.

(i.4) Favor 880 water-swellable polymer tested by the Opponents was a crosslinked partially neutralised polyacrylic acid as in the Examples in the opposed patent.

(i.5) The Patent Proprietor had provided no explanation as to why the claimed tests did not work with Favor 880.

(i.6) The very small difference in concentration of the Dextran for 0% and 100% exclusion could not be measured reliably using the method of the patent.

(i.7) Blank measurements showed that there was an inherent error in the method of at least about 0.6%.

(i.8) As shown by Annex 2, there was a standard deviation of 0.004% in the filtrate concentration.

(i.9) This would imply a grand total estimate of error equal to about 1.4%.

(i.10) For a superabsorbent having a capacity of 60 g/g no exclusion of the Dextran would give a concentration of 0.5000% whereas total exclusion would give a concentration of 0.5051% (see also D17).

(i.11) Thus, for a 60 g/g capacity superabsorbent, and taking into account the error of 1.4%, it was impossible to distinguish between complete exclusion and none at all using the method of the patent.

(i.12) Repeating the analysis for the case of 100 g/g superabsorbent capacity, the error in determining excluded volume would be massive i.e. 84.5%. With a polymer having a 290 g/g capacity, the error in excluded volume would be reduced to 26%.

(i.13) However, a swelling capacity of 290 g/g was significantly higher than the swelling capacity of the vast majority of known superabsorbent polymers.

(i.14) The test procedures set out in Claims 1 to 3 were therefore flawed in that by their very nature they could not provide meaningful results for the vast majority of absorbent polymers.

(i.15) Further tests had been carried on samples of absorbent polymer prepared according to D2. The process disclosed in Examples I and II of D2 fell within at least Claims 4, 5 and 7 of the opposed patent (cf. Annex 2).

(i.16) These results further confirmed that the claimed
tests were fundamentally flawed and hence that the
patent was insufficient.

(i.17) They also showed that even a polymer prepared
according to the process claimed in the opposed patent
did not fall within Claims 1 to 3.

(i.18) In view of the evidence submitted, the burden of
proving sufficiency should be shifted to the Patent
Proprietor.

(i.19) Insufficiency arguments set out in the letter
dated 24 September 2004 relating to the term "thread-
ball-shaped molecule with molecular diameter R" in
Claims 1 to 3 of the patent in suit were also
maintained.

VI.   With its Statement of Grounds of Appeal filed on
        18 April 2005, Appellant I submitted the following
        documents:
        Tables A and B: tests results on Samples 9 and 10 of D2;
        and
        D18: Declaration of Dr. H. Schmidt dated 15 April 2005.

        The arguments concerning insufficiency of disclosure
        presented by Appellant I in its Statement of Grounds of
        Appeal may be summarized as follows:

        (i.1) The pore volume test of the patent in suit was
        neither exact nor sound and of course not reproducible.
        It yielded for example negative pore volumes or
        percentages above 100%.

(i.2) Samples 9 and 10 of D2 were state of the art
samples which exactly followed the teaching of the
patent in suit (cf. Claim 5).

(i.3) The pore volume tests carried out by Appellant II
on these Samples clearly showed that meaningless
results were obtained.

(i.4) The Appellants had sufficiently proved lack of
enablement.

(i.5) According to numerous decisions of the Technical
Boards of Appeal of the EPO the patent in suit must
contain sufficient information to carry out the
invention within the whole area that was claimed, i.e.
not only with respect to the examples given in the
patent in suit.

(i.6) Sample 9 of D2 clearly showed with a V/V% average
of 46.53 (cf. Table A) that the claimed range of 60% or
more was not fulfilled. Therefore, the claims in
general and in particular Claims 1 and 5 were not
sufficiently disclosed.

(i.7) Furthermore, the measurements in ion-exchange
water of Samples 9 and 10 showed that they neither
exhibited a V/V% average of 80% or more nor possessed
an average of the Average Pore Size of 10-30 nm.
Consequently, the subject-matter of Claims 2 and 3 was
likewise not sufficiently disclosed, since both samples
were however embodiments of the patent in suit.

(i.8) Reference was made in that respect to decision
T 226/85 in which it was stated "it is, however,

important to note that for sufficiency not only the
exemplified specific embodiments must be reproducible
but any embodiment which falls within the ambit of the
claim."

(i.9) The Appellants had provided numerous pieces
evidence that the pore volume tests of the patent in
suit did not work.

(i.10) The Patent Proprietor had failed to submit
evidence showing that the tests gave meaningful results.

(i.11) The shift of burden of proof to the Patent
Proprietor was justified.

