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**Datasheet for the decision
of 21 May 2019**

Case Number: T 1530/15 - 3.2.06

Application Number: 08804075.3

Publication Number: 2190393

IPC: A61F13/15, A61L15/60

Language of the proceedings: EN

Title of invention:
PROCESS FOR METERING SUPERABSORBENTS

Patent Proprietor:
BASF SE

Opponents:
Evonik Degussa GmbH
NIPPON SHOKUBAI KABUSHIKI KAISHA

Headword:

Relevant legal provisions:
EPC Art. 54(1), 54(3), 123(2), 84, 56

Keyword:

Novelty - main request (no) - implicit disclosure (yes)
Amendments - auxiliary request VI - added subject-matter (yes)
- clarity (no)
Inventive step - auxiliary request VIII (no)

Decisions cited:

Catchword:



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Case Number: T 1530/15 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 21 May 2019

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
27 May 2015 concerning maintenance of the
European Patent No. 2190393 in amended form.**

Composition of the Board:

Chairman	M. Harrison
Members:	W. Ungler
	T. Rosenblatt

Summary of Facts and Submissions

- I. The appellants (patent-proprietor and opponent 2) filed respective appeals against the interlocutory decision of the opposition division in which the opposition division found that European patent No. 2 190 393 in an amended form met the requirements of the EPC.
- II. The Board issued a summons to oral proceedings with a subsequent communication containing its provisional opinion. The Board opined *inter alia* that the subject-matter of granted claim 1, corresponding to the appellant-proprietor's main request, lacked novelty and did not involve an inventive step, whereas the subject-matter of the amended claim considered allowable by the opposition division (corresponding to an auxiliary request VI submitted with its statement of the grounds of appeal) did not meet the requirements of Articles 84, 123(2) and 56 EPC.
- III. Oral proceedings before the Board were held on 21 May 2019 in the absence of appellant-opponent 2, as announced in its letter of 16 April 2019. During the oral proceedings the appellant-proprietor withdrew auxiliary requests I-V and VII filed with its statement of grounds of appeal, and submitted auxiliary request VIII.
- IV. The appellant (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained as granted (main request), auxiliarily that the patent be maintained in amended form on the basis of auxiliary request VI filed with the statement of grounds of appeal or on the basis of auxiliary request VIII filed during the oral proceedings of 21 May 2019.

V. Appellant-opponent 2 requested in writing that the decision under appeal be set aside and the patent be revoked.

VI. Respondent-opponent 1 requested that the appeal of the appellant-proprietor be dismissed.

VII. The evidence relied upon by the parties and relevant for the present decision is the following:

D1: WO-A-2008/055935,

D31: WO-A-2005/011860,

D40: Flow properties of Powders and Bulk Solids, D. Schulze.

VIII. Claim 1 of the patent as granted (main request) has the following wording:

"A process for metering superabsorbents wherein the superabsorbent is metered using a screw conveyor and selected, or treated with a cohesion control agent, to have an unconfined yield strength of from 0.75 to 1.5 kPa, measured according to ASTM Standard D 6773-02 (Book of Standards 04.09) at consolidation stress of 6 kPa."

IX. Claims 1 and 4 of auxiliary request VI (i.e. the amended form of the patent which the opposition division found to be allowable) read:

"1. A process for metering superabsorbents wherein the unconfined yield strength of the superabsorbent is measured and if it has an unconfined yield strength of from 0.75 to 1.5 kPa, measured according to ASTM Standard D 6773-02 (Book of Standards 04.09) at consolidation stress of 6 kPa, the superabsorbent is

metered using a screw conveyor."

"4. The process of any of claims 1 to 3, wherein the superabsorbent is treated with a cohesion control agent which is a non-aqueous liquid having a viscosity of at least 20 mPas and not more than 1 000 mPas at 20 °C."

- X. Compared to auxiliary request VI, in auxiliary request VIII claim 1 remains unchanged whereas claim 4 and its dependent claims have been deleted.

