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Datasheet for the decision of 30 September 2011

Case Number: T 2237/09 - 3.3.03

Application Number: 01934126.2

Publication Number: 1285010

IPC: C08F 10/02, C08F 4/24, C08F 2/34

Language of the proceedings: EN

Title of invention:
Process for the gas phase polymerisation of olefins

Patent Proprietor:
INEOS EUROPE LIMITED

Opponent:
Univation Technologies, LLC

Headword:
-

Relevant legal provisions:
EPC Art. 83

Relevant legal provisions (EPC 1973):
-

Keyword:
"Sufficiency of disclosure (main request and auxiliary request): no"

Decisions cited:
-

Catchword:
-

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Case Number: T 2237/09 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 30 September 2011

Appellant: (Patent Proprietor)	INEOS EUROPE LIMITED Hawkslease Chapel Lane Lyndhurst Hampshire SO43 7FG (GB)
Representative:	Hawkins, David George Compas Patents LLP 120 Bridge Road Chertsey Surrey KT16 8LA (GB)
Respondent: (Opponent)	Univation Technologies, LLC 5555 San Felipe, Suite 1950 Houston Texas 77056 (US)
Representative:	Serravalle, Marco Serravalle sas Via G. Matteotti, 21/23 I-26854 Cornegliano Laudense (LO) (IT)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office dated 16 September 2009 and posted 28 September 2009 revoking European patent No. 1285010 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman: B. ter Laan
Members: O. Dury
C.-P. Brandt

Summary of Facts and Submissions

I. The appeal by the patent proprietor lies against the decision of the opposition division of 16 September 2009 and posted 28 September 2009 to revoke European patent No. EP 1 285 010 B1, based on application N°. 01 934 126.2.

II. The granted patent was based on 6 claims of which claims 1 to 3 read :

"1. Chromium high molecular weight polyethylene pellet having a weight average molecular weight (Mw) comprised between 250000 and 2000000, a high load melt index comprised between 1 to 3 g per 10 minutes, and a density comprised between 950 and 958 kg per cubic meter.

2. Chromium high molecular weight polyethylene pellet according to claim 1 **characterised by** an impact strength greater than 23 kJ/m^2.

3. Chromium high molecular weight polyethylene pellet according to any of the preceding claims **characterised by** a bottle stress crack resistance greater than 50 h."

III. A notice of opposition against the patent was filed on 24 April 2007, in which the revocation of the patent in its entirety was requested on the grounds of Art. 100(a) EPC (lack of novelty as well as lack of an inventive step) and Art. 100(b) EPC.

IV. The decision of the opposition division was *inter alia* based on the following documents :

D3 : US-A-5 169 817

D5 : ASTM D6474-99: Standard Test Method for Determining Molecular Weight Distribution and Molecular Weight Averages of Polyolefins by High Temperature Gel Permeation Chromatography, February 2000

D6 : test report dealing with Mw measurements according to ASTM D6474-99 of three polyethylene samples under two different experimental conditions

D8 : set of data, filed on 23 April 2009, reporting High Load Melt Index (HLMI) and Mw of various polyethylenes prepared by suspension polymerisation in a single reactor using 5 different Ziegler-Natta titanium-based catalysts.

V. The decision under appeal was based on claims 1 to 6 as granted (main request) and on one auxiliary request filed on 1 September 2009.

In its decision, the opposition division held that the object of the patent in suit did not comply with the requirements of Art. 83 EPC because it did not provide sufficient information for the skilled person to determine the parameter Mw recited in claim 1 of each of the main and auxiliary requests in a reliable and reproducible way over the whole range claimed. The patent in suit was therefore revoked.

VI. On 23 November 2009, the patent proprietor (appellant) lodged an appeal against the above decision. The prescribed fee was paid on the same day. In their

statement of grounds of appeal filed on 29 January 2010 the appellant requested that the decision of the opposition division be upheld and the patent in suit be maintained unamended.

VII. By letters dated 11 June 2010 and 29 August 2011 the opponent, now respondent, requested the dismissal of the appeal and filed comments on the statement of grounds of appeal.

VIII. In a communication issued on 11 May 2011 accompanying the summons to oral proceedings, the issues to be discussed at the oral proceedings were identified by the Board. Regarding sufficiency of disclosure, it was *inter alia* pointed out that one of the questions to be answered would be whether or not the patent in suit provided sufficient guidance for the skilled person to know how to prepare pellets having the specific combination of properties as defined in the claims.

IX. Oral proceedings were held on 30 September 2011 in the presence of both parties.

After an exchange of arguments regarding sufficiency of disclosure, the appellant filed an auxiliary request of five claims, corresponding to claims 1, 2, 4, 5 and 6 as granted.