VII.   In its letter dated 2 August 2005, the Respondent
        argued essentially as follows concerning insufficiency
        of disclosure:

(i.1) The tests carried out by the Appellants could not
be considered as objective because they were not an
exact repetition of the specific embodiments indicated
in the patent in suit.

(i.2) The tests on Samples 9 and 10 of document D2, as
provided by Appellant I, did not present in detail all
the necessary operational data.

(i.3) A polymer usually had a molecular weight range
and a molecular weight distribution. The test
experiments provided by Appellant I did not show such
data.

(i.4) Appellants I and II had argued that the burden of proof had been transferred to the patentee to provide evidence supporting that the method for determining the pore size volume was sufficiently disclosed.

(i.5) It was however the permanent jurisdiction of the Boards of Appeal in the European Patent Office that for proving an insufficient disclosure of an invention lack of reproducibility of the examples provided in the respective patent in suit was to be demonstrated.

(i.6) Any experimental data provided in respect of a sample of super absorbent Favor 880 could not be considered as providing objective evidence that the embodiments described in the present patent were objectionable under Article 83 EPC.

VIII.   In a communication dated 8 August 2006 annexed to the summons to oral proceedings scheduled to take place on 30 November 2006, the Board drew the attention of the Parties to issues concerning the determination of the pore volume and the manufacture of the claimed products in view of the disclosure of document D2.

IX.   With its letter dated 26 October 2006, the Respondent submitted a first auxiliary request consisting of six claims and a second auxiliary request consisting of a single claim.
Independent Claims 1 and 6 of the first auxiliary request corresponded to granted Claims 2 and 10. Independent Claims 2 and 3 and dependent Claims 4 to 5 were said to be based on granted Claims 4 and 5, and on granted Claims 6 and 7.

Claim 1 of the second auxiliary request corresponded to Claim 10 as granted.

It also presented arguments concerning insufficiency of disclosure which may be summarized as follows:

(i.1) Neither Appellant had exactly repeated the specific embodiments described in the patent in suit with respect to the measurement method of the pore volume of a water-swellable crosslinked polymer as claimed in claims 1 to 11 of the patent in suit as granted.

(i.2) Therefore, due to the lack of evidence, sufficiency of disclosure of the patent in suit should be acknowledged.

(i.3) According to the permanent jurisdiction in the EPO, the only requirement with respect to information not explicitly disclosed in a patent with respect to the requirements of sufficiency of disclosure was that information which was not explicitly disclosed in a patent sufficiently, was obvious to a person skilled in the art in a way that a detailed description of said information was superfluous in the light of the general knowledge of a skilled person.

(i.4) This applied to the way of determining the total amount of absorption for physiological salt solution and to the temperature at which the absorbency should be determined.

(i.5) Reference was made to paragraph [0029] of the patent in suit and to the standard procedures to

determine the absorbency of super absorbent materials
EDANA 442.1-99 and 441.1-99 as well as JIS K 7224-1996
according to which the parameters were measured by
swelling the super absorbent materials or polymers at
23 ± 2 °C.

(i.6) The same applied with respect to the so-called
thread-ball shaped molecules which were used in the
measurement of the pore volume as described in the
present patent. Reference was also made to the letter
of Appellant I dated November 27, 2002, page 5, second
paragraph).

(i.7) The molecular diameter of said thread-ball-
shaped molecules was known to a person skilled in the
art for example from catalogues of commercially
available products of said thread-ball-shaped molecules.

(i.8) The Respondent contradicted the allegations of
Opponent II with respect to the high measurement errors
(about 1.4 %).

X.   The arguments presented by Appellant I in its letter
        dated 27 October 2006 and concerning insufficiency of
        disclosure may be summarized as follows:

        (i.1) Reference was made to decision T 172/99 of
        7 March 2002 (not published in OJ EPO).

        (i.2) It had been shown that the pore volume test was
        not sufficiently disclosed for at least two polymers
        which were covered by the claim language.

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(i.3) Contrary to the Patent Proprietor's assertion, the test experiments carried out by Appellant I provided both the film swell index for Samples 9 and 10 and the weight average molecular weight of the polyacrylate precursor prepared according to Example I of D2 (cf. D18).

XI.   In its letter dated 27 October 2006, Appellant II argued essentially as follows:

(i) All the claims in the opposed patent referred either directly or indirectly to pore volume as measured by a particular non-standard test procedure.

(ii) It was for the Patent Proprietor to demonstrate that the patent in suit contained a full disclosure of the method by which the parameter was to be measured.

(iii) Claim 3 of the granted patent referred to an average pore size and a standard deviation in pore size. There was no indication whatsoever either in the claim or in the description of the patent as to how the standard deviation in pore size should be calculated.

