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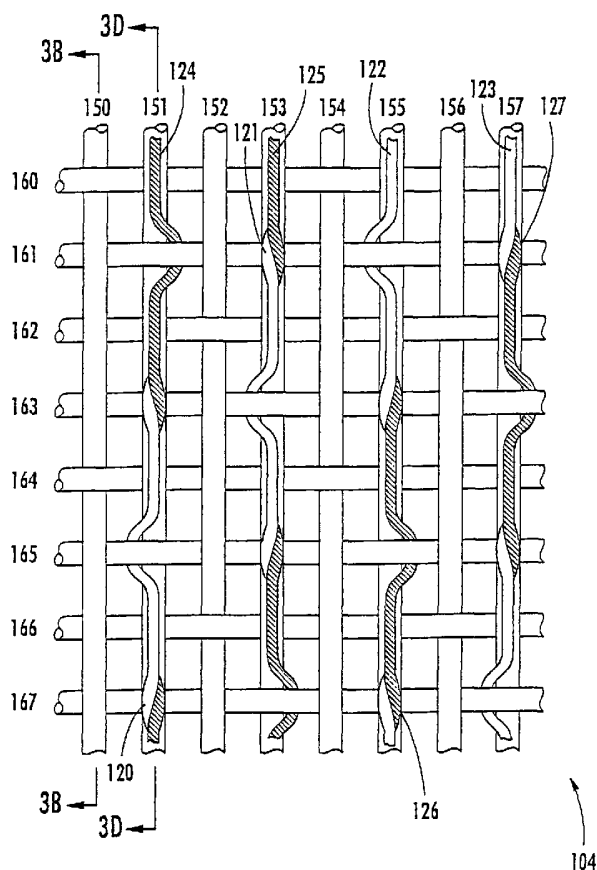
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[Continued on next page]

(54) Title: WARP-STITCHED MULTILAYER PAPERMAKER'S FABRIC



(57) Abstract: A warp-stitched multilayer papermaker's fabric has a set of bottom warp yarns, a set of bottom weft yarns, a set of top weft yarns and a set of warp stitching yarn pairs. The bottom warp yarns are interwoven with the bottom weft yarns. The stitching warp yarns interweave with both the bottom weft yarns and the top weft yarns, and are woven such that at locations where the first of the stitching warp yarns in a pair weaves in the top fabric layer, the second stitching warp yarn in the pair drops below the top fabric layer to interweave with one or more bottom weft yarns to bind the top fabric layer and the bottom fabric layer together. The first stitching warp yarn of the stitching warp yarn pair may weave on a first side of one of the bottom warp yarns while the second stitching warp yarn of each stitching yarn pair may weave on the other side of that bottom warp yarn. Each stitching yarn pair may be substantially stacked above a bottom warp yarn. The fabric may further include a set of top warp yarns that interweave with the top weft yarns in the top fabric layer. The set of top warp yarns may be woven from a first warp beam, the set of bottom warp yarns may be woven from a second warp beam and the set of stitching warp yarns may be woven from a third warp beam.



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

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 D21F1/00

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)
IPC 7 D21F D03D

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 273 698 A (WEAVEXX CORP) 8 January 2003 (2003-01-08)	1-5, 7, 8, 11-17, 31-37, 39, 40, 43, 46-59
Y	paragraphs '0002!, '0004!, '0026! - '0028!, '0048!, '0049!, '0057!, '0058! figures 1, 3, 7, 9 ----- -/--	6, 38, 60-65

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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- *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

22 November 2004

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03. 12. 2004

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INTERNATIONAL SEARCH REPORT

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	US 5 152 326 A (VOEHRINGER FRITZ) 6 October 1992 (1992-10-06) cited in the application column 3, line 3 - line 13 column 4, line 48 - column 7, line 7 figures 2a-2c	31,32, 35,48,51
Y A	----- DE 34 25 808 A (KUFFERATH ANDREAS GMBH) 24 January 1985 (1985-01-24) page 11, line 24 - line 30 page 14, line 14 - line 33 figures 1,2	60-65 1,17
X A	----- US 2003/010393 A1 (KUJI TAKEHITO) 16 January 2003 (2003-01-16) paragraphs '0037! - '0061! figures 1-2J	31,32, 46-49,51
Y	----- US 5 967 195 A (WARD KEVIN J) 19 October 1999 (1999-10-19) cited in the application column 1, line 12 - line 24 column 1, line 35 - line 57 column 4, line 29 - column 6, line 65 column 11, line 11 - line 41 figures 1A-2J	1,60
X	----- US 2003/010393 A1 (KUJI TAKEHITO) 16 January 2003 (2003-01-16) paragraphs '0037! - '0061! figures 1-2J	31-38, 43, 46-48,51
Y	----- US 5 967 195 A (WARD KEVIN J) 19 October 1999 (1999-10-19) cited in the application column 1, line 12 - line 24 column 1, line 35 - line 57 column 4, line 29 - column 6, line 65 column 11, line 11 - line 41 figures 1A-2J	6,38
X	----- US 5 967 195 A (WARD KEVIN J) 19 October 1999 (1999-10-19) cited in the application column 1, line 12 - line 24 column 1, line 35 - line 57 column 4, line 29 - column 6, line 65 column 11, line 11 - line 41 figures 1A-2J	31-37, 39,43, 46-49,51
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E	----- WO 2004/038094 A (ALBANY INT CORP) 6 May 2004 (2004-05-06) page 5, line 21 - page 6, line 7 page 9, line 3 - line 4 page 13, line 15 - page 14, line 3 figures 1,2,9A,9B	31-38, 43,47, 48,51
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/007784

Box 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 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 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.:
1-17, 31-65
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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-17,60-65

triple layer papermaker's fabric having warp/machine direction stitching yarn pairs that are substantially vertically stacked above a bottom warp/machine direction yarn

2. claims: 18-30, 66-71

warp-stitched multi-layer papermaker's fabric having stitching warp yarn pairs, wherein for each stitching yarn pair, the first yarn of the pair weaves on a first side of a bottom warp yarn and the second yarn of the pair weaves on the other side of said bottom warp yarn

3. claims: 31-59

warp-stitched triple layer papermaker's fabric, in which the top warp yarns are woven from a first warp beam, the bottom warp yarns from a second warp beam and the stitching warp yarns from a third warp beam

INTERNATIONAL SEARCH REPORT

International Application No
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