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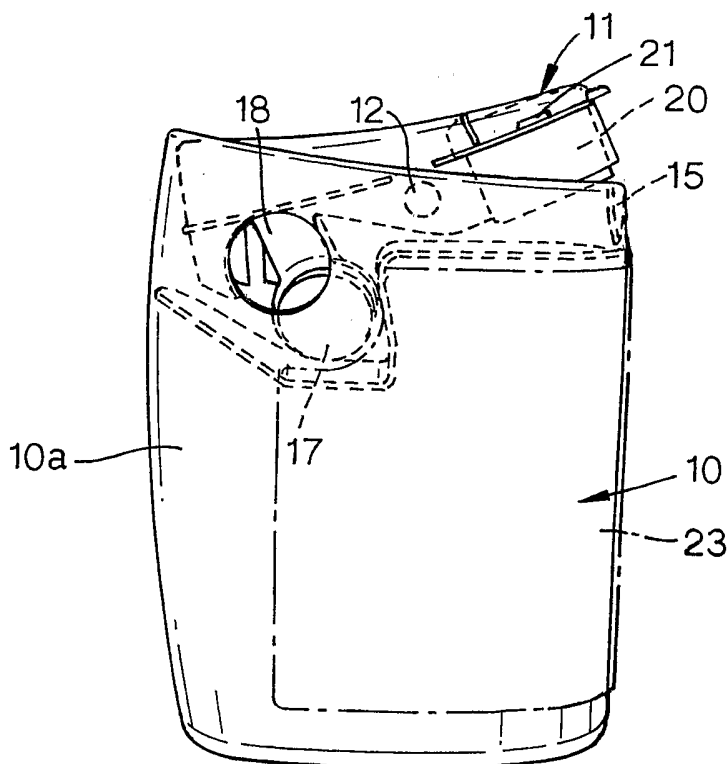
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[Continued on next page]

(54) Title: A CONTAINER FOR PILLS AND A METHOD OF FORMING SUCH A CONTAINER



(57) Abstract: A container for pills and the like, and comprising a shell (10), a closure (11) for that shell, a pivotal mounting (12) in the shell for the closure so that the closure is arranged for rotation on an axis to rock between a closed position in which the closure seals the shell, and an open position in which the closure can dispense a pill or the like from the interior of the shell through an aperture, in which there is a detent (engageable by button 17) arranged to secure the closure in its closed position, and a point on the surface of the shell to which pressure can be applied to release the detent and so allow the closure to be rocked from its closed position to its open position. The purpose of the container is to prevent access by children to pharmaceutical drugs within the container, while allowing elderly or infirm adults to have easy access to those drugs. An independent claim included for a method of forming such a container.

WO 2005/090187 A1



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.

CONTAINER5 Technical Field of the Invention

The invention relates to a container for pills, and to a method of forming such a container.

Background of the Invention

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Concerns for the safety of young children have led to the development of numerous 'child resistant' containers for pharmaceutical drugs in the form of pills, capsules or tablets. Examples of such containers are described and illustrated in UK Patent Specifications 1,527,812 and 2,319,244 and US Patent Specifications 3,923,180 and 5,575,399.

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Known examples of 'child resistant' containers have been successful in reducing the death rate from accidental poisoning among young children who have gained access to containers holding pharmaceutical drugs prescribed for others. The opening of such 'child resistant' containers has required both manual dexterity and some physical force; and may use a cognitive skill, like two step handling (e.g. push and turn). The combined requirement for

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children.

Notwithstanding this success, many patients for whom pharmaceutical drugs have been prescribed are elderly, infirm, or suffering from a condition (e.g. arthritis) which reduces their ability to open 'child resistant' containers. This has led to concerns about easy access to pharmaceutical drugs for elderly people having insufficient dexterity and/or strength in their hands to extract medication from known 'child resistant' containers.

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These concerns have been addressed in two US Patent Specifications, 5,934,492 and 6,112,920. Both these specifications deal with the opening of a cap to give access to the body of a container. In '492, the cap is removable by the application of an adult sized finger. The finger of a young child would be too small to actuate a mechanical locking device to release the cap. In '920, the cap is removable by a combined downward pressure and counter clockwise rotation. With both specifications, access to the pills is achieved by the application of significant pressure to remove the whole of a cap, which seals the container. Neither of these specifications discloses provision for dispensing pills by an elderly person while restricting access to those pills by a young child.

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Disclosure of the Invention

The invention provides a container for pills and the like, and having a closure which may be released by a compressive force applied between two opposed locations on the exterior, and
5 which, after release, may be opened by application of pressure acting at right angles to the compressive force, the pressure causing the closure to rotate about an axis parallel to the direction of the compressive force, so to open an aperture leading to the interior of the container.

The invention also provides a container for pills and the like, and comprising a shell, a
10 closure for that shell, a pivotal mounting in the shell for the closure so that the closure is arranged for rotation on an axis to rock between a closed position in which the closure seals the shell, and an open position in which the closure can dispense a pill or the like from the interior of the shell through an aperture, in which there is a detent arranged to secure the closure in its closed position, and a point on the surface of the shell to which pressure can be applied to
15 release the detent and so allow the closure to be rocked from its closed position to its open position.

