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**Datasheet for the decision
of 14 October 2019**

Case Number: T 2381/16 - 3.3.03

Application Number: 04741240.8

Publication Number: 1651720

IPC: C08L23/10, C08J5/18, B32B27/32

Language of the proceedings: EN

Title of invention:
POLYOLEFIN ARTICLES

Patent Proprietor:
Basell Poliolefine Italia S.r.l.

Opponent:
Borealis AG

Relevant legal provisions:
EPC Art. 56
RPBA Art. 12, 13

Keyword:
Inventive step - (no)
Auxiliary requests - admitted (no) - no case presented for these



Beschwerdekammern

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Case Number: T 2381/16 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 14 October 2019

Appellant:

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted on 29 August 2016
rejecting the opposition filed against European
patent No. 1651720 pursuant to Article 101(2)
EPC.**

Composition of the Board:

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

Summary of Facts and Submissions

- I. The appeal lies from the decision of the opposition division posted on 29 August 2016 rejecting the opposition against European patent number 1 651 720.
- II. The patent was granted with a set of 8 claims, whereby claim 1 read as follows:

"Articles prepared by extrusion, mouldings [*sic*] and combinations thereof, comprising a heterophasic polyolefin composition having a meltflowrate [*sic*] value up to 2 g/10 min (ISO 1133, 5kg, 230°C) comprising (percent by weight):

- 1) 65-95% of a crystalline propylene polymer selected from propylene homopolymer, the said polymer being insoluble in xylene at ambient temperature in an amount over 85% and having a polydispersity index, measured by rheological method, ranging from 4.5 to 13 and an intrinsic viscosity ($[\eta]$) value of over 2.2 dl/g; and
- 2) 5-35% of an elastomeric olefin polymer of ethylene with a C₃-C₁₀ α -olefin and optionally a diene, having an ethylene content ranging from 15 to 85% and an intrinsic viscosity ($[\eta]$) value of at least 1.4 dl/g;

wherein the ratio of the intrinsic viscosity value of crystalline polymer (1) to that of elastomeric polymer (2) ranging from 0.45 to 1.6."

- III. A notice of opposition was filed in which revocation of the patent in its entirety was requested.

The following documents, *inter alia*, were relied upon in the opposition proceedings:

D1: US-B1-6 433 087 (with Notice of Opposition)

D8: Experimental report filed by the patent proprietor with letter dated 12 May 2016.

IV. According to the decision the requirements of novelty, sufficiency of disclosure and added subject-matter were met. It is not necessary for the purposes of this decision to provide further details of these findings.

Regarding inventive step the closest prior art was held to be D1, the subject-matter claimed being distinguished therefrom in that:

- the MFR₅ of the polymer blend was defined;
- the polydispersity index (hereinafter "PDI") of the crystalline polypropylene polymer was defined;
- the intrinsic viscosities of the polymer components (1) and (2) and the blend were determined in tetralin;
- the viscosity of the crystalline polypropylene (1) was defined;
- the xylene insoluble percentage of the crystalline polypropylene (1) was defined.

The patent contained no suitable comparative examples. However on the basis of the experimental report D8 it was shown that the specified range of the PDI resulted in improved balance of impact properties and stiffness of the compositions and of the pipes produced therefrom. In particular D8 established that positive effects were obtained by the claimed subject-matter with respect to the flexural modulus of the composition and the ring stiffness and modulus of elasticity of tension in the resulting pipes. The problem solved was the provision of an improved article comprising a

propylene composition and having an improved balance of both high modulus of elasticity in extension and high impact strength. The solution of employing a matrix polymer of broader PDI than disclosed in D1 was not rendered obvious either on the basis of D1 alone or in combination with other cited documents.

Thus the opposition was rejected.

- V. The opponent (appellant) filed an appeal against the decision.

Inter alia, objections pursuant to Article 56 EPC were pursued.

- VI. With letter dated 12 May 2017 the patent proprietor (respondent) requested dismissal of the appeal and submitted sets of claims forming first to fifth auxiliary requests. An extension of one month to file a substantive response to the statement of grounds of appeal was requested.

- VII. The Board issued a summons to attend oral proceedings. With communication dated 2 April 2019 the Board noted *inter alia* the absence of any substantive response by the respondent.

- VIII. With letter dated 31 May 2019 the respondent addressed the arguments set out in the statement of grounds of appeal.

