

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 January 2008 (24.01.2008)

PCT

(10) International Publication Number
WO 2008/009872 A1

(51) International Patent Classification:

B65D 83/14 (2006.01) **B05B 12/04** (2006.01)
B65D 83/16 (2006.01) **B05B 11/00** (2006.01)

(21) International Application Number:

PCT/GB2007/001907

(22) International Filing Date: 22 May 2007 (22.05.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

0614137.8 15 July 2006 (15.07.2006) GB

(71) Applicant (for all designated States except US):

RECKITT BENCKISER (UK) LIMITED [GB/GB];
103-105 Bath Road, Slough, Berkshire, SL1 3UH (GB).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BUTLER, Martin**
[GB/GB]; Reckitt Benckiser (UK) Limited, Dansom Lane,
Hull HU8 7DS (GB).

(74) Agents: **HOLMES, Jeremy, M.** et al.; RECKITT

BENCKISER PLC, Legal Department-Patents Group,
Dansom Lane, Hull HU8 7DS (GB).

(81) Designated States (unless otherwise indicated, for every

kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, 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, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every

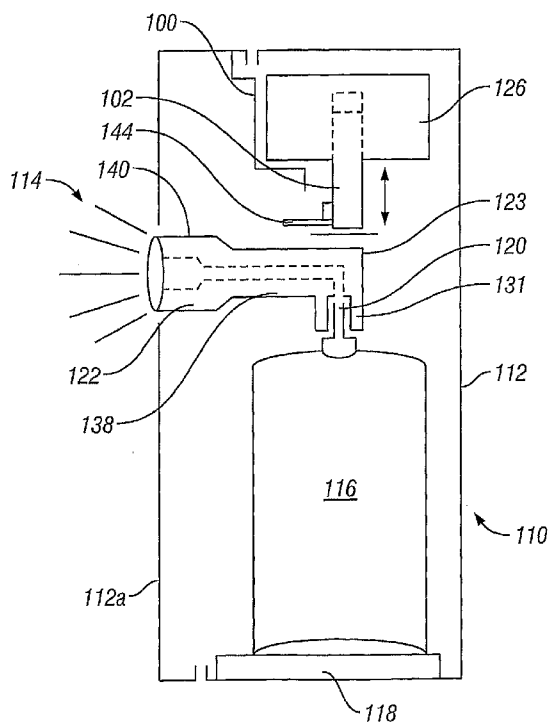
kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ,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

Published:

— with international search report

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: SPRAY DEVICE



(57) Abstract: A spray device comprises spray container receiving means and spray container actuation means (102, 126), wherein the spray container actuation means are adapted to periodically cause ejection of spray material from a spray container (116) by means of an actuator arm (102), wherein the actuator arm (106) incorporates position indication means (144).

WO 2008/009872 A1

Spray Device

This invention relates to an apparatus for spraying a fragrance, a pest control material, a deodorising fluid, or similar, and to a container for use in a spraying apparatus and to a method of spraying.

Prior art devices for spraying fragrances, deodorising agents and sanitising fluids into a room consist of a mechanically actuated arm which is periodically activated to press down on a spray head secured to an aerosol canister containing the material to be sprayed.

The prior art devices are typically constructed as described below and as shown in Figures 1 and 2. An outer casing 12 has an opening 14 through which the spray is ejected. The casing 12 has a removable front section 12a which is removed to allow a refill canister 16 containing the spray material to be placed in the casing 12. A moulded spray head 22 is located over an outlet stem 20 of the aerosol spray canister 16. The spray head 22 has an inlet section 31 to be placed over the outlet stem 20 of the aerosol canister 16. Inner shoulders of the spray head 22 bear against the outlet stem 20 to cause material to be ejected from the canister 16 into the opening 30 and out of an outlet 22 of the spray head. A location block 23 allows location of the spray head 22 in the casing 12. An actuation arm 24 is located over the spray head 22 and is caused periodically to press against the spray head 22 to cause material from the aerosol canister 16 to be ejected through the spray head 22 out of the opening 14 in the casing and into the surroundings. The actuator arm 24 is either battery powered or mains powered and can be set

to activate at various time intervals which, for example, may be to activate every seven minutes, every fifteen minutes or every thirty minutes, whichever is set by a user.

