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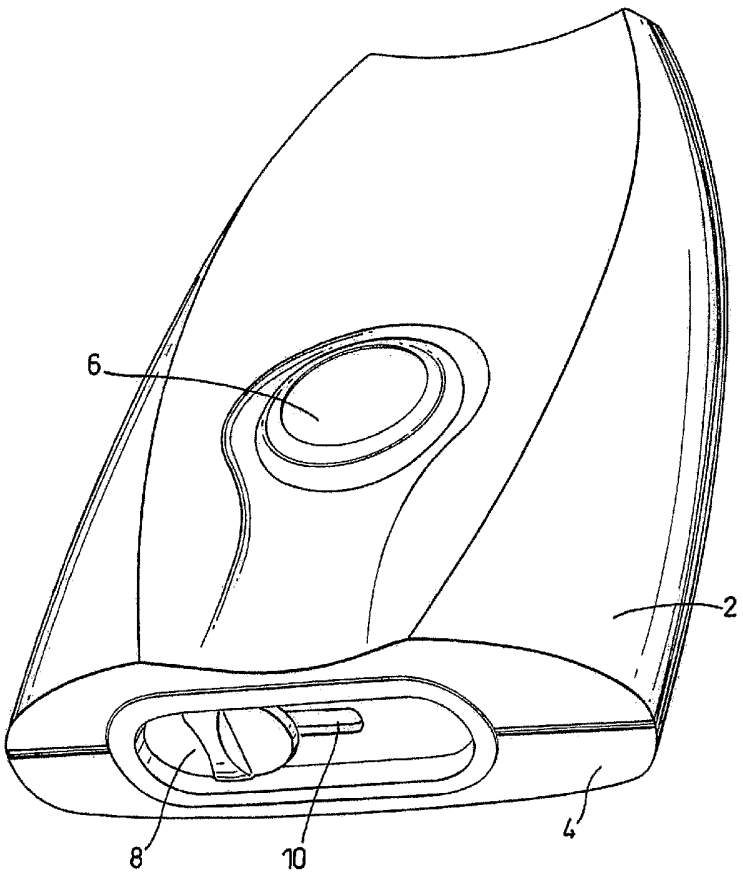

(57) Abstract: A tablet dispenser comprises two shell-halves (2, 4) embracing a carousel holder having tablets on both of its sides. An actuator (6) is openable to move the carousel stepwise and to advance, and dispense, tablets through an outlet (10). The tablets advance along tracks and are positively retained therein so as not to rattle.

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DISPENSER

This invention relates to a dispenser, in particular to a tablet dispenser.

Tablet dispensers able to dispense tablets one-by-one under the control of a user are known. Many such dispensers employ a blister pack of tablets. Others contain naked tablets, and are less wasteful in terms of packaging, but more prone to rattling, and to problems of jamming due to the difficulty in controlling the position of advancing tablets.

According to a first aspect of the invention there is provided a tablet dispenser comprising:

a tablet carousel having a plurality of seatings for tablets;

a wall element in spaced relation to the carousel, the carousel and the wall element together defining a guideway for tablets, leading to an outlet from the dispenser, wherein tablets on the guideway are in contact with both the carousel and the wall element and are thereby restrained until released;

an actuator which when depressed causes the carousel to turn, releasing a tablet through the outlet; and

resilient means which raises the actuator, once the actuator has been released.

Preferably the inside of the dispenser is sealed from the external atmosphere, when purchased. The dispenser may be filled with an inert gas or contain a desiccant, when purchased.

Preferably the seatings of the carousel comprise an annular array. Preferably the seatings are such as to prevent tablets moving relative to the carousel in the forwards, rearwards or inwards direction, but not in the outwards direction. Preferably the seatings are cupped, but present no obstruction on their outer side. On their outer side they preferably lead to a downward tab, or ramp. However the outwards movement of a tablet is preferably obstructed by another part of the tablet dispenser, until it reaches the tablet dispensing position.

The carousel could have seatings for tablets on one side (i.e. face) only. Preferably, however, the carousel has seatings for tablets on both sides.

Thus, the carousel preferably has an annular array of seatings for tablets, on both sides. Preferably there are seatings for tablets on one side of the carousel are displaced from the seatings for tablets on the other side, in the circumferential direction. Preferably the seatings on each side of the carousel are mid-way between the seatings on the other side.

Preferably the guideway has a ring-shaped part, aligned with the carousel, and a spur leading from the ring-shaped part to the outlet. Suitably, therefore, the guideway may

resemble the number "6", albeit with the spur being short, in some embodiments.

When the carousel has tablets on both sides there are in effect two guideways, defined in part by respective sides of the carousel and respective wall elements, leading to a region where there is a common guideway which leads to the outlet. In a preferred embodiment each guideway is as defined above; the two guideways may resemble two numbers "6" superimposed, having separate ring-shaped parts but a common spur leading from the ring-shaped parts to the outlet.

Preferably the tablets in the carousel are engaged between the carousel and the wall element(s) in such a way that they do not rattle, but they can slide along the guideway(s) when the actuator is operated.

Preferably the dispenser has a carousel holder inside it. The carousel may be located between a wall of the carousel holder and a wall of the dispenser. The carousel preferably has a hub, and the carousel holder and the wall preferably define seatings for the ends of the hub. Preferably the spacing of the carousel and the carousel holder, and of the carousel and the wall, are such that tablets on the carousel are engaged therebetween, firmly enough not to rattle but not so firmly that, in use, the carousel is restrained from rotary movement or the tablets are inhibited from sliding along the guideways on operation of the actuator.

The carousel holder is preferably an internal part of the dispenser. Suitably it engages with one wall of the

dispenser, thereby entrapping the carousel, and is then covered by a second wall of the dispenser; the first and second walls being two external shell-halves of the dispenser. Preferably those shell-halves sealingly engage together.

The tablet dispenser may have means to show the number of tablets dispensed, or the number remaining; for example a counter. Preferably the carousel has indicia and a wall of the tablet dispenser has a window for viewing of indicia.

In one preferred embodiment the indicia are numbers. However other indicia could be used. For example the indicia could be successive lines or bars, reducing in length. The window could be slot-shaped so that the visual impression, as the carousel rotated and tablets were dispensed, was of a bar or line which reduced in length (like a falling thermometer).

In another embodiment part of the carousel may be different in appearance from the rest of the carousel. The part of the carousel different in appearance will generally be the one associated with the last few tablets to be dispensed. It might, for example, simply be different in colour. The user will see that the dispenser is almost exhausted by the fact that the colour seen through the window has changed - for example it may have become red.

Preferably the indicia are all carried on one side of the carousel, and there is only one window, even when tablets are carried on both sides of the carousel. If each tablet

seating on one side of the carousel is associated with one of the indicia and there are no further indicia, the indicia will only indicate pairs of tablets. For example when the indicia are numbers they will be numbers in a series 2, 4, 6... etc. Preferably, however, each seating is associated with one of the indicia. One way of achieving this is to provide lands for marking the first series of indicia (for example odd or even) in radial alignment with seatings, and further lands for indicating a second series of the remaining indicia (for example even or odd) between seatings.

Preferably, the lands for the first series of indicia are provided by the aforementioned downward tabs, or ramps.

Preferably the tablets in the tablet dispenser are naked; preferably they are not pre-packaged using e.g. blister packaging.

As described, the cavity for the carousel may be provided by the carousel holder and a wall or shell-half of the tablet dispenser. In another embodiment the carousel holder could by itself provide the cavity, having two wall parts which engage together around the carousel. The carousel holder can then be handled and moved, and assembled with the other parts of the tablet dispenser.

Preferably the actuator is in the form of a button carrying teeth which engage with teeth on the carousel, the arrangement being such that depression of the button causes the carousel to turn. Suitably the button is aligned with an opening in the centre of the carousel holder and with the hub of the carousel, and the teeth of

the actuator pass through the opening and into the region of the hub, to engage with the teeth of the carousel. Preferably the button returns to its starting position under a resilient force.

