(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 813 551 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
01.08.2007 Bulletin 2007/31

(51) Int Cl.:
B65D 83/16 *(2006.01)* ***B05B 11/00*** *(2006.01)*

(21) Application number: **06110690.2**

(22) Date of filing: **06.03.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **30.01.2006 IT MI20060150**

(71) Applicant: **MeadWestvaco Calmar S.p.A.**
20090 Pieve Emanuele (MI) (IT)

(72) Inventors:
- **Marelli, Andrea**
  20080 Milano 3 Basiglio (MI) (IT)
- **Ribera Turro', Victor**
  08015 Barcelona (ES)

(74) Representative: **Giambrocono, Alfonso et al**
Giambrocono & C. S.p.A.
Via Rosolino Pilo 19/B
20129 Milano (IT)

(54) **Safety pushbutton for operating fluid substance dispensing pumps**

(57) An operating pushbutton (6) for dispensing pumps (1) for fluid substances contained in containers on which the pumps are mounted. The pushbutton has an end portion (7) which can translate on a portion (6) thereof applicable to the pump stem, such that when a pressure is exerted on said end portion it undergoes a free translation before causing the other pushbutton portion to move, hence preventing accidental dispensing of the fluid substance.

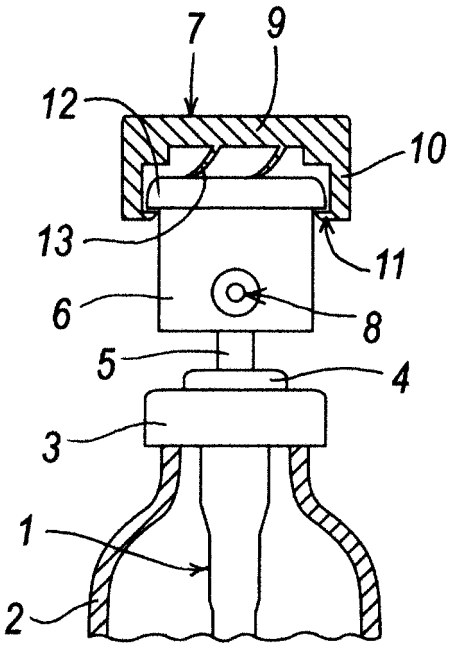

FIG. 1

EP 1 813 551 A1

Description

[0001] The present invention relates to a safety pushbutton for operating fluid substance dispensing pumps.

[0002] To controlledly dispense fluid substances (in particular liquid or creamy substances), it is known to use valves or pumps mounted on the mouth of containers in which the substances are contained, either under or not under pressure. Such pumps or valves have a hollow stem projecting out of the respective container and a pushbutton or cap which is mounted on the free end of the stem and has a nozzle or hole through which the fluid substance can be dispensed to the outside of the container following axial translation of the pushbutton. When the pump is in its rest condition there is no flow of fluid substance from the nozzle of the pushbutton. When pressure is exerted (usually with a finger of one hand) on the free end of the pushbutton, this moves axially together with the stem on which it is mounted, hence operating the pump or valve and dispensing the fluid substance. Even small movements of the pushbutton away from its rest position cause the substance to emerge from the container in which it is held, this in many cases representing an important drawback. For example, if the substance is a perfume or a deodorant, it is often held in a small container which can be carried in the user's handbag: the user (in this case generally a woman) may inadvertently exert a small pressure on the free end of the container when inserting a hand into the handbag, with the result that the pushbutton moves slightly away from its rest position, to cause undesired dispensing of the substance. A similar undesired dispensing of the fluid substance can occur if, after being filled, the containers are positioned one on another (for example packaged in boxes in which the containers may be positioned on several levels) to facilitate their transport and storage: a temporary axial force may be transmitted to the free end of the pushbuttons of those containers lying at lower levels (for example as the result of impacts received by the boxes used to transport them), resulting in a small movement or oscillation which can cause undesired dispensing of fluid substance.

[0003] To reduce this drawback, pumps have been produced in which the stem can be moved away from its rest position through a limited distance without the fluid substance emerging. Pumps of this known type have a complicated and costly structure: one of these is described for example in US 3,583,605.

[0004] The main object of the present invention is to provide a safety pushbutton which can be mounted on the free end of the stem of any pump or valve of known type and prevents dispensing of fluid substance when the free end of the pushbutton undergoes, away from its rest position, a movement (generally of a small extent) which is less than an amount determined during the design and manufacture of the pushbutton.

[0005] A further object is to provide a pushbutton of the aforesaid type which is of low production cost and has a simple structure of reliable operation.

[0006] These and other objects are attained by a safety pushbutton applicable to the stem of a pump or valve for dispensing fluid substances, characterised by comprising two separate portions, namely a free end portion and, respectively, a main portion in which there are provided a seat for the free end of said stem and a nozzle for the exit of fluid substance originating from said seat, to which the nozzle is connected by a conduit provided in the main portion of the pushbutton, said end portion being movable relative to the main portion of the pushbutton, on which it is retained by retention elements which hold together these two pushbutton portions, between which there is interposed an elastically deformable element which urges the free end portion away from the main portion of the pushbutton towards and against said retention elements.

