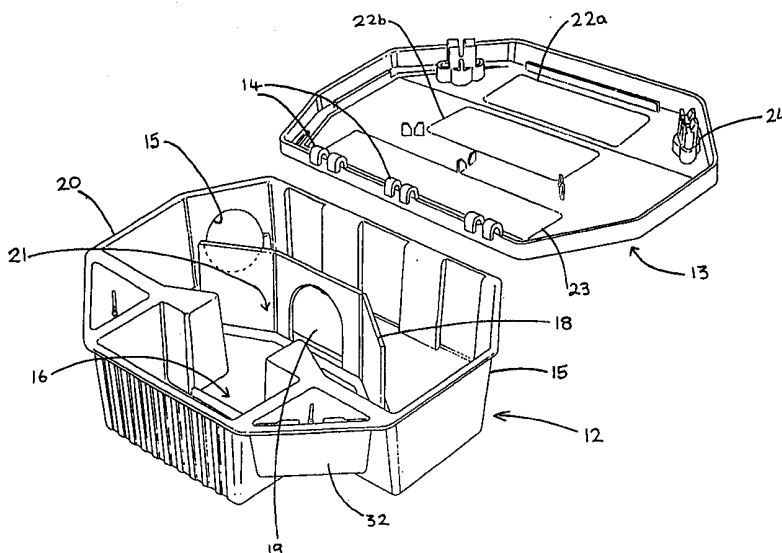




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A01M 25/00	A1	(11) International Publication Number: WO 99/03340 (43) International Publication Date: 28 January 1999 (28.01.99)
(21) International Application Number: PCT/GB98/00259 (22) International Filing Date: 28 January 1998 (28.01.98) (30) Priority Data: 9715067.6 16 July 1997 (16.07.97) GB (71) Applicant: FORWARD ENVIRONMENTAL SERVICES GROUP LTD. [GB/GB]; Unit 2, Central Court, Finch Close, Nottingham NG7 2NN (GB). (72) Inventor: ISSITT, Nicholas; The Barn, Church Street, Braunston, Rutland LE15 8QT (GB). (74) Agent: SMITH, Peter, James; Serjeants, 25 The Crescent, King Street, Leicester LE1 6RX (GB).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report.

(54) Title: TAMPER RESISTANT BAIT STATION FOR RATS



(57) Abstract

A bait station for containing rat poison contains a housing (12, 13); at least one opening (15) in the housing for a rat to enter; and a bait position (16) in the housing for locating poisoned bait. A divider (18) is provided between the bait position (16) and each opening (15) to prevent direct access to the bait from the opening, for example by a child. However, there are at least two different routes from the bait position (16) leading to openings (15). Research has shown that rats, unlike mice, prefer not to eat in a confined space and it is believed that the choice of escape routes offered by the bait station of the invention encourages a rat to eat more of the bait. The bait station may include a hinged lid (13) with locking means (24, 25) to prevent tampering with the bait.

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TITLE

Tamper Resistant Bait Station for Rats

DESCRIPTIONField of the Invention

The invention relates to tamper resistant bait stations in which poisoned bait is left for consumption by rats.

Background Art

Bait stations in the form of enclosed units containing poisoned bait are commonly used for killing rats and mice. The rat or mouse enters the bait station, eats the bait and dies two to three days later. By the time it dies, the animal has digested all the bait so another animal which eats the dead rodent is not poisoned. Such bait stations are preferable to traps which retain the rodent, as they can be used to kill several animals without requiring constant monitoring.

A preferred type of bait station is designed such that a child cannot open the unit, and cannot gain access to the bait by reaching into the unit.

Research has been carried out with mice to find a shape of bait station in which the mouse feels secure, and eats sufficient poisoned bait to kill it. If a mouse eats only a small amount of the bait it may survive. It has been found that mice prefer to eat in a bait station which contains a passageway between two openings in its housing, and a separate side feeding compartment containing the bait. The compartment is separated from the passageway by a divider which contains a central gap to allow the mouse access to the feeding compartment. Thus, there is just one route (through the central gap in the divider) from the feeding compartment to either of the openings in the bait station housing. It is presumed that the mouse can eat in this compartment without fearing attack from larger

predators. In contrast, a mouse will not eat in a compartment shaped as a straight tunnel.

It has previously been assumed that rats prefer feeding in the same kind of environment as mice and therefore both rat and mouse bait stations have been made with a separate side feeding compartment in which the animal sits to eat the bait.

THE INVENTION

The invention provides a bait station for containing a poisoned bait for rats, the bait station comprising a housing, an opening in the housing, a bait position for locating the bait within the housing, a divider between the opening and the bait position; wherein there are at least two different routes through or around the divider from the bait position to the opening.

Each route must allow the passage of an average sized rat.

This contrasts with a prior art bait station in which there is only one route from a bait position in the feeding compartment to the openings in the housing.

Research carried out by the inventors has surprisingly demonstrated that rats prefer to feed in a very different environment to mice. Rats have been found to prefer feeding where there are at least two exits from any enclosed space. For example, a rat is happy feeding in a hollow tube. The inventors believe this to be because rats are afraid of attack by other rats.

A tubular shape is not acceptable for a bait station, since it allows a child to reach in and grasp the bait. A bait station according to the invention therefore includes a divider located between each opening in the housing of the bait station and the bait position, but ensures that the divider allows at least two different routes from the

bait position to the opening. The divider should preferably be located such that it is impossible to poke a straight object through the opening and contact any bait located in the bait position.

