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Datasheet for the decision of 15 March 2021

Case Number: T 0760/17 - 3.3.09

Application Number: 05001395.2

Publication Number: 1559323

IPC: A22C13/00, C08J5/18, C08L29/04, C08L77/00

Language of the proceedings: EN

Title of invention:
Smokable polymeric casing

Patent Proprietor:
Viskase Companies, Inc.

Opponent:
Kalle GmbH

Headword:
Polymeric film for smoking encased foodstuff/VISKASE

Relevant legal provisions:
EPC Art. 56
RPBA Art. 12(4)
RPBA 2020 Art. 13(2)

Keyword:
Main request and auxiliary requests I to IX - inventive step (no)
Auxiliary requests of the series "A, "B" and "C" - admission (no)

Decisions cited:

Catchword:

Europäisches Patentamt
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Beschwerdekammern

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Case Number: T 0760/17 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 15 March 2021

Appellant: (Opponent)	Kalle GmbH Rheingaustrasse 190-196 65203 Wiesbaden (DE)
Representative:	Plate, Jürgen Plate Schweitzer Zounek Patentanwälte Rheingaustrasse 196 65203 Wiesbaden (DE)
Respondent: (Patent Proprietor)	Viskase Companies, Inc. 8205 S. Cass Avenue, Suite 115 Darien, IL 60561 (US)
Representative:	Von Rohr Patentanwälte Partnerschaft mbB Rüttenscheider Straße 62 45130 Essen (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 20 January 2017 rejecting the opposition filed against European patent No. 1559323 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	A. Haderlein
Members:	A. Veronese
	D. Rogers

Summary of Facts and Submissions

I. The appeal was filed by the opponent against the decision of the opposition division rejecting the opposition filed against European patent No. EP 1 559 323 B1.

II. The opponent (appellant) had requested revocation of the patent on the grounds under Article 100(a) EPC (lack of novelty and inventive step) and Article 100(b) and 100(c) EPC.

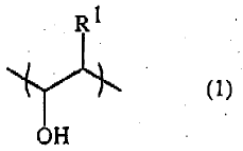
III. Granted claim 1 reads:

1. A seamless tubular, smokable, biaxially stretched, heat-shrinkable thermoplastic film which may be used for food packaging, said film comprising:

(i) at least one polyvinyl alcohol resin in amounts of from 15 wt.% to 45 wt.% based on the weight of said film, characterised in that said polyvinyl alcohol resin comprises, based on said polyvinyl alcohol resin, less than 2 wt.% of water as determined according DIN 51777 pursuant to the method of Karl-Fischer and a maximum methanol content of less than 2 wt.% and wherein said polyvinyl alcohol resin has a hydrolysis degree in the range of from 70 to 100 Mol %;
(ii) at least one aliphatic polyamide in amounts of from 55 wt.% to 85 wt.% based on the weight of said film; and
(iii) at least one anti block agent in amounts of from 3 wt.% to 5 wt.% based on the weight of said film;

said at least one polyvinyl alcohol resin comprising a polymer (A), said polymer (A) comprising:

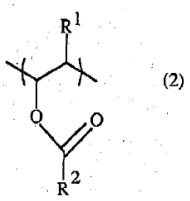
(a) from 15,0 to 99,9 wt.%, based on said polymer (A), of structural units corresponding to formula (1)



(1)

wherein R^1 denotes hydrogen or methyl, preferably hydrogen;

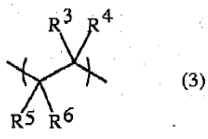
(b) from 0,0 to 50,0 wt.%, based on said polymer (A), of structural units corresponding to formula (2)



(2)

wherein R^2 denotes an alkyl rest having from 1 to 6 carbon atoms, especially methyl or ethyl, preferably methyl;

(c) from 0,0 to 50,0 wt.%, based on said polymer (A), of structural units corresponding to formula (3)



(3)

wherein R^3, R^4, R^5 and R^6, independently from each other, denote organic rests having a molecular weight in the range of from 1 to 500 g/mole.

