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CHAMBRES DE RECOURS  
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DES BREVETS

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File Number: T 652/91 - 3.3.1  
Application No.: 84 300 763.4  
Publication No.: 0 116 457  
Title of invention: Dispensable polypropylene adhesive-coated tape

Classification: C09J 1/02

D E C I S I O N  
of 2 March 1993

Applicant: Minnesota Mining and Manufacturing Company

Opponent: Unilever N.V.  
Hoechst Aktiengesellschaft, Frankfurt (Main)

Headword: BOPP tapes/MINNESOTA

EPC Article 56

Keyword: "Inventive step (confirmed) - after amendment"



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Boards of Appeal

Chambres de recours

Case Number : T 652/91 - 3.3.1

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.1  
of 2 March 1993

**Appellant :** Minnesota Mining and Manufacturing Company  
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**Respondent 01 :** Unilever N.V.  
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**Respondent 02 :** Hoechst Aktiengesellschaft, Frankfurt (Main)  
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**Decision under appeal :** Decision of the Opposition Division of the  
European Patent Office of 12 March 1991, posted  
on 27 June 1991 revoking European patent  
No. 0 116 457 pursuant to Article 102(1) EPC.

**Composition of the Board :**

**Chairman :** K.J.A. Jahn  
**Members :** R.W. Andrews  
J-C. Saisset

## Summary of Facts and Submissions

- I. European patent No. 0 116 457 in respect of European patent application No. 84 300 763.4, which was filed on 7 February 1984, was granted on 8 July 1987 (cf. Bulletin 87/28).
  
- II. Notices of opposition, which were filed on 26 March 1988 and 6 April 1988, requested the revocation of the patent on the ground that its subject-matter did not involve an inventive step. The oppositions were supported, inter alia by the following documents:
  - (2) CH-A-371 587 and
  - (4) US-A-3 241 662.
  
- III. By a decision delivered orally on 12 March 1991, with written reasons being issued on 27 June 1991, the Opposition Division revoked the patent. The Opposition Division held that the subject-matter claimed according to the main and two auxiliary requests did not involve an inventive step in the light of documents (2) and (4).

Furthermore, the Opposition Division found that certain claims of the auxiliary requests were not allowable since they either related to subject-matter not specifically claimed in the patent as granted or to a new category of claim.
  
- IV. An appeal was lodged against this decision on 27 August 1991 with payment of the prescribed fee. In his statement of grounds of appeal filed on 6 November 1991 and during the oral proceedings held on 2 March 1993, the Appellant emphasised there are significant differences in the properties required for a backing for tapes intended to be manually dispensed by being cut on the serrated blades of table-top dispensers and those needed for

backings for tapes intended to be torn by hand across their width and that the difference between "cutting" and "tearing" is more than a matter of mere semantics.

The Appellant argued that the skilled person would not have expected that biaxially orientating a polypropylene film would solve the problem addressed by the disputed patent since this increases the resistance of the film to being punctured and hence to being easily cut by the teeth of a table-top dispenser.

In the Appellant's view, document (4) merely confirms what he has admitted to be known and is irrelevant since the whole thrust of this document is towards solving a different problem from the one underlying the disputed patent. With respect to this document, the Appellant submitted during oral proceedings a facsimile concerning a conversation between an employee of the Appellant and Gerald Robinson, one of the inventors of the adhesive tapes disclosed therein.

With respect to document (2), the Appellant has contended that it is silent with respect to tapes and it is a remote and obscure document which has been ignored for more than 20 years. However, even if the skilled person were to take it into consideration the films disclosed in Examples 3 and 4 are too thin and shrink too much for them to be suitable as adhesive-coated tapes. With respect to the Respondent's repetition of Example 4 of the document, the Appellant alleged that the drawing temperatures of Examples 1 and 2 were too low to be employed on a commercial scale and that in the absence of any details of how the samples were prepared for the elongation at break tests, the reported values were questionable. Furthermore, the Appellant submitted that the question to be asked in relation to this document was whether the skilled person would select a biaxially oriented polypropylene (BOPP)

backing disclosed in 1963 in the expectation of some improvement or advantage not whether the skilled person could coat such a backing with adhesive.