It is preferred that there are two opposed detents to secure the closure in its closed position, and two opposed points on the surface of the shell to which pressure can be applied to release the detents and so allow the closure to be rocked from its closed position to its open
20 position.

In one form, pressure to release the closure member is applied directly. In an alternative form, pressure to release the closure is applied through a suitably flexible point or points on an external part or parts of the container or container shell.

It is preferred that the aperture is on the opposite side of the axis to the position of
25 application of pressure.

It is preferred that the container has an associated small sealable space for safe retention of a pill or a portion of a pill.

It is further preferred that the small sealable space is located in the closure.

In one preferred configuration there is an additional button on the back of the closure
30 member to increase child resistance.

In another preferred configuration, a sleeve or channel is used both to hold the container together and to carry notices or directions relating to pills to be stored in the container.

The invention also provides a method of forming a container as described above, the method comprising the steps of arranging two half portions of the container in proximity with
35 each other, with the closure trapped between parts adapted to allow rocking movement of the closure, and then locking the two half portions together with a sleeve or channel.

In one preferred form of the method, the two half portions are connected together along a flexible hinge line, so that they can be arranged in proximity with each other by folding them together about the hinge line.

In an alternative form of the method, the two half portions are brought into proximity with each other as separate entities.

Brief Description of the Drawings

A specific embodiment of the invention and variants thereof will now be described by way of example with reference to the accompanying drawings, in which :-

Figure 1 is a view from one side and slightly above a container for pills or the like;

Figure 2 is a view from one end and above that container with a small sealable space open;

Figure 3 is a side elevation;

Figure 4 is an end elevation;

Figure 5 is a similar end elevation showing operability of the container;

Figure 6 is a transparent view of the container, showing operable parts;

Figure 7 is a perspective view showing a closure for the container;

Figure 8 is a sketch of a top portion of a non child-resistant variant of the container;

Figure 9 is a cross sectional view showing a vertical section through that container;

Figure 10 is a sketch of a top portion of another variant of the container, showing an additional child resistant feature:

Figure 11 is a cross sectional view showing a vertical section through the top of the variant shown in Figure 10;

Figures 12 and 13 are cross sectional views showing transverse cross sections through a container, and illustrating operability of detents to secure the container in a closed condition;

Figure 14 is a diagram showing a first stage in assembly of the container shown in Figs 1 to 6;

Figure 15 is another diagram showing that stage in assembly of the container;

Figure 16 is a diagram showing a second stage in the assembly of the container; and

Figures 17 to 19 are diagrams corresponding to Figures 14 to 16, and showing another method of assembly.

Description of the Specific Embodiments

A container for pills, capsules, tablets or the like is shown in Figures 1 to 6. The container has a hollow shell 10, surmounted by a closure member 11. The closure member 11 is arranged to rock on an axis between trunnions 12 (best seen in Figures 6 and 7), so that it is movable between a closed position, in which it seals the shell, and an open position, in which it

is possible for a pill or the like to be dispensed from the interior of the shell. As shown in Figures 1 to 4, the container is standing on a flat horizontal surface, and the trunnions 12 lie on a horizontal axis.

When the closure member 11 is in its closed position, a shield portion 14 on the member 11 blocks a notch 15 in the top of the shell 10. When the member 11 is in its open position, the shield portion 14 is raised to allow access to the interior of the shell 10 through the notch 15. Thus by rocking the closure member 11, pills can be dispensed from the interior of the shell 10.

To prevent unauthorised access to the pills by young children, the container has a locking mechanism. The locking mechanism comprises two opposed points 16 on the surface of the shell 10. The points 16 are formed as very thin layers of the plastic shell, and are sufficiently flexible to permit inward deflection (i.e. towards each other). On the closure member 11 there are dependent buttons 17, which are supported from the member 11 by short flexible strips 18. The flexibility of the strips 18 allows pressure on the points 16 to deflect the buttons 17 inwardly within the shell 10. Inward deflection of the buttons 17 allows the buttons to disengage from detents (not shown in Figures 1 to 7, but well illustrated in Figures 12 and 13 relating to a variant of the container). In another form, the points 16 are formed as open holes which allow direct access to the buttons 17.

Thus operation of the container to dispense pills is a two stage process as illustrated in Figure 5. First the opposed points 16 are pressed towards each other by pressure A. This releases the buttons 17 from the detents. Second, downward pressure B on the end of the closure member 11 nearer to the points 16 allows the member 11 to rock on the trunnions 12, and so opens the notch 15 to allow a pill to be dispensed. In a specific mode of operation, a person wishing to dispense a pill would lift the container in one hand, exert pressure A using thumb and middle finger, and then, when the closure member was unlocked, open the closure member 11 by applying downward pressure B with their fore finger. Inversion of the container then dispenses a pill.

Sequential application of two gentle pressures at right angles to each other requires the mental process of an adult which would be beyond the competence of most young children, while allowing single handed operation. Two handed operation is also possible.

