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**Datasheet for the decision
of 10 July 2024**

Case Number: T 2081/22 - 3.3.03

Application Number: 15806538.3

Publication Number: 3156427

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C08F2/10, A61L15/60

Language of the proceedings: EN

Title of invention:
SUPER ABSORBENT RESIN

Patent Proprietor:
LG Chem, Ltd.

Opponent:
Nippon Shokubai Co.,Ltd.

Relevant legal provisions:
EPC Art. 84

Keyword:
Claims - clarity (no)

Decisions cited:
G 0003/14



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Case Number: T 2081/22 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 10 July 2024

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted on 29 June 2022
revoking European patent No. 3156427 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman F. Rousseau
Members: O. Dury
W. Ungler

Summary of Facts and Submissions

- I. The appeal of the patent proprietor lies from the decision of the opposition division revoking patent EP 3 156 427. Said patent was granted in respect of the European patent application published as EP 3 156 427 A1 (hereinafter "**D13**"), which was based on international application PCT/KR2015/005957 that was published as WO 2015/190879 A1 (hereinafter "**D27**").
- II. The decision under appeal was based on a main request and on a 1st auxiliary request, both filed with letter of 8 April 2022. In that decision, the opposition division decided, among others, that neither claim 1 of the main request, nor claim 1 of the 1st auxiliary request met the requirements of Article 84 EPC. Therefore, the patent was revoked.
- III. The patent proprietor (appellant) appealed against that decision and, together with their statement of grounds of appeal, filed two sets of claims as main request and 1st auxiliary request, as well as, among others, the following document:

D33: Certified English translation of two passages of D27
- IV. The opponent (respondent) filed a rejoinder to the statement of grounds of appeal.
- V. The parties were summoned to oral proceedings and a communication pursuant to Article 15(1) RPBA indicating specific issues to be discussed at the oral proceedings

was then sent to the parties.

VI. Oral proceedings were held on 10 July 2024.

VII. **The requests of the parties are as follows:**

(a) The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request or on the basis of the 1st auxiliary request both filed with their statement of grounds of appeal.

(b) The respondent requested that the appeal be dismissed.

VIII. Claim 1 of the **main request** read as follows:

"1. Method for preparing a superabsorbent polymer comprising a crosslinked polymer comprising the steps:

- obtaining a base polymer by polymerizing water-soluble ethylene-based unsaturated monomers having an acidic group in which at least a part thereof is neutralized;
- subjecting the base polymer in the form of a powder to a surface crosslinking;

wherein the surface crosslinking reaction is performed by heating the surface crosslinking agent-added base polymer particles at 180 to 200°C for at least 20 minutes, the maximum reaction temperature of the surface crosslinking reaction is 180 to 200 °C, the holding time at the maximum reaction temperature is 20 minutes to 50 minutes; the initial reaction temperature of the reaction solution containing the

surface crosslinking agent with the base polymer at the start of the cross-linking reaction is 100 to 170 °C, and the temperature rise time from the initial reaction temperature, until the time when the maximum reaction temperature is reached, is controlled to be more than 10 minutes and not more than 40 minutes;

wherein the surface crosslinking agent contains diol or polyol having 2 to 8 carbon atoms, and the base polymer has a gel strength before surface crosslinking (G' ; Pa) of 4600 Pa to 7000 Pa;

wherein the super absorbent polymer has CRC of 26 to 32 g/g, AUP of 22 to 26 g/g, a horizontal gel strength G' of 7,000 to 12,000 Pa, and SFC of 50 to 75 ($\cdot 10^{-7} \text{cm}^3 \cdot \text{s/g}$), and

wherein the super absorbent polymer satisfies the relationship represented by the following formula 1:

[Formula 1]

$$\left(\frac{\text{AUP}}{\text{CRC}} \times \frac{G'}{1000} \right)^2 > 15 \text{ Pa}^2$$

in the formula 1,

CRC represents a centrifuge retention capacity for a physiological saline solution (0.9 wt% aqueous sodium chloride solution) of the super absorbent polymer for 30 minutes, and is measured in accordance with EDANA (European Disposables and Nonwovens Association) recommended test method No. WSP 241.3,

AUP represents an absorbency under pressure for a physiological saline solution (0.9 wt% aqueous sodium chloride solution) of the super absorbent polymer under 0.7 psi for 1 hour, and is measured in accordance with EDANA recommended test method No. WSP 242.3, and