IV. The documents submitted during the opposition proceedings included:

D1: DE 103 02 960 A1

D3: WO 02/078455 A1

D5: WO 03/020823 A1

D6: "Mowiol® Polyvinyl Alcohol", Clariant Deutschland GmbH, dated December 1999

V. In its decision the opposition division found, *inter alia*, that:

- D6 was to be admitted into the proceedings.
- The claimed subject-matter was novel over D1 and involved an inventive step over D1 and/or D3, which did not provide any pointer towards selecting the claimed amount of antiblock agent.

VI. The following documents were submitted by the parties during the appeal proceedings:

D12: H. Zweifel, Plastics Additives Handbook, 5th Edition, Hanser Publishers, Munich, 2001

D13: "Comparison Influence of weight-% Antiblock Agent", presented by the proprietor during the oral proceedings before the board

VII. In its reply to the notice of appeal, the proprietor (respondent) requested that the appeal be dismissed or, alternatively, that the patent be maintained on the basis of one of auxiliary requests I to IX, filed by letter dated 9 September 2015. Three series of auxiliary requests "A", "B" and "C", identified as "main request" "A", "B" and "C" and as auxiliary requests I-A to IX-A, I-B to IX-B and I-C to IX-C, were filed under cover of a letter dated 13 January 2021.

VIII. Claim 1 of each of auxiliary requests I to IX (AR-I to AR-IX) was limited, progressively, to contain all the features of claim 1 of the previous requests and, in addition, the following additional features:

- AR-I: narrower ranges (15 wt% to 35 wt% and 65 wt% to 85 wt%) to define the amounts of the polyvinyl alcohol resin and polyamide

- AR-II: narrower ranges (25 wt% to 99.9 wt% and 0.1 wt% to 50 wt%) to define the amounts of units (1) and (2) in the polyvinyl alcohol

- AR-III: a selection of specific polyamide types, including, for example, nylon 6 (polyamide 6)

- AR-IV: a thermoplastic polyvinyl alcohol resin comprising less than 2% of volatile components or volatile impurities

- AR-V: specific groups R^3, R^4, R^5 and R^6 to characterise unit (3) of the polyvinyl alcohol resin

- AR-VI: a polyvinyl alcohol resin having a viscosity of 2 to 70 mPas

- AR-VII: a polyvinyl alcohol resin having a melt flow index in the range of 10 to 60 g/10 min

- AR-VIII: specific antiblock agents, including, for example, calcium carbonate

- AR-IX: a polyvinyl alcohol resin comprising a plasticizer being, for example, glycerol

Claim 1 of each of the auxiliary requests of the series "A", "B" and "C" corresponds, respectively, to claim 1 of the main request and auxiliary requests I to IX, the only difference being that:

- In the series "A", claim 1 has been amended to indicate that polymer (A) is Mowiflex® TC 232.

- In the series "B", claim 1 has been amended to indicate that polymer (A) is defined as "in inventive example 3".

- In the series "C", claim 1 has been amended by limiting the definition of polymer (A) so that all units (1), (2) and (3) are present in the structure.

IX. The appellant's arguments which are relevant for the decision can be summarised as follows.

D3, or alternatively D1, could be selected as the closest prior art. The Mowiol® polyvinyl alcohols used to prepare the comparative films of the patent and of Examples 3 and 4 of D3 fell within the definition of the polyvinyl alcohol resin of granted claim 1 because unit (3) was only optionally present. Thus, granted claim 1 encompassed films which did not achieve the alleged improvement of smoke permeability. There was no correlation between the requirement that the polyvinyl alcohol resin used to prepare the film contains less than 2% of water or alcohol and the final structure of the film. Water or methanol could be present in other starting materials (e.g. the polyamide), and water was sprayed on the film during manufacture. Thus, this feature was not limiting. Homogeneity, improved permeability to smoke substances and oxygen barrier properties were not limiting features either, since they were not mentioned in granted claim 1.

