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(51) INT CL:
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B65D 83/16 (2006.01) **B65D 83/26** (2006.01)

(56) Documents Cited:
GB 2436284 A **GB 2421897 A**
GB 2418857 A **EP 1164235 A2**
WO 2003/050366 A1 **BE 001015999 A3**
DE 010014472 A1 **FR 002824096 A1**
US 20100051641 A1 **US 20060245818 A1**

(58) Field of Search:
 INT CL **A61L, B65D, E05F**
 Other: **Online: EPODOC, WPI**

(54) Title of the Invention: **Door handle**
 Abstract Title: **Door handle comprising a liquid/gel dispenser**

(57) A door handle is disclosed, the door handle being adapted to apply liquid or gel (liquid/gel) to a user's hand. The handle 1 comprises a handle grip 2 and a liquid/gel reservoir 6 associated with the handle. A liquid/gel displacement device is arranged in the grip and a non-return valve is provided to allow liquid/gel to flow from the reservoir to the displacement device. A hollow trigger 8 is displaceably mounted on the grip and adapted to actuate the displacement device when the handle is gripped for displacement of liquid/gel from the device, into the trigger and thence on to a hand or its digits gripping the trigger.

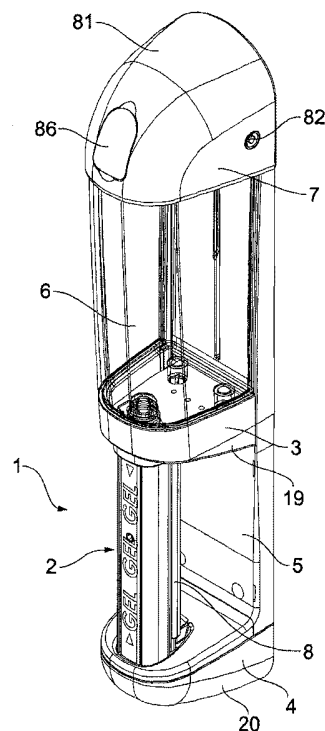


FIG. 1

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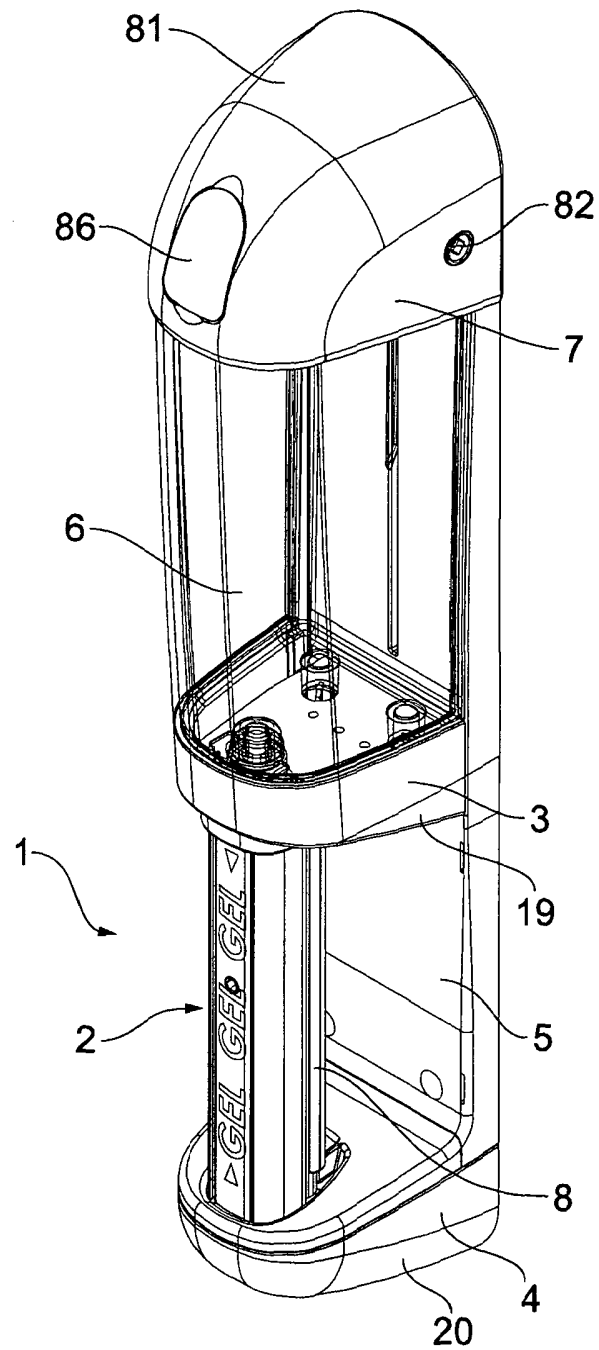