In one embodiment of the invention, there is a single divider, which has a central hole, and each edge of which is spaced from the walls of the housing of the bait station. Thus a rat may pass from the bait position to an opening via the central hole in the divider or around either edge of the divider.

Alternatively separate dividers may be provided between each opening in the housing and the bait position.

The divider or dividers may be transparent to increase the rat's feeling that it is not dangerously enclosed, and to give it sight of any other rats entering the bait station.

The divider or dividers are preferably removable to allow for easy stacking of the bait stations in transit.

An upper lid portion of the bait station housing may be transparent or have transparent panels. These allow an inspector to check that the station still contains enough bait and/or to see if a rat is in the station without having to remove the lid. A panel may also be used to record information such as when the bait station was last checked. This may be a transparent panel with a suitable sticker on its inside, or a plain coloured panel, either of which can be written on with a suitable pen.

It is important that unauthorized people, especially children, cannot open up the bait station to gain access to the poisoned bait. Therefore a locking mechanism is preferably provided to lock the lid portion to a lower housing of the bait station. This may consist of two separate locks, each of which must be opened

simultaneously, thus improving security. In one embodiment each lock includes a plurality of stepped flanges on either the lid portion or the lower housing and a plurality of cooperating teeth on the other of the lid portion and the lower housing. In this case a special key is used to take the flanges out of cooperation with the teeth and allow the box to be opened.

THE DRAWINGS

Figure 1 is a perspective view of a prior art bait station;

Figure 2 is a perspective view of a bait station according to the invention in an open position with the lid detached;

Figure 3 is a top view of the bait station of Figure 2 in an open position;

Figure 4 is a front view of the bait station of Figure 2;

Figure 5 is a top view of the bait station of Figure 2 in a closed position;

Figure 6 is a side view of the bait station of Figure 2;

Figure 7A is a top view of an insert suitable for use with the bait station of Figure 2; and Figure 7B is a side view of such an insert;

Figure 8 is an exploded perspective view of the components of a locking device for a bait station according to the invention; and

Figure 9 shows a rod suitable for positioning bait within the bait station of Figure 2.

Referring to Figure 1, a prior art bait station consists of an enclosure made up of a lower housing 1 and a lid 2. The lid 2 is flexibly attached to the lower housing by a plastic hinge 3. The lower housing includes two openings 4 which form a passageway 5 therebetween. A feeding compartment 6 is separated from the passageway by a divider 7 which has one central opening 8. Bait is left in the feeding compartment 6 and a mouse or rat enters the feeding compartment 6 via the passageway 5 and the central

opening 8 to eat the bait. A mouse feels safe eating bait in the enclosed feeding compartment 6 and will eat its fill. Before the present invention it was thought that a rat also preferred to eat its food in such an enclosed compartment.

Figure 2 shows a bait station according to the invention, specifically designed for a rat. This bait station consists of an enclosure made up of a lower housing 12 and a lid 13. The lower housing 12 and the lid 13 are moulded separately from polypropylene, and have a thickness of around 1 - 1.5 mm. Making these components separately makes it possible to stack the boxes efficiently prior to assembly. The lid 13 is attached to the lower housing 12 by hinges 14. The plastic around the hinges is thickened to give extra strength.

The lower housing includes two circular openings 15 (only one of which is visible in Figure 2). The openings 15 are positioned such that a rat can see right through the box from one side to the other.

The bait station includes a feeding area 16 in which a poisoned bait may be located. This is preferably done by threading a solid block bait onto a piece of wire 17, shown in Figure 9, and clipping the wire into one of two sets of slots 34 and 35a,b in the feeding area 16 (See Figure 3). The bait station may receive several baits in its feeding area. Alternatively, if loose grain poisoned bait is used, the box is secured to the floor so that the bait cannot possibly be shaken out of the box.

Located between the openings 15 and the feeding area 16 is a central divider 18, which is removable so that the bait stations may be easily stacked. This divider prevents children or pets reaching into the bait station and obtaining access to the poisoned bait. The divider 18 is so positioned and sufficiently large that it is impossible

to push a probe through either of the openings 15 to reach the bait. In the illustrated example the divider includes a central hole 19, and does not extend to the walls 20 of the lower housing 12. The divider may be formed initially flat, as shown in Figures 7A and 7B, and then be bent before being fitted into place in the bait station.

When feeding, a rat sits in an inner passageway 21 formed by the divider 18, with its head and possibly shoulders extending into the feeding area 16. The rat feels safe in this position because, should it be approached by another rat, it has three possible routes of escape from the bait station. For example, if a second rat should appear in area A (Figure 3) the feeding rat could escape via area C, or through the central hole 19 in the divider 18 to area B. This is in contrast to the prior art bait station of Figure 1 where any rat sitting in the feeding chamber 6 is effectively trapped. If a second rat should approach in area X, there is no escape route for the feeding rat.

The lid 13 includes transparent plates 22a, 22b and 23. Plates 22a and 22b allow an inspector to see whether the bait needs replacing and whether there is a rat inside the bait station, without opening the lid. Plate 23 is used for the recording of information. A plain label is placed on the underside of the lid and the top of the lid can be written on and subsequently wiped clean. Thus, information such as when the bait station was last inspected, and by whom, can be recorded on the lid.

The bait station includes two locking mechanisms, one of which is shown in detail in Figure 8. It is important that children cannot open the bait station so the locks must be very difficult to tamper with.

When the bait station is closed by bringing the lid 13 down onto the lower housing 12, two upper lock portions 24

attached to the lid 13 are brought down onto two lower lock portions 25 attached to the lower housing 12.