(iv) Furthermore, a calculation made by Appellant II, showed that apart from comparative Example 3, the values for the average pore size reported in Table 2 of the patent in suit did not agree with those calculated using the equation given in Claim 3.

XII. Oral proceedings took place before the Board on 30 November 2006.
      At the oral proceedings the discussion essentially focussed on the question of sufficiency of disclosure

in view of the methods for determining the pore volumes used for characterizing the polymers according to granted Claims 1 and 2, of the determination of the average pore size and standard deviation thereof, and the method for determining the pore volume of water swellable polymer according to granted Claim 8.

(a) The Appellants, while having indicated that they essentially relied on the arguments and evidence presented in that respect during the written phase of the appeal for supporting their objection of insufficient disclosure, made additional submissions in that respect which may be summarized as follows:

(a.1) The methods for determining pore volumes as disclosed in granted Claims 1, 2 and 8 were not restricted to polymers meeting the requirements of Claims 1, 2 and 3. They should also be applicable to water swellable polymers of the prior art.

(a.2) Favor 880 and SXM 9543 which had been used in the tests carried out by Appellant II were superabsorbent polymers, based on partially neutralized polyacrylic acid as the polymers used in the Examples of the patent in suit.

(a.3) The patent in suit did not define the thread-ball shaped molecule used for carrying out the test for determination of pore volume.

(a.4) Document D1, which referred to Dextran products did not even refer to this term. Furthermore, the diameters which could be calculated from the Stoke's radii indicated in D1 (page 2) for the various Dextran

products did not correspond to the diameters indicated
in the patent in suit for the Dextran products used as
"thread-ball shaped molecule".

(a.5) Stoke's radius might be determined in two
different ways, either using a dynamic method
(diffusion) or a static method (light scattering).
These methods did not lead to the same results.

(b) The Respondent, while also essentially relying on
the arguments presented in the written phase of the
appeal made further submissions in order to support its
view that the patent in suit did not lack sufficiency
of disclosure in these respects. They may be summarized
as follows.

(b.1) The criteria for sufficiency of disclosure was
the possibility of repeating the examples of the patent
in suit.

(b.2) The Respondent had no difficulties for carrying
out the tests. The accuracy of the test was about 1%.

(b.3) The skilled person would know what was meant by
"thread ball shaped molecules" and by the diameter of
such molecules.

(b.4) An explanation to the problems encountered by the
Appellants could have been that they had used polymers
with an insufficient absorbency.

(b.5) As shown by document D17, the difference in the
Dextran concentration in the filtrate between a 0%

exclusion and a 100% exclusion increased with the
absorbency of the polymer.

(b.6) The patent in suit was concerned with
superabsorbent polymers which were known to have a high
absorbency in physiological solution, e.g. more than
100g/g.

(b.7) Furthermore, the absorbency of these polymers was
known to be even higher in ion-exchanged water than in
physiological solution.

(b.8) The Respondent had developed its own method for
calculating an average pore size of water swellable
crosslinked polymer. Nevertheless, the standard
deviation would however be determined as known by the
skilled person.

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

         The Respondent requested that the appeals be dismissed,
         or, in the alternative, that the decision under appeal
         be set aside and the patent be maintained on the basis
         of Claims 1 to 6 of the first auxiliary request, or on
         the basis of Claim 1 of the second auxiliary request,
         both submitted with letter dated 26 October 2006.

Reasons for the Decision

1.   The appeals are admissible.

Main request

2.   *Sufficiency of disclosure*

2.1   As indicated in paragraph [0005] of the patent in suit,
        the aim of the invention is to provide water swellable
        crosslinked polymers which display sufficient high
        absorption capacity when put under an increased
        pressure in a state combined with fibrous matters.
        According to paragraph [0009], this can be achieved
        only if the swellable crosslinked polymers have a
        specific pore size on a molecular level.

2.2   Swellable crosslinked polymers meeting these
        requirements are represented by the polymers according
        to Claim 1 and by the polymers according to Claim 2 of
        the patent in suit.

2.3   While Claim 1 is directed to a water swellable
        crosslinked which is characterized only by the feature
        that it has a total pore volume of pores with a pore
        size in gels of 5.1-27 nm of 60 v/v % or more relative
        to the entire amount of a physiological salt solution
        absorbed into the polymer, as determined by the method
        defined in that claim, Claim 2 relates to a water
        swellable crosslinked polymer which is characterized
        only by the feature that it has a total pore volume of
        pores with a pore size in gels of 5.1-27 nm of 80 v/v %
        or more relative to the entire amount of an ion

exchanged water absorbed into the polymer, as
determined by the method defined in that claim.

2.4   It is thus clear that the essential feature of the
        claimed water swellable crosslinked polymers according
        to Claim 1 and to Claim 2 resides in the total pore
        volume of pore in the range of pore size of 5.1 to 27
        nm as determined by the methods indicated in these
        claims.

