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Datasheet for the decision of 18 June 2013

Case Number: T 1308/10 - 3.2.05

Application Number: 01932667.7

Publication Number: 1276596

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Language of the proceedings: EN

Title of invention:
Enhancing production of resin within specifications

Patent Proprietor:
Union Carbide Chemicals & Plastics Technology Corporation

Opponent:
Total Petrochemicals Research Feluy S.A.
Industrial Property

Relevant legal provisions:
EPC 1973 Art. 54, 56
EPC Art. 123(2)
RPBA Art. 13(1)

Keyword:
Novelty - (yes)
Inventive step - (no)
Amendments - added subject-matter (yes)
Late-filed request - request clearly allowable (no)

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European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 1308/10 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 18 June 2013

Appellant: (Opponent)	Total Petrochemicals Research Feluy S.A. Industrial Property Patents Zone Industrielle C 7181 Seneffe (Feluy) (BE)
Respondent: (Patent Proprietor)	Union Carbide Chemicals & Plastics Technology Corporation 39 Old Ridgebury Road Danbury, Connecticut 06817-0001 (US)
Representative:	Adrian Chetwynd Hayes Boult Wade Tennant Verulam Gardens 70 Gray's Inn Road London WC1X 8BT (GB)
Decision under appeal:	**Decision of the opposition division of the European Patent Office posted on 15 April 2010 rejecting the opposition filed against European patent No. 1276596 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman: M. Poock
Members: S. Bridge
G. Weiss

Summary of Facts and Submissions

I. An appeal was filed on 22 June 2010 against the decision of the opposition division rejecting the opposition filed against European patent No. 1 276 596. The appeal fee was paid simultaneously and the statement setting out the grounds of appeal was received on 25 August 2010.

II. The opposition division held that the grounds for opposition cited in Article 100(a) EPC (lack of novelty, Article 54 EPC 1973, and lack of inventive step, Article 56 EPC 1973) and Article 100(b) EPC (the invention is not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art) did not prejudice the maintenance of the patent as granted.

III. Oral proceedings were held before the board of appeal on 18 June 2013.

IV. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 1 276 596 be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request), or, alternatively, that the decision be set aside and that a patent be maintained on the basis of one of the sets of claims filed 17 May 2013 (auxiliary requests 1 to 4), or on the basis of the set of claims filed 5 January 2011 (now auxiliary request 5), or on the basis of the set of claims filed at the oral proceedings on 18 June 2013 (auxiliary request 6).

V. Claim 1 as granted (main request) reads as follows:

"1. Method of enhancing the production of a first granular resin product having a first set of properties, said first granular resin product (A) being made in a substantially continuously operating reactor (1) during a campaign including the scheduling of a second granular resin product (B) having at least one property of a value different from that of said first granular resin product comprising

(a) optionally passing granular resin product (A) having said first set of properties from said reactor (1) through a conduit (16) or a trim bin (9) to an end point,
(b) collecting granular resing *(sic)* product (A) from said reactor (1) having said first set of properties in a trim forward bin (9),
(c) changing the conditions of said reactor (1) from conditions for manufacturing granular resin product (A) having said first set of properties to new conditions for manufacturing said second granular resin product (B),
(d) passing granular resin product made under said new conditions in said reactor (1) through said conduit (16) to an end point and
(e) blending granular resin product from said trim forward bin (9) into said conduit (16) while performing step (d)."

VI. Step (e) of claim 1 respectively according to auxiliary requests 1 to 4 differs from step (e) of claim 1 according to the main request in that the following text has been added at the end of step (e):

"to form a granular resin product having a first set of properties of said first granular resin product (A)."

VII. Claim 1 according to auxiliary request 5 differs from claim 1 according to the main request in that the following text has been added after step (e):

"wherein the amount of granular product collected in step (b) is controlled as a function of the anticipated production of off-grade granular product between steady state production of said first and second products."

VIII. Claim 1 according to auxiliary request 6 differs from claim 1 according to the previous request in that the following text has been added in step (e):

"to form a granular product resin within the specification for product (A)".

