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**Datasheet for the decision
of 20 September 2022**

Case Number: T 2036/18 - 3.3.10

Application Number: 11790996.0

Publication Number: 2678097

IPC: C07C273/02, C05G3/00, C05C9/00

Language of the proceedings: EN

Title of invention:
FLUID BED GRANULATION OF UREA AND RELATED APPARATUS

Patent Proprietor:
CASALE SA

Opponent:
Stamicarbon B.V.

Headword:

Relevant legal provisions:
EPC Art. 100 (a), 100 (b), 100 (c)

Keyword:
Grounds for opposition do not preclude the maintenance of the patent as granted

Decisions cited:

Catchword:



Beschwerdekammern

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Chambres de recours

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Case Number: T 2036/18 - 3.3.10

D E C I S I O N
of Technical Board of Appeal 3.3.10
of 20 September 2022

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 15 June 2018
rejecting the opposition filed against European
patent No. 2678097 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chair P. Gryczka
Members: R. Pérez Carlón
F. Blumer

Summary of Facts and Submissions

I. The appeal lies from the opposition division's decision rejecting the opposition against European patent No. 2 678 097.

II. Notice of opposition had been filed on the grounds of added subject-matter (Article 100(c) EPC), insufficiency of disclosure (Article 100(b) EPC), and lack of novelty and inventive step (Article 100(a) EPC).

III. The documents filed during the opposition proceedings include the following:

D1 WO 2005/092486

D3 US 4,857,098

IV. The patent as granted, which is the main request of the respondent (patent proprietor), contains two independent claims. Claim 7 is directed to an apparatus; claim 1 relates to a process in the apparatus of claim 7. These claims read as follows:

"7. An apparatus for fluidized-bed granulation of a urea solution (2), comprising:

- *a granulator (1) having a main longitudinal direction from a feed end (1_S) where granulation is started to a product discharge end (1_E) where urea granular product (5) is discharged by the granulator,*
- *a feeding means of the urea solution, comprising at least a main feed line (2) and several urea input*

lines (2_A, 2_B, 2_C) taken from said main feed line, and distributed along said longitudinal direction, from a first urea input which is the closest to said feed end, to a last urea input which is the closest to said product discharge end,

- *the apparatus further comprising feeding means of an additive (6),*

characterised in that said feeding means of said additive are arranged to provide a non uniform concentration of the additive in the urea input lines, and

in that the additive feeding means comprise additive lines (6A-6C) for mixing the additive directly with respective urea input lines (2A-2C) taken from the main urea feed and directed to respective spraying means of the granulator.

1. A process for preparation of a granular urea product in the apparatus of claim 7 by granulating a urea solution in a fluidized bed, where the granulation process takes place along a substantially longitudinal growth path, from a granulation starting end (1_S) to a product discharge end (1_E) of said fluidized bed, and said urea solution enters the fluidized bed by means of several ureal input lines (2_A, 2_B, 2_C) taken from a main urea feed (2), the urea inputs being distributed along said longitudinal path, from a first urea input which is the closest to said granulation starting end, to a last urea input which is the closest to said product discharge end, and where an additive (6) is mixed with said urea solution, wherein the concentration of said additive in said urea inputs is non-uniform, so that at least two of said urea inputs have a different concentration of said additive, the process being characterized in that the additive is

divided into a plurality of additive streams (6_A-6_C), and each additive stream is mixed directly with a respective urea input line (2_A-2_C)."

V. The opposition division came to the following conclusions.

A flow was inevitably carried by a line. Therefore, the replacement of the feature "flow" by "line" did not provide any new technical information. Claims 1 and 7 thus found the required basis. Claim 4 found a basis on page 4, lines 18 to 27 and page 10, line 25 to page 11, line 7 of the application as originally filed.

The claimed invention was sufficiently disclosed for it to be carried out by a skilled person. A non-uniform concentration of additive could simply be achieved by controlling the concentration in different input lines.

D1 disclosed a process and apparatus with one additive line fed to the urea input. Claims 1 and 7 of the patent required a plurality of additive streams/lines to be mixed with a respective urea input line, and their subject-matter was thus novel.

