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Datasheet for the decision of 11 February 2010

Case Number: T 0870/06 - 3.3.09

Application Number: 98963757.4

Publication Number: 1034076

IPC: B32B 27/34

Language of the proceedings: EN

Title of invention:
Multilayer heat-shrinkable thermoplastic film

Patentee:
Cryovac, Inc.

Opponent:
Convenience Food Systems GmbH Kempten

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56
EPC R. 115(2)
RPBA Art. 15(3)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Novelty - yes"
"Inventive step - yes"

Decisions cited:
T 0246/91

Catchword:
-

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Case Number: T 0870/06 **-** 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 11 February 2010

Appellant: (Opponent)
Convenience Food Systems GmbH Kempten
Roemerstr. 12
D-87437 Kempten (DE)

Representative:
Kutzenberger, Helga
Kutzenberger & Wolff
Patentanwaltssozietät
Theodor-Heuss-Ring 23
D-50668 Köln (DE)

Respondent: (Patent Proprietor)
Cryovac, Inc.
100 Rogers Bridge Road, Building A
P.O. Box 464
Duncan
South Carolina 29334 (US)

Representative:
UEXKÜLL & STOLBERG
Patentanwälte
Beselerstrasse 4
D-22607 Hamburg (DE)

Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 28 April 2006 concerning maintenance of European patent No. 1034076 in amended form.

Composition of the Board:

Chairman: W. Sieber
Members: J. Jardón Álvarez
M-B. Tardo-Dino

Summary of Facts and Submissions

I. The grant of European patent No. 1 034 076 in respect of European patent application No. 98963757.4 in the name of Cryovac, Inc., which had been filed on 13 November 1998 as International application PCT/US1998/024293 (WO 1999/026783), was announced on 11 February 2004 (Bulletin 2004/07) on the basis of 18 claims. Independent Claims 1, 16 and 17 read as follows:

"1. A heat-shrinkable film comprising

a) an outer heat-sealing layer comprising a heat-sealable polyolefin,
b) an outer abuse layer comprising a polyamide with a melting temperature ≥ 180°C, and
c) an intermediate layer comprising a polyamide with a melting temperature lower than 165°C.

16. A flexible container made of a heat-shrinkable film of any of the preceding claims, said container having at least a sealed area formed by the heat-sealing layer a).

17. A product packaged with a heat shrinkable film of any of the preceding claims 1-15 wherein the outer heat-sealing layer a) is the layer in contact with the product packaged."

Claims 2 to 15 and 18 were dependent claims.

II. Notice of Opposition requesting the revocation of the patent in its entirety on the grounds of lack of

novelty and inventive step (Article 100(a) EPC) was filed by Convenience Food Systems GmbH Kempten on 9 November 2004.

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

G2: US-A-4 963 426;

G3: EP-A1-0 527 237; and

G12: EP-A1-0 720 910.

III. By its interlocutory decision announced orally on 30 March 2006 and issued in writing on 28 April 2006, the Opposition Division denied the novelty of the subject-matter of Claim 1 as granted, but held that the grounds for opposition raised by the Opponent did not prejudice the maintenance of the patent in amended form, according to the auxiliary request (Claims 1-17) filed during the oral proceedings. Independent Claims 1 and 3 of the auxiliary request read as follows:

"1. A flexible container made of a heat-shrinkable film comprising

a) an outer heat-sealing layer comprising a heat-sealable polyolefin,

b) an outer abuse layer comprising a polyamide with a melting temperature ≥ 180°C, and

c) an intermediate layer comprising a polyamide with a melting temperature lower than 165°C,

said container having at least a sealed area formed by the heat sealing layer a).

3. A product packaged with a heat shrinkable film comprising

a) an outer heat-sealing layer comprising a heat-sealable polyolefin,

b) an outer abuse layer comprising a polyamide with a melting temperature ≥ 180°C, and

c) an intermediate layer comprising a polyamide with a melting temperature lower than 165°C,

wherein the outer heat-sealing layer a) is the layer in contact with the product packaged."

Claims 2 and 4-17 were dependent claims.