Preferably, also, release of the button such that it returns to its rest position also causes the carousel to advance, and attain the correct position for the next occasion of use. As the carousel moves from one starting position to the next starting position it preferably releases a tablet, which falls through the outlet. Preferably the tablet is thus released during the phase of movement of the carousel caused by the release of the button.

One wall of the tablet dispenser may have an upstanding boss which projects through the carousel and the carousel holder. Suitably it has cut-outs aligned with the teeth on the button, so as not to obstruct their movement; and preferably to guide the movement of the button.

Preferably, therefore, the carousel has one ring of teeth facing towards the button, engagable with first teeth carried by the button; and a second ring of teeth facing away from the button, engagable with further teeth carried by the button. Such further teeth are preferably carried on legs which pass through the central opening of the carousel. Preferably when the button is depressed the first teeth on the button engage the first ring of teeth on the carousel to advance it. When the button is released and moves back to its starting position those teeth disengage but the teeth carried on legs engage with

the teeth of the second ring of the carousel, to cause the second phase of movement.

In another embodiment the button has an annular skirt projecting from it, so that it is cup-shaped, having first teeth adjacent to the proximal end of the annular skirt, and second teeth, adjacent to the distal end of the annular skirt. Preferably when the button is depressed the first teeth on the button engage the first ring of teeth on the carousel to advance it, to cause the first phase of movement. When the button is released and moves back to its starting position those teeth disengage but the second teeth on the button engage with the second ring of teeth on the carousel, to cause the second phase of movement.

The resilient means may comprise a tapering (e.g. conical) prong on one part and an array of prongs or legs on the other part, for example 3 or 4 in number, which define a space into which the conical prong advances when the actuator is depressed, but with progressive elastic displacement of the array of prongs. One part is the button, the array of prongs being carried on its underside. The other part is preferably a wall (or shell-half) of the tablet dispenser. When the button is released the array of prongs relaxes and raises the conical prong and thus the button.

In another embodiment in which the button has an annular skirt (as described above) the resilient means comprises a plurality of ramps declining in the distal direction (preferably 3 or 4) of the skirt and carried within the skirt; and an equal plurality of legs or prongs carried by

the inner face of one wall of the tablet dispenser. When the button us depressed the legs or prongs are displaced by the advancement of the ramps, and the displacement gives rise to a restorative force, acting to return the button to its starting position. Preferably the legs or prongs are C- or U-shaped in cross-section, so as to embrace, and guide, the ramps.

Preferably the button can be located in one orientation only, in the tablet dispenser. For example it may have only one unique shape feature; for example a flat portion, or a cut-out or a projection, co-operating with a complementary shape feature of its seating within the tablet dispenser.

Preferably the outlet has a closure. Preferably the closure is a sliding closure. Preferably the sliding closure may only be slid to open the tablet dispenser following a releasing step, by means of which the sliding closure is freed, to permit it to be slid. Preferably the releasing step comprises configuring or displacing the closure to permit it to be slid. In one preferred embodiment the sliding closure comprises two limbs connected together at one end, and in their rest position splayed apart to a greater or lesser degree (the angle of separation preferably not exceeding 20°, however). They must be pressed together for the closure to be slid.

Preferably the closure has a locking lug which obstructs a part of the carousel, only when the closure is closed, so that the carousel cannot then turn. The carousel can only turn once the closure has been moved to the open position.

Preferably the closure when closed forms a seal over the outlet; at least when the dispenser is purchased.

Preferably the outlet and closure are covered by a peel-off seal, for example a foil, when the dispenser is purchased. Preferably the peel-off seal is readily visible so as to have a tamper-evident function.

In accordance with a second aspect of the present invention there is provided a mechanism for producing stepwise rotary movement from a linear impulse, the mechanism comprising:

a carousel having a first ring of teeth on one side and a second ring of teeth on the other side;

an actuator depressable in a direction orthoganol to the plane of rotation of the carousel to cause rotation of the carousel;

and resilient means to restore the actuator to its starting position once it has been released,

wherein the actuator has first formations on its underside, which first formations act upon the first ring of teeth of the carousel when the actuator is depressed to cause a first rotary movement of the carousel, and second formations carried in spaced relation from the underside of the actuator, which second formations act upon the second ring of teeth of the carousel when the actuator is restored to its starting position to cause a second rotary movement of the carousel, wherein the second rotary

movement of the carousel completes one step of the mechanism.

Preferred features of the second aspect are as defined above in relation to the first aspect.

In one embodiment to load the carousel with tablets, the carousel is assembled as part of the dispenser but without any tablets, and tablets are then fed into it via the outlet, while the carousel is turned in the opposite direction to the direction in which it is turned, in use. Preferably this happens with the actuator not in place. A tool is preferably engaged with the carousel, instead of the actuator. The tool is turned to turn the carousel in said opposite direction, whilst tablets are fed to the carousel via the outlet.

In another embodiment the tablets are set in place before the container is assembled before the first second walls are engaged together. When there is a carousel holder as mentioned above, tablets may be placed on the inside of one wall of the carousel holder - held horizontal - in predetermined positions, and the carousel may be laid onto the carousel holder with the seatings aligned with the tablets. When the carousel has seatings also on its other side tablets may be laid in those seatings. The appropriate wall of the tablet dispenser is then engaged with the first wall, so that the wall of the carousel holder and the all of the tablet dispenser entrap the tablets and the carousel. The carousel holder may now be handled and moved. The other parts of the tablet dispenser may now be engaged.

In accordance with a third aspect of the invention there is provided a method of manufacturing a tablet dispenser by assembly together of parts previously described, wherein the tablet dispenser is charged with tablets either by feeding them into the assembled tablet dispenser through the outlet, or by setting them into a carousel holder of the type described and then closing the carousel holder to entrap the carousel and tablets.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 shows a dispenser in accordance with the invention, assembled, in a perspective view from above;

Figs. 2A-2E show the dispenser of Fig. 1 in an exploded perspective view, looking in a direction from above and from one side;

Figs. 3A-3E show the dispenser of Fig. 1 in an exploded perspective view, looking in a direction from below and from one side;

Fig. 4 shows a second embodiment of tablet dispenser, in a perspective view generally from above;

Fig. 5 shows the carousel of the second embodiment, detached from the rest of the tablet dispenser, in a perspective view generally from above;

Fig. 6 shows the inside of the lower shell-half of the second embodiment, detached from the rest of the tablet dispenser, in a perspective view generally from above;

Figs. 7A-7C are alternative views of the button of the second embodiment;

Figs. 8A, 8B are alternative views of the sliding closure of the second embodiment;

Fig. 9 is a perspective view of the carousel of a third embodiment; and

Fig. 10 is a perspective view of an inner part of a fourth embodiment.

The first embodiment of tablet dispenser has upper and lower shell-halves 2, 4, a rotary tablet-dispensing mechanism provided between them, and an actuator in the form of a button 6 protruding through the wall of upper shell-half 2. At the bottom of the dispenser the two shell-halves together define an outlet for tablets, the outlet having a sliding closure 8 in a slideway 10.

The rotary tablet dispensing mechanism includes a carousel 12 and a carousel holder 14. When assembled the carousel is retained, in a manner permitting rotary movement, between the carousel holder 14 and the lower shell-half 4.

Lower shell-half 4 has on its inside a series of moulded-in formations (Fig. 2E). Notably, it has:

- a guideway, or track, 16 formed by parallel curved spaced-apart edges 18, 20. The guideway is somewhat in the shape of the number "6" albeit having a short spur or tail, which leads to the outlet.
- an upstanding boss 22 located in the middle of the guideway (within the "eye" of the number "6"). The boss is constituted by a cylindrical wall formed with three long axial slots 24 extending to the base of the boss, at 120° intervals; and three shorter axial slots 26 between the long axial slots 24 spaced from adjacent long axial slots by 60°, and spaced from each other by 120°.
- outside the boss, a low annular wall 38 and an annular well 40 between the low annular wall 38 and the boss 22.
- a prong 28 upstanding from the inside of the shell-half, inside the boss 22. The prong 28 tapers in the direction away from the lower shell-half 4. It is trigonal in cross-section, being made up of three wall sections set at 120° to each other (as can be seen in Fig. 2E).
- four upstanding turret-like securement pegs 30 just outside the guideway.
- at the top end of the shell-half, two spaced-apart walls 32, 34 and, between them, a storage void 36.

