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Datasheet for the decision of 20 June 2018

Case Number: T 0073/15 - 3.3.03

Application Number: 06829327.3

Publication Number: 1957547

IPC: C08F10/02, C08J5/18, C08F110/02

Language of the proceedings: EN

Title of invention:
POLYMER

Patent Proprietor:
Borealis Technology Oy

Opponent:
The Dow Chemical Company

Relevant legal provisions:
EPC Art. 54, 56, 100(a), 100(b)
RPBA Art. 12(4), 13(3)

Keyword:
Late-filed facts - admitted (no)
Late-filed argument - admitted (no)
Novelty - (yes)
Inventive step - (yes)

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Case Number: T 0073/15 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 20 June 2018

Appellant: (Opponent)	The Dow Chemical Company 2030 Dow Center Midland, MI 48674 (US)
Representative:	V.O. P.O. Box 87930 2508 DH Den Haag (NL)
Respondent: (Patent Proprietor)	Borealis Technology Oy P.O. Box 330 06101 Porvoo (FI)
Representative:	Dehns St. Brides House 10 Salisbury Square London EC4Y 8JD (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 9 October 2014 concerning maintenance of the European Patent No. 1957547 in amended form.**

Composition of the Board:

Chairman	D. Semino
Members:	M. C. Gordon
	C. Brandt

Summary of Facts and Submissions

I. The appeal of the opponent lies from the interlocutory decision of the opposition division posted on 9 October 2014 according to which European patent number 1 957 547 could be maintained in amended form on the basis of auxiliary request I, corresponding to auxiliary request II filed with letter of 12 March 2013 and renumbered at the oral proceedings.

II. The patent was granted with a set of 13 claims, whereby claim 1 read as follows, wherein "WVTR" stands for "Water Vapour Transmission Rate":

"A high density polyethylene homopolymer or copolymer with at least one C_{3-20} alpha olefin, wherein said polymer has an MFR_2 of 0.05 to 10 g/10min, a density of at least 940 kg/m^3 and a strain at break (measured according to ISO 527-3) in the transverse direction of at least 650% and when said polymer is formulated as a film having a thickness of 30 microns, it has a WVTR of less than 4.5 g/m^2/24 hours according to ASTM F 1249 at 38°C and 90% humidity."

Claims 2-11 were directed to preferred embodiments of the polymer of claim 1, claim 12 to an article or film comprising said polymer and claim 13 to the use of a polymer or film in packaging.

III. A notice of opposition against the patent was filed in which revocation of the patent on the grounds of Article 100(a) EPC (lack of novelty, lack of inventive step), Article 100(b) EPC and Article 100(c) EPC was requested.

The following documents, *inter alia*, were cited in support of the opposition:

D5: WO-A-1996/019527
D7: Todd, W.G. *et al* "Maximize Barrier Performance of Reduced-Gauge HDPE Films" (9872/1101), Equistar, presented at ANTEC 1999
D8: Technical Datasheet, Alathon(r) M6020 from Equistar, September 2003 (0903)
D9: WO-A-2005/090464.
D10: Todd, W.G. *et al* "Predictive Model Helps Develop New High Performance HDPE for Barrier Film Applications", Lyondell Chemical Company, Houston, 9871/1101 (November 2001).

IV. According to the decision the main request, claim 1 of which differed from claim 1 as granted by specifying that the polymer was "being formed using Ziegler-Netta catalysts" and in that the MFR_{21} was 5 to 50 g/10 minutes, was held to lack novelty.

Auxiliary request I differed from the main request in that claim 1 additionally contained a restriction of the Mw/Mn to the range 4 to 7. This request, having a total of 11 claims, was held to meet the requirements of the EPC.

V. The opponent (appellant) appealed against the decision. In the statement of grounds of appeal and two further written submissions objections of lack of novelty, lack of inventive step and insufficiency of disclosure were maintained.

A new objection of lack of novelty was advanced, relying on documents filed for the first time with the statement of grounds of appeal (designated D14a and b,

D15 and D16).

It is not necessary for the purposes of this decision to give further details about these documents.

VI. The patent proprietor (respondent) replied, submitting 13 sets of claims as auxiliary requests I-XIII.

VII. The Board issued a summons to oral proceedings and a communication.

The objection of insufficiency of disclosure was not found convincing.

The attack on novelty submitted with the statement of grounds of appeal and relying on newly submitted documents was held to be neither formally admissible nor substantively convincing.

Furthermore the arguments against inventive step were not found to be persuasive.

It was also noted that the respondent had not explained the rationale behind any of the auxiliary requests submitted.