- XI. The arguments of the appellant-proprietor may be summarised as follows:

Main request

D1 did not disclose a metering process within the meaning of paragraph 25 of the patent. D1 only disclosed a conveying process for the purpose of testing the flow behaviour of different superabsorbents but did not disclose the required range of the unconfined yield strength at the specific consolidation stress defined for the superabsorbent to be metered by the process of claim 1. From the similarity of the substances and the processes leading to the examples of a superabsorbent in D1 nothing could be concluded as regards its unconfined yield strength at the required consolidation stress. Moreover, the expression of claim 1 "selected, or treated with a cohesion control agent, to have an unconfined yield strength..." implied that a selection of the superabsorbent and a treatment of the superabsorbent with a cohesion control agent had to be carried out intentionally or, in other words, on purpose. This involved an active step of determining that the criteria for the unconfined yield strength were met at the time of metering and, in case they were

not met, the treatment of the superabsorbent to attain the required value in order to ensure the required flow properties of the superabsorbent for its consecutive metering by a screw conveyor. This constituted the gist of the invention underlying claim 1, which lay in the recognition that despite the known dependency of the flow properties of superabsorbents on many parameters, a metering process could be precisely performed with superabsorbents which were "selected, or treated with a cohesion control agent, to have an unconfined yield strength" in the claimed range at the specified consolidation stress, wherever the process was carried out.

Auxiliary request VI

The amendment in claim 4 merely clarified that the superabsorbent in claim 1 was one which had been treated with a cohesion control agent. The term "or" in the wording of granted claim 1 "selected, or treated with..., to have..." had to be read as an inclusive or, therefore allowing the skilled person to derive unambiguously the combination of the selection step according to amended claim 1 and the treated condition of the superabsorbent of amended claim 4 as a product feature. The skilled person would in any case not understand claim 4 as implying a successive treatment step after its metering.

Auxiliary request VIII

Claim 1 was distinguished over D31 by the steps of measuring the unconfined yield strength of the superabsorbent before metering, by the specific range for the unconfined yield strength at the specific consolidation stress and by the use of a screw

conveyor. These features allowed for a superior metering of superabsorbent, as stated for example in paragraph 25 of the patent. The choice of the unconfined yield strength had been found to be the determining parameter to attain this object independent of possible variations in the operating conditions. The specified value of the consolidation stress reflected in particular the stress undergone by the superabsorbents when metered by a screw conveyor, as also highlighted by the specific embodiments in the patent. D40 made it clear that no conclusion on the unconfined yield strength at a specific consolidation stress could be drawn from the single flowability parameter disclosed in D31.

XII. The arguments of the appellant-opponent 2 and respondent-opponent 1 may be summarised as follows:

Main request

Claim 1 was not limited to a metering process as mentioned in paragraph 25 of the patent, rather the term "metering" had to be given a broader meaning as also justified by paragraph 24. The mass flow test described on page 24 of D1, using a screw conveyor, disclosed a metering process within this broader meaning. The claimed process was also not limited to a purposeful treatment of the superabsorbent; a superabsorbent which had been treated by an appropriate cohesion control agent and which as a result presented an unconfined yield strength within the claimed range was a superabsorbent "treated... to have...", independent of whether this was done on purpose or not. The superabsorbent referred to in the 3rd row of Tables 1 and 2 in Example 2 of D1 was identical in terms of its composition, its production process and in view of

its reported flow properties to the superabsorbent polymer B of the patent in suit. Consequently unconfined yield strength at the specified consolidation stress also had to be identical.

Auxiliary request VI

Granted claim 1 defined, by use of the conjunction "or", alternative options for the superabsorbent's unconfined yield strength to be met which were changed in amended claim 4 to cover cumulative conditions, resulting for example in a process comprising the steps of selecting a superabsorbent which had the specified unconfined yield strength in its "as is" state and which was then additionally treated with a cohesion agent, contrary to the content of the application as filed. Moreover, the expression "is treated" was anyway ambiguous since it could be read either as a product feature or as a process feature.

