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**Datasheet for the decision
of 18 January 2023**

Case Number: T 1279/20 - 3.3.03

Application Number: 06787952.8

Publication Number: 1907430

IPC: C08F10/02, C08F2/34, C08F4/24,
C08F4/69, C08F210/02,
C08F210/16

Language of the proceedings: EN

Title of invention:
BLOW MOLDING POLYETHYLENE RESINS

Patent Proprietor:
Univation Technologies, LLC

Opponent:
TotalEnergies OneTech Belgium

Relevant legal provisions:
RPBA 2020 Art. 12(2), 12(4), 12(6) sentence 2
EPC Art. 56

Keyword:
Late-filed facts - should have been submitted in first-
instance proceedings (yes)
Inventive step - (yes)



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Case Number: T 1279/20 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 18 January 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
24 March 2020 concerning maintenance of the
European Patent No. 1907430 in amended form.**

Composition of the Board:

Chairman D. Semino
Members: D. Marquis
R. Cramer

Summary of Facts and Submissions

I. The appeal lies against the decision of the opposition division concerning maintenance of European patent No. 1 907 430 on the basis of the main request filed with letter of 17 March 2014.

II. Claim 1 of the main request read as follows:

"1. A continuous fluidized-bed gas-phase polymerization process for making a high strength, high density polyethylene copolymer, comprising:
contacting monomers that include ethylene and at least one non-ethylene monomer with fluidized catalyst particles in a gas phase in the presence of hydrogen gas at an ethylene partial pressure of 689 kPa (100 psi) or more and a polymerization temperature of 120 °C or less, wherein oxygen is present in the range of from 10 to 500 ppbv based on the ethylene feed rate, to produce a polyethylene copolymer having a density of 0.945 g/cc or more and an ESCR Index (defined as the measured ESCR, based on ASTM D1693, condition B, using 10% Igepal CO-630 in water, divided by the product of 0.0481 and (Density)^{-1.42}, wherein Density values are based on ASTM D1505) of 1.4 or more wherein the catalyst particles are prepared at an activation temperature of 700 °C or less, and wherein the catalyst particles consist essentially of silica, chromium, and titanium".

III. The following documents were *inter alia* cited in the opposition procedure:

F9: US 5,473,027

F14: WO 2005/052012

- IV. As far as it is relevant to the present case, the decision under appeal considered that document F9 was the closest prior art. The process of claim 1 differed from the process of F9 in the use of catalyst particles prepared at an activation temperature of 700°C or less and in that the polyethylene copolymer obtained from that process had an ESCR index of 1.4 or above. The problem starting from F9 was to provide a continuous fluidized-bed gas-phase polymerization process for making a high strength, high density polyethylene copolymer having an increased ESCR index, improved die swell and processability (polydispersity index Mw/Mn), and increased catalyst productivity. The solution was a combination of a certain type of catalyst and specific process conditions according to claim 1, in particular utilising a low activation temperature (<700°C) for the catalyst. There was no motivation in the closest prior art and in the other cited documents including F14 to use a catalyst as disclosed in claim 1 of the main request in order to solve the posed problem. The requirements of Article 56 EPC were therefore met.
- V. The opponent (appellant) lodged an appeal against the decision of the opposition division and submitted document F18 (Declaration of Daniel Siraux dated 28 July 2020) with their statement setting out the grounds of appeal.
- VI. With the reply to the statement of grounds the patent proprietor (respondent) maintained several auxiliary requests filed during opposition proceedings.
- VII. The parties were summoned to oral proceedings and a communication pursuant to Article 15(1) RPBA 2020 indicating specific issues to be discussed at the oral

proceedings was sent to the parties.

VIII. Oral proceedings were held on 18 January 2023 by videoconference.

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

The appellant requested that the decision of the opposition division be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed, or that the decision of the opposition division be set aside and the patent be maintained on the basis of one of the first to third auxiliary requests filed with letter of 23 April 2015, of the fourth auxiliary request filed with letter of 15 June 2015, or of the fifth auxiliary requests filed during the oral proceedings on 24 June 2015.

