



US007189781B2

(12) **United States Patent**  
**Acevedo et al.**

(10) **Patent No.:** **US 7,189,781 B2**  
(45) **Date of Patent:** **Mar. 13, 2007**

(54) **MOISTURE CURABLE, RADIATION  
CURABLE SEALANT COMPOSITION**

(75) Inventors: **Margarita Acevedo**, Minneapolis, MN  
(US); **Mai T. Nguyen-Misra**,  
Shoreview, MN (US)

(73) Assignee: **H.B. Fuller Licensing & Finance Inc.**,  
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 86 days.

(21) Appl. No.: **10/387,360**

(22) Filed: **Mar. 13, 2003**

(65) **Prior Publication Data**

US 2004/0181007 A1 Sep. 16, 2004

(51) **Int. Cl.**

**C08J 3/00** (2006.01)

**C08K 3/20** (2006.01)

**C08L 75/00** (2006.01)

**C08L 83/00** (2006.01)

**E06B 3/00** (2006.01)

(52) **U.S. Cl.** ..... **524/588**; 52/204.5; 428/34;  
428/38; 522/97; 524/589; 524/590; 525/100;  
525/101; 525/102; 525/123; 525/455; 528/22;  
528/26

(58) **Field of Classification Search** ..... 524/588,  
524/589, 590; 522/97; 52/204.5; 428/34,  
428/38; 525/100, 101, 102, 123, 455; 528/22,  
528/26

See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,632,557 A 1/1972 Brode et al.  
4,345,053 A 8/1982 Rizk et al.  
4,352,858 A 10/1982 Stanley  
4,645,816 A 2/1987 Pohl et al.  
4,684,538 A 8/1987 Klemarczyk  
4,775,719 A 10/1988 Markevka et al.  
4,808,255 A 2/1989 Markevka et al.  
4,820,368 A 4/1989 Markevka et al.  
4,824,875 A 4/1989 Gutek  
4,839,455 A 6/1989 Fong  
4,960,844 A 10/1990 Singh  
4,965,117 A 10/1990 Lautenschlaeger et al.  
5,013,631 A 5/1991 Su  
5,124,210 A 6/1992 Fong  
5,177,916 A 1/1993 Misera et al.  
5,225,412 A 7/1993 Hrib et al.  
5,326,845 A 7/1994 Linden  
5,350,803 A 9/1994 Prejean  
5,397,648 A 3/1995 Babu et al.

5,428,209 A 6/1995 Babu et al.  
5,478,427 A 12/1995 Huver et al.  
5,653,073 A 8/1997 Palmer  
5,665,823 A 9/1997 Saxena et al.  
5,856,404 A 1/1999 Choung et al.  
5,860,835 A 1/1999 Ohsumi  
5,873,203 A 2/1999 Thiel  
6,055,783 A 5/2000 Guhl et al.  
6,204,350 B1 3/2001 Liu et al.  
6,221,978 B1 4/2001 Li et al.  
6,245,145 B1 6/2001 Lisec  
6,286,288 B1 9/2001 France  
6,303,731 B1 10/2001 Carlson et al.  
6,355,317 B1 3/2002 Reid et al.  
6,387,449 B1 5/2002 Reid et al.  
6,401,428 B1 6/2002 Glover et al.  
6,414,077 B1 7/2002 Barron et al.  
6,451,870 B1 9/2002 DeCato et al.  
6,463,706 B1 10/2002 Guhl et al.  
6,498,210 B1 12/2002 Wang et al.  
6,750,309 B1\* 6/2004 Chu et al. .... 528/28  
2001/0051260 A1 12/2001 Johnson et al.  
2002/0100550 A1\* 8/2002 Mahdi et al. .... 156/329  
2002/0189743 A1 12/2002 Hornung et al.  
2002/0194813 A1 12/2002 Virnelson et al.  
2004/0059069 A1 3/2004 Grimm et al.

**FOREIGN PATENT DOCUMENTS**

EP 0 608 891 B1 8/1994  
EP 0 646 632 A1 4/1995  
EP 0 549 228 B1 8/1996  
EP 0 776 956 A2 6/1997  
EP 0 852 280 B1 7/1998  
EP 1 052 362 A2 11/2000  
EP 0 826 701 B1 12/2000  
WO WO 98/25001 6/1998  
WO WO 98/53008 11/1998  
WO WO 99/14169 3/1999  
WO WO 01/05846 1/2001

**OTHER PUBLICATIONS**

“Shadow Curing of UV Adhesives”, George W. Ritter, Proceedings  
of the 24th Annual Meeting of the Adhesion Society, p. 83, Feb.  
2001, (1 page).

Next Generation Radiation Curable PSA's Based on Acrylated  
Polyesters, Acevedo et al, published in RadCureLetter in May 1999,  
pp. 68-71.

\* cited by examiner

*Primary Examiner*—Patrick D. Niland

(57) **ABSTRACT**

Sealant composition comprising at least one of a) a moisture  
curable, radiation curable polyurethane prepolymer or b) a  
blend comprising a moisture curable polyurethane prepoly-  
mer and a radiation curable prepolymer. Also disclosed are  
insulating glass assemblies that use such dual-cure sealant  
compositions.

**43 Claims, No Drawings**