Each upper lock portion 24 includes four flanges 26, each containing a ramp on its underside producing a step 27 on the inside of the flange. Each lower lock portion includes four teeth 28 of complementary shape to the stepped flanges 26 of the upper lock portion. As the lid 13 of the bait station is closed, each upper lock portion is forced onto its corresponding lower lock portion so that the flanges 26 clip into place with their steps 27 located under the teeth 28.

To open the bait station, a key 29 is inserted into a hole 30 in each upper lock portion 24 and twisted. Because the key includes an oval portion 31, this twisting prises apart the four flanges 26 of each upper lock portion 24 sufficiently that their steps 27 are no longer retained under the teeth 28. The lid 13 can then be lifted to gain access to the inside of the bait station.

Each bait station includes two complete locking mechanisms, each with four co-operating flanges and steps. Thus, to open the bait box without two keys it would be necessary to prize open eight flanges at once. It is extremely difficult to gain access to any of the flanges which are enclosed in lock housings 32, so the bait station is effectively tamper-proof.

The lid 13 of the bait station also fits very closely to the lower housing 12 so that an implement such as a screwdriver cannot be used to prise the lid open.

The bottom of the lower housing 12 includes slits 33 for fixing the bait station to a floor. There may also be slits in the back of the bait station for attaching it to a wall.

CLAIMS

1. A bait station for containing rat poison, the bait station comprising:
 - a housing (12,13);
 - an opening (15) in the housing (12,13);
 - a bait position (16) for locating a bait within the housing (12,13);
 - a divider (18) between the opening (15) and the bait position (16);wherein there are at least two different routes through or around the divider (18) from the bait position (16) to the opening (15).
2. A bait station according to claim 1, wherein there are two openings (15) in the housing (12,13) and a substantially straight path therebetween.
3. A bait station according to claim 2, wherein a single divider (18) separates both the openings (15) from the bait position (16).
4. A bait station according to claim 3, wherein there is a route from the bait position (16) to an opening (15) through a hole (19) in the divider (18).
5. A bait station according to claim 3 or claim 4, wherein there is a route from the bait position (16) to an opening around at least one edge of the divider (18).
6. A bait station according to any preceding claim, wherein the or each divider (18) is transparent.
7. A bait station according to any preceding claim, wherein at least a portion (22,23) of the housing (12,13) is transparent.

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8. A bait station according to claim 7, wherein the transparent portion includes one or more transparent panels (22,23) in an upper part (13) of the housing.

9. A bait station according to any preceding claim, wherein the housing includes a lower portion (12) and a lid (13) pivotally attached to the lower portion (12) so that the lid (12) may pivot between an open and a closed position, and the bait station includes at least one locking device (24) for maintaining the lid (13) in its closed position.

10. A bait station according to claim 9, wherein the locking device (24) includes a plurality of stepped flanges (26) on one of the lid (13) and the lower housing (12) and a plurality of complementary teeth (28) on the other of the lid (13) and the lower housing (12), the flanges (26) engaging the teeth (28) when the lid (13) is in its closed position.

11. A bait station according to claim 10 wherein the flanges (26) may be taken out of engagement with the teeth (28) by the use of a key (29).

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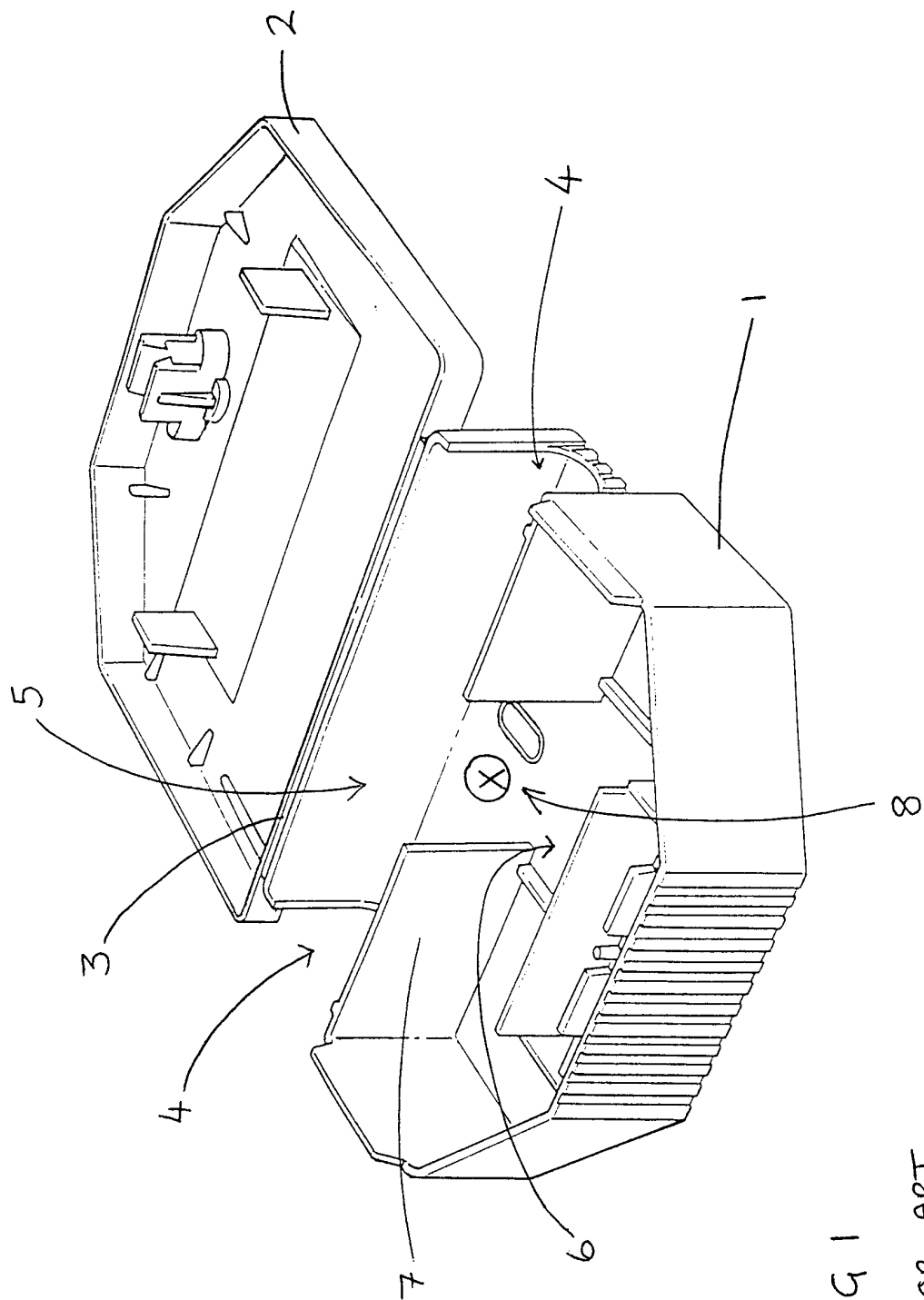