Auxiliary request VIII

D31 represented the closest prior art to the subject-matter of claim 1, disclosing a process of metering superabsorbents which presented a flowability corresponding to the flowability range derivable from the values specified in claim 1 (see for example page 5, lines 17-21 and page 50, lines 1-8, pages 6, 7 and 50 or Tables 1 and 2; see also D40). D31 implicitly also disclosed a metering process including the measurement of the superabsorbent's flowability parameter according to the protocol set out on page 53. In the absence of any recognisable technical effect arising from the differences between the claimed process and that of D31, an objective problem could therefore only be seen in providing an alternative

metering process with reliable operating parameters also ensuring good flow properties of superabsorbents with an appropriate (or different) conveying means. Screw conveyors were well known for transporting and metering superabsorbents, as recognised already in the patent and the patent publications cited therein. D40 disclosed that the unconfined yield strength at the given consolidation stress defined in claim 1 was linked by a simple proportional relationship to the flowability indicated in D31. Since the specific consolidation stress defined in claim 1 could only be considered arbitrary, it followed that the range of the unconfined yield strength was obvious for the skilled person.

Reasons for the Decision

Main request

1. D1 constitutes prior art according to Article 54(3) EPC for the subject-matter of claim 1 of the patent in suit. This was also not contested by the appellant-proprietor.
2. The reasoning given in the impugned decision for the opposition division's conclusion that the subject-matter of granted claim 1 lacked novelty in view of D1 can be followed by the Board.
3. The counter arguments of the appellant-proprietor do not convince the Board that there is any reason to overturn the conclusions in that part of the impugned

decision, as explained below.

3.1 First, the appellant-proprietor's arguments for contesting the disclosure of a metering process in D1 are not convincing. They are essentially based on a narrow interpretation of the wording of claim 1 in view of selected passages in paragraphs 24 and 25 of the description of the patent in suit. Such interpretation is however not reflected by any corresponding feature in claim 1. A particular accuracy in metering or a steady uninterrupted flow, alleged by the proprietor as being part of the invention, are not required by the features claimed. The broader interpretation of the term "metering" in claim 1, also based on paragraph 24, as adopted by the opposition division and the opponents, is indeed not excluded by the wording of claim 1. Moreover, and as pointed out by appellant-opponent 2, the summary presented in paragraph 117 of the patent which is based on the tests carried out on the examples of superabsorbent metered by the same process as carried out in D1, underlines that no difference between these two "metering" processes exists.

3.2 Further, the appellant-proprietor contested the conclusion by the opposition division that the polymer identified in D1 was identical to polymer B of the patent in suit since it necessarily had the same flow properties and thus presented an identical unconfined yield strength at the specified consolidation stress.

Although it qualified these two superabsorbents of D1 and the patent in suit only as "similar" in view of their composition, preparation and resulting flow properties, the appellant-proprietor did not indicate any actual difference between them, nor did it provide

any evidence which could have cast doubt that under the described circumstances the unconfined yield strengths at the defined consolidation stress of the two superabsorbents had to be the same.

The Board accepts that the flow properties of superabsorbent powders depend on a large number of parameters and operating conditions. However, it is not apparent from the information available from the patent and from D1, in particular when comparing the description of the superabsorbent preparation and the test procedures in both documents (for the measurement methods D1, see page 20, line 31 to page 21, line 13, page 24, lines 1 to 10, and in the patent in suit, paragraphs 103-106, 108; for the preparation of the superabsorbent in D1, page 24, line 14 to page 25, line 20, and in the patent, paragraphs 109 to 112), that any difference between such parameters indeed exists between the relevant two polymers of D1 and of the patent in suit, which difference (if present) might have pointed to different values for the unconfined yield strength at the given consolidation stress but with nevertheless otherwise identical numerical values of the tested absorption and flow properties (cf. the values for CRC, AUL, FSGBP, flow rate and mass flow at 300 and 600 rpm in Tables 1 and 2 of D1 for the composition with 2000 wt.-ppm "PEG400" with those of polymer B of the patent in suit in Table 1).

