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(54) **HOT MELT ADHESIVE COMPOSITION FOR BONDING PACKS OF PLASTIC CONTAINERS**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,411,954 A 10/1983 Butch et al.
4,500,021 A * 2/1985 Bildusas C09J 7/0221
156/762
4,526,577 A 7/1985 Schmidt et al.
4,578,302 A 3/1986 Schmidt et al.
4,822,653 A 4/1989 Kauffman et al.
5,001,179 A 3/1991 Kauffman et al.
5,037,411 A 8/1991 Malcolm et al.
5,090,861 A 2/1992 Malcolm et al.
5,418,052 A 5/1995 Sugie et al.
5,714,254 A 2/1998 Jacob
5,939,483 A 8/1999 Keppers

6,103,814 A 8/2000 VanDrongelen et al.
6,162,859 A 12/2000 Lu et al.
6,486,229 B1 11/2002 Ziyi et al.
6,818,093 B1 11/2004 Taal et al.
6,987,142 B2 1/2006 St. Clair et al.
7,262,251 B2 8/2007 Kanderski et al.
7,906,583 B2 3/2011 Lechat et al.
8,263,696 B2 9/2012 Goubard et al.
8,703,263 B2 4/2014 De Keyzer et al.
2003/0181584 A1 9/2003 Dale et al.
2005/0176887 A1 8/2005 St. Clair
2005/0182194 A1 8/2005 He et al.
2006/0234580 A1 10/2006 Sustic
2007/0249781 A1 10/2007 De Keyzer et al.
2008/0081858 A1 4/2008 Okazaki
2008/0153981 A1 6/2008 Goubard et al.
2008/0306214 A1 12/2008 Kanderski
2009/0291298 A1 11/2009 Robert et al.
2011/0021103 A1 * 1/2011 Alper B32B 5/26
442/329
2014/0324006 A1 10/2014 Zhong
2015/0017868 A1 * 1/2015 Stafeil C09J 157/02
442/381
2015/0037579 A1 2/2015 Juers et al.
2015/0197671 A1 * 7/2015 Becker B32B 37/1207
206/503
2016/0068723 A1 3/2016 Moriguchi et al.

FOREIGN PATENT DOCUMENTS

EP 0302394 B1 2/1989
EP 1564273 A1 8/2005
EP 1566423 A1 8/2005
EP 1719809 11/2006
GB 1456003 11/1976
JP 62081470 A 4/1987
JP 63043983 A 2/1988
JP 1144483 6/1989
JP 6078508 10/1994
JP 7057867 B2 6/1995
JP 02637269 8/1997
JP 03495277 2/2004
WO WO1992/008763 A1 5/1992
WO WO98/02498 A1 1/1998
WO WO2003/044087 A2 11/2007
WO WO2013/004337 1/2013
WO WO2013/004339 1/2013
WO WO2013/004340 1/2013
WO WO2013/004341 1/2013
WO WO2013/011561 1/2013
WO WO2014/189150 11/2014
WO WO2015/007785 1/2015

* cited by examiner

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(57) **ABSTRACT**

The present invention relates to a hot melt adhesive composition, comprising based on the total weight of the hot melt adhesive composition: (a) more than 25 weight percent of at least one block copolymer, (b) from about 27 to about 45 weight percent of at least one plasticizer, (c) from about 18 to less than about 55 weight percent of a combination of at least two different resins; and (d) optionally up to 10% weight percent of at least one wax. The hot melt adhesive composition of the invention can be used for bonding bundles of plastic containers such as bottles into packs.

14 Claims, No Drawings