FIG. 1

2/14

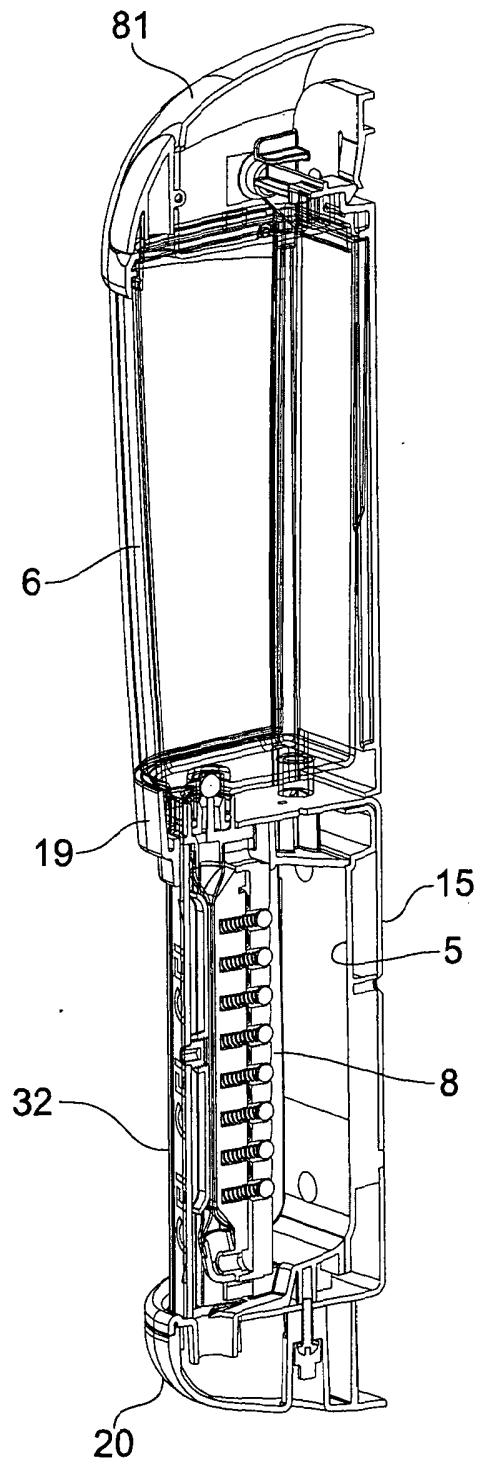


FIG. 2

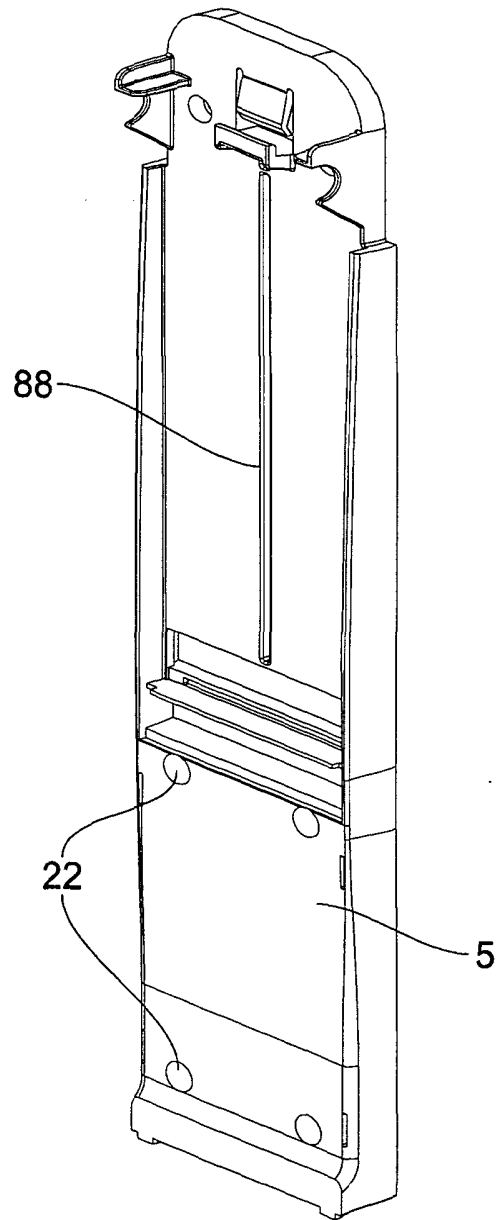


FIG. 3

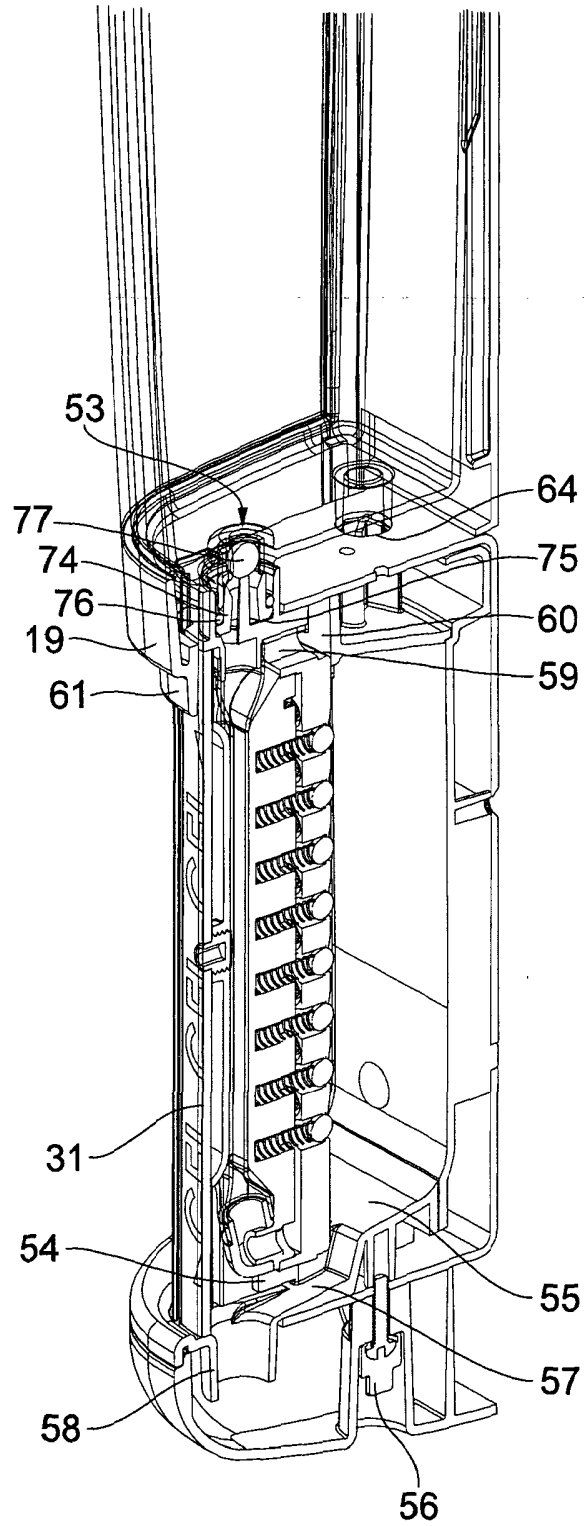
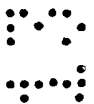