To allow for circumstances in which a user may only require the dose contained in one half of a normal sized pill, provision is made for the temporary retention of an unused half pill. As shown particularly in Figures 2, 6 and 7, the end of the closure member 11 nearer to the shield portion 14 has a small sealable space 20. The space 20 is closed by a lid 19. The lid 19 is hingedly mounted on the closure member 11 by a short flexible strap 21. The strap 21 allows the lid 19 to be moved upwardly away from the space 20 to allow insertion or removal of a pill or half a pill as the user may require.

Two variants of containers according to the invention are shown in Figures 8 and 9, and Figures 10 and 11 respectively.

Figures 8 and 9 show a shell 30 associated with a closure member 31, which is rockable on trunnions 32. The shell has a notch 35, and the closure member 31 has a shield portion 34. 5 Unlocking of the closure member 31 (not shown in Figures 8 and 9), followed by depression of the closure member by pressure B', allows the dispensing of a pill from within the shell 30. In the absence of a locking mechanism, this variant is less child resistant.

Figures 10 and 11 show a second variant of a container according to the invention, having an additional child resistant feature. In this case a shell 40 has a closure member 41, and after 10 unlocking, and depression of additional button 50, pressure B'' rocks the closure member anticlockwise (as seen in figure 11) to allow the dispensing of a pill from within the shell 40.

In Figures 12 and 13, the shell 40 has apertures 46a, through which buttons 47 can be pushed inwardly through the shell 40 to release the closure member 41. Figure 12 shows the 15 buttons 47 being pushed together by pressure A'', and Figure 13 shows the closure member 41 being pushed down by pressure B''. In this case the flexible points 16 of the embodiment shown in Figures 1 to 7 are not required, as pressure A'' is applied directly to the buttons 47.

It will be understood that the provision of two opposed points with two dependent buttons is not essential to the operation of the container according to the invention. A single point with 20 sufficient flexibility to allow a button to be released from a detent, or a single direct acting button which could be released from a detent, could be used to unlock the closure member in respective containers.

Two methods of assembly for containers according to the invention are shown in Figures 14 to 16 and 17 to 19 respectively. Both methods will be described with reference to the 25 container shown in Figures 1 to 7.

As shown in Figures 14 and 15, the shell 10 is moulded in two halves 10a and 10b, joined 30 along a flexible hinge line 22. The container is assembled by pivoting the halves 10a and 10b upwardly together. As the two halves are nearly in contact with each other, the closure member 11 is positioned between them, so that trunnions 12 engage with pivot holes (not shown) on the inside of the shell 10. The two halves 10a and 10b are forced together, so trapping the buttons 17 in proximity with the flexible points 16. A 'U' shaped channel 23 is then forced over the 35 halves 10a and 10b (as shown in Figure 16) to keep those halves permanently on contact with each other. As shown particularly in Figures 1, 2 and 3, the 'U' shaped channel 23 may be used to carry promotional material, and/or written description of the contents and dosage of the pills to be kept in the container. Thus a single shell 10 formed as a single moulding could be used for many different pills, with the channel 23 being used to identify the particular pills within the container.

An alternative method of assembly is shown in Figures 17 to 19. In this case, the two halves of the shell are formed as discrete parts (i.e. un-joined by any hinge line 22). As with the method shown in Figures 14 to 16, the two half shells 10a and 10b are brought together around the closure member 11. A 'U' shaped channel 23 is then forced over the halves to keep those
5 halves permanently in contact with each other.

Advantages of the Invention

The purpose of the container is to prevent access by children to pharmaceutical drugs within
10 the container, while allowing elderly or infirm adults to have easy access to those drugs.

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CLAIMS

- 1/ A container for pills and the like, and having a closure which may be released by a compressive force applied between two opposed locations on the exterior, and which, after
5 release, may be opened by application of pressure acting at right angles to the compressive force, the pressure causing the closure to rotate about an axis parallel to the direction of the compressive force, so to open an aperture leading to the interior of the container.
- 2/ A container for pills and the like, and comprising a shell, a closure for that shell, a pivotal
10 mounting in the shell for the closure so that the closure is arranged for rotation on an axis to rock between a closed position in which the closure seals the shell, and an open position in which the closure can dispense a pill or the like from the interior of the shell through an aperture, in which there is a detent arranged to secure the closure in its closed position, and a point on the surface of the shell to which pressure can be applied to release the detent and so
15 allow the closure to be rocked from its closed position to its open position.
- 3/ A container as claimed in claim 2 in which there are two opposed detents to secure the closure in its closed position, and two opposed points on the surface of the shell to which pressure can be applied to release the detents and so allow the closure to be rocked from its
20 closed position to its open position.
- 4/ A container as claimed in any one of the preceding claims in which pressure to release the closure member is applied directly.
- 25 5/ A container as claimed in any one of claims 1 to 3, in which pressure to release the closure is applied through a suitably flexible point or points on an external part or parts of the container or container shell.
- 6/ A container as claimed in any one of the preceding claims, in which the aperture is on the
30 opposite side of the axis to the position of application of pressure.
- 7/ A container as claimed in any one of the preceding claims, in which the container has an associated small sealable space for safe retention of a pill or a portion of a pill.
- 35 8/ A container as claimed in claim 7, in which the small sealable space is located in the closure.

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9/ A container as claimed in any one of the preceding claims, in which there is an additional button on the back of the closure member to increase child resistance

10/ A container as claimed in any one of the preceding claims, in which a sleeve or channel is used both to hold the container together and to carry notices or directions relating to pills to be stored in the container.