The carousel 12 is generally ring-shaped. It has a central cylindrical opening 42. On each of its sides it has nine seatings 44, for tablets. At the inner region of the carousel (i.e. adjacent to the opening 42) each seating has a cupped shape, but at the outer region of the carousel each seating terminates in a downwardly inclined

tab or ramp 46a, 46b. There are nine seatings for tablets on one side of the carousel in an annular array and nine on the other side in an annular array. The seatings for tablets on one side of the carousel are circumferentially displaced from the seatings on the other side of the carousel, being halfway between them. Consequently the downwardly inclined tabs 46a on the upper side of the carousel are in between the corresponding tabs 46b on the lower side of the carousel (the latter tabs being upwardly-facing when viewed from the upper side of the carousel).

The lower side of the carousel, shown in Fig. 3D, is formed, around the central cylindrical opening 42, with an annular upstanding wall 50. At the base of this wall, and within it, is a ring of upstanding teeth 52, each with a slant upper face. These teeth 52 are spaced apart from each other by the width of one tooth. On the other side of the carousel, adjacent to the ring of teeth 52, is a second ring of teeth 54 identical to the ring of teeth 52, but circumferentially displaced from them by one tooth-width. This displacement can be seen in Figs. 2D and 3D.

The carousel holder shown in Figs. 2C and 3C contains said outlet, which is sealed with a peel-off foil (not shown) at the time of purchase. The carousel holder has a smooth guideway, or track, 56 leading to it. It has a central cylindrical opening 58. On its outside it has four lugs 60 each having a pair of securement eyes 62. The carousel holder 14 is of sufficient size to entrap a carousel 12 against the lower shell-half 4.

The carousel holder 14 is moulded with the slideway 10. In the slideway is secured the sliding closure 8. The sliding closure 8 has a first portion 63 generally in the plane of the slideway and a second portion in the form of a locking lug 64, projecting orthogonally from the first portion. This locking lug 64 projects into the edge region of carousel holder 14, between an adjacent pair of tabs 46a, 46b.

The button 6 is shown in Figs. 2B and 3B. It has a cap 65 which carries on its inside three legs 66, spaced from each other by an interval of 120°. Each leg has an outwardly-extending foot 68 having a slant leading face 70. Inwardly of the legs 66 there are three prongs 72 which together define a space to receive the tapering prong 28 carried by lower shell-half 4.

The cap 65 of the button 6 has on its rim facing the lower shell-half 4 three teeth 74 spaced at 120° from each other. Each tooth 74 has a slant leading face 76.

Upper shell-half 2 has a cylindrical opening 78 similar in size to the opening 58. Around the cylindrical opening 78 are two short cylindrical walls 80, 82, between which is defined an annular space 84. Generally around this region there are provided four turret-like securement pegs 86.

The upper region of the shell-half 2 is generally open but the wall is formed with four parallel stiffening walls 87.

The assembly of the device will now be described.

Lower shell-half 4 is placed with its inside wall facing upwards, and the carousel 12 is placed on it, with the central cylindrical opening 42 around the boss 22. The annular upstanding wall 50 is thereby located against the inside wall of the shell-half 4, inside the annular well 40. In this position the carousel can be rotated freely about the boss. At this point no tablets are present.

The carousel holder 14 is then located over the carousel and the turret-like securement pegs 30 snap within one of the securement eyes 62, of each of the lugs 60. The edge of the carousel holder sealingly engage against the inside wall of the shell-half 4.

At this stage the carousel is loaded with tablets, fed into it through the opening. The carousel is turned in the opposite direction to the direction in which it is turned in use. This is achieved by a tool (not shown) which is inserted through the central cylindrical opening 58 in the carousel holder. The tool engages the carousel directly and turns it under the action of a stepper motor, until the requisite number of tablets (18 in this embodiment) have been loaded into the carousel.

Next, the actuator button is engaged. This is done with the legs 66 aligned with the long axial slots 24. The teeth 74 are aligned with the shorter axial slots 26. The button is pressed into place; the legs 66 flex inwards to allow this to happen. Once they have got past the teeth 52, 54 on the carousel 12 they relax and keep the button in position. When engaged, the teeth 74 on the cap 65 of the button 6 are in proximity to the upper ring of teeth 54 on the carousel. Also, in this position the tapering

prong 28 is in the space between the prongs 72 of the button 6. The prongs are thereby flexed outwards. As a result of this elastic displacement and the tapering shape of the prong 28 there is a resulting force which urges the button upwards.

The next step of the assembly is to engage the upper shell-half 2. This is pressed into place. The turret-like securement pegs 86 engage in the available securement eye 62 of each of the lugs 60. Further such parts interengage, as shown in the drawings, and need not be described further here.

The operation of the dispenser will now be described.

At the start the closure 8 is in its closed position. Not only is the slideway 10 closed, but the locking lug 64 is engaged with one of the downwardly-inclined tabs 46a, 46b of the carousel, preventing its rotation. Sliding the closure to the open position disengages the locking lug 64 from the tab and allows the carousel to be turned. The button is pressed and the teeth 74 engage with the ring of teeth 54 and advance the carousel. As the carousel turns it draws with it the tablets; this is a consequence of the cupped shape of the seatings 44. When the button is released the carousel is urged upwards by the action of the prong 28 in the prongs 72 and the feet 68 of the button engage the other ring of teeth 52 to advance the carousel, to a position in which a tablet can leave the carousel and fall through the opening.

Simultaneously, the teeth 74 disengage from the ring of teeth 54. The carousel is now in the correct position for

the next dispensing operation. Using both the downward motion and the return motion of the button to advance the carousel by one index step of movement has the benefit that the movement of the button is more compact, than would be the case if only the downward motion advanced the carousel by one index step of movement.

The void 36 is used to store a leaflet giving usage and safety instructions.

An alternative assembly method is to put the carousel holder in a horizontal position, guideway facing upwards. Tablets (8 in this embodiment) are laid onto it in predetermined positions. The carousel is then placed over the tablets; the seatings and tablets coincide. The exposed, upward-facing side of the carousel is then charged with 8 more tablets, placed in the seatings. The appropriate wall (shell-half) of the tablet dispenser is then engaged onto the carousel holder. This sub-unit may if needed be moved for assembly of the remaining parts, the button and the other shell-half.

A second embodiment is shown in Figs. 4-8B. This differs from the first embodiment in three respects:

- it has a tablet counter (Figs. 4 and 5)

- it has different resilient means acting on the button (Figs. 6-7C)

- it has a different sliding closure (Figs. 8A-8B).

In this second embodiment the tablet counter comprises indicia in the form of numbers 0, 1, 2, 3, …….16. Odd numbers 1, 3, 5…. 15 are carried on lands, constituted by the upper surfaces of tabs 100, which are radial outward extensions of the seatings 102 on the upper side of the carousel. Even numbers are provided on smaller lands 104 provided between the seatings 102. Thus the lands for the odd numbers are slightly displaced from the tabs for the even numbers, in the radial direction. A viewing window 106 is provided in the upper shell-half 108 of the tablet dispenser. This can be seen in Fig. 4. The window 106 is somewhat slot-shaped, to allow for the slight radial displacement of the odd and the even numbers.

Having regard to the direction of movement of the carousel in use, it will be seen from Fig. 5 that the numbers are arranged to count down from 16, thereby showing the user the number of tablets left in the pack.

The numbers are marked with a strongly contrasting tone to the rest of the carousel, in order to be readily legible through the window. For example they may be black, or a strong red colour, against a pale (e.g. grey or white) carousel.

In an alternative the tablet counter may comprise only number markings 0, 2, 4, 6, 8, 10 and 12 on the tabs 100. When two tablets have been dispensed the number "14" appears in the window; when two more tablets are dispensed the number "12" appears; and so on.

