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(54) Child resistant closure

(57) A child resistant closure (CRC) 14 forms part of a container 1. The container 1 has a neck 12 comprising at least two circumferential beads 13, 15. Each of the beads has a respective interruption 34, 36 at respectively different radial positions. The CRC also has a lid 18 rotatable relative to the neck and formed with a locking member 30 which engages with the lowest bead 36 in the closed position. The CRC could instead be two-piece with the beads being formed inside a collar for fixing to the neck of a container.

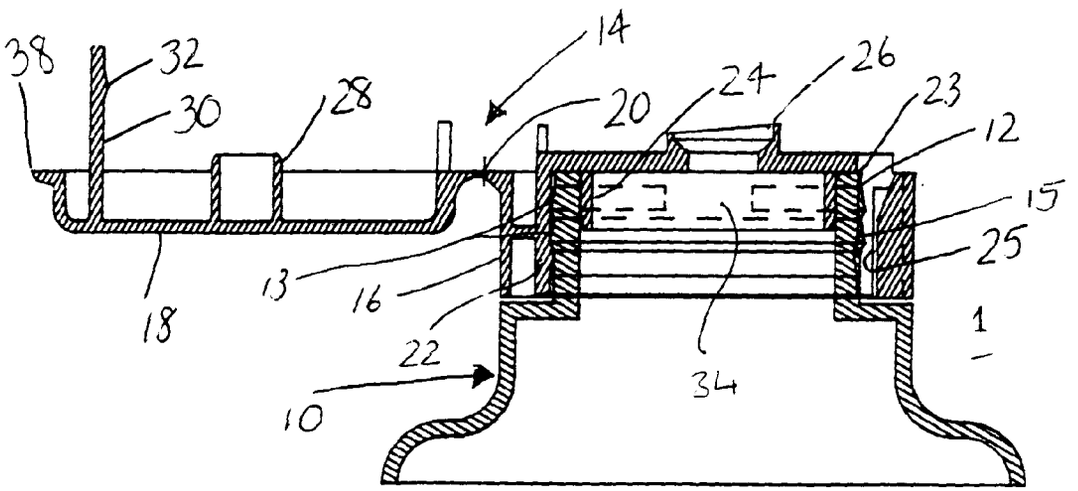

FIGURE 1

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Description

This invention relates to a child resistant closure (CRC) and, more particularly but not solely, to a CRC for medicine bottles and the like.

Many substances, such as medicines, weed killer and cleaning agents, are harmful if ingested or spilled on the skin. It is therefore necessary to prevent a child from gaining access to the contents of bottles containing such substances. It is well known to provide closures for such bottles which can only be opened by carrying out a particular process or series of steps, such that a young child would be unlikely to be able to open the bottle, either on purpose or by accident.

One type of known CRC (US-A-4 718 567) comprises a cap which engages in a snap fit over the neck of a bottle. The cap consists of a base which defines a dispensing opening, and a lid which engages in a snap fit over the opening so as to close it. The lid is provided with an elongate hooked locking member which extends downwardly therefrom. When the lid is closed, the locking member extends into a recess formed in the base, and the hooked portion of the locking member engages under a bead formed around the nozzle of the bottle, such that the lid is prevented from being opened. The bead has an interruption at one radial position. To open the lid the cap is rotated until the locking member is in the same radial position as the interruption, when the lid may then be pulled open. The positions of the interruption and the locking member are marked with arrows so that when the arrows are aligned, the lid can be opened.

The arrangement described above is an effective method of prevent young children from gaining access to dangerous substances, since they would be unaware of the necessary procedure to be followed in order to open a bottle having such a child resistant closure provided thereon. However, in the event that the cap is not rotated relative to the bottle after the lid is closed the arrows will remain aligned and a child may be able to gain access to the contents of the bottle, which would clearly be dangerous.

We have now devised an arrangement which overcomes the problem outlined above. In accordance with a first aspect of the present invention there is provided a container having a child resistant dispensing closure, the container having a neck comprising at least two circumferential beads, each of which is formed with an interruption at a different respective radial position, said closure comprising a lid which is rotatable relative to the neck, and which is formed with a locking member which engages with the lowest bead on the container when the lid is closed.

Although the container neck must be provided with two beads, three or more such beads may be provided, resulting in a more complex series of operations to open the lid successfully.