IX. The following documents are referred to in the present decision:

F1: US-A-4,360,044;
F2: US-A-3,216,629;
F3: US-A-4,560,285;
F4: WO-A-99/43716.

X. The arguments of the appellant in the written and oral proceedings can be summarised as follows:

Main request

According to paragraph [0007] of the patent in suit, "*granular*" is used interchangeably with "*particulate*" and thus does not distinguish the subject-matter of claim 1 from that of either documents F1 or F4. Claim 1

makes no statement concerning the properties of the resin produced in step (e). The manufacture of a product with "*significantly different properties*" (document F1, lines 35 to 41) requires an active change in the operating conditions of the continuously operating reactor, so that step (c) of claim 1 is thus implicitly disclosed. The embodiment in column 4, lines 12 to 17 of document F1 involves mixing in a pneumatic conveying system and thus implies the use of a conduit. The subject-matter of claim 1 according to the main request is not new with respect to the disclosures of any one of documents F1 and F4 (see the embodiment shown in figure 14).

Blending is common in the art (see documents F1 to F4). The subject-matter of claim 1 according to the main request lacks an inventive step with respect to the "*special situations*" (column 4, lines 31 to 54) in combination with the general teaching (column 1, lines 5 to 38) of document F1.

Auxiliary requests 1 to 4

Specifications involve ranges within which the property values of the resin must lie. Thus in the example 1, the properties of "*product A*" are a flow index FI of 70 and density of 0.96125 gm/cc while its "*AIM grade specification*" is of 70±4 for FI and 0.963-0.9595 gm/cc for density (paragraph [0030]). Claim 1 only refers to sets of properties and not to specifications.

Auxiliary requests 1 to 4 are late filed, raise new issues of clarity, sufficiency of disclosure and original disclosure (Articles 84 and 83 EPC 1973 and Article 123(2) EPC) and should not be admitted into the proceedings.

Auxiliary request 5

Auxiliary requests 1 to 4 filed 17 May 2013 are understood to have replaced the 'auxiliary request' as filed with the response to the grounds of appeal. Thus, auxiliary request 5 is a newly (re)introduced request whose admissibility has to be examined.

The added feature (controlling an amount "*as a function of anticipated production…*", see granted claim 3) is unclear. Nevertheless, insofar as it can be understood, this additional feature does not go beyond the common knowledge of the skilled person familiar with reducing off-specification losses by post-reaction blending of product (document F4, page 4, lines 9 to 12). The control of amounts is an unavoidable necessity when blending resins, if the blend is to meet a particular specification. Thus, the subject-matter of claim 1 according to auxiliary request 5 is unclear and lacks an inventive step with respect to document F1 in combination with common knowledge.

Auxiliary request 6

The added feature concerning the "*specification for product (A)*" is not defined in the claim. Furthermore, the specification can be arbitrarily broad and therefore does not set any limits or provide any particular technical effect. That a blend has to meet a specification constitutes common knowledge of the skilled person. This modification thus does not prima facie overcome the lack of inventive step objection. This late filed request thus should not be admitted into the proceedings.

XI. The arguments of the respondent in the written and oral proceedings can be summarised as follows:

Main request

The claims must be interpreted with a mind willing to understand. In consequence, it is implicit that the result of step (e) is product (A). Similarly, the first two paragraphs of the description of the patent in suit imply that the claimed process refers to a continuous process. The term "*granular*" also distinguishes the claimed process from the pellets used in the embodiment of document F1 (column 3, lines 30 to 32).

Document F1 concerns mixing heterogeneous batches of product to obtain homogeneous ones and thus does not disclose a method of enhancing a product while scheduling a production campaign. Document F1 does not disclose changing the reactor conditions, i.e. step (c) of claim 1 and, furthermore, does not disclose using a conduit.

Document F4 does not disclose a voluntary change in the operating conditions of the reactor shown in figure 14 or the mixing of granular product.

Thus, the subject-matter of claim 1 is new with respect to each of documents F1 and F4.

Document F1 concerns an apparatus to blend batches of resins to even out periodic variations in the production process. The disclosure concerning "*special situations*" only teaches that the product collected during the transition period which is not suitable for use with either the previously prepared or the subsequently prepared product "*can be separately*

withdrawn from 1, 2, or more bins for sale under special designated specifications" (column 4, lines 31 to 55).