5

It has been found that disadvantages arise with these prior art spraying devices in that the direction of the spray is not well constrained and so the spraying of the material may occasionally miss the opening in the outer casing thereby wasting the spray material and not working efficiently. The spray head may twist sideways away from the outlet in the casing for example. Also, when replacing an empty canister 16, it is difficult for a user to see if the actuation arm is in a retracted position in which the canister 16 can be inserted or in an extended position in which the canister 16 may snag on the arm 24 and interfere with proper functioning of the device, or even permanently damage the canister 16.

20 It is an object of the present invention to address the above mentioned disadvantages.

According to an aspect of the present invention there is provided a spray device having spray container receiving means and spray container actuation means, wherein the spray container actuation means are adapted to periodically cause ejection of spray material from a spray container by means of an actuator arm, wherein the actuator arm incorporates position indication means.

30

The position indication means of the actuator arm may be a projection thereof, which projection preferably projects away from, preferably substantially perpendicularly away

from, a front face of the actuator arm. The projection may project from a lower edge of actuator arm. The projection may project from a projecting land of the actuator arm, said land being forward of the front face of the actuator arm. The projection may taper towards an end thereof, and may have a flattened tip. The actuator arm is preferably operable to move between an activation position and a retracted position. When in the activation position the projection is generally parallel to, or more preferably coplanar with, an upper face of the spray container.

The spray container actuation means preferably has a cover portion, through which the position indication means preferably projects. The projection preferably projects approximately 2mm to 4mm from a front face of the cover portion.

The cover portion preferably incorporates a slot, through which the projection may project. The slot preferably comprises a spray container receiving section and a projection-travel section. Preferably, the two sections are at an angle to each other, preferably in the form of a dog-leg. The projection-travel section is preferably adapted to allow the projection to travel unhindered between the activation and retracted positions.

Preferably, the projection-travel section is adapted to allow greater visibility of the projection and/or the projecting land in the activation position compared to the retracted position.

The actuation means may include position adjustment means, adapted to allow a user to adjust the position of the actuator arm.

- 5 The position adjustment means may be the position indication means.

The spray device may include a spray container.

- 10 The invention extends to an actuator arm for a spray device, which actuator arm incorporates position indication means, and/or position adjustment means.

- All of the features disclosed herein may be combined with
15 any of the above aspects, in any combination.

For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the
20 accompanying diagrammatic drawings in which:

Figure 1 is a schematic view of a prior art spraying device;

- 25 Figure 2 is a schematic front view of the spraying device shown in Figure 1;

Figures 3a to 3c show schematic front perspective, rear perspective and front elevation views of a cover plate
30 used in connection with a spraying device;

Figures 4a and 4b show schematic perspective front and rear views of lever arm for use with a spraying device having a cover plate as shown in Figures 3a to 3c; and.

- 5 Figure 5 is a schematic perspective view of the spraying device parts of which are shown in Figures 3a, b, c and 4.

The prior art spraying device shown in Figure 2 incorporates an upper section with the reference numeral
10 12. With a view to addressing the disadvantages of the prior art devices discussed in the introduction, a cover plate 100 as shown in Figures 3a to 3c and a lever arm 102 shown in Figures 4a and 4b are to be used instead of the section 12 and arm 24 shown in Figure 2. Otherwise, the
15 general construction of the spraying device is much the same as shown in Figure 2.

In use, a spraying device having the cover plate 100 and lever arm 102 is part of a device as shown in Figure 5
20 which receives an aerosol spray canister 116 placed on a platform 118. An outlet stem 120 of the spray canister 116 is engaged in a lower opening 130 in a spray head 122. The aerosol spray canister 116 is a replaceable item, whilst the spray head 122 is typically supplied with the
25 aerosol spray 116.

When the aerosol spray canister 116 is placed in position a fluid path for fragrance (or sterilising material or other material) for spraying is formed from the aerosol
30 spray canister 116, through the spray head 122, to the opening 114 in a front section of an outer cover 112.

In order to cause spraying of the material within the aerosol spray canister 116, the lever arm 102 is caused to move down onto the spray head 122 by the actuator 126. The actuator 126 has numerous selectable settings which user may select with use of an adjustment control (not shown). The settings may be, for example, to cause the actuator arm 102 to move and cause spraying of the aerosol spray canister 116 every nine minutes, every eighteen minutes, every thirty-six minutes or any other of the large number of possible settings, as would be preferred by a user.