G' represents a horizontal gel strength of the super absorbent resin measured using a rheometer, after absorbing and swelling a physiological saline solution (0.9 wt% aqueous sodium chloride solution) to the super absorbent polymer for 1 hour,

wherein the horizontal gel strength G' of the super absorbent resin is measured by a method as described in the specification, comprising the steps of:

absorbing a physiological saline solution to the super absorbent polymer to swell the super absorbent polymer; positioning the swelled super absorbent polymer between plates of a rheometer having a predetermined interval to pressurize the two plate surfaces; confirming a shear strain in the linear viscoelastic regime section where storage modulus and loss modulus are steady, while increasing the shear strain using the rheometer under vibration; and measuring the storage modulus and the loss modulus of the swelled super absorbent polymer under the confirmed shear strain, respectively, and measuring the average value of the storage modulus as a gel strength, and

wherein the SFC represents a physiological saline solution (0.685 wt% aqueous sodium chloride solution) flow conductivity ($\cdot 10^{-7} \text{cm}^3 \cdot \text{s/g}$) for the super absorbent polymer, and is measured in accordance with the method disclosed in the specification.".

IX. Claim 1 of the **1st auxiliary request** differed from claim 1 of the main request in that the following feature was added at the end of the claim:

"and wherein the super absorbent polymer satisfies the relationship represented by the following formula 2

[Formula 2]

$$\sqrt{\frac{(CRC+AUP)}{2} * \left(\frac{G'}{1000}\right) * SFC} > 100.$$

in the formula 2, AUP, CRC and G' are as defined in the formula 1 and SFC represents a physiological saline solution (0.685 wt% aqueous sodium chloride solution) flow conductivity ($\cdot 10^{-7} \text{cm}^3 \cdot \text{s/g}$) for the super absorbent polymer, and is measured in accordance with the method disclosed in the specification."

X. The appellant's arguments, in so far as they are pertinent, may be derived from the reasons for the decision below. They are essentially as follows:

(a) The feature of claim 1 of the main request reading

"the initial reaction temperature of the reaction solution containing the surface crosslinking agent with the base polymer at the start of the cross-linking reaction is 100 to 170 °C, and the temperature rise time from the initial reaction temperature, until the time when the maximum reaction temperature is reached, is controlled to be more than 10 minutes and not more than 40 minutes"

had been introduced by the amendments made in claim 1 as granted and was ambiguous. Claim 1 therefore did not meet the requirements of Article 84 EPC.

(b) Claim 1 of the 1st auxiliary request lacked clarity for the same reason as claim 1 of the main request.

XI. The respondent's arguments, in so far as they are pertinent, may be derived from the reasons for the decision below. They are essentially as follows:

The feature of claim 1 of the main request objected to by the appellant was clear. Therefore, the appellant's objections under Article 84 EPC raised against claim 1 of both the main request and of the 1st auxiliary request should be rejected.

Reasons for the Decision

Main request - Article 84 EPC

1. The appellant contested the conclusion reached by the opposition division that claim 1 of the main request, which was undisputedly identical to the main request dealt with in the decision under appeal, lacked clarity.
2. In that regard, it was common ground that the following feature defining the step of the surface crosslinking reaction according to claim 1 of the main request was not part of the claims as granted and could, therefore, following the ruling of G 3/14 (OJ EPO 2015, 102) be

examined at the present stage of the proceedings:

"the initial reaction temperature of the reaction solution containing the surface crosslinking agent with the base polymer at the start of the cross-linking reaction is 100 to 170 °C, and the temperature rise time from the initial reaction temperature, until the time when the maximum reaction temperature is reached, is controlled to be more than 10 minutes and not more than 40 minutes;"

The Board has no reason to be of a different opinion.

3. The requirement of clarity is meant to ensure that the skilled person can determine unambiguously the scope of the subject-matter for which protection is sought, in particular in order to know when (s)he is working within or outside the ambit of the claim. In view of that, it has to be answered whether the amendments introduced into the claims as granted, in the present case the feature indicated in above point 2, result in the boundaries of the claim to be unambiguously defined. Also, the normal rule of claim construction is that the terms used in a claim should be given their broadest technically sensible meaning in the context of the claim in which they appear.
4. The respondent's objections concerned among others the features of claim 1 "initial reaction temperature" and "temperature rise time" comprised in the amendment indicated in above point 2, whose clarity is assessed separately hereinafter.