There is no indication that a product according to a particular specification can be obtained as a result of blending an off-grade material produced during the transition period. Furthermore, the process described in document F1 is not continuous.

The subject-matter of claim 1 according to the main request is inventive with respect to the disclosure of document F1.

Auxiliary requests 1 to 4

The claims must be interpreted with a mind willing to understand so that a "*set of properties*" has to be understood as a "*specification*". These two terms concern the same idea and merely express it using different vocabulary. The amendment made to step (e) of claim 1 respectively according to auxiliary requests 1 to 4 is thus clear and originally disclosed. Furthermore, the invention is sufficiently disclosed in the examples for the skilled person to practice the invention.

Auxiliary request 5

The now auxiliary request 5 was originally filed during the opposition proceedings and has never explicitly been withdrawn. It is thus already in the proceedings.

Clarity is not a ground of opposition and the terms used are clear to the skilled person. None of the documents discloses controlling the amount of granular

product collected in step (b) as a function of the anticipated production of off-grade granular product between steady state production of said first and second products. Any argument to the contrary involves hindsight.

Therefore, the subject-matter of claim 1 according to auxiliary request 5 is inventive.

Auxiliary request 6

The distinction between a set of properties and a specification has only become apparent during the oral proceedings so that this request could not have been filed earlier. Furthermore, the amendment made means that subject-matter of claim 1 according to auxiliary request 5 now overcomes the lack of inventive step objection. Therefore, auxiliary request 6 should be admitted into the proceedings.

Reasons for the Decision

1. *The appeal is admissible.*

2. *Novelty - Main request*

2.1 Understanding claim 1

2.1.1 The adjective "*granular*" is derived from "*granules*" and these latter seem to include pellets according to the Oxford English Dictionary definition:

> **granule**, *n*.
> **a**. A small grain; a small compact particle; a pellet. Employed *spec*. in *Zool*. and *Bot*., also in *Astron*. and *Pharmacol*.

It was argued on behalf of the respondent that in the art of polymers "*granules*" and "*pellets*" have a different meaning, and in particular, that "*granules*" are to be understood as the resin as it exits the reactor. However, a basis for such an interpretation can neither be found in the claims nor in the patent in suit. On the contrary, according to document F4, the reaction generates polymer in particulate or powder form and an extruder is needed to obtain either "*granules*" or "*pellets*" (document F4, page 2, lines 7 to 12 and lines 21 and 22).

Furthermore, according to paragraph [0007] of the patent in suit, the term "*granular*" is to be understood interchangeably with "*particulate*", wherein the latter term covers any kind of particles.

Thus, the term "*granular*" as used in claim 1 does not provide a basis for distinguishing the claimed subject-matter from "*particulate*" resin (see document F1, column 1, lines 20 to 38; document F4, page 2, lines 7 to 12).

2.1.2 The subjective value judgement "*enhancing*" does not correspond to any particular technical feature. The expression "*enhancing production of a first resin product*" thus only constitutes an implicit reference to the blending of step (e) of claim 1. Thus, the mixing of, for example, heterogeneous batches of product to obtain more homogeneous ones (see document F1,

column 1, lines 20 to 23) also constitutes one possibility for such an enhancement.

2.1.3 Specifications and sets of properties

Although it was argued on behalf of the respondent, that "*a [first] set of properties*" is to be understood to be the same as a "*specification*" for that product, there is no basis for this in the patent in suit. Throughout the patent, a distinction is made between properties which may or may not remain within a specification (for example, paragraph [0001] last sentence; paragraphs [0002], [0005], [0006], [0011], [0018] and [0030]) while explicitly pointing out that "*the specifications may be a single value or a range of values for a single property*" (column 6, lines 5 and 6). Thus, the patent in suit draws a clear distinction between the properties of a resin and a specification for a such a resin. In consequence, there is no basis in the patent in suit for a "*set of properties*" to be understood to mean the same thing as a "*specification*".