[0007] The structure and characteristics of the safety pushbutton will be more apparent from the ensuing description of one embodiment thereof given by way of non-limiting example with reference to the accompanying drawing, in which Figures 1, 2 and 3 are partly sectional side elevations of a safety pushbutton in three successive positions between its rest position and its dispensing position.

[0008] The figures show schematically a pump 1 (of any known type) mounted on the mouth of a container 2 by means of a ring cap 3, 4. From the upper end 4 (with respect to the drawing) of the ring cap 3, 4 there projects the stem 5 of the pump 1; the container 2 contains (in known manner, not shown for simplicity) a fluid (liquid or creamy) substance which is fed into the pump 1 by a dip tube, not shown in the drawings as it is of usual type well known to the art.

[0009] When the pump is operated, the fluid substance originating from the pump 1 is expelled to the outside through a dispensing nozzle of a pushbutton 6 mounted on the free end of the stem 5 and operable by a finger of one hand pressing on the free end (the upper end with respect to the figures) of the pushbutton. The present invention relates to the structure and operation of the pushbutton 6, 7 which, as will be apparent from the ensuing description, can be defined as a "safety pushbutton". This pushbutton comprises two separate portions, namely a main portion 6 and a free end portion 7.

[0010] The main portion 6 is shown in front view and has substantially the form of a pushbutton of any known type, it comprising a nozzle 8 (for expelling the fluid substance from the container 2 to the outside environment) which, by means of a conduit, not shown but also of a type known in the art, is connected to a seat (also not shown in the drawing) in which the free end of the stem 5 of the pump 1 is sealedly inserted.

[0011] The free end portion 7 of the safety pushbutton is shown in axial section in the figures and has substantially the form of a disc 9 from which there projects a tubular skirt 10 (or a plurality of separate appendices) having at its free end a series of inwardly projecting teeth 11 (or a continuous rib). The rib or teeth 11 interfere with

a continuous rib 12 projecting outwards from the upper end of the pushbutton main portion 6 such that the disc 9 can rock about the portion 6 but cannot separate therefrom, this being prevented by the teeth or rib 11 which interfere with the projecting rib 12 (the desired result of allowing the two pushbutton portions to rock about each other but preventing their involuntary separation could evidently be achieved in other equivalent ways, for example by making teeth or a rib projecting from one of the two portions engage in a respective groove or recess provided in the opposing surface of the other pushbutton portion).

[0012] As can be seen from the figures, there project from the lower surface of the disc 9 a plurality of inclined flexible appendices 13, the free ends of which rest on the upper surface of the pushbutton main portion 6, to maintain the disc 9 (and hence the end portion 7 of the pushbutton) raised from the upper surface of the pushbutton main portion 6 when the pump and the pushbutton are in their rest condition (Figure 1).

[0013] When a pressure is exerted on the upper surface of the disc 9 with one finger, the flexible appendices 13 firstly flex and the disc 9 approaches the upper surface of the pushbutton main portion, without this operating the pump 1: for this to happen, the elastic resistance of the appendices 13 to flexure must be less than the force required to operate the pump (which generally contains a spring tending to maintain it urged into its closed rest position).

[0014] After a small initial free movement, the disc 9 (or a non-flexible element forming part of the end portion 7 of the pushbutton) comes into contact with the pushbutton portion 6, as shown in Figure 2. Starting from this position and continuing to press on the disc 9, this continues to move downwards (with respect to the figures), but now causing the pushbutton portion 6 to move and hence the pump to operate, so dispensing the fluid substance through the nozzle 8.

[0015] The elastically deformable elements which tend to maintain the two pushbutton portions spaced apart can be different from the appendices 13 shown in the drawings: for example, they can consist of a metal spring or a different element. The pushbutton can be advantageously produced very easily and economically by moulding all its components from plastic material.

[0016] From the description, it will be apparent that forces can be transmitted to the top of the free end portion of the pushbutton which cause it to undergo movements within values determined during production, without resulting in operation of the pump on which the pushbutton is applied.

Claims

1. A safety pushbutton applicable to the stem of a pump or valve for dispensing fluid substances, **characterised by** comprising two separate portions, namely a free end portion and, respectively, a main portion in which there are provided a seat for the free end of said stem and a nozzle for the exit of fluid substance originating from said seat, to which the nozzle is connected by a conduit provided in the main portion of the pushbutton, said end portion being movable relative to the main portion of the pushbutton, on which it is retained by retention elements which hold together these two pushbutton portions, between which there is interposed an elastically deformable element which urges the free end portion away from the main portion of the pushbutton towards and against said retention elements.