Feature "initial reaction temperature"

5. Regarding the "initial reaction temperature", the Board agrees with the opposition division and the respondent that the requirements of Article 84 EPC are not met because no clear meaning can be attributed to the feature indicated in point 2 above regarding the meaning of the term "the initial reaction temperature of the reaction solution containing the surface crosslinking agent with the base polymer at the start of the cross-linking reaction is 100 to 170 °C", so that the boundaries of claim 1 are ambiguous.
- 5.1 In particular, as put forward by the opposition division (decision: page 12, first paragraph), no definition of the term "initial reaction temperature ... at the start of the cross-linking reaction" is present in operative claim 1. In view of the wording of the claim itself ("initial reaction temperature", "start of the cross-linking reaction"), the Board considers that said initial reaction temperature can - due to the linguistic structure of the passage - only refer to the temperature at which the cross-linking reaction effectively starts. In that regard, the Board sees no reason to consider that this interpretation, which is fully in line with linguistic considerations, would not be a technically sensible reading that would not be considered by the skilled person. The appellant has not provided any convincing reasons (see below point 5.4) to show that the skilled person would exclude this interpretation, based on the linguistic structure of the claim, on technical grounds. Thus, it cannot be held that such interpretation would result from a mind desirous to misunderstand, as was argued by the appellant (statement of grounds of appeal: page 7, fourth

paragraph).

- 5.2 However, it is unclear to the Board how such an "initial reaction temperature", which should characterise a specific phase of the surface cross-linking step defined in operative claim 1, namely "the start of the cross-linking reaction", is to be effectively determined, as was already held by the opposition division (see decision under appeal: page 11, last paragraph; page 12, first paragraph).
- 5.3 The appellant argued that the initial reaction temperature was a clear parameter and would be measured in the same way as the maximum reaction temperature (statement of grounds of appeal: page 7, penultimate paragraph; page 8, first to third paragraphs).

However, the question at stake is not how to measure a given temperature. Rather, in view of the wording of claim 1, the question to be answered is whether the skilled person is able to determine "the initial reaction temperature ... **at the start of the cross-linking reaction**" (emphasis by the Board), whereby it was not shown that the skilled person would know how to unambiguously determine when "the start of the cross-linking reaction" effectively occurs. For that reason, the appellant's arguments do not justify that the Board deviates from the conclusion reached by the opposition division.

- 5.4 The appellant indicated that "the Opposition Division did not follow the patentee's position that nothing else than the temperature of the pre-heated surface cross-linking reactor into which the reaction solution is introduced could be meant, although this is also supported by the present patent (cf. paragraph [110] of

D13)". That view was pursued in appeal (statement of grounds of appeal: page 8, first paragraph).

- 5.4.1 However, also the Board is not convinced by that argument of the appellant since the wording of the feature at stake does not make reference to the temperature of a reactor but to the temperature at which the cross-linking reaction starts (as indicated in point 5.1 above).
- 5.4.2 In addition, according to Article 84 EPC the subject-matter being claimed should be clear, which means that the skilled person should be in a position to determine unambiguously whether he/she is working within or outside the scope of the claims on the basis of the terms in a claim. This is all more the case for post grant amendments, which should be clear by themselves.

When a granted claim has been amended by insertion of a feature which was not part of the claims as granted that feature, i.e. the amendment, is subject to examination under Article 84 EPC (G 3/14, Order and point 54 of the Reasons) and therefore should be clear for the skilled person when read in the context of the claim itself. This is due to the fact that in opposition and appeal proceedings before the EPO, the patentee has in principle - irrespective of the question of the admittance of late submissions - the opportunity to amend the claims to bring them into line with more specific passages of the description. Thus, a claim should not be interpreted in a specific sense by implying into it features which appear only in the description, as this would go contrary to the requirement of clarity and would deprive claims of their intended function. Therefore, the appellant's arguments based on an interpretation of the amendment

made in claim 1 of the main request indicated in point 2 above in the light of the description did not convince.

5.5 Also the reference to points 1.7 and 1.9 of the reasons of T 685/18 referred to by the appellant is not convincing (statement of grounds of appeal: page 7, last paragraph) since it is only derivable therefrom that the surface cross-linking reaction is performed "at elevated temperature". However, it is not derivable from the cited passages how "the initial reaction temperature ... at the start of the cross-linking reaction" can be determined in an unambiguous manner by the skilled person.