FIG. 4



5/14

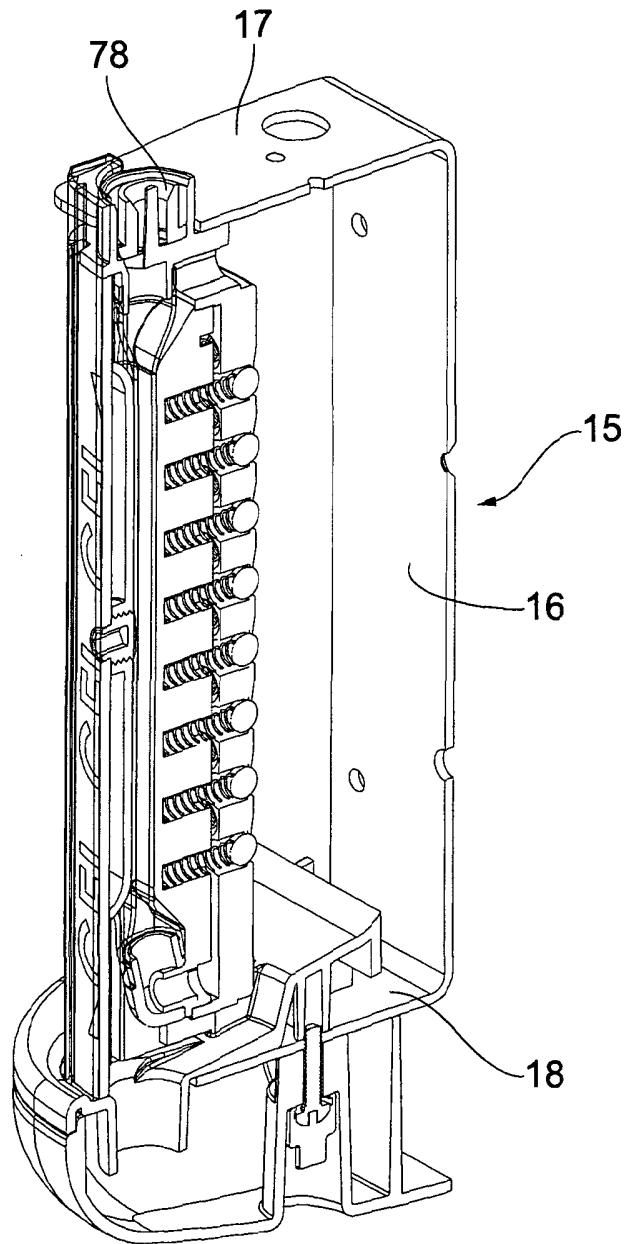
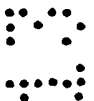


