

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

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

Date of mailing
(day/month/year) see form PCT/SA/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/US2019/066564

International filing date (day/month/year)
16.12.2019

Priority date (day/month/year)
17.12.2018

International Patent Classification (IPC) or both national classification and IPC
INV. B32B27/20 B32B7/02 B32B7/023 B32B7/12 B32B27/08 B32B27/16 B32B27/32 B32B33/00 B32B38/00
C08J5/18 C08K3/36 C08L23/00

Applicant
TAGHLEEF INDUSTRIES, INC.

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 43 <i>bis</i> .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 66.1 *bis*(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:



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Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

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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. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 19-21

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

☒ no international search report has been established for the whole application or for said claims Nos. 19-21

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☐ See Supplemental Box for further details

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has, within the applicable time limit:
- ☐ paid additional fees
 - ☐ paid additional fees under protest and, where applicable, the protest fee
 - ☐ paid additional fees under protest but the applicable protest fee was not paid
 - ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-18, 22-28

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>6</u>
	No: Claims	<u>1-5, 7-18, 22-28</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-18, 22-28</u>
Industrial applicability (IA)	Yes: Claims	<u>1-18, 22-28</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

1 **Re Item IV**

Lack of unity of invention

This Authority considers that the application does not meet the requirements of unity of invention as several inventions appear to be claimed that are not so linked as to form a single general inventive concept, as it is required by Rule 13.1 PCT.

Reference is made to the following documents:

D1 WO 03/093004 A1 (EXXONMOBIL CORP [US]) 13 November 2003
(2003-11-13)

The common matter linking together the independent claims **1**, **9** and **22** is a blend of a polyolefin and an adsorbent silica. Such blends however are known in the prior art and are for example disclosed in **D1**.

More in detail, **D1** discloses a thermoplastic film comprising a core layer and at least one printing skin layer (claim 1). The printing skin layer comprises a polypropylene homopolymer, another olefinic polymer (claim 4, paragraph [0024]) and a water absorption additive which may be silica (claim 5). The printing skin layer may utilize the same blend as the core layer (paragraph [0053]). The overall film is preferably made by coextrusion of the layers (paragraph [0058]). Neither the type of silica nor its pore size is specified but the silica may be used in an amount between 5 wt.-% and 30 wt.-% (paragraph [0050]). Water contact angles or surface tension values are not explicitly disclosed in **D1**. It appears that the surface tension of at least 35 dynes is also not implicitly disclosed while the composition of the printing skin layer will generate a water contact angle of at least 100 degrees and hence it has to be considered as implicitly disclosed. The overall film may be uniaxially or biaxially stretched what will mandatorily generate fractured voids at the surface as a result of the incorporated silica (paragraph [0057]). The printing skin layer is optionally treated with corona, flame or plasma (claim 15). The overall film has a light transmittance between 0 % and 35 % and is therefore translucent (paragraph [0062]). It may also be a three- or five-layer film with several skin or intermediate layers (paragraph [0055]-[0056]) and may be used as a label (paragraph [0019]).

In view of the disclosure of **D1**, the following inventions can now be distinguished:

Invention I: Claims **4, 5, 6, 9, 22-27** as well as **1-3, 7, 8, 10-18** and **28**

A multilayer extruded film as defined in independent claim **1**, wherein the adsorbent silica is a silica gel or a precipitated silica or has a pore size in the range of 30 Å to 500 Å, or wherein the silica-comprising layer has a surface tension of at least 35 dynes, or a film as defined in independent claim **22**.

The special technical feature of this invention is a surface tension of at least 35 dynes of the silica-comprising layer, or the silica employed being a silica gel or a precipitated silica, or having a pore size of 30 Å to 500 Å.

Claims **1-3, 7, 8, 10-18** and **28**, the subject-matter of which doesn't appear to be novel in the sense of Article 33(2) PCT over the disclosure of **D1**, are for formal reasons also assigned to this invention.

Invention II: Claims **19-21**

A master batch for use in extruding a film layer as defined in independent claim **19**.

The special technical feature of this invention is the formulation of a master batch comprising a blend of 95 wt.-% or less polyolefin and 5 wt.-% or more adsorbent silica.

The special technical features of these inventions are obviously not the same, nor are they corresponding special technical features within the meaning of Rule 13.2 PCT:

The special technical features defining **invention I** apparently solve the technical problem of increasing the printability of hydrophobic polyolefin surfaces for water-based inks. This problem is solved by using adsorbent silica with a specific pore size and surface area. According to the application, both criteria are only met by adsorbent silica produced either by a gel or by a precipitation process. Therefore, the claims **4, 5, 6, 9** and **22 to 27** relate to one invention solving the same problem.