D1 was the closest prior art. The problem underlying the claimed invention was to provide a process and apparatus which allowed different stages of granulation to be carried out with different and specific concentrations of the additive (page 9, sixth paragraph of the contested decision). The claimed solution was characterised by including a plurality of additive streams/lines to be mixed with respective urea inputs. The prior art did not prompt towards the claimed solution, which was thus inventive.

VI. The arguments of the appellant (opponent) were as follows.

The application as originally filed provided no basis for the feature "input lines" in claims 1 and 7. Neither did it provide a basis for claim 4. The claims as granted thus contained added subject-matter.

The feature "additive lines" in claims 1 and 7 could be read as requiring a single line. In addition, the point of addition D in Figure 1 of D1 could be considered to embrace a plurality of lines. Lastly, Figure 4 of the patent, an embodiment of the claimed invention, was equivalent to Figure 1 of D1. For these reasons, document D1 disclosed all the features of claims 1 and 7.

If claims 1 and 7 were to be novel over D1, it would be by virtue of requiring at least a second additive line to be mixed with a urea line. The problem underlying the claimed invention was to provide an apparatus capable of producing urea granules with alternative distributions of the additive. The claimed solution, characterised by the presence of a second additive line, would have been obvious to a skilled person and was thus not inventive.

VII. The respondent's arguments were as follows.

The skilled reader understood that any urea flow which entered the granulator must be carried by a corresponding line. The term used was a linguistic choice which conveyed no new, undisclosed information. Claim 8 as originally filed taught the skilled reader its combination with the features of claim 7. Claim 4 thus also found the required basis.

The non-uniform concentration feature in claims 1 and 7 required a different additive concentration between different lines. The skilled person would have found no difficulty in finding means to achieve this. The claimed invention was thus sufficiently disclosed.

Claim 7 required additive lines, in plural. D1 only disclosed embodiments having a single additive line. Claim 7 was thus novel. The same argument applied to claim 1.

Document D1 was the closest prior art. It did not disclose additive lines in plural; only one line. The problem underlying the claimed invention was to improve the control of the granulation process. The state of the art did not hint at the claimed solution, characterised by requiring additive lines for mixing the additive directly with respective urea input lines. The claimed apparatus and process were thus inventive.

VIII. The oral proceedings, which both parties requested be held by videoconference, took place on 20 September 2022.

IX. The final requests of the parties were as follows.

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

The respondent requested that the appeal be dismissed or that the patent be maintained with the claims of one of the first to eighth auxiliary requests, filed with a letter dated 16 February 2018.

- X. At the end of the oral proceedings, the decision was announced.

Reasons for the Decision

1. The appeal is admissible.
2. Amendments

The appellant argued that claims 1, 4 and 7 of the patent as granted contained added subject-matter.

2.1 Claim 7

Claim 7 relates to an apparatus for fluidised-bed granulation of urea. It comprises a main urea feed and several urea input lines taken from the main line. It also comprises a feeding means of an additive, arranged to provide a non-uniform concentration in the urea input lines.

It was not disputed that claim 7 of the patent as granted resulted from the combination of claims 11 and 13 as originally filed and the change of "urea input flows" to "urea input lines" in line 41.

The appellant argued that "line" related to piping or tubing, whereas "flow" referred to a fluid substance. No basis for the former could be found in the application as originally filed.

The board considers, however, that page 7, line 4 of the application provides this basis. In this passage, which discloses the apparatus according to the claimed invention, reference is made to "a main urea feed and urea input flow lines corresponding to the above urea

inputs". This passage thus discloses "lines" as the means for introducing the urea "flows" into the granulator.

2.2 Claim 1

Claim 1 results from the combination of claims 1 and 5 as filed and amends "flows" to "lines". The arguments and conclusion are the same as set out above for claim 7.

2.3 Claim 4

Granted claim 4 depends on claim 3.

The appellant argued that claim 8 as filed depended on claim 6, which corresponds to claim 2 instead of claim 3. The change of dependency added undisclosed subject matter.

