



Europäisches Patentamt
European Patent Office
Office européen des brevets



Publication number:

0 416 179 A1

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 89309065.4

(51) Int. Cl.⁵: **B65D 50/10, B65D 47/36**

(22) Date of filing: 07.09.89

(43) Date of publication of application:
13.03.91 Bulletin 91/11

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

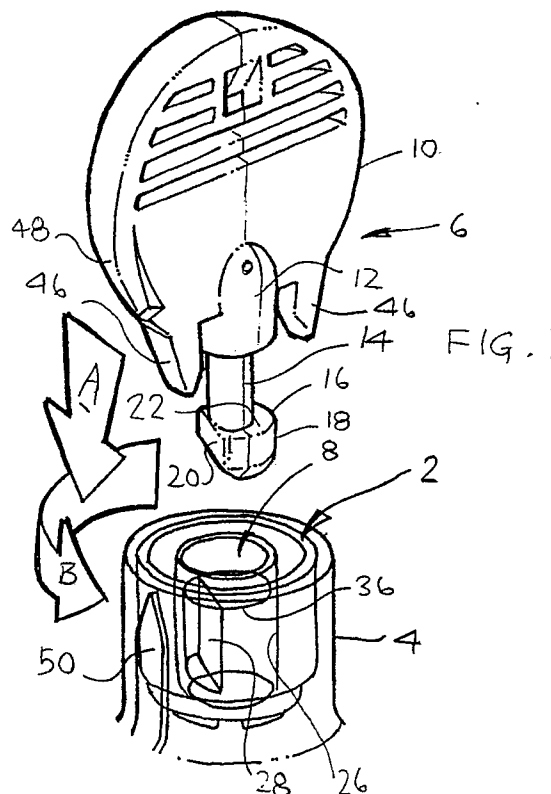
(71) Applicant: **NOMIX MANUFACTURING
COMPANY LIMITED**
Portland Building Portland Street
Staple Hill Bristol BS16 4PS(GB)

(72) Inventor: **Ali, Eren**
51 Alma Road
Clifton, Bristol(GB)

(74) Representative: **Cheyne, John Robert**
Alexander Mackenzie et al
HASELTINE LAKE & CO. Hazlitt House 28,
Southampton Buildings Chancery Lane
London WC2A 1AT(GB)

(54) **A closeable outlet fitting.**

(57) A closeable outlet fitting, for example for use with containers of hazardous materials, comprises a socket 2 and a plug 6. An outlet passage 8 of the socket 2 has a first region 24 of non-circular cross-section, through which a boss 16 on the plug 6 can pass only when in an aligned orientation. After insertion, rotation of the plug brings part of the boss 16 beneath a shoulder 34, so that withdrawal of the plug 6 is prevented. Resistance of the plug 6 to turning, and difficulty of bringing it precisely to the aligned orientation, makes the plug difficult to remove from the socket for young children.



EP 0 416 179 A1

A CLOSEABLE OUTLET FITTING

This invention relates to a closeable outlet fitting, and is particularly, although not exclusively, concerned with such a fitting which is suitable for use with containers, such as containers for liquid herbicide, having outlets which are initially closed by a partition which must be pierced before first use.

If the contents of such a container are only partially used, the problem arises of storing the container, and the remaining contents, in a safe manner. In particular, it is important for the container to be closed by a child-resistant closure if the contents are hazardous.

According to the present invention there is provided a closeable outlet fitting for a container, the fitting comprising a socket, having an outlet passage, and a plug for sealing engagement with the outlet passage, the plug comprising a stem carrying a boss of non-circular cross-section, and the passage having a first region, with a cross-section complementary to that of the boss, and a second region within which the boss is rotatable, the second region being disposed inwardly of the first region with respect to the direction of insertion of the plug into the outlet passage, there being a shoulder at the transition between the first and second regions, which shoulder faces in the direction of insertion of the plug into the outlet passage, whereby the plug is insertable into and withdrawable from the outlet passage in an aligned orientation of the boss and the first region, rotation of the plug relative to the socket from that aligned orientation causing a part of the boss to engage the shoulder to prevent withdrawal of the plug.

