BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 290/88 - 3.2.1

Application No.: 81 102 847.1

Publication No.: 0 038 075

Title of invention: A packing material for aseptic packages

Classification: B65D 65/40

D E C I S I O N
of 4 December 1990

Applicant:

Proprietor of the patent: AB TETRA PAK

Opponent: 01) Etude et Réalisation de Châines Automatiques E.R.C.A.
02) PKL Verpackungssysteme GmbH

Headword:

EPC Articles 52(1), 56, 100(b), 123(2) and 123(3)

Keyword: "Sufficiency of disclosure (yes)" - "Inventive step (yes)"

Headnote

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 290/88 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal
of 4 December 1990

Appellant : (Opponent 1)
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Respondent : (Proprietor of the patent)
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Decision under appeal :
Decision of the Opposition Division of the European Patent Office dated 24 February 1988 and posted on 18 April 1988 rejecting the oppositions filed against European patent No. 0 038 075 pursuant to Article 102(2) EPC

Composition of the Board :

Chairman : F. Gumbel
Members : S. Crane
W. Moser

Summary of Facts and Submissions

I. European patent No. 0 038 075 was granted with effect from 21 August 1985 on the basis of European patent application No. 81 102 847.1 filed on 14 April 1981, priority being claimed from Swedish patent application No. 8 002 845 dated 16 April 1980.

II. The patent was opposed by the Appellants (Opponents 1) and Opponents 2.

The grounds of opposition invoked were lack of novelty and/or inventive step with respect to the state of the art (Article 100(a) EPC), insufficiency of disclosure (Article 100(b) EPC) and extension of subject-matter (Article 100(c) EPC).

The following state of the art documents were introduced into the opposition proceedings:

(D1) FR-A-2 366 932
(D2) FR-A-2 374 219
(D3) FR-A-2 073 137
(D4) Emballage-Digest April 1979, pages 210 to 220
(D5) Nord-Emballage July/August 1979, page 27
(D6) Food Engineering International November 1979, pages 35/36
(D7) Reprint from Packaging Digest April 1980 "Sheet Co-extrusion - Ball gets rolling into plastics"
(D8) The Condensed Chemical Dictionary 10th Edition, Van Nostrand Reinhold Company, pages 830, 831, 837
(D9) "Neue Verpackung" Heft 8, 1979, pages 896 to 899
(D10) "Verpackungs-Rundschau" Heft 2, 1980, pages 135 to

III. By its decision taken at the oral proceedings on 24 February 1988 and notified in written form on 18 April 1988, the Opposition Division rejected the oppositions.

IV. The Appellants filed an appeal against this decision by telex on 15 June 1988, duly confirmed in writing on 18 June 1988, with instructions to debit the appeal fee from their account.

The Statement of Grounds of Appeal was filed on 18 August 1988. In this statement the Appellants referred to two further state of the art documents, viz:

(D13) Emballage Selection International Nr. 191, April 1979, pages 1 and 2
(D14) FR-A-1 198 792.

They requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

V. In a communication of the Board under Article 11(2) RPBA dated 11 July 1990 the Board expressed its reservations on the question of whether the subject-matter of granted Claim 1 was properly disclosed in the original application. Furthermore, the Board mentioned the following standard reference works which, in its opinion, could be of significance with regard to the question of inventive step:

(D15) Kirk-Ohmer, Encyclopedia of Chemical Technology, 3rd edition, Vol. 10, pages 218, 219
(D16) Encyclopedia of Polymer Science and Technology, Vol. 6, page 782
(D17) Kunststoff-Handbuch, Vol. IV, Polyolefine, page 415.

VI. At the oral proceedings held on 4 December 1990, which the duly summoned Opponents 2 did not attend, the Respondents (Proprietors of the patent) presented a new set of Claims 1 to 3 together with a correspondingly revised description.

Independent Claim 1 is worded as follows:

Method of producing a packing material for aseptic packages of the type which is manufactured in that a web of packing material is formed to a tube (28) by joining together the longitudinal edges of the web, whereupon the tube formed is filled with the intended contents and divided up into individual packages (30) or packing containers through repeated flattening and sealing of the tube along narrow zones located across the tube, wherein the packing material (17) is provided along the whole surface which is intended to form the inside of the packages with a bacteria-tight thin plastic coating (6), wherein said inside forming surface of the packing material as well as the surface of said coating connected to said inside forming surface of the packing material are sterile and wherein both said thin plastic coating and the material forming said inside forming surface of the packing material are different thermoplastic materials and can be re-separated from each other,
c h a r a c t e r i z e d i n t h a t
the combination of the following layers of said packing material is used:

(a) the thermoplastic layer (3) forming the inside of the packages (30) consists of polyethylene,

(b) the thin thermoplastic coating (6) consists of polypropylene with a thickness of between 5 and 10 g/m^2

and in that
the thermoplastic layer (3) and the polypropylene coating (6) are extruded by separate extruders (12, 14) in two separate but successive extruding operations, the surface or contact zone (7) of the thermoplastic layer (3) extruded is protected by sterile gas until the polypropylene coating (6) has been applied on to the contact zone (7) by means of a hood (40) between said successive extruding operations, and said thermoplastic coating (6) of polypropylene is applied to the thermoplastic layer (3) at a temperature sufficient to heat the contact zone (7) of the thermoplastic layer (3) facing said coating (6) to a temperature exceeding 150°C.

Dependent Claims 2 and 3 relate to preferred features of the method according to Claim 1.

The Respondents accordingly requested the maintenance of the patent in amended form on the basis of these new claims and amended description as submitted at the oral proceedings together with Figures 1 and 3 to 5 of the patent specification to be renumbered as 1 to 4.

VII. The Appellants maintained their request that the patent be revoked. Their arguments in support of this request can be summarised as follows:

Considering first the formal allowability of the new claims it is not clear where a basis is to be found in the original disclosure for the combination of method features contained in the characterising clause of Claim 1. This claim can only be arrived at by combining features of the embodiments according to original Figures 2 and 5 in an unacceptable way. The new claims were, therefore, not admissible having regard to the requirements of Article 123(2) EPC.

On the question of sufficiency of disclosure there were three issues that had to be taken into account. Firstly, in the arrangement shown in Figure 5, the surface of the polyethylene layer 3 that is to form the inside surface of the packages, and which should be sterile, is contacted immediately after extrusion by the outer surface of the cooling roller 13. This roller would constitute a source of contamination. Secondly, it would not be possible to operate at the lower end of the thickness range for the thin plastic coating specified in Claim 1. Although in principle there would be no difficulty in forming a coating of this thickness that was to constitute a permanent constituent of a laminate, the coating according to Claim 1 had in fact to be self-supporting and strong enough to allow it to be removed reliably in one piece from the packing material before this was filled. Any remaining debris from the thin coating would be a source of contamination. A coating of the minimum thickness specified in Claim 1 would have insufficient strength for its intended purpose. This view was supported by the later application EP-A-0 083 131 of the Respondents, document (D20), in which in a similar material a thickness of approximately 30 μm for the polypropylene coating was suggested. Thirdly, the requirement that the contact zone of the polyethylene layer be brought up to a temperature of 150°C by the application of the coating to it was wholly unrealistic when taking into account the relative thermal capacities of the polyethylene layer 3 and the coating 6, especially when the polyethylene layer was combined with other backing materials. The application of the coating could not, therefore, have any sterilizing effect in itself, in contradiction to what was said in the patent specification. These three issues, especially when considered in combination, led forcibly to the conclusion that the patent specification contained insufficient

information to allow the skilled man to perform the method of Claim 1 in such a way that fully sterile packing material would be reliably produced.

Lastly, as far as inventive step was concerned, the subject-matter of Claim 1 was obvious having regard in particular to documents (D1), (D3), (D13), (D16) and (D17). Document (D1), on which the preamble of Claim 1 was based, disclosed several alternatives for producing sterile packing material. Alongside the particularly described methods using preformed webs which were heat-sterilized before lamination or the co-extrusion of inherently sterile layers, this document also clearly suggested to the skilled man to extrude the layers of the packing material sequentially as specified in Claim 1. It was self-evident that the first extruded layer had to be protected against contamination before the coating layer was extruded onto it. As to the choice of the materials for the layer and the coating, document (D13) already indicated in the context of a similar sterile packing material that polyethylene and polypropylene bonded together poorly. It was, therefore, obvious to use this pair of materials for making a form-fill-seal packing material as specified in Claim 1. Since such materials conventionally used a polyethylene layer for forming the inside surface of the package, the use of polypropylene for the removable coating followed automatically. Lastly, the upper value for the thickness of the polypropylene layer specified in Claim 1 did not differ significantly from the thicknesses mentioned in document (D16). Since the skilled man knew from document (D17) that thin extrusion-coated polyolefine films adhered badly and since the polypropylene coating was in any case a waste product,

the skilled man would endeavour to use the minimum thickness practicable. Further documents relating to polypropylene films of equivalent thicknesses were:

(D18) US-A-3 616 190
(D19) FR-A-2 159 294.

