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30 January 1997 (30.01.97)

(54) Title: IMPACT MODIFIED MELT-STABLE LACTIDE POLYMER COMPOSITIONS AND PROCESSES FOR MANUFACTURE THEREOF

(57) Abstract

The invention is directed toward melt-processable lactide polymer compositions, processes for manufacturing these compositions, and articles made from these compositions. The compositions include a first phase, which contains a polylactide-based polymer, and a second phase which includes elastomer. The elastomer is present in an amount sufficient to provide a polymer composition having an impact resistance of at least about 0.7 ft-lb/in. after the melt-processable polymer composition has been injection molded into bars and tested according to ASTM D256 (1993) method C. Preferably, the compositions also include a reactive compatibilizing agent. Methods of making these compositions and articles made from these compositions are also disclosed.

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INTERNATIONAL SEARCH REPORT

Int .onal Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C08L67/04

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 6 C08L

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 90 01521 A (BATTELLE MEMORIAL INSTITUTE) 22 February 1990 see page 77, line 9; claims 35,36,3941 see page 83, line 25-30	1,2,4,6, 7,13,14, 22,24
Y		1-7,13, 14,22-24

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
1 October 1996	16. 12. 96

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016	Voigtländer, R

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Int onal 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.
X	US 5 252 642 A (SINCLAIR RICHARD G ET AL) 12 October 1993 see column 8, line 43; claims 1,4 see column 7, line 10 see column 8, line 63 to column 9, line 9 see column 8, line 17-24 see column 9, line 13-19	1,2,4,6, 7,13,14, 16,22, 24,25
Y		1-7,13, 14,16, 22-25

X	WO 94 07941 A (CARGILL INC) 14 April 1994 see page 13, line 7 see page 28, line 25 see page 10, line 10 see page 13, line 14-16 see page 29, line 5 see page 30, line 9-11 see page 36, line 29-31	1,2,4,7, 8,13-15, 19,22
Y		1-5,7,8, 13-15, 19,22,23

Y	US 5 359 026 A (GRUBER PATRICK R) 25 October 1994 cited in the application see claim 8; example 1	1-4,6-8, 13-16, 18,19, 22,24,25

Y	"Gesamtjahreskatalog 1990/91" 1990 , FRANKONIA-JAGD XP002004224 see page 227	1,2,4, 6-8, 13-16, 18,19, 22-25

Y	CHEMICAL ABSTRACTS, vol. 115, no. 16, 21 October 1991 Columbus, Ohio, US; abstract no. 166514, XP002004225 see abstract	1,2,4-8, 13-16, 19,22, 24,25
Y	& ACS SYMP. SER. 469, 1991, pages 181-193, DOLLINGER, H.M. ET AL. : "Biocontinuous controlled release matrix ..."	1,2,4-8, 13-16, 19,22, 24,25

A	WO 92 04410 A (DU PONT) 19 March 1992 see claims 1,6	16

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INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/US 96/00463

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"Encyclopedia of polymer science and engineering" 1988 , JOHN WILEY , NEW YORK XP002014816 see p. 768, penultimate para. to end of p. 769 -----	8

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 96/00463

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.:
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:

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

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

see further information

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 searches 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.:

1-6, 8, 13-21, 22-23, 24-25

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.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 96/ 00463

FURTHER INFORMATION CONTINUED FROM PCT/ISA/210

1. Claims : 1-6, 13-21, 22-23, 24-25 and 7
   with respect to compositions comprising PLA-first phase and a second phase comprising natural rubber
2. Claims : 1-6, 13-21, 22-23, 24-25 and 8
   with respect to compositions comprising PLA-first phase and a second phase comprising epoxidized rubber
3. Claims : 1-6, 13-21, 22-23, 24-25 and 9
   with respect to compositions comprising PLA-first phase and a second phase comprising compositions of at least 50wt% epoxidize rubber and natural rubber
4. Claims : 1-6, 13-21, 22-23, 24-25 and 10
   with respect to compositions comprising PLA-first phase and a second phase comprising synthetic rubber
5. Claims : 1-6, 13-21, 22-23, 24-25 and 10-12
   with respect to compositions comprising PLA-first phase and a second phase comprising crosslinked rubbers of flexible polymers and/or co-polymers.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int .onal Application No
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Information on patent family members

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