In a preferred embodiment of the outlet fitting, there is only one orientation of the plug relative to the socket in which the boss is aligned with the first region of the outlet passage. The dexterity required to turn the plug in the socket to the correct orientation, and then to withdraw the plug, will be beyond the capabilities of young children, particularly if the plug fits in the socket in a manner which provides some resistance to turning, for example by virtue of the friction between the plug and the socket. Such resistance to turning may, for example, be provided by engagement between a cylindrical portion of the plug, provided at the end of the stem away from the boss, and a complementary cylindrical recess at the outer end of the passage.

In a preferred embodiment, the cross-section of the boss and the first region of the outlet passage has only one axis of symmetry. This cross-section may, for example, be in the shape of a major sector of a circle. The second region of the

passage may be circular, its wall being coextensive with the arcuate part of the first region.

The plug may be provided with lugs, extending on opposite sides of the stem, for engagement with the outer surface of the wall defining the passage, these lugs providing further resistance to turning of the plug in the socket.

A closeable outlet fitting in accordance with the present invention is particularly suitable where, before first use of the container, the outlet passage is closed by a partition which must be pierced before the contents of a container can be discharged. It is possible for the hole formed in the partition when it is pierced to constitute the first region of the outlet passage. However, in a preferred embodiment, the first region of the outlet passage includes a flat surface, against which the partition, when pierced, can lie as the plug is inserted.

The plug preferably includes a grip portion which can be grasped between thumb and forefinger in order to manipulate the plug as it is inserted into or withdrawn from the socket. The plug may be provided, possibly on an edge of the grip portion, with some form of indicator, for example an arrow, which must be aligned with a similar indicator on the outer face of the socket when the plug is to be inserted into or withdrawn from the socket.

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

Figure 1 shows, diagrammatically, a closeable outlet fitting comprising a socket and a plug;

Figure 2 shows the plug being inserted into the socket;

Figure 3 shows the plug engaged in the socket in an unlatched configuration; and

Figure 4 shows the plug engaged in the socket in a latched condition.

The closeable outlet fitting shown in the drawings is intended for use with containers of toxic or otherwise hazardous liquids, such as herbicide. The fitting comprises a socket 2 which, for use, would be fitted in a liquid-tight manner in the neck 4 of a container of the herbicide. The outlet fitting also includes a plug 6 which is engageable with the socket 2 to close an outlet passage 8.

The plug 6 comprises a grip portion 10 having a cylindrical projection 12 from which extends a stem 14 having at its free end a boss 16. As shown in Figure 1, the boss 16 has a non-circular cross-section which, in the specific embodiments shown, is in the shape of a major sector of a circle. Thus, the outer periphery of the boss 16 has an arcuate

portion 18, extending over an angle of more than 180°, and a flat face 20. The lower edge of the arcuate portion 18 is chamfered. The upper surface 22 of the boss 16 extends transversely of the stem 14.

The outlet passage 8 has three regions. The first region 24 has a cross-section which is complementary to that of the boss 16. In other words, the first region 24 of the outlet passage 8 has a cross-section which is the shape of the major sector of a circle, and has an arcuate portion 26 and a flat portion 28.

The second region 30 of the outlet passage 8 has a circular cross-section with the same diameter as that of the arcuate portion of 26 of the first region 24. The third region 32 of the outlet passage 8 is also circular, and also has the same diameter as the arcuate portion 26 of the first region 24. Thus, the second and third regions 30 and 32, and the arcuate portion 26 of the first region 24, are coaxial and coextensive.

At the transition between the first region 24 and the second region 30, there is a shoulder 34 extending between the flat surface 28 and the wall of the region 30. This shoulder 34 faces in the direction of insertion of the plug 6 into the socket 2, that is, inwardly of the container to which the socket 2 is fitted.