- V. The Respondent 02 contended that document (4), which was considered to be the closest prior art, disclosed the thickness of the tape and that the backing should not stretch to a length greater than 1.6 times its original length, preferably 1.4 times i.e. 40% in its longitudinal direction before it will break. However, although this document stated that usually the longitudinal direction orientation is greater than the transverse direction orientation, it was silent with regard to the actual stretching ratios. Nevertheless, this gap in the disclosure of document (4) was filled by document (2). In this Respondent's opinion, it was obvious to combine the teaching of these two documents and the skilled person having made this combination would arrive at the claimed subject-matter.

Since the difference between "cutting" and "tearing" was merely linguistic, the Respondent 02 contended that the problem underlying the disputed patent had already been solved. In this connection the Respondent argued that it was the teaching the skilled person would derive from document (4) that had to be considered and not the statements in the facsimile filed by the Appellant during oral proceedings.

Respondent 01 neither made any submissions in response to the grounds of appeal nor any requests. In the telefax of 18 February 1993, it was merely stated that Unilever N.V. would not be represented at the oral proceedings.

- VI. The Appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis

of the main set of Claims 1 to 7 or of the auxiliary set of Claims 1 to 6, both filed during oral proceedings. The only independent claim of the main request reads as follows:

"A tape (10) that can be easily manually dispensed from a dispenser having a toothed cutting blade (22) using a cutting force of less than 13 Newtons when tested on a device (20) according to the method described herein with reference to Figures 2, 3, 4 and 5 of this specification, the tape comprising a biaxially oriented elongate polypropylene film backing (12) having a thickness of 0.013 mm to 0.05 mm and a layer (14) of adhesive coated on one surface of the backing, the backing having the properties that it will break before it can be stretched in its longitudinal direction by 30% and can be stretched by at least 40% in its transverse direction before breaking, the tape having a serrated cut edge when cut by said cutting blade and being substantially undistorted adjacent said serrated cut edge, said tape being made by the steps of

(a) forming a biaxially oriented polypropylene film by casting a polypropylene sheet;

(b) orienting the cast polypropylene sheet in a direction that will become the longitudinal direction of the backing by stretching the sheet in that direction by a factor of between 3 to 7 times its original length dimension;

(c) orienting the sheet in the direction that will become the transverse direction of the backing by stretching the sheet in that direction by a factor of between 3 to 10 times its original width dimension;

(d) lastly stretching the sheet one or more times in the direction that will become the longitudinal direction of the backing to produce a total stretching factor of 1.5 to 5 times with respect to its length after the first longitudinal and transverse stretchings; and

(e) coating the film with adhesive to form a tape that can easily be manually dispensed on a tabletop tape dispenser."

The main claim according to the auxiliary request differs from that of the main request in that it is specified that the toothed cutting blade is dull and that the film backing has a secant modulus of elasticity at one percent elongation in its longitudinal direction of at least  $25 \times 10^5$  kilopascals and it will break before it can be stretched in its longitudinal direction by 25%.

The Respondent 02 requested that the appeal be dismissed.

VII. At the conclusion of the oral proceedings, the Board's decision to maintain the patent on the basis of the claims of the main request was announced.

#### Reasons for the Decision

1. The appeal is admissible.
2. There are no objections under Article 123 EPC to either set of claims. Claim 1 of the main request is based on granted Claims 1, 3 and 10 and Examples 2 to 7 (cf. also Claims 1, 3 and 11 as filed, original Examples 2 to 7 and page 4, lines 17 and 18 of the published patent application).

Claims 2 to 7 according to the main request correspond to Claims 2, 4, 5, 6, 11 and 12 as granted respectively (cf. also Claim 2, 4, 5, 6, 12 and 13 as filed).

- 2.1 Claim 1 of the auxiliary request is based on Claims 1, 2, 3 and 10 as granted, page 2, lines 14 and 15 and Examples 2 to 7 (cf. also Claims 1, 2, 3 and 11 as filed, page 1, lines 18 and 19 and page 4, lines 17 and 18 and Examples 2 to 7 of the published patent application).

Claims 2 to 6 according to the auxiliary request correspond to granted Claims 4, 5, 6, 11 and 12 respectively (cf. also Claims 4, 5, 6, 12 and 13 as filed).

3. The disputed patent relates to a tape comprising a layer of adhesive coated on a BOPP film backing which can be easily and precisely manually dispensed from a table-top dispenser.

