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(54) **ACIDIC VISCOELASTIC SURFACTANT BASED CLEANING COMPOSITIONS**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,489,686	A	1/1970	Parran, Jr.	
4,790,958	A *	12/1988	Teot	C09K 8/62 166/307
5,576,279	A	11/1996	Pyles	
5,639,722	A *	6/1997	Kong	C02F 5/08 134/42
5,700,771	A	12/1997	Hardy et al.	
5,965,502	A *	10/1999	Balzer	A61K 8/20 510/127
6,258,859	B1	7/2001	Dahayanake et al.	
6,482,866	B1	11/2002	Dahayanake et al.	
6,608,020	B1	8/2003	Durbut et al.	
6,703,352	B2	3/2004	Dahayanake et al.	
6,770,607	B2 *	8/2004	Chen	A61K 8/042 424/70.19
6,831,108	B2	12/2004	Dahanayake et al.	
7,025,883	B1	4/2006	Olivier	
7,238,648	B2	7/2007	Dahayanake et al.	
7,279,446	B2	10/2007	Colaco et al.	
7,481,935	B2	1/2009	Olivier	
7,999,035	B2	8/2011	Boeckh et al.	
2002/0069901	A1	6/2002	Evers	
2003/0119680	A1	6/2003	Chang et al.	
2003/0119706	A1	6/2003	Pfeiffer et al.	
2004/0009880	A1 *	1/2004	Fu	C09K 8/68 507/200
2004/0097385	A1	5/2004	Chen et al.	
2004/0121925	A1 *	6/2004	Harmalker	A61K 8/11 510/119
2005/0209108	A1	9/2005	Fu et al.	
2006/0000609	A1	1/2006	Cavazzoli et al.	
2006/0063681	A1	3/2006	Christanti et al.	
2007/0004609	A1	1/2007	Hloucha et al.	

(Continued)

FOREIGN PATENT DOCUMENTS

EP	0911022	4/1999
EP	0916720	5/1999

(Continued)

OTHER PUBLICATIONS

BASF The Chemical Company, "Care Chemicals & Formulators, Lupasol types", pp. 1-10. Apr. 30, 2010.

Procter & Gamble Professional, "Material Safety Data Sheet—Dawn Heavy Duty Floor Cleaner", Version 5, pp. 1-4 Oct. 28, 2010.

Procter & Gamble Professional, "Material Safety Data Sheet—Dawn Heavy Duty Floor Cleaner—concentrate", Version 3, pp. 1-5 Nov. 1, 2010.

(Continued)

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(57) **ABSTRACT**

Acidic viscoelastic cleaning compositions are disclosed which use non polymer thickening agents. According to the invention, cleaning compositions have been developed using viscoelastic surfactants in acidic cleaning formulations. These provide the dual benefit of thickening as well as an additional cleaning, thereby improving performance. Applicants have also identified several pseudo linking agents which when, used with viscoelastic surfactants provide enhanced viscoelasticity and cleaning.

11 Claims, 5 Drawing Sheets