11/ A method of forming a container as claimed in any one of the preceding claims, and comprising the steps of arranging two half portions of the container in proximity with each other, with the closure trapped between parts adapted to allow rocking movement of the closure, and then locking the two half portions together with a sleeve or channel.

12/ A method as claimed in claim 11, in which the two half portions are connected together along a flexible hinge line, so that they can be arranged in proximity with each other by folding them together about the hinge line.

13/ A method as claimed in claim 11, in which the two half portions are brought into proximity with each other as separate entities.

14/ A container substantially as hereinbefore described by way of example with reference to and as shown in Figures 1 to 7, or Figures 8 and 9, or Figures 10 and 11, and Figures 12 and 13 of the accompanying drawings.

15/ A method of forming a container as claimed in claims 1 to 9 and 14, and substantially as hereinbefore described by way of example with reference to Figures 14 to 16 or Figures 17 to 19 of the accompanying drawings.

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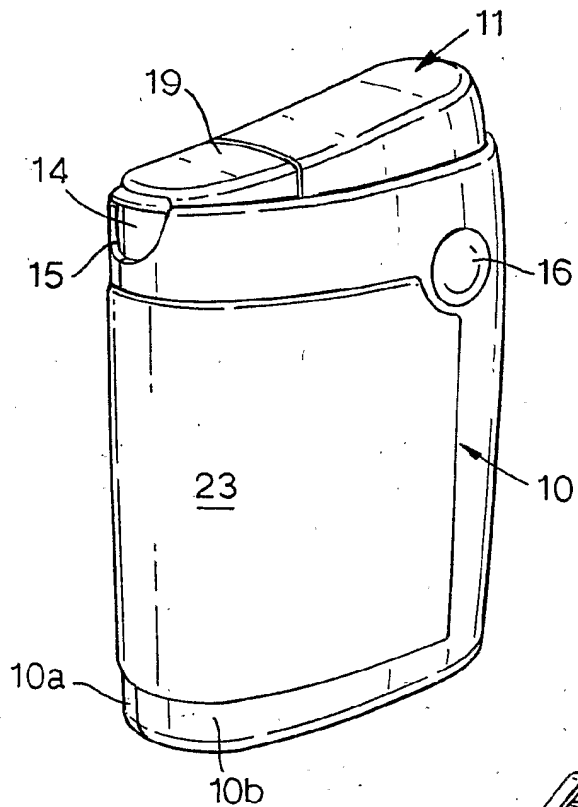


Fig. 1.

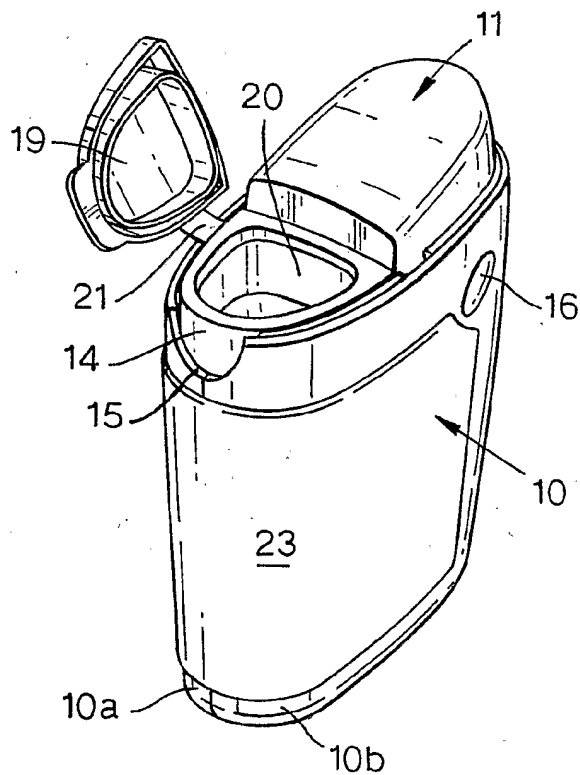


Fig. 2.

2/6

Fig.3.