2.5   In this connection, the Board observes that the
        respective pore volumes referred to in Claim 1 and in
        Claim 2 are determined by specific methods which have
        been developed by the Respondent itself.

2.6   Consequently, it must be considered that the specific
        pore volumes referred to in Claim 1 and in Claim 2
        which are the only essential features for selecting
        water swellable crosslinked polymers in order to carry
        out the claimed invention are newly formulated and,
        hence, unfamiliar parameters which have to be
        determined by specific and newly developed methods.

2.7   As stated in the decision T 172/99 in the case of
        claimed subject-matter relying on a newly formulated
        and, hence, unfamiliar parameter to define the solution
        of a technical problem by which a relevant effect is
        achieved, the patentee, who has the duty of making a
        full and fair disclosure of his invention to the public
        (Article 83 EPC), is under a particular obligation to
        disclose all the information necessary reliably to
        define the new parameter not only (i) in a formally
        correct and complete manner such that its values can be
        obtained by a person skilled in the art without undue

burden, but also (ii) in a manner which reliably retains the validity of the parameter for the solution of the technical problem for the application or patent in suit as a whole in the sense that the values routinely obtained will not be such that the claimed subject-matter covers variants incapable of providing the relevant effect or, therefore, of solving the associated technical problem.

2.8   Since, in the present case, it is the methods of determination of the specific pore volumes which give their technical significance to these features for the implementation of the claimed invention, it thus follows that the implementation of the claimed invention presupposes that the values of the specific pore volume as indicated in Claim 1 and in Claim 2 could be determined in a reliable and reproducible manner by the very specific methods mentioned in these claims.

2.9   In this connection, the Board notes that the published application (EP-A2-0 835 885) provides in the passage from page 7, line 54 to page 8, line 31 practical technical information as to carry out the determination of the pore volume in gels in a state of swollen with a physiological salt solution.

2.10   According to page 7, line 54 to page 8, line 5, **about** 10 mg (W1 g) of a water-swellable crosslinked polymer is precisely weighed out and then swollen by placing it into a screw tube of 100 ml along with **about** 30 ml (W2 ml) of a physiological salt solution, and then allowed to stand stationary for 60 hours. Afterwards **about** 30 ml (W3 ml) of a 1.00 % (Ci %) physiological

salt solution of dextran with a molecular diameter of
51 Å (i.e. 5.1nm)("Dextran T10", made by Pharmacia
Biotech Co., Ltd.) is added, and the tube is capped and
then shaken for 60 hours with a shaker ("Double Shaker"
NR-150, made by Taitec Co., Ltd.). After this shaking,
the resultant swollen gel is filtered off with a glass
filter. The filtrate is subjected to GPC analysis to
determine the concentration (Cf %) of dextran in the
filtrate from a calibration curve as made beforehand
from the peak height of dextran with a known
concentration (emphases by the Board).

2.11   Thus, according to page 8, lines 15 to 20, the pore
        volume of pores having a diameter of 0-51 Å, i.e.
        between 0-5.1 nm is given by the formula:

        $$PV(0-5.1nm)(ml/g) = (W2+W3)[1-\{W3/(W2+W3)\}x(Ci/Cf)]/W1.$$

2.12   According to page 8, lines 21 to 31 the pores volume of
        pores between 0 and 270 Å (0 and 27 nm) and 0 and 560 Å
        (0 and 56 nm) are determined in the same way as the
        pore volume of pores between 0 and 51 Å (i.e. 0 and 5.1
        nm) except that dextrans with a molecular diameter of
        270 Å (27 nm) and with a diameter of 560 Å (56 nm) (i.e.
        Dextran T500 and T2000) are respectively used instead
        of a dextran with a molecular diameter of 51 Å (i.e.
        5.1 nm).

2.13   The Board also notes that the published application
        provides in the passage from page 8, line 40 to page 9,
        line 20 the corresponding technical information as to
        carry out the determination of the pore volume in gels
        in a state swollen with ion exchanged water.

0160.D

2.14   According to page 8, lines 40 to 49, **about** 10 mg (W1 g)
        of a water-swellable crosslinked polymer is precisely
        weighed out and then swollen by placing it into a screw
        tube of 100 ml along with **about** 30 ml (W4 ml) of ion-
        exchanged water, and then allowed to stand stationary
        for 60 hours. Afterwards **about** 30 ml (W5 ml) of a
        1.00 % (Ci %) ion-exchanged water solution of dextran
        with a molecular diameter of 51 Å (i.e. 5.1 nm)
        ("Dextran T10", made by Pharmacia Biotech Co., Ltd.) is
        added, and the tube is capped and then shaken for 60
        hours with a shaker ("Double Shaker" NR-150, made by
        Taitec Co., Ltd.). After this shaking, the resultant
        swollen gel is filtered off with a glass filter. The
        filtrate is subjected to GPC analysis to determine the
        concentration (Cf %) of dextran in the filtrate from a
        calibration curve as made beforehand from the peak
        height of dextran with a known concentration (emphases
        by the Board).