VIII. In support of their request the Respondents put forward the following arguments:

The views of the Appellants on the question of sufficiency of disclosure were undermined by the fact that over the last ten years the method claimed had been used to producing packing material in very considerable quantities, and no problems with lack of sterility had occurred. If the cooling roller mentioned by the Appellants as a potential source of contamination was indeed problematic in this respect, the skilled man, by the application of his common general knowledge, could very easily take the appropriate measures to overcome this. As regards the thickness of the polypropylene coating it was surprising that the Appellants had not obtained samples of the packing material produced and sold by the Respondents and tested it to see how thick this coating actually was and whether it could be removed from the packing material without tearing. Finally, the primary purpose of the polypropylene coating was to preserve the sterility of the surface of the polyethylene layer that is obtained by virtue of it having been held as a melt in the extruder. The extrusion of the polypropylene coating on to the polyethylene would, however, have some supplemental sterilizing effect. The temperature reached by the contact zone of the polyethylene layers as the polypropylene is extruded onto it depends on many factors. There was no reason why the temperature of 150°C stated in Claim 1 could not be reached by appropriate selection of the various interacting parameters.

With regard to inventive step it was pointed out that the method of Claim 1 was characterised by a combination of several features, none of which could be found in an identical form in the prior art. It was the interplay of these features that had enabled the claimed invention to lead to considerable commercial success, despite the fact that at least in the view of the Appellants it was not workable.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rules 1(1) and 64 EPC; it is, therefore, admissible.

2. **Formal allowability of the amendments**

2.1 Current Claim 1 comprises the features of the independent method Claim 5 as granted and its dependent Claim 7. All of the features of the preamble of Claim 1 as granted, which by virtue of the reference in Claim 5 to Claim 1 were implicitly present in Claim 5, have also been taken up into the preamble of current Claim 1. With respect to the features of the characterising clause of Claim 1 as granted these appear in clarified or limited form as characterising features of current Claim 1. Thus, the definition of the material of the thermoplastic layer which forms the inside surface of the packages in terms of the difference in its melting temperature to that of polypropylene has been replaced by the statement that this material is polyethylene. The reference to the melting temperature difference, therefore, became redundant, the melting temperatures of polyethylene and polypropylene being well established, and has been deleted. Further, the

range of "thicknesses" (more accurately the weight per unit area) for the polypropylene layer has been limited to 5 to 10 g/m^2, the minimum value of 5 g/m^2 corresponding to that stated in granted Claim 1 and the maximum value of 10 g/m^2 corresponding to the preferred value stated in the original description. (It is accepted by both parties that these values correspond to a true thickness of 5.5 to 11.1 μm).

Dependent Claims 2 and 3 derive from Claims 3 and 4, respectively 8 as granted.

There is, therefore, no objection to the current claims under Article 123(3) EPC.

2.2 In the opinion of the Board that part of the original disclosure describing in detail, with respect to the embodiment of Figure 2, the prevailing conditions under which the polypropylene layer is extruded on to the polyethylene layer would be interpreted by the skilled man as also applying to the essentially equivalent embodiment of Figure 5. That these features are, therefore, also present in the embodiment of Figure 5 is implicit and accordingly current Claim 1, which contains a combination of these features with other features that are only applicable to the embodiment of Figure 5, does not offend against Article 123(2) EPC as alleged by the Appellants. Moreover, this combination of features is explicitly claimed in original Claim 8 when referred back to original Claim 6 (after replacement of the stated value of 140°C by the value of 150°C mentioned on page 6, paragraph 1 of the original description in the same context).

2.3 The amendments made to the description in comparison with that originally filed consist essentially in an evaluation of the most relevant state of the art and an adaptation to the terms of the new claims.

2.4 In conclusion, the Board finds no formal objections to the documents forming the basis of the Respondents' request.

3. Sufficiency of disclosure

3.1 The first line of the Appellants' attack under this heading relates to the cooling roller which contacts the polyethylene layer shortly after it is extruded, possibly acting as a source of contamination. In the opinion of the Board the skilled man would, if as the result of routine quality control tests it was established that the necessary degree of sterility was not being obtained, quickly identify the cooling roller as the only possible source of the contamination and could, on the basis of his common general knowledge and without the application of any inventive skill, take appropriate measures, such as shielding the roller, to eliminate this source. It belongs to the well established jurisprudence of the Boards of Appeal that the common general knowledge of the skilled man reading the specification of the contested patent has to be taken into account when determining the question of sufficiency of disclosure.