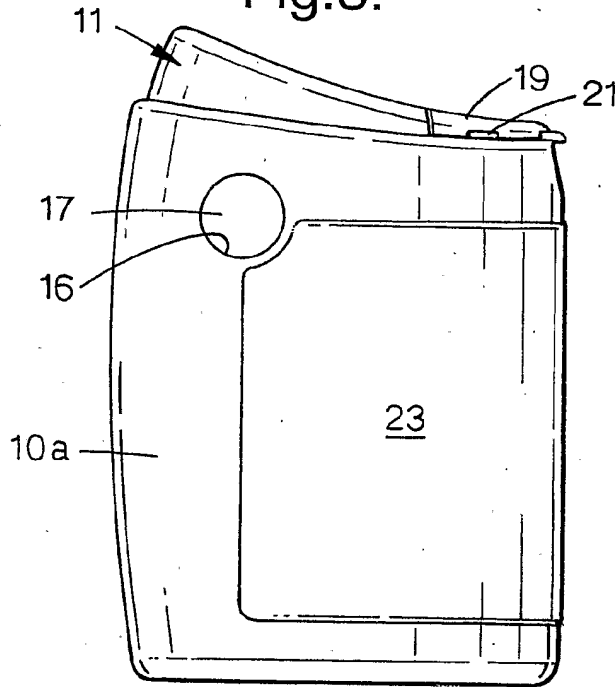
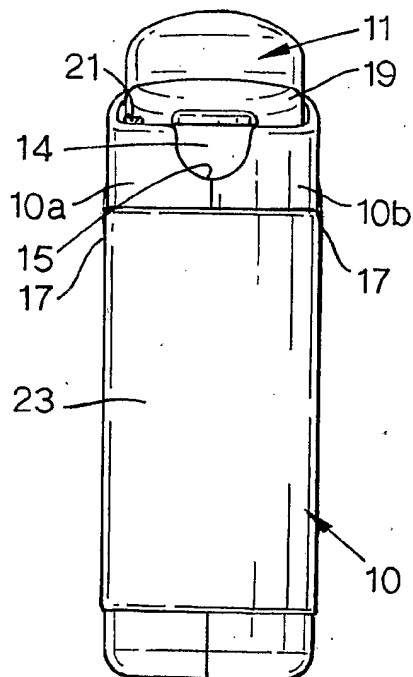


Fig.4.



3/6

Fig.5.