In another alternative either of the sets of lands are marked with bars, and on successive lands the bars are of

diminishing size. Through a slot-shaped window, the user sees a falling bar, and is given an indication when the pack is soon to be exhausted.

In yet another alternative, the carousel has a different colour in the region of the seatings leading up to the final tablet seating. For example it may be red. When the user sees the red colour through the window, he or she knows that the pack is soon to be exhausted. Typically, when the different colour becomes visible there may be 2-6 tablets left.

Considering now the second difference in this second embodiment, the resilient means, this difference arises from a different arrangement as between the button 108 and the lower shell-half 110. The lower shell-half 110 comprises four legs 112. Each leg is spaced from its adjacent legs by 90°. Each leg is C-shaped in cross-section, with the groove of each leg facing outwards. The button 108 has an annular skirt 114. Within the skirt, carried on its inside wall, are four ramps 116. Each ramp is spaced from its adjacent ramps by 90°. The ramps decline as at 118 in the distal direction of the skirt, then terminate in short non-ramped portions 120.

The skirt has a single flat portion 122, to facilitate engagement of the button in its correct, unique, orientation. The button carries four teeth 124 externally of, and at the proximal end of, the skirt, performing the same function as the teeth 74 of the first embodiment. The button carries two teeth 126 externally of, and at the distal end of, the skirt, performing the same function as the three feet 68 of the first embodiment. When the

button is engaged in place the ramps 116 are engaged with the legs 112, being located in fact within the grooves of the legs. When the button is depressed the legs are deflected inwards by the ramps. The plastics material of the legs is resilient and an elastic restorative force arises, so that when the button is released it is pushed upwards, back to its starting position.

The sliding closure in the second embodiment differs from that of the first embodiment in that a force must be applied to the sliding closure, orthogonal to the direction of sliding, before sliding can be effected. Preferably this force allows an obstruction as between the sliding closure and adjoining structure of the pack to be cleared. Once the obstruction has been passed the force can be released and sliding movement still continued.

The sliding closure 128 of this second embodiment comprises a first part 130 which includes a locking lug 132, analogous to parts 63 and 64 of the first embodiment. However it also includes a second part 134 connected to the first part end-to-end by a bridge piece 136. The closure can only be slid when the second part 134 is depressed. During sliding movement the lateral edges of the first part 130 are guided within opposed grooves formed in the base of the pack, between the carousel holder and the respective shell-half; and the lateral edges of the second part 134 are guided within opposed grooves formed in the base of the pack, between the carousel holder and the respective shell-half. The first part 130 is unobstructed and could undergo sliding movement within the pair of opposed grooves which receive its lateral edges. However the second part 134 could only

do the same within the pair of grooves which guide its lateral edges, once a part 138 which it carries at its distal end is moved out of abutment with adjoining structure of the pack. The part 138 projects towards the first part 130. It has a neck 140 and, on top of the neck, a head 142. The head 142 has portions which project beyond the lateral limits of the neck 140; in other words the head 142 is wider than the neck 140. One of the projections is shown in Fig. 8B as 144. There is an identical projection on the other side.

It is these projections 144 which serve as the obstructions. When the second part is pressed downwards, towards the third part, the obstructions are disengaged and the sliding closure can be slid, to open the tablet dispenser for use. There are no obstructions to sliding the sliding closure back into its closed position.

It will be seen from Figs. 8A and 8B that the second part of the sliding closure has a ridge 146, generally in the distal region of the second part 134 but not right at the distal end itself. The purpose of the ridge 146 is to cause the user to press the first part in a way which will allow opening, at least for an adult. Provision of the ridge 146 somewhat set back from the distal end itself, means that the force needed to deflect the second part sufficiently for opening is achievable by an adult, but not by a child.

It will be seen in Fig. 6 that the tracks which form the guideway are incomplete; they terminate in flats or lands to each side of the central region (which has the legs

112). It is found that close packing of tablets is thereby facilitated, whilst guidance of the tablets is unimpaired.

In other respects the second embodiment is the same as the first embodiment and in such respects the description of the first embodiment given above applies also to the second embodiment.

Fig. 9 shows the carousel of the third embodiment. The teeth within the hub are not shown. The carousel again has tablet seatings 200, 202, on both sides but it will be seen that there are only four tablet seatings on each side. Consequently the tablet seatings on each side of the carousel are spaced at 90° intervals, and there are large lands 204 between them. In this embodiment a tablet counter is provided in a simple way, by providing two numbers on each land, one at each end thereof. The numbers are equiangularly spaced so that there is the correct progression of numbers, 8, 7….1, 0. In this embodiment the arrangement of teeth at the hub of the carousel is not shown. However this is the same in principle as that shown with reference to the first embodiment, but with the arrangement being such as to cause 45° of rotation, on each operation of the button.

Fig. 10 shows an inner carousel holder (the part not formed by a shell-half of the tablet dispenser). It is similar to the part shown in Fig. 3C but has a head part 210 projecting from it, projecting from its end opposite to the outlet of the tablet dispenser. The head part has a main wall 212 and side walls 214, 216 but no front wall. The main wall has resilient plastic tangs 218, 220. In the assembled dispenser the main wall, side walls and the

opposed wall of the facing shell-half form a storage void for a PIL (Product Information Leaflet), the tangs helping to retain the PIL.

A further embodiment (not shown) differs from the first embodiment only in that the carousel holder has two walls or shell-halves, and surrounds the carousel. The carousel, carousel holder and tablets are a unit which is fitted between the shell-halves of the dispenser, by peg and eye fixings such as those described above. To charge the carousel with tablets one wall of the carousel holder is kept in a horizontal position and tablets (8 in this embodiment) are laid onto it in predetermined positions. The carousel is then placed over the tablets; the seatings and tablets coincide. The exposed side of the carousel is then charged with tablets (8 more) and the second wall engaged with the first wall, such that the contacting edges form a seal.

CLAIMS

1. A tablet dispenser comprising:

a tablet carousel having a plurality of seatings for tablets;

a wall element in spaced relation to the carousel, the carousel and the wall element together defining a guideway for tablets, leading to an outlet from the dispenser, wherein tablets on the guideway are in contact with both the carousel and the wall element and are thereby restrained until released;

an actuator which when depressed causes the carousel to turn, releasing a tablet through the outlet; and

resilient means which raises the actuator, once the actuator has been released.

2. A tablet dispenser as claimed in claim 1, wherein the carousel has a first ring of teeth on one side and a second ring of teeth on the other side and wherein the actuator has first formations on its underside, which first formations act upon the first ring of teeth of the carousel when the actuator is depressed to cause a first rotary movement of the carousel, and second formations carried in spaced relation from the underside of the actuator, which second formations act upon the second ring of teeth of the carousel when the actuator is restored to its starting position to cause a second rotary movement of

the carousel, wherein the second rotary movement of the carousel completes one step of the mechanism.

3. A tablet dispenser as claimed in claim 1 or 2, wherein the carousel has seatings for tablets on both of its sides.

4. A tablet dispenser as claimed in claim 3, wherein the seatings on one side of the carousel are displaced from the seatings on the other side, in the circumferential direction.

5. A tablet dispenser as claimed in any preceding claim, wherein the tablets in the tablet dispenser are naked.

6. A tablet dispenser as claimed in any preceding claim, wherein the tablet dispenser contains a carousel holder which holds the carousel captive, the carousel holder either having two walls which engage together about the carousel, or one wall which engages onto a wall of the dispenser, about the carousel.

7. A tablet dispenser as claimed in any preceding claim, wherein the tablet dispenser has an outlet with a sliding closure, the sliding closure having means for configuring or displacing the sliding closure to permit it to be slid open.

8. A tablet dispenser as claimed in any preceding claim, wherein the tablet dispenser has an outlet with a closure which has a locking lug which obstructs part of the carousel only when the closure is closed, so that the carousel cannot then turn.

9. A tablet dispenser as claimed in any preceding claim, wherein the resilient means comprises a tapering prong or ramp on one part and an array of legs or prongs on the other part, which define a space into which the tapering prong or ramp advances when the actuator is depressed, causing elastic displacement of the array of legs or prongs.