FIG 1
PRIOR ART

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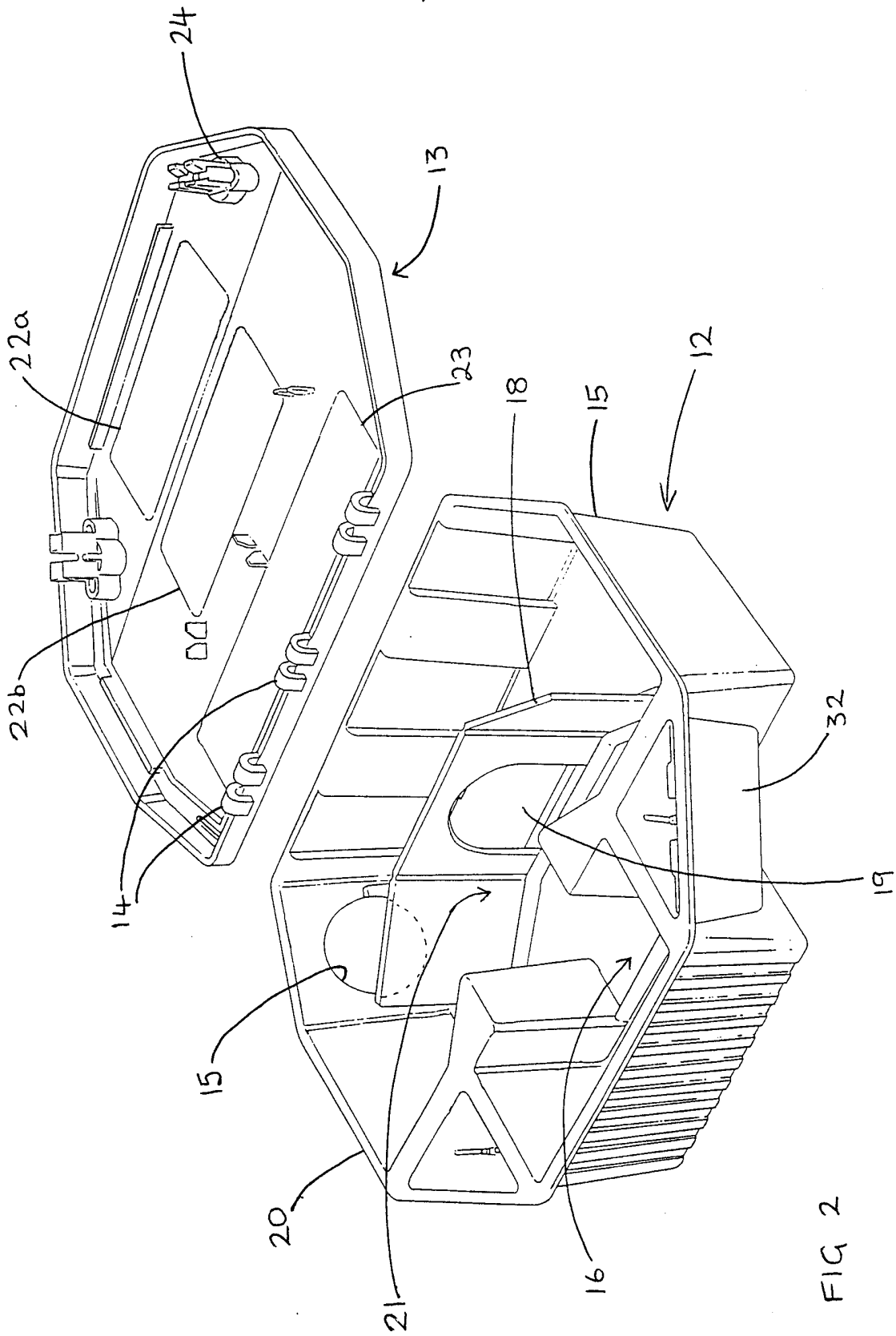
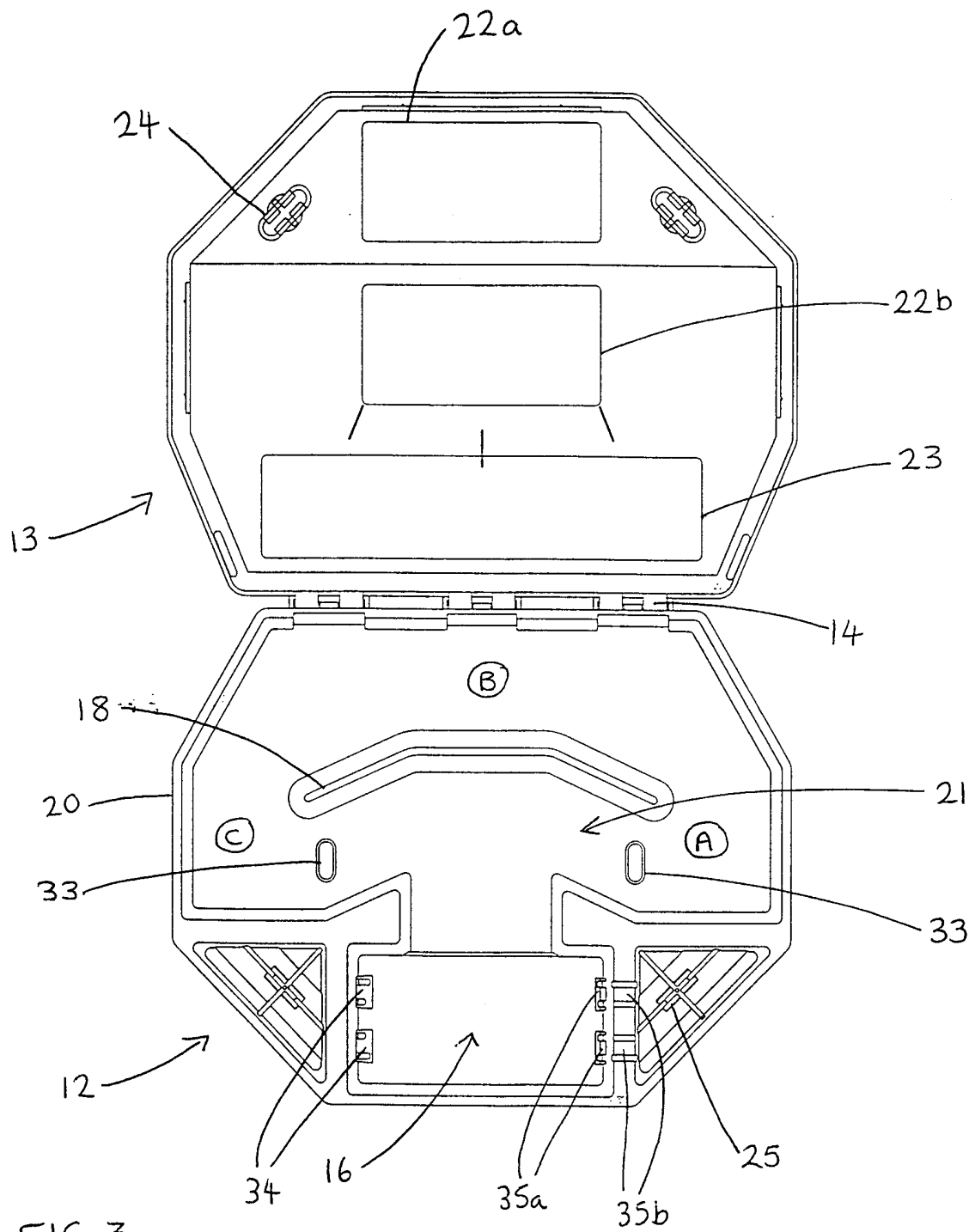