Consequently, a superabsorbent with an unconfined yield strength at the specified consolidation stress falling within the claimed range is considered to be implicitly directly and unambiguously disclosed in D1.

Although not in itself decisive, it may also be noted at this juncture that since the information in D1 and

in the patent in regard to the preparation and testing of these two polymers is also identical (and identical wording is indeed used to a large extent in the passages cited above), any different conclusion on this matter would have seemingly led to the question whether the information on how to achieve the claimed unconfined yield strength and other properties was complete, thus challenging the requirement of sufficiency of disclosure (which had also been raised as an opposition ground but which ultimately did not require a decision by the Board).

- 3.3 Finally, the appellant-proprietor's further argument, according to which there was no disclosure of a selection, or treatment with a cohesion control agent, of a superabsorbent "with the purpose" of having the claimed flow property, also fails. Claim 1 simply defines two alternative conditions for the superabsorbent to have the specified flow property. At least the alternative defined by the wording of claim 1 "or treated with a cohesion control agent to have...", does not imply any technical limitation by any intended purpose of the claimed metering process. Any superabsorbent which has been treated, for whatever purpose, with a cohesion control agent, and as a result thereof presents an unconfined yield strength at the specified consolidation stress within the claimed range, is considered to fall under the wording "or treated with ... to have..." in claim 1. As already explained in point 3.2 above, the superabsorbent polymer A of D1 has been treated with a cohesion control agent (2000 wt.pppm "PEG400") and as a result of this treatment has (i.e. it was treated to have) an unconfined yield strength within the claimed range.

4. The Board thus sees no reason to deviate from the conclusion reached by the opposition division. The subject-matter of granted claim 1 is thus considered to lack novelty within the meaning of Article 54(1) and (3) EPC, so that the ground of opposition under Article 100(a) EPC is prejudicial to maintenance of the patent as granted.

Auxiliary request VI

5. The subject-matter resulting from the amendment of claim 4 does not meet the requirements of at least Articles 123(2) and 84 EPC.
 - 5.1 Granted claim 1 defines two alternative conditions for the superabsorbent to be metered in order for it to have the required flow property, either by the selection of a particular superabsorbent known (or determined) to have the desired property in its "as is" state or, in case it does not have this property, to treat the superabsorbent with a cohesion control agent so as to obtain appropriate flow properties (see also page 20, lines 27-40 of the application as filed underlying the patent in suit).

The process according to amended claim 4, however, defines a treatment step which may be an additional step to the process steps defined by amended claim 1, i.e. additionally to a preceding measurement of the unconfined yield strength and, in case the measured value for the superabsorbent in its "as is" state falls within the claimed range, its consecutive metering. This means that the metered superabsorbent, known (because it is measured) to have the required flow property in its "as is" state, is additionally treated with the cohesion control agent. This additional

treatment may be at any moment before, during or after the metering, for whatever purpose; the claim provides no restriction on this.

The appellant-proprietor did not indicate any basis for such a combination of process steps in the description of the application as filed. Nor could the Board find any such disclosure.

The appellant-proprietor argued instead that the term "or" in original (and granted) claim 1 was understood by the skilled person as an inclusive or. However, such an interpretation is at least not unambiguously derivable from the wording of original (and granted) claim 1 and is moreover in clear contrast to the passage of page 20 referred to above, as also pointed out by appellant-opponent 2 in its appeal grounds, pages 5 and 6.

The Board concludes that the subject-matter of amended claim 4 extends beyond the content of the application as filed and therefore contravenes Article 123(2) EPC.

- 5.2 The alternative argument of the appellant-proprietor, reading the expression in amended claim 4 "is treated with..." as specifying a product feature, rather than defining an additional process step, is also not accepted. Claims 1 and 4 are directed to a process, whereby the straightforward reading of the expression "is treated" would normally be understood to relate to a process step. Accepting nevertheless for the sake of argument the appellant-proprietor's reading of the terminology as a technically meaningful interpretation, the wording of claim 4 would anyway be ambiguous because it does not clearly exclude its interpretation as a process step. The Board finds, contrary to the

argument of the appellant-proprietor, that such interpretation as a process step is indeed also technically meaningful. The claim is not limited to a process resulting necessarily in a final product, so that such additional treatment might for example be necessitated by succeeding processing steps. The resulting ambiguity is contrary to the requirement of clarity according to Article 84 EPC.