10. A tablet dispenser as claimed in any preceding claim, wherein the resilient means comprises an actuator in the form of a button with a skirt projecting from it, the skirt having within it a plurality of ramps declining in the distal direction of the skirt and an equal plurality of legs or prongs carried on the inside face of one wall of the tablet dispenser, wherein when the button is depressed the legs or prongs are displaced, and the displacement gives rise to a restorative force, acting to return the button to its starting position.

11. A mechanism for producing stepwise rotary movement from a linear impulse, the mechanism comprising:

a carousel having a first ring of teeth on one side and a second ring of teeth on the other side;

an actuator depressable in a direction orthoganol to the plane of rotation of the carousel to cause rotation of the carousel;

and resilient means to restore the actuator to its starting position once it has been released,

wherein the actuator has first formations on its underside, which first formations act upon the first ring of teeth of the carousel when the actuator is depressed to cause a first rotary movement of the carousel, and second formations carried in spaced relation from the underside of the actuator, which second formations act upon the second ring of teeth of the carousel when the actuator is restored to its starting position to cause a second rotary movement of the carousel, wherein the second rotary movement of the carousel completes one step of the mechanism.

12. A method of assembling a tablet dispenser as claimed in any preceding claim, wherein the tablet dispenser is charged with tablets either by feeding them into the assembled tablet dispenser through the outlet, or by setting them into a carousel holder as claimed in claim 6 and then closing the carousel holder to entrap the carousel and tablets.

13. A tablet dispenser or method of assembly substantially as hereinbefore described with particular reference to the drawings.