When it is desired to open the container to gain access to the contents, it is necessary to rotate the lid relative to the container until the locking member is aligned with the interruption in the lower bead of the container. The lid may then be lifted until the locking member engages with the bead above. Then by further rotating the lid to a different position, until the locking member is aligned with the corresponding interruption, the lid may be released and fully opened (assuming there are just two beads). When the lid is closed, the closure is automatically child resistant again. This is because, even if the lid is closed such that the locking member is aligned with the lower interruption, it is still necessary to rotate the lid in order to release the lid from the second bead. On the other hand, if the lid is closed with the locking member aligned with the upper interruption, the lid must first be rotated to align the locking member with the lower interruption.

Preferably, the locking member comprises an elongate prong which extends from the inner surface of the lid, substantially at right angles thereto. Preferably, the prong is formed with a detent adjacent its end, facing the beads when in the closed position.

The relative positions of the locking member and the interruptions may be indicated by means of respective external arrows.

Preferably also, the closure comprises a base member to which the lid is connected by means of a hinge, the base being arranged to engage in a snap fit with the container so as to enable the base to rotate concurrently with the lid, relative to the container.

Instead of providing the beads on the neck of the container, a two-piece closure may be provided, the first piece corresponding to the closure utilised in the first aspect of the invention and the second piece being in the form of a collar having the beads formed on an external surface thereof. The collar can then be fitted by suitable means to a plain bottle neck

Thus, in accordance with a second aspect of the present invention, there is provided a child resistant closure for fitting to a container, the closure comprising a collar for fixing to the container and defining a dispensing opening and a lid for closing said opening, the collar being formed with at least two circumferential beads, each of which is formed with an interruption at a different respective radial position, the lid being rotatable relative to the collar, and being formed with a locking member which engages with the lowest bead on the collar when the lid is closed.

The features of the closure according to the second aspect of the invention may otherwise correspond to those of the first aspect of the invention.

Closures according to either aspect of the present invention may be made of any suitable material and by any convenient manufacturing method. However, they are preferably formed by injection moulding of an appropriate plastics material such as polypropylene, high- or low-density polyethylene or linear-low-density polyethylene.

Embodiments of the present invention will now be

described by way of example only and with reference to the accompanying drawings, in which:-

Figure 1 is a cross-sectional view of a container having a CRC, in accordance with the present invention;
Figure 2 is a view of the container and closure of Figure 1 when the lid is closed;
Figure 3 is a view of the container of Figure 1, as viewed from a first position;
Figure 4 is a view of the container of Figure 1, as viewed from a second position;
Figure 5 is a view of the container and closure of Figure 1, when in use;
Figure 6 is a view of the container and closure of Figure 1, when in use; and
Figure 7 is a plan view of the container and closure of Figure 1.

Figure 1 of the drawings shows a container 1, in accordance with the present invention. The container 1 comprises a bottle 10 which is formed with a neck 12 at its upper end and also a child resistant closure 14. The bottle neck 12 is formed with two mutually axially separated circumferential beads 13, 15. The closure 14 is formed of injection moulded polypropylene and comprises a generally cylindrical base 16 and a lid 18. The base 16 and the lid 18 are connected together by means of an integral hinge 20.

The base 16 comprises an outer sleeve 22 and an inner cylindrical portion 24 which is formed with a generally central dispensing nozzle 26 at its upper end. The inner cylindrical portion 24 is of a diameter substantially equal to the inner diameter of the bottle neck 12, such that, in use, the base 16 engages in a snap fit with the bottle neck 12, with the inner cylindrical portion 24 being positioned within the bottle neck 12 and the outer sleeve 22 surrounding the outer wall of the bottle neck 12.

The outer sleeve 22 is provided with a gap 23, such that a portion of the beads 13, 15 on the bottle neck 12 remain uncovered by the outer sleeve 22 when the closure 14 is fitted on the bottle 10. The base 16 defines a recess 25 adjacent the gap 23.

The lid 18 comprises a generally cup-shaped member which is formed with a substantially central cylindrical portion 28 on its inner surface. The diameter of the cylindrical portion 28 is substantially equal to that of the dispensing nozzle 26. An elongate locking member 30 extends from the inner surface of the lid 18, at a position adjacent its circumference. The locking member 30 is formed with a detent 32 in the form of an outwardly-directed hook-like member adjacent its end.

