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B32B 5/18 (2006.01) *B32B 38/06* (2006.01)

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[Continued on next page]

(54) Title: COATED ABRASIVE ARTICLE WITH FOAM BACKING AND METHOD OF MAKING

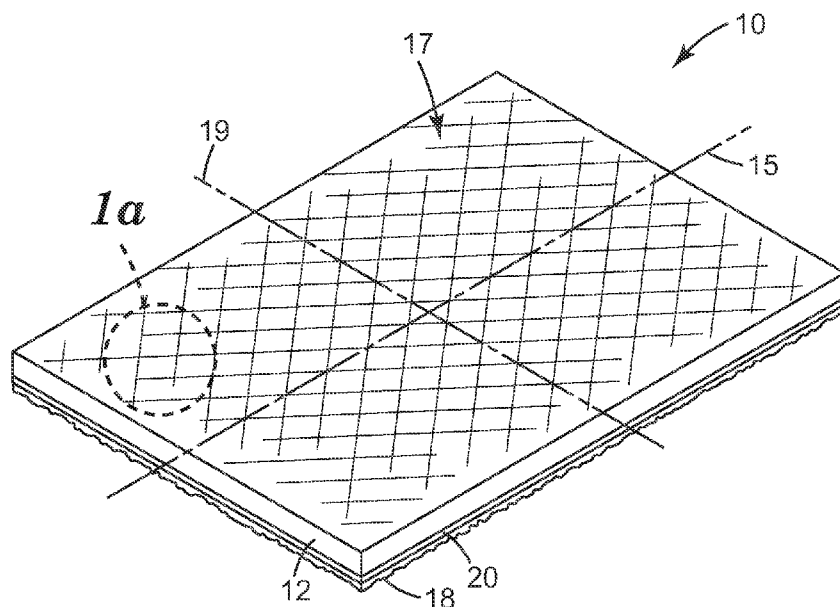


Fig. 1

(57) Abstract: A polyurethane foam backing suitable for making a coated abrasive article is disclosed. The polyurethane foam backing has a textured surface bearing an array of raised features and land areas. The array's geometry is designed such that a 90 degree peel force to remove a production tooling having a contacting surface bearing a plurality of microreplicated mold cavities from the textured surface is acceptable.



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

18 October 2012

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/023921**A. CLASSIFICATION OF SUBJECT MATTER****B32B 5/30(2006.01)i, B32B 5/18(2006.01)i, B32B 27/40(2006.01)i, B32B 38/06(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)

B32B 5/30; B24B 21/04; B24D 13/14; B24B 7/30; B24D 3/02; B24D 3/00; B24D 11/00

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) & Keywords: coated abrasive article, foam backing, polyurethane, total surface area, contacting surface, hardness

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007-121135 A2 (3M Innovative Properties Company) 25 October 2007. See the entire document.	1-3,9-11,16
A	WO 02-43925 A1 (3M Innovative Properties Company) 06 June 2002. See the entire document.	1-3,9-11,16
A	WO 02-076678 A1 (3M Innovative Properties Company) 03 October 2002. See the entire document.	1-3,9-11,16
A	US 2007-0066186 A1 (Michael J. Annen) 22 March 2007. See the entire document.	1-3,9-11,16
A	WO 2006-007036 A1 (3M Innovative Properties Company) 19 January 2006. See the entire document.	1-3,9-11,16
A	US 2005-0060947 A1 (James L. McArdle et al.) 24 March 2005. See the entire document.	1-3,9-11,16

☐ 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 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

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09 AUGUST 2012 (09.08.2012)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/023921

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.: 8
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:

Claim 8 refers to a multiple dependent claim that refers to other multiple dependent claims. Therefore, the meaning of the technical feature to which it refers is vague and unclear.

3. ☒ Claims Nos.: 4-7,12-15
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:

Group 1: Claims 1-3 relate to a coated abrasive article comprising a polyurethane foam backing having a textured surface characterized with a Total Surface Area.

Group 2: Claims 9-11 relate to a polyurethane foam backing comprising a surface textured by a production tooling having a specific contacting surface.

Group 3: Claim 16 relates to a coated abrasive article comprising a polyurethane foam backing; an abrasive layer comprising a make coat and abrasive particles; and a size coat comprising an acrylic.

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 fee, this Authority did not invite payment of any additional fee.

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/023921

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