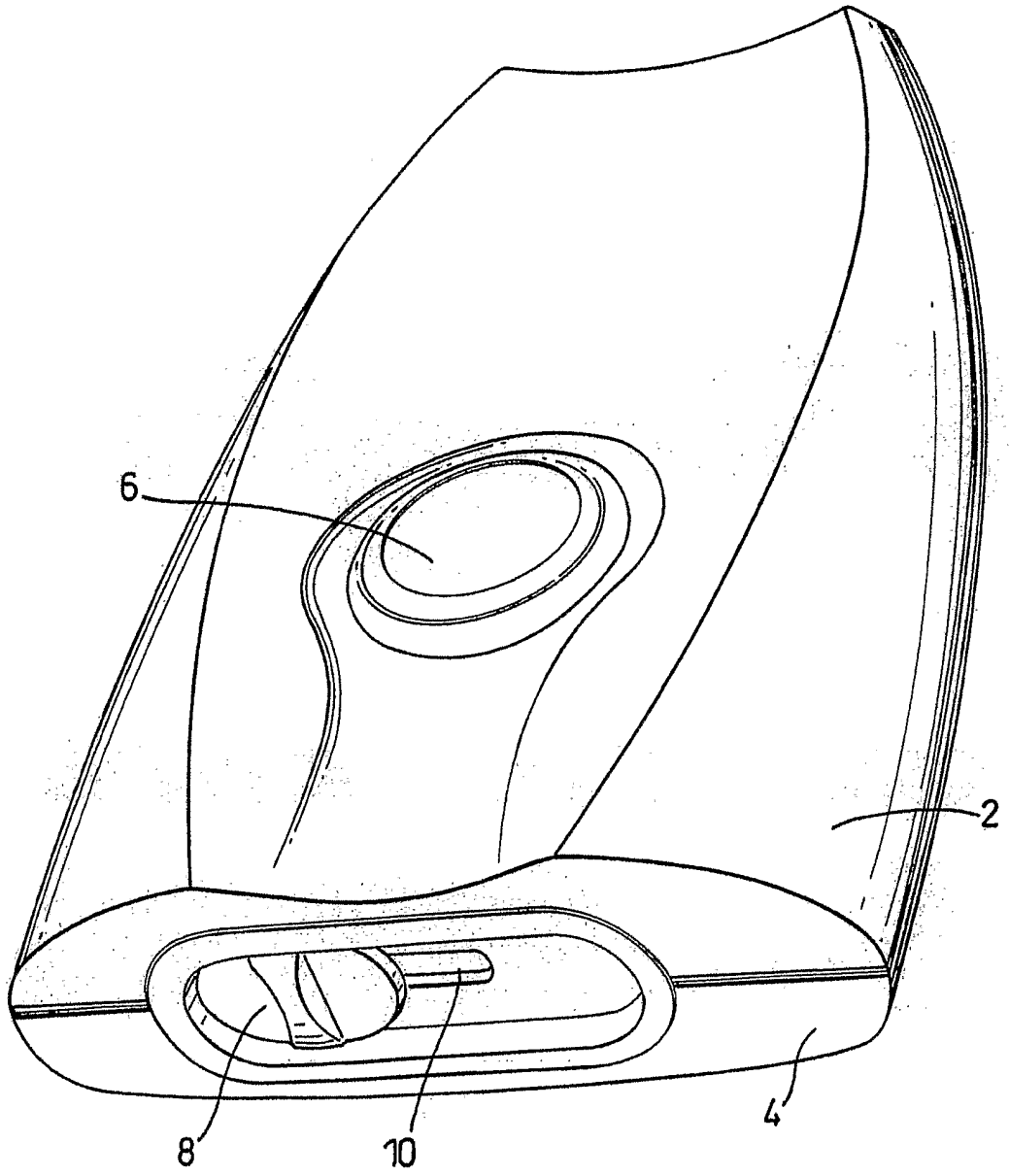

Fig. 1

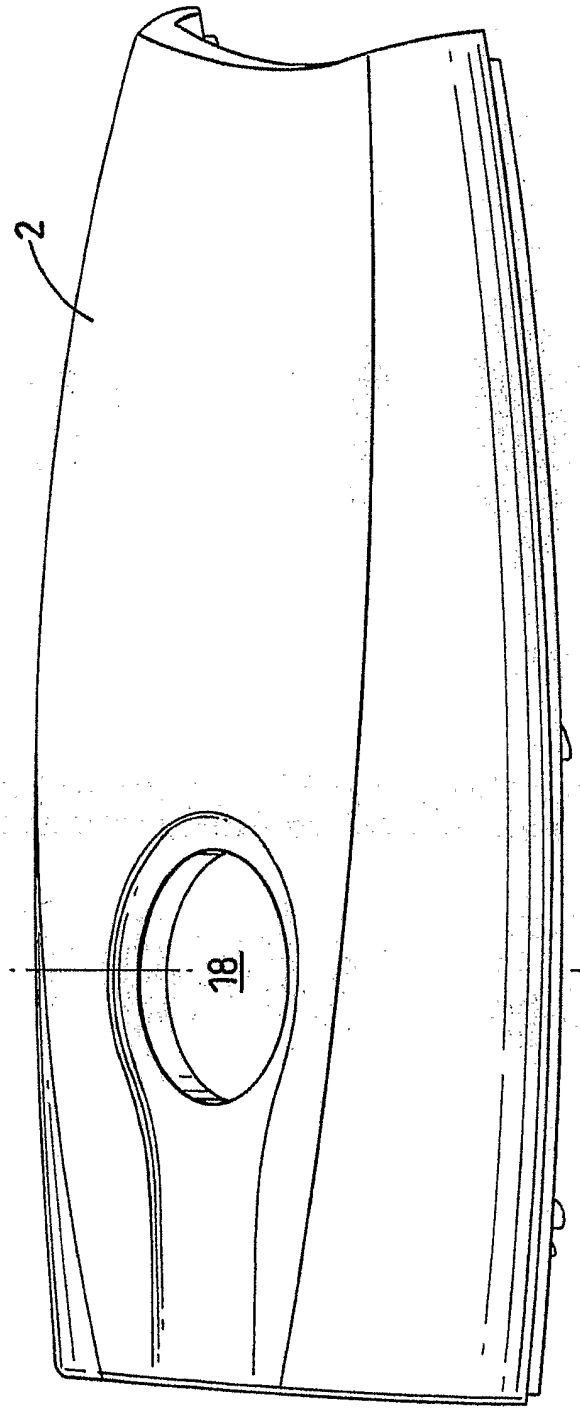

Fig. 2A

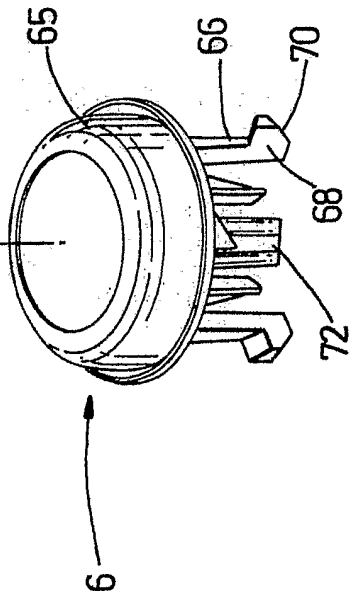

Fig. 2B

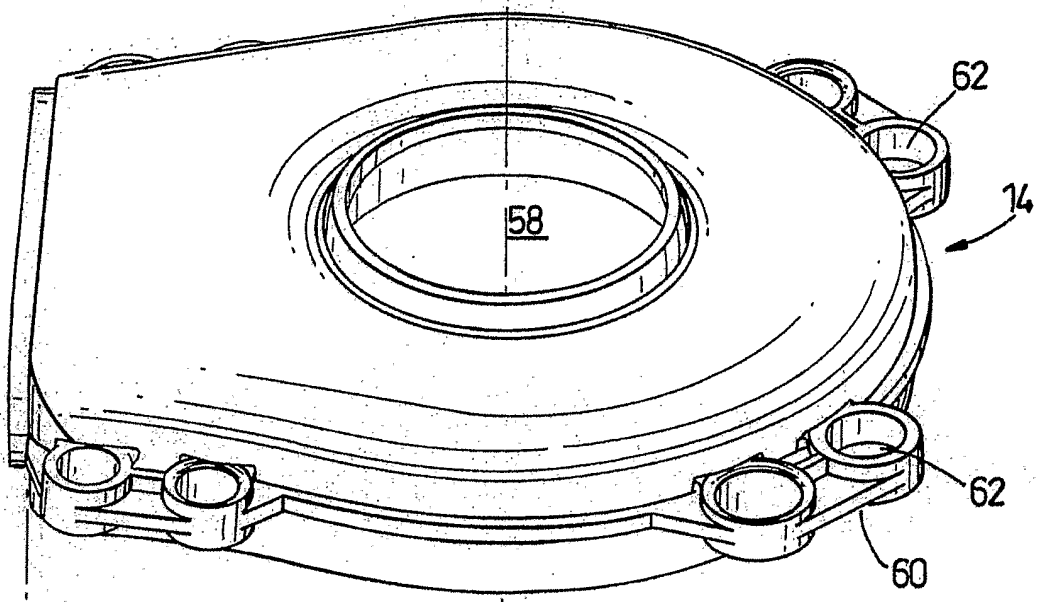