VIII. Each party made a further written submission.

IX. Oral proceedings were held before the Board on 20 June 2018.

X. The arguments of the appellant can be summarised as follows:

(a) Sufficiency of disclosure

It was conceded that the sole example of the patent was repeatable. However the claims were of very broad scope meaning that a single example was not sufficient to provide a basis for generalisation, in particular because the claims had two functional features (water vapour transmission rate and strain at break) which constituted results to be achieved. Furthermore these properties were both influenced by the crystallinity and density of the composition but in opposite directions. However, the patent contained no instructions how to adjust or adapt these properties simultaneously to be in the required ranges. Whilst some limited adaptation might be possible, it was not credible that it applied over the entire scope of the claims.

The comparative example related to a polymer prepared with a Ziegler-Natta catalyst, the polymer having compositional properties either within the claimed ranges or very close thereto. Despite this, performance parameters such as water vapour transmission and strain at break were not satisfied.

The patent provided no indication specifically about the catalyst to be used - on the contrary, the patent as granted stated that any catalyst could be used - and there was no indication how the type of catalyst influenced the outcome in terms of product properties.

Furthermore it was impossible to obtain combinations of the features relating to melt flow and molecular weight distribution over the whole scope of the claims since apparently these features were interrelated with the consequence that they

mutually affected each other. Should no such interrelationship exist, then it was not explained how to influence these independently of each other. Likewise it was not explained how these, individually or in concert, influenced the outcome in terms of the product properties.

Furthermore in terms of the properties defined in the claims, the patent did not adequately explain the conditions under which these were to be determined, e.g. the nature of the film samples employed for the tests.

(b) Novelty

In view of the dismissal of the novelty objection by the opposition division, a further search had been carried out which revealed the documents submitted for the first time with the statement of grounds of appeal.

During opposition proceedings the opponent had taken the view that the amendments made by the patent proprietor were not suitable to overcome the novelty objections raised, and that the amended claims in any case suffered from other defects which would result in non-allowability. Consequently no necessity was identified to advance an alternative novelty attack or supporting documents.

This evaluation however changed upon receipt of the decision.

(c) Inventive step

In a first approach the closest prior art was represented by D5, example 2, the distinguishing feature being the specified range of Mw/Mn. There was no evidence for any technical effect, meaning that the objective problem had to be formulated as the provision of an alternative composition.

The solution was provided by D9 which related to film-forming compositions which were required to exhibit the same combination of properties as those of the patent in suit and which similarly related to a blend of polymers, one of which was the same type as in D5, the second one being a metallocene produced polymer. According to example 1 of D9 a 45/55 wt% blend of these polymers, having a Mw/Mn of 8.43 was employed. D9 however permitted the proportions of the two components to range between 35-65 wt% respectively and appropriate variation would result in compositions having Mw/Mn in the required range. This would also have the consequence that the melt flow rate would fall within the claimed range.

The same objection applied with respect to the combination of D5 and D7/D8, which latter documents addressed the same problem and employed resins of higher Mw/Mn than the claimed range.

In a second approach, D10 taught how to adjust the properties of HDPE in order to obtain films having a desired profile in terms of physical and barrier properties.

In a third approach, presented for the first time in the letter of 30 April 2018, the aforementioned

D9 was seen as the closest prior art.

XI. The arguments of the respondent can be summarised as follows:

(a) Sufficiency of disclosure

The patent provided a fully worked example with a detailed description of all aspects thereof (catalyst, monomers, conditions etc.). The description provided further information relating to all details of the process required in order to obtain the claimed materials. The appellant - who bore the burden of proving lack of sufficiency - had failed to provide any facts to support its objections. It had not been shown that it was not possible to modify the example of the patent in order to obtain other compositions meeting the requirements. The commercial HDPE shown in the table of the patent was outside the scope of the claim - this however did not demonstrate a lack of sufficiency. In particular it had not been shown that this was prepared by the protocol of example 1 of the patent.

Regarding the various measurements, the patent provided details of how these were to be carried out including sample dimensions.

(b) Novelty

The objection and supporting documents submitted for the first time with the statement of grounds of appeal should not be admitted. There was no justification for submitting these at such a late stage of the proceedings considering that the

amendments in question had been filed already with the rejoinder to the notice of opposition.

(c) Inventive step

D5 related to a composition consisting of a single polymer having a value of Mw/Mn below that claimed. D9 proposed an alternative approach involving a combination of two polymers and having a Mw/Mn above the claimed range. The two documents represented different and incompatible approaches to solving the problem common to these documents and the patent in suit, i.e. the provision of packaging films. The proposed combination of these teachings would only arise as the result of an - inadmissible - *ex post facto* approach.