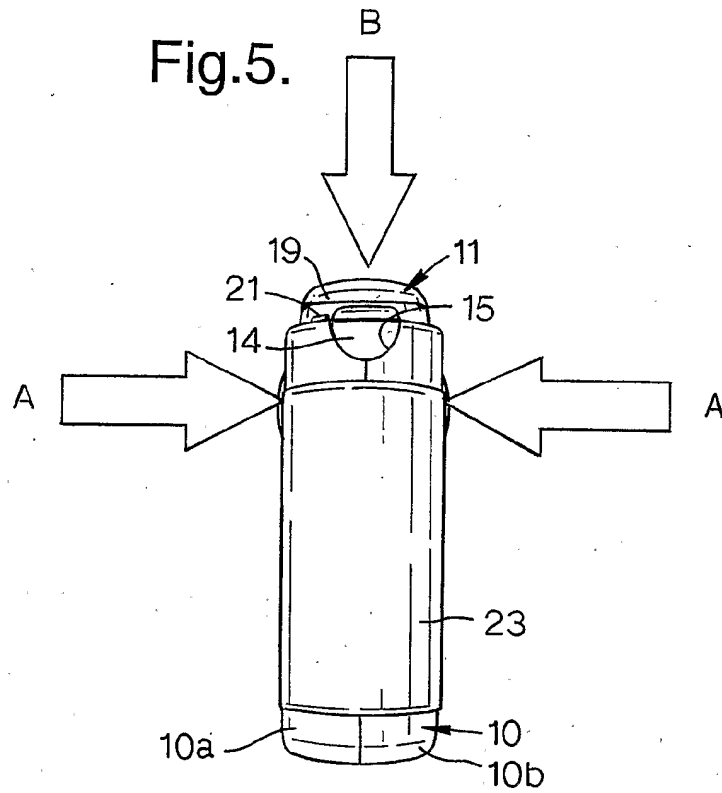
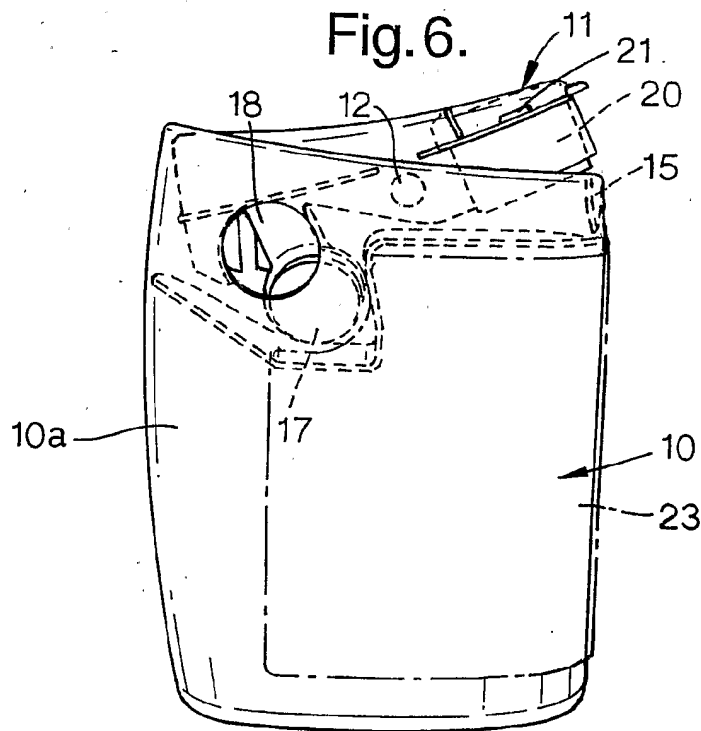
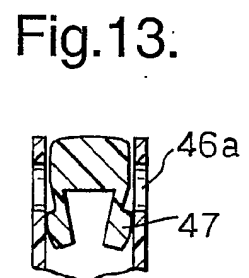
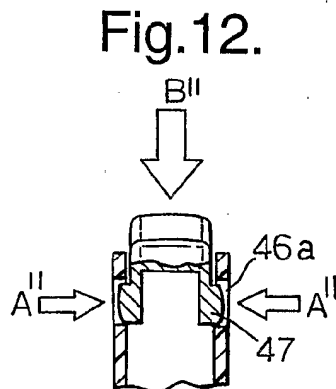
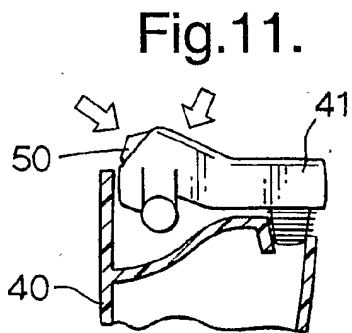
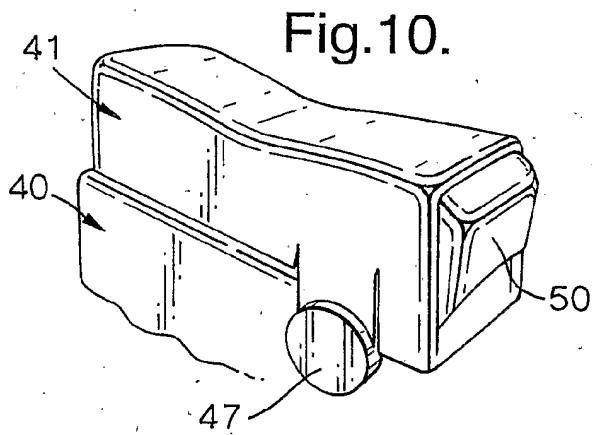
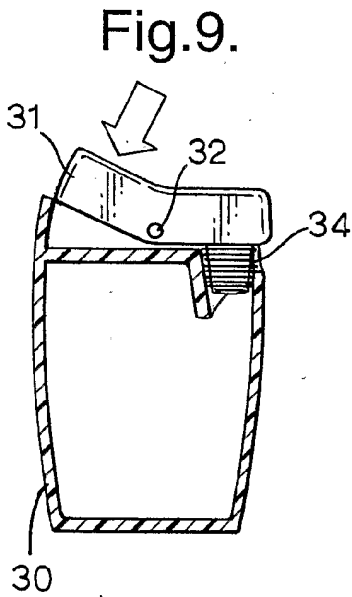
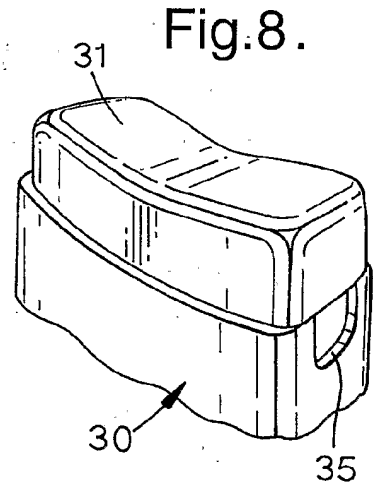
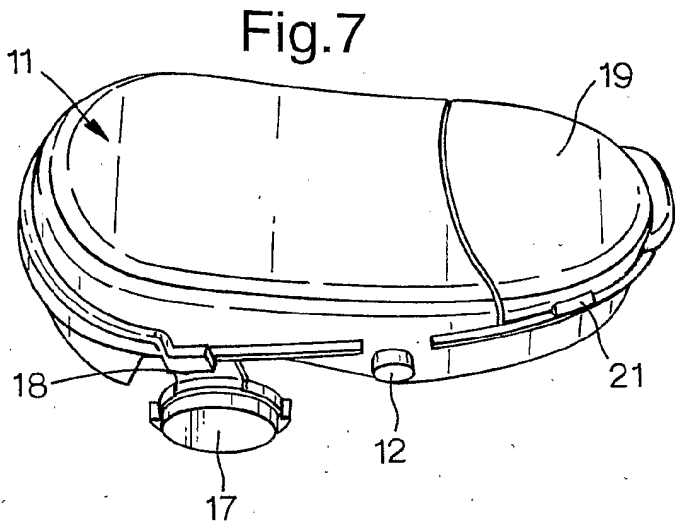


Fig.6.