- IX. With letter, also of 31 May 2019, the appellant made further written submissions.

- X. The Board issued a communication setting out its preliminary view on the case.
- XI. With letter dated 6 August 2019 the appellant requested that none of the auxiliary requests be admitted, or that in the case any of these were admitted the case be remitted to the department of first instance.
- XII. Oral proceedings were held before the Board on 6 September 2019.

In the course of the oral proceedings the respondent withdrew the first and second auxiliary requests.

Claim 1 of the third auxiliary request was limited to pipes with defined ring stiffness. Claim 1 of fourth auxiliary request corresponded to claim 1 of the third auxiliary request with a further restriction in respect of the modulus of elasticity in tension of the pipes. The set of claims of the fifth auxiliary request differed from the one of the fourth auxiliary request by deletion of claims directed to the composition.

- XIII. The arguments of the appellant, insofar as relevant for the present decision, can be summarised as follows:

(a) Main request - inventive step

- (i) The closest prior art was considered, in accordance with the findings of the decision, to be D1.
- (ii) It was acknowledged that D1 did not disclose the specified range of PDI, which thus represented the distinguishing feature. This was the only possible

distinguishing feature relied upon by the respondent as involving an inventive step.

(iii) The experimental report D8 did not provide a valid comparison between the subject-matter claimed and the closest prior art since the composition of example 1 of the patent and of the two examples of D8 differed from each other in more respects than the PDI, namely:

- amounts of matrix and copolymer
- ethylene monomer content of the copolymer
- intrinsic viscosity ratio.

Considering that the two examples of D8 had identical PDI, the results showed that the above further differences had a significant effect on the properties of the composition, and hence the properties of articles, in particular pipes, prepared therefrom. Thus it was impossible to derive any effect arising solely from the PDI. Example 2 of the patent, invoked by the respondent (see below) could not be used as a basis for comparison, certain similarities in the compositions notwithstanding, since the pipe upon which the tests had been carried out was of different dimensions (diameter 250mm, thickness 10.7mm) to that of example 1 of the patent (diameter 110.24 mm, thickness 3.2mm), and it had not been shown that the results reported would be representative for those of the pipe as used in the examples of D8.

- (iv) As a result there was no evidence for a technical effect associated with the distinguishing feature and consequently, contrary to the findings of the decision, no evidence that this resulted in an improvement in properties of any kind.
- (v) Thus the objective technical problem could only be formulated as the provision of further compositions.
- (vi) A number of documents contemplated broadening the PDI as a means to improve the properties of polymer systems. D1 itself in column 2, lines 1-11 discussed strategies for increasing the rigidity and strength of polypropylene, one of which was broadening of the molecular weight distribution.
- (vii) On that basis the articles of claim 1 were not inventive.

(b) Auxiliary requests - admittance

No explanations had been provided for any of the auxiliary requests. Thus the reason for submitting these was not known, meaning that the provisions of the rules of procedure had not been complied with. Thus they should not be admitted.

XIV. The arguments of the respondent, insofar as relevant for the decision, can be summarised as follows:

(a) Main request - Inventive step:

- (i) Closest prior art was D1.
- (ii) A number of differences was present, the critical one - the specified range of PDI - providing an effect and supporting the presence of an inventive step.
- (iii) Experimental report D8 provided evidence that this feature gave rise to improved properties of the composition. Comparison of example 1 of the patent with the examples of D8 showed improvements in flexural modulus of the polymer composition and improved ring stiffness and modulus of elasticity in tension of the pipe. Whilst there were some further differences in the constitution of the compositions compared, it had not been shown that these would account for any of the effects demonstrated.

A comparison with example 2 of the patent was also relevant. The difference in the pipe dimensions between example 2 and that employed in example 1 of the patent and in the examples of D8 did not invalidate these conclusions since the equations accounted for and normalised these parameters. Thus comparison of example 2 of the patent with the results of D8 provided further strong evidence of an improvement in the properties of the composition and resulting pipes associated with the distinguishing

feature, i.e. the claimed range of PDI.

- (iv) The technical effect achieved by the distinguishing feature was an improvement in the properties of the pipes.
- (v) The objective technical problem was accordingly to be formulated as the provision of improved compositions for pipes.
- (vi) There was no teaching in the prior art to adjust the PDI of the matrix component of the heterophasic polymer in order to achieve the indicated improvements in the properties of pipes.