FIG 2

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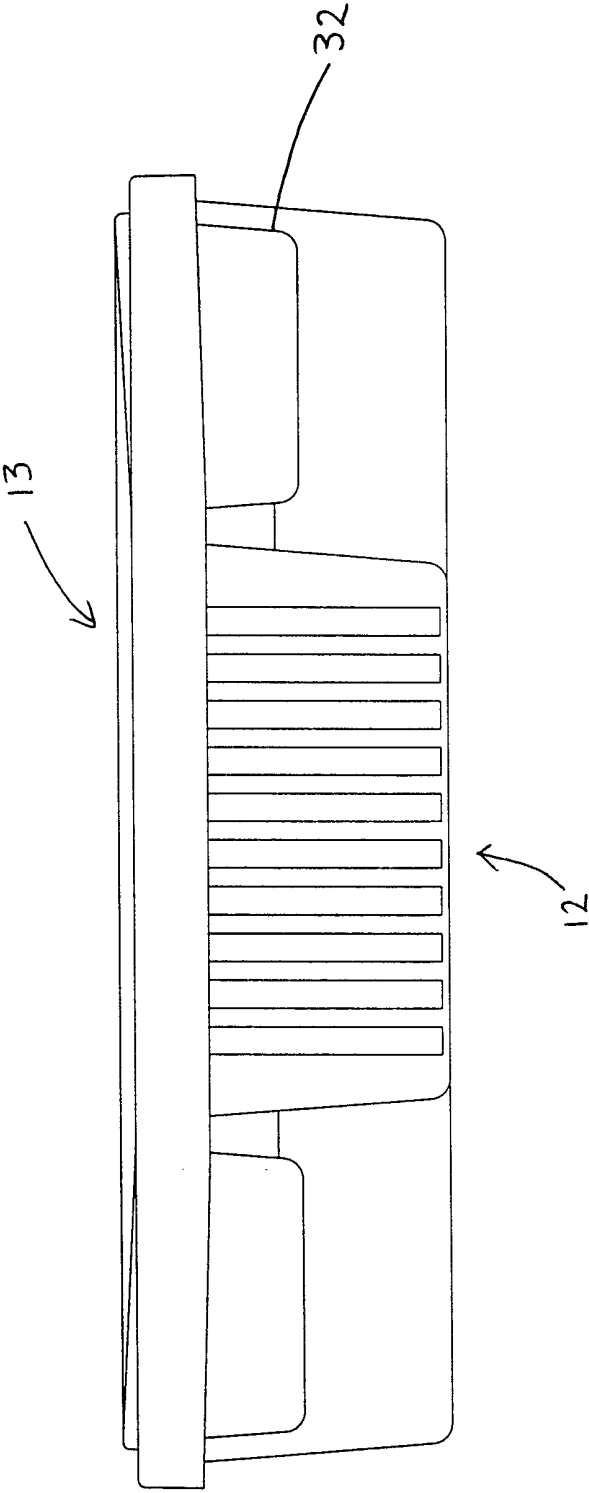
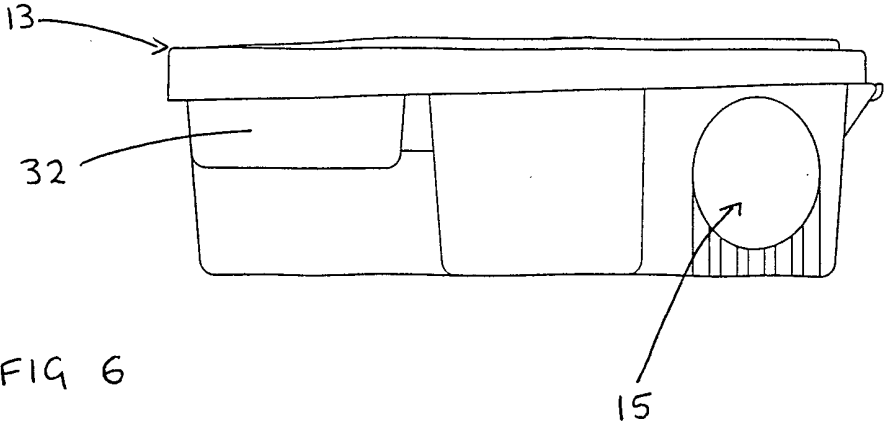
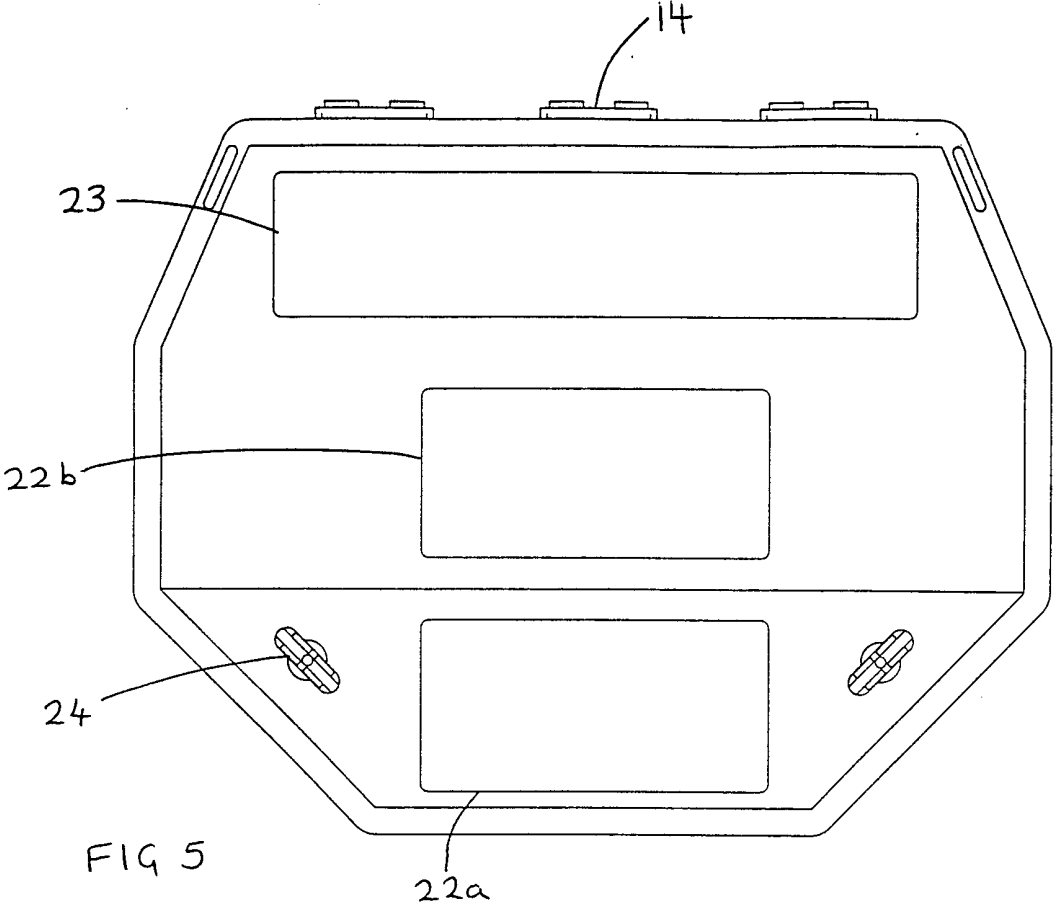