Before the first use of the container to dispense its contents, the outlet passage 8 is closed, in the first region 24, by a partition 36. Before the container is used, this partition must be broken and, in a preferred embodiment, it is broken by the sharp edge of an obliquely formed spigot on equipment to which the container is fitted. By way of example, the container may be used with herbicide delivery equipment as disclosed in EP-0300762. When piercing the partition 36, the container is preferably oriented with the obliquely cut spigot so that the partition 36 is cut only along the arcuate portion 26, leaving it hinged to the flat portion 28, as shown in Figure 2. In order to accomplish this, it is necessary for the socket 2 to be fitted to the container in a predetermined orientation, and this may be achieved, for example, by providing a cooperating axially extending slot and groove on the outer surface of the socket 2 and the inner surface of the neck 4 of the container, respectively.

The outlet passage 8 is bounded by an inner wall 38 of the socket 2, and the socket 2 also has an outer skirt 40. An annular space 42 is left between the inner wall 38 and the outer skirt 40. This space 42 has a flared portion 44 at its outer end.

The grip portion 10 of the plug 6 has a pair of lugs 46 which extend generally parallel to the stem 14 on opposite sides of the projection 12. One edge of the grip portion 10 is provided with an

indicator in the form of an arrow head 48, and a corresponding arrow head 50 is provided on the outer surface of the neck 4 of the container.

Assuming that the partition 36 has been pierced, the plug 6 is inserted into the socket 2 by aligning the arrows 48 and 50, as shown in Figure 1, and inserting the plug in the direction of the arrow A. When the arrows 48 and 50 are aligned, the boss 16 is aligned with the first region 24 of the outlet passage 8, and so it can pass through this passage into the second region 30. In the course of this passage, the partition 36 is hinged against the surface 28, as shown in Figures 2 and 3.

When the plug 6 is fully inserted, as shown in Figure 3, it is turned away from the position in which the arrows 48 and 50 are aligned, for example in the direction of the arrow B. Figure 4 shows the plug 6 turned through 180° from the position shown in Figure 3, and it will be appreciated that part of the boss 16 extends beneath the shoulder 34, so that the surfaces 22 and 34 are in abutment. This prevents the plug 6 from being withdrawn from the socket 2. Of course, withdrawal will also be prevented in other orientations of the plug 6 and the socket 2, except for the position in which the arrows 48 and 50 are aligned.

In the inserted position, as shown in Figure 4, the projection 12 is a close fit within the third region 32 of the outlet passage 8 so providing a liquid-tight seal, preventing leakage of the contents of the container. This seal provides some resistance to turning of the plug 6 in the socket 2, and further resistance to turning is provided by the lugs 46 engaging in the flared region 44 of the gap 42. Yet further resistance to turning is provided by the resilient action of the partition 36 against the stem 14.

To withdraw the plug 6 it is necessary to rotate it until the arrows 48 and 50 are precisely aligned, and then to pull it out by means of the grip portion 10. This operation is difficult for a young child to perform, since it is necessary to rotate the plug 6 to the precise position against some resistance, and then to grip the grip portion 10 firmly between thumb and forefinger to withdraw the plug 6. Consequently, the fitting provides a measure of protection against the exposure of young children to possibly harmful materials within the container.

As shown in Figure 1, the plug may be provided with a hole 52. The purpose of the hole 52 is to provide a means of fitting the plug to the container when the container is in use to dispense its contents. Thus, for example, the container may be provided with a projecting pin on a suitable part of its outer surface, which is a frictional fit in the hole 52.

Although the non-circular shape of the first region 24 of the outlet passage 8 is provided by

the provision of the flat surface 28, other non-circular shapes could be used. Also, it is possible for the pierced partition 36 to be used to provide the non-circular configuration, with the boss 60 then engaging beneath the free edge of the partition 36 when the plug 6 is turned into the latched condition.