The claimed film differed from the films of D3 only in that it comprised an antiblock agent. This could possibly prevent “blocking” of the film. Moreover, there was no evidence that it could improve its permeability. The films of the patent could not be

compared to those of D3, due to differences in the manufacturing conditions. The skilled person confronted with the problem of preventing blocking of the film would have considered using an antiblock agent, in the required amount. The use of these agents was foreseen in D3 and was common knowledge in film manufacturing, as shown in D12. Thus, the claimed matter did not involve an inventive step.

The features characterising the auxiliary requests did not confer an inventive step either. The additional definitions of the structure, viscosity and melt flow index of the polyvinyl alcohol resin did not distinguish this resin from those of D3. The same applied to the requirement that less than 2% volatile components or impurities be present. The selected antiblock agents were commonly used, as shown in D12. Furthermore, glycerine was present in the films of D3 and the melt flow index of pure polyvinyl alcohols could not be measured. Thus, none of the auxiliary requests involved an inventive step.

X. The respondent's arguments which are relevant for the decision can be summarised as follows.

D3, rather than D1, was the closest prior art. The film of granted claim 1 differed from the films disclosed in Examples 3 and 4 of D3 in that it had a homogeneous structure, better permeability properties, and it comprised a different polyvinyl alcohol resin and an antiblock agent, in the claimed amount. The homogeneous structure and the improved properties were not mentioned, but they were implicit features of claim 1. These distinguished the claimed film from that of D3. The structure of the claimed polyvinyl alcohol was that disclosed in D5, which was incorporated by reference in

the description of the patent. The teaching of this document had to be taken into account when interpreting the scope of claim 1. In particular, page 9 of D5 defined a polymer structure where unit (3) was present. This definition excluded from the claimed scope the Mowiol® polyvinyl alcohols of D3 and of the comparative examples of the patent. Even assuming that Mowiol® polymers fell among the claimed scope, a comparison between the film of comparative Sample (5) of the patent and the films of D3 showed that the antiblock agent improved the permeability properties of the claimed films. Thus, an inventive step had to be acknowledged across the entire scope claimed.

Claim 1 of each of auxiliary requests I to IX defined more specifically the polyvinyl alcohol resin and the polyamide used to prepare the films. The amendments aimed to overcome the objections of invalid priority and the lack of sufficiency of disclosure and further delimited the claimed subject-matter from the prior art. They also focused on the films of the inventive examples. The selected viscosity and the plasticizer improved the processability of the film. The exclusion of volatile substances and/or impurities prevented the formation of bubbles during manufacture. Only polyvinyl alcohol resin was likely to absorb water.

The auxiliary requests of the series "A", "B" and "C" had been filed as a direct and immediate reaction to an objection raised for the first time by the board in its communication under Article 15(1) RPBA 2020.

XI. Requests

The appellant requested that the decision under appeal be set aside and that the patent be revoked in its

entirety.

The respondent requested that the appeal be dismissed or, alternatively, that the patent be maintained on the basis of:

- one of auxiliary requests I to IX, filed under cover of the letter dated 9 September 2015, or, alternatively,

- one of the auxiliary requests of the series "A", "B" or "C", identified as "main request" "A", "B" and "C" and as auxiliary requests I-A to IX-A, I-B to IX-B and I-C to IX-C, all filed by letter dated 13 January 2021.

