



US006926959B2

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

(10) **Patent No.: US 6,926,959 B2**  
(45) **Date of Patent: Aug. 9, 2005**

- (54) **RADIATION CURABLE ADHESIVE COMPOSITIONS COMPRISING BLOCK COPOLYMERS HAVING VINYL FUNCTIONALIZED POLYDIENE BLOCKS**
- (75) Inventors: **Mark S. Kroll**, Arden Hills, MN (US); **Margarita Acevedo**, Minneapolis, MN (US); **Janelle C. Cameron**, Mendota Heights, MN (US); **Thomas F. Kauffman**, Harleysville, PA (US); **Jeffrey S. Lindquist**, Maple Grove, MN (US); **Eugene R. Simmons**, Vadnais Heights, MN (US); **David B. Malcolm**, Maplewood, MN (US); **Kathryn A. Coleman**, Minneapolis, MN (US)
- (73) Assignee: **H. B. Fuller Licensing & Financing, 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 70 days.

- (21) Appl. No.: **10/425,776**
- (22) Filed: **Apr. 29, 2003**
- (65) **Prior Publication Data**  
US 2003/0199604 A1 Oct. 23, 2003

**Related U.S. Application Data**

- (62) Division of application No. 09/771,764, filed on Jan. 29, 2001, now Pat. No. 6,579,915.
- (60) Provisional application No. 60/179,263, filed on Jan. 31, 2000.
- (51) **Int. Cl.<sup>7</sup>** ..... **C08F 2/46**
- (52) **U.S. Cl.** ..... **428/345**; 428/343; 428/355 R; 428/349; 428/355 EN; 428/355 BL; 428/500; 522/109; 522/110; 522/111; 522/112; 524/502; 524/505; 524/270; 524/274; 526/931; 526/935
- (58) **Field of Search** ..... 522/109, 110, 522/111, 112; 524/502, 505, 270, 274; 428/343, 355 R, 355 EN, 349, 355 BL, 500; 526/931, 935

(56) **References Cited**  
U.S. PATENT DOCUMENTS

4,181,752 A	1/1980	Martens et al.
4,329,384 A	5/1982	Vesley et al.
4,533,566 A	8/1985	Evans et al.
5,093,406 A	3/1992	Lossner et al.
5,160,383 A	11/1992	Gartland et al.
5,358,772 A	10/1994	Nakagawa et al.
5,382,604 A	1/1995	Erickson
5,614,577 A	3/1997	Sasaki et al.
5,662,758 A	9/1997	Hamilton et al.
5,700,623 A	12/1997	Anderson et al.
5,719,226 A	2/1998	Kegley
5,773,506 A	6/1998	Nestegard et al.
5,804,663 A	9/1998	De Craene et al.
5,891,957 A	4/1999	Hansen et al.
5,932,648 A	8/1999	Troska et al.
6,358,605 B1	3/2002	Casper

**FOREIGN PATENT DOCUMENTS**

WO WO 00/22062 4/2000

**OTHER PUBLICATIONS**

“Rubber-based Radiation Curable Pressure Sensitive Adhesives”, Martine Dupont, et al., Nov. 1999, 7 pages.  
“UV Crosslinkable Styrenic Block Copolymers . . . A Door To High Temperature Resistant Hot Melt Adhesive Applications” Martine Dupont, the Journal of the Adhesive and Sealant Council, Inc., 1997 Spring Convention, Pittsburgh, Pennsylvania, Mar. 23–26, pp. 229–240.

*Primary Examiner*—James J. Seidleck  
*Assistant Examiner*—Sanza L. McClendon

(57) **ABSTRACT**

The invention is directed to a radiation curable adhesive composition comprising at least one vinyl modified block copolymer having a first polyvinyl aromatic block and a second polydiene block having vinyl functionality, and at least one tackifier. Optionally, the composition may comprises at least one second block copolymer that has not been vinyl modified, at least one plasticizer, and at least one wax. The invention is also directed to a double-faced label formed from the composition and the method of producing said label.

**26 Claims, 4 Drawing Sheets**