Even if it were considered that the problem was only to provide further compositions, then the claimed solution would still have to be considered as non-obvious. No document taught to carry out the indicated modification compared to the closest prior art for any reason. If anything D1 taught away from this solution - the discussion in column 2, lines 1-11 contained no indication to adjust the PDI of the matrix of a heterophasic polymer.

Whilst it could not be excluded that other properties of the compositions influenced the properties of interest, there was no evidence that a composition and pipe having the indicated properties could be obtained with a composition having a PDI outside the

claimed range.

- (vii) On that basis, an inventive step should be acknowledged.

(b) Third-fifth auxiliary requests - admittance

The requests had been filed in due time. Although no detailed explanations in support thereof had been provided, this was not necessary since the requests were self-explanatory and clearly directed to overcoming the objections of the appellant. These requests corresponded either to the requests from the first instance proceedings and/or contained features taken from the description with the purpose further to differentiate the claimed subject-matter from the prior art, thus reinforcing the considerations leading to a finding of non-obviousness. None of the requests gave rise to fresh issues.

- XV. The appellant requested that the decision under appeal be set aside and that the European patent No. 1651720 be revoked. It was further requested that the third to fifth auxiliary requests not be admitted into the proceedings. In case of admittance of one of the auxiliary requests it was requested to remit the case to the first instance for further prosecution.

- XVI. The respondent requested that the appeal be dismissed, or, in the alternative, that the patent be maintained in amended form according to one of the third to fifth auxiliary requests filed with letter dated 12 May 2017 (response to the statement setting out the grounds of appeal). It was further requested that the newly raised objection against novelty based on D2 and the related

documents D10, D10a, D14, D15, D18, D19 and D19a as well as the objections against Article 123(2) EPC other than regarding the formula in claim 3 not be admitted into the proceedings.

XVII. At the conclusion of the oral proceedings it was announced that the decision would be given in writing.

Reasons for the Decision

1. In view of the conclusions reached below, it is not necessary to take a decision on the issues of added subject-matter, sufficiency of disclosure or novelty for the main request. In particular the decisions announced during the course of the oral proceedings before the board not to admit a number of objections under Article 123(2) EPC and concerning lack of novelty do not affect the outcome of the present case and do not need to be dealt with in any detail in the present decision.

2. Main request - inventive step

2.1 By common consent the closest prior art was held to be D1.

2.2 Distinguishing feature

It was also a matter of consensus that the subject matter claimed is distinguished therefrom by the specified value of PDI of the crystalline polypropylene polymer.

During the course of the opposition and appeal

proceedings there was discussion about whether certain other features of the claims would also represent a distinction over the closest prior art, reference being made in particular to the melt flow rate of the composition and to the xylene insolubles content of the crystalline polypropylene polymer. However, since no argument has been advanced in respect of a technical effect associated with any of these features, nor in respect of their relevance for the acknowledgement of lack of obviousness, it is not necessary for the Board to take a decision on whether these represent distinguishing features or not as in any case they cannot contribute to the presence of an inventive step.

2.3 Technical effect

The patent itself does not contain any suitable comparisons. However the respondent had submitted during the opposition proceedings test report D8 and based its arguments regarding the presence of an effect on the data reported therein in combination with those of the patent.

The essentials of the compositions of examples 1 and 2 of the patent in suit and of the examples of D8 are given in the following table whereby "MFR" denotes melt flow rate and "Xyls" denotes xylene solubles content:

	Example 1 of patent	Example 2 of patent	Example 1 of D8	Example 2 of D8
PDI 1 st component	6.2	6.7	4	4
MFR 1 st component (g/10 min)	1.6	0.68	1.5	1.3
Xyls 1st component (weight %)	1.6	1.4	2.1	2.2
Split (weight %)	92/8	90/10	90/10	83.5/16.5
Ethylene content 2 nd component (weight %)	42	46	47	53
Xyls final (weight %)	8.3	10.1	10	15.5
Ethylene content, final (weight %)	3.3	4.7	4.5	8.5
Viscosity Ratio	0.86	1.09	0.94	1.1

It is seen that the PDI of the examples of the patent is within the claimed range whilst that of the two examples provided in D8 is not, corresponding to the distinguishing feature.

However there are other differences between the respective first polymer of these compositions going beyond the distinguishing feature namely:

- Melt flow rate (MFR)
- Xylene solubles (Xyls).