In order to locate the spray head 122 with respect to the cover plate 100, the spray head 122 has a location block 123 above a lower, inlet, section 131 of the spray head 122. The location block 123 is received in a location section 140 of the cover plate 100, shown in Figures 3a to 3c. The location section 140 receives the location block 123, the latter being wider than the inlet section 131. The location section 140 has a close fit with the inlet section 131. Space is allowed below the location block 125 to allow for vertical movement of the spray head 122 relative to the location section 140 when it is activated.

Reference is made in this description to the spraying device being a fragrance spraying device. The spraying device may also be used for spraying deodorising material sanitising materials or any other materials in the spray form. The apparatus described is typically for use in period spraying into a closed area such as a room. The apparatus is also described in relation to the use of an aerosol spray canister 116 for the material to be sprayed.

However, different types of container other than aerosol container could be used.

In order to address the disadvantages discussed above, the lever arm 102 and the cover plate 100 have been developed.

The cover plate incorporates a curved opening 142 in which the lever arm 102 is located and along which opening 142 the lever arm 102 travels. In Figure 3c a projection 144 of the lever arm is shown at a raised position (144a) and a lowered position (144b), to show the two extremes of motion of the lever arm 102 and the projection thereof 144 with respect to the curved opening 142.

The shape of the curved opening 142 has been chosen to allow an arc of motion for the projection 144 of the lever arm 102 as it moves upwards and downwards as it is activated by the actuator 126. The lever arm 102 moves in a pivoting motion about an opening 146 in which is received a fixing pin extending from the centre of one of a plurality of gear wheels that drive the lever arm 102, in the same manner known from the prior art.

The shape of the curved opening 142 as been chosen to more clearly demonstrate to a user that the projection 144 of the lever arm 102 moves between raised and lowered positions, which movement is not clear in the prior art devices. The presentation of the curved opening 142 in this manner allows a user to more easily discern whether the lever arm 102 is in a raised or lowered position, so that the user can more easily replace the spray canister 116 when it is spent.

The lever arm 102 differs from a prior art lever arm in that the projection 144 is present. The projection 144 projects through the curved opening 142 to clearly show to a user whether the lever arm 102 is in the raised or lowered position. As will be apparent from the description above, when the lever is in the raised position, as shown by the position 144a in Figure 3c, it is possible for a user to insert a fresh canister 116, whereas when the lever arm 102 is lowered, as shown by the position of the projection 144b in Figure 3c, it is more difficult for a user to insert a new canister 116, because the spray head 112 is more likely to foul on the lever arm 102 in the lowered position.

Thus, the projection 144, which extends out of the curved opening 142 provides a very clear visual indication to a user of the position of the lever arm 102. The projection 144 has a length of approximately 12 mm to allow it to project forward of a front face of the curved opening 142 by approximately 6 mm. Furthermore, a land 148 has been provided on the lever arm 102 to provide a further visual indication to a user of the position of the lever arm 102. In prior art actuator arms, the front face of the actuator arm was hollowed out and was more difficult to see. The land 148 extends approximately 3 mm forward of a front face of the lever arm. The land is visible at its lowered position at 148b in Figure 3c. The land is visible in its raised position at 148a in that Figure. It is clearly much more visible when lowered.

30

Pivoting of the lever arm 102 is achieved by movement of a toothed wheel (not shown) with which a toothed section 150 of the lever arm 102 engages. Pivoting motion of the

lever arm 102 is achieved about the opening 146, as mentioned above. The motion of the lever arm 102 is driven in the same way as the prior art discussed in relation to Figures 1 and 2.

5

The advantageous provision of the projection 144, the land 148 and the curved opening 142 provides the advantage of allowing a user to clearly see the position of the lever arm 102, which has not been possible with prior art
10 devices.