Reasons for the Decision

Main request

1. *Admission of D6 and D12*

1.1 The respondent requested that D6 and D12 not be admitted into the appeal proceedings.

1.2 D6 is an information brochure describing the structure and properties of Mowiol® polymers. It was filed during the opposition proceedings and was admitted by the opposition division. The appellant requested that D6 not be admitted into the appeal proceedings, on the ground that the date on which D6 was made available to the public cannot be established. However, as decided by the opposition division, there is no reason to assume that D6, a brochure from Clariant, which is clearly meant for informative purposes and bears the date December 1999, was not made available to the

public before the filing date of the patent in suit (January 2005). Thus, the board does not see any reason to reverse the opposition division's decision to admit this document or to disregard its content in the appeal proceedings (Article 12(4) RPBA 2007, still applicable to the present case under Article 25 RPBA 2020).

1.3 D12 is a chapter of a textbook relating to the use of antiblock agents in film manufacturing. It was filed by the appellant with its statement setting out the grounds for appeal, thus at the first possible stage of the appeal proceedings. It merely describes the common general knowledge and provides a better understanding of the state of the art in the field of antiblock agents, a very relevant issue in the context of the inventive-step objection. For these reasons, the board does not see any reason to disregard this document under Article 12(4) RPBA 2007 either.

2. *Inventive step*

2.1 The opposed patent relates to a tubular biaxially stretched film, produced in the form of a food casing, which is suitable for the production of smoked sausages and other foods. The film should enable the permeation of smoke components to allow colouring and/or flavouring of encased foods. Furthermore, the film should provide oxygen barrier properties and have good permeability properties (see e.g. paragraphs [0001], [0032] and [0077] to [0081] of the patent in suit).

Closest prior art

2.2 The opposition division and the appellant considered that either D1 or D3 can be selected as the closest prior art. According to the respondent, D3 was the most

suitable starting point because it related to a more similar problem. Both D1 and D3 relate to thermoplastic tubular biaxially stretched films suitable for smoking foods. However, only D3 addresses, like the opposed patent, the problem of enabling the permeation of smoke components, while providing oxygen barrier and good mechanical properties (see D3, page 1, lines 4 to 9, page 3, line 30 to page 4, line 8 and the examples). Thus, the board agrees that this document is the closest prior art.

2.3 The biaxially stretched films prepared according to Examples 3 and 4 of D3 comprise 80 wt% of polyamide 6 and 15 wt% of a polyvinyl alcohol (Mowiol® 5-88 in Example 3 and Mowiol® 6-98 in Example 4), a polyvinyl alcohol resin falling within the definition of granted claim 1.

Differences from the closest prior art

2.4 The respondent argued that the film claimed in the granted patent differed from the films in Examples 3 and 4 of D3 in that:

- It has an homogeneous structure and improved smokability properties.

- It comprises a different polyvinyl alcohol resin.

- It comprises an antiblock agent, in the claimed amount.

2.5 The respondent considered that, although granted claim 1 did not explicitly mention it, homogeneity was an implicit feature characterising the claimed film. The skilled person readily understood that, to be suitable

for smoking a food, a film must have a homogeneous structure. That person would not have considered the films of D3 as homogeneous, because they contained hydrophilic phase domains. These were visible, for example, in the figures of D3.

2.6 This argument is not convincing. Like the opposed patent, D3 relates to a film for packaging foods having sufficient permeability to smoke substances. The film is suitable for smoking encased foods, while providing oxygen barrier and good mechanical properties (see page 1, lines 4 to 9, page 3, line 30 to page 4, line 8 and the table on page 14). In view of this teaching, the skilled person would not consider the absence of hydrophilic phase domains to be an implicit feature of a film for smoking encased foods. Thus, homogeneity, in particular the absence of hydrophilic phase domains, is not a feature distinguishing the film of granted claim 1 from that disclosed in D3. For this same reason, the respondent's view that the claimed film differs from that of D3, because it provides a higher water transmission rate and an oxygen barrier, cannot be accepted either. Like homogeneity, these properties are not mentioned in granted claim 1 and cannot be considered as implicit distinguishing technical features.