X. The appellant's arguments regarding sufficiency of disclosure may be summarised as follows:

(a) the description provided information e.g. with regard to the catalyst to be used and the process to be carried out in order to prepare the claimed

pellets. This general teaching was further illustrated by an example. Although no data regarding the Mw of the pellets so prepared were available, the example was illustrative of the invention and, hence, in accordance with claim 1;

(b) the patent in suit indicated which standard method should be used for the determination of each of the parameters recited in the claims, apart from the Mw. For the latter D5 was however the industry standard to be used, with which the respondent agreed;

(c) the skilled person following the teaching of D5 was given sufficient information to determine the Mw of pellets according to claim 1. In this regard, the skilled person could derive from D5 how each of the 16 parameters identified therein, including the operating Gel Permeation Chromatography (GPC) column temperature, should be set in order unambiguously to determine the Mw;

(d) as indicated in paragraph [0018] of the patent in suit, the parameter "bottle stress crack resistance" mentioned in claim 3 of the patent in suit, was to be determined according to ASTM D1693-97a. Although this method, which was conceived for sheets, had to be adapted for the determination of the stress crack resistance of a bottle, the skilled person would readily understand how to adapt that procedure and carry out the determination at 60°C as indicated in Table 3 of the patent in suit.

(e) hence, the patent in suit provided sufficient information to carry out the claimed invention.

XI. The respondent's objections regarding sufficiency of disclosure were essentially as follows:

(a) the patent in suit did not teach what should be done in order to prepare polyethylene pellets with the combination of properties required in claim 1. The same was valid regarding the further combination of parameters mentioned in claims 2 and 3. Although the patent in suit provided information of a very general nature regarding the experimental conditions to be used to prepare the claimed pellets, it did not provide any teaching regarding which special adaptation(s) was/were required in order to obtain the specific combination of parameters according to the claims. Hence, the claimed pellets were either not novel or could only be obtained using specific catalysts and/or process conditions, which were however not indicated in the patent in suit;

(b) according to the patent specification, the parameter Mw recited in the claims should be measured according to conventional GPC techniques. It was agreed that the skilled person would determine this parameter using the industry standard D5, which identifies a list of 16 parameters to be reported in order to allow an unambiguous determination of Mw. D5, however, allowed some variability in the selection of most of those parameters. In the absence in the patent in suit of any indication of the experimental

conditions selected for those parameters, apart from the type of column, the skilled person was not in a position unambiguously to determine the Mw. D6 further demonstrated that using a GPC column temperature of 135°C or 160°C led to a significant variation in Mw. Similar variations would be obtained when considering any other of the 16 parameters indicated in D5. This ambiguity in terms of Mw was so large that it amounted to insufficient disclosure;

(c) as illustrated by the data provided in D2, D3 and D8, it was technically not possible to measure the HLMI of a polyethylene having a molecular weight higher than about 600 000. In this respect also, the patent in suit failed to provide sufficient information on how to proceed to measure the HLMI for a polyethylene having a Mw of up to 2 000 000 as mentioned in claim 1;

(d) the parameter "bottle stress crack resistance" recited in claim 3 of the patent in suit was unusual. The ASTM D1693-97a method quoted in paragraph [0018] of the patent in suit was directed to the determination of the environmental stress crack resistance (ESCR) of polyethylene sheets, not bottles, and taught to make the measurement at 50°C, not 60°C as reported in the patent in suit. Hence, not only did the skilled person not known what the parameter "bottle stress crack resistance" meant, but he was not given any indication of how the ASTM D1693-97a method should be adapted in order to determine that parameter;

(e) the requirements of Art. 83 EPC were, hence, not met.

XII. The appellant (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained as granted or, in the alternative, on the basis of the auxiliary request (claims 1-5) as filed during the oral proceedings.

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

XIII. The Board announced its decision at the end of the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. Sufficiency of disclosure

2.1 Claim 1 of the patent in suit

2.1.1 Claim 1 is directed to polyethylene pellets characterised by a specific combination of three parameters, each of which being within a specific range.

2.1.2 The preparation process of the claimed pellets is disclosed in paragraphs [0019] to [0035] and in the sole example of the patent in suit. Paragraphs [0020] to [0027] describe supported catalysts that may suitably be used for the polymerisation of the ethylene (co)monomers. According to paragraph [0028] the

supported catalyst must before use be activated by a heat treatment in a non-reducing atmosphere. Paragraphs [0029] and [0030] deal with an optional prepolymerisation stage for the catalyst that results in a prepolymer e.g. in the form of a powder. Paragraphs [0031] to [0032] further describe the polymerisation process of the ethylene (co)monomers, using standard gas phase polymerisation and conventional processing conditions. Finally, paragraphs [0033] and [0034] mention the formation of pellets from the polyethylene using conventional conditions.

2.1.3 However, all the information provided in those passages of the specification is given in very general terms, most of the features being described as optional or merely preferred. Hence, reading the whole description of the patent in suit, the only teaching provided is that the claimed pellets can be obtained by conventional methods as long as

- a supported chromium based catalyst is used in a gas phase polymerisation process; and
- the supported catalyst is subjected to at least one calcination/activation step.