3.2 With regard to the question as to whether the method described and claimed in the contested patent leads to a packing material with the necessary sterile qualities, or whether the extreme thinness of the polypropylene coating would prevent this functioning properly, the Board is faced with contrary assertions from the parties the

divergences between which the Board is unable to resolve on the strength of its own specialised knowledge. It is true that under Article 114(1) EPC the European Patent Office, in proceedings before it, examines the facts of its own motion and is not restricted in this examination to the facts, evidence and arguments provided by the parties and the relief sought. But if the European Patent Office is unable to establish the facts of its own motion, it is the party whose argument rests on these alleged facts who loses thereby. (See Decision T 219/83, OJ EPO 1986, 211, point 12).

In the present situation the Board is of the opinion that it would not have been beyond the means or competence of the Appellants to have obtained samples of what is after all a product that has been sold in large quantities and have tested it to provide substantiation for their assertions. In the absence of such evidence, the Appellants' assertions can only be treated as an unproven assertion that cannot lead to a finding that the claimed invention has not been disclosed in a manner sufficiently clear and concise for it to be carried out by a person skilled in the art.

3.3 The situation with regard to the question of the temperature reached by the contact zone of the polyethylene layer as the polypropylene layer is extruded onto it is similar but somewhat different insofar as the Board itself has doubts as to whether the contact zone of the polyethylene layer could in fact be brought to a temperature of at least 150°C for a time sufficient for this to have any significant sterilizing effect as is suggested by the description of the patent specification. Current Claim 1, however, merely requires that at some point, for an unspecified length of time, the contact zone reaches 150°C and makes no mention of any sterilizing

effect. The number of imponderables surrounding the estimation of the temperature actually reached by the contact zone are so numerous that the Board cannot with any conviction say that the requirement of Claim 1 in this respect cannot be met. Accordingly, this line of attack on the sufficiency of disclosure also fails.

3.4 The Board, therefore, comes to the conclusion that also the ground of opposition under Article 100(b) EPC is no bar to the maintenance of the patent in the amended form as requested.

4. State of the art

The closest state of the art is that shown in document (D1) which relates to a sterile packing material of the form-fill-seal type, methods and apparatus for producing this material and apparatus for forming the material into packages. According to this prior art, the sterility of the layer of the packing material that is to form the inside surface of the package is preserved by a coating that is peeled off shortly before the material is formed into a package, filled and sealed. It is suggested to use thermoplastic materials for both the sterile layer and the coating but no specific materials are mentioned. The sterility of the thermoplastic layer may be achieved by extruding it or by a separate heat treatment step.

Documents (D4), (D5), (D6), (D7), (D9), (D10) and (D13) all relate to the "Neutral Aseptic System" of packaging developed by the Appellants. This system utilises a packing material comprised essentially of a polypropylene base layer and a peelable polyethylene cover layer, the contacting surfaces of the two layers being sterile. After separation of the layers the polypropylene base layer is deep drawn to form beaker-like containers, which after

filling with the product are covered and closed by the polyethylene layer. The sterile packaging system of document (D2) is similar in some respects but in this case the cover layer is of metal foil and is not bonded to the base layer.

Document (D3) of the Respondents relates to a conventional form-fill-seal packing material of which the layer forming the inside surface of the packages is comprised of polyethylene or polypropylene, but without a thermoplastic protective layer. Document (D14) relates to a method of sterilizing such a form-fill-seal packing material and forming it into packages.

Documents (D8), (D11), (D12), (D15), (D16), (D18) and (D19) have all been cited to show what thicknesses of polyethylene or polypropylene coatings or films were conventional in the packaging art or known generally, whereas document (D17) is concerned with general considerations involved when extrusion coating with thin polyolefin films.

Document (D20) is not prepublished and need not, therefore, be considered further.

5. Novelty

The method according to Claim 1 is distinguished from the closest state of the art according to document (D1), on which the preamble of the claim is based, by the features of its characterising clause. Since the novelty of the subject-matter of Claim 1 is no longer in dispute, further explanations in this respect can be dispensed with.

6. **Inventive step**

6.1 The characterising features of Claim 1 can be divided into two groups, those concerned with the choice of materials for the thermoplastic layer that forms the inside surface of the packages and for the thin thermoplastic coating, as well as the thickness of this coating, and those relating to the way in which the thermoplastic layer and the thermoplastic coating are formed and brought together.

All of these features contribute to the solution of the technical problem involved, which is to develop a method for producing a cost-effective sterile form-fill-seal packing material that is reliably protected from recontamination until it is used to form packages, and from which the protective coating layer can be readily removed.

