(19) World Intellectual Property **Organization**

International Bureau





(43) International Publication Date 10 February 2005 (10.02.2005)

(10) International Publication Number WO 2005/011956 A3

(51) International Patent Classification⁷: B29C 47/50, 47/76, 47/92

(21) International Application Number:

PCT/EP2004/051393

(22) International Filing Date: 7 July 2004 (07.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: MI2003A001472

18 July 2003 (18.07.2003)

(71) Applicant (for all designated States except US): NATU RAW LTD. [VC/VC]; Trust House 112, Bonadie Street, Kingstown (VC).

(72) Inventor; and

(75) Inventor/Applicant (for US only): BERTOLINO, Giorgio, Romano [IT/IT]; Via Cirio, 3, I-10152 Torino (IT).

(74) Agent: GERVASI, Gemma; Notarbartolo & Gervasi S.p.A., Corso di Porta Vittoria, 9, I-20122 Milan (IT).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, $GM,\ KE,\ LS,\ MW,\ MZ,\ NA,\ SD,\ SL,\ SZ,\ TZ,\ UG,\ ZM,$ ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

of inventorship (Rule 4.17(iv)) for US only

Published:

with international search report

(88) Date of publication of the international search report: 14 April 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR PRODUCTION OF STARCH-BASED THERMOPLASTIC MATERIALS

(57) Abstract: Process for production or processing of starch-based thermoplastic materials comprising: feeding of starch, water and any other components, as plasticizers, for example polyhydric alcohols, into a first section (8) of a screw extruder; compression and homogenization of the material with formation of a melted mixture in said first section; compression of the mixture in a second section (15) of a screw extruder and extrusion via an appropriately shaped die (6); process comprising the passage of said material through a pressure control valve (4) located between said first and second section.



INTERNATIONAL SEARCH REPORT



A. CLASSIFICATION OF SUBJECT MATTER IPC 7 B29C47/50 B29C B29C47/92 B29C47/76 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) B29C IPC 7 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) EPO-Internal C. DOCUMENTS CONSIDERED TO BE RELEVANT Category ° Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No. χ US 5 707 474 A (ANDERSEN PER JUST ET AL) 1 - 2113 January 1998 (1998-01-13) column 19, lines 12,13; figure 15 column 53, lines 55-65 US 4 902 455 A (WOBBE HANS) χ 18 - 2120 February 1990 (1990-02-20) column 3, lines 51-54; figure 1 1-17PATENT ABSTRACTS OF JAPAN χ 18 - 21vol. 0183, no. 96 (M-1644), 25 July 1994 (1994-07-25) & JP 06 114915 A (SEKISUI CHEM CO LTD), 26 April 1994 (1994-04-26) abstract; figure 1 1 - 17Α E US 2004/151058 A1 (MEIER-KAISER MICHAEL 18-21 ET AL) 5 August 2004 (2004-08-05) paragraph '0029!; figure 2a Further documents are listed in the continuation of box C. X Patent family members are listed in annex. ° Special categories of cited documents: "T" later document published after the international filing date or priority date and not in conflict with the application but "A" document defining the general state of the art which is not considered to be of particular relevance cited to understand the principle or theory underlying the invention *E* earlier document but published on or after the international "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 filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "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 docu-"O" document referring to an oral disclosure, use, exhibition or ments, such combination being obvious to a person skilled other means *P* document published prior to the international filing date but later than the priority date claimed "&" document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 18 January 2005 26/01/2005 Authorized officer Name and mailing address of the ISA 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 Mans, P

INTERNATIONAL SEARCH REPORT

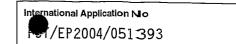
Information on patent family members

International Application No FEP/2004/051393

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5707474		13-01-1998	US	5851634 A	22-12-1998
		·	US	5508072 A	16-04-1996
			ÜS	5385764 A	31-01-1995
			US	5453310 A	26-09-1995
			ΑÜ	1676895 A	21-08-1995
			BR	9506698 A	16-09-1997
			CA	2179272 A1	10-08-1995
			EP	0743899 A1	27-11-1996
			ĴΡ	9505121 T	20-05-1997
			ÜS	5976235 A	02-11-1999
			US	6083586 A	04-07-2000
			WO	9521056 A1	10-08-1995
			US	5631053 A	20-05-1995
			US		
				5736209 A	07-04-1998
			US	5810961 A	22-09-1998
			US	5716675 A	10-02-1998
			US	5705203 A	06-01-1998
			US	5843544 A	01-12-1998
			US	5776388 A	07-07-1998
			AU	1432995 A	27-06-1995
			WO	9515849 A1	15-06-1995
			ΑT	223297 T	15-09-2002
			AU	706484 B2	17-06-1999
			ΑU	5280398 A	02-04-1998
			AU	675687 B2	13-02-1997
			ΑU	5729794 A	22-06-1994
			ΑU	683249 B2	06-11-1997
			AU	6354494 A	14-09-1994
			AU	699154 B2	26-11-1998
			AU	7194196 A	06-03-1997
			BR	9307526 A	31-08-1999
			BR	9405730 A	28-11-1995
			CA	2143004 A1	09-06-1994
			CA	2156050 A1	01-09-1994
			CN	1403349 A	19-03-2003
			CN	1126233 A ,B	
			CN	1099711 A	08-03-1995
			CN	1099711 A 1250736 A	19-04-2000
			DE	69431293 D1	
			DE		10-10-2002
				69431293 T2	30-04-2003
			EG	20546 A	31-07-1999
			EP	1155794 A2	21-11-2001
			EP	1308263 A2	07-05-2003
			EP	0678068 A1	25-10-1995
			ΕP	0686082 A1	13-12-1995
			ĪĻ	107722 A	22-02-1998
			IL	108671 A	16-08-1998
			JP	9507463 T	29-07-199 7
			JP	8507035 T	30-07-1996
		<u> </u>	NZ	259123 A	24-02-1997
US 4902455	A	20-02-1990	DE	3744193 C1	26-01-1989
			FR	2625134 A1	30-06-1989
			GB	2213092 A ,B	
			JP	1204715 A	17-08-1989

INTERNATIONAL SEARCH REPORT

Information on patent family members



Patent document cited in search report	Publication datė		Patent family member(s)	Publication date
US 2004151058 A1	05-08-2004	DE WO EP JP TW	10129707 A1 02096619 A1 1390190 A1 2004527404 T 537960 B	05-12-2002 05-12-2002 25-02-2004 09-09-2004 21-06-2003

Form PCT/ISA/210 (patent family annex) (January 2004)