- 3.1 It is known to use tapes having backings made of unplasticised polyvinylchloride, cellophane and cellulose acetate in table-top dispensers because of the ease with which they can be manually cut by dispensing blades on such table-top dispensers (cf. page 2, lines 19 to 26).

However, for economic reasons and, to some extent, for environmental reasons, the need arose for tapes having similar dispensing characteristics to these prior art ones with BOPP film backings.

- 3.2 Therefore, the technical problem in the light of this closest prior art is to provide an adhesive coated tape with a backing made of BOPP which can be easily manually cut (i.e. requiring a cutting force of less than 13 Newtons when tested according to the method disclosed in the disputed patent) by the dispensing blade of a table-top dispenser without significant stretching of the backing over the dispensing blade to produce a serrated cut edge on the backing closely corresponding to the shape of the teeth on the cutting blade.

3.3 According to the patent in suit, this technical problem is essentially solved by a tape having a BOPP backing having the properties that it will break before it can be stretched in its longitudinal direction by 30% and can be stretched by at least 40% in its transverse direction before breaking which is made by orientating a cast polypropylene film by first stretching in the direction that will become the longitudinal direction of the backing, then in the transverse direction and finally in the longitudinal direction of the backing and coating the film with adhesive. By adjusting the balance of the stretching ratios in the three stretching operations, BOPP films having the desired properties are obtained.

In the light of Examples 3 to 7 of the disputed patent and of Experiments C1 to C4 filed on 19 November 1992, the Board is satisfied that the above technical problem has been solved.

3.4 The Respondent maintained that document (4) represented the closest prior art. However, this document is solely concerned with the problem of ensuring that the pressure-sensitive mass composition of an adhesive tape is securely and firmly anchored to the BOPP film backing (cf. column 2, line 52 to column 3, line 21). Since this is an entirely different technical problem to the one addressed and solved by the disputed patent, the Board considers this document to be an unsuitable starting point for the examination in respect of inventive step.

4. After examination of the cited prior art, the Board has concluded that the claimed subject-matter is novel. Since novelty is not in dispute, it is not necessary to give detailed reasons for this finding.

5. It still remains to be decided whether the claimed subject-matter involves an inventive step.
- 5.1 Document (4) relates to a pressure-sensitive adhesive tape having a BOPP backing that has been activated to improve its anchorage characteristics and a normally tacky and pressure-sensitive adhesive composition comprising a specified terpolymer. The BOPP film backing has an edge tear to cross tear ratio of at least 10:1 and is sufficiently resistant to elongation that it does not stretch more than 1.6 times its original length (cf. Claim 1).

In column 1, lines 25 to 45, the term BOPP is defined and a general indication is given on how biaxially oriented films may be produced. Also in this passage it is stated that the degree of orientation in each direction need not be the same and usually the longitudinal direction orientation is greater than the transverse direction orientation. No further details regarding the manufacture of BOPP are given. The BOPP films used in the examples are commercially available ones for which certain properties are given (cf. column 4, lines 57 to 75 and column 6, lines 6 to 24).

It is also observed in this document that BOPP possesses the proper balance of properties and characteristics including, inter alia, tear strength, elongation and tensile strength, to make it a suitable backing for adhesive tapes (cf. column 1, lines 46 to 50, and column 1, line 68 to column 2 to 18). Its resistance to elongation and tensile strength allows the adhesive tape to be pulled from a roll without breaking and tearing. The relatively high edge tear and relatively low cross tear of BOPP enables it to be easily dispensed with conventionally used devices employing a serrated edge cutter bar.

In the Board's judgment, in the absence of any further details concerning the dispensing of the tape, the skilled person would conclude that this prior art tape could not be dispensed by being torn by hand across its width but may be dispensed by being manually pulled onto one end of the serrated blade of a dispenser. This action initiates a tear across the width of the tape. In other words, the tape has a serrated cut edge only in the vicinity of the edge that was pulled against the teeth of the dispenser blade and, since the tear will typically not be aligned with the cutting edge of the blade, the dispensed piece of tape does not have a precisely positioned and neatly cut edge conforming to the shape of the cutting edge of the blade.

Thus, although this document discloses that BOPP is a suitable backing for pressure-sensitive adhesive tapes, it provides no indication of how the above-defined technical problem may be solved.