2.15   Thus, according to page 9, lines 1 to 5, the pore
        volume of pores having a diameter of 0-51 Å, i.e.
        between 0-5.1 nm is given by the formula:

        $$PV(0-5.1nm)(ml/g) = (W4+W5)[1-\{W5/(W4+W5)\}\times(Ci/Cf)]/W1.$$

2.16   According to page 9, lines 7 to 11 the pores volume of
        pores between 0 and 90 Å (0 and 9 nm) 0 and 118 Å
        (0 and 11.8 nm), 0 and 270 Å (0 and 27 nm) and 0 and
        560 Å (0 and 56 nm) are determined in the same way as
        the pore volume of pores between 0 and 51 Å (i.e. 0 and
        5.1 nm) except that dextrans with molecular diameters
        of 90 Å (9 nm), 118 Å (11.8 nm), 270 Å (27 nm), and 560
        Å (56 nm) (i.e Dextran T40, T70, T500 and T2000) are

respectively used instead of a dextran with a molecular
diameter of 51 Å (i.e. 5.1 nm).

2.17   In that respect, it is noted by the Board that
Appellant II has carried tests (cf. document D8) on
samples of superabsorbent polymers (i.e. Favor 880 and
SXM 9543 both of Stockhausen, Inc) in order to
determine their pore volumes in a physiological salt
solution and in ion-exchanged water according to the
methods set out in Claims 1 and 2.

2.18   In that respect, it is observed that page 3 of D8
describes the procedure according to which these tests
have been carried out as follows:

"Test 1 : Physiological Salt Solution (All measurements
must be EXACT)
1. Weigh out 0.01g of SAM (as received) into a screw
tube of 100 ml
2. Add 30ml of 0.9% saline solution, close cap tightly
3. Let it soaked for 60 hours
4. Add 30 ml of a 1% physiological salt solution of
Dextran (99g of 0.9% saline solution + 1g of Dextran
T10), close cap tightly
5. Shake the tube for 60 hours using "Double Shaker"
NR-150. made by Taitec Co. Ltd)
6. Filter the swollen gels via a glass filter and
collect the filtrate
7. Subject the filtrate to a GPC analysis to determine
the concentration (Cf%) of Dextran from a calibration
curve as made beforehand from the peak height of
Dextran with a known concentration.
8. Repeat steps 1-7, but replacing Dextran T10 with
Dextran T500

9. Repeat steps 1-7, but replacing Dextran Tl0 with
Dextran T2000".

and

"Test 2 : Ion-Exchanged Water (All measurements must be
EXACT)

1. Weigh out 0.01g of SAM (as received) into a screw
tube of l00 ml

2. Add 30 ml of 0.9% ion-exchanged water, close cap
tightly

3. Let it soaked for 60 hours

4. Add 30 ml of a 1% ion-exchanged water of Dextran
(99g of 0.9% saline solution + 1g of Dextran Tb), close
cap tightly

5. Shake the tube for 60 hours using "Double Shaker"
NR-150. made by Taitec Co. Ltd)

6. Filter the swollen gels via a glass filter and
collect the filtrate

7. Subject the filtrate to a GPC analysis to determine
the concentration (Cf%) of Dextran from a calibration
curve as made beforehand from the peak height of
Dextran with a known concentration.

8. Repeat steps 1-7, but replacing Dextran Tl0 with
Dextran T40

9. Repeat steps 1-7, but replacing Dextran Tl0 with
Dextran T70

10. Repeat steps 1-7, but replacing Dextran Tl0 with
Dextran T500

11. Repeat steps 1-7, but replacing Dextran Tl0 with
Dextran T2000."

2.19   Consequently, it is in the Board's view, indisputable
        that the tests carried out by the Appellant II for the
        determination of the pore volumes of these samples of
        superabsorbent polymers have been carried out in the

framework of the instructions given by the patent in
suit for carrying these determinations according to the
methods referred in Claims 1 and 2.

2.20   It is further clear that even stricter standards have
        been applied by Appellant II when carrying out its
        analyses since, according to the test procedures
        disclosed in D8, it is required that "All measurements
        must be EXACT) while, according to the patent in suit,
        a certain degree of uncertainty is apparently tolerated
        (cf. the wording "about" used in combination with the
        values W1, W2, and W3, W4 and W5).