Furthermore there are additional divergencies between the respective second components and also between the total compositions:

- Ethylene content of the dispersed fraction
- Ethylene content of the final polymer
- Xylene solubles (Xyls) of the final polymer
- The split between the two components
- Viscosity ratio of the whole polymer.

In detail, example 2 of the patent corresponds in terms of the split and the ethylene content of the second component closely to example 1 of D8. However the differences between the values of melt flow rate and xylene solubles of the first component are so large that it cannot be concluded that any difference in properties of the resulting compositions or pipes is solely the consequence of the distinguishing feature. Moreover, three different splits are employed in the set of data reported in the table above meaning that any comparison between any other sets of examples other than the two mentioned above is not meaningful. It is also apparent that the nature of the two components employed varies between the examples, further impeding any meaningful comparison.

The structure of the data provided, with multiple variations in properties between the various examples, does not make it possible to determine whether any technical effect arises as a result of the distinguishing feature, i.e. to isolate the influence - if any - of the polydispersity index.

Consideration of example 2 of the patent introduces yet a further divergence. Not only are properties such as the MFR and xylene solubles in the first fraction

different, the pipe properties were determined on a pipe of approximately double the diameter and double the thickness of that employed in example 1 of the patent and the examples of D8 (see section XIII.(a)(iii), above). The submissions of the respondent that the underlying equations would correct or normalise for these differences has not been proven, and hence this submission cannot be entertained.

Accordingly the data supplied are not suitable to furnish evidence for a technical effect associated with or deriving from the distinguishing feature.

2.4 Objective technical problem, its solution

As a consequence of the foregoing, the technical problem can be formulated only as the provision of further compositions based on those known from D1.

The solution to this problem was the indicated limitation of the PDI of the first component of the compositions, i.e. the propylene homopolymer.

2.5 Obviousness

In view of the objective problem, i.e. the provision merely of further compositions with no requirement for any particular properties, any conceivable modification - for example of the PDI - represents an obvious solution.

D1 itself suggests in column 2, lines 1-11 that it is known that the properties of propylene homopolymer - of which the present component 1 is an example - can be adjusted by broadening the molecular weight distribution, which corresponds to increasing the PDI.

Hence the closest prior itself suggests adjustment of that parameter identified as the distinguishing feature as a route to providing further compositions.

Furthermore it has not been argued, and there is no evidence, that there was any particular technical obstacle to achieving a PDI in the claimed range.

It is correct, as submitted by the respondent (see section XIV.(a).(vi), above), that D1 does not contain any explicit teaching to adjust the PDI of the matrix of a heterophasic polymer. However by the same token, there is no teaching in D1 which would lead away from this, contrary to the position of the respondent. However in view of the minimalistic nature of the objective technical problem to be solved, no such differentiated or directed teaching is required. It is merely a matter of doing something different, and D1 provides an indication of one such possible measure to accomplish this goal. It has furthermore not been argued, let alone rendered credible, that the skilled person would have had any reason to dismiss such a modification to the polypropylene matrix of a heterophasic polymer.

Accordingly an inventive step is denied.

3. Third to fifth auxiliary requests - admittance

These requests were filed with the rejoinder to the statement of grounds of opposition. No explanation of any kind was provided at that stage. With letter dated 31 May 2019 the respondent indicated the amendments that had been made and, at least for the third auxiliary request, stated that these amendments had been made "in order to provide further differentiation from the prior art". Further explanations were given

only superficially at the oral proceedings. In particular, even at that stage, no specific arguments as to the relevance of the amendments to overcome the objections for the main request, in particular the lack of inventive step were provided.

Article 12(2) RPBA require that the parties present their complete case at the outset of the appeal proceedings, i.e. with the statement of grounds of appeal and the reply thereto.

The respondent has however failed to set out the case for the auxiliary requests with the reply to the statement setting out the grounds of appeal, so that the requests cannot be considered as properly filed at that stage. Even taking into account the letter of 31 May 2019 and the position at the oral proceedings, the Board, in the absence of a justification for not having filed any argumentation at the correct point in time and in the absence of a proper argumentation even at a later time, does not find any reason for admitting the auxiliary requests.

The Board accordingly finds it appropriate to exercise its discretion under Articles 12 and 13 RPBA by not admitting the third to fifth auxiliary requests 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:



C. Spira

D. Semino

Decision electronically authenticated