

PATENT COOPERATION TREATY

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INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference see form PCT/ISA/220		FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/EP2018/082678	International filing date (day/month/year) 27.11.2018	Priority date (day/month/year) 01.12.2017
International Patent Classification (IPC) or both national classification and IPC INV. C08J5/18		
Applicant ANHEUSER-BUSCH INBEV S.A.		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	Date of completion of this opinion see form PCT/ISA/210	Authorized Officer Okunowski, Joachim Telephone No. +49 89 2399-0	
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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>9, 10</u>
	No: Claims	<u>1-8, 11-18</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-18</u>
Industrial applicability (IA)	Yes: Claims	<u>1-18</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

- D1 EP 1 657 276 A1 (TOYO BOSEKI [JP]) 17 mei 2006 (2006-05-17)
- D2 WO 2011/054786 A1 (BASF SE) 12 mei 2011 (2011-05-12)
- D3 US 2009/227735 A1 (SHIH WAYNE KEN [US] ET AL) 10 september
2009 (2009-09-10)
- D4 US 6 555 623 B1 (YANG LAU S [US] ET AL) 29 april 2003 (2003-04-29)
- D5 Ansgar Behler: "Filme",
Römp online 4.0, 1 januari 2005 (2005-01-01), XP055471259,
Stuttgart (DE)
Gevonden op het Internet:
URL:<https://roempp.thieme.de/roempp4.0/do/data/RD-06-00798>
[gevonden op 2018-04-27]
- D6 GROENINCKX G ET AL: "MORPHOLOGY AND MELTING BEHAVIOR
OF SEMICRYSTALLINE POLY(ETHYLENE TEREPHTHALATE). I.
ISOTHERMALLY CRYSTALLIZED PET",
JOURNAL OF POLYMER SCIENCE PART B: POLYMER PHYSICS,
JOHN WILEY & SONS, INC, US,
deel 18, 1 januari 1980 (1980-01-01), bladzijden 1311-1324,
XP002048713,
ISSN: 0887-6266, DOI: 10.1002/POL.1980.180180612

Item V

The observations made under this Item are made in the light of the observations under Item VIII of this opinion as regards features that cannot offer a distinction over the prior art.

- 1 D1 discloses a polyester film comprising polyethylene terephthalate (PET) and polybutylene terephthalate (PBT) or polytrimethylene terephthalate (PTT) (paragraphs [0007]-[0010]). The films can have some shrinkage, namely up to 1.1%, and moreover, shrinkage is not a feature of the present claims that could provide any distinction over D1. Preferred film thicknesses are 3-100

µm (paragraph [0026]). In the preparation of the polyester, the use of maleic acid anhydride as comonomer is explicitly disclosed (paragraph [0037]). Drawing is done at 60-120°C, and heat setting at 180-230°C (paragraphs [0051], [0052]). The disclosure of D1 therefore anticipates the subject-matter of claims 1-8, 11, 12, 14-18, which thus lacks novelty (Article 33(2) PCT).

- 2 D2 discloses polyester shrink films (page 1, line 5 to page 2, line 14), the polyester composition including a polyester comprising terephthalic acid monomer units. Maleic acid anhydride units are explicitly disclosed for a preferred embodiment (page 5, lines 1-20, notably line 17). Polyols as in present claim 13 are disclosed as well (page 6, lines 6-32). The disclosure of D2 therefore anticipates the subject-matter of claims 1-8, 13, 17, 18, which thus lacks novelty (Article 33(2) PCT).
- 3 Claims 9 and 10 would not appear to be open to objection for lack of novelty.

It would appear that the present application is mainly concerned with shrink films made mainly of modified polyethylene terephthalate or like polyesters. D3, which relates to heat-shrinkable films for e.g. label applications of a blend of polyesters that appear to be made up predominantly of terephthalic acid units and ethylene glycol units, notably in the contents as defined in present claim 10 (paragraphs [0002], [0009]-[0029]) would appear to be more appropriate as starting point than D1 or D2. Thus, D3 is considered to represent the closest prior art for the subject-matter of present claims 9 and 10.

D3 does not disclose that the polyester has been modified by copolymerization with maleic acid anhydride. Thus, the subject-matter of claims 1, 9 and 10 is distinguished over the closest prior art in that polyester has been modified by copolymerization with maleic acid anhydride (as regards claim 9: in the molar proportions defined by this claim). However, the application would appear to indicate that the modified polyester of claim 1 is merely to offer an alternative to prior art modified polyethylene terephthalates for shrink films. No surprising result stemming from the incorporation of comonomeric units derived from maleic acid anhydride, which is in itself commonly known (as shown by D1 and D2), are reported. The incorporation

of such units into polyesters is *per se* known from D1 and D2. One should also note that the claims actually claim the maleic anhydride as an additive to the polyester, not as comonomeric unit, and that the examples, which show maleic anhydride as comonomeric unit, do therefore show no effect for the claimed subject-matter as all. Thus, the subject-matter of claims 9 and 10 is not considered to involve an inventive step (Article 33(3) PCT).