D10 described a predictive theoretical model for determining film properties based on density, MFR and melt index, for HDPE produced, according to the section "Experimental Data" in a "high temperature, high pressure multi-reactor solution process". The teaching of D10 was not repeatable since there was no disclosure of experimental conditions. Consequently D10 did not represent an enabling disclosure. Furthermore the WVTR values of the resins reported in D10 were outside the ranges claimed and there was no disclosure of strain at break or molecular weight distribution. Hence, insofar as any unambiguous teaching could be derived from D10, there was no basis for combining the teaching of D10 with that of D5.

The attack based on D9 as the closest prior art had never previously been advanced in the entire proceedings and the statement of grounds of appeal

did not contain any indication that D9 on its own was to form the basis for an attack on inventive step. On the contrary, it had only ever been invoked as a secondary document. The Board should exercise its discretion not to admit the argument on inventive step based on D9 as the closest prior art.

XII. The appellant requested that the decision under appeal be set aside and that the European patent No. 1957547 be revoked.

XIII. The respondent requested that the appeal be dismissed, or, in the alternatively that the patent be maintained in amended form on the basis of any of auxiliary requests I to XIII, all submitted with the reply to the statement of grounds of appeal.

Reasons for the Decision

1. Sufficiency of disclosure

1.1 Regarding the objection relating to the breadth of the claim, and the question of whether a single example was sufficient, it is conspicuous that the appellant has provided no experimental evidence or documentary corroboration in support of its position that the skilled person would have difficulties working within the scope of the claims beyond the specific example given. In particular it is emphasised that it was not disputed that the example of the patent in suit was reproducible.

Considering that the patent was granted, and maintained, albeit in amended form, the presumption is

that the requirements of sufficiency of disclosure are met. The burden was thus on the appellant to prove the contrary, which burden has not been discharged.

With respect to the argument based on the properties of the comparative example - "Commercial HDPE ZN" - prepared using an unknown Ziegler-Natta catalyst under unknown conditions - and which has the required WVTR but not the required strain at break (paragraph [0087] and Table 1), the appellant appears in its arguments to have overlooked the absence of a disclosure - even implicit or approximate - of the value of MFR_{21} and has not otherwise demonstrated why this should be be assumed to be in the claimed range, and furthermore has overlooked that the value of Mw/Mn (9) is outside the claimed range.

Thus whilst it is correct that the comparative example does not satisfy the functional requirements of the operative claim, significantly, certain of the disclosed product features are not according to the claims, in particular the Mw/Mn. The observation that a composition which does not fulfil certain features of the claim also does not satisfy the functional requirements does not provide evidence of a lack of sufficiency of disclosure.

Regarding the objection relating to the absence of details on how to measure various parameters, it is apparent that, contrary to the position of the appellant, the description of the patent provides in the section "Analytical Tests" a full description in terms of preparation of the measurement samples, their dimensions, and the test conditions in terms of temperature etc.
In any case, even if this argument were to be supported

by the facts, the consequence would be that any uncertainty of the experimental conditions to be employed would impinge upon the reliability or meaning of the parameters given in the claim and the feasibility of ascertaining whether a given product met these. This is however a question of clarity (Article 84 EPC) and not of sufficiency. Insofar as the corresponding mechanical and vapour transmission features were already in claim 1 as granted this objection is not available in respect thereof (G 3/14).

Regarding further aspects of the objections, in particular the question of the impossibility of obtaining all possible combinations of values within the ranges of the two melt flow rates and Mn/Mn defined, the appellant itself answered this objection by acknowledging that these properties were interrelated/interdependent and hence by necessity not freely and independently variable.

2. Novelty - admittance of the objection raised in the statement of grounds of appeal

The appellant did not contest the conclusions of the decision under appeal with respect to novelty based on the documents available in the opposition proceedings but advanced a new attack, based on documents filed for the first time with the statement of grounds of appeal.

As justification for the submission of these documents the appellant referred to the presentation of amended claims by the respondent.

The amendments in question had however been made at the earliest possible stage of the opposition procedure,

namely in the response to the notice of opposition.

Accordingly, had the opponent considered that these amendments necessitated the presentation of further documents, this could and should have been done at that stage of the opposition procedure (cf. Article 12(4) RPBA).

The appellant argued that since it had been considered that the claims suffered from other defects, it was not thought necessary to present further documents.

Whilst this argument gives some insight into the strategy adopted by the opponent, it does not provide any explanation or justification as to why the documents and associated arguments were not submitted during the proceedings before the opposition division, but only shows that a different approach had been chosen.