2.1.4 In step (d) of claim 1, the expression "*product made under said new conditions*" does not distinguish between the production of "*second granular resin product (B)*" and "*off-grade granular product between steady state production of said first and second products*". In consequence, step (e) either results in a blend of resin products A and B (not technically unreasonable in view of products A and B only differing in at least one property value) or a blend of resin product A with "*off-grade granular product [produced] between steady state production of said first and second products*". Nothing in claim 1 requires the latter blend - if any - to be within the target specification of product A.

Thus, the subject-matter of claim 1 is not limited to obtaining a product according to a particular specification as a result of blending an off-grade material produced during the transition period of continuously operated reactor undergoing a change in operating conditions.

2.1.5 Claim 1 only requires the reactor to be capable of substantially continuous operation, but does not specify that changing the conditions of said reactor of step (c) *must* occur while the reactor continues to be in operation. Thus, the method of claim 1 is not limited to a continuous process.

2.2 Document F1

Document F1 discloses that "*special situations may arise when it is desirable to empty and collect product from only a single bin or from selected bins. In particular, when a continuous polyethylene reactor is undergoing change from the manufacture of one product type to another type having significantly different properties, it is recognized that the product collected during the transition period may not be truly suitable for use with either the previously prepared or the subsequently prepared product*" (column 4, lines 31 to 44).

The manufacture of a product with "*significantly different properties*" requires an active change in the operating conditions of the reactor, so that step (c) of claim 1 is thus implicitly disclosed.

The expression "*may not be truly suitable for use with … the previously prepared … product*" implies that there

may be "*product collected during the transition period*" which is suitable for use with the "*previously prepared product*".

However, there is no direct and unambiguous disclosure that such product, insofar as it exists, will necessarily be blended into the "*previously prepared product*"; i.e. steps (d) and (e) of claim 1 of the main request are not directly and unambiguously disclosed in document F1 in the context of the continuous reactor undergoing a grade change as included in step (c) of claim 1 of the main request.

2.3 Document F4

Although document F4 generally discusses the difficulties arising from grade changes during continuous catalytic polymerisation (page 4, lines 1 to 17), no reference is made to a grade change (corresponding to step (c) of claim 1 of the main request) with respect to the method of using the apparatus disclosed in figure 14.

Thus, there is no direct and unambiguous disclosure of collecting and/or withdrawing resin made before and after changing the reaction conditions from manufacturing a first resin product to new conditions for manufacturing a second resin product having at least one property differing from that of the first resin (see steps (b) and (d) of claim 1 of the main request). Therefore, there is also no direct and unambiguous disclosure of the blending of such resins (see steps (d) and (e) of claim 1 of the main request).

2.4 In consequence, the subject-matter of claim 1 according to the main request is new with respect to each of documents F1 and F4 (Article 54 EPC 1973).

3. *Inventive step - Main request*

Document F1 represents the closest prior art and concerns the blending of large batches of particulate polymers that are compositionally heterogeneous into batches that are compositionally uniform (column 1, line 20 to 23).

The subject-matter of claim 1 differs therefrom in that insofar as the reactor continues to operate during step (c), i.e. while the operating conditions are changed from conditions for manufacturing one resin to those needed manufacturing another resin, product collected according to step (b) during the transition period of the reactor is blended with the previously prepared product from the trim bin in accordance with step (e). Under these circumstances, steps (d) and (e) solve the problem of minimising off-grade production (patent as published, paragraph [0006]) thereby *enhancing* the production of the first granular resin.

As already noted above, the discussion of the "*special situations*" (document F1, column 4, lines 31 to 44) implies that there may be "*product collected during the transition period*" which is suitable for use with the "*previously prepared product*". When the continuous polyethylene reactor has just undergone a change from the manufacture of one product type to another type having significantly different properties, the properties of the "*product collected during the transition period*" will inevitably start to move away from the values corresponding to the specification of

the first product in the direction of those of the other product type. Thus "*product collected during the transition period*" whose properties, although offset from the ideal specification values, are still nevertheless within albeit close to the border of the specification of the first product will necessarily be suitable for use with the "*previously prepared product*".