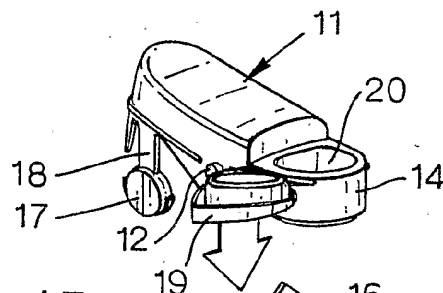
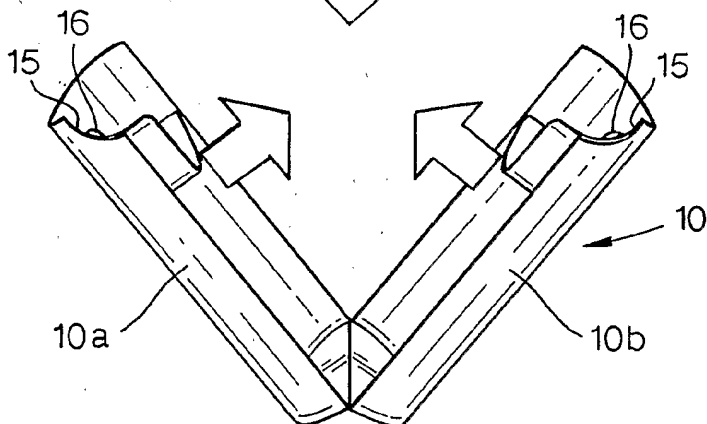
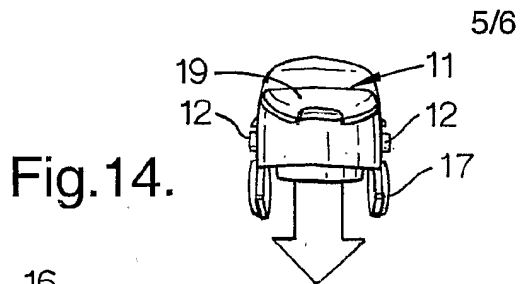


Fig.15.

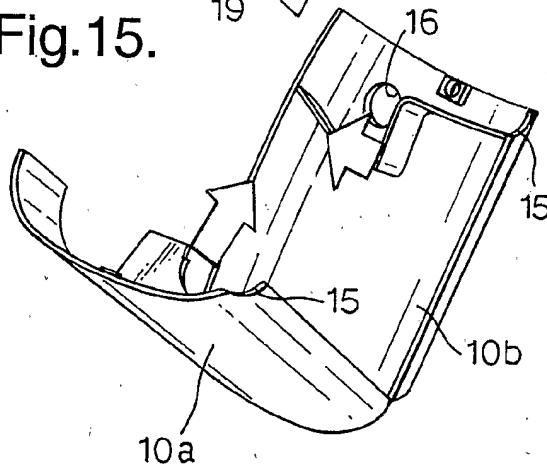
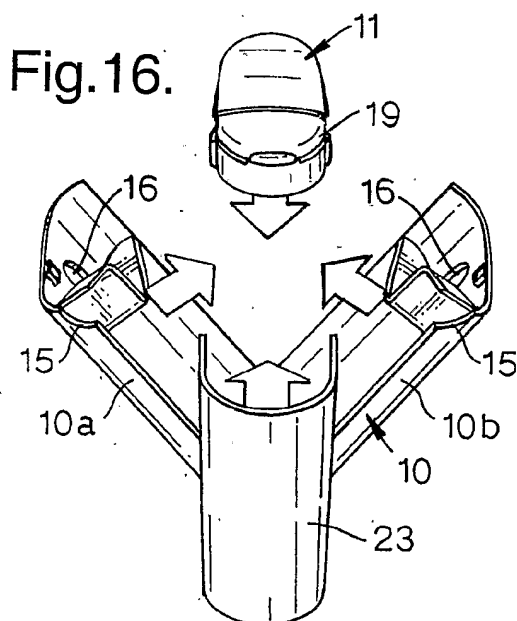


Fig.17.

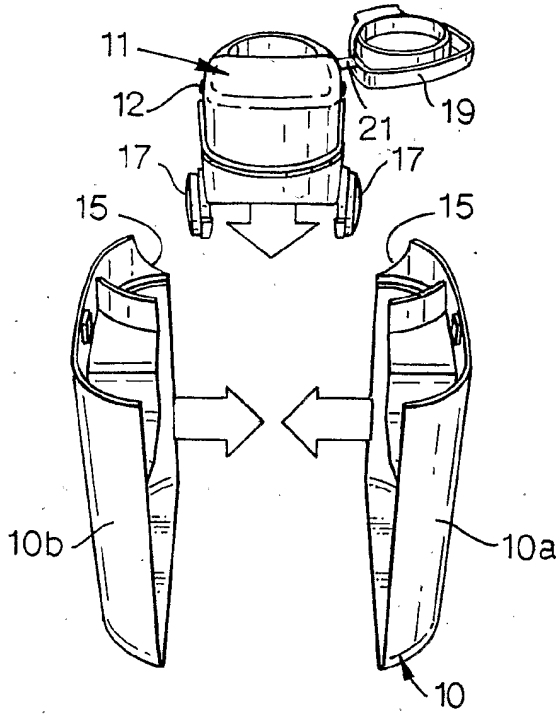


Fig.18.

