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**Datasheet for the decision
of 18 November 2010**

Case Number: T 0730/08 - 3.3.09

Application Number: 96908798.0

Publication Number: 0831994

IPC: B32B 27/08

Language of the proceedings: EN

Title of invention:

Production of uniaxially shrinkable biaxially oriented polypropylene films

Patentee:

ExxonMobil Oil Corporation

Opponent:

Treofan Germany GmbH & Co. KG
Brückner Technology Holding GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 56, 83

Relevant legal provisions (EPC 1973):

-

Keyword:

"Sufficiency - yes"
"Inventive step - yes"

Decisions cited:

-

Catchword:

-



Case Number: T 0730/08 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 18 November 2010

Appellant 01: Treofan Germany GmbH & Co. KG
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Appellant 02: Brückner Technology Holding GmbH
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Respondent: ExxonMobil Oil Corporation
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office announced orally on
22 November 2007 and posted 2 January 2008
rejecting the opposition filed against European
patent No. 0831994 pursuant to Article 102(2)
EPC 1973.

Composition of the Board:

Chairman: W. Sieber
Members: J. Jardón Álvarez
K. Garnett

Summary of Facts and Submissions

I. European patent No. 0 831 994 was granted in respect of European patent application No. 96908798.0, which was filed in the name of MOBIL OIL CORPORATION (now ExxonMobil Oil Corporation) on 13 March 1996 as International application PCT/US96/03448 (WO 96/033864). The mention of grant was published on 13 August 2003 in Bulletin 2003/33. The patent was granted with 7 claims, Claim 1 reading as follows:

"1. A method for preparing a uniaxially heat shrinkable, biaxially oriented, multilayer film having a polypropylene-containing core layer having a melting point (as determined by Differential Scanning Calorimetry at heating rate of 2°C/minute) of less than 160°C and at least one polyolefin-containing skin layer adjacent the core layer, wherein the method comprises coextruding the core layer and the skin layer to provide a coextrudate, biaxially orienting the coextrudate and reorienting the biaxially oriented coextrudate, **characterised in that**

the biaxial orientation is conducted by orienting the film on a line which utilises linear motors to directly propel opposed pairs of tenter clips synchronously whereby primary orienting by simultaneous biaxial orienting is effected by accelerating along a diverging path directly opposed pairs of tenter clips holding the film, and

the reorientation of the biaxially oriented coextrudate is effected on the same line along a parallel path subsequent to the diverging path by simultaneously accelerating the directly opposed pairs

of tenter clips along some portion of the parallel path."

Claims 2 to 7 were dependent claims.

II. Notices of opposition were filed on 13 May 2004 by:

Trespaphan GmbH & Co. KG, now Treofan Germany GmbH & Co. KG (Opponent 01), and

Brückner Maschinenbau GmbH, now Brückner Technology Holding GmbH (Opponent 02).

Revocation of the patent in its entirety was requested by Opponent 01 on the grounds pursuant to Article 100(a) (lack of novelty and lack of inventive step) and Article 100(b) EPC, by Opponent 02 on the grounds pursuant to Article 100(a) (lack of inventive step) and Articles 100(b) and (c) EPC.

During the opposition proceedings *inter alia* the following documents were cited:

D4: JP 55-103931;

D5: EP 0 498 249 A2;

D6: US 4 853 602 A; and

D7: BOPP MARKETS AND GROWTH-DEVELOPMENT IN TECHNOLOGY;
P. Kurth in POLYPROPYLENE'94, 4-5 October 1994,
Zurich, Switzerland; , Session VII, pages 2-1
to 2-19.

III. In the decision announced orally on 22 November 2007 and issued in writing on 2 January 2008, the opposition division rejected the oppositions, because, in its opinion, none of the grounds for opposition raised by the opponents prejudiced the maintenance of the patent as granted.

IV. On 26 February 2008 Opponent 02 (Appellant 02) filed an appeal against the decision of the opposition division and paid the prescribed fee on the same day. With the statement setting out the grounds of appeal filed on 9 May 2008, Appellant 02 requested that the decision under appeal be set aside and the patent be revoked in its entirety. In support of its arguments, Appellant 02 also filed the following fresh documents:

D15: EP 0 171 733 A2; and

D16: WO 96/07699 A1.

V. On 3 March 2008 Opponent 01 (Appellant 01) also lodged an appeal and paid the prescribed fee on the same day.

VI. By communication of 7 July 2008, duly received by Appellant 01, the registry of the board informed Appellant 01 that it appeared from the file that the written statement of grounds of appeal had not been filed, and that it was therefore to be expected that the appeal would be rejected as inadmissible pursuant to Article 108, third sentence, EPC in conjunction with Rule 101(1) EPC. Appellant 01 was informed that any observations had to be filed within two months of notification of the communication.