FIG. 5



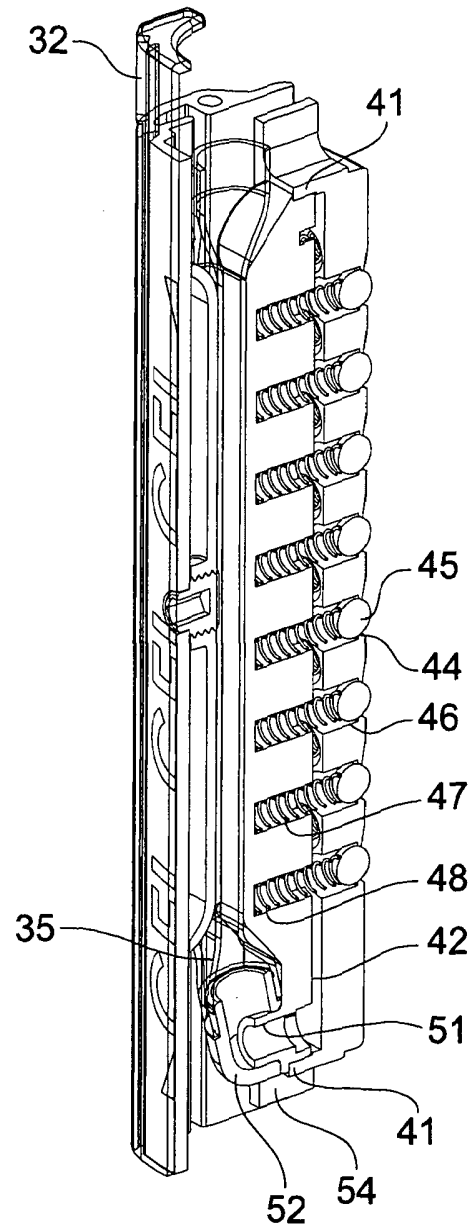


FIG. 6

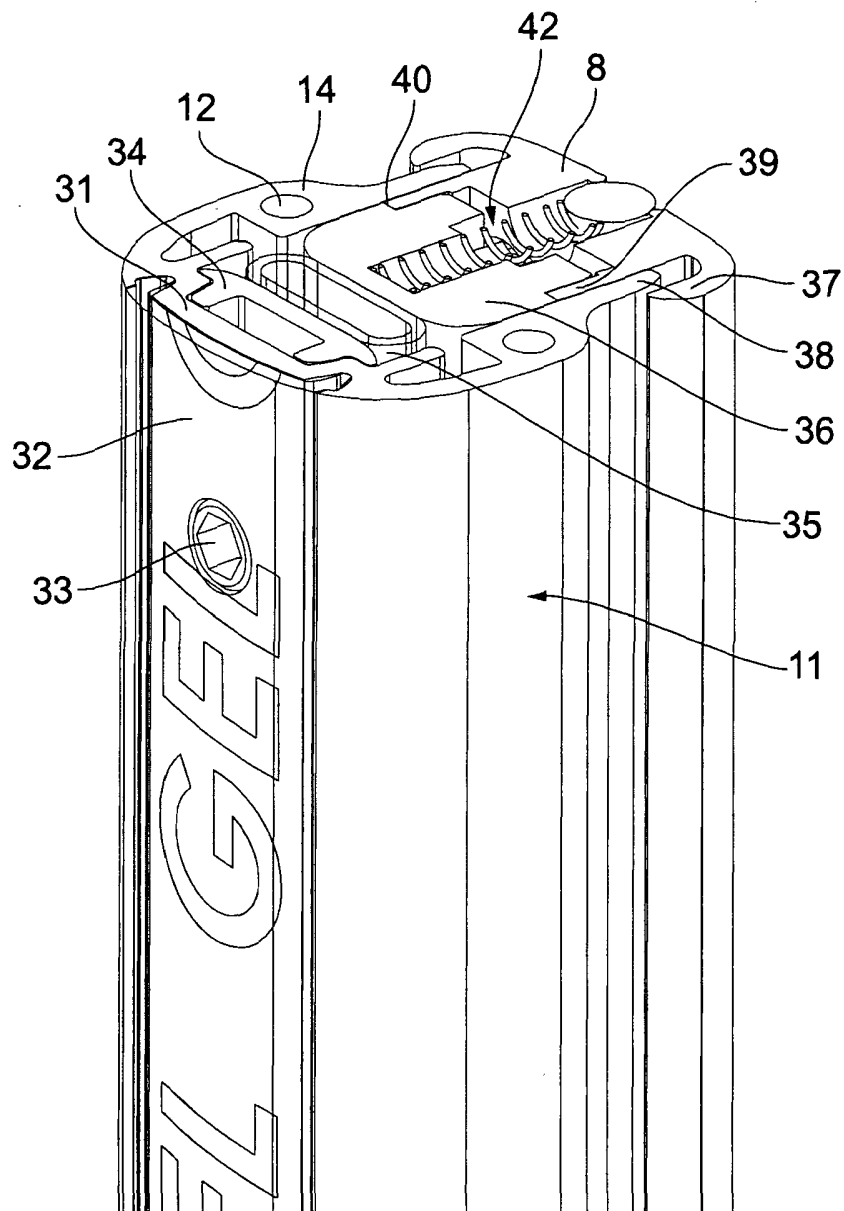


FIG. 7

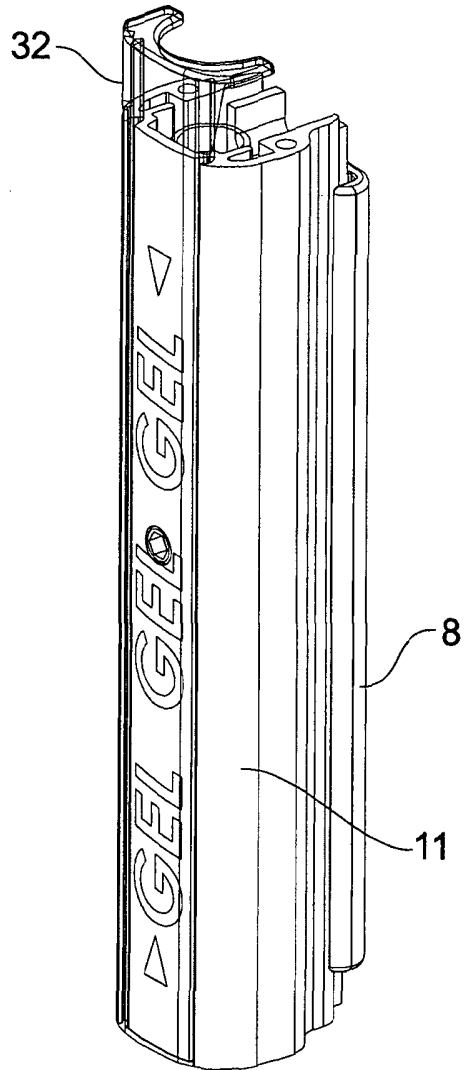


FIG. 8



9/14

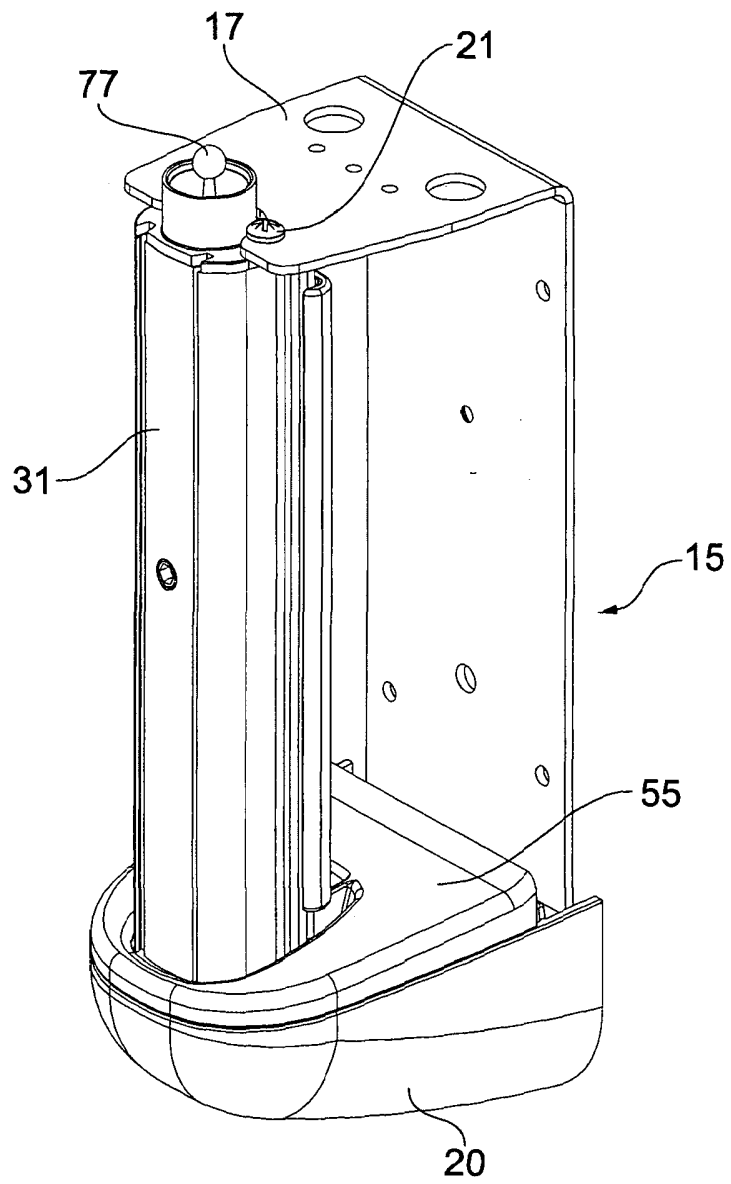
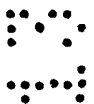