The Opposition Division in its decision acknowledged the novelty of the claimed subject-matter over the disclosures of G2 and G12. Concerning G2 it noted that the objection of the Opponent relied incorrectly on a combination of an example with another embodiment of the document. Concerning G12 it noted that the film therein described was not disclosed to be in the form of a container having a sealed area formed by the heat-sealing layer (a) comprising a heat-sealable polyolefin. Further, there was no explicit statement as to which side of the film was to be in contact with the product packaged. Finally, there was no explicit or implicit disclosure in G12 that the films disclosed in some of the examples, having an outer polyamide layer, had to be used in combination with a specific package closing technique, namely heat-sealing. G12 disclosed also the packaging method of clipping.

Concerning inventive step, the Opposition Division, starting from D12 as closest prior art document, saw the technical problem to be solved by the claimed

subject-matter as being firstly to facilitate the heat-seal ability and secondly to avoid the problem of "heat-sealing overlap". The solution to this technical problem was not obvious in view of G12, which did not suggest a package having a polyamide outer layer. Moreover, the problem of heat-sealing had not been addressed in any of the prior art documents and, consequently, its solution could not be expected from the prior art. Similar considerations applied to the subject-matter of Claim 3.

IV. On 6 June 2006 the Opponent (Appellant) filed an appeal against the decision of the Opposition Division and paid the appeal fee on the same day.

In the Statement of Grounds of Appeal filed on 6 September 2006, the Appellant requested the revocation of the patent in its entirety on the grounds of lack of novelty and lack of inventive step.

V. With its letter dated 9 January 2007 the Patent Proprietor (Respondent) requested that the appeal be dismissed and the patent be maintained in the form which had been upheld by the Opposition Division.

VI. On 2 September 2009 the Board dispatched a summons to attend oral proceedings on 11 February 2010. In the attached annex to the summons the Board drew the attention of the parties to the points to be discussed during the oral proceedings.

VII. By letter dated 14 December 2009 the Appellant informed the Board that it would not attend the oral proceedings. It further withdrew its request for oral proceedings.

VIII. With letter dated 11 January 2010 the Respondent maintained its request that the appeal be dismissed and filed as an auxiliary request a set of claims headed "Set B".

IX. On 11 February 2010, oral proceedings were held before the Board where the Appellant (as announced) was not represented. Since it had been duly summoned, however, the oral proceedings were continued in its absence in accordance with Rule 115(2) EPC, and Art 15(3) RPBA.

During the oral proceedings the Respondent withdrew the pending first auxiliary request ("Set B") and filed two new sets of claims ("Set C" and "Set E") for a first and a second auxiliary request, respectively.

X. The arguments presented by the Appellant may be summarized as follows:

- The Appellant maintained that documents G2 and G12 anticipated the subject-matter of Claims 1 and 3.

- Example 2 of G2 described a three-layer film comprising a polyamide with a melting temperature ≥ 180°C and a further layer comprising a polyamide with a melting temperature lower than 165°C. Moreover, the description clearly indicated that it was possible to laminate another thermoplastic resin layer to the films. It pointed out that the disclosure of G2 was not limited to the working examples and that the general indication in the description of the possible addition of a further

layer undoubtedly anticipated the subject-matter of Claims 1 and 3.

– Additionally, G12 disclosed also films according to Claims 1 and 3 of the patent. In particular the film of Example 11 of G12 included all the features of the films used in the patent in suit. These films of G12 were used for the preparation of heat-shrinkable bags thus resulting in containers and packaged products having all the features of Claims 1 and 3.

– Concerning inventive step, the Appellant argued that even if novelty was acknowledged, the claimed subject-matter lacked inventive step having regard to the disclosure of G2 or G12. Moreover it also lacked inventive step starting from G3 as closest prior art. The films used in the patent differed from the ones used in G3 only by the presence of an intermediate layer comprising a polyamide with a melting temperature lower than 165°C. In the absence of a technical effect for this difference, this measure was regarded as obvious and not contributing to any inventive step.

XI. The arguments presented by the Respondent may be summarized as follows:

– The Respondent maintained that the claimed subject-mater was novel. It argued that the Appellant had picked out single words from different sentences in G2 and pressed them into a combination which was not only not specifically

suggested by G2 but also would be against its general teaching.

– Concerning G12 it argued that it did not disclose flexible containers made of the films having the features of Claim 1 and also did not disclose a container having a sealed area formed by the heat-sealing layer (a).