In the background to the invention, document F1 discloses that to provide a maximum percentage of product falling within product specifications, a manufacturer will blend a product lot having an undesirably high melt index with a product lot having an undesirably low melt index. The resulting mixed lot will have a melt index within specifications (column 1, lines 8 to 14). This background knowledge together with the aim of the invention to provide compositionally uniform batches of particulate product (column 1, line 20 to 23) provide the skilled person with the incentive to blend "*product collected during the transition period*" which is suitable for use with the "*previously prepared product*" but whose property values are near the border of the specification for this product into "*previously prepared product*" to obtain a compositionally uniform batch of particulate product and thereby *enhance* his production.

When setting out to perform such blending, it is also obvious for the skilled person to use an apparatus as disclosed in document F1. One embodiment (column 4, lines 12 to 17) uses a pneumatic conveying system in lieu of the conveyor belt used in another embodiment (figure 3). The skilled person will thus have to choose one of these embodiments and will do so according to the known relative merits of a conveyor belt and a

pneumatic conveying system. Although the skilled person is required to perform a choice at this point, no unexpected advantages or effects arise from the particular choice of a pneumatic conveying system. The patent in suit also does not disclose any particular advantages resulting from the use of a conduit. The choice of a pneumatic conveying system with its implied use of conduits thus does not give rise to an inventive step.

The skilled person is led to the selective withdrawal of suitable particulate "*product collected during the transition period*" and particulate "*previously prepared product*" from their respective bins to blend them, for example, into a conduit of a pneumatic conveying system as disclosed in the additional embodiment of document F1 (column 4, lines 12 to 17) and thus carries out steps (d) and (e) according to claim 1 of the main request without having to perform an inventive step.

As already noted in section 2.1.4 above, the subject-matter of claim 1 is not limited to obtaining a product according to a particular specification as a result of blending off-grade material produced during the transition period of continuously operated reactor undergoing a change in operating conditions.

The above considerations are also independent of the fact - pointed out by the respondent - that "*product not desired for delivery under a particular product designation can be separately withdrawn from 1, 2 or more bins for sale under special designated specifications*" (column 4, lines 50 to 54).

It was also argued on behalf of the respondent, that the process described in document F1 is not

"*continuous*". However, the only requirement contained in claim 1 is for the reactor to be capable of continuous operation - this is also the case with the reactor discussed in document F1 (column 4, lines 35 to 41).

Thus the subject-matter of claim 1 according to the main request is not based on an inventive step so that the requirements of Article 56 EPC 1973 are not met.

4. *Auxiliary requests 1 to 4*

4.1 Admissibility

In the annex to the summons to oral proceedings, the board introduced a new issue by drawing the parties' attention to the potential relevance of document F1 - filed during the opposition proceedings - with respect to claim 1 of the main request. Thus, the board considers it only fair to provide the patent proprietor/respondent with an opportunity to react to this new issue. Furthermore, auxiliary requests 1 to 4 were filed within the time frame set for the oral proceedings before the board so as to give the opponent/appellant enough time to react to such new requests and prepare his case accordingly. For these reasons, the board has admitted auxiliary requests 1 to 4 into the proceedings (Article 13(1) of the Rules of Procedures of the Boards of Appeal - RPBA).

4.2 Article 83 EPC 1973, Article 84 EPC 1973, Article 123(2) EPC

Step (e) of claim 1 respectively according to auxiliary requests 1 to 4 differs from step (e) of claim 1

according to the main request in that the following text has been added at the end of step (e):

"*to form a granular resin product having a first set of properties of said first granular resin product (A).*"

Step (e) concerns the blending of granular resin product from said trim forward bin (which according to step (b) contains granular resin product A) into said conduit while performing step (d), i.e. while passing granular resin product made under said new conditions in said reactor through said conduit. These new reactor conditions concern the manufacture of the second granular resin product B which has at least one property of a value different from that of said first granular resin product A.

Thus, step (e) involves blending product A (from the trim forward bin) with a product which has at least one property of a value which is *different* to that of corresponding property of the first set of properties of product A. Such a blend therefore cannot result in "*a granular resin product having a first set of properties of said first granular resin product (A)*" because it has been mixed with a product having a different value for at least one of these properties.