Accordingly the appellant has failed to demonstrate to the Board's satisfaction that it should not have advanced the arguments and documents filed with the statement of grounds of appeal as the basis of a new novelty attack during the proceedings before the department of first instance. Moreover there were several reasons why the evidence provided seems doubtful as detailed in the communication sent by the Board in preparation of the oral proceedings.

The Board therefore considers it appropriate to exercise its power pursuant to Article 12(4) RPBA to hold inadmissible the new novelty objection based on D14a, D14b, D15 and D16.

There being no further novelty objections raised in

appeal proceedings, the requirements of Article 54 EPC are held to be satisfied.

3. Inventive step

The patent in suit is directed to a high density polyethylene polymer with excellent processability, mechanical strength (strain at break, tear strength) and which is capable of being formed into films with excellent WVTR (paragraph [0001]). The films are intended for uses such as food packaging (paragraph [0002]).

In the statement of grounds of appeal, two approaches were presented with respect to the discussion of inventive step based on the documents D5 and D10 as closest prior art respectively.

3.1 D5 as closest prior art.

It was not disputed between the parties (see in this respect the statement of grounds of appeal, page 14, lines 4-23 and the rejoinder, section 59). that D5 related to the same problem and broadly the same type of materials as the patent in suit i.e. polyethylene films for food packaging with good WVTR (D5, page 1, lines 5-9 and 12-23).

3.1.1 Distinguishing feature

It was also a matter of consensus that the distinguishing feature was the value of Mw/Mn, D5 specifying in claim 1 a value of less than 2.5 and in example 2 disclosing a composition having all features as required by operative claim 1 apart from the Mw/Mn

which had a value, of 2.5.

3.1.2 Technical effect

The examples of the patent do not permit any conclusions to be drawn as to whether the distinguishing feature gives rise to any technical effect with respect to the compositions of D5.

3.1.3 Objective technical problem

The objective technical problem can therefore only be formulated as the provision of further HDPE films suitable for packaging and exhibiting i*nter alia* good WVTR and mechanical strength.

3.1.4 Obviousness

D5 itself provides no pointers to the claimed solution since it requires a range of Mw/Mn below that defined. Indeed D5 emphasises at page 12 line 20 to page 13 line 11 that the defined Mw/Mn range (less than 2.5 as in claim 1) creates a distinction between the resins according to D5 and those produced using "traditional" Ziegler-Natta or chromium catalysts. This demonstrates that the definition of Mw/Mn within the context of D5 is not arbitrarily chosen, but is in fact central to the invention thereof.

Accordingly based on the teaching of D5 alone it would not be obvious to modify the resins thereof by changing the Mw/Mn to lie in the claimed range, on the contrary this would go against the teaching of the document.

The appellant invoked as a secondary disclosure the teaching of D9, which also relates to water vapour

transmission resistant films for food packaging, in particular cereal liners (page 1, lines 9 and 10). The compositions of D9 are blends of two polymers having different properties (page 1, lines 1-8). The first polymer has Mw/Mn in the range 1.5-5 (claim 2; page 2, line 13). According to example 1 a two component polymer blend is prepared, consisting of two branched polymers, one heterogeneously branched, the other homogeneously branched (commencing at page 23, line 26). The resulting composition has a Mw/Mn of 8.4 (page 24, line 13; Table 1).

Thus although D9 is directed to the same general purpose as the patent in suit and D5, the solution it provides is incompatible with that of D5 to the extent that a feature identified as central to the invention of D5, namely the specified range of Mw/Mn is different, i.e. significantly higher in D9. Indeed whilst D5 relates to a single polymer, as demonstrated in its examples, the whole thrust of D9 is to employ a blend of polymers, one to provide the necessary film properties and the other - broader molecular weight distribution polymer - to provide processability (D9, page 1, line 20 to page 2 line 8).

The argument of the appellant (statement of grounds of appeal, page 15, line 25 to page 16, line 3; page 17 lines 3-10) was that since D5 disclosed a lower Mw/Mn and D9 disclosed a higher Mw/Mn it would be obvious by combining these teachings to arrive at an intermediate Mw/Mn, corresponding to values within the range of claim 1.

However this argument relies on *ex post facto* considerations in particular with respect to aiming for a particular range of Mw/Mn. Neither D5 or D9 provide a

pointer to the Mw/Mn range of claim 1 and themselves disclose mutually exclusive values of Mw/Mn, as explained above. Indeed the only document to contain such information pointing to the now claimed range is the patent itself.