6.2 The Board holds the view, in essential agreement with the arguments developed by the Appellants on this point, that the features of the first group identified above do not in themselves make a sufficient contribution to the state of the art to justify an inventive step.

In particular, the skilled man wishing to put into effect the teachings of document (D1), which does not mention suitable thermoplastic materials for the layers involved, will have to look for a suitable material pairing to give the desired results. He could not have failed to have been aware of the widely publicised "Neutral Aseptic System" of the Appellants as exemplified in, for example, documents (D4) and (D13). In the latter document it is stated that polyethylene/polypropylene material pairing has been chosen since these two materials adhere poorly to each other.

It is well known that form-fill-seal packing material is generally provided with a polyethylene layer on that surface that will form the inside of the package, see for example document (D3). When considering ways of providing a sterile material of this type, in accordance with the teachings of document (D1) it would, therefore, be obvious, having regard to the clear indication in document (D13), to choose polypropylene for the thin coating layer.

Concerning the issue of the obviousness of choosing a coating having a thickness as claimed, it is to be noted that in the packing material made according to Claim 1, the polypropylene coating is essentially a waste product so that the skilled man will endeavour to keep this as thin as is practically possible having regard to the fact that it must be strong enough to allow it to be peeled from the polyethylene layer. He also knows from document (D17) that the adhesion of an extrusion coated polyolefin layer decreases as this layer becomes thinner, which in view of the requirement for good peelability gives him another incentive to reduce the thickness of the polypropylene coating. It is also true that the top end of the range of thicknesses given in Claim 1, i.e. approximately 11 μm, is not so significantly different from the minimum thickness values for polypropylene films known in the art (document (D15) for example suggests a minimum of approximately 13 μm) that the skilled man could not have arrived at a thickness within the range claimed by virtue of routine experimentation. On the other hand, there is some merit in the Respondents' argument that a skilled person would be discouraged from choosing such a thin layer in a case where it has to be peeled from the laminate without leaving any debris whatsoever on the remaining inside forming layer. The doubts expressed by the Appellants concerning sufficient disclosure in respect

of peelability in one piece also appear to point in this direction (see point VII, last paragraph above). The Board, however, takes the view that these considerations are not sufficient to justify the existence of an inventive step in themselves.

6.3 With regard to the second group of characterising features, the only state of the art that is of any relevance is document (D1).

This document specifically exemplifies three main alternatives for producing a laminated sterile packing material. In the first, the layers of the laminate are preformed webs which are heat sterilized in a sterilization chamber and then laminated together by pressure welding. In the second, the first layer is a preformed web which is heat sterilized in a sterilization chamber and then roller coated with the second layer. In the third, the two layers are co-extruded. In this latter embodiment no sterilization chamber as such is required since the layers leave the extruder in a sterile condition. It is also suggested in general and somewhat obscure terms that at least one of the two layers may be extruded and deposited on the other layer at a temperature close to that of extrusion (page 7, last paragraph of D1).

The Board cannot see in this suggestion a clear teaching to the skilled man to extrude sequentially the first (polyethylene) layer and then to deposit by extrusion on this layer the peelable (polypropylene) coating, the contact zone of the polyethylene layer being protected by a sterile gas between the two extrusion operations by means of a hood, as is required by current Claim 1. Instead, it seems much more likely, since this suggestion is made immediately after the description of the second

main alternative mentioned above, that the skilled man would simply understand it as referring to the possibility of replacing the roller coating operation by extrusion coating, i.e. the base layer would still be preformed and require separate sterilization.

Document (D1) in fact teaches clearly how this separate sterilization step can be eliminated by extruding both layers, but solely in the context of co-extrusion, which, since this did not require the maintenance of a sterile environment between separate extrusion operations, would appear, at least in this respect, advantageous over the method actually proposed in the contested patent. The skilled man would, therefore, have no incentive to depart from the specific teachings of document (D1) in this regard.

Furthermore, it would appear that it is the use of sequential extrusion as specified in Claim 1, in combination with the particular materials chosen, that results in the good peelability of the protective coating despite its extreme thinness.

6.4 The Board, therefore, comes to the conclusion that the subject-matter of current Claim 1 cannot be derived in an obvious manner from the state of the art and must accordingly be seen as involving an inventive step, Articles 52(1) and 56 EPC.

This claim, together with its dependent Claims 2 and 3 and the revised description, can, therefore, form the basis for maintaining the patent in amended form.

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 claims and description as submitted at the oral proceedings together with Figures 1 and 3 to 5 as granted, to be renumbered 1 to 4.

The Registrar: The Chairman:

S. Fabiani F. Gumbel

C
W. Moser