6. It follows that the patent cannot be maintained on the basis of auxiliary request VI at least for the above reasons.

Auxiliary request VIII

7. The subject-matter of amended claim 1 of auxiliary request VIII lacks an inventive step and thus contravenes Article 56 EPC.
 - 7.1 The parties agreed that D31 discloses a metering process for superabsorbents (see for example the first paragraph on page 50). Irrespective of the fact that D31 deals *inter alia* with the avoidance of dust when conveying superabsorbents, it nevertheless also addresses flowability properties of the superabsorbents, as is apparent for example from page 4, 3rd paragraph. It can thus be considered to represent the closest prior art for the subject-matter of claim 1 when considering inventive step.
 - 7.2 The Board finds that the following features of the claimed process are not directly and unambiguously derivable from D31:
 - (a) the step of measuring the unconfined yield strength prior to metering,

- (b) metering a superabsorbent having an unconfined yield strength in the claimed range at a consolidation stress of 6 kPa,
- (c) using a screw conveyor for metering.

7.3 However, the Board cannot accept that these features taken either individually or in combination provide any particular technical effect compared to the effects achieved by the process of D31.

7.3.1 The first distinguishing feature (a) has as an effect that the operator of the process can determine whether a superabsorbent has appropriate properties. Also for the metering process according to D31 the operator has to ensure in some way that the material intended to be metered has the required properties, so that this step of measuring could be seen at most as contributing to carrying out the intended metering process reliably.

7.3.2 Concerning the second distinguishing feature (b), it is to be noted that according to the known proportional relationship that exists between the unconfined yield strength, the consolidation stress and the dimensionless parameter "flowability" (FFC) disclosed in D31, the flow properties in terms of flowability of the superabsorbents to be metered by the claimed process are the same as or very similar to those considered as preferable in D31: calculating the flowability FFC, being equal to the consolidation stress divided by the unconfined yield strength, for the values defined by claim 1 results in a range of 4...8, which corresponds precisely to the preferred range disclosed in D31 (see top of page 7 and pages 48, 49, 52; see also paragraph 38 of the patent in suit).

The dimensionless parameter flowability however cannot

be measured directly, rather measurement of the unconfined yield strength at a specified consolidation stress is required, see D40, section 4.4. As further explained in D40, from the value of only the flowability FFC the unconfined yield strength cannot be unambiguously derived, since flowability functions are not necessarily linearly dependent on the consolidation stress (see for example page 8, last paragraph). The indication of the consolidation stress is necessary. This value is however not disclosed in D31.

Any particular effect related to determining the unconfined yield strength at the specific consolidation stress of 6 kPa is not derivable from the patent in suit, as already pointed out by the Board in its preliminary opinion sent before the oral proceedings. Since the flowability range derivable from the claimed values for the superabsorbent in the patent corresponds to the preferred range disclosed in D31, it can only be concluded that the flow properties of the claimed superabsorbents and those of D31 required for the respective metering processes are the same or at least very similar.

For the allegation made by the appellant-proprietor (during the oral proceedings before the Board) that the specified value of 6 kPa was particularly relevant for the metering of superabsorbents by screw conveyors, no statement of any such significance can be found in the patent in suit, nor did the appellant-proprietor submit any evidence supporting this. As pointed out also by respondent-opponent 1, the tests reported in the patent in suit do not comprise comparative data in view of variations of the consolidation stress either in terms of different conveying equipment, let alone any data

covering the generality of the superabsorbents claimed.