2.7 The respondent has also argued that D3 does not disclose the polyvinyl alcohol resin of granted claim 1. The board does not agree with this view. This resin is only characterised in that it comprises a polymer comprising from 15.0 to 99.9 wt% of a unit (1) and 0.0 to 50.0 wt% of units (2) and (3). This means that, whereas unit (1) must be present in the structure, the presence of either one of units (2) and (3) is optional. Thus, the claimed definition

encompasses "Mowiol® 5-88" and "Mowiol® 6-98" disclosed in Examples 3 and 4 of D3. As shown in D6, these are polyvinyl alcohol polymers obtained by controlled hydrolysis of polyvinyl acetate. The first number ("5" and "6") indicates the polymer viscosity, expressed in mPas. The second number ("88" and "98") indicates the degree of hydrolysis of the polyvinyl acetate (see D6 "B1 General characteristics"). From their degree of hydrolysis, it can be deduced that "Mowiol® 5-88" and "Mowiol® 6-98" comprise the two units (1) and (2) in amounts falling within the claimed range. Residue (3) is absent but, as mentioned above, if unit (2) is present, the presence of unit (3) is only optional according to claim 1.

2.8 The respondent has contended that the definition of the claimed polyvinyl alcohol resin was further limited by the disclosure of D5 because this document was "incorporated by reference" in paragraphs [0025] and [0034] of the opposed patent. D5 was to be considered an expert opinion as to the claimed polyvinyl alcohol resin. Page 9 of D5 taught that the units (2) and (3) of the polyvinyl alcohol are both present and are contained in the resin in the amounts of 0.1 to 50 mol% and 0.1 to 20 mol%, respectively. This definition excluded the Mowiol® polymers from the claimed subject-matter.

2.9 The board does not agree. The components making up the claimed film are clearly defined, and their structure can be understood without difficulty by the person skilled in the art. Thus, there is no reason to read into claim 1 features which are not mentioned there, and even less the features disclosed in a separate document mentioned in the description. Furthermore, even if reference is made to D5, the basic structure of

the polyvinyl alcohol, shown on page 8, is the same as that of claim 1. The structural definitions shown on page 9, referred to by the respondent, are presented only as "preferred". Therefore, the claimed polyvinyl alcohol resin of claim 1 encompasses the Mowiol® polyvinyl alcohol polymers disclosed in D3.

2.10 For the sake of completeness, the following is also noted. It was common ground that the requirement in claim 1, that the polyvinyl alcohol resin comprises less than 2 wt% of water and methanol concerns only one of the starting materials used to prepare the claimed film and not the film itself. As observed by the appellant and by the board in its preliminary opinion, this requirement does not necessarily result in a difference in the structure of the film. This is, for example, because water or alcohol can be present in other materials making up the blend used to prepare the film or can be included during the manufacturing process. Thus, this feature is unsuitable to distinguish the claimed subject-matter from the prior art.

2.11 The films exemplified in Examples 3 and 4 of D3 do not contain an antiblock agent, although the use of an antiblock agent is foreseen on page 4, line 31 of that document.

2.12 Thus, the presence of an antiblock agent, in the amount specified in claim 1, is the only technical feature distinguishing the claimed film from the films of Examples 3 and 4 of D3.

Technical effect

2.13 As already mentioned above, the claimed invention aims at preparing a biaxially stretchable film having good mechanical properties, which enables smoke components to permeate, while providing an oxygen barrier. The patent teaches that the films of the prior art do not have these properties, in particular because the permeability to smoke substances is insufficient (see paragraphs [0016] to [0025], [0032] and [0070]). It also teaches that the gist of the invention resides in the use of a particular polyvinyl alcohol resin, Mowiflex® TC 232. Indeed, paragraph [0032] states that:

"*A breakthrough was made when a specific, newly developed polyvinyl alcohol resin was used. This polyvinyl alcohol polymeric resin product is known and commercially available as Mowiflex® TC 232*" (emphasis by the board).