– Concerning inventive step, the Respondent, starting from G2 as closest prior art, saw the problem to be solved by the claimed subject-matter as providing bags that, when sealed, guarantee a sufficient seal strength without any sticking of the outer abuse layers, even if overlapping occurred, and which had a good balance of shrink, optical, mechanical and barrier properties. In its opinion the solution to this problem by the claimed container was not rendered obvious by any of the documents cited by the Appellant, mainly because none addressed the problem underlying the invention.

XII. The Appellant requested that the decision under appeal be set aside and that the European patent No. 1 034 076 be revoked.

The Respondent requested that the appeal be dismissed or alternatively, that the patent be maintained on the basis of the set of Claims C (Claims 1-17) or the set of claims E (Claims 1-16), filed during the oral proceedings as auxiliary requests 1 and 2, respectively.

Reasons for the Decision

1. The appeal is admissible.

MAIN REQUEST

2. *Novelty (Article 54 EPC)*

2.1 Claim 1 of the main request is directed to a container made of a heat-shrinkable film having the following features:

a) a flexible container made of
b) a heat-shrinkable film comprising
b1) an outer heat-sealing layer comprising a heat sealable polyolefin,
b2) an outer abuse layer comprising a polyamide with a melting temperature ≥ 180°C, and
b3) an intermediate layer comprising a polyamide with a melting temperature lower than 165°C, wherein
c) the container has at least a sealed area formed by the heat-sealing layer.

Claim 3 is directed to a product packaged with the film as described in Claim 1 including the further feature that
d) the outer heat-sealing layer (b1) is the layer in contact with the packaged product.

2.2 The Appellant contested the novelty of these claims having regard to the disclosures of documents G2 and G12.

According to EPO practice, the claimed subject-matter would lack novelty only if it were derivable as a whole directly and unambiguously from a prior art disclosure and if a "clear and unmistakable teaching" of the combination of all claimed features could be found in said disclosure.

2.3 Document G2 discloses a heat-shrinkable laminated film of at least two layers comprising a mixed aliphatic polyamide resin layer (A) and a mixed resin layer (B) comprising as main component a saponified ethyl vinyl acetate copolymer (Claim 1). Additionally, the laminated film may contain at least one olefin resin layer (Claim 5).

2.4 There is, however, no explicit disclosure in G2 of a film comprising two polyamide layers and a heat-sealable polyolefin layer as required by the films of Claims 1 and 3:

2.4.1 The paragraph bridging columns 4 and 5 of G2 describes laminated films that additionally contain thermoplastic resin layers. In particular, the following structures are disclosed:

- EVA/adhesive/(B)/(A)/adhesive/EVA
- EVA/adhesive/(B)/(A)/adhesive/ionomer
- EVA/adhesive/(B)/(A)/adhesive/LLDPE+EVA
- EVA/adhesive/(B)/(A)/adhesive/VLDPE+LLDPE
- VLDPE/adhesive/(B)/(A)/adhesive/VLDPE
- EPC+PP elastomer/adhesive/(B)/(A)/adhesive/VLDPE+LLDPE
- EPC/adhesive/(B)/(A)/adhesive/VLDPE
- EPC/adhesive/(B)/(A)/adhesive/EPC+PP elastomer.

None of these eight exemplified structures contains more than one polyamide layer and in none there is an outer polyamide layer as required by the films according to Claim 1, let alone an outer polyamide layer with the required melting characteristics.

2.4.2 Nor do those working examples of G2 which comprise a thermoplastic resin layer, namely Examples 3 to 10 and Comparative Examples 3 and 4 (Table 2), disclose a film as required in Claims 1 and 3. None of the films described in these examples has an outer polyamide layer or more than one polyamide layer.

2.5 There is also no implicit disclosure of such films in G2.

2.5.1 The Appellant pointed to the films of Example 2 and Comparative Example 2 of G2 which included two polyamide outer layers. A combination of these films with the possible presence of a thermoplastic resin layer (column 4, lines 1 - 7) would anticipate the films required in Claim 1.