No reply was received.

VII. With letter dated 3 February 2009 the patent proprietor (respondent) requested as main request that the appeals be dismissed. The respondent further filed sets of claims for two auxiliary requests and the following new documents:

- D17: "New High-Grade S-BOPP and S-BOPET Film Types Produced with the Linear Motor Stretching Technology" Dr.-Ing. Jürgen Breil, Brückner Maschinenbau GmbH, Specialty Plastic Films '99, 13-15 December 1999, Zürich, Switzerland, pages Session IV/1-1 to Session IV/1-21;
- D18: "Added Value Speciality Films Produced with Sequential and Simultaneous Stretching Lines" by Dr.-Ing. Jürgen Breil, Brückner Maschinenbau GmbH, Speciality Plastic Films 2002 29-30 October 2002 Zürich, Switzerland, pages Session 2/2-1 to Session 2/2-32;
- D19: "New Developments for Biaxially Stretched Polyolefin Films with Linear Motor Driven Simultaneous Stretching Technology" by Dr. Juergen Breil, Brueckner Maschinenbau GmbH, 2002 (hand dated), five pages; and
- D20: "Speciality Oriented Films. -New Markets - New Applications -New Developments" by Dr. Jürgen Breil, Brückner Maschinenbau GmbH, Speciality Plastic Films 2004, 18-19 October 2004, six pages.

VIII. On 22 July 2010 the board dispatched a summons to attend oral proceedings on 18 November 2010. In the attached communication the board drew the attention of the parties to the points to be discussed during the oral proceedings.

IX. With letter dated 18 October 2010 the respondent filed further arguments in support of its requests, a set of claims for a third auxiliary request and the following document:

D21: "Lisim[®] Linear Motor Simultaneous Stretching Technology" Presentation at CMM International Conference, Chicago, 16 April 1997, Dr. Jürgen Breil, fourteen pages.

X. On 18 November 2010 oral proceedings were held before the board. In the course of the oral proceedings, the respondent withdrew all its previous requests and filed a set of five claims for a new third auxiliary request and an accordingly adapted description.

Claim 1 of the third auxiliary request reads:

"1. A method for preparing a uniaxially heat shrinkable, biaxially oriented, multilayer film having a polypropylene-containing core layer having a melting point (as determined by Differential Scanning Calorimetry at heating rate of 2°C/minute) of less than 160°C and at least one polyolefin-containing skin layer adjacent the core layer, wherein the method comprises coextruding the core layer and the skin layer to provide a coextrudate, biaxially orienting the coextrudate and reorienting the biaxially oriented

coextrudate and wherein the core layer is formed of a single atactic homopolymer material or a blend of isotactic polypropylene with modifier which reduces the crystallisation or crystallinity of the polypropylene by increasing chain imperfections or reducing isotacticity of the polypropylene-containing core, whereby the film after biaxial orientation has sufficiently low crystallinity to permit the reorientation without tearing, characterized in that

the biaxial orientation is conducted by orienting the film on a line which utilises linear motors to directly propel opposed pairs of tenter clips synchronously whereby primary orienting by simultaneous biaxial orienting is effected by accelerating along a diverging path directly opposed pairs of tenter clips holding the film,

the reorientation of the biaxially oriented coextrudate in machine direction at a stretch level of greater than 30% is effected on the same line along a parallel path subsequent to the diverging path by simultaneously accelerating the directly opposed pairs of tenter clips along some portion of the parallel path, and

the resulting film has a shrinkage of greater than 15% at 135°C in the direction of reorientation and stability of $\pm 5\%$ in the direction normal to the direction of reorientation."

Claims 2 to 5 are dependent claims.

XI. The arguments presented by Appellant 02 in its written submissions and at the oral proceedings may be summarized as follows:

- Appellant 02 did not raise any objections to the admissibility of the third auxiliary request of the respondent during the oral proceedings. It also had no objections concerning Articles 123(2) or (3) EPC.
- Appellant 02 maintained that the patent in suit did not fulfil the requirements of sufficiency of disclosure because it failed to indicate the process parameters necessary to prepare a high quality polypropylene film. It also pointed out that its objection was in fact related to inventive step and the same level of skill for the skilled person was required when interpreting the prior art and the disclosure of the patent in suit.
- Finally Appellant 02 argued that the claimed subject-matter lacked inventive step having regard to the combined teaching of documents D7 and D5. In its opinion it was obvious to apply the process of D7 for the preparation of the claimed polypropylene shrink films, as films using the same materials were disclosed in D5.