The special technical feature defining **invention II**, does not appear to solve any particular technical problem besides providing an alternative, and therefore claims **19-21** appear to relate to a second invention.

2

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following further documents:

- D2** US 4 741 950 A (LIU LELAND L [US] ET AL) 3 May 1988
(1988-05-03)
- D3** JP H03 130150 A (TORAY INDUSTRIES) 3 June 1991
(1991-06-03)

Novelty

Following the statements in the Non-Unity reasoning regarding the disclosure of **D1**, the subject-matter of independent claim **1** and dependent claims **2, 3, 7, 8, 10-18** and **28** is not new in the sense of Article 33(2) PCT over this disclosure.

D2 discloses a biaxially oriented polymer film (claim 6) made of a core layer and at least one outer skin layer (claim 1) where the skin layer is a blend of isotactic polypropylene and silica serving as anti-blocking agent (claim 4, 7). As possible silica diatomaceous earth is mentioned which is a porous and therefore adsorbent silica (column 5, lines 35-61). The layers are preferably coextruded (column 6, line 1-3).

Therefore, according to **D2** the subject-matter of independent claim **1** is not new in the sense of Article 33(2) PCT.

Additionally **D2** discloses that the extruded film has an increased wettability in order to permit printing (column 1, lines 6-58). The used silica may be either silica gel or precipitated silica used in an amount between 0.1 wt.-% and 10 wt.-% (column 5, lines 35-61). As silica gel Syloid is mentioned which to the knowledge of the examiner has pore sizes in between the size range mentioned in the subject-matter of claim **9**. The film is stretched and therefore fracturing will occur on the surface (claim 6). The overall film may be optionally corona treated (column 6, line 19-23) and is translucent (column 2, line 20-24). The first and second skin layer contain a particulate whitening material (claim 8).

As a consequence, the subject-matter of claims **2-5, 7-16** and **28** is not new in the sense of Article 33(2) PCT with respect to **D2**.

D3 discloses a stretched polyolefin monolayer film with improved printing properties containing a void forming filler in an amount between 10 wt.-% and 40 wt.-% (page 348). The filler may be diatomaceous earth (page 348). Diatomaceous earth comprises typically between 80 wt.-% and 90 wt.-% silica. The monolayer film is opaque and therefore translucent (page 348). Already without corona treatment surface wetting tensions above 45 dynes are measured (page 348). The composition of the polyolefin monolayer film will generate a water contact angle of at least 100 degrees and hence this feature has also to be considered as implicitly disclosed.

Therefore, the subject-matter of independent claim **22** and dependent claims **23-27** is not new in the sense of Article 33(2) PCT with respect to **D3**.

Since surface tensions of at least 35 dynes are already disclosed in **D3** for a monolayer it would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to the multilayer films disclosed in **D1** or **D2**, thereby arriving at a multilayer extruded film according to claim **6**.

3 **Re Item VII**

Certain defects in the international application

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in **D1**, **D2** and **D3** is not mentioned in the description, nor is the document identified therein.

4 **Re Item VIII**

Certain observations on the international application

The application does not meet the requirements of Article 6 PCT, because claims **1**, **6** and **9** are not clear.

The term "adsorbent" used in independent claim **1** is vague and unclear since different types of adsorption exist. Consequently, the term leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT. From the description it becomes obvious that the term "adsorbent" relates to the hydrophilicity of the porous silica and the adsorption of water-based ink on the surface and internal surface of the silica and therefore the type of adsorption should be specified in independent claim **1**.

It should be noted that the term "adsorbent" also appears in claims **4, 5, 7, 9, 19, 21** as well as **22** and as "absorbent" in claim **8** which is obviously a spelling mistake. Therefore, the clarification of the subject-matter of independent claim **1** is utterly important.

Additionally, it is clear from the description on page 3, line 9-14 that a certain level of silica is essential to the definition of the invention.

Since independent claim **1** does not contain this feature it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

Furthermore, claim **6** does not meet the requirements of Article 6 PCT because the matter for which protection is sought is not clearly defined. The subject matter of the claim refers to a layer with a water contact angle of at least 100 degrees and a surface tension of at least 35 dynes. Therefore, the claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result. In this case it appears possible to define the structural and compositional features of a layer which would lead to the desired contact angle and surface tension.

Apart from that, the measurement methods used for determining the water contact angle as well as the surface tension should be incorporated into the subject-matter of claim **6** since different measurement methods exist which might not yield necessarily comparable results. Similarly, the measurement method for the pore size range should be included in the subject-matter of claim **9**.