2.5.2 The Board notes, however, that in order to arrive at an embodiment according to Claim 1 it is not sufficient to select Example 2 of the several examples of G2 and then to choose to add a thermoplastic resin, because there are still several options regarding the arrangement of this additional thermoplastic resin layer (i.e., between the layers; on one side; on both sides). Thus in view of the several options from which a choice must be made it cannot be concluded that, when a thermoplastic layer is used in G2 it will be inevitably result in a film such as the one used in the present

Claims 1 and 3. Furthermore, there is nothing in G2 that would specifically suggest the combination of two polyamide layers (in fact, the preferred embodiment in G2 has only one polyamide layer, as pointed out in column 3, lines 49-52) with a thermoplastic resin layer, whereby a polyamide layer is one of the outer layers of the film and a thermoplastic resin layer is the other outer layer of the film. In this connection, it is worth pointing out that none of the embodiments specifically listed in G2 or the examples of G2 describe a film with such an asymmetrical structure.

2.6 Consequently, there is no clear and unmistakable teaching in G2 of a film having the claimed combination of features mentioned above in paragraph 2.1 (cf features (b1) to (b3)).

2.7 Turning now to G12, this document discloses a multilayer film comprising (a) a first layer comprising a blend of a crystalline nylon and a material which disrupts the crystallinity of the crystalline nylon; (b) a second layer comprising a blend of a crystalline nylon and a material which disrupts the crystallinity of the crystalline nylon; and (c) a third layer, between the first and second layers, comprising a material having a modulus lower than the modulus of the crystalline nylon, and having a crystallinity of less than 60% (Claim 1), a packaged product using the above film and a process for packaging a meat product in a package which comprises encasing the meat product within the above packaging film, and cooking the meat product while it is encased in the film (Claims 22 and 23). The films of G12 are preferably prepared by tubular coextrusion and blown bubble orientation

(page 4, lines 32-33 and the process of the examples). They are suited to many different forms of packaging applications, such as shirred casings, heat shrinkable bags, films (both heat-shrinkable as well as non-heat-shrinkable), and web and lid stock suitable for thermoforming. The films illustrated in Figures 2 through 4 (multilayer films with 5, 6 and 7 layers) are especially suited for use in heat-shrinkable seamless casings (page 4, lines 28-29).

2.8 It is not in dispute that the multilayer films of Examples 1-3, 10, 11, 18, 19 and 26 of G12 (having 5, 6 or 7 layers, including a heat-sealing layer) fulfil the requirements of the films used in Claims 1 and 3 of the main request.

2.9 There is, however, no reference to a specific packaging use of the films of Examples 1-3, 10, 11, 18, 19 and 26 of G12, in particular not to a flexible container made of these films having at least a sealed area formed by the heat-sealing layer as required by Claim 1 of the main request (cf feature (c)) or to a product packaged having the outer heat-sealing layer in contact with the product as required by Claim 3 of the main request (cf feature (d)).

2.9.1 While packaging is mentioned in general terms, eg on page 4, lines 10-11 and lines 51-52, there is no explicit mention of use of the films for preparing containers having a sealed area formed by the heat-sealable polyolefin. Moreover, the packages disclosed do not comprise any heat seals. Thus, the multilayer films as illustrated in Figures 2-4 are especially suited for use in heat-shrinkable ***seamless*** casings

(page 4, lines 28-29), and the only package explicitly mentioned in G12 is the formation of a casing closed by a pair of clips (see Figure 5), which does not anticipate the claimed subject-matter.

2.9.2 Additionally, there is no information in G12 indicating that the formed packages would have a sealed area formed by the heat-sealing layer or that the outer heat-sealed layer is the layer in contact with the packaged product. Further, if one would manufacture, for example, the tubular film of Example 11 into a casing or bag, the first polyamide layer of the tubular film will be the innermost layer of the casing or bag. Thus, a polyamide layer would be in contact with the food, which is just the opposite of what is required in Claim 3 of the main request. That the first layer in the examples of G12 is indeed the innermost layer of the tubular film is clear from the whole content of G12, but in particular from Claim 13 of G12 which identifies a structure comprising the following sequence:

first nylon/low modulus/second nylon/oxygen barrier/abuse resistant

whereby the abuse resistant layer is typically the outermost layer of a package.

2.9.3 In summary, the subject-matter of Claims 1 and 3 of the main request is neither explicitly disclosed nor implicitly hinted at in G12 and therefore not clearly and unambiguously derivable from G12.