The additional argument that, if the proportions within the compositions of D9 were varied, one would arrive at a composition with Mw/Mn within the claimed range (statement of grounds of appeal, page 17 lines 3-10) is essentially correct in principle. However, there is no indication in D9 to carry out such a modification or any other guidance in the prior art to direct the skilled person towards compositions with the required Mw/Mn, meaning that this argument also relies on *ex post facto* considerations.

Accordingly the combination of D5 and D9 does not render the subject-matter claimed obvious.

The appellant invoked further documents, D7 and D8 both of which relate to the resin "M6020" (D7, Table 1, 3rd entry; D8 entire document). D7 reports the values of Mw and Mn from which it can be calculated that the Mw/Mn is 7.8 and so outside the range required by operative claim 1. It is also reported that the MFR_{21} is 88.0 g/10 minutes, and hence also outside the claimed range.

Accordingly the same considerations arise as for the combination of D5 and D9 in that the Mw/Mn in D7/D8 is above the range of D5 and incompatible with the teaching thereof. Furthermore the different MFR_{21}, lying outside the claimed range, raises the question of how the combination of D7/D8 with D5 would lead directly to a composition fulfilling this requirement.

3.1.5 It is therefore concluded that D5 neither alone nor in combination with one or more of the documents D7-D9 renders the subject-matter claimed obvious.
A similar argument was also made with respect to the combination of D5 with D10, which latter document is discussed in the following section.

3.2 D10 as closest prior art

In a second approach the appellant invoked D10 as closest prior art.
This document is a theoretical treatment relating to a productive model to "help develop new high performance HDPE for barrier film applications" (title).

In the "Discussion" on page 1 of the document various properties are identified which it was considered influenced the barrier properties. With respect to MWD it is stated that the effect has not been well established but that "it is believed narrower MWD is better". On page 2 there is reference to experimental data but no details of these individual polymers or their production is given. There then follows details of the equations developed as a predictive model based on these - only very generally described - polymers. Table 1 lists the experimental data with certain properties of the polymers prepared, however Mw/Mn is not given, notwithstanding that, as submitted by the appellant, the values MFR_{21}/MFR_2 can serve in a general manner as a proxy for Mw/Mn (statement of grounds of appeal, page 19, lines 2 and 3).

The further argument that the resin F1 of D10 appears to be identical to that of D7 (M6020) in view of the reported values of melt index, density and MFR is, notwithstanding the lack of relevance of D7, (see

section 3.1.4, above), not convincing since other properties given in Table 1 of D7 (Mn, Mw, Mw/Mn) are not reported in D10. It is therefore not apparent how it should be possible to conclude, as the appellant seemingly has done, that the Mn/Mn is in fact the same as in D7.

Indeed the information given in D10 is so generalised and incomplete that it is not possible to draw any firm conclusions as to properties or trends. In particular it is not possible to derive from this document any indication to a composition having the claimed features. At most the reverse might be possible in that the data of the patent could potentially serve to assist in verifying the model of D10.

Accordingly the disclosure of D10 either on its own or as a secondary document in combination with D5 does not render the claimed subject-matter obvious.

3.3 Approach based on D9 as the closest prior art - admittance

With letter of 30 April 2018, and thus after issue of the summons to oral proceedings and the communication of the Board, the appellant for the first time in the entire proceedings presented an attack on inventive step invoking D9 as the closest prior art.

Contrary to the submissions of the appellant at the oral proceedings before the Board, no indication, even implicit, can be identified in the statement of grounds of appeal of an approach to inventive step based on D9 as the closest prior art. All that is stated herein is that D9 is to be combined as a secondary document with D5 (starting at page 15, line 25 and summarised at page

19, line 25).

The presentation of this argument in the letter of 30 April 2018 thus represents a change of case made subsequent to issue of the summons to oral proceedings.

The document D9 has been in the opposition proceedings from the outset. As also noted above with respect to the newly submitted novelty approach (see section 2, above), the amended claims in question had been in the proceedings since the earliest possible point, i.e. the reply to the notice of opposition.

No justification has been advanced and none can be identified by the Board for submitting this line of argument only at this advanced stage of the procedure. Since, as further submitted by the respondent, it was not certain whether additional experimental evidence was needed and which amendments might been necessary to address this newly advanced line of argument should it have been admitted and discussed, it was clear that the new line of attack raised issues which the respondent could not reasonably be expected to deal with without adjournment of the oral proceedings.

Under these circumstances, the objection of lack of inventive step based on D9 as closest prior art is not admitted pursuant to Article 13(3) RPBA.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman:

L. Stridde D. Semino

Decision electronically authenticated