2.14 The results in Tables 1 and 2 of the patent confirm that films prepared using Mowiflex® TC 232 have a higher water vapour transmission rate (MVTR, correlating with smoke permeability) than those prepared using Mowiol® polymers, as in the prior art. An MVTR above 800 g/100in^2/24hours/mil is observed with Mowiflex® TC 232, and less than 65 g/100in^2/24hours/mil with Mowiol®, the polyvinyl alcohol of the prior art (see Tables 1 and 2). This improvement is certainly unexpected, but it is not achieved across the entire scope claimed. This is because the definition of the polyvinyl alcohol resin of claim 1 encompasses, as mentioned above, the Mowiol® polyvinyl alcohol of the films of the reference examples.

2.15 The respondent argued that, even if assuming that claim 1 encompassed Mowiol® polymers, the claimed film, which contained an antiblock agent, performed better than the films of D3. This was evident when comparing the MVTR observed with the film of comparative Sample 5 of the patent (Table 1) with that of the films of Examples 3 and 4 of D3 (calculated in D13, relying on the values shown on page 14 of D3). This improvement was, in the respondent's opinion, induced by the antiblock agent present in the film of comparative Sample 5.

2.16 The board does not agree with this interpretation of the results. Paragraphs [0032] and [0070] of the patent leave no doubt that Mowiflex® TC 232 is the essential agent for improving the permeability and the oxygen barrier properties of the films according to the invention. According to paragraph [0041] of the patent, an antiblock agent can be used, optionally, to prevent adherence of film surfaces, e.g. when rolls of film are subjected to heat or pressure. No pointer can be found in the patent that an antiblock agent can improve film permeability.

2.17 Concerning the comparative data presented by the respondent, it is noted that the MVTR values expressed in g/100 in^2/24 hours of the Mowiol® film of Sample 5 containing an antiblock agent (63.1, see Table 1 of the patent), and of the Mowiol® films of Examples 3 and 4 of D3 not comprising that agent (32.8 and 16.3, shown in D13), are at least one order of magnitude lower than those of the Mowiflex® TC 232 films (from 700 to above 1700, see Table 2 of the patent). This means that, in practice, the Mowiol® films have very low MVTRs and that, in absolute terms, the differences between their MVTRs are small. Changes in the viscosity and/or to the degree of hydrolysis of the Mowiol® can induce these

small differences: compare the films comprising Mowiol® 5-88 and Mowiol® 6-98 of Examples 3 and 4 of D5. The difference is similar to that observed with the film of Sample 5, which comprises a still different Mowiol® (Mowiol® 18-88), in addition to the antiblock agent. Thus, the (small) alleged improvement in MVTRs in Sample 5 could be induced by this different Mowiol®, rather than by the antiblock agent.
Furthermore, as noted by the appellant, the films of D3 have been subjected to different manufacturing steps, which can also influence the MVTR. For example, they have been subjected to a relaxation annealing step at 160-180°C, have not been sprayed with water (like those of Sample 5) and have been stretched in a different manner longitudinally and laterally. Finally, they contain glycerine, a plasticizer.

2.18 For these reasons, the comparative data presented by the respondent are not suitable to show that the slight increase in MVTR observed with the Mowiol® film of Sample 5 of the patent over that of the Mowiol® films of D3 is induced by the antiblock agent.

Underlying technical problem

2.19 In view of these findings, the problem suggested by the respondent, of providing a film having improved smokability and oxygen barrier properties and acceptable mechanical properties, is not achieved across the entire scope claimed. This, in particular, as far as a polyvinyl resin which is not Mowiflex® TC 232 is used to prepare the film.

2.20 Starting from Examples 3 and 4 of D3, the underlying technical problem has then to be reformulated to one less ambitious, of providing an alternative film

suitable for smoking foods, which reduces the risk of film adherences or, in other words, which reduces "blocking" of film layers.