FIG. 9



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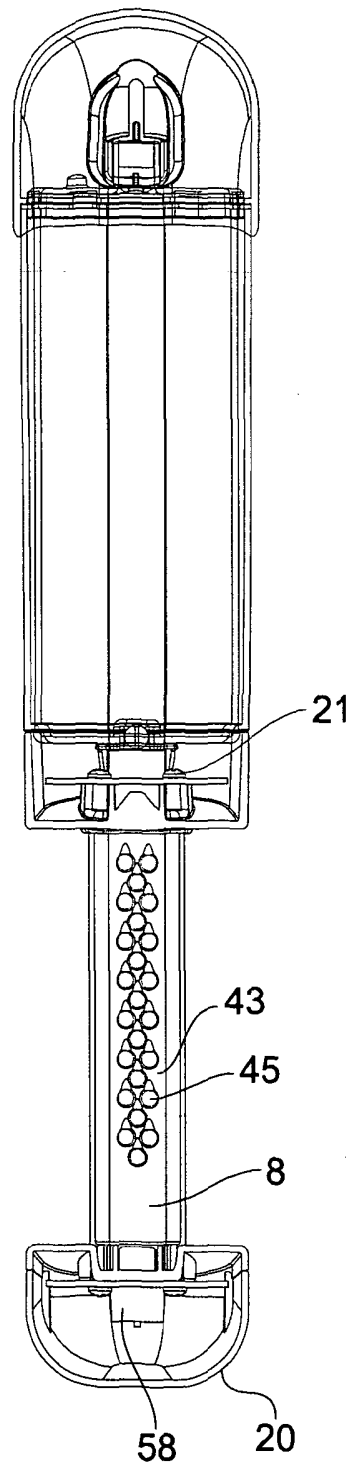