2.21   The results of the pore volume determination in
        physiological salt solution made by Appellant II are
        presented in the Table on page 4 of D8.

2.22   In that respect, the Board observes that for the
        determination of the pore volume of Sample C in the
        range 0-5.1 nm, five measurements of the final
        concentration Cf of dextran in the filtrate have been
        carried out, which give values of the measured final
        concentration of 0.497, 0.501, 0.501, 0.498 and 0.504%
        respectively, and which allow to calculate the
        corresponding values of pore volume of respectively
        -36.22, +11.98, +11.98, -24.10 and +47.62 ml/g.
        Independently of the fact that negative and hence
        meaningless values of the pore volume would appear to
        be obtained, the Board further observes that a slight
        variation in the measured value of the Cf of 0.003%
        (absolute) i.e. 0.6% relative leads to a quadrupling of
        the measured pore volume (11.98 to 47.62 ml/g). The
        extreme sensitivity of the determined pore volume to
        the measured value of the final concentration Cf is

further illustrated, in the Board's view, in that Table, by the fact that a very slight variation of 0.001% absolute, i.e. 0.2% relative of the value of the measured Cf already induces a relative variation of 23% of the determined pore volume (cf. Sample B, PV (0-56)).

2.23   In this connection, the additional tests carried out by Appellant II on partially neutralized polyacrylic acid polymers prepared according to Sample 9 (Sample referred as W108601) and to Sample 10 (Sample referred as W108602) of Example 2 of D2 (cf. Annex 2, and Table 1 thereof submitted with the Statement of Grounds of Appeal), show that either negative i.e. meaningless results (cf. Sample W108602, only negative values of pore volume for the pore size range 0-5.1 nm) or drastically divergent results (e.g. a pore volume between 3.01 and 54.44 for the Sample W108601 in pore diameter range of 0 to 56nm, and a pore volume varying between 21.99 and 73.49 for the Sample W108602 in the same pore diameter range) in terms of pore volume are obtained for the same polymer when using the method disclosed in the patent for determining the pore volume of these polymers. Although Annex 2 does not disclose *expressis verbis* the respective final concentration Cf measured when carrying the method for determining the pore volume in the pore diameter ranges (i.e. 0-5.1 nm, 0-27 nm, 0-56 nm) of each repeat, the Board notes that these tests have been carried in the same way as those of D8, so that it could be reasonably expected that the same range of experimental error in the determination of the final concentration has occurred, and that hence these tests also illustrate the extreme sensitivity of the determined pore volume to the measured final concentration.

2.24   The results of the pore volume determination in ion-
        exchanged water made by Appellant II are presented in
        the Tables of pages 5 to 7 of D8.

2.25   In that respect, the Board observes that for the
        determination of the pore volume of Sample C in the
        range 0-5.1 nm, five measurements of the final
        concentration Cf of dextran in the filtrate have been
        carried out, which give values of the measured
        concentration of 0.502, 0.496, 0.494, 0.500 and 0.506%
        respectively, and which allow to calculate the
        corresponding values of pore volume of respectively:
        +23.90, -48.39, -72.87, 0.00, and +71.15 ml/g.
        Independently of the fact that negative and hence
        meaningless values of the pore volume would appear to
        be obtained, the Board further observes that a slight
        variation in the measured value of the Cf of 0.004%
        absolute i.e. 0.8% relative leads to a tripling of the
        measured pore volume (23.90 to 71.15 ml/g). The extreme
        sensitivity of the determined pore volume to the
        measured value of the final concentration Cf is further
        illustrated, in the Board's view, in these Tables, by
        the fact that a very slight variation of 0.001%
        absolute, i.e. 0.2% relative of the value of the
        measured Cf already induces a relative variation of 23%
        of the determined pore volume (cf. Sample C, PV (0-56);
        Repeats 3 and 4).

2.26   In this connection, the additional tests carried out by
        Appellant II on partially neutralized polyacrylic acid
        polymers prepared according to Sample 9 (Sample
        referred as W108601) and to Sample 10 (Sample referred
        as W108602) of Example 2 of D2 (cf. Annex 2, and

Table 2 thereof submitted with the Statement of Grounds of Appeal of Appellant II), show that negative i.e. meaningless results in terms of V/V % (cf. Sample W108601 (Repeats 1 and 5) and Sample W108602 (Repeat 1) or drastically divergent results (cf Sample W108601 Repeats 3 and 4) are obtained.