FIG. 4

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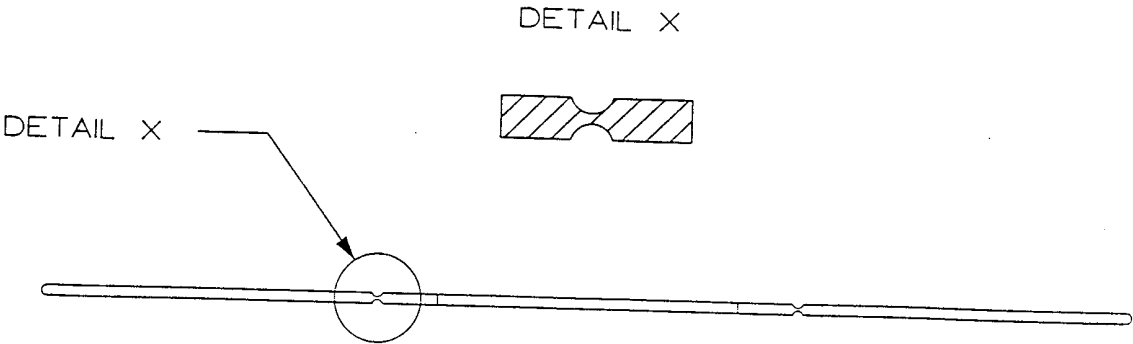