XII. The arguments of the respondent may be summarised as follows:

- Concerning sufficiency of disclosure, the respondent pointed out that it was known to the skilled person how to achieve the stretch ratios of the claimed films. The machine used was known from D6 and the

patent further required the use of this machine for making uniaxially shrinkable films. The optimum parameters would depend on the specific compositions of the film as well on the properties of the equipment, such as length of heating zones, line speed, etc. This could be established by the skilled person by routine experimentation.

- The respondent, starting from the disclosure of D5 as closest prior art, saw the problem underlying the patent in suit as being the provision of a method for obtaining improved shrinkable films which may be reoriented without tearing and without using heated rolls. The films obtained by the claimed method had particularly good dimensional stability in the transverse direction over a broad temperature range. The solution according to the claimed process was not obvious in view of the cited prior art. In particular D7 gave no hint to the claimed method as it did not relate to shrink films.

XIII. Appellant 01 requested in its notice of appeal dated 3 March 2008 that the decision under appeal be set aside and that the European patent No. 0 831 994 be revoked.

Appellant 02 requested that the decision under appeal be set aside and that the European patent No. 0 831 994 be revoked.

The respondent requested that the decision under appeal be set aside and the patent be maintained on the basis of the third auxiliary request filed during the oral proceedings.

Reasons for the Decision

1. *Admissibility*

1.1 Appellant 01 did not file a written statement setting out the grounds of appeal within the time limit provided by Article 108, third sentence, EPC in conjunction with Rule 126(2) EPC. In addition, neither the notice of appeal, nor any other document filed, contains anything that could be regarded as a statement of grounds pursuant to Article 108 EPC and Rule 99(2) EPC. Therefore, the appeal of Appellant 01 has to be rejected as inadmissible (Rule 101(1) EPC).

1.2 The appeal of Appellant 02 is admissible.

THE RESPONDENT'S REQUEST

2. *Amendments (Article 100(c) EPC/Article 123 EPC)*

2.1 Claim 1 results from the combination of granted Claims 1, 2 and 7. It further includes the feature that the reorientation is carried out "in the machine direction at a strength level greater than 30%" in accordance with the disclosure on page 4, lines 30-32 of the application as originally filed.

Dependent Claims 2-5 correspond to granted Claims 4-6.

2.2 Appellant 02 did not raise any objections under Article 100(c)/123(2) EPC against the amended claims of this request and the board is satisfied that these claims meet the requirements of Article 100(c)/123(2) EPC.

The objection raised by Appellant 02 under Article 100(c) EPC against paragraph [0033] in the description of the granted patent became otiose, since the respondent deleted the objected passage when adapting the description. There is therefore no need for the board to comment on this issue.

2.3 The amendments made to the claims undisputedly limit their scope. The requirements of Article 123(3) EPC are therefore also satisfied.

3. *Sufficiency of disclosure (Article 100(b) EPC)*

3.1 The board agrees with the finding in the appealed decision that the patent discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

3.2 The patent is directed to a method of preparing a uniaxially heat shrinkable, biaxially oriented, multilayer film having a shrinkage of greater than 15% at 135°C in the direction of reorientation and stability of $\pm 5\%$ in the direction normal to the direction of reorientation, the method being defined by the materials used in the core and skin layers and the process steps, namely: coextruding the layers to provide a coextrudate, simultaneous biaxially orienting the coextrudate and reorienting the biaxially oriented coextrudate. The technologies required for carrying out these process steps were already known before the priority date of the patent.

3.3 Appellant 02 has not disputed that it was possible to prepare a film as claimed using the method of the patent. Basically it argued that the patent lacked *the specific process conditions* to be used in the simultaneous biaxially orientation step in order to obtain high quality films. The reasons for this were, firstly, that there was no commercial equipment available at the priority date of the patent to carry out this process step and, secondly, that the equipment as described in D6 did not, in Appellant 02's opinion, contain any useful information for the simultaneous orientation of polypropylene films.

3.4 However, the patent in suit indicates in paragraph [0033] how to carry out the simultaneous biaxial orientation "by accelerating along a diverging path directly opposed pairs of tenter clips holding the film" and refers in paragraph [0036] to D6 for further details. Document D6 describes in detail such apparatus (see Figure 14 and the corresponding description of the Figure in the specification). Furthermore, Appellant 02 admitted during the oral proceedings that it had developed an apparatus as described in D6 before the priority date of the patent in suit. The mere fact that such equipment was not commercially available does not constitute a bar to sufficiency of disclosure. The public had access to the teaching of D6 and had the possibility to apply it.

