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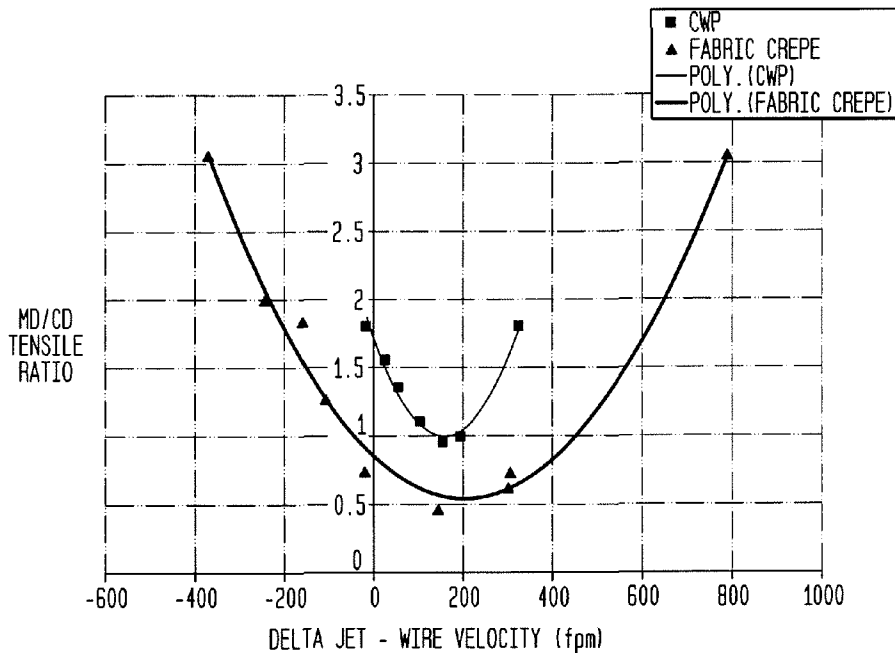
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[Continued on next page]

(54) **Title:** MULTI-PLY PAPER TOWEL



(57) **Abstract:** A multi-ply absorbent towel made from papermaking fiber comprising at least a first ply and a second ply bonded together, the towel having a basis weight of greater than 30 lbs per 3000 ft<sup>2</sup> ream (48.8 gsm) and less than 50 lbs per 3000 ft<sup>2</sup> ream (81.4 gsm), wherein the plies are selected and adhered together such that the towel typically exhibits (i) a GM TEA, mm-g/mm<sup>2</sup> of greater than [0.00125 (GM Tensile, g/3") - 0.75] and (ii) a GM Tensile Modulus, g/in/%, less than [0.0083 (GM Tensile Strength, g/3") + 15.4] {(i) a GM TEA, mm g/mm<sup>2</sup>, of greater than [0.00952 (GM Tensile, g/cm) - 0.75] and (ii) a GM Tensile Modulus, g/cm/%, less than [0.0249 (GM Tensile Strength, g/cm) + 6.06]}.

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PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG). — *of inventorship (Rule 4.17(iv))*

**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))*

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/76712

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B31F 1/12; D21H 27/30; D21F 11/00 (2008.01)  
USPC - 162/111; 162/125; 162/129; 428/292.1; 428/156

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): B31F 1/12; D21H 27/30; D21F 11/00 (2008.01)  
USPC: 162/111; 162/125; 162/129; 428/292.1; 428/156

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 practicable, search terms used)

USPTO - WEST, Google

Search terms: absorbent; basis; emboss; hydroentangle; modulus; multiply; paper; sat; saturated; spunlaced; tea; tensile; tissue; total energy; tough; towel; two ply; weight

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2005/0103455 A1 (EDWARDS et al.) 19 May 2005 (19.05.2005), para [0196], [0227], [0220], [0228],	1-55
Y	US 6,368,454 B1 (DWIGGINS et al.) 09 April 2002 (09.04.2002), Tables 4, 7; col 4 ln 8-10	1-30, 44, 47-51
Y	US 2006/0081347 A1 (KERSHAW et al.) 20 April 2006 (20.04.2006), Table 5, pg 14, sheet M; para [0003], [0007], [0048]	31-55
Y	US 2004/0209058 A1 (CHOU et al.) 21 October 2004 (21.10.2004), Fig 12; para [0141], [0145]	10-30, 45, 46
Y	US 2006/0042767 A1 (BHAT et al.) 02 March 2006 (02.03.2006), para [0074]	6, 7, 28, 29
A	US 2002/0148584 A1 (EDWARDS et al.) 17 October 2002 (17.10.2002), entire document, especially claims 21, 106	1-55
A	US 6,649,024 B2 (ORIARIAN et al.) 18 November 2003 (18.11.2003), entire document	1-55
A	US 20030041989 A1 (ORIARIAN et al.) 06 March 2003 (06.03.2003), entire document	1-55

 Further documents are listed in the continuation of Box C. 

\* Special categories of cited documents:

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"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)

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"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

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

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