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Published:

- with international search report (Art. 21(3))
- 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))

- (88) Date of publication of the international search report:
14 March 2013

- (15) Information about Correction:

Previous Correction:
see Notice of 22 November 2012

(54) Title: IMPROVEMENTS IN & RELATING TO TYRE RECYCLING

(57) Abstract: The present invention processes rubber products, such as from tyres, according to a process in which an extractant is introduced to the rubber material and subjected to a wet milling process to create a slurry-like material. Volatile distillate fractions are recovered from the slurry which may be used as a fuel. Further heating can produce substantially dry carbon rich product, which can be similar in character to pyrolytic carbon.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ2012/000023**A. CLASSIFICATION OF SUBJECT MATTER*****B29B 17/02(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)

B29B 17/02; B02C 19/00; C08J 11/04; C09C 1/48; B02C 19/12; C01B 31/02

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

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

eKOMPASS(KIPO internal) & Keywords: recycle, rubber, wet milling

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3978199 A (MARUHNIC; PETER et al.) 31 August 1976 See claim 1	1-4
A	US 6722593 B1 (DOBOZY; JOHN) 20 April 2004 See claim 1	1-4
A	US 5316224 A (DOBOZY; JOHN) 31 May 1994 See claim 1	1-4
A	US 5611492 A (HUNT; JAMES R. et al.) 18 March 1997 See claim 1	1-4



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

21 JANUARY 2013 (21.01.2013)

Date of mailing of the international search report

23 JANUARY 2013 (23.01.2013)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ2012/000023

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.: 7, 12-14, 16-17, 21- 22, 24, 29, 33 and 36
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 7, 12-14, 16-17, 21-22, 24, 29 and 33 are unclear because they refer to multiple dependent claims 6, 11, 15, 20, 23, 28 and 32, respectively, which do not comply with PCT Rule 6.4(a).
Claim 36 is contrary to PCT Rule 6.2(a) in that the claim relies on references to the description.
3. ☒ Claims Nos.: 5, 6, 8-11, 15, 18-20, 23, 25-28, 30-32 and 34-35
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/NZ2012/000023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3978199 A	31.08.1976	JP 51-100988 A JP 59-036664 B	06.09.1976 05.09.1984
US 6722593 B1	20.04.2004	AU 2000-278910 B2 AU 7891000 A DE 60044587 D1 EP 1427576 A1 EP 1427576 A4 EP 1427576 B1 JP 2003-534956 A WO 02-28609 A1	24.01.2008 15.04.2002 05.08.2010 16.06.2004 06.08.2008 23.06.2010 25.11.2003 11.04.2002
US 5316224 A	31.05.1994	WO 91-05818 A1	02.05.1991
US 5611492 A	18.03.1997	None	