



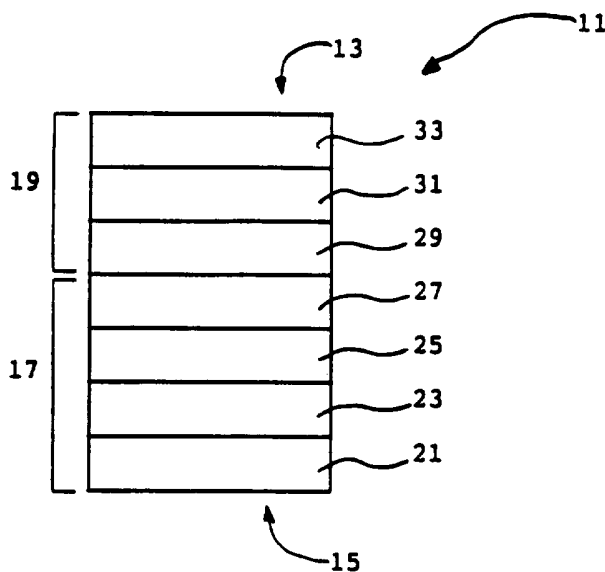
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>5</sup> : D06N 3/08, 7/00, B32B 27/30</p>	<p>A3</p>	<p>(11) International Publication Number: <b>WO 93/05227</b> (43) International Publication Date: 18 March 1993 (18.03.93)</p>
<p>(21) International Application Number: PCT/US92/07523 (22) International Filing Date: 11 September 1992 (11.09.92) (30) Priority data: 758,621 12 September 1991 (12.09.91) US (71) Applicant: MANNINGTON MILLS, INC. [US/US]; P.O. Box 30, Salem, NJ 08079 (US). (72) Inventors: WANG, C., David ; 207 Harker Avenue, Lifewood, Wilmington, DE 19803 (US). EBY, John, M. ; 32 Canterbury Drive, Pennsville, NJ 08070 (US). LAN, David ; 1125 Flint Hill Road, Arundel, DE 19808 (US). CHEN, Hao, A. ; 59 Carter Way, Glen Mills, PA 19342 (US). JUDD, Richard, E. ; 106 Hillcrest Garden Apartments, Woodstown, NJ 08098 (US). JOSLIN, Richard, D. ; 29 South Home Avenue, Gibbstown, NJ 08027-1401 (US).</p>		<p>(74) Agents: TURNER, John, B. et al.; Finnegan, Henderson, Farabow, Garrett &amp; Dunner, 1300 I Street, N.W., Washington, DC 20005-3315 (US). (81) Designated States: AU, CA, JP, KR, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, SE). <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 15 April 1993 (15.04.93)</p>

(54) Title: RESILIENT FLOOR COVERING AND METHOD OF MAKING SAME

(57) Abstract

This invention is directed to a resilient, flexible surface covering that has a wear surface that meets the highest standards of stain, mar, scuff, and soil resistance and a method of making the same. The improved resilient surface covering comprises (a) a resilient support surface; and (b) a resilient wear surface adhered to the resilient support surface, the resilient wear surface comprising an underlying wear layer base coat and an overlying wear layer top coat adhered to the wear layer base coat, the wear layer base coat comprising a flexible, thermoset, polymeric composition having a flexibility such that the wear layer base coat passes a 1 inch mandrel diameter face out mandrel bend test when applied at a nominal dry film thickness of 1.0 mil over a flexible 80 mil underlying substrate, the wear layer top coat comprising, a hard, thermoset, UV-curable blend of acrylic or acrylate monomers, the wear layer top coat having a glass transition temperature of greater than 50 °C. The present invention is also directed to separately or in combination with the improved wear surface, a resilient surface covering that has a strengthening layer that provides improved strength, toughness, resistance to breakage, especially resistance to tearing, and resistance to deformation, especially resistance to indentation and sliding gouging, and a method of making the same. The improved strengthening layer resilient surface covering comprises (a) a resilient support surface comprising an unfoamed strengthening layer comprising a vinyl resin and a polymerized, cross-linked monomer, with the proviso that, the strengthening layer is not disposed between two foam layers; and (b) a resilient wear surface adhered to the resilient support surface.



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**INTERNATIONAL SEARCH REPORT**

PCT/US 92/07523

International Application No

**I. CLASSIFICATION OF SUBJECT MATTER** (If several classification symbols apply, indicate all)<sup>6</sup>  
 According to International Patent Classification (IPC) or to both National Classification and IPC  
 Int.Cl. 5 D06N3/08;                      D06N7/00;                      B32B27/30

**II. FIELDS SEARCHED**

Minimum Documentation Searched <sup>7</sup>	
Classification System	Classification Symbols
Int.Cl. 5	D06N ;                      B32B ;                      B05D

Documentation Searched other than Minimum Documentation  
 to the Extent that such Documents are Included in the Fields Searched<sup>8</sup>

**III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup>**

Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	GB,A,2 107 723 (AMSTRONG WORLD INDUSTRIES INC.) 5 May 1983	1-3, 10, 11
Y	see the whole document	14-17, 31, 33, 48, 43, 44, 46
A	---	
Y	US,A,4 333 987 (HAROLD KWART ET AL.) 8 June 1982 cited in the application see column 1, line 8 - line 15 see column 1, line 55 - column 3, line 13	14-17
A	---	3, 10, 40, 42, 43, 45
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- <sup>10</sup> Special categories of cited documents:
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- "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.
- "A" document member of the same patent family

**IV. CERTIFICATION**

Date of the Actual Completion of the International Search <p align="center">18 FEBRUARY 1993</p>	Date of Mailing of this International Search Report <p align="center">19. 03. 93</p>
International Searching Authority <p align="center">EUROPEAN PATENT OFFICE</p>	Signature of Authorized Officer <p align="center">PAMIES OLLE S.</p>

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
X	US,A,3 958 043 (ALLAN W. MCKEE, JR. ET AL.) 18 May 1976 see column 3, line 8 - line 27; claims 1,5,6; figure 1 see column 4, line 11 - line 19 see column 7, line 4 - line 32	18-24,47
Y	---	31,33,48
A	---	25-30, 32,34,35
A	US,A,4 150 169 (G.E. BAGLEY ET AL.) 17 April 1979 see column 2, line 14 - column 4, line 12; claim 1	1-3,11, 43,44,46
A	---	18-28, 31, 34-39, 47,49
A	US,A,3 870 591 (JACK H. WITMAN) 11 March 1975 cited in the application  see column 4, line 16 - line 20; claims; figures; examples see column 5, line 6 - line 9 see column 6, line 7 - line 33	1
A	US,A,3 935 368 (JONAS WEISS) 27 January 1976 see claims; examples 1,3	1
A	---	1-3,10, 11, 15-17, 40,43
A	GB,A,2 201 906 (AMSTRONG WORLD INDUSTRIES INC.) 14 September 1988  see page 4, line 24 - page 5, line 8; claims 1,2,12-15,31,32,46,47 see page 7, paragraph 2 & US,A,4 781 987 (...) cited in the application	1-3,10, 11, 15-17, 40,43
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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 92/07523

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

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

1. Claims 1-17, 31-39, 40-46, 49-52
2. Claims 18-30, 47, 48

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.
- No protest accompanied the payment of additional search fees.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.**

US 9207523  
SA 64619

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 18/02/93

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