2.10 For the reasons given above, the subject-matter of Claims 1 and 3, and, by the same token, the subject-matter of dependent Claims 2 and 4 to 17, is novel over G2 and G12.

3. *Inventive step (Article 56 EPC)*

3.1 The patent in suit is directed to a flexible container made of a heat-shrinkable film and to a product packaged with such heat-shrinkable film. The films used include a low melting polyamide in an intermediate layer, in combination with an outer abuse layer comprising a high melting polyamide and another outer layer comprising a heat-sealable polyolefin.

Generally, the packaging of food items by means of a heat-shrinkable, gas-barrier, thermoplastic film comprises configuring the heat-shrinkable packaging material, either partially or completely, around a product (eg by placing the food item within a bag or pouch fabricated from the film), removing excess air from inside the package (eg vacuumizing the bag or pouch), sealing it and thereafter exposing the package to a heat source thereby causing the heat-shrinkable film to shrink and conform with the contours of the packaged food. These films provide the packaged foods with an attractive appearance and in the meantime protect the packaged product from the environment and prolong its shelf-life. The films to be used need to have a good balance of gas barrier, mechanical and optical properties as well as good sealing properties. Packaging films with a more or less satisfactory balance of these properties are known (paragraphs [0002] to [0006] of the patent specification).

However, a problem that is often found with the available films is that during heat-sealing step problems arise (overlap, insufficient seal strength and/or sealing or sticking to the outer abuse layer: paragraphs [0007] to [0009] of the patent specification).

3.2 Closest prior art

3.2.1 The Appellant regarded the teaching of documents G2, G3 or G12, relating to polyamide films suitable as packaging films, as representing the closest prior art.

3.2.2 However, neither G3 nor G12 qualify as closest prior art as they relate to a different type of packaging film and/or to a different application thereof.

3.2.3 G3 is directed to a biaxially-oriented laminated polyamide film (see Claim 1). The films described in G3 do not contain an intermediate layer comprising a lower melting polyamide (cf Claim 1; see also examples), and they are not heat-shrinkable as defined in the present claims (because they are heat treated at a temperature higher than the orientation temperature; cf. page 5, line 51).

The object of G3 is to provide a biaxially-oriented laminated polyamide film having excellent oxygen gas barrier properties, high flexing resistance and toughness, using recycling material (see page 12, lines 21 - 28).

It follows that G3 neither discloses subject-matter conceived for the same purpose as the claimed invention, nor does it have the most relevant technical features in common with the claimed subject-matter. Consequently, it does not qualify as closest prior art.

3.2.4 G12 describes similar films to those now claimed (see above under 2.7-2.8) suitable for use as packaging films. However, G12 is essentially directed to seamless casings, ie to casings having no sealed area. As indicated in point 2.9.1 above, seamless casings are the preferred embodiments of G12. Also the only exemplified embodiment (Figure 5) shows a product being packaged in a casing closed by a pair of clips. Although heat shrinkable bags are mentioned, there is no particular mention of the seal ability issue, let alone of the problem arising in relation with overlap during sealing.

Consequently, G12 also does not qualify as closest prior art document.

3.2.5 G2 discloses films structurally related to those now claimed (see above 2.3 to 2.5) which are also suitable for making bags for wrapping fatty food such as raw meat and processed meat having irregular shapes (see column 1, lines 12 - 22). The heat-sealable films of G2 include a thermoplastic resin, preferably an olefin resin in order to achieve the desired extrusion property, stretch ability and seal ability (see column 4, lines 1 - 7). Both outer layers of all the heat-sealable structures described in the examples and working examples of G2 (see above point 2.5) are made of (equal or different) polyolefin resins.

Thus, the films of G2 are representative for the known packaging films mentioned in the introduction of the patent as heat-shrinkable films (see 3.1 above) and can be regarded as representing the closest prior art.

The films used in the applications of Claims 1 and 3 of the main request differ from the films of G2 by the presence of a multilayer structure comprising a low melting polyamide in an intermediate layer in combination with an outer abuse layer comprising a high melting polyamide and another outer layer comprising a heat-sealable polyolefin.

