(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
9 November 2006 (09.11.2006)

PCT

(10) International Publication Number
WO 2006/118613 A3

(51) International Patent Classification:
B29C 67/00 (2006.01)

(21) International Application Number:
PCT/US2005/043868

(22) International Filing Date:
6 December 2005 (06.12.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/116,633 29 April 2005 (29.04.2005) US

(71) Applicants and
(72) Inventors: **STEINKE, Richard, A.** [US/US]; 810 Gypsum Court, Boulder City, NV 89005 (US). **LOVE, Theodore, M.** [US/US]; 2152 Bridle Wreath Lane, Las Vegas, Nevada 89156 (US). **MOORE, James, G.** [US/US]; 111 Laguna Lane, Boulder City, Nevada 89005 (US).

(74) Agent: **RUSSELL, M., Reid**; 854 West 3390 South, Hurricane, UT 84737 (US).

(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, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, 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, IS, IT, LT, LU, LV, 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))*

Published:
— *with international search report*

(88) Date of publication of the international search report:
11 December 2008

(54) Title: METHOD AND APPARATUS FOR VACUUM FORMING A WHEEL FROM A URETHANE MATERIAL

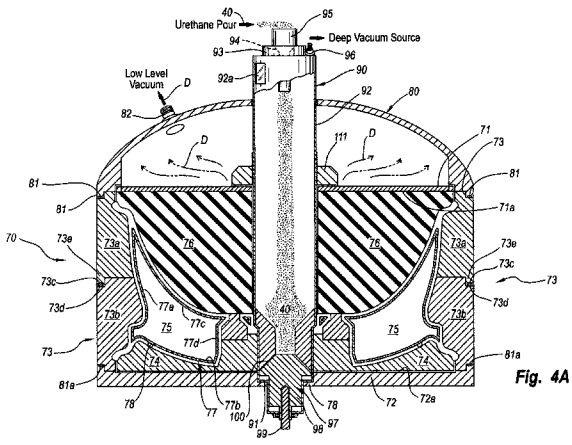


Fig. 4A

(57) Abstract: A method and apparatus for vacuum forming a wheel from a urethane material that includes a mold having a wheel shaped cavity therein that can be empty, or can contain a wheel core. The mold receives a cover fitted in sealing engagement over the mold top and a cylindrical canister is fitted through the center of which cover and the mold center, which canister is open at a top end to receive a pour of mixed urethane material passed therein and which canister includes a needle valve located in its lower end that exhausts into one end of the mold cavity. The cylindrical canister includes a port for connection to a deep vacuum source and the dome shaped cover includes a port that is for connection to a low level vacuum source, with the deep vacuum to remove air from the urethane material as it is being poured into the canister, and with, after filling, the canister port is open to atmosphere and the needle valve is opened to exhaust the mixture into the mold cavity wherethrough it is pulled by the low level vacuum pulled through the cover port, filling the mold cavity, forming the urethane wheel.

WO 2006/118613 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/43868

A. CLASSIFICATION OF SUBJECT MATTER
IPC: B29C 67/00(2006.01)

USPC: 264/46.9
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)
U.S. : 264/46.9

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
None

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4416926 A (Maglio) 22 November 1983 (22/11/1983) See Entire Document	20
---		---
Y		20-26
Y	US 4900097 A (Kostov et al) 13 February 1990 (13/02/1990) See Entire Document	20-26
Y	US 6325462 A (Hummel et al) 04 December 2001 (04/12/2001) See Emtire Document	21-26
A	US 6235227 A (Koyama et al) 22 May 2001 (22/05/2001)	
A	US 2005/0225006 A1 (Murar et al) 13 October 2005 (13/10/2005)	

☐ 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 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 another 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
16 June 2008 (16.06.2008)

Date of mailing of the international search report
02 JUL 2008

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (571) 273-3201

Authorized officer
Russell D. Stormer
Telephone No. 571-272-6687

Form PCT/ISA/210 (second sheet) (April 2007)