Referring to Figure 2 of the drawings, in use, when the lid 18 is closed, the cylindrical portion 28 on the lid 18 engages within the dispensing nozzle 26 on the base so as to seal it, and the detent 32 on the locking member 30 slides into the recess 25 and engages under the lower bead 15 on the bottle neck 12, thereby preventing the lid 18 from being opened.

The lower bead 15 of the bottle neck 12 is provided with an interruption 34 at a particular radial position, and the upper bead 13 is provided with a similar upper interruption 36 at a different radial position, as shown in Figures 3 and 4 respectively.

Referring to Figure 5 of the drawings, in order to open the lid 18, the closure 14 must be rotated relative to the bottle 10 such that the locking member 30 is adjacent the lower interruption 34 in the bottle neck bead 15. The lid 18 may then be lifted, by means of a lip 38 provided for this purpose, until the detent 32 on the locking member 30 engages under the upper bead 13, thereby preventing the lid 18 from being lifted further.

With reference to Figure 6, in order to fully open the lid 18, the use must first rotate the closure 14 around the bottle neck 12, whiles the lid is still in the slightly lifted position of Figure 6, until the locking member 30 is adjacent the interruption 36 in the upper bead 13 of the bottle neck 12. The lid 18 may then be fully opened. Since the prong 30 is resilient, the detent 32 simply rides over the upper and/or lower bead 13, 15 as the lid is snapped shut, depending on whether the prong is aligned with either the lower interruption 34 or upper interruption 36.

Referring to Figure 7 of the drawings, the relative positions of the interruptions 34, 36 (not shown) and the locking member 30 (not shown) are preferably indicated by means of, for example, an arrow 40 on the shoulder 42 of the bottle 10. The user rotates the closure until the arrow 40 is aligned with, for example, the lip 38 of the lid 18, another arrow (not shown) on the lid itself, or otherwise, thus enabling the user to quickly and easily locate the correct opening position.

Note that in an alternative embodiment, the beads 13, 15 may be provided on the outer sleeve 22 of the base 16 instead of on the bottle neck 12. The outer sleeve would then be fixed to the bottle neck 12 whilst the lid 18 could be hinged on an inner sleeve, also rotatable relative to the outer sleeve. In this case, the procedure for opening and closing the lid would be the same as that described above, except that it would be necessary to rotate the lid together with the inner sleeve, relative to the outer sleeve of the base.

The opening procedure can be made more complicated by providing more beads, each having an interruption in a different radial position such that the closure must be rotated more times in order to release the lid.

Other modifications and variations of the described embodiment as well as other embodiments will now be apparent to the person skilled in the art, without departing from the scope of the present invention as defined by the appended claims.

Claims

1. A container having a child resistant dispensing clo-

sure, the container having a neck comprising at least two circumferential beads each of which is formed with an interruption at a different respective radial position, said child resistant dispensing closure comprising a lid which is rotatable relative to the neck, and which is formed with a locking member which engages with the lowest bead on the container when the lid is closed.

2. A container as claimed in claim 1, wherein the neck of the container is provided with only two of said circumferential beads.

3. A container as claimed in claim 1, wherein the neck of the container is provided with three or more of said beads.

4. A container as claimed in any preceding claim, wherein the locking member comprises an elongate prong which extends from the inner surface of the lid, substantially at right angles thereto.

5. A container as claimed in claim 4, wherein the prong is formed with a detent adjacent its end.

6. A container as claimed in any preceding claim, wherein the relative positions of the locking member and the interruptions are indicated by means of arrows.

7. A container as claimed in any preceding claim, wherein the closure comprises a base member to which the lid is connected by means of a hinge, the base being arranged to engage in a snap-fit with the container so as to enable the base to rotate relative to the container.

8. A child resistant closure for fitting to a container, the closure comprising a collar for fixing to the container and defining a dispensing opening and a lid for closing said opening, the collar being formed with two or more circumferential beads each of which is formed with an interruption at a different respective radial position, the lid being rotatable relative to the collar and being formed with a locking member which engages with the lowest bead on the collar when the lid is closed.