FIG. 10

11/14

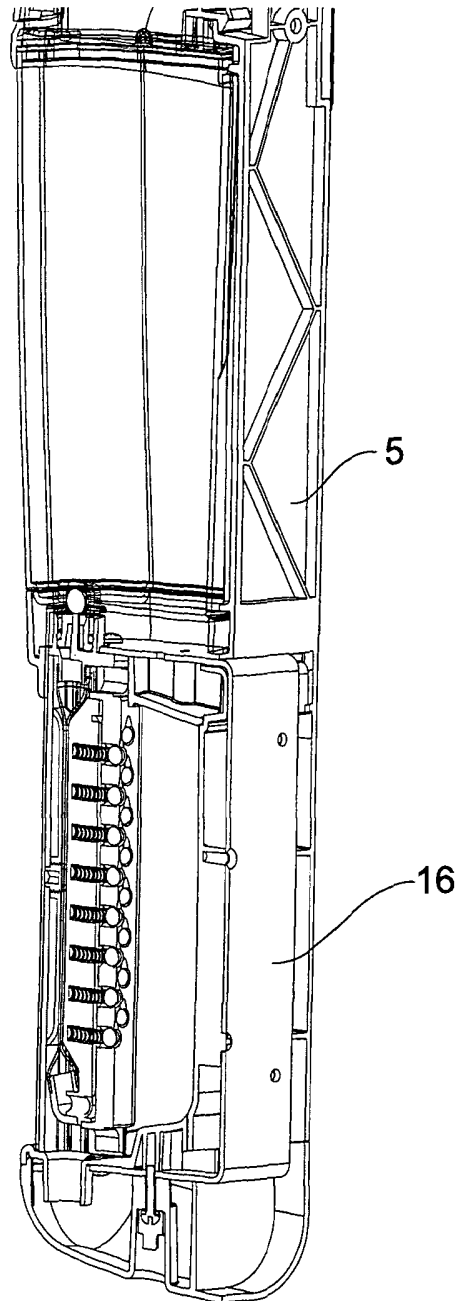


FIG. 11

12/14

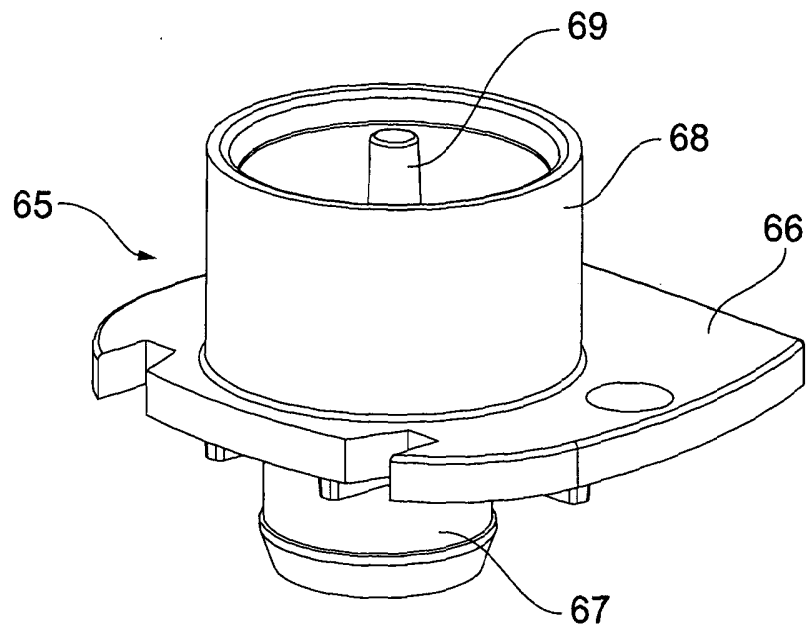


FIG. 12

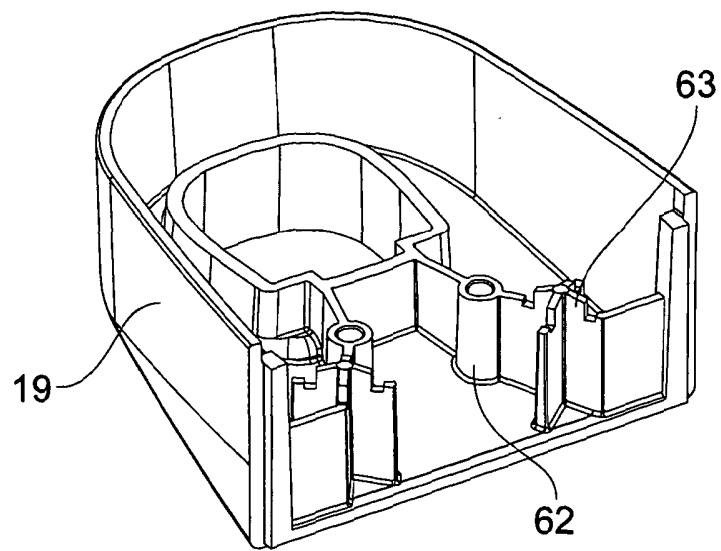


FIG. 13

13/14

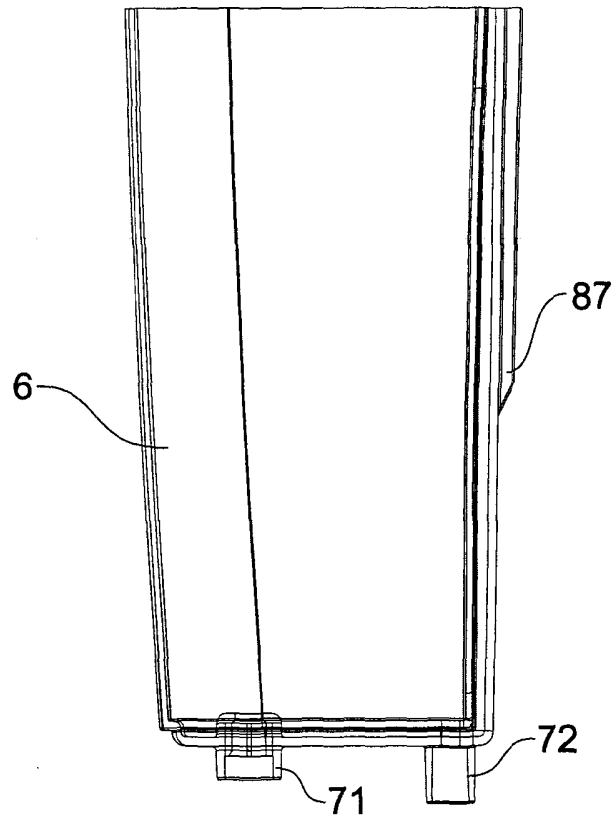


FIG. 14

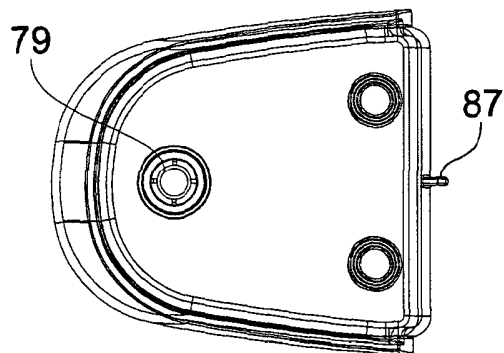


FIG. 15



14/14

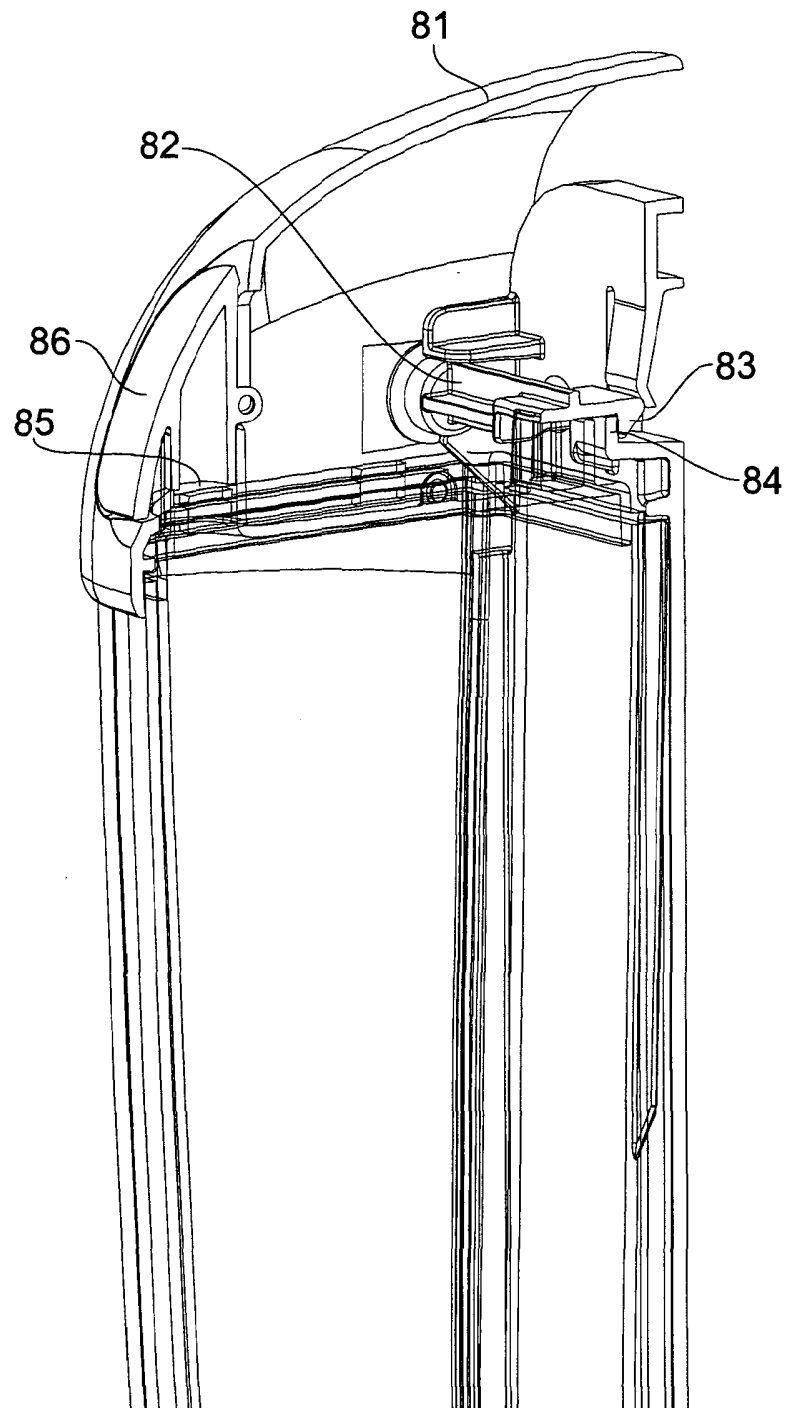


FIG. 16

DOOR HANDLE

The present invention relates to a door handle adapted to apply liquid or gel to a user's hand.

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Application of disinfectant gel to users' hands is recognised to improve cleanliness and control spread of infection, particularly in public buildings such as schools and hospitals.

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The object of the present invention is to provide an improved disinfectant liquid or gel applying door handle.