Fig. 2C

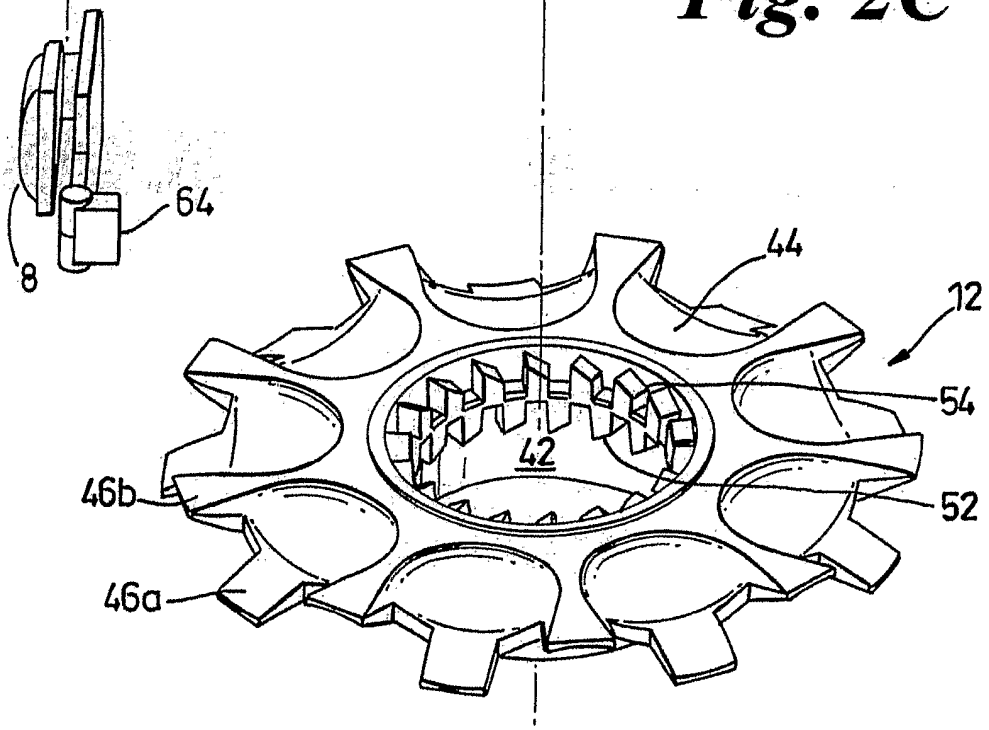

Fig. 2D

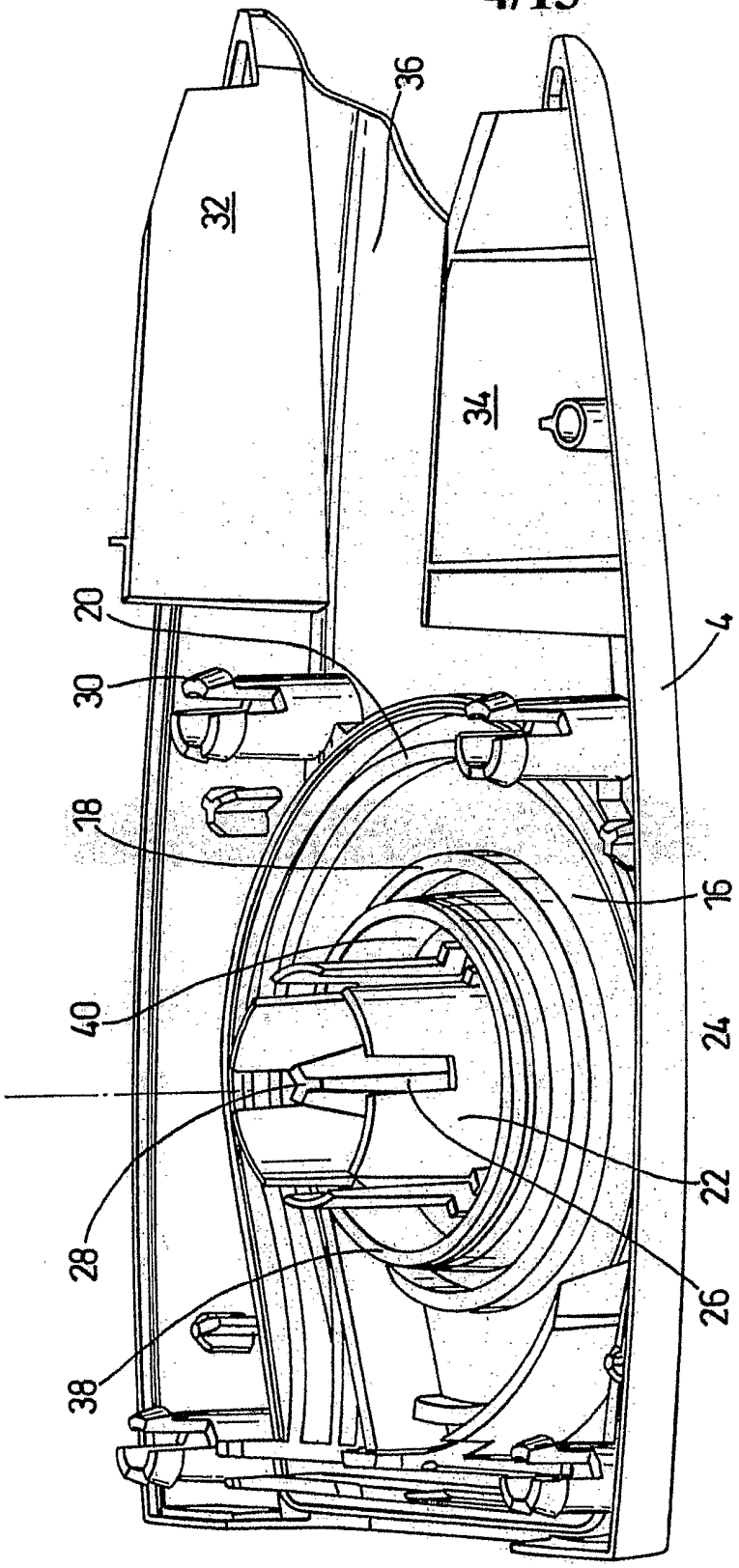

Fig. 2E

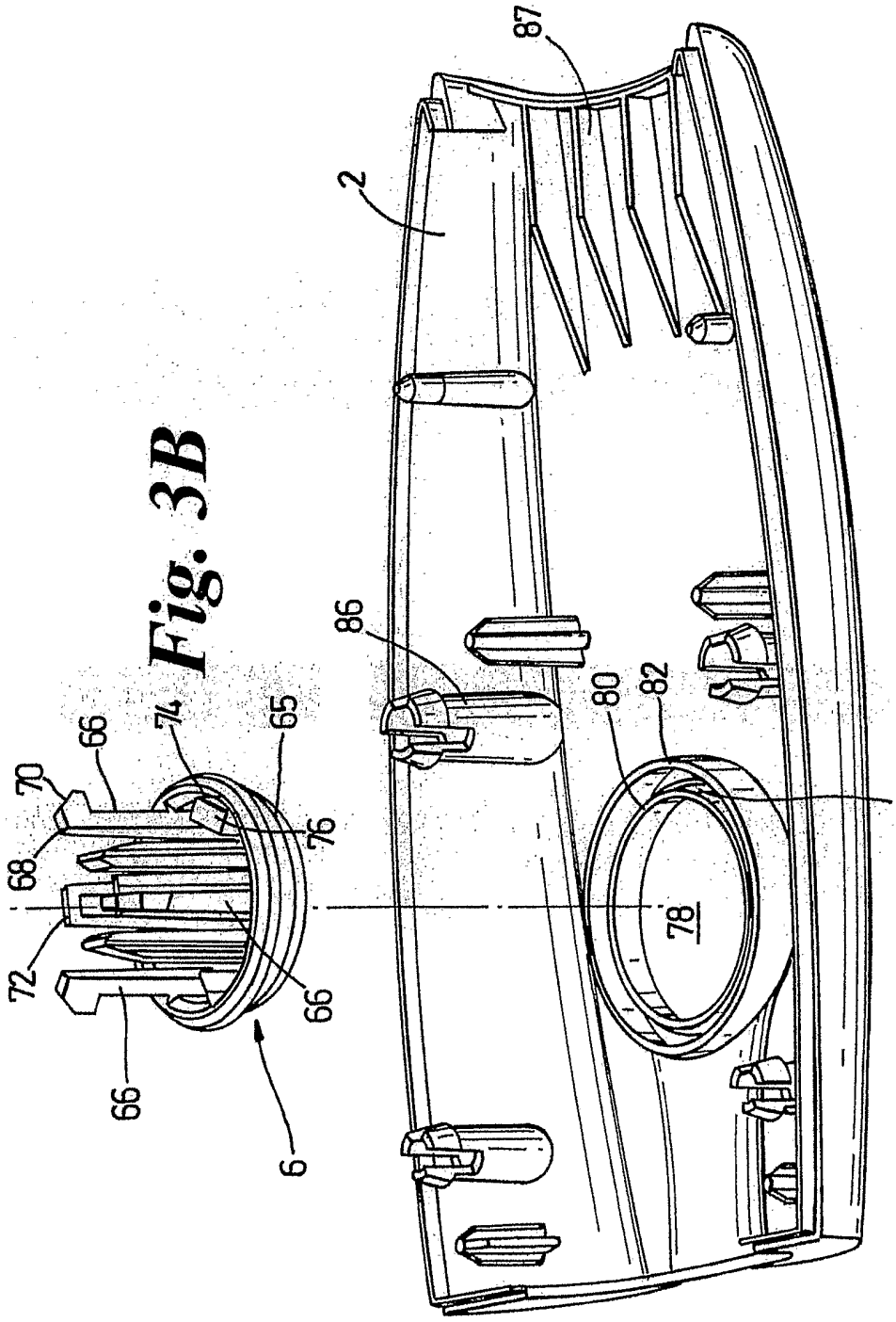

Fig. 3A

Fig. 3B