3.3 Problem to be solved

3.3.1 As indicated in T 246/91 of 14 September 1993 (Reasons for the Decision, point 4.4, not published in OJ EPO), an objective definition of the technical problem to be solved should normally start from the technical problem actually described in the patent. Only if it turns out that incorrect state of the art was used to define the technical problem or that the technical problem disclosed has in fact not been solved, can an inquiry be made as to what other technical problem objectively existed.

As explained above, G2 can be regarded in the present case as exemplifying the packaging films mentioned in paragraph [0006] of the patent. Therefore, there is no reason to question the technical problem described in the patent in suit.

3.3.2 According to paragraph [0007] of the patent specification a drawback of the known films is that in the packaging process it is generally necessary to carefully position the packages to be vacuumized and sealed close to the other in the vacuum chamber, but so as to avoid any overlapping of the packages. In fact when overlapped or partially overlapped packages are heat-sealed, either it is not possible to get a seal of sufficient seal strength between the innermost heat-sealing layers of each overlapped package or, if the temperature and pressure of the sealing bars are high enough to guarantee sealing through the overlapped webs, sealing of the overlapped outermost layers is also obtained, which leads to a high number of rejects. This also means that in the packaging process the speed of the overall process is limited by the number of packages that, at each sealing cycle, can be positioned, without overlapping, in the vacuum and sealing chamber.

3.3.3 The technical problem to be solved by the claimed subject-matter can thus be formulated as the provision of a flexible container showing a good balance of shrink, optical and mechanical properties and providing a high packaging speed, specially when overlaps arises.

3.4 Solution to the problem

The examples in the patent in suit show that the above mentioned problem has been credibly solved. They show that the containers made of the films as described in Claim 1 indeed have a good balance of shrink, optical, mechanical and barrier properties (see Table 1). The results in Table II further show that improved puncture resistance and in-line abuse resistance are obtained

using these films when compared with a commercially available package representative of the prior art. Finally, the test on overlapped seal ability indicates that reliable seals, ie where package hermeticity and integrity are maintained, are obtained using the claimed packages (see paragraphs [0094] - [0096]).

3.5 Obviousness

3.5.1 It remains to be decided whether, in view of the available prior art documents, it would have been obvious for the skilled person to solve this technical problem by the means claimed.

3.5.2 In the Board's judgement there is no hint to this solution in the cited prior art. In fact, none of the documents cited by the Appellant addresses the problem of the sticking of the packages when overlapped during heat-sealing and, consequently, they cannot give any hint to the claimed solution. By avoiding sticking of the packages, fewer rejects are produced and the packaging speed can be increased.

In fact, the skilled person would get no incentive from G2 itself, since there is nothing in G2 which would specifically suggest combining two polyamide layers with a thermoplastic layer as defined in Claims 1 and 3 of the main request, respectively (in this context see points 2.4 and 2.5, above). G3 does not refer to heat-shrinkable films at all, and cannot therefore provide any incentive with respect to a problem relating to heat-shrinkable films. Finally, G12 does not address heat-sealing at all, and even if one would manufacture one of the tubular films disclosed in G12, eg the film

of Example 11, into a casing or bag, the resulting container would not have the required sequence of layers as set out in Claim 1 and 3 of the main request, respectively (in this context see in particular point 2.9.2, above).

3.5.3 The Board cannot accept the argument of the Appellant that the skilled person would arrive at the claimed invention by choosing known film structures. When assessing the issue of inventive step, the decisive question is not whether the skilled person could arrive at the invention (in the present case the use of a film with a specific layer structure), but whether he would have done so with a reasonable expectation of obtaining containers having advantageous sealing properties. In the present case, the Appellant has not shown that the person skilled in the art would have chosen a film as used in Claims 1 and 3 of the main request in order to solve the objective technical problem. Moreover, the Appellant's approach appears to be based on an unallowable *ex post facto* analysis.

3.6 Consequently, the subject-matter of Claims 1 and 3, and, by the same token, the subject-matter of the dependent Claims 2 and 4 to 17, involves an inventive step within the meaning of Article 56 EPC.

4. As the claims of the main request fulfil the requirements of the EPC, there is no need for the Board to consider the Respondent's auxiliary requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar The Chairman

G. Röhn W. Sieber