- 7.3.3 The use of a screw conveyor, instead of the pneumatic conveyance system disclosed in D31, is not disclosed in the patent as providing any particular, unexpected technical effect in view of its use for metering superabsorbents with the claimed flow properties either. Screw conveyors used for metering superabsorbents are disclosed in the patent in suit merely as well known metering devices for conveying superabsorbents (see for example paragraphs 8 to 16, 27, 36).
- 7.3.4 Contrary to the appellant-proprietor's argument, the Board also does not accept that the combination of the above identified distinguishing features provides for, or contributes to, any synergistic technical effect. The general statement in paragraph 25 is not sufficient to support this assertion, at least for the reason that it does not even mention the specified consolidation stress. The Board is also not convinced that selecting superabsorbents on the basis of the unconfined yield strength at the specified consolidation stress provides improved metering results independent of the prevailing operation conditions, when compared to a process known from D31 which does not use the claimed pair of parameters but rather their ratio. As already mentioned before, a technical relationship between the unconfined yield strength at the specific consolidation stress of 6 kPa and (general) screw conveyors is nowhere substantiated in the patent. The example data in the patent has notably been produced by use of a rather specific conveying screw (see paragraph 108 of the patent) and a particular significance of the chosen consolidation stress in this regard is not apparent. No comparative data for other screws, let alone other

conveying means or other superabsorbents is available.

- 7.4 Starting from a process known from page 50 of D31 as the closest prior art, a technical problem may therefore be seen in providing an alternative metering process with appropriate conveying means and appropriate superabsorbents.
- 7.5 Although D31 does not specifically suggest measuring the flowability of a superabsorbent before metering it, it does suggest consistently that superabsorbents to be conveyed should preferably present a flowability FFC within certain specified ranges (see for example top of page 7). A skilled person wishing to implement a metering process according to D31 would therefore in any case have to select a material having the required flow properties. There are two well known options governing this preparatory step: either the operator knows the flow properties of the superabsorbent (because it was certified by the producer), or the skilled person is not aware or possibly not sure about this, prompting them at least in the latter case to measure the required flow property before starting the metering process. That the operator would only start metering if the value is in the required range, is obvious for the skilled person. Therefore, no inventive step can be seen in performing the step of measuring prior to metering. As already foreshadowed above, this step can also not be seen as providing, in combination with the other distinguishing features, any surprising technical effect, since such preceding action (i.e. checking the product being used) would obviously always, at least in case of doubt, be considered by an operator as something to be performed before carrying out a successive operation, independent of the specific

parameter governing the ensuing process.

7.6 As regards screw conveyors, these are described in the patent specification with reference to several published patent applications as being generally known for accurately metering superabsorbents (see paragraphs 8 to 20), as also mentioned by appellant-opponent 2 on page 15 of its appeal grounds. This was also not disputed by the appellant-proprietor. In the absence of any particular technical effect achieved by the use of a well known screw conveyor for metering, and given the fact that the appellant-proprietor did not provide any evidence of any such effect, the Board finds that the use of such a well known conveying means used for its well known purpose and effects would also be obvious for the skilled person.

7.7 As mentioned above, the selection of superabsorbents having an appropriate flowability is already known from D31, while D40 explains that the dimensionless parameter flowability cannot be measured directly but is rather determined by measurement of the unconfined yield strength and depends on the consolidation stress. A consolidation stress has therefore in any case to be selected for measuring the unconfined yield strength in order to determine finally the flowability according to D31. The specific value selected for the consolidation stress according to claim is devoid of any particular significance in view of the claimed metering process in its generality (i.e. using any undefined screw conveyor with superabsorbents in general) and can therefore only be considered to represent an arbitrary choice. An arbitrary choice does not involve an inventive step.

7.8 Since the distinguishing features also do not contribute to any recognisable synergistic technical

effect but rather all provide for the technical effects a skilled person would expect, the subject-matter defined by the combination of features of claim 1 does not involve an inventive step, contrary to Article 56 EPC.

8. In the absence of any set of claims complying with the requirements of the EPC, the patent has to be revoked (Article 101(3)(b) EPC).

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:



M. H. A. Patin

M. Harrison

Decision electronically authenticated