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(54) Title: ACOUSTIC PANELS AND METHODS FOR PREPARING THEM

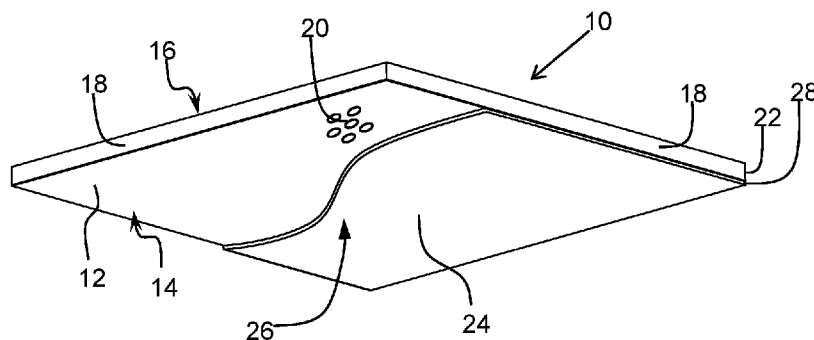


Figure 1

(57) Abstract: The disclosure relates to acoustic panels and methods for preparing them. The disclosure relates more particularly to panels having a porous facing and to methods for making such panels. One aspect of the disclosure is an acoustic panel comprising a base structure. The base structure has one or more edges, an outward major surface having a total area, and an inward major surface opposing the outward major surface. The base structure has a noise reduction coefficient (NRC) of at least about 0.3. The panel includes a coating layer directly disposed on the outward major surface of the base structure, the coating layer being formed of an open-cell foam. The coating layer has an exterior major surface opposing the outward major surface of the base structure. The coating layer is substantially scattering for light in the wavelength range of 380 nm to 780 nm, and has an absorption coefficient of less than 0.5 for acoustic frequencies in the range of 100 Hz to 10,000 Hz.



SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,  
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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**A. CLASSIFICATION OF SUBJECT MATTER****E04B 1/86(2006.01)i, E04B 9/04(2006.01)i, E04B 1/84(2006.01)i**

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)

E04B 1/86; C09D 5/00; D21H 1340; E04B 1/82; E04B 184; E04B 2/02; E04F 13/00; E04F 13/02; E04B 9/04; E04B 1/84

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) &amp; Keywords: acoustic panel, base structure, coating layer, noise reduction coefficient, open-cell foam, light scattering

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012-095562 A1 (ACOUSTIC GROUP OY. et al.) 19 July 2012 page 3, line 25 - page 20, line 10, claims 1-22, table 3 and figures 1, 3	1-2,6-7,9-10,12-21
Y		3-5,8,11
Y	US 8684134 B2 (USG INTERIORS, LLC. et al.) 01 April 2014 column 2, line 40 - column 6, line 65 and figures 1, 3	3-5,8
Y	US 6616804 B2 (FOSTER et al.) 09 September 2003 column 2, line 60 - column 3, line 3 and figures 1-2	11
A	US 2013-0133978 A1 (BORRONI, MARK.) 30 May 2013 paragraphs [0007]-[0008], [0033]-[0043] and figures 3-4	1-21
A	US 8100226 B2 (CAO et al.) 24 January 2012 column 4, line 25 - column 8, line 12, claims 1-2, 14-15 and figure 3	1-21

 Further documents are listed in the continuation of Box C. See patent family annex.

\* Special categories of cited documents:

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"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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

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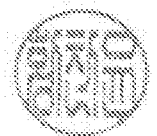
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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2019/042264

