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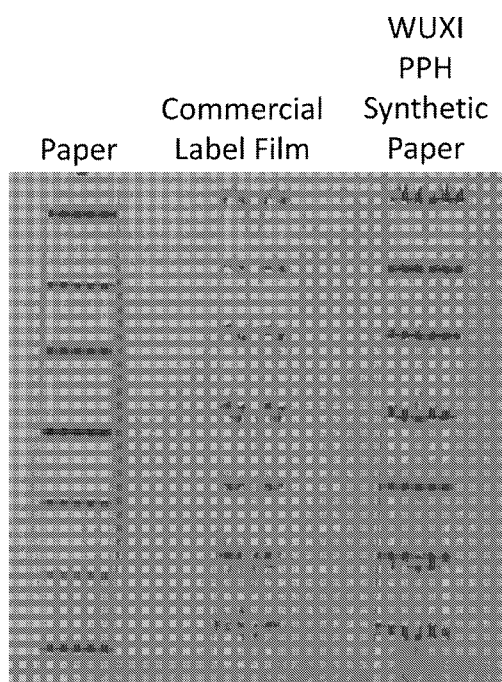
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(54) Title: PRINTABLE FILM



(57) Abstract: An extruded multilayer film includes a top layer comprising a blend of a polyolefin and adsorbent silica. The adsorbent silica is 5% or more of the blend and the polyolefin is 95% or less of the blend. The multilayer film is oriented in at least one direction to cause fracturing of the top layer to provide a microporous surface exposing the adsorbent silica gel. The fractured top layer is receptive to receiving a printing ink on an exposed surface thereof with enhanced pigment entrapment and rapid ink drying. A single layer film in the form of the top layer, and also oriented in at least one direction also constitutes a part of this invention.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER 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		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) B32B C08J		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/093004 A1 (EXXONMOBIL CORP [US]) 13 November 2003 (2003-11-13)	1-3,7,8, 10-18,28
Y	claims 1, 4, 5, 15 paragraph [0019] - paragraph [0024] paragraph [0050] - paragraph [0063] -----	6
X	US 4 741 950 A (LIU LELAND L [US] ET AL) 3 May 1988 (1988-05-03)	1-5, 7-16,28
Y	claims 1, 4, 6-8 column 1, line 6 - line 58 column 2, line 20 - line 24 column 5, line 35 - line 61 column 6, line 1 - line 23 -----	6
X	JP H03 130150 A (TORAY INDUSTRIES) 3 June 1991 (1991-06-03)	22-27
Y	page 348 ----- -/--	6
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search	Date of mailing of the international search report	
19 August 2020	27/08/2020	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Nowak, René	

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International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2018 115012 A (KYODO PRINTING CO LTD) 26 July 2018 (2018-07-26) claims 1, 7 paragraph [0026] - paragraph [0029] paragraph [0059] - paragraph [0074] -----	1,4-9, 11,12, 14,16, 17,19, 21,28
X	EP 1 721 737 A1 (TOYO SEIKAN KAISHA LTD [JP]) 15 November 2006 (2006-11-15) paragraph [0075] - paragraph [0076] paragraph [0097] - paragraph [0099] -----	1,5,7,8, 11,12, 14,16, 17,19,28
X	US 2004/151934 A1 (SCHWARK DWIGHT W [US] ET AL) 5 August 2004 (2004-08-05) claims 1, 10 paragraph [0038] paragraph [0068] - paragraph [0086] paragraph [0138] - paragraph [0151] -----	1,3,5,7, 8,10-17, 19-21,28

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/066564

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-18, 22-28

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.

2. claims: 19-21

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

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2019/066564

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03093004	A1	13-11-2003	AU 2003233478 A1 17-11-2003
		CA 2480774 A1 13-11-2003	
		EP 1499495 A1 26-01-2005	
		WO 03093004 A1 13-11-2003	
US 4741950	A	03-05-1988	AT 76842 T 15-06-1992
		CA 1330032 C 07-06-1994	
		DE 3779557 T2 28-01-1993	
		EP 0265184 A2 27-04-1988	
		ES 2032449 T3 16-02-1993	
		GR 3004797 T3 28-04-1993	
		JP S63165137 A 08-07-1988	
		MX 159753 A 17-08-1989	
		US 4741950 A 03-05-1988	
JP H03130150	A	03-06-1991	JP H0417790 B2 26-03-1992
		JP H03130150 A 03-06-1991	
JP 2018115012	A	26-07-2018	NONE
EP 1721737	A1	15-11-2006	AU 2005215307 A1 01-09-2005
		CN 1922009 A 28-02-2007	
		CN 103121318 A 29-05-2013	
		EP 1721737 A1 15-11-2006	
		JP 5130713 B2 30-01-2013	
		JP W02005080076 A1 25-10-2007	
		KR 20060118594 A 23-11-2006	
		US 2007042145 A1 22-02-2007	
		WO 2005080076 A1 01-09-2005	
US 2004151934	A1	05-08-2004	AU 2004207784 A1 12-08-2004
		BR PI0407033 A 17-01-2006	
		CA 2514369 A1 12-08-2004	
		EP 1587679 A1 26-10-2005	
		JP 4388955 B2 24-12-2009	
		JP 2006518292 A 10-08-2006	
		MX PA05007702 A 30-09-2005	
		NZ 541194 A 24-12-2008	
		US 2004151934 A1 05-08-2004	
		WO 2004067273 A1 12-08-2004	