Claim 4 of the patent, which includes the features of claim 3, restricts those of claim 2 by requiring:

- at least two additives
- each additive having a dedicated flow line

The part of claim 4 requiring the additives to be mixed with urea solution is a feature of claim 5 as originally filed and thus of claim 1 as granted. The last part of claim 4, requiring the additive to be mixed "with the same or different urea input or urea inputs", does not add any limitation.

Both limitations listed above can be found in claim 7 of the application as filed, which requires more than one additive (i.e. at least two), each of them having a

dedicated flow line. Thus, claim 7 provides the required basis for the features of claim 4 as granted.

2.4 The board is thus of the view that the ground for opposition of Article 100(c) EPC does not preclude the maintenance of the patent as granted.

3. Sufficiency of disclosure

3.1 The appellant argued that if the proprietor were to rely, as a distinguishing feature over D1, on the first characterising feature of claim 7, requiring a non-uniform concentration of the additive in the urea input lines, the claimed invention could not be considered sufficiently disclosed.

3.2 However, the respondent did not rely on this feature as a distinction over D1, and neither does the board in this decision. Under these circumstances, there is no need for the board to elaborate on this point.

4. Novelty

4.1 It was agreed between the parties that the novelty of the apparatus of claim 7 hinged on whether D1 disclosed additive lines for mixing the additive directly with respective urea input lines since D1 disclosed all other features of claim 7.

4.2 Document D1 discloses an apparatus for urea granulation (Figure 1). Line D of Figure 1 discloses the additive's point of mixing with urea, before the last sprayer (S).

4.3 The appellant firstly argued that claim 7 did not require a plurality of lines. Line D of Figure 1 of D1

thus disclosed the alleged distinguishing feature.

However, claim 7 distinguishes between the "main feed line" and the "urea input lines" which arise from it. Claim 1 not only requires additive lines (plural) but also that they allow mixing with respective urea input lines (plural).

- 4.4 In a different line of argument, the appellant considered that D1 disclosed a plurality of additive lines. Example 1 of D1 disclosed adding a formaldehyde solution to urea. Formaldehyde was added in part to the urea melt directly after the urea plant's evaporators and, in part, to the urea melt by line D according to Figure 1. This was an embodiment of claim 7 of the patent.

However, claim 7 not only requires a plurality of lines but also that they allow mixing the additive directly with respective "urea input lines", which do not include the "main feed line", let alone any location prior to that point, as in example 1 of D1.

- 4.5 The appellant also argued that Figure 4 of the patent, which was indistinguishable from the figure in D1, was in line with the claimed invention according to paragraph [0039] of the patent specification. Also for this reason the claimed apparatus was not novel.

However, claim 7 requires additive lines for mixing additive with respective input lines. The apparatus of Figure 4 of the patent is thus not according to claim 7 as it requires the full amount of additive to be mixed with the last urea input (2c), as disclosed in paragraph [0039] of the patent.

4.6 Lastly, on the basis of the argument presented by the respondent (response to the grounds of appeal, page 12, lines 25 to 28) that Figure 1 of D1 was a simplified representation of the apparatus, the actual number of sprayers being in reality greater than depicted, the appellant argued that, by the same token, the line labelled D must correspond to a plurality of lines.

However, even if the last section of Figure 1 of D1 were to be regarded as depicting a plurality of sprayers and a plurality of lines D for feeding additive D1, D1 is silent on how additive lines and urea input lines are to be connected.

4.7 The board thus concludes that the apparatus of claim 7 is novel. By the same token, the process of claim 1, carried out in the apparatus of claim 7, is novel too.

5. Inventive step

5.1 Closest prior art

The opposition division and the parties considered that document D1 was the closest prior art. The board sees no reason to differ.

It has not been disputed that if the claimed apparatus were to be novel over document D1, it would be by virtue of requiring additive lines for mixing the additive directly with respective input lines.

5.2 Technical problem underlying the invention

The parties had different views as to the formulation of the technical problem underlying the invention.

The appellant defined it as solely to provide an alternative apparatus for the preparation of urea granules with alternative distributions of the additive whereas the respondent relied on improvements.

In the following, whether the subject-matter of claim 7 is inventive is examined under the assumption that the technical problem underlying the claimed invention is that defined by the appellant. Since the solution to this problem is not obvious, it is not necessary to examine whether a more ambitious problem is also solved.