3.5 Moreover the objection that the patent specification lacked the specific process conditions is too vague to have any force. Appellant 02 failed to indicate which specific parameters were in its opinion not sufficiently disclosed in the patent, the absence of

which would mean that the claimed process could not be carried out without undue burden.

Moreover, Appellant 02 did not provide any experimental evidence showing that reworking of the patent was not possible.

3.6 Insofar as Appellant 02 argued during the oral proceedings that its objection of insufficiency of disclosure was in fact associated with the objection of inventive step in the sense that the patent and the prior art should be interpreted in accordance with the same standards, it is noted that this is not an objection of insufficiency of disclosure, and that, in any case, it is the practice of the EPO to apply the same level of skill when, for the same invention, the questions of sufficiency of disclosure and inventive step are considered (see, for instance, Case Law of the Boards of Appeal of the European Patent Office, 6th Edition 2010, Chapter II.A.2).

4. *Novelty*

The opposition division acknowledged novelty of the subject-matter of the granted claims, which were broader than the present claims. No novelty objections were raised by Appellant 02 during the appeal proceedings. The board sees no reason to raise an objection on its own.

5. *Inventive step*

The patent in suit relates to the manufacture of uniaxially heat shrinkable, biaxially oriented,

multilayer films having a polypropylene-containing core layer and at least one polyolefin-containing skin layer. Such films are useful for certain packaging applications where it is desirable to effect shrinkage along a single axis without substantial shrinkage in the cross direction.

5.1 Closest prior art

5.1.1 Processes for the preparation of oriented polypropylene films having high unidirectional shrinkage and therefore useful for labelling non-uniform articles are already known, for example from documents D4 and D5.

5.1.2 The board sees the disclosure of D5 as representing the closest prior art document. D5 discloses a process for making biaxially oriented polymer shrink films (see Claim 1) and shrink films having an imbalance of shrinkage consisting essentially of a machine direction shrinkage greater than a transverse direction shrinkage in a ratio of 2:1 (Claim 14). The shrink films are composed of polyolefins, such as polypropylene, and may be coextruded films (see page 4, lines 31-34). The films may be produced by machine direction reorientation of a biaxially oriented film (see page 5, lines 17-24). In Example 2 of D5 a multilayer heat shrinkable film is prepared by coextruding a unspecified polymer material where the reorientation in the machine direction is carried out by placing the film on a series of heated rolls.

5.1.3 Contrary to this, Appellant 02 relied on D7 as the closest prior art document, essentially because D7 discloses the equipment used in the patent in suit (see D7, page 2-17).

5.1.4 In the board's judgement the disclosure of D7 does not represent a suitable starting point for the assessment of inventive step. According to EPO jurisprudence, the closest prior art for assessing inventive step is a prior art document disclosing subject-matter conceived for the same purpose or aiming at the same objective and having the most relevant technical features in common. In document D7 the advantages of biaxially oriented propylene films in packaging are mentioned and a new linear motor simultaneous stretching process (LISIM[®] process, as it is now known) is discussed. However, D7 does not deal either with the preparation of uniaxially heat shrinkable films or with the preparation of multilayer films having a polyolefin-containing skin layer. Consequently, it does not qualify as the closest prior art document.

5.2 Problem to be solved and its solution

5.2.1 Having regard to the closest prior art, the respondent submitted that the heat shrinkable films according to Claim 1 had a shrink stability of at least $\pm 5\%$ in the transverse direction. Furthermore, the claimed process provided films which exhibit this shrink stability in the transverse direction over a fairly broad temperature range. Concerning Example 2 of D5, this example in fact shows good shrink properties for the film in the transverse direction for only one temperature. This information is insufficient to

provide valuable information on dimensional stability of the films over a wider temperature range.

- 5.2.2 Additionally, the method of D5 uses heated rolls for reorientation, such rolls creating problems when the uniaxially heat shrinkable film includes, as with the patent in suit, a polyolefin-containing skin layer which has a lower melting temperature than the core.
- 5.2.3 The technical problem to be solved by the patent in relation to D5 can thus be formulated as the provision of a method for preparing uniaxially heat shrinkable multilayer films having a polypropylene-containing core layer and a polyolefin-containing skin layer and having improved dimensional stability and wherein the drawbacks associated with the use of heated rolls are avoided.
- 5.2.4 The solution to this problem proposed by the patent in suit is the method according to Claim 1, which is characterized by the selection of a specific polypropylene containing layer with a specific sequence of process steps, namely simultaneous biaxial orientation effected by accelerating along a diverging path directly opposed pairs of tenter clips holding the film, and directly following reorientation on the same line by simultaneously accelerating the directly opposed pairs of tenter clips along some portion of the parallel path.
- 5.2.5 In order to demonstrate that the technical problem as defined above has effectively been solved by the claimed method, the respondent relied on the test report filed on 21 September 2007. As apparent from the

table of this test report, the method of Claim 1 yields films with a high shrink stability in the transverse direction at different temperatures (80°C to 135°C). Moreover the method does not involve contact between the skin layer and heated rolls, thus avoiding the drawbacks of the reorientation method of D5.