2.21 When confronted with this problem, the skilled person would have considered including an antiblock agent in the film. The use of antiblock agents is, in fact, already envisaged on page 4, line 31 of D3. Furthermore, D12, a document representing common general knowledge in the field, confirms that the use of antiblock agents for preventing adherence of polymer films is common practice during film manufacture. Finding the effective amount of this agent would be trivial for the skilled person. There is no evidence that the selection of the claimed amount is associated with any particular technical effect. Accordingly, the subject-matter of claim 1 of the main request does not involve an inventive step over D3 alone or in combination with D12.

Auxiliary requests I to IX

3. *Inventive step*

3.1 In its reply to the statement of grounds of appeal, the respondent described the amendments made in auxiliary requests I to IX. It also stated that some amendments limited the claims to the inventive examples and delimited the claimed subject-matter from the prior art. However, the respondent did not refer to any piece of prior art. In particular, it did not elaborate on the relevance of the amendments in relation to the outstanding inventive-step attacks, let alone over D3. During the oral proceedings, it decided to discuss auxiliary requests IV and IX and relied on its written

submissions as far as the other requests were concerned.

3.2 Claim 1 of auxiliary request IX includes the features present in all preceding requests. It differs from claim 1 of the main request in that it specifies:

(a) narrower ranges (15 wt% to 35 wt% and 65 wt% to 85 wt%) to define the amounts of polyvinyl alcohol resin and polyamide

(b) narrower ranges (25 wt% to 99.9 wt% and 0.1 wt% to 50 wt%) to define the amount of units (1) and (2) in the polyvinyl alcohol

(c) a selection of specific polyamide types, including, for example, nylon 6 (polyamide 6 or PA6)

(d) specific groups R^3, R^4, R^5 and R^6 to characterise unit (3) of the polyvinyl alcohol resin

(e) specific antiblock agents, including, for example, calcium carbonate and silica

(f) a polyvinyl alcohol resin comprising a plasticizer being, for example, glycerol

(g) a thermoplastic polyvinyl alcohol resin comprising less than 2% of volatile components or volatile impurities

(h) a polyvinyl alcohol resin having a viscosity of 2 to 70 mPas

(i) a polyvinyl alcohol resin having a melt flow index in the range of 10 to 60 g/10 min

3.3 Features (a) to (c) do not further distinguish the claimed subject-matter from D3, because Mowiol® 5-88, Mowiol® 6-98 and polyamide 6, present in the films of Examples 3 and 4 of D3, still fall under the claimed scope. Feature (d) defining residues R^3, R^4, R^5 and R^6 of unit (3) is not limiting either; this unit being only optionally present.

3.4 Feature (e) limits the antiblock agent to a selected list, which includes for example calcium carbonate and silica. However, these are known antiblock agents, as shown in D12, page 590, right hand side. Thus, their selection would be obvious for the skilled person, for the reasons already presented above (point 2.21).

3.5 Feature (f) indicates that the polyvinyl alcohol resin used to prepare the film includes a plasticizer being, for example, glycerol. However, as noted by the appellant and as also conceded by the respondent, glycerol is included in the mixture used to prepare the films of Examples 3 and 4 of D3. Thus, it is present in these films. Furthermore, according to the respondent's written submissions, the plasticizer is added to improve the processability of the film, i.e. the manufacturing process, rather than the properties (e.g. the permeability to smoke) of the film which is currently claimed. Thus, glycerol does not contribute to inventive step.

3.6 Feature (g) requires that the thermoplastic polyvinyl alcohol resin comprises less than 2 wt% of volatile components or volatile impurities, which, as acknowledged by the parties, can be water or methanol. According to the respondent, the absence of volatile components prevents the formation of bubbles during

film manufacturing. Even if it were considered a distinguishing technical feature, this requirement would not contribute to inventive step. As observed by the appellant and by the board in its preliminary opinion, excluding volatile agents from the polyvinyl alcohol resin does not necessarily result in a difference in the structure of the film. In fact, these agents can be added as such or be present in the other ingredients which are blended before being extruded into a film. Claim 1 is open to the presence of other substances, such as water or methanol, and does not limit their presence in the other ingredients. The respondent argued that only polyvinyl alcohol is likely to absorb water. Yet, as noted by the appellant, polyamide, the major component of the film, can also absorb water. This respondent's argument was objected to by the appellant as being late filed, but the board sees no reason to disregard it, since it is a normal development of the appellant's submissions. Hence, excluding the presence of volatile ingredients from the resin would not solve the problem of bubble formation across the entire scope claimed. It follows that this requirement cannot contribute to inventive step.