5.3 Solution

The solution to this technical problem is the apparatus having a granulator, a feeding means of urea solution comprising a main feed line and several urea input lines, and a feeding means of an additive arranged to provide a non-uniform concentration of the additive in the urea input lines of claim 7, characterised in that it has additive lines for mixing the additive directly with respective urea input lines.

5.4 Success

It is not disputed that the apparatus of claim 7 solves the problem of providing an alternative apparatus for the preparation of urea granules with alternative distributions of the additive.

5.5 It thus remains to be decided whether the proposed solution to the objective problem defined above would have been obvious for the skilled person in view of the prior art.

5.5.1 Example 1 of D1, with reference to Figure 1, discloses a process and apparatus in which formaldehyde is mixed with urea melt directly after the evaporators in the urea plant and partially added to the urea melt at place D, which is immediately before the last sprayer or group of sprayers.

On page 2, lines 23-25, D1 discloses that a portion of the granulation additive may be supplied "in a preceding section of the granulator by for example mixing a portion of the granulation additive with the urea melt before it is added to the granulator".

Document D1 relates to the production of urea granules with the highest relative amount of additive at the outer layer (page 3, lines 19-21).

5.5.2 The appellant argued that the skilled person seeking to produce granules with alternative distributions of the additive would have followed the teaching on page 2 of D1 that the additive may be supplied to a preceding section of the granulator. By doing so, they would have arrived at the claimed invention without requiring inventive skills. Lastly, as a mere alternative, the claimed apparatus would have been the result of routine engineering.

5.5.3 However, with the apparatus disclosed in D1, only two types of granules can be obtained via the additive distribution:

- a first type of granules having no additive in the core and additive on the surface, as the result of the process on page 3, lines 28-35
- a second type of granules which contain additive in the core and 2.5 times that additive's

concentration on the surface, as the result of the process of example 1

In contrast, the granules obtainable by the claimed apparatus can also have more additive in the core and less or no additive on the surface. The structure of these granules are not envisaged by D1.

Following the teaching of D1 and seeking to produce alternative distributions of the additive, the skilled person had no reason to depart from the structure of the granules to be obtained. They would thus not arrive at the claimed apparatus.

- 5.5.4 The appellant saw on page 2, lines 22-24 of D1 a prompt towards the claimed solution. This passage discloses that a portion of the additive may be supplied "in a preceding section of the granulator". Addition should thus be carried out "in the granulator", and the mode in claim 1 was an obvious option.

However, the appellant's interpretation of this passage is not convincing. The sentence next to it discloses, as an example, mixing a portion of the additive with the melt before it is added to the granulator. D1 is thus not limited to mixing additive and urea "in the granulator".

- 5.5.5 The appellant argued that to modify the distribution of additive, the skilled person could add further additive either to the "main feed line" or the "urea input lines", in the wording of claim 7. This was an arbitrary choice.

However, the skilled person would only include a line for mixing additive to the "urea input lines" with the

structure of the granules sought in mind. The structure of the granules obtained by the claimed apparatus are, however, not envisaged in D1. This argument is thus not convincing.

5.5.6 The appellant relied also on D3 as a pointer towards the claimed invention.

D3 relates to an apparatus containing a rotating drum. It discloses granules having a fertiliser coating and an outer sulfur coating. The coatings are made by spraying fertiliser and sulfur in molten form onto urea cores, either separately or together (column 2, lines 45-47). D3 does not relate to a granulator of the type required by claim 7, nor does it disclose mixing urea and an additive. D3 thus does not point towards the claimed solution.

5.5.7 The board thus concludes that the apparatus of claim 7 is inventive (Article 56 EPC).

5.5.8 It was undisputed that if claim 7 were to be considered inventive, the same conclusion applied to claim 1, which is directed to a process in the apparatus of claim 7. The conclusion also applies to the claims dependent on claim 1. The claimed subject-matter is thus inventive.

5.6 The ground for opposition of lack of inventive step under Article 100(a) EPC does not preclude the maintenance of the patent as granted.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar:

The Chair:



C. Rodríguez Rodríguez

P. Gryczka

Decision electronically authenticated