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

- F18 was relevant to the question of inventive step and should be admitted into the proceedings.
- Claim 1 of the main request lacked an inventive step over F9 in combination with F14.

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

- F18 was filed late and should not be admitted into the proceedings.
- Claim 1 of the main request was inventive over F9 in combination with F14.

Reasons for the Decision

1. Admissibility of document F18
 - 1.1 The appellant submitted document F18 with their statement setting out the grounds of appeal. F18 is a statement by Mr. Siraux pertaining to the question of inventive step and addressing the relevance of the examples of F14 with regard to the closest prior art document F9. Document F18 was not part of the decision under appeal nor was it filed during the opposition proceedings. F18 therefore represents evidence that does not meet the requirements of Article 12(2) RPBA 2020 and as such it is to be considered as an amendment to the appellant's case (Article 12(4) RPBA 2020).
 - 1.2 According to the provisions of Article 12(6) RPBA 2020, second sentence, the Board shall not admit requests, facts, objections or evidence which should have been submitted, or which were no longer maintained, in the proceedings leading to the decision under appeal, unless the circumstances of the appeal case justify their admittance.
 - 1.3 Document F18 is used by the appellant in the discussion of inventive step starting from F9 as closest prior art in view of F14 (statement setting out the grounds of appeal, page 4). In particular, F18 is intended to show that although the polymerization processes in the examples in F14 were carried out in a slurry and not in

the gas phase as in F9, F14 was relevant to the question of inventive step. That argument had however already been raised at the outset of the opposition procedure (section 2.5.2 of the notice of opposition) and the specific point regarding the lack of relevance of the examples of F14 on the grounds that the polymerization in these examples was carried out in a slurry was clearly addressed by the patent proprietor in their reply to the notice of opposition (section 31).

- 1.4 It is therefore apparent that the evidence contained in F18 could, and should, have been provided during the opposition procedure in order to be considered by the opposition division. The Board also does not find other circumstances of the appeal case that would justify the admittance of F18 into the proceedings.
- 1.5 The appellant argued that the filing of F18 was caused by the decision of the opposition division. The decision of the opposition division addressing the relevance of F14 (page 7, sixth paragraph) however only points to facts already raised by the patent proprietor in opposition, namely that F14 would lack relevance as it concerned a process different from the one disclosed in F9. The decision of the opposition division does therefore not justify the filing of F18 only in appeal.
- 1.6 The Board therefore finds it appropriate not to admit F18 in the appeal proceedings (Article 12(6) RPBA 2020).

Main request

2. Inventive step

2.1 Document F9 was considered as the closest prior art in the contested decision and it was further seen as the closest prior art by both parties in appeal. Its examples 3, 11 and 12 disclosing a process for the preparation of an ethylene/1-butene copolymer with chromium catalysts activated at a temperature of 1525°F (corresponding to 829°C, see column 7, lines 21-23) were considered among others as particularly relevant. The ESCR index of the compositions is not provided in F9. The opposition division concluded that claim 1 of the main request only differed from the examples of F9 in the activation temperature of the catalyst (less than 700°C in claim 1) and in the ESCR index of the polyethylene copolymer (1.4 or more in claim 1). That conclusion was shared by the parties in appeal (statement of grounds of appeal page 3, fifth and sixth paragraphs and reply to the statement of grounds of appeal sections 4.8 and 4.9). The Board does not see any reason to depart from that conclusion.

2.2 The decision of the opposition division (section 4.3) established that examples 13, 18, 19 and 21 of the patent in suit represented the process according to claim 1 of the main request (catalyst activation at 600°C and 550°C) and that examples 8-10 (catalyst activation at 825°C) were representative of the process of the examples of F9 (catalyst activation at 829°C). These examples showed that the activation of the catalyst at a temperature of 700°C or less lead to a polyethylene copolymer having an ESCR index above 1.4, a percentage die swell of above 80% and improved processability. On that basis the problem defined in

the contested decision was the provision of a continuous fluidized-bed gas-phase polymerization process for making a high strength, high density polyethylene copolymer having an increased ESCR index, improved die swell and processability (polydispersity index Mw/Mn), and increased catalyst productivity.