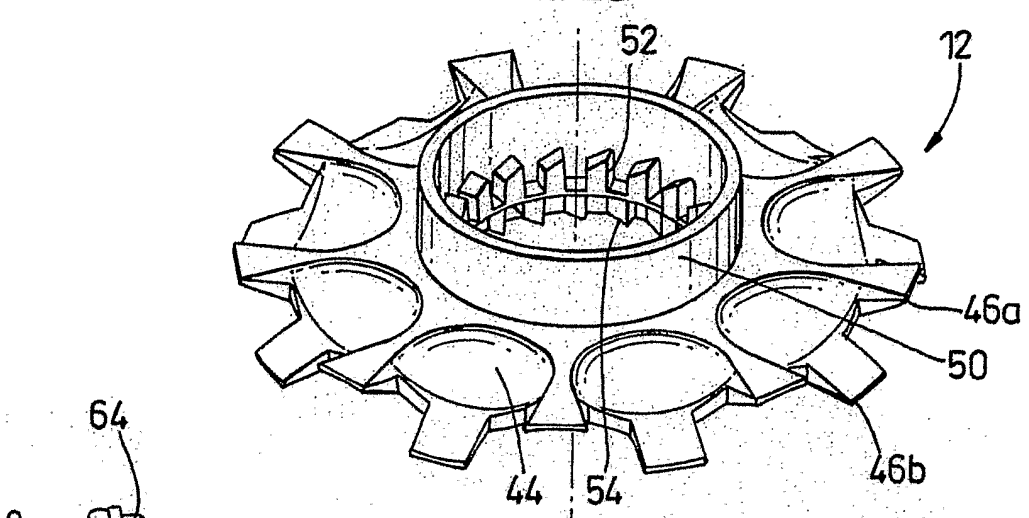

Fig. 3D

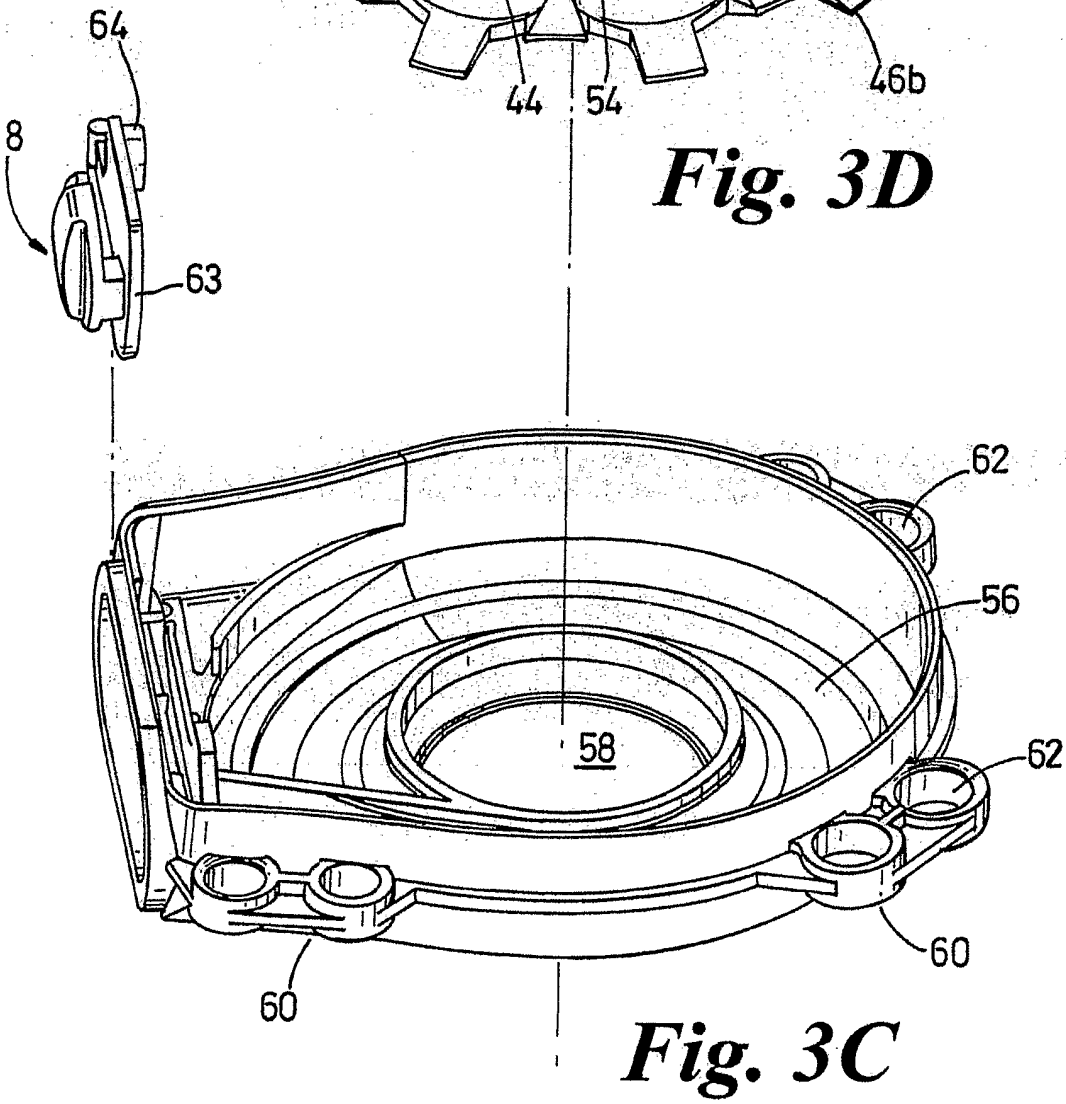

Fig. 3C

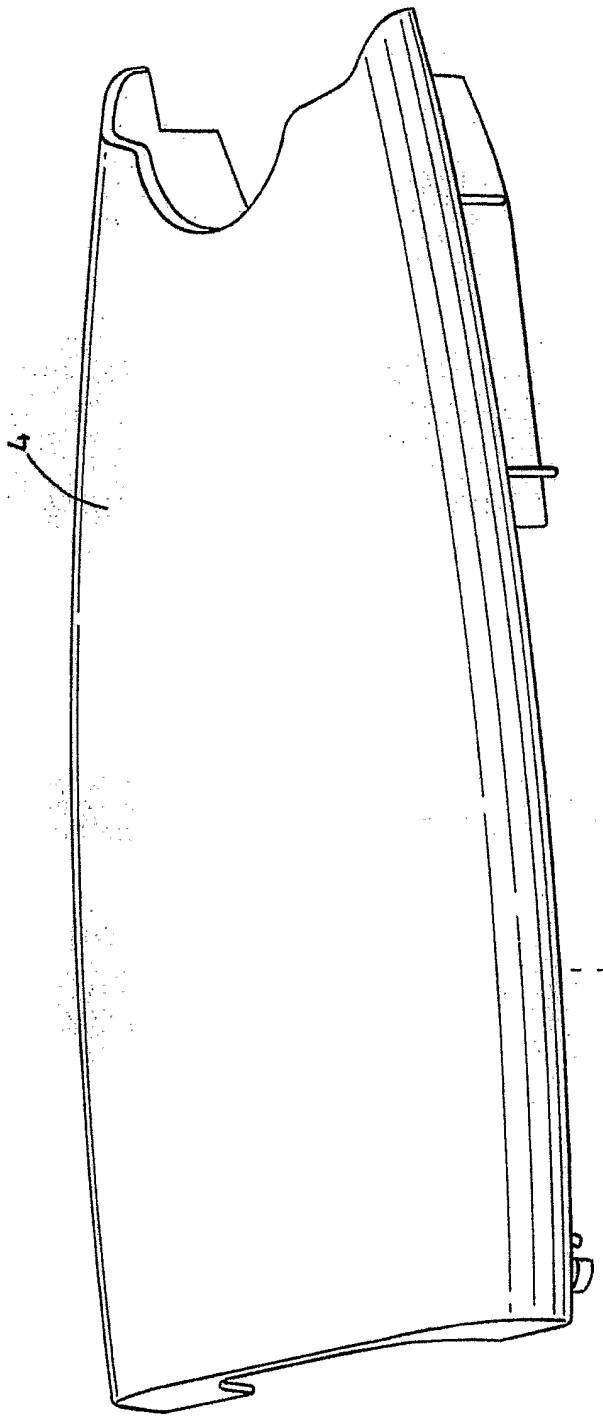

Fig. 3E

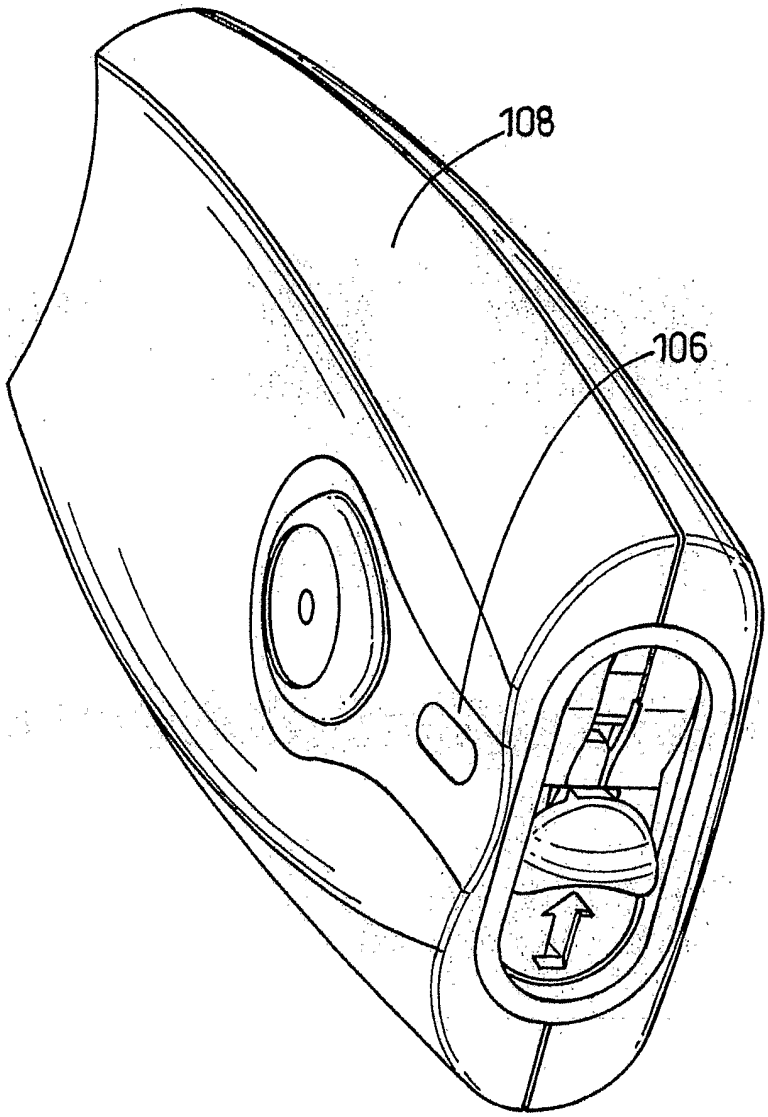

Fig. 4