5.3 Obviousness

5.3.1 The question which remains to be decided is whether the solution proposed by Claim 1 is obvious from the prior art.

5.3.2 There is no hint to the claimed solution in D5, where the reorientation is carried out on heated rolls. The use of heated rolls means that, at reorientation, the film is no longer held by any clips and the heating results in a certain relaxation in the transverse direction during reorientation and, in addition, to certain shrinkage in transverse direction due to the balancing of the stretching in machine direction.

5.3.3 There is also no suggestion of this solution in document D7, on which Appellant 02 mainly relied. Document D7 is a presentation at the Polypropylene '94 conference dealing with biaxially oriented polypropylene films in packaging, focusing mainly on the potential growth for BOPP film applications and, in particular, its use for polypropylene based synthetic paper. D7 ends with a presentation of the new Linear Motor Simultaneous Stretching Process (now known as LISIM®) and this process is compared with the existing 3-stage sequential stretching process (pages 2-16 to 2-19). This new process as illustrated in the figure

of page 2-17 is presented as an alternative to the three stage stretching process for the preparation of oriented films.

However, D7 is completely silent about shrink films in general and uniaxially heat shrinking films are not mentioned at all. The skilled person would not find any hint in this document suggesting the use of the LISIM[®] process in order to improve the dimensional stability of uniaxially heat shrinkable polypropylene films.

- 5.3.4 Appellant 02 argued that the tensilizing step carried out in D7 is made by stretching the already biaxially oriented film and that, in principle, any stretching would cause a modification of the shrink properties of the film. Appellant 02 then concluded that taking account of the fact that the patent in suit was silent about the process parameters which would provide a high quality shrinkable film, the application of the process of D7 for the preparation of shrinkable films would be obvious.
- 5.3.5 The board agrees with Appellant 02 that the equipment referred to on page 2-17 of D7 could be used for carrying out the process now claimed. However, the teaching of D7 is not directed to the preparation of shrink films; the tensilizing step described there is followed by an annealing step wherein the film shrinks back due to change of cristallinity. As discussed during the oral proceedings, the tensilizing step is mainly carried out to improve the tensile strength of the films. However, the fact that this step can also be carried out when preparing shrink films is not an

indication to the skilled person to the preparation of shrink films.

The skilled person would not find any hint in this document suggesting the use of the equipment shown on page 2-17 in order to improve the dimensional stability of biaxially oriented films having a polypropylene core layer and a polyolefin skin layer.

5.3.6 Thus, the combination of the teaching of D5 with the teaching of D7 can only be made with the knowledge of the invention (*ex-post facto*) and cannot bring into question the inventive step of the claimed subject-matter.

5.3.7 As regards the argument of Appellant 02 relied upon during the proceedings that the LISIM[®] process yielded inherently high quality films with specific properties, in particular films having high dimensional stability, it is conspicuous to the board that this argument is not supported by any prior art. In fact, the only cited prior art pointing to this improved property of uniaxially heat shrinkable films is post-published (see, for instance, the shrink properties of the film of page 5 of D20).

5.4 In summary, the board considers that, in the light of the cited prior art, it would not have been obvious to a person skilled in the art to modify the process of D5 by using the equipment of D7 in order to arrive at uniaxially shrinkable films with improved dimensional stability. The subject-matter of Claim 1 thus involves an inventive step within the meaning of Article 56 EPC.

The subject-matter of dependent Claims 2 to 5, which relate to preferred embodiments of the method of Claim 1, also satisfy the requirements of Article 56 EPC.

6. As regards the adapted description filed during the oral proceedings before the board, Appellant 02 did not raise any objections. For its part, the board was satisfied that the description had been correctly adapted.

Order

For these reasons it is decided that:

1. The appeal of Appellant 01 is rejected as inadmissible.
2. The decision under appeal is set aside.
3. The case is remitted to the opposition division with the order to maintain the patent on the basis of:
 - (a) Claims 1 to 5 according to the third auxiliary request filed on 18 November 2010 during the oral proceedings;
 - (b) Pages numbered 2 to 5 of the amended description filed on 18 November 2010 during the oral proceedings.

The Registrar

The Chairman

G. Röhn

W. Sieber