FIG 7A

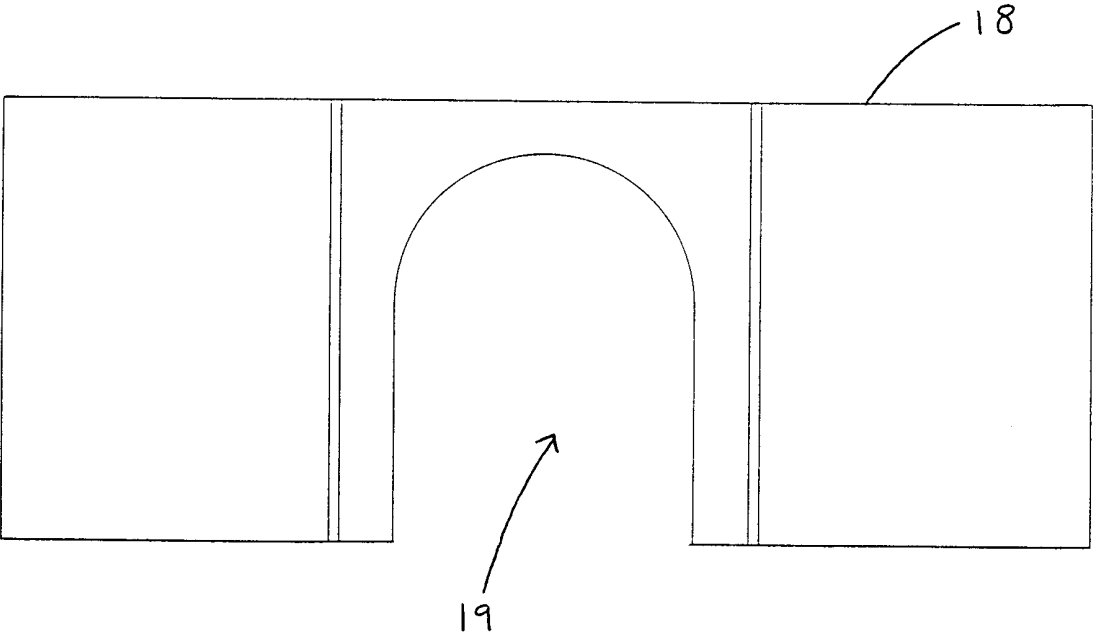


FIG 7B

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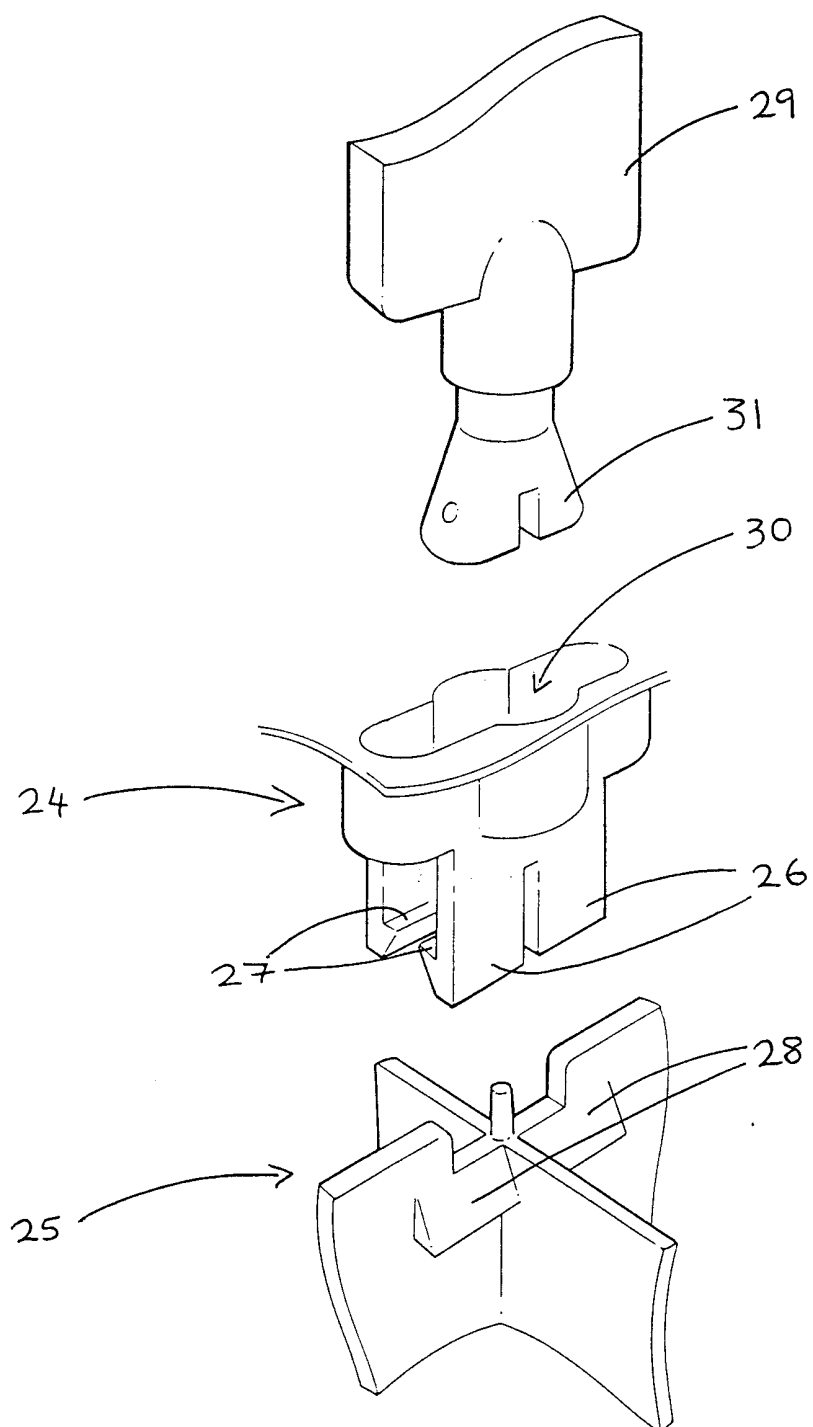


FIG 8

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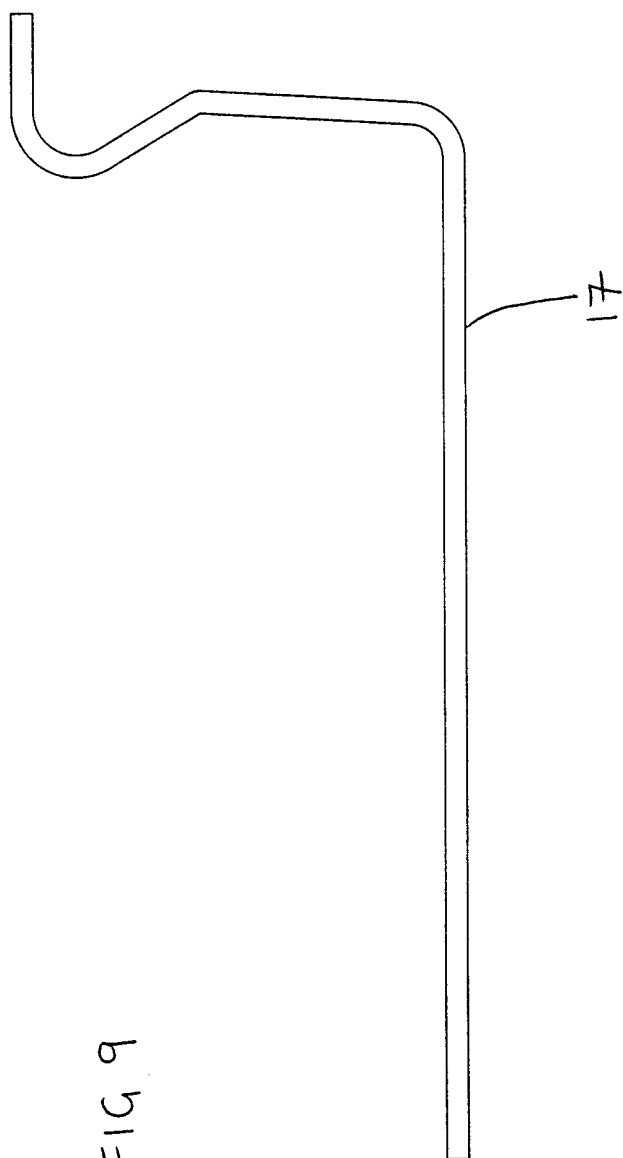


FIG 9

INTERNATIONAL SEARCH REPORT

Int ional Application No

PCT/GB 98/00259

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A01M25/00

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)

IPC 6 A01M

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 448 852 A (SPRAGINS CISSE W ET AL) 12 September 1995	1,9-11
A	see column 1, line 50 - column 2, line 21 see column 3, line 4 - column 5, line 25 see claims; figures ---	2,3,5
X	US 5 272 832 A (MARSHALL EDWARD F ET AL) 28 December 1993	1,9
A	see column 1, line 55 - column 2, line 16 see column 2, line 43 - column 4, line 7 see claims; figures ---	2-5,10, 11
A	US 4 031 653 A (JORDAN CARMEL T) 28 June 1977 see column 1, line 52 - column 2, line 26 see claims; figures ---	1,7
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

21 April 1998

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 94 22297 A (CLOROX CO) 13 October 1994 see claims; figures -----	1,2

INTERNATIONAL SEARCH REPORT

Information on patent family members

In. tional Application No

PCT/GB 98/00259

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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WO 9422297 A	13-10-94	AU 6399994 A	24-10-94