Contrary to the position of the respondent, there is no basis in the patent in suit for a "*set of properties*" to be understood to mean the same thing as a "*specification*" (see section 2.1.3 above).

Thus, the text added to step (e) of claim 1 respectively according to auxiliary requests 1 to 4 thus specifies a physical impossibility which the skilled person would not know how to achieve

(Article 83 EPC 1973), renders the claim as a whole unclear (Article 84 EPC 1973) and was not disclosed as such in the application as filed (Article 123(2) EPC).

5. *Auxiliary request 5*

5.1 Admissibility

The main request and the "*auxiliary request*" as filed with the response to the notice of appeal on 5 January 2011 were never explicitly withdrawn by the respondent and, in particular, not when filing auxiliary requests 1 to 4 on 17 May 2013. In this respect, the board concurs with the respondent's view that a withdrawal of a request has to be explicit and beyond any doubt. With the letter of 14 June 2013, the respondent merely clarified that the set of claims filed as "*auxiliary request*" on 5 January 2011 is to be considered as auxiliary request 5. Thus, what is now auxiliary request 5 is already in the proceedings and its admissibility is not open to question.

5.2 Inventive step

The skilled person is generally familiar with the principle of blending off-grade resin product to avoid having to sell such material at a substantial discount compared to '*consistently to specification grade*' polymer (document F4, page 4, lines 6 to 12; document F3, column 2, lines 54 to 61; document F1, column 1, lines 6 to 14). Obtaining a resulting mix whose properties are within a particular specification necessarily requires the quantities of the resins to be mixed to be selected depending on the property values of the off-grade material. Thus, the skilled person will necessarily be familiar with controlling the

quantities to be used for blending in view of achieving a particular specification. This merely corresponds to the inevitable practice for blending off-grade resin product to avoid losses. Such considerations do not require hindsight as argued by the respondent. In the particular context of a reactor undergoing a grade change as set out in document F1, it is thus necessary to retain sufficient "*previously produced product*" for blending the amount of off-grade granular product which is going to be produced in the transition period. Nothing else is expressed in claim 1 according to the auxiliary request 5 with the control of "*the amount of granular product collected in step (b)" as "a function of the anticipated production of off-grade granular product between steady state production of said first and second products*". The expression "*as a function of the anticipated production*" is very broad and is not given any particular limits in the description of the patent in suit. The "*function*" thus remains completely open and so cannot even impose any particular limits on the properties the blend should achieve. Therefore, such a step is obvious to the skilled person.

The feature added to claim 1 according to auxiliary request 5 thus does not render the subject-matter inventive. In consequence, the subject-matter of claim 1 according to auxiliary request 5 does not meet the requirements of Article 56 EPC 1973.

5.3 Clarity

Although not a ground for opposition, the issue of clarity was nevertheless raised by the appellant with respect to features contained in granted claim 3. In view of the above finding of lack of inventive step, the question of whether the issue of clarity may be

addressed by this board does not need to be investigated.

6. *Auxiliary request 6*

Claim 1 according to auxiliary request 6 differs from claim 1 according to auxiliary request 5 in that the following feature has been added into step (e):

"*to form a granular product resin within the specification for product (A)*"

This amendment introduces the concept of a "*specification*" into the claimed subject-matter. Although a resin sample may be tested to determine the values of its properties, it is not possible to infer which specification it was intended to meet, since specifications may be arbitrarily broad. This coincides with the understanding of a specification according to the patent in suit (see section 2.1.3 above), where it may be understood as ranges of values for the properties of the resin. As such ranges can be arbitrarily broad, the above amendment does not introduce any further limitation into the claimed subject-matter. Furthermore, that a blend has to meet a specification constitutes common knowledge of the skilled person (see also document F4, page 4, lines 2 to 12). Therefore, this amendment is not prima facie suitable for overcoming the issue of lack of inventive step, for example, as set out above regarding the subject-matter of claim 1 according to auxiliary request 5.

In consequence, the board exercises its discretion under Article 13(1) RPBA and does not admit this request into the proceedings.

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:

S. Sánchez Chiquero M. Poock

Decision electronically authenticated