Patent document cited in search report	Publication date	Patent family member(s)	Publication date		
WO 2012-095562 A1	19/07/2012	AU 2012-206496 A1	25/07/2013		
		AU 2012-206496 A1	19/07/2012		
		BR 112013017852 A2	18/09/2018		
		CA 2824502 A1	19/07/2012		
		CN 103347962 A	09/10/2013		
		EP 2663602 A1	20/11/2013		
		FI 123952 B	15/01/2014		
		FI 20115032 A	13/07/2012		
		FI 20115032 D0	12/01/2011		
		IL 227413 A	30/09/2013		
		IL 227413 D0	30/09/2013		
		JP 2014-509330 A	17/04/2014		
		KR 10-2014-0022798 A	25/02/2014		
		MX 2013008109 A	31/03/2014		
		RU 2013135682 A	20/02/2015		
		US 2014-0000981 A1	02/01/2014		
		US 9027704 B2	12/05/2015		
		WO 2012-095562 A9	19/07/2012		
		ZA 201304958 B	26/11/2014		
		US 8684134 B2	01/04/2014	AR 091442 A1	04/02/2015
				AR 095492 A1	21/10/2015
AU 2013-280717 A1	03/01/2014				
AU 2013-280717 B2	05/03/2015				
AU 2014-228338 B2	05/11/2015				
BR 112014032257 A2	27/06/2017				
BR 112015021767 A2	18/07/2017				
CA 2877816 A1	03/01/2014				
CA 2877816 C	25/10/2016				
CA 2905079 A1	18/09/2014				
CA 2905079 C	21/02/2017				
CL 2014003521 A1	15/05/2015				
CL 2015002512 A1	26/02/2016				
CN 104379849 A	25/02/2015				
CN 104379849 B	07/09/2016				
CN 105189885 A	23/12/2015				
CN 105189885 B	05/04/2017				
CO 7170169 A2	28/01/2015				
DK 2971391 T3	17/09/2018				
EP 2867418 A1	06/05/2015				
EP 2867418 B1	18/09/2019				
EP 2971391 A1	20/01/2016				
EP 2971391 B1	13/06/2018				
ES 2685896 T3	15/10/2018				
HK 1207135 A1	22/01/2016				
IN 11175DEN2014 A	02/10/2015				
JP 2015-525317 A	03/09/2015				
JP 2016-516144 A	02/06/2016				
JP 6093478 B2	08/03/2017				

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2019/042264**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		JP 6141974 B2	07/06/2017
		KR 10-1565370 B1	03/11/2015
		KR 10-1636257 B1	05/07/2016
		KR 10-2015-0020249 A	25/02/2015
		KR 10-2015-0121234 A	28/10/2015
		LT 2971391 T	10/08/2018
		MX 2015000148 A	10/04/2015
		MX 2015011664 A	16/12/2015
		MX 336442 B	19/01/2016
		MX 343614 B	14/11/2016
		NZ 703765 A	25/11/2016
		NZ 712620 A	23/03/2018
		PE 05182015 A1	19/04/2015
		PE 16852015 A1	13/11/2015
		PE 20150518 A1	19/04/2015
		PE 20151685 A1	13/11/2015
		PL 2971391 T3	31/10/2018
		PT 2971391 T	19/10/2018
		RU 2572864 C1	20/01/2016
		TW 201400674 A	01/01/2014
		TW 201437462 A	01/10/2014
		TW I611077 B	11/01/2018
		TW I614385 B	11/02/2018
		UA 116234 C2	26/02/2018
		UA 116633 C2	25/04/2018
		US 2014-0000978 A1	02/01/2014
		US 2014-0000979 A1	02/01/2014
		US 2014-0124291 A1	08/05/2014
		US 8770345 B2	08/07/2014
		US 8925677 B2	06/01/2015
		WO 2014-004360 A1	03/01/2014
		WO 2014-143660 A1	18/09/2014
US 6616804 B2	09/09/2003	AU 4619001 A	29/11/2001
		AU 783445 B2	27/10/2005
		CA 2348326 A1	24/11/2001
		EP 1158095 A2	28/11/2001
		EP 1158095 A3	12/06/2002
		US 2002-0096278 A1	25/07/2002
		US 2003-0041987 A1	06/03/2003
US 2013-0133978 A1	30/05/2013	AU 2011-226914 B1	17/11/2011
		CN 103069086 A	24/04/2013
		CN 103069086 B	25/11/2015
		EP 2593614 A1	22/05/2013
		EP 2593614 B1	13/04/2016
		NZ 606959 A	30/05/2014
		US 8770344 B2	08/07/2014
		WO 2012-006663 A1	19/01/2012

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2019/042264**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 8100226 B2	24/01/2012	AR 081055 A1	06/06/2012
		AU 2010-341649 A1	19/07/2012
		AU 2010-341649 A1	21/07/2011
		AU 2010-341649 B2	28/11/2013
		BR 112012014918 A2	30/08/2016
		CA 2784897 A1	21/07/2011
		CA 2784897 C	14/02/2017
		CN 102803628 A	28/11/2012
		CN 102803628 B	16/12/2015
		CO 6592050 A2	02/01/2013
		EC SP10010703 A	30/06/2011
		EP 2516766 A2	31/10/2012
		HK 1178582 A1	28/10/2016
		JP 2013-515183 A	02/05/2013
		JP 5758403 B2	05/08/2015
		MY 162314 A	31/05/2017
		RU 2012126805 A	27/01/2014
		RU 2560735 C2	20/08/2015
		TW 201135022 A	16/10/2011
		TW I531702 B	01/05/2016
		UA 109886 C2	26/10/2015
		US 2011-0147119 A1	23/06/2011
		WO 2011-087670 A2	21/07/2011
		WO 2011-087670 A3	06/10/2011