According to the invention there is provided a door handle adapted to apply liquid or gel (liquid/gel) to a user's hand, the handle comprising:

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- a handle grip,
- a liquid/gel reservoir associated with the handle,
- a liquid/gel displacement device in the grip,
- a non-return valve allowing liquid/gel flow from the reservoir to the displacement device,
- a hollow trigger displaceably mounted on the grip and adapted to actuate the displacement device when the handle is gripped for displacement of liquid/gel from the device, into the trigger and thence on to a hand or its digits gripping the trigger.

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25

Although reservoir could be arranged in use below the displacement device, with the liquid/gel being sucked up from it, normally the use position of the reservoir will be above the grip with gravity assisting or causing the liquid/gel to flow down and.

30

Whilst it is envisaged that the displacement device could be a piston and cylinder device, or a diaphragm and chamber device, which devices would normally be expected to require a return spring for the cylinder or chamber and the trigger, preferably, the displacement device is a resilient device of elastomeric material

adapted to return from its shape after displacement of liquid or gel to its original shape for replenishing the displacement device.

In accordance with a particular feature, the trigger is provided with a plurality
 5 of liquid/gel outlets which are normally closed and are individually opened by digital pressure on them, whereby the liquid or gel is expelled selectively where the digits act against the trigger.

In the prototype, individual balls are provided to close individual outlets, with
 10 each ball being urged into its outlet by a respective spring. The springs can be coil springs or leaf springs in the form of tabs bent from a single strip. For production, it is envisaged that the balls can be replaced by closure members integrally moulded to resilient fingers, which urge their closure members into the outlets.

15 To help understanding of the invention, a specific embodiment thereof will now be described by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a door handle in accordance with the invention;

20 Figure 2 is a similar perspective view of the door handle of Figure 1, sectioned on a central vertical plane;

Figure 3 is a perspective view of a door plate of the door handle;

Figure 4 is a view similar to Figure 2 on a larger scale;

25 Figure 5 is a view similar to Figure 4 with many components removed to show a metal pressing supporting a grip of the handle;

Figure 6 is a similar view of the grip only;

Figure 7 is a horizontal section through the grip;

Figure 8 is a non-sectioned view similar to Figure 6;

Figure 9 is a non-sectioned view similar to Figure 5;

30 Figure 10 is a sectional view from the direction of the door on a plane parallel with the door;

Figure 11 is a sectional view on the plane of Figure 2 in perspective from the door;

Figure 12 is a perspective view of a reservoir to displacement vessel adapter;

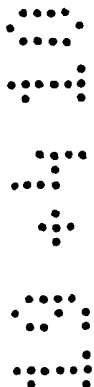


Figure 13 is a perspective view of an upper moulding for locating the trigger;

Figure 14 is a side view of a reservoir of the handle;

Figure 15 is a plan view of the reservoir;

Figure 16 is a sectional perspective view showing the top of the reservoir.

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Referring first to Figure 1 of the drawings, a door handle 1 has a grip 2 connected via two brackets 3,4 to a door plate 5 fast in use with a door (not shown). Above the grip is arranged a disinfectant gel reservoir 6. The door plate 5 extends up to a further bracket 7. A trigger 8 on the door side of the grip is displaceable towards the grip to dispense disinfectant gel from reservoir onto digits of a hand pulling on the grip.

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This description will describe in sequence:

- the structural arrangement of the grip;
- the gel displacement arrangements; and then
- the ancillary details.

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There are numerous Figures in the drawings, which are CAD drawings, with views chosen to illustrate particular features. It is suggested that if a feature cannot be found quickly in one Figure, the others should be referred to.

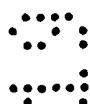
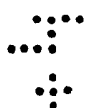
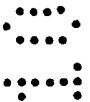
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The grip 2 is based on an extrusion 11, having two bores 12 in its sidewalls 14. It is fixed to the door via a sheet metal pressing 15, having a central web 16 against the door in use and upper and lower flanges 17,18 within plastics material mouldings 19,20. The latter give the impression of being brackets 3,4, although they are in reality covers. Screws 21 passing through the flanges engage in the bores 12 for fastening the extrusion 11 to the pressing.

25

The door plate 5 is a single moulding extending the height of the handle and having apertures 22 aligned with apertures in the web of the pressing for screws (not shown) to fix the handle to the door. The screws fasten the pressing 15, by acting via the door plate.

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The extrusion 11 has a front wall 31, albeit covered with a decorative strip 32. Within the front wall, and adjustably positioned by a grub screw 33, is a static pressure plate 34 for a tubular resilient vessel 35. On the other side of the vessel, there is arranged a moving pressure plate 36, against which the trigger 8 bears. The trigger has lips 37 which pass around the outside of lips 38 of the extrusion 11, thus locating the trigger laterally whilst allowing it to be moved towards the extrusion. Internally of the extrusion, the trigger bears at longitudinal strips 39 against steps 40 on the moving pressure plate. These two parts are adhered and sealed together at the strips/steps, with the strips being interconnected top and bottom by fillets 41 between the strips 39 fitting and sealed to complementary formations on the moving pressure plate. Arrangements for locating the trigger at its ends will be described below.

Internally and along their length, the trigger and the moving pressure plate define a void 42. In its face 43 facing the door plate 5, the trigger plate has an array of apertures 44, each normally closed by a ball 45, the balls being held into seats 46 internally of the apertures by springs 47 bearing against the bottoms of blind sockets 48 in the pressure plate.

Towards the bottom of the pressure plate, it is provided with a hollow boss 51 which communicates with the void 42. It carries a bend 52, which is engaged in the lower end of the tubular vessel 35. Bearing in mind that the upper end of the vessel has a non-return valve 53 to be described in more detail below, it will be appreciated that:

- when the vessel is full of disinfectant gel which has flowed on through the bend 52 and up into the void 42 and

- when the trigger is pulled towards the extrusion 11 of the grip 2,

the moving pressure plate squeezes the vessel against the static pressure plate 34, displacing gel. This flows into the void 42 and out at ones of the balls that were urged in against their springs by manual pulling on the handle. Thus disinfecting gel is displaced onto the hand.

The lower end of the trigger and moving pressure plate assembly 36/8 has tangs 54 which engage in a secondary lower moulding 55 on the top side of the lower

flange 18, whereas the moulding 20 covers the underside of the flange. These two mouldings are held to the flange by a screw 56. The moulding 55 has a recess 57 in which the tangs engage, restricting the assembly 36/8 from moving freely backwards out of engagement with the extrusion 11. Below the bend 52, the moulding 55 has a drain 58 for allowing any excess gel to run down into the bottom moulding 20, which is dish-shaped to collect it. Periodically, on filling of the reservoir, the screw and the bottom moulding can be removed for cleaning out of any such collected gel.