Item VII

- 1 The application uses the abbreviation "PET" both as abbreviation for polyethylene terephthalate (claim 1) and as abbreviation for terephthalic acid (claim 2), which is non-unitary use of terminology (Rule 10.2 PCT).
- 2 No sources are indicated for the prior art described in the application (Rule 5.1(a)(ii) PCT).
- 3 The unit "psi" on page 16, lines 12-20 is no S.I.-unit (Rule 10.1(e) PCT).
- 4 The scale of the drawings and the distinctness of their graphical execution is such that it is not guaranteed that a photographic reproduction with a linear reduction in size to two-thirds would enable all details (especially text details) to be distinguished without difficulty. Also, the height of the numbers and letters in the drawings is less than 0.32 cm (Rule 11.13(c)(h) PCT).
- 5 It is noted that, in the example, under "Step 1: Esterification", three components are listed but four values of molar proportion. This is inconsistent.
- 6 Claims 1-13, 17 and 18 would all appear to belong to the same category, and are therefore not grouped in the most practical way possible (Rule 6.4(c) PCT).
- 7 The expression "but not limited to group" seems to miss a word.

Item VIII

1 The claims lack clarity (Article 6 PCT).

1.1 Usually, a film is considered to be less than 0.25 mm thick (see D5). However, the present application embraces thicknesses for the film of up to and including 1.0 mm (see claim 5). Thus, in the present application, the term "film" is given a meaning which deviates from the meaning usually given in the art, which detracts from the clarity of the feature "film" in claim 1.

1.2 In claim 1, the definition that the film comprises one or more polyesters selected from but not limited to group consisting polyethylene terephthalate (PET), polyethylene naphthalate (PEN), poly-1,4-dicyclohexanedimethylene terephthalate (PCT), Polybutylene terephthalate (PBT), Polytrimethylene terephthalate (PTT), polyethylene naphthalate bibenzoate (PENBB) or mixtures thereof is ambiguous, and detracts from the clarity of claim 1. One possible interpretation is that one or more of the listed polyesters must be present, but that other polyesters may be present as well, however, this is already expressed by the preceding word "comp", which is indicative of an open claim formulation. Another possibility is that the choice of polyesters from said listed polyesters is merely optional.

In view of this, claim 1 is interpreted, for the purposes of novelty and inventive step, to provide no delimitation as regards the choice of polyester.

Analogous observations are to be made for claims 12 and 14, claim 12 therefore provides no further delimitation.

1.3 In view of the observation under preceding Item VII, point 1, the term "PET film" in claim 17 is ambiguous. Claim 17 is considered to define films of any polyester including terephthalic acid units, including those of D2.

- 1.4 Claims 1, 14 and 17 define the polyester film to be heat-shrinkable, but do not indicate what the delimiting shrinkage value should be or how it should be determined (for the latter, see also following point 6). Claims 1, 14 and 17 therefore lack clarity, and offer no distinction over the prior art as regards heat shrinkage behaviour.
- 1.5 Claim 1 defines a film which comprises, *inter alia*, a polyester and maleic acid anhydride as cross-linking agent. Hence, the cross-linking agent is present as acid anhydride, not as a comonomeric unit. However, the example would appear to show that terephthalic acid, ethylene glycol (this is an essential part of the polyester to be formed and hence not an additional, optional diol as meant in claim 1) and maleic acid anhydride are copolymerized, i.e. the film comprises a comonomeric unit derived from maleic acid anhydride (probably isomerized partially to a fumaric acid structure, cf. column 1, lines 34-48 of D4). Thus, in the exemplary film, no maleic acid anhydride as such is present. This contradiction with the claims detracts from the clarity of the claims. For the purposes of novelty and inventive step, the claims are interpreted to relate to the presence of comonomeric units stemming from maleic acid anhydride rather than to the presence of maleic acid anhydride itself.

These observations also apply to claims 14 and 17.

- 1.6 Claim 6 lacks clarity since this claim does not clearly define the usual temperatures during transportation (these will depend on e.g. area and season), and the extent of resistance of the film against such temperatures, and hence does not clearly define the glass transition temperature of the polyester material. This claim is not considered to provide a distinguishing feature.
- 1.7 Claims 3, 4 and 18 do not define how the heat shrinkage behaviour defined in these claims is to be determined (e.g. relative humidity, procedure, etc.). The description provides no information on this as well. Thus, these claims lack clarity and are not considered to provide an additional feature that would provide a distinction over the prior art.

Moreover, it is noted that claim 18 appears to be incomplete.

- 1.8 Claims 7 and 8 define the polyester material by certain values of glass transition temperature (claim 7) or melt temperature (claim 8) the material has to show. However, these claims do not indicate how these parameters are to be determined, although the determination method will have influence on the value obtained. It is noted that the description offers no guidance in this respect.

A method commonly used to determine said parameters is DSC. However, the way DSC is carried out can have considerable influence on the measurement result obtained (see D6, "Synopsis"). Claims 7 and 8 lack therefore clarity and are not considered to provide an additional feature that would provide a distinction over the prior art.

- 1.9 The passage on page 7, line 6 to line 25, relating to the role of the expression "about", tries to widen the scope of what is defined by the wording of the claims in a vague manner, and therefore detracts from the clarity of the claims.
- 1.10 A period normally terminates a claim. The period behind the "°C" that is followed by more, in claims 8, 14, 18, detracts therefore from the clarity of the claims.
- 1.11 Claim 17 does not end with a period.
- 2 Claims 1 and 2 are two independent claims for one and the same category, which is indicative of a lack of conciseness of the set of claims (Article 6 PCT).