3.7 Features (h) and (i) require the polyvinyl alcohol resin to have a viscosity of 2 to 70 mPas and a melt flow index in the range of 10 to 60 g/10 min. According to the respondent, these features further delimit the claimed subject-matter from the prior art. However, there is no evidence that selecting these parameters is associated with an improvement of the film properties, or that the Mowiol® resins of D3 do not fulfil these requirements. For example, as noted by the appellant, Mowiol® 5-88 and Mowiol® 6-98 of Examples 3 and 4 of D5 have a viscosity of 5 and 6 mPas, falling within the claimed range (see also point 3.5 above). Furthermore,

according to the respondent, the claimed viscosity is selected to improve the processability of the film. Thus, like glycerol, it is used to improve the manufacture of the film, rather than its final properties.

3.8 Moreover, although the claimed viscosity and melt flow index are preferred according to paragraph [0035] of the patent, like other characteristics of the tested Mowiflex® TC 232 resin (for example the presence and structure of unit (3) and other additives), they are not specified in the examples describing the preparation of the tested films. According to the respondent, this feature was added to further delimit the claimed subject-matter from the closest prior art. However, the respondent has not shown why this feature would contribute to inventive step. Accordingly, like the preceding ones, features (h) and (i) cannot contribute to inventive step.

3.9 From this it follows that the respondent's argument that the selection of features (a) to (i) was "purposive" is not persuasive either.
Accordingly, it is concluded that, for the reasons already presented when discussing the main request, auxiliary request IX does not involve an inventive step over D3 alone, or in combination with D12. Since claim 1 of each of auxiliary requests I to VIII is characterised by only some of the aforementioned features (a) to (i), and is broader in scope, the same conclusions apply to these requests. Thus, none of them involves an inventive step.

Auxiliary requests of the series "A", "B" and "C"

4. *Admission*

4.1 According to the respondent, the auxiliary requests of the series "A", "B" and "C" were filed as an immediate and direct reaction to the preliminary views given by the board in its communication under Article 15(1) RPBA. In its opinion, the requests addressed an objection, raised for the very first time by the board, that the definition of the claimed polyvinyl alcohol resin encompassed the Mowiol® polyvinyl alcohol resins of D1 and D3. Furthermore, for this reason, the alleged technical effect could not be acknowledged across the entire scope claimed.

4.2 The board does not agree with this view. The opposition division already considered the definition of the claimed polyvinyl resin to encompass the polyvinyl alcohol of D3 (see point 7.2.1 of the decision). Moreover, in its statement of grounds of appeal, the appellant had clearly indicated that, for this reason, the films of the comparative examples fell under the claimed scope and could not solve the underlying technical problem. It had also remarked that the respondent had itself provided evidence that the alleged technical effect could not be achieved across the entire scope claimed (see the passage bridging pages 9 and 10 of that statement). This means that the board's preliminary opinion was based on facts and arguments which were already discussed in the decision under appeal and in the appellant's statement of grounds of appeal.

4.3 For these reasons, the board does not find any exceptional circumstances justified by cogent reasons

for filing the auxiliary requests of the series "A", "B" and "C" and amending the party's case at an advanced stage of the appeal proceedings. Thus, these requests are not admitted into the appeal proceedings (Article 13(2) RPBA 2020).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

A. Nielsen-Hannerup A. Haderlein

Decision electronically authenticated