



US008821687B2

(12) **United States Patent**
Muvundamina et al.(10) **Patent No.:** **US 8,821,687 B2**
(45) **Date of Patent:** **Sep. 2, 2014**(54) **FLUSHABLE ARTICLE INCLUDING
POLYURETHANE BINDER AND METHOD OF
USING THE SAME**(75) Inventors: **Mutombo J. Muvundamina,**
Minneapolis, MN (US); **Brian W.**
Carlson, Woodbury, MN (US)(73) Assignee: **H.B. Fuller Company,** St. Paul, MN
(US)(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 271 days.(21) Appl. No.: **13/315,812**(22) Filed: **Dec. 9, 2011**(65) **Prior Publication Data**

US 2012/0160715 A1 Jun. 28, 2012

Related U.S. Application Data(60) Provisional application No. 61/421,895, filed on Dec.
10, 2010.(51) **Int. Cl.****D21H 13/14** (2006.01)
D21H 13/26 (2006.01)
D21H 17/46 (2006.01)
D21H 21/18 (2006.01)
A61L 15/62 (2006.01)
A61F 13/00 (2006.01)
C08G 18/00 (2006.01)
A61F 13/84 (2006.01)
A61F 13/15 (2006.01)(52) **U.S. Cl.**CPC **A61F 13/15211** (2013.01); **A61F 13/84**
(2013.01); **A61F 13/8405** (2013.01)
USPC **162/157.5**; 162/157.3; 162/158;
162/168.1; 162/168.2; 162/231; 162/184;
162/185; 528/59; 427/372.2; 427/385.5(58) **Field of Classification Search**USPC 162/157.1–157.6, 157.3, 158, 168.1,
162/168.2, 231, 183–185; 206/210; 602/41;
604/358; 528/59; 427/372.2, 385.5;
156/296

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,846,158 A 11/1974 Vasilyadis et al.
4,002,171 A 1/1977 Taft
4,117,187 A 9/1978 Adams et al.
4,343,403 A * 8/1982 Daniels et al. 206/210
4,537,807 A 8/1985 Chan et al.
4,578,359 A 3/1986 Wells et al.
5,252,332 A 10/1993 Goldstein
5,494,960 A 2/1996 Rolando et al.
5,500,281 A 3/1996 Srinivasan et al.
5,576,364 A 3/1996 Faas et al.
5,508,101 A * 4/1996 Patnode et al. 442/340
5,509,913 A * 4/1996 Yeo 604/3645,567,510 A * 10/1996 Patnode et al. 442/351
5,612,438 A 3/1997 Raleigh et al.
5,620,788 A 4/1997 Garavaglia et al.
5,629,081 A 5/1997 Richards et al.
5,667,635 A 9/1997 Win et al.
5,738,646 A 4/1998 Fox et al.
5,770,528 A 6/1998 Mumick et al.
5,905,046 A 5/1999 Takeda et al.
5,907,012 A 5/1999 Voss et al.
5,916,678 A * 6/1999 Jackson et al. 428/373
5,916,969 A 6/1999 Wang et al.
5,952,251 A 9/1999 Jackson et al.
5,969,052 A 10/1999 Mumick et al.
5,972,805 A 10/1999 Pomplun et al.
5,976,694 A 11/1999 Tsai et al.
5,981,012 A 11/1999 Pomplun et al.
5,986,004 A 11/1999 Pomplun et al.
6,043,317 A 3/2000 Mumick et al.
6,121,170 A 9/2000 Tsai et al.
6,162,328 A * 12/2000 Cenisio et al. 162/135
6,194,517 B1 2/2001 Pomplun et al.
6,258,427 B1 7/2001 Kerins et al.
6,277,768 B1 8/2001 Mumick et al.
6,287,419 B1 9/2001 Takeuchi et al.
6,291,372 B1 9/2001 Mumick et al.
6,294,238 B1 9/2001 Pomplun et al.
6,384,297 B1 5/2002 Colman et al.
6,403,706 B1 6/2002 Wang et al.
6,410,155 B2 6/2002 Mumick et al.

(Continued)

FOREIGN PATENT DOCUMENTS

AU 2012101775 1/2013
EP 905313 3/1999
GB 2284820 6/1995
JP 0327195 2/1991
JP 03277335 12/1991
JP 04370300 12/1992
JP 05148799 6/1993
JP 10140494 A * 5/1998 D21H 17/27
JP H10-140494 A 5/1998
JP 10195797 7/1998
JP 11047026 2/1999
JP 11047027 2/1999
JP 2000005093 1/2000
JP 2005194635 7/2005
JP 2008073357 4/2008
WO WO2006/069119 6/2006
WO WO2008/059266 5/2008
WO WO2009/138885 11/2009
WO WO 2013015735 1/2013

OTHER PUBLICATIONS

Machine translation of JP H10-140494A, Advanced Industrial Prop-
erty Network, Japan Patent Office, [online], [retrieved on Oct. 31,
2013]. Retrieved from the Internet: <URL: http://dossier1.ipdl.inpit.go.jp/AIPN/odse_top_dn.ipdl?N0000=7400>.*

(Continued)

Primary Examiner — Dennis Cordray(74) *Attorney, Agent, or Firm* — Kirsten Stone; Allison
Johnson(57) **ABSTRACT**A flushable article such as a wipe that includes a substrate that
includes fibers, and a dried binder composition in contact
with the fibers, the article (e.g., wipe) being insoluble in water
having a pH of no greater than 6, and disintegrating in water
having a pH of at least 6.5.**41 Claims, No Drawings**