The upper cover moulding 19 is fitted below the upper flange 17 and restricts the upper end of the assembly 36/8 in similar manner, by engagement of tangs 59 in a recess 60. The top end of the decorative strip 32 engages a lower rim 61 of the cover moulding, with the rim passing on round the extrusion 11 to contain the tangs. Behind the recess 59, the moulding has two bosses 62 into which screws (not shown) pass down through the upper flange 17 to secure the moulding. Also two cruciform spigots 63 of the moulding engage in apertures 64 in the upper flange.

The upper end of the extrusion 11 has an adapter moulding 65 engaged in it. It is captivated by the upper screws 21 passing through it via a lip 66 that engages underneath the flange 17. On its underside, the adapter carries a hollow boss 67 onto which the top end of the resilient vessel 35 fits. On its top side and passing through the flange 17, the adapter has another hollow boss 68, with a central spigot 69.

The reservoir has a smaller depending open boss 71, with two further closed bosses 72, which engage the cruciform spigots 63 extending through the flange 17. With an interference fit, the open boss receives an insert 74, with an out-turned lip 75. This captivates an O-ring 76. The latter seals the boss 71 in the boss 68. The insert also loosely captivates a non-return valve ball 77, at a tapered seat 78. When the reservoir is not fitted to the handle, the ball engages the seat 78 and closes the boss 71 against out flow of gel. When the reservoir is fitted, the spigot 69 lifts the ball off the seat 78. The boss 71 has a complementary, oppositely facing seat 79, against which the ball is lifted to act in a non-return valve manner against return flow on gripping of the handle and movement of the trigger into the extrusion 11. Thus the gel in the vessel 35 is displaced out at the trigger. When the trigger is released, the vessel

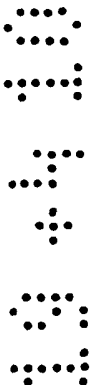


recovers its shape. The balls 45 seal the trigger against ingress of air under action of their springs and the vessel is refilled.

It will be appreciated that the balls are arranged against their seats in a manner such as to prevent egress of gel except when they are pressed in. They are not arranged as non-return valves complementary the non-return valve 53 such that, if the trigger were pressed in without pressure on any of the balls, gel would flow at all the balls.

A top moulding 81, which appears to be a bracket in the same way that mouldings 19,20 appear to be brackets 3,4, is provided to captivate the reservoir in its use position. It has a rotary latch 82. This and the top end of the door plate have complementary formations 83,84 for locking the top moulding in position. The moulding has a filler port 85 and a bung 86 for topping up of the reservoir with gel without its removal from the handle.

A final detail is that the reservoir has rear rib 87, which engages in a slot 88 in the door plate for lateral location of the reservoir.



CLAIMS

1. A door handle adapted to apply liquid or gel (liquid/gel) to a user's hand, the handle comprising:

- a handle grip,
- a liquid/gel reservoir associated with the handle,
- a liquid/gel displacement device in the grip,
- a non-return valve allowing liquid/gel flow from the reservoir to the displacement device,
- a hollow trigger displaceably mounted on the grip and adapted to actuate the displacement device when the handle is gripped for displacement of liquid/gel from the device, into the trigger and thence on to a hand or its digits gripping the trigger.

2. The door handle of claim 1, wherein the reservoir is arranged in use below the displacement device, with the liquid/gel being sucked up from it.

3. The door handle of claim 1, wherein the use position of the reservoir is above the grip with gravity assisting or causing the liquid/gel to flow down.

4. The door handle of claim 1, 2 or 3, wherein the displacement device is a piston and cylinder device.

5. The door handle of claim 1, 2 or 3, wherein the displacement device is a diaphragm and chamber device

6. The door handle of claim 4 or 5, wherein the displacement device has a return spring for the cylinder or chamber and the trigger.

7. The door handle of any preceding claim, wherein the displacement device is a resilient device of elastomeric material adapted to return from its shape after displacement of liquid or gel to its original shape for replenishing the displacement device.

8. The door handle of any preceding claim, wherein the trigger is provided with a plurality of liquid/gel outlets which are normally closed and are individually opened by digital pressure on them, whereby the liquid or gel is expelled selectively where the digits act against the trigger.

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9. The door handle of claim 8, wherein individual balls are provided to close individual outlets, with each ball being urged into its outlet by a respective spring.

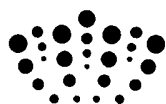
10. The door handle of claim 9, wherein the springs are coil springs or leaf springs in the form of tabs bent from a single trip.

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11. The door handle of claim 8, wherein closure members are provided to close individual outlets, the closure members being integrally moulded to resilient fingers, which urge their closure members into the outlets.

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Application No: GB1006366.7

Examiner: Mr Alastair Kelly

Claims searched: 1-11

Date of search: 30 July 2010

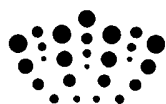
Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A	-	GB2436284 A (GERMBLOCK) See abstract and figures
A	-	GB2421897 A (HOOD) See abstract and figures
A	-	GB2418857 A (WYERS) See abstract and figures
A	-	EP1164235 A2 (RENTOKIL) See abstract and figures
A	-	WO03/050366 A1 (RENTOKIL) See abstract and figures
A	-	US2010/051641 A1 (SASSOON) See abstract and figures
A	-	US2006/245818 A1 (STROPKAY) See abstract and figures
A	-	BE1015999 A3 (NOUSOM) See figures and note EPODOC & WPI abstracts attached
A	-	FR2824096 A1 (SCHLEE) See figures and note EPODOC & WPI abstracts attached
A	-	DE10014472 A1 (THOLFUS) See figures and note EPODOC & WPI abstracts attached

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Y	Document indicating lack of inventive step if combined with one or more other documents of	P	Document published on or after the declared priority date but before the filing date of this invention.



same category.	
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

Worldwide search of patent documents classified in the following areas of the IPC

A61L; B65D; E05F

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI

International Classification:

Subclass	Subgroup	Valid From
E05B	0001/00	01/01/2006
A61L	0002/18	01/01/2006
B65D	0083/16	01/01/2006