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D E C I S I O N
of 28 September 1994

Case Number: T 0161/92 - 3.2.5

Application Number: 84401091.8

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IPC: B29C 59/10, B26F 1/26

Language of the proceedings: EN

Title of invention:
Process for preparing perforated thermoplastic films

Patentee:
ETHYL CORPORATION

Opponent:
BP Chemicals PlasTec GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56, 84

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
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Case Number: T 0161/92 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 28 September 1994

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office delivered on 26 November 1991, dispatched on 23 December 1991, revoking European patent No. 0 166 058 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: W. D. Weiß
Members: A. Burkhart
M. K. S. Aúz Castro

Summary of Facts and Submissions

I. The Appellant (Proprietor of the patent) lodged an appeal against the decision of the Opposition Division revoking the European patent No. 0 166 058.

Opposition was filed against the patent as a whole based on Article 100(a) and (b) EPC.

The Opposition Division held that the grounds for opposition mentioned in Article 100(a) EPC (lack of inventive step), prejudiced the maintenance of the patent having regard to the documents

(D1) US-A-4 351 784, and

(D3) US-A-3 703 569.

II. The Appellant, during the oral proceedings before the Board, held on 28 September 1994, requested that the decision under appeal be set aside and that the patent be maintained as granted or on the basis of Claims 1 to 8 filed as first auxiliary request on 25 April 1992, a description yet to be adapted and the drawings as granted or on the basis of Claims 1 to 8 filed as second auxiliary request during oral proceedings, a description yet to be adapted and the drawings as granted.

Claim 1 as granted (main request) reads as follows:

"1. A process for the preparation of perforated thermoplastic polyolefin resin film having tapered capillaries (28) comprising forming a hot film (17) of thermoplastic material, applying the hot film (17) to a moving, perforated screen (14), applying an air pressure differential across the film towards a portion (15) of

the screen sufficient to distort the film into the perforations and cause rupture of the film, and subjecting the perforated film (18) to a corona discharge treatment (in 22, 23), characterized in that (a) the perforated screen (14) is non-welded and (b) a surfactant in an effective amount from up to 10 percent by weight of the polyolefin resin is blended with the resin prior to the forming of the hot film (17)."

Claim 1 according to the first auxiliary request reads as follows:

"1. A process for the preparation of perforated thermoplastic polyolefin resin film having tapered capillaries (28) comprising forming a hot film (17) of thermoplastic material, applying the hot film (17) to a moving, perforated non-welded screen (14), applying an air pressure differential across the film towards a portion (15) of the screen sufficient to distort the film into the perforations and cause rupture of the film, and subjecting the perforated film (18) to a corona discharge treatment (in 22, 23), characterized in that a surfactant in an effective amount from 5 up to 10 percent by weight of the polyolefin resin is blended with the resin prior to the forming of the hot film (17), so as to obtain a perforated thermoplastic film exhibiting a run-off percent of from 0 to 5 percents."

Claim 1 according to the second auxiliary request differs from Claim 1 according to the first auxiliary request in that the surfactant is said to be "polarizable migrating".

III. The Respondent requested that the appeal be dismissed.

IV. During appeal proceedings the Appellant cited inter alia documents:

(D2) US-A-4 151 240,

(D2') US-A-3 929 135 (referred to in document D2 and in the description of the patent in suit) and

(D6) Plastics Compounding 1991/92 Redbook, pages 19, 22, 24 and 56 as representing generally known state of the art.

The Appellant's arguments can be summarised as follows:

Document (D1) represented the closest prior art disclosing, in addition to all the features in the first part of Claim 1 as granted, the measure to use a non-welded screen to produce the perforated film having a run-off of from 5 to 20 percent. The disclosure of this document had, however, to be seen before the background of state of the art represented by document (D2') which was cited in the description of the patent in suit. The capillaries of the perforated film disclosed therein had a so-called flower pot configuration which resulted in this known film having a run-off of zero percent. Although a welded screen had to be used for the production of this film (see document (D2)) which rendered the process relatively expensive, the quality of this product was so predominant that the less expensive product resulting from the method disclosed in document D1 was not marketable. A skilled person, therefore, would have considered this development to lead to a dead end and would have rather considered other methods like, for instance, mechanical methods or corona discharge, to produce the perforated film rather than to proceed on this discouraging way.

Even if a skilled person would have nevertheless envisaged to continue on the way initiated by document (D1), there would have been many other options (see

document (D1), column 3, lines 37 to 42, and EP-B-0 166 058, page 2, lines 17 and 18) than the one chosen by the patent in suit which could have been used to look for an improvement of the run-off value. Consequently, there was no one way street guiding to the invention.

Moreover, nothing in document (D1) pointed to that a solution for the basic technical problem of the patent in suit could have been found in document (D3), since this concerned the adhesion on fluids on the surface of an unperforated film. The addition of the surfactant in the context of the other features of Claim 1 resulted in a surprising combinatory effect.