The patent specification in particular does not contain any other information about the catalyst (chemical composition, chromium content, nature of support, surface properties, preparation process), the ethylene polymerisation or the pellet processing that could serve as a guidance for the skilled person to identify which of these features are indispensable in order inevitably to obtain pellets having the claimed combination of parameters.

However, as acknowledged in paragraphs [0004] to [0007] of the patent in suit and as confirmed by the appellant during the oral proceedings before the Board, the specific combination of parameters recited in claim 1 is special and provides to the claimed polyethylene pellets specific properties that had not been obtainable before. In this regard, the appellant has in particular consistently argued that none of the documents cited during the procedure disclosed that specific combination of parameters. Hence, the Board considers that such a special combination of properties could not be obtained using *any* chromium oxide supported catalyst, i.e. including those which are conventional in the art and/or commercially available, and *any conventional processing steps* as disclosed in the description of the patent in suit, even taking into consideration the mandatory thermal activation step (paragraph [0028]), since that is also known in the art (e.g. D3: col. 4, line 60 to column 5, line 4; examples 8-12; comparative example C).

2.1.4 Furthermore, there is no information which parts of the process should be changed in which way if pellets were produced having properties falling outside the claimed ranges. Considering that most of the features mentioned in the description are merely indicated as being optional, the skilled person is left with the task of performing an elaborate program in order to find out which combination of catalyst, catalyst treatment, polyethylene polymerisation steps and pellet processing conditions should be used in order to provide a product having the specific combination of parameters as defined in claim 1 of the patent in suit. Hence, the skilled person can only establish by trial and error

whether or not his particular choice of numerous parameters will provide a satisfactory result. Under such circumstances, the disclosure is not reproducible without undue burden and the requirements of Art. 83 EPC are not met (see Case Law of the Boards of Appeal of the EPO, 6th edition, 2010, section II.A.4.2).

2.1.5 The single example according to the claimed subject-matter provided in the patent specification is not sufficient to satisfy the requirements of Art. 83 EPC since the patent as a whole does not give any indication of which variations of that specifically disclosed embodiment would also result in the claimed pellets.

2.1.6 Therefore, it has to be concluded that on the basis of the information provided in the patent specification, the subject matter of claim 1 of the patent in suit can only be obtained as a matter of chance or would require considerable efforts in terms of trial and error in order to find out which combination of conditions will lead to the claimed pellets.

2.1.7 In view of the above, claim 1 cannot be considered to meet the requirements of sufficiency of disclosure (Art. 83 EPC).

2.2 Claim 3 of the patent in suit

2.2.1 According to claim 3, the pellets should have a "bottle stress crack resistance" falling within a specific range.

2.2.2 There is no evidence on file that the parameter "bottle stress crack resistance" is known in the art and/or that there exists an accepted definition for this expression.

2.2.3 It was not contested by the appellant that the ASTM D1693-97a standard quoted in paragraph [0018] of the description refers to "*environmental* stress crack resistance" (ESCR), which is generally used for the determination of the ESCR of polymer sheets, not bottles, and had to be adapted.

2.2.4 Also, it is not clear how the pellets according to claim 3 relate to a bottle or to "bottle stress crack resistance".

2.2.5 Besides, contrary to the situation of claim 1 for which no method of determination of Mw was indicated in the patent in suit but for which the parties agreed that there was an accepted industry standard available, for the parameter of claim 3 the patent specification indicates a method of determination which, however, has to be adapted, but it does not provide any information concerning the required adaptation. In this regard, the appellant further failed to demonstrate that this lack of information could be circumvented by the information provided in the patent in suit e.g. either because it belonged to common general knowledge or because it could be retrieved in a reliable manner by reworking the example.

2.2.6 Therefore, not only does the skilled person not know the technical meaning of the term "bottle stress crack resistance" but he also does not know how to determine

this parameter. Consequently, there can not be derived from the patent in suit any clear teaching of what is to be done in order reliably to obtain a product according to claim 3. Claim 3 does therefore not meet the requirements of Art. 83 EPC for this reason as well as for the same reason as given above for claim 1.

2.3 Under these circumstances, there is no need for the Board to deal with the further objections of lack of sufficiency that had been raised e.g. with respect to the determination of the weight average molecular weight Mw and/or the technical feasibility of preparing polyethylene pellets over the whole range of claim 1.

2.4 For the reasons given above, the main request has to be refused.

Auxiliary request

3. Claim 1 of the auxiliary request is identical to claim 1 of the main request, so that the same reasoning applies. Therefore, the auxiliary request also does not comply with the requirements of Art. 83 EPC and has to be refused.

4. As none of the requests of the appellant (patent proprietor) is allowable, the appeal has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

E. Görgmaier B. ter Laan