9. A child resistant closure as claimed in claim 8, wherein the collar is provided with only two of said beads.

10. A child resistant closure as claimed in claim 8, wherein the collar is provided with three or more of said beads.

11. A child resistant closure as claimed in claims 8 to 10, wherein the locking member is an elongate prong which extends from the inner surface of the lid substantially at right angles thereto.

12. A child resistant closure as claimed in claim 11, wherein the prong is formed with a detent adjacent its end.

13. A child resistant closure as claimed in any of claims 8 to 12, wherein the relative positions of the locking member and the interruptions are indicated by means of arrows.

14. A child resistant closure as claimed in any of claims 8 to 13, further comprising a base member to which the lid is connected by means of a hinge, the base member and lid being rotatable relative to the collar.

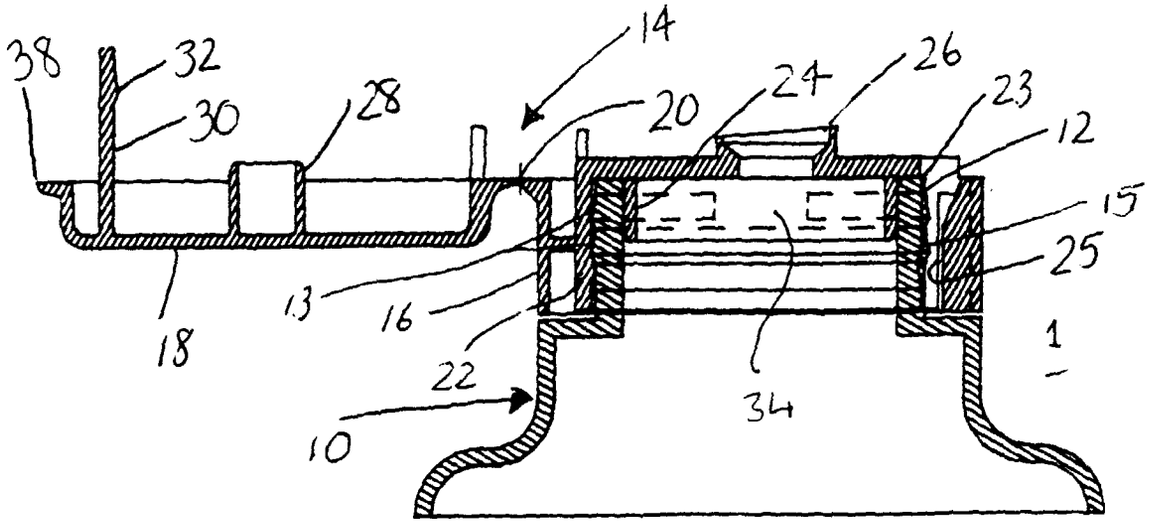

FIGURE 1

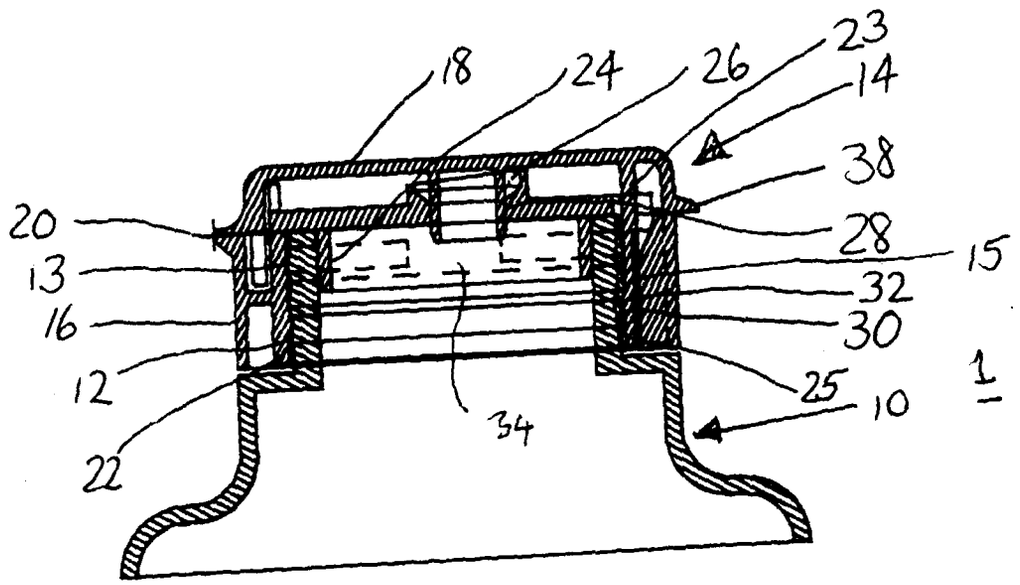

FIGURE 2

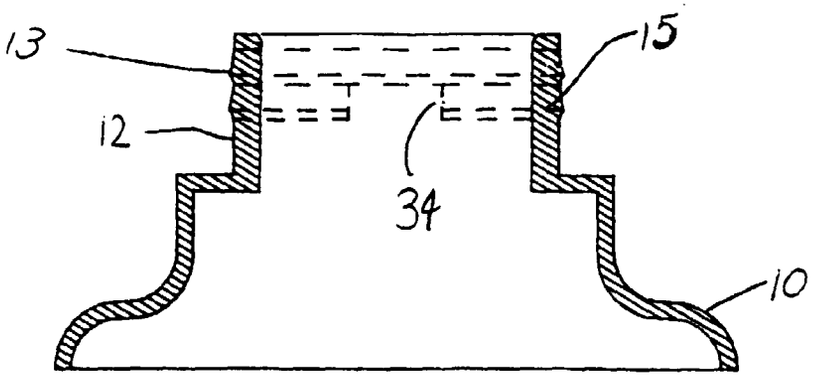

FIGURE 3

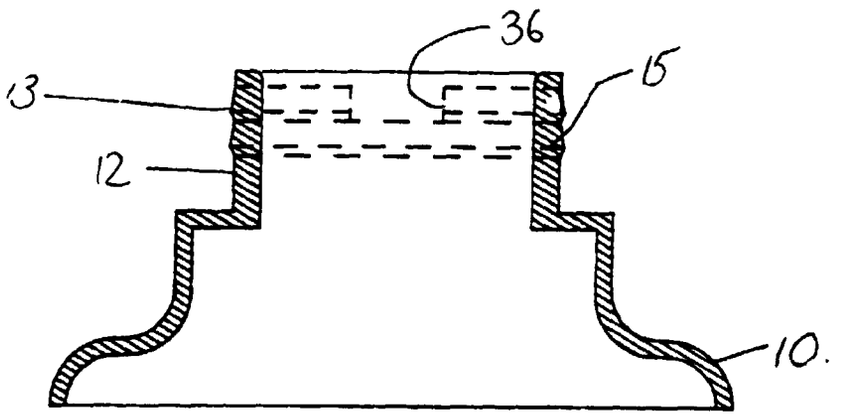

FIGURE 4

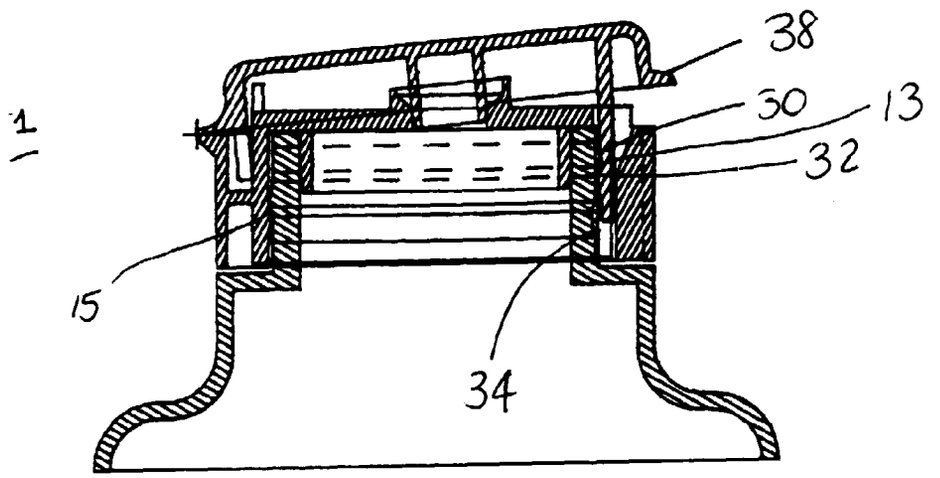

FIGURE 5

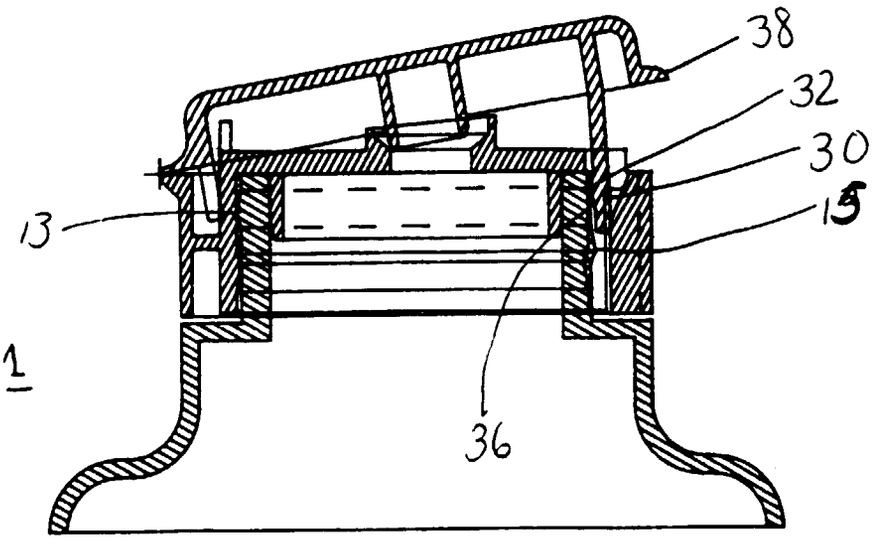

FIGURE 6

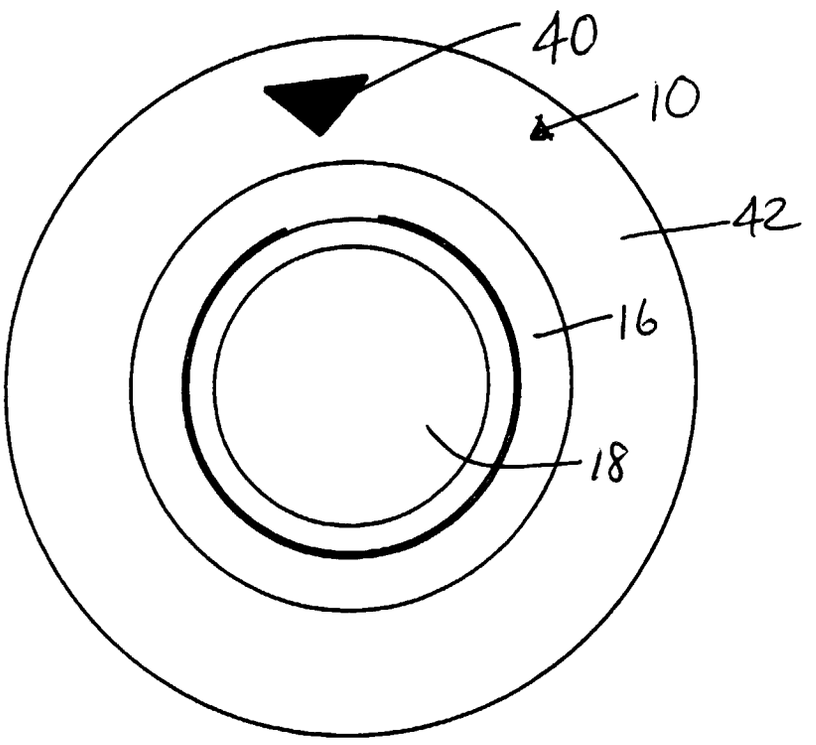

FIGURE 7

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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 6648

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.6)
Y,D	US-A-4 718 567 (LA VANGE) * the whole document *	1-7, 11-14	B65D55/02
Y	US-A-3 703 974 (BOXER ET AL.) * the whole document *	1-14	
Y	WO-A-94 11268 (PIERSON INDUSTRIES) * page 2, line 21 - line 26; claims 1,2,6; figures 3,4 *	8-14	
A	US-A-4 941 580 (JULIAN) * column 6, line 31 - line 36; figure 11 *	8-14	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 December 1996	Bridault, A

CATEGORY OF CITED DOCUMENTS

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