Claims

1. A closeable outlet fitting for a container, the fitting comprising a socket, having an outlet passage, and a plug for sealing engagement with the outlet passage, the plug comprising a stem carrying a boss of non-circular cross-section, and the passage having a first region, with a cross-section complementary to that of the boss, and a second region within which the boss is rotatable, the second region being disposed inwardly of the first region with respect to the direction of insertion of the plug into the outlet passage, there being a shoulder at the transition between the first and second regions, which shoulder faces in the direction of insertion of the plug into the outlet passage, whereby the plug is insertable into and withdrawable from the outlet passage in an aligned orientation of the boss and the first region, rotation of the plug relative to the socket from that aligned orientation causing a part of the boss to engage the shoulder to prevent withdrawal of the plug.

2. A closeable outlet fitting as claimed in claim 1, in which the cross-sections of the boss and the first region each have only one axis of symmetry.

3. A closeable outlet fitting as claimed in claim 2, in which the cross-sections of the boss and the first region each have the shape of the major sector of a circle.

4. A closeable outlet fitting as claimed in any one of the preceding claims, in which the second region has a circular cross-section.

5. A closeable outlet fitting as claimed in claim 4, in which the first region of the outlet passage has an arcuate wall portion which is coextensive with the wall of the second region. 6. A closeable outlet fitting as claimed in any one of the preceding claims, in which the outlet passage has a third region, in the form of a recess of circular cross-section, which cooperates with a projection on the plug to provide a liquid-tight seal preventing flow through the outlet passage.

7. A closeable outlet fitting as claimed in claim 6, in which the plug includes a lug which engages the outer surface of a wall defining the recess, when the plug is inserted into the socket.

8. A closeable outlet fitting as claimed in any one of the preceding claims, in which the plug and the socket are provided with respective indicating

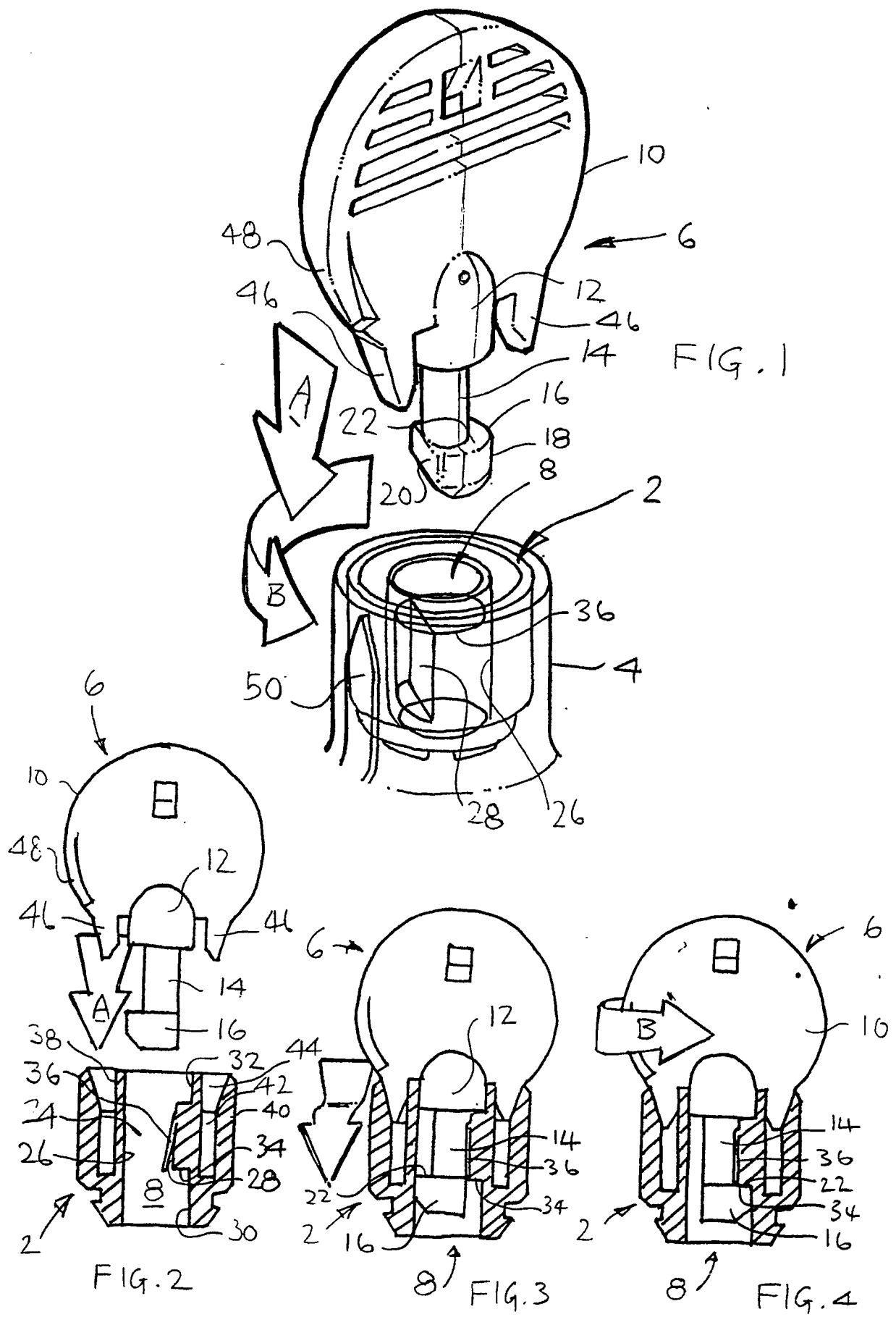
means for assisting in positioning the plug and the socket in the aligned orientation.