2.27   The extreme sensitivity in both methods of the determined pore volume to the measured final concentration Cf would appear, in the Board's view, to be inherent to the method of calculating the pore volume starting from the final concentration Cf. As taught by the patent in suit, the pore volume in physiological salt solution for a specific pore diameter range (e.g. 0-5.1nm) is given by the formula:

$$PV(0\text{-}5.1nm)(ml/g) = (W2+W3)[1-\{W3/(W2+W3)\}x(Ci/Cf)]/W1.$$

This implies, when replacing Ci, W1, W2, W3 by their values (i.e. 1%, 0.01g; 30ml; 30ml) that:

$$PV (0\text{-}5.1) = 60[1-(30/60ml)x\ 1/Cf]/0.01, \text{ i.e.}$$

$$PV (0\text{-}5.1) = 6000(1- 0.5/Cf) = 6000(Cf-0.5)/Cf.$$

It is hence clear that the slightest variation in the determination of the final concentration is amplified by a factor in the order of 6000, when calculating the corresponding pore volume in physiological salt solution. It is further evident that one would come to the same conclusion in view of the corresponding formula used for calculating the pore volume in ion-exchanged water (cf. paragraph 2.15 above).

0160.D

2.28   This extreme sensitivity finds, in the Board's view,
        also its origin in the very little difference in final
        concentrations of dextran in the filtrate which occurs
        between the case of a 0% exclusion and a 100% exclusion
        of the dextran molecule from the gel pores when
        determining the pore volume. As shown by the Appellant
        II in its Statement of Grounds of Appeal and not
        contradicted by the Respondent, this difference is as
        low as 0.051% absolute for a superabsorbent polymer
        having an absorbency of 60g/g. In other words a
        variation of 1% relative of the value of the measured
        final concentration induces a variation of 0 to 100% of
        the measured value of the actual volume of the pores in
        a specific diameter range (e.g. from 0 to 5.1nm).

2.29   Thus, the Board, in the absence of counter evidence
        from the side of the Respondent, can only conclude that
        the tests carried by the Appellant II merely bring to
        the light the inherent extreme sensitivity of the
        determination of pore volumes by the methods referred
        in Claims 1 and 2 to the measured final concentration
        Cf. It thus follows that, despite conducting the
        measurement of the final concentration of the dextran
        in the filtrate with due care and good accuracy as done
        by the Appellant II, there is, as shown above (cf.
        paragraphs 2.22, 2.23, and 2.25 to 2.26), an extreme
        inaccuracy in the determination of the pore volumes
        according to the methods referred to in Claims 1 and 2.

2.30   This extreme inaccuracy in the determination of the
        pore volume in a specific pore diameter range hence
        drastically questions the reliability of this feature,
        and by way of consequence the reliability of the
        feature set out in Claim 1 that a water swellable

0160.D

crosslinked polymer must exhibit a total volume of
pores in the diameter range of 5.1 to 27 nm of at least
60% of the total volume of pores as determined by the
method referred in that claim, and the reliability of
the feature set out in Claim 2 that crosslinked polymer
must exhibit a total volume of pores in the diameter
range of 5.1 to 27 nm of at least 80% of the total
volume of pores as determined by the method referred in
that claim.

2.31   Whilst a reasonable amount of experimental inaccuracy
        is permissible when it comes to sufficiency of
        disclosure, the level of uncertainty in the present
        case is, in the Board's view, such that there would
        have to have been available adequate instructions in
        the specification or on the basis of the general
        knowledge of the skilled person in order to reduce the
        level of uncertainty in the determination of the pore
        volume in a specific pore diameter interval, to a level
        which would not jeopardize the validity of the measured
        parameter for the solution of the technical problem.

2.32   Although the patent in suit gives absolutely no
        indication on the degree of error of the determinations
        of the pore volume in the specific ranges of pore sizes,
        it has, nevertheless, been submitted by the Respondent
        at the oral proceedings before the Board that the pore
        volumes can be determined with an accuracy of 1% or
        less by the methods disclosed in the patent in suit.

2.33   Independently of the facts, that no evidence has been
        submitted in that respect by the Respondent, and that
        such an accuracy would necessitate an extremely high
        accuracy of the determination of the final

concentration of dextran in the filtrate in view of the
amplifying effect of the factor 6000 between the
variation of final concentration on the value of the
pore volume calculated therefrom, the Board can however
only state that the patent in suit does not contain any
indication of further factors which might strongly
increase the accuracy of the determination of the final
concentration, and hence the reliability of the
determination of the pore volume by the methods
referred to in Claims 1 and 2.

2.34   In that respect, the Board does not accept the argument
         of the Respondent, that the patent in suit is directed
         to superabsorbent polymers having a high absorbency,
         i.e. in the Respondent's view, of more than 100 g/g,
         and that for these polymers the pore volume could be
         determined with a good accuracy.