The term surfactants, as used in Claim 1 of the patent in suit was intended to cover compounds collectively referred to as antistatic agents, antifog agents and wetting agents (EP-B-0 166 058, page 5, lines 18 and 19) and referred to the surface energy characteristics of these compounds, as used conventionally in this technique. Document (D6), although published after the filing date of the patent in suit, reflected a general knowledge with which any person skilled in the art was familiar already before the priority date of the patent in suit. The most common method used to measure this surface energy characteristics as prescribed, e.g. be ASTM, related the wetting tension of a film surface to its ability to accept and retain ink, coatings, adhesives etc.. This testing method, however, made no sense when testing a perforated film for determining its run-off value. For films, like the products disclosed in (D3), which required antistatic properties the static decay rate is more correlative to the end use than the surface tension test and is therefore preferred. For the present invention a specific run-off test had first to be developed.

It had to be emphasised that this document expressly warned not to use the high levels of antistatic agents used according to the auxiliary requests.

V. The Respondent, during the appeal proceedings, cited inter alia document

(D4) Ullmanns Encyklopädie der technischen Chemie, 4th edition (1978), volume 4, pages 268 to 271,

as a general state of the art and argued essentially as follows:

There was agreement that the subject-matter of Claim 1 as granted differed from the process disclosed in document (D1) only by the addition of a surfactant in an effective amount from up to 10 percent of the polyolefin resin. Moreover, document (D1) (column 4, lines 3 to 6) stated that other additives known in the art might be added to achieve the desired physical characteristics.

According to the description of the patent in suit (page 3, lines 6 and 7, and page 5, lines 18 to 24) the term surfactant was intended to cover any surface active agents which were known to alter the surface tension of a liquid in which they dissolve and also included compounds which were known as antistatic agents, antifog agents and wetting agents. Moreover, the surfactants were also known to embrace slip agents, lubricants and mould release agents which play a role during processing in preventing plastics from sticking to metal. This fact was confirmed by document (D6) (page 19) cited by the Appellant as representing general state of the art, as well as by document (D4). In particular glycerine fatty acid esters, surfactants preferably used by the patent in suit, were well known slip agents and antistatics (cf. (D4), pages 269 and 271).

According to document (D4) (page 270, third paragraph, and page 271, penultimate paragraph) such additives were usually added in amounts of 0.1 up to several weight percent, the practitioner being accustomed to experimentally optimise the concentration in every particular case.

Consequently, granting the patent would mean to exclude a majority of commonly used additives from the teaching of document (D1).

The auxiliary requests were questionable with respect to Article 123 (2) EPC, because the lower limit of 5% for the run-off value was originally disclosed for a specific surfactant composition only. Moreover, the feature "... so as to obtain a perforated thermoplastic film exhibiting a run-off percent of from 0 to 5 percents" was objectionable on the basis of Article 84 EPC because of lack of clarity.

Reasons for the Decision

1. *Closest state of the art and novelty*

Document (D1) representing the closest prior art discloses a process for preparing thermoplastic films comprising the feature of using a non-welded screen in combination with all the features in the first part of Claim 1.

This fact is undisputed and needs no further justification.

Although document (D1) states in its column 4, lines 3 to 6, that "other additives known in the art may be added to achieve the desired physical characteristics", surfactants are not specifically mentioned as additives in this meaning.

The subject-matter of Claim 1 is, therefore, considered to be novel with respect to the disclosure of this closest state of the art and, hence, also with respect to the other documents cited.

2. *Technical problem and solution*

Document (D1) states that the process disclosed therein results in a film having a run-off of 5 to 20 percent.

The Appellant set out, that, having in mind that a product with a run-off value of zero percent existed on the market (documents (D2) and (D2')), the product produced according to the disclosure of document D1 was not marketable. The process according to the documents (D2)/(D2') was, however, less economic than the one according to document (D1), because the former needed a more expensive welded screen for its execution.

Starting from document (D1) there is the problem to modify this process to produce a film having a run-off value which was comparable to the film produced by the process disclosed in documents (D2/D2')) without giving away its lead in economy.

According to Claim 1 as granted, this problem is solved in that "a surfactant in an effective amount from up to 10 percent by weight of the polyolefin resin is blended with the resin prior to the forming of the hot film".

3. *Inventive step*

3.1. The Appellant has asserted that the skilled practitioner would have considered the process according to document (D1) to be a dead end of a development which he would have left having in mind that there existed a process which resulted in a perfect product.

The historical development, however, stands against this argumentation. Document (D2) which achieves an ideal run-off value of zero by a particular geometrical shape (flower pot shape) of the capillaries was published in 1975; document (D2') which improves the method of manufacturing a welded screen usable in the production of a perforated film according to document (D2) was published in 1979.