2.3 Both parties in appeal agreed with the analysis of the opposition division with regard to the relevance of the examples of the patent in suit. The parties however differed in their formulation of the problem solved in view of F9. The appellant in particular contended on page 3 of the statement of grounds of appeal that the problem was to obtain an ethylene copolymer with good ESCR values (without referring to any other property).

2.4 The data reported in Tables 1 and 2 of the patent in suit show that all other things being comparable, the processes using a catalyst that was activated at 600°C or 550°C (examples 13, 18, 19 and 21) lead to ethylene/1-butene copolymers having higher polydispersity (Mw/Mn), higher ESCR index and a higher die swell percentage than the processes using a catalyst that was activated at 825°C (examples 8, 9 and 10), which was not contested by the appellant. With regard to the catalyst productivity, however, the data reported in Tables 1 and 2 do not show an increase for the examples according to claim 1 of the main request that could be reliably associated with the catalyst activation temperature. The improvement of catalyst productivity was therefore not made credible for the process according to claim 1 of the main request and therefore was not retained for the formulation of the problem over F9 (Case Law of the Boards of Appeal, 10th Edition, 2022, I.D.4.1).

- 2.5 On the basis of the examples of the patent in suit the objective technical problem is therefore to be formulated as the provision of a gas phase process to form high strength, high density polyethylene resins with improved ESCR index and die swell properties coupled with improved processability.
- 2.6 The question of obviousness in the present case is thus whether the prior art contained a motivation to use a temperature for the activation of the catalyst that was below 700°C when aiming at solving the problem posed.
- 2.7 The appellant considered F14 as being a relevant document that provided the solution to the posed problem starting from F9. F14 relates to a resin having high ESCR, high impact resistance, high stiffness and good processability (paragraphs 5-7) and it also addresses the question of the activation of a catalyst (paragraph 11) analogous to the one used in the patent in suit. The activation temperature of the catalyst is disclosed in F14 to be in the range of 370 to 540°C (paragraph 29), a range that is within the one of claim 1 of the main request (less than 700°C). Although F14 appears to more specifically relate to slurry polymerization processes, paragraph 38 nonetheless indicates that the resins can be made by a gas phase polymerization, i.e. the process that is used in the examples of F9.
- 2.8 F14 teaches that improved ESCR values can be obtained as a result of a lower activation temperature of the catalyst (paragraph 34). F14 however only teaches an improvement of ESCR and not an improvement of the ESCR index as defined claim 1 of the main request. It is apparent from paragraph 77 of the patent in suit that the ESCR index is proportional to the ESCR value

multiplied by the density of the polyethylene to the power of 142. Since the density of the polymer is also influenced by the polymerization process, increasing the ESCR value of a resin does not necessarily mean that the ESCR index of that resin will be improved nor that it will be above 1.4 as required by claim 1 of the main request. Since neither F9 nor F14 provide the ESCR values of the resins they disclose and no submissions, nor evidence have been provided by the appellant as to the values of ESCR and of the ESCR index of the polymers obtained in the examples of F9, nor of any variation thereof by modifying the activation temperature, it cannot be concluded that by applying the teaching of F14 to F9, the skilled person would have solved the problem posed and arrived at a process according to claim 1. For that reason alone it can be concluded that the teaching of F14 does not lead to claim 1 of the main request. There is furthermore no suggestion in F14 that the die swell and the processability of the polyethylene copolymer could be improved as a result of the choice of the catalyst activation temperature.

- 2.9 The arguments of the appellant in appeal therefore do not give any reason to the Board to overturn the decision of the opposition division on inventive step. It is therefore concluded that the process of claim 1 of the main request meets the requirements of Article 56 EPC.

3. As no other objection was raised against the main request, the Board does not need to deal with any other point and the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Hampe

D. Semino

Decision electronically authenticated