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C08J 3/02 (2006.01) *B65D 85/46* (2006.01)
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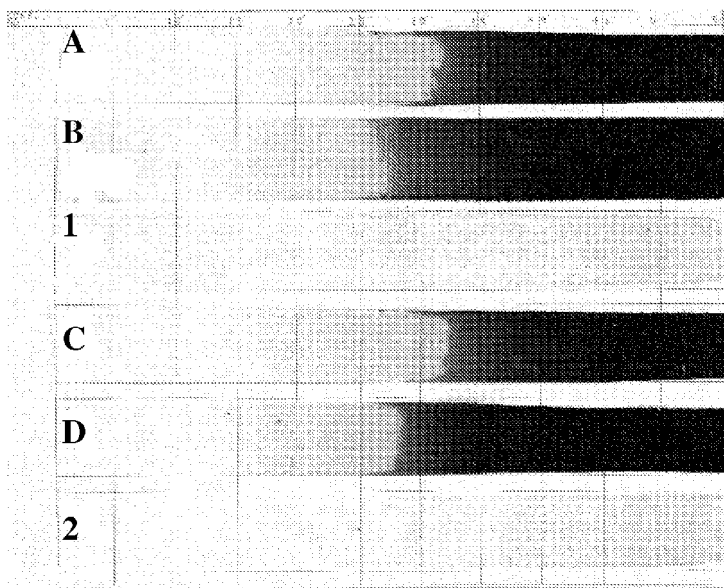
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[Continued on next page]

(54) Title: SUSTAINABLE POLY(VINYL CHLORIDE) MIXTURES FOR FLOORING PRODUCTS

Fig. 3.

15' 30' 45'



(57) Abstract: A mixture of poly(vinyl chloride) and epoxidized methyl soyate is disclosed. The epoxidized methyl soyate as a plasticizer replaces butyl benzyl phthalate which is conventionally used for the manufacture of multi-layer laminate sheet flooring or single layer tile flooring. The epoxidized methyl soyate, a bio-plasticizer, unexpectedly is a "drop-in" replacement for the butyl benzyl phthalate, both in terms of processing and performance. Also poly(vinyl chloride) - epoxidized methyl soyate mixtures have much better heat stability than poly(vinyl chloride) - butyl benzyl phthalate mixtures.



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Published:

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- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

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15 April 2010

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/050010**A. CLASSIFICATION OF SUBJECT MATTER***C08L 27/06(2006.01)i, C08K 5/12(2006.01)i, C08J 3/02(2006.01)i, C08K 5/541(2006.01)i, B32B 27/30(2006.01)i, B32B 19/02(2006.01)i, B65D 85/46(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC : C08L; C08K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models
(Chinese Patents and application for patent)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: polyvinyl chloride, epoxidized methyl soyate, plastisol, frothing agent

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,797,753 B2 (BENECKE; HERMAN P. et al.) 28 September 2004 cited in the application	1,2,6,7
Y	See abstract; column 3, lines 51-62; column 14, lines 21-25.	3-5,19-21
Y	US 3,945,955 A (IHDE, JR.; FREDERICK J.) 23 March 1976 See abstract; example 1; claims 1 and 2.	3-5
Y	US 2005-0136259 A1 (MOHANTY; AMAR K.et al.) 23 June 2005 See abstract; Par.[0008],[0011],[0012],[0020],[0032],[0065]-[0069], and [0073].	19-21
A	US 4,237,239 A (LILLEY; GEORGE L.) 02 December 1980 See the whole document.	1-7,19-21
A	EP 0040055 A1 (BP CHEMICALS LIMITED) 18 November 1981 See the whole document.	1-7,19-21
A	HOLSER; RONALD ALAN. Carbonation of Epoxy Methyl Soyate at Atmospheric Pressure,Journal Of Oleo Science. Accepted 17 August 2007, Vol. 56, No 12,pages 629-632,ISSN 1345-8957. See the whole document.	1-7,19-21

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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Date of mailing of the international search report

25 FEBRUARY 2010 (25.02.2010)

Name and mailing address of the ISA/KR

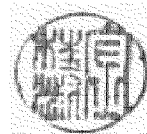
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INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ZHU; JIANG, et al. Curing and Mechanical Characterization of a Soy-Based Epoxy Resin System, Journal of Applied Polymer Science. Received 18 April 2003, Vol. 91, No. 6, pages 3513-3518, ISSN 0021-8995. See the whole document.	1-7, 19-21

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/050010**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: 10-14, 17, and 18
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Claims 10-14, 17, and 18 refer to claim 8 or 9 which is not drafted in accordance with the third sentence of Rule 6.4(a).

3. Claims Nos.: 8, 9, 15, and 16
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/050010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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