5.6 The appellant's statement that "the skilled person would be capable of determining the beginning of the temperature rise time within the common approaches to detect the temperature of a reaction solution" (statement of grounds of appeal: page 8, penultimate paragraph of section 5, whereby the beginning of the temperature rise time is defined in claim 1 to be the initial reaction temperature) is not in line with the appellant's previous view that "it is difficult to determine the exact temperature at which the cross-linking reaction starts" (minutes of the oral proceedings before the opposition division: page 3, fifth paragraph). Therefore, that mere allegation cannot succeed.

5.7 At the oral proceedings before the Board, the appellant argued that some passages of the Korean original PCT patent application as filed (D27) had not been translated correctly in the European application as filed (D13). This concerned in particular paragraphs 85 and 110 of D13, for which a certified translation had

been filed as document D33 with the statement of grounds of appeal. In view of the translations of D33, the skilled person would understand that the initial reaction temperature specified in claim 1 of the main request was the temperature of the reactor in which the surface crosslinking reaction was performed, whereby said temperature could be easily measured using common methods.

5.7.1 This argument presupposes that a claim should be interpreted not only in the light of the patent specification, but even in the light of the translation of the PCT-application submitted to the EPO at the time of entry into the regional phase, or - as in the present case - in the light of a corrected translation thereof filed during the appeal proceedings. However, there is no legal basis for such an approach. According to Article 14(2) EPC the translation filed with the EPO at the time of entry into the regional phase may be corrected. However, this does not mean that a correction of that translation would automatically lead to a correction of the corresponding passage in the patent specification. This would require a specific request to this effect, which was not made in the present case. For this reason alone, it was not necessary to decide on the issue of admittance of D33 into the proceedings.

5.7.2 Furthermore, as indicated in point 5.4.2 above, the Board considers that an amendment of a granted claim taken from the description of the patent specification should be clear in itself, which excludes that the inserted feature being interpreted contrary to its express wording in the sense of a specific passage of the description. Therefore, the appellant's argument

must be rejected.

5.7.3 In view of the above, even if D33 were to have been admitted into the proceedings, which was contested by the respondent, the appellant's argument could not have succeeded. Under these circumstances, there was no need for the Board to decide on the admittance of D33.

5.8 For these reasons, the feature "the initial reaction temperature of the reaction solution containing the surface crosslinking agent with the base polymer at the start of the cross-linking reaction is 100 to 170 °C" does not meet the requirements of Article 84 EPC.

Feature "temperature rise time"

6. The Board further agrees with the opposition division (decision: page 11, third paragraph) that if the initial reaction temperature cannot be determined unambiguously, because the application fails to define this temperature and/or to provide a method that could be used to determine it, the period of time for the temperature increase (see feature "temperature rise time" specified in the feature indicated in point 2 above) cannot be measured in an unambiguous manner either since the precise start of the period of time under scrutiny is not clear.

6.1 In that respect, the appellant put forward that "the temperature rise time starts as soon as a temperature of 100 to 170°C is reached" (statement of grounds of appeal: page 8, starting from the fifth paragraph).

6.2 However, the use of the term "reaction" on two occasions in the feature indicated in above point 2 shows that the moment to be selected as starting point

for measuring the "temperature rise time" is defined in operative claim 1 itself to be the start of the crosslinking reaction, which can be expected to depend on the nature of the chemical components involved and process conditions used. In other words, said feature imposes that the surface crosslinking reaction effectively starts at a temperature of 100 to 170 °C. The reading of that feature contemplated by the appellant, however, does not impose such a requirement and, already for that reason, is not convincing.

7. In view of the above, the appellant's arguments do not justify that the Board deviates from the decision of the opposition division according to which claim 1 of the main request does not meet the requirements of Article 84 EPC.

1st auxiliary request

8. Claim 1 of the 1st auxiliary request comprises the same feature as claim 1 of the main request indicated in point 2 above, which was found to lead to the conclusion that claim 1 of the main request lacked clarity. Therefore, the same conclusion has to be reached for claim 1 of the 1st auxiliary request.
9. Since none of the appellant's requests is allowable, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



K. Götz-Wein

F. Rousseau

Decision electronically authenticated