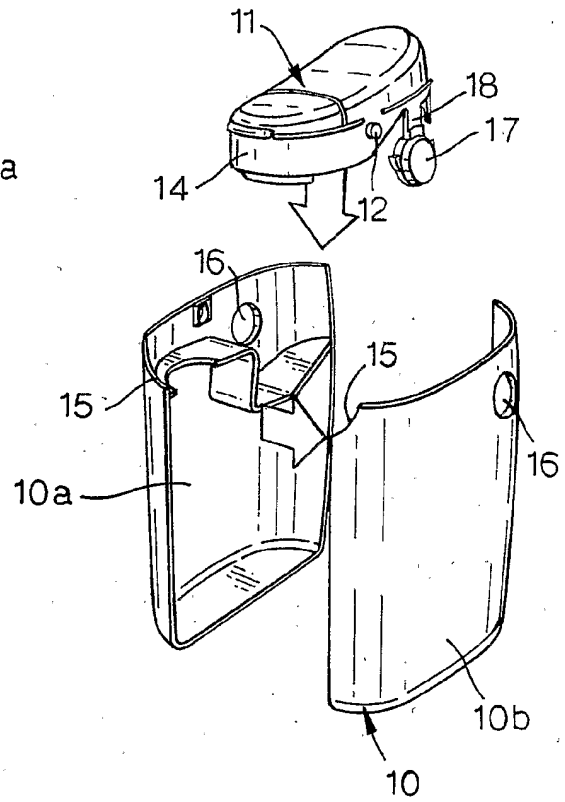
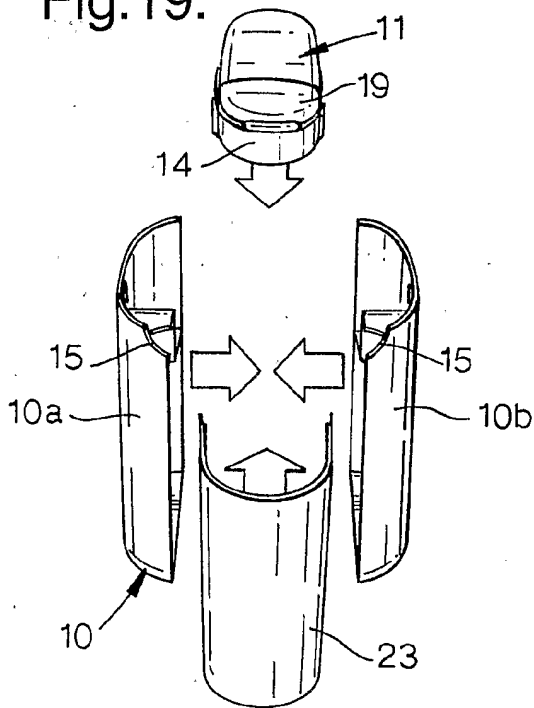


Fig.19.



PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 101421-1 WO	FOR FURTHER ACTION <small>see Form PCT/ISA/220 as well as, where applicable, item 5 below.</small>	
International application No. PCT/SE 2005/000396	International filing date (<i>day/month/year</i>) 17 March 2005	(Earliest) Priority Date (<i>day/month/year</i>) 19 March 2004
Applicant AstraZeneca AB et al		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. Certain claims were found unsearchable (see Box No. II)

3. Unity of invention is lacking (see Box No. III)

4. With regard to the title,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

A CONTAINER FOR PILLS AND A METHOD OF FORMING SUCH A CONTAINER.

5. With regard to the abstract,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

a. the figure of the drawings to be published with the abstract is Figure No. 6

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

b. none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 2005/000396

A. CLASSIFICATION OF SUBJECT MATTER		
IPC7: B65D 50/04, B65D 50/06, B65D 47/20, A61J 1/03 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)		
IPC7: A61J, B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPO-INTERNAL, WPI DATA, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 20020179644 A1 (EVANS ET AL), 5 December 2002 (05.12.2002) --	1-15
A	US 5709318 A (ODER), 20 January 1998 (20.01.1998), column 3, line 43 - column 6, line 54 --	1-15
A	US 6343725 B1 (LOHRMAN), 25 February 2002 (25.02.2002), column 3, line 5 - column 4, line 3 --	1-15
A	WO 0140095 A1 (SUSSEX TECHNOLOGY, INC), 7 June 2001 (07.06.2001), page 6, line 1 - line 8; page 6, line 23 - page 8, line 12 --	1-15
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 application or patent 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		Date of mailing of the international search report
20 June 2005		28-06-2005
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86		Authorized officer Anette Hall/MP Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2005/000396

Box No. 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.: 14 , 15
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:

Claims 14 and 15 are not clear and concise since the inventions are defined only by reference to figures.

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 No. 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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 2005/000396

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6431416 B1 (LOHRMAN), 13 August 2002 (13.08.2002), column 3, line 27 - line 54, figures 4-5 --	1-15
A	US 6283333 B1 (KNICKERBOCKER ET AL), 4 Sept 2001 (04.09.2001), column 7, line 47 - line 53, figures 11,12 -- -----	1-15

INTERNATIONAL SEARCH REPORT
Information on patent family members

28/05/2005

International application No.
PCT/SE 2005/000396

US	20020179644	A1	05/12/2002	NONE		
US	5709318	A	20/01/1998	NONE		
US	6343725	B1	25/02/2002	US	6431416 B	13/08/2002
WO	0140095	A1	07/06/2001	AU	2253201 A	12/06/2001
US	6431416	B1	13/08/2002	US	6343725 B	05/02/2002
US	6283333	B1	04/09/2001	BR	0116779 A	06/01/2004
				CA	2434158 A	25/07/2002
				CN	1486265 A	31/03/2004
				EP	1351864 A	15/10/2003
				JP	2004523432 T	05/08/2004
				MX	PA03005631 A	29/01/2004
				PL	365614 A	10/01/2005
				WO	02057152 A	25/07/2002