Although there had thus been available for years a method for preparing a perforated film which was perfect with respect to its intended use, the development of alternative methods was continued which, at that time, produced perforated films with higher run-off values but did so at a lower price than the method disclosed in documents (D2)/(D2') operating on the basis of an expensive welded screen. The method disclosed in document (D1) (published in 1982) using a less expensive unwelded screen is one of these alternative methods which try to compensate the negative effect of not ideally shaped capillaries by other measures. If the experts skilled in this field of technology would have been discouraged by the existence of the ideal method (documents (D2)/(D2')), the method according to document (D1), in the description of which document (D2') is acknowledged, never would have been developed nor even made the basis of a patent application. Moreover, document (D1) already reports that favourable run-off values of as low as 5 percent were achieved.

Consequently, there is no reason, why the encouraging disclosure of document (D1) should have been considered as the dead end of a development.

3.2. Document (D1) states (column 4, lines 2 to 6) that plasticiser "and other additives known in the art may be added to achieve the desired physical characteristics". These known perforated films, like those according to the patent in suit, are intended to be used "as a component of disposable composition garments for sanitary apparel purposes, such as napkins, diapers, or for hospital pads, bed or sleeping bag linings, and the like (cf. (D1), column 1, lines 18 to 22; EP-B-0 166 058, page 2, first paragraph).

This particular use which involves that the film is in contact with sensitive skin under a moisture saturated atmosphere calls for antifogging properties of the film surface. Before being moistened, the film is in dry contact with the various other materials of which the diaper is composed and of the garment of the person wearing the sanitary article. This situation requires antistatic properties of the film. An economic production of the film requires that the extruded polymeric material does not stick to the tool and develops a smooth film surface.

It has been known that polymeric compositions may be equipped with such properties by the addition of certain known additives which have been classified as antifogging agents, antistatic agents, and slip agents (internal lubricants), respectively (cf. Handbooks (D4) and (D6)). It has also been known that these classes of additives overlap insofar as certain compositions may meet the requirements of more than one of these functionally defined classes. It has been particularly known that glycerine fatty acid esters simultaneously

exert the function of an internal lubricant ((D4), page 269 (table 3)), of an antistatic agent ((D4), page 271, second paragraph), and of an antifogging agent ((D6), the paragraph bridging pages 22 and 24). Moreover, the glycerine fatty acid esters are admitted by major national administrations for the use in sanitary and food applications (cf. (D4), page 269, table 3, last column).

A skilled person who, following the teaching of document (D1), column 4, lines 3 to 6, looks for an additive to equip the known film with the combination of physical properties required by such sanitary garments will, therefore, find the glycerine fatty acid esters to constitute ideal candidates.

In this obvious way the skilled person, who is performing his routine duty, will be guided to select just this type of additive which is also suggested by the patent in suit as a preferred surfactant composition to solve the basic problem of the invention (cf. EP-B-0 166 058, page 3 penultimate paragraph; page 4, lines 41/42).

The skilled person will even expect that the known capacity of the glycerine fatty acid esters to increase the wettability of the polymeric compositions to which it is added will result in a decrease of the run-off percentage, because, according to basic physical law, a higher wettability implies a higher capillary ascension and, therefore, an increased flow of the fluid through capillaries. The capillary ascension belongs to those effects on which known methods to measure surface tension are based.

Consequently, a reduced run-off percentage of the perforated film is not even a surprising bonus effect

but a further expected result of the obvious addition of glycerine fatty acid esters to the polymeric composition.

The subject-matter of Claim 1 as granted, therefore, does not involve an inventive step.

3.3. Claims 1 according to both auxiliary requests contain as a final feature "so as to obtain a perforated thermoplastic film exhibiting a run-off percent of from 0 to 5 percents". This effect bound feature renders the matter for which protection is sought unclear in the meaning of Article 84 EPC. A skilled person who, although executing the method steps according to these claims, does not arrive at a run-off percent of from 0 to 5 percent does not know whether he has not executed the process steps in a correct manner or whether he has simply chosen a wrong surfactant which principally does not allow to reach such a low run-off value. Consequently, when assessing inventive step, this feature cannot be considered as being highly discriminating.

The quantity of an additive which is added to a polymeric composition may vary from 0.1 to several mass percent (see document (D4), page 270, third paragraph, and page 271, penultimate paragraph) depending on the particular composition, of the intended application and of eventual administrative restrictions. This means that the skilled person is accustomed to determine by routine experiments the particular amount of any particular additive in view of the combination of qualities he wants to achieve. Such optimising experiments, which for certain surfactants may lead to amounts of 5 to 10%, belong to the routine tasks of a practitioner which, although sometimes tedious, are not considered to involve an inventive step.

The glycerine fatty acid esters mentioned above belong to the class of polar migrating surfactants.

Consequently, the subject-matter of Claims 1 according to the auxiliary requests do not involve an inventive step either.

4. Since, therefore, none of the Appellant's requests are allowable, the appeal has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Townend W. D. Weiß