Furthermore, the downward movement of the lever arm 102 is achieved by rotation of toothed wheels, as referred to above. Upward movement of the lever arm 102, as is the
15 case with the prior art, is achieved by pressure from the aerosol canister 116 valve forcing the lever arm 102 back to the raised position. When the canister 116 is removed from the device, when it is spent, the canister cannot push the lever arm 102 back to the raised position.
20 Consequently, it is typically the case that when a user removes the canister 116 the lever arm 102 is the lowered position. The prior art has required that the user uses a pin or pen, or other pointed object to raise an actuator arm to the raised position to allow insertion of a fresh
25 canister. This is not required in the present case, because a user can easily push the projection 144 to cause the lever arm 102 to move to the raised position and allow easy insertion of the canister 116. This has significant advantages for ease of use by a user.

30

The projection 144 extends horizontally forwards from the base of the lever arm. This provides a greater surface area to the base of the lever arm 102. Consequently a

greater surface area is provided with which the lever arm 102 contacts the spray head 122. Thus, the pressure of contact between the arm 102 and the spray head 122/canister 116 is reduced. This reduces the risk of failure of the stem 120 of the canister 116.

Attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any

novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A spray device comprises spray container receiving means and spray container actuation means, wherein the spray container actuation means are adapted to periodically cause ejection of spray material from a spray container by means of an actuator arm, wherein the actuator arm incorporates position indication means.
2. A spray device as claimed in claim 1, in which the position indication means of the actuator arm is a projection thereof.
3. A spray device as claimed in claim 2, in which the projection projects perpendicularly away from a front face of the actuator arm.
4. A spray device as claimed in any one of claims 2 or 3, in which the projection projects from a lower edge of actuator arm.
5. A spray device as claimed in any one of claims 2 to 4, in which the projection projects from a projecting land of the actuator arm.
6. A spray device as claimed in any one of claims 2 to 5, in which the projection tapers towards an end thereof.
7. A spray device as claimed in any preceding claim, in which the actuator arm is operable to move between an activation position and a retracted position.

8. A spray device as claimed in claim 7, in which when in the activation position the projection is generally parallel to, or coplanar with, an upper face of the spray container.

5

9. A spray device as claimed in any preceding claim, in which the spray container actuation means has a cover portion adapted such that the position indication means projects therethrough.

10

10. A spray device as claimed in claim 9, in which the cover portion incorporates a slot, through which the projection projects.

15 11. A spray device as claimed in claim 10, in which the slot comprises a spray container receiving section and a projection-travel section.

12. A spray device as claimed in claim 11, in which the
20 two sections are at an angle to each other.

13. A spray device as claimed in claim 11 or claim 12, in which the projection-travel section is adapted to allow the projection to travel unhindered between the activation
25 and retracted positions.

14. A spray device as claimed in any preceding claim, in which the actuation means includes position adjustment means adapted to allow a user to adjust the position of
30 the actuator arm.

15. A spray device as claimed in claim 14, in which the position adjustment means is the position indication means.
- 5 16. A spray device as claimed in any preceding claim, which includes a spray container.
17. An actuator arm for a spray device, which actuator arm incorporates position indication means, and/or position
10 adjustment means.
18. A spray device substantially as described herein with reference to figures 3 to 5 of the accompanying drawings.
- 15 19. An actuator arm for a spray device substantially as described herein with reference to figures 3 to 5 of the accompanying drawings.