9. A closeable outlet fitting as claimed in any one of the preceding claims, in which a breakable partition is provided in the first region of the outlet passage.

10. A closeable outlet fitting as claimed in any one of the preceding claims, in which the plug is provided with a grip portion engageable between the thumb and forefinger of a user, the grip portion being flat and extending parallel to the direction of insertion of the plug into the socket.

11. A closeable outlet fitting substantially as described herein with reference to, and as shown in, the accompanying drawings.

12. A container provided with a closeable outlet fitting in accordance with any one of the preceding claims.





European Patent
Office

PARTIAL EUROPEAN SEARCH REPORT
which under Rule 45 of the European Patent Convention
shall be considered, for the purposes of subsequent
proceedings, as the European search report

Application number
EP 89 30 9065

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	GB-A-2 145 698 (ROYMERE LTD.) * Page 1, line 123 - page 2, line 64; figures 1-5,8-12 *	1,2,4, 6,8,12	B 65 D 50/10 B 65 D 47/36
Y, A	--	5	
X	US-A-4 506 794 (WILSON) * Column 3, lines 23-58; figures 1,2,4,6,11 *	1-6,8	
	--		
X	FR-A- 372 685 (JAHNKE) * Page 1, lines 17-28; figures 1-3 *	1,4-6	
A	--	10	
Y	US-A-3 896 958 (ROBBINS) * Column 2, lines 16-47; column 2, line 56 - column 3, line 2; column 3, line 2; column 3, lines 24-45; figures 1-4 *	12	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			B 65 D B 67 B
INCOMPLETE SEARCH			
The Search Division considers that the present European patent application does not comply with the provisions of the European Patent Convention to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of some of the claims. Claims searched completely: Claims searched incompletely: Claims not searched: 11 Reason for the limitation of the search: Rule 29(6) EPC.			
Place of search THE HAGUE		Date of completion of the search 09-04-1990	Examiner BERRINGTON
CATEGORY OF CITED DOCUMENTS		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	
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			



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	---	1	
Y	GB-A-1 287 610 (W. FREEMAN & CO.) * Page 1, lines 43-57; figures 1-3 *	10	
A	EP-A-0 026 055 (DIEMOULDERS PTY LTD.) * Page 6, lines 18-31; page 7, lines 12-30; figures 7,8 *	9	
	----		TECHNICAL FIELDS SEARCHED (Int. Cl. 4)