5.2 The Board, in reaching the above conclusions regarding the teaching imparted to the skilled person by document (4), has not considered the facsimile containing the reported statements of one of the inventors named therein.

5.3 Document (2) relates to a process for the preparation of films from polypropylene containing at least 70% of isotactic polypropylene. The films may also be used in the form of sheets and tapes (cf. page 1, lines 1 to 7). Although there is no mention of the use of these tapes as backing films for pressure-sensitive adhesive tapes, it is clear that this is one possible use the skilled person would bear in mind.

According to the paragraph bridging pages 1 and 2 of this document, by controlling various interdependent parameters such as, for example, the properties of the starting

polymer, the stretching temperature and stretching ratio, films having excellent mechanical and optical properties may be obtained by stretching in two directions.

Example 4 of this document describes the preparation of a 10 $\mu$  thick polypropylene sheet by first stretching a 500 $\mu$  thick cast polypropylene sheet in a ratio of 1:3 in the longitudinal direction, then in a ratio of 1:9 in the transverse direction and finally in a ratio of 1:3 in the longitudinal direction. The resulting BOPP film is reported to have had an elongational break in the longitudinal and transverse direction of 25% and 35% respectively.

Both parties submitted experimental data for films prepared according to this Example from starting materials said to be equivalent to a polypropylene having an intrinsic (limiting) viscosity of 3.5. The Appellant's results demonstrated that it was impossible to obtain a BOPP sheet with a elongation of break in the longitudinal direction of less than 51% (cf. Example F-1a filed on 19 November 1992). The Respondent's results, which were intended to demonstrate that the values for elongation at break in both directions were dependent on the stretching temperature, must be discounted since it is not clear whether the two stretch ratios in the longitudinal direction were 1:3.5 or 1:3 (cf. page 5 and the table on page 6 of the Respondent's letter filed on 20 February 1993).

Irrespective of whether the Respondent's experimental results are taken into consideration or not, the teaching of document (2) would not enable the skilled person to deduce that the solution to the technical problem underlying the patent in suit lies in adjusting the three stretch ratios in such a manner that the resulting BOPP sheet will break before it can be stretched in the

longitudinal direction by 30% but will not break before it can be stretched by at least 40% in its transverse direction.

A close study of document (4) would not provide the skilled person with any reason, particularly in view of the problem addressed and solved in that document, to combine its disclosure with that of document (2) rather with that of the many other documents relating to the manufacture of BOPP sheets. In the Board's view, this particular combination can only be arrived at with the benefit of hindsight.

Therefore, in the Board's judgment, the proposed solution to the technical problem of providing an adhesive coated tape with a backing made of BOPP having similar dispensing characteristics to tapes with backings made from unplastified PVC, cellophane or cellulose acetate is inventive. Hence, Claim 1 according to the main request and Claims 2 to 7, which relate to preferred embodiments of the tape according to Claim 1, are allowable.

In the Board's opinion, even if document (4) were to be considered as representing the closest state of the art, the subject-matter of the claims according to the main request would still involve an inventive step.

In this case, the technical problem underlying the disputed patent would be to provide a pressure-sensitive adhesive tape having improved dispensing characteristics when dispensed from a table-top dispenser having a toothed cutting blade.

The disclosure of this document and document (2) as discussed above, either taken alone or in combination, would not render the solution outlined in paragraph 3.3 above obvious to the skilled person, particularly since

document (2) is wholly silent with respect to pressure-sensitive adhesive tapes and their dispensing from table-top type dispensers.

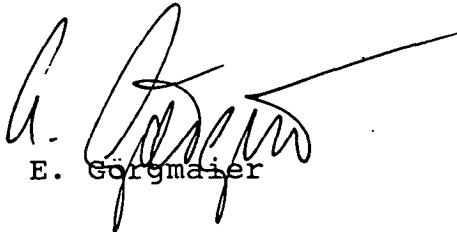
In view of the above finding it is not necessary to consider the Appellant's auxiliary request.

Order

For these reasons, it is decided that:

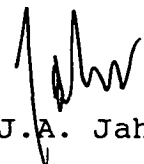
1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the main set of Claims 1 to 7 filed during oral proceedings.

The Registrar:



E. Görgmaier

The Chairman:



K.J.A. Jahn