2.35   This is because, while it might be true, as shown by
         document D17, that a higher absorbency of the polymer
         would increase the difference between the final
         concentration Cf corresponding to the 0% exclusion and
         the final concentration corresponding to the 100%
         exclusion, the Board can only state that neither
         Claim 1 nor Claim 2 contains a such limitation in terms
         of absorbency of the claimed polymer (i.e. at least
         100 g/g), and that the description of the patent in
         suit is totally silent on such minimal level of
         absorbency of the claimed polymers.

2.36   The Board also does not accept the further argument of
         the Respondent that when determining the pore volume in
         ion-exchanged water the absorbency of the polymers is
         increased with respect to its absorbency in

physiological salt solution, and that hence the method referred to in Claim 2 would allow a more reliable determination of the pore volume than the one referred to in Claim 1.

2.37   Even if it were accepted that the absorbency is greater in ion-exchanged water than in physiological salt solution although there is no such evidence on file, this is because the tests carried out by the Appellant II (cf. D8) clearly show that the sensitivity of the determination of the pore volume to the measurement of the final concentration C_f remains in any case extreme when the polymers are tested in ion-exchanged water e.g. a tripling of the determined pore volume in ion-exchanged water in the range 0-5.1 nm for Sample C for a 0.8% relative variation of the measured final concentration to be compared with a quadrupling of pore volume in physiological salt solution for the same Sample C in the same range of pore size for a 0.6% relative variation of the final concentration.

2.38   Nor could the lack of instructions in the patent in suit (cf. paragraph 2.33 above) be overcome by the general knowledge of the skilled person, since the pore volumes according to Claims 1 and 2 represent newly formulated parameters determined by new methods for which, hence, no common general knowledge was evidently available in the art before the priority date of the patent in suit.

2.39   Consequently, the patent in suit does not disclose the method for determining the specific pore volumes as referred to in Claims 1 and 2 in a manner which reliably retains the validity of these parameters for

the solution of the technical problem, in the sense
that the values routinely obtained would not be such
that the claimed subject-matter of Claim 1 and the
claimed subject-matter of Claim 2 cover polymer
variants incapable of providing the relevant effect
(i.e. high absorption capacity when put under an
increased pressure).

2.40   For these reasons, the Board comes to the conclusion
that the patent in suit does not comply with the
requirements of Article 83 EPC.

2.41   This conclusion would not be altered by the argument of
the Appellant that the requirement of sufficiency of
disclosure must be regarded as met if the examples of
the patent in suit could be reproduced.

2.41.1 In the present case, the actual technical contribution
to the state of the art by the disclosure of the patent
in suit essentially consists of providing methods for
selecting water swellable crosslinked polymers having
high absorption capacity when put under pressure.

2.41.2 As indicated in paragraph 2.3 above, the claimed
polymers according to Claims 1 and 2 are only
characterized by a specific pore volume as determined
by the methods mentioned in these claims, but no
further specific details are given in these claims in
respect of the chemical structure or the level of
absorbency of the claimed polymers.

2.41.3 Since, in order to carry out the invention, the skilled
person must hence be able to distinguish between water
swellable crosslinked polymers having these specific

pore volumes and those not exhibiting these features,
the fact that the methods for determining the pore
volume of water swellable crosslinked polymers
disclosed in the patent might give conclusive results
in the case of the specific partially neutralized
crosslinked polyacrylic acid polymers disclosed in
Examples 1 to 5 for the method referred to in Claim 1,
and in the Examples 1, 6 and 7 for the method referred
in Claim 2, does not change the fact that these methods
must also be reliably applicable to any water swellable
crosslinked polymer in order to allow the skilled
person to disregard variants incapable of providing the
relevant technical effect.

2.42   This is, however, not the case here, since it has been
convincingly shown by the Appellants that the methods
for determining the pore volume referred to in Claims 1
and 2 of the patent in suit give totally unreliable
results when applied to other water swellable
crosslinked polymers, even very closely structurally
related to those exemplified in Examples 1 to 7 of the
patent in suit, i.e. further partially neutralized
crosslinked polyacrylic acid polymers such as Favor 880,
SVM 9543, and those prepared according to Samples 9
and 10 of Example 2 of document D2.

First and second auxiliary requests

3.   Since Claim 1 of the first auxiliary request
corresponds to Claim 2 of the main request, and since
Claim 1 of the second auxiliary request is directed to
an absorbent article comprising a water swellable
crosslinked polymer, whose definition correspond to
that of the water swellable crosslinked polymer

according to Claim 2 of the main request, it thus
follows that these requests do not meet the
requirements of Article 83 EPC. They must hence be
refused.

4.   Since none of the requests presented by the Respondent
can be allowed, the decision under appeal must be set
aside and the patent be revoked.

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:

E. Görgmaier   R. Young