

(12) United States Patent Faraldi et al.

DISPOSABLE CARTRIDGE FOR MIXING EXOTHERMIC OR ENDOTHERMIC REACTION SUBSTANCES, AND RELATIVE CARTRIDGE-SUPPORT ASSEMBLY

(75) Inventors: Paolo Faraldi, San Remo (IT); Marco Federico Pidria, Orbassano (IT); Edoardo Merlone Borla, Candiolo (IT)

(73) Assignee: C.R.F. Societa Consortile Per Azioni, Orbassano (IT)

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 503 days. (*) Notice:

(21) Appl. No.: 10/850,964

(30)

May 20, 2004

Prior Publication Data

US 2005/0007870 A1 Jan. 13, 2005

Foreign Application Priority Data May 20, 2003 (IT) TO2003A0372

Int. Cl. B01F 3/12 B01F 15/02 B65D 25/08 (2006.01) (2006.01) (2006.01)

References Cited (56)

U.S. PATENT DOCUMENTS

1,592,632 A *	7/1926	Hahn 206/222
2,184,152 A *	12/1939	Saffir 206/222
2,694,641 A *	11/1954	Marshall et al 426/8
2,753,868 A *	7/1956	Seemar 206/222
3,347,410 A *	10/1967	Schwartzman 206/222

US 7.303.328 B2 (10) **Patent No.:**

(45) Date of Patent: Dec. 4, 2007

3,521,745	Α	*	7/1970	Schwartzman 206/222
3,537,605	Α	*	11/1970	Solowey 206/222
3,715,189	Α	*	2/1973	Nighohossian et al 422/61
3,842,836	Α	鞍	10/1974	Ogle 604/416
3,860,114	\mathbf{A}	鞍	1/1975	Merckardt 206/219
4,254,768	A	빯	3/1981	Ty 604/518
4,608,043	Α	*	8/1986	Larkin 604/87
5.071.034	Α	*	12/1991	Corbiere 206/222

(Continued)

FOREIGN PATENT DOCUMENTS

DE 3/1970 1 551 361

(Continued)

OTHER PUBLICATIONS

IBM Corp., "Endothermic Cooling Cartridge," *IBM Technical Disclosure Bulletin 37*(11):567-571, Nov. 1994.

Primary Examiner—Tony G. Soohoo (74) Attorney, Agent, or Firm—Seed IP Law Group PLLC

ABSTRACT

The cartridge has two compartments normally for containing two substances of the mixture, which are separated by a preferential break member; one of the two compartments contains a liquid solvent, and is fitted with a bellows having an intake valve and for producing a pumping action by varying the volume of the bellows by exerting pressure on the bellows. The bellows first causes breakage of the member to mix the two substances, and then produces flow of the mixture to accelerate its reaction. The cartridge is insertable inside a cavity of a support for heating or cooling in predetermined conditions.

27 Claims, 1 Drawing Sheet