1/4

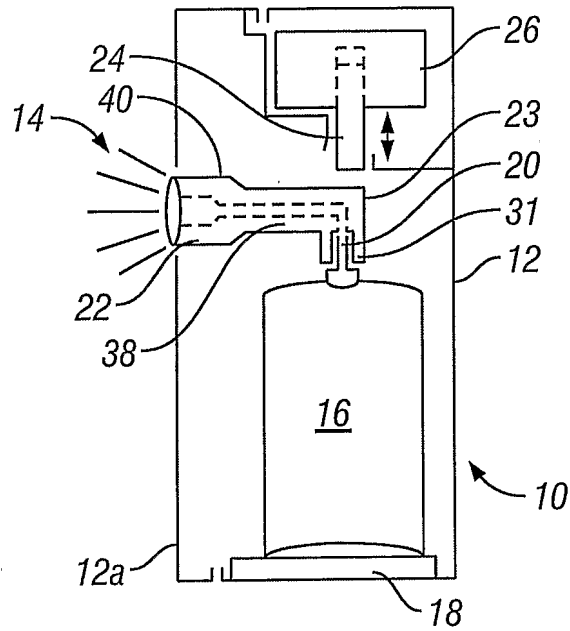


FIG. 1

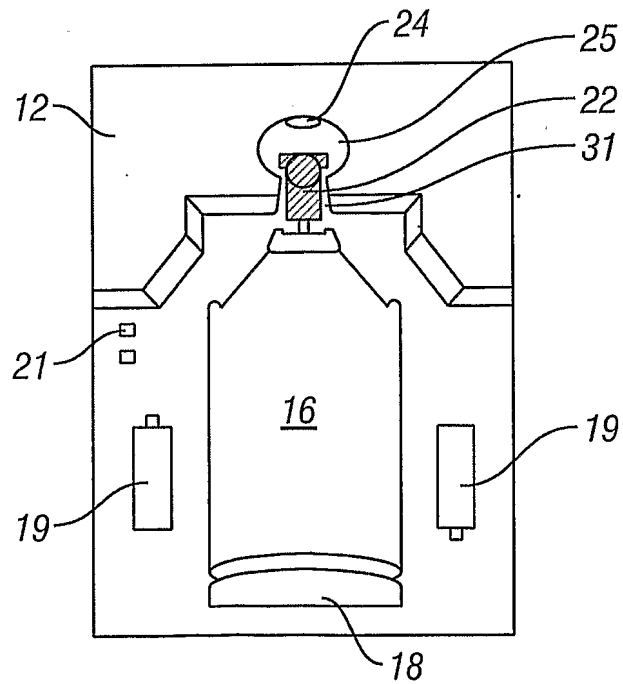


FIG. 2

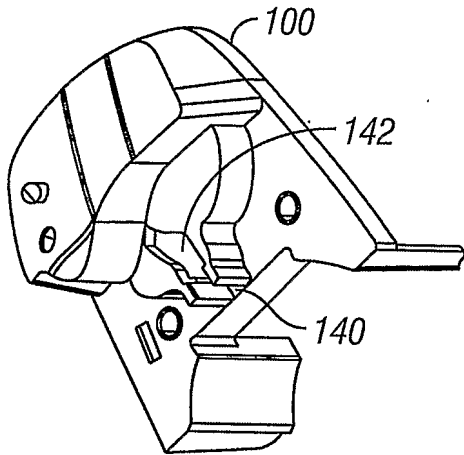


FIG. 3a

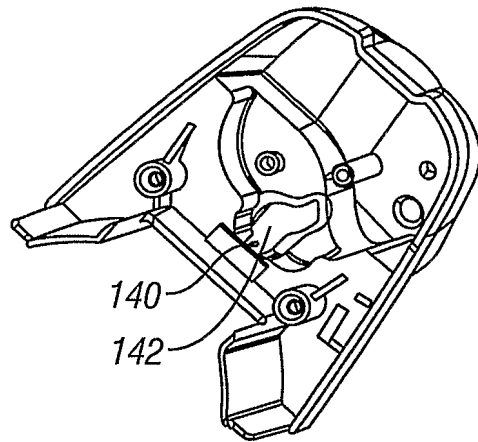


FIG. 3b

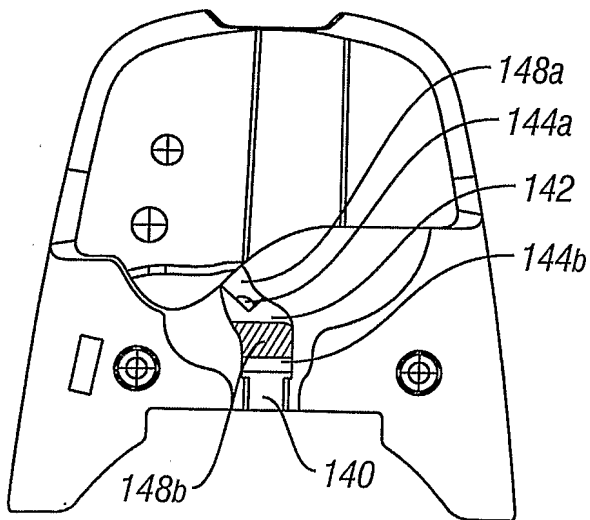


FIG. 3c

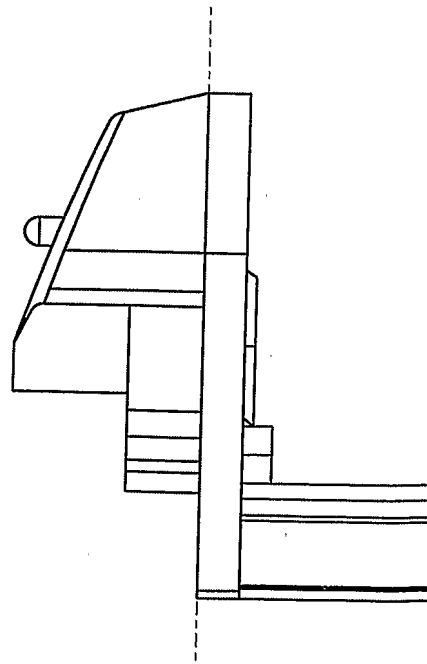


FIG. 3d

3/4

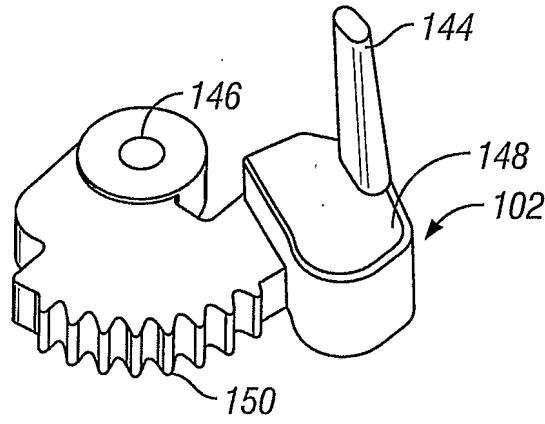


FIG. 4a

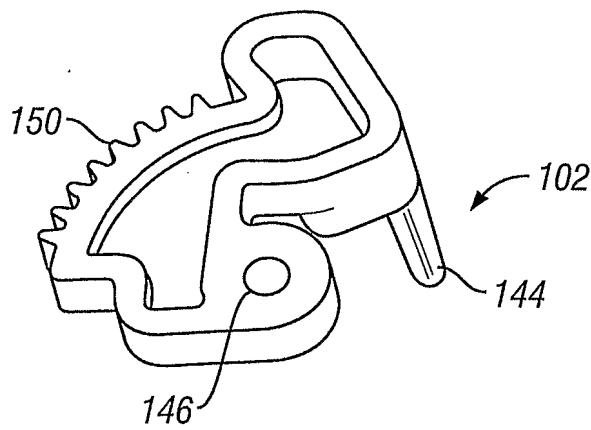


FIG. 4b

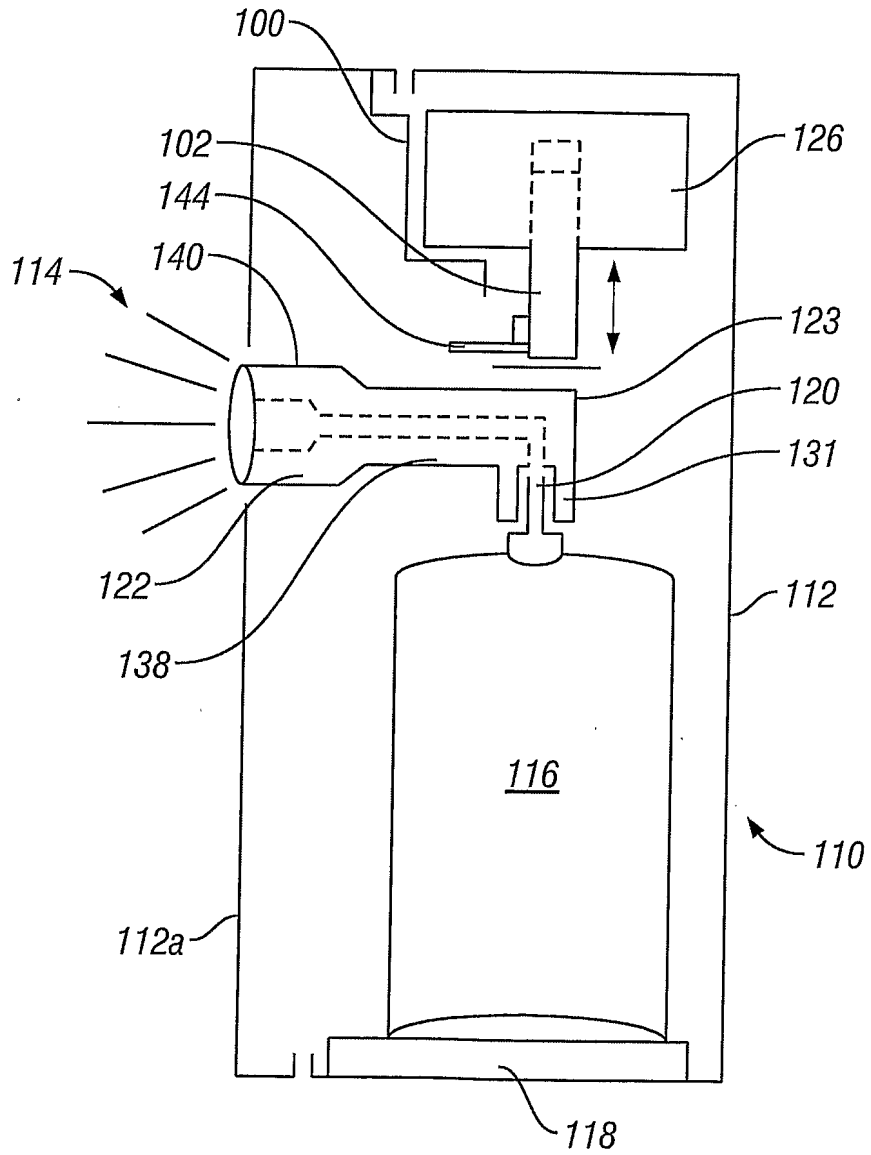


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2007/001907

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65D83/14 B65D83/16 B05B12/04
 ADD. B05B11/00

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)
 B65D B05B

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.
X	FR 2 454 810 A (HUBERT GUY) 21 November 1980 (1980-11-21) page 4, line 22 - line 37 figure 5	1-5,7-17
X	JP 09 183470 A (YOSHINO KOGYOSHO CO LTD) 15 July 1997 (1997-07-15) abstract; figures 5,7	1-5,7, 9-17
X	CH 514 362 A (STEINER PAUL [CH]) 31 October 1971 (1971-10-31) figure 1	1-8, 14-17
