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(71) Applicant: OWENS CORNING INTELLECTUAL
CAPITAL, LLC [US/US]; One Owens Corning Parkway,
Toledo, OH 43659 (US).(72) Inventors: BUDINCAK, John, F., Jr.; 1349 North-
woods Trail, Wadsworth, OH 44281 (US). VAN SLOUN,
Jeffrey, J.; 25673 Willowbend Road, Perrysburg, OH
43551 (US). ANNAN, Nikoi; 802 West Locust Street, New-
ark, OH 43055 (US). LOH, Roland, R.; 1060 Village
Parkway, Coppell, TX 75019 (US). LIGHTLE, Rodger,
D.; 5200 Tyner Ave., NW, Canton, OH 44708 (US). HET-
TLER, Neil Robert; 113 Bedwn Back Lane, Granville,
OH 43023 (US). QI, Weigang; 6811 Meadow Glen Dr.,
S., Westerville, OH 43082 (US). KUNKLER, William
Anthony; 161 Claren Drive, Heath, OH 43056 (US).(74) Agent: SMITH, Kenneth, J.; Calfee, Halter & Griswold
LLP, The Calfee Building, 1405 East Sixth Street, Cleve-
land, OH 44114 (US).

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DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
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— of inventorship (Rule 4.17(iv))

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— with international search report (Art. 21(3))

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(54) Title: LAMINATED FOAM PRODUCT AND METHODS FOR MAKING LAMINATED FOAM PRODUCTS

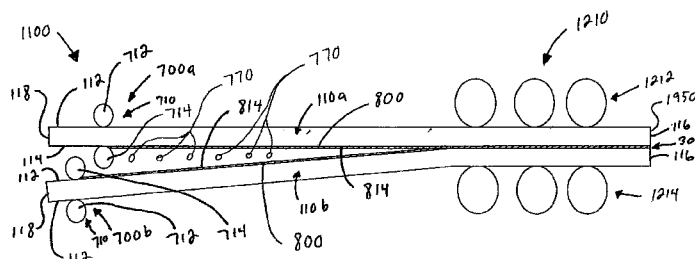


Fig. 18

(57) Abstract: Thermally laminated foam boards, methods for making thermally laminated foam boards, apparatus for making thermally laminated foam boards, smaller foam pieces made from thermally laminated foam boards, methods for making smaller foam pieces from thermally laminated foam boards, parts made from thermally laminated foam boards, methods for making parts from thermally laminated foam boards, and tools for making parts from thermally laminated foam boards are disclosed. The thermally laminated foam boards are made by thermally bonding at least two polystyrene boards together.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/042207

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B29C 67/20 (2013.01)

USPC - 428/36.5

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)

IPC(8) - B29B 17/00, 17/04; B29C 44/34, 47/06, 51/14, 65/20, 67/20; B29K 23/00, 25/00, 55/02, 105/04; B29L 9/00, 31/10; B32B 5/18, 7/00, 27/00, 27/08, 27/28, 27/30, 37/00, 37/15; B65D 65/40; C08J 11/00, 11/06; C08L 25/04 (2013.01)

USPC - 156/94, 244.11, 244.27; 264/37.32; 428/36.5, 36.7, 220, 304.4, 308.4, 316.6, 317.1, 317.9, 318.6, 319.3, 319.7, 319.9, 515, 516

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

USPC - 428/517, 518, 519, 520, 521, 522, 903.3

CPC - B29B 17/04; B29C 47/0019, 47/0021, 47/065; B29K 2025/00, 2105/04, 2105/26; B32B 5/18, 27/08, 2272/00 (2013.01)

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

PatBase, Google Patent, Google, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 44 21 016 A1 (QUITTMANN et al) 21 December 1995 (21.12.1995) see machine translation	13, 14
Y		1-11, 15, 17-23, 25
Y	US 5,118,561 A (GUSAVAGE et al) 02 June 1992 (02.06.1992) entire document	1-11, 22, 23
Y	US 6,477,061 B1 (JOHNSON) 05 November 2002 (05.11.2002) entire document	5-8, 15, 18-21, 25
Y	CA 2 248 982 C (HODSON et al) 30 July 2002 (30.07.2002) entire document	9-11, 17-23, 25
A	US 2011/0217893 A1 (GOERING) 08 September 2011 (08.09.2011) entire document	1-32
A	US 2002/0119722 A1 (WELCH et al) 29 August 2002 (29.08.2002) entire document	1-32

☐ Further documents are listed in the continuation of Box C.

* 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

20 November 2013

Date of mailing of the international search report

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Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
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Authorized officer:

Blaine R. Copenheaver

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/042207

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 extra 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 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.:
1-32

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/042207

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees need to be paid.

Group I, claims 1-32 are drawn to a method of making a foam product.

Group II, claim 33 is drawn to a rotary cutting tool.

The inventions listed in Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1, because under PCT Rule 13.2 they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I, a method of making a foam product comprising bonding at least two polystyrene boards together, removing a portion of the polystyrene and thereby forming the foam product, are not present in Group II; and the special technical features of Group II, a cutting tool comprising an annular support, cutting elements, and a base, are not present in Group I.

Since none of the special technical features of the Group I and II inventions are found in more than one of the inventions, unity is lacking.