2. A safety pushbutton as claimed in claim 1, **characterised in that** said elastically deformable element consists of at least one deformable appendix projecting from one of the two pushbutton portions and resting on the other pushbutton portion.

3. A safety pushbutton as claimed in claims 1 and 2, **characterised in that** said retention elements consist of teeth or ribs projecting from one of said pushbutton portions and interacting with ribs or recesses provided on the other pushbutton portion.

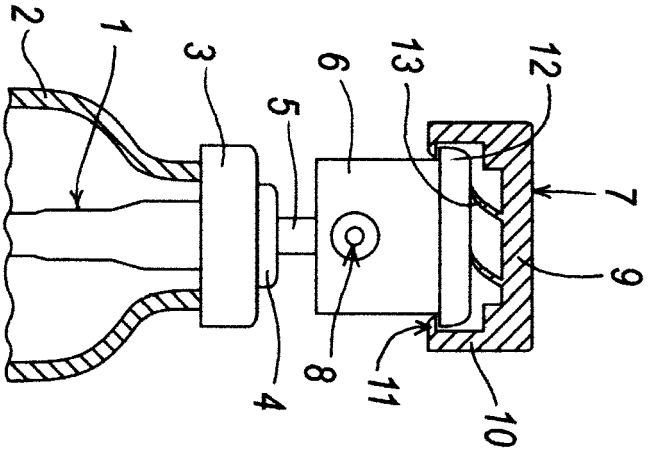

FIG. 1

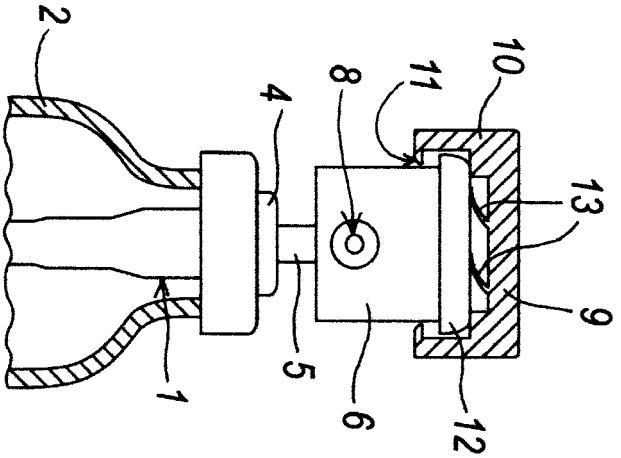

FIG. 2

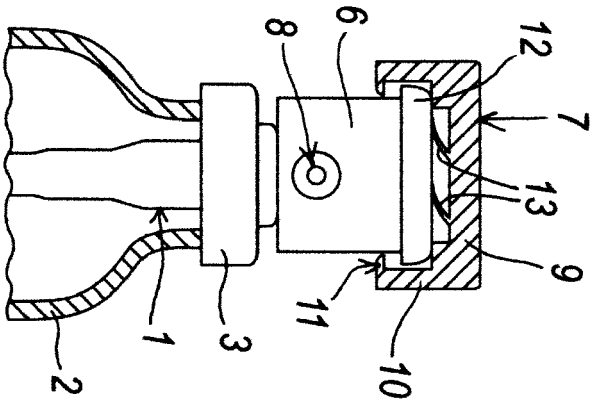

FIG. 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 11 0690

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 3 752 370 A (DAVENPORT R) 14 August 1973 (1973-08-14) * column 3, lines 8-65; figures 1-4 *	1,3 2	INV. B65D83/16 B05B11/00
X	US 3 587 942 A (GAILITIS ADOLPH R) 28 June 1971 (1971-06-28) * figures 1-3 *	1,3	
X	WO 91/10607 A (DUNNE MILLER WESTON LTD [GB]) 25 July 1991 (1991-07-25) * page 6, lines 9-16; figures *	1,3	
Y	US 3 729 120 A (SETTE J ET AL) 24 April 1973 (1973-04-24) * column 2, lines 24-34; figure 2 *	2	
A	EP 1 048 590 A1 (OREAL [FR]) 2 November 2000 (2000-11-02) * figures 1,2a-2d *	1	
			TECHNICAL FIELDS SEARCHED (IPC) B65D B05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 April 2007	Balz, Oliver

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 11 0690

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

03-04-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3752370 A	14-08-1973	NONE	
US 3587942 A	28-06-1971	BE 749558 A1	26-10-1970
WO 9110607 A	25-07-1991	AU 7221291 A	05-08-1991
US 3729120 A	24-04-1973	NONE	
EP 1048590 A1	02-11-2000	AT 241535 T	15-06-2003
		CA 2305030 A1	29-10-2000
		DE 60002947 D1	03-07-2003
		DE 60002947 T2	11-03-2004
		ES 2199744 T3	01-03-2004
		FR 2792913 A1	03-11-2000
		JP 2000335662 A	05-12-2000
		US 6264067 B1	24-07-2001

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 3583605 A **[0003]**