X	DE 12 83 065 B (HUNT WILLIAM GRAYSON) 20 February 1969 (1969-02-20) column 3, line 36 - column 4, line 38; figures 1,2,4	1-8, 14-17
	----- -/--	

 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 document 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 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

20 August 2007

Date of mailing of the international search report

29/08/2007

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

Authorized officer

Roldán Abalos, Jaime

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2007/001907

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 293 442 B1 (MOLLAYAN GIRARD D [US]) 25 September 2001 (2001-09-25) figures 1,2,11 -----	1-5,7,8, 14-17
X	US 5 318 208 A (VAN DER WAL JURJEN [US]) 7 June 1994 (1994-06-07) figures 5,6 -----	1-5,7,8, 14-17
X	US 3 368 717 A (WEBER III ROBERT L) 13 February 1968 (1968-02-13) figures 1,2,8 -----	1-5,7,8, 14-17
X	US 2 991 912 A (THOMAS ANTHONY J ET AL) 11 July 1961 (1961-07-11) figures 1,5 -----	1-5,7,8, 14-17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2007/001907

Box 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.: 18, 19
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:
see FURTHER INFORMATION sheet PCT/ISA/210

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box 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.
- No protest accompanied the payment of additional search fees.

Continuation of Box II.2

Claims Nos.: 18,19

Rule 6.2 PCT The large number of technical features disclosed in the drawings makes impossible a meaningful search in respect of claims 18 and 19.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2007/001907

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2454810	A	21-11-1980	NONE	
JP 9183470	A	15-07-1997	NONE	
CH 514362	A	31-10-1971	NONE	
DE 1283065	B	20-02-1969	NONE	
US 6293442	B1	25-09-2001	NONE	
US 5318208	A	07-06-1994	NONE	
US 3368717	A	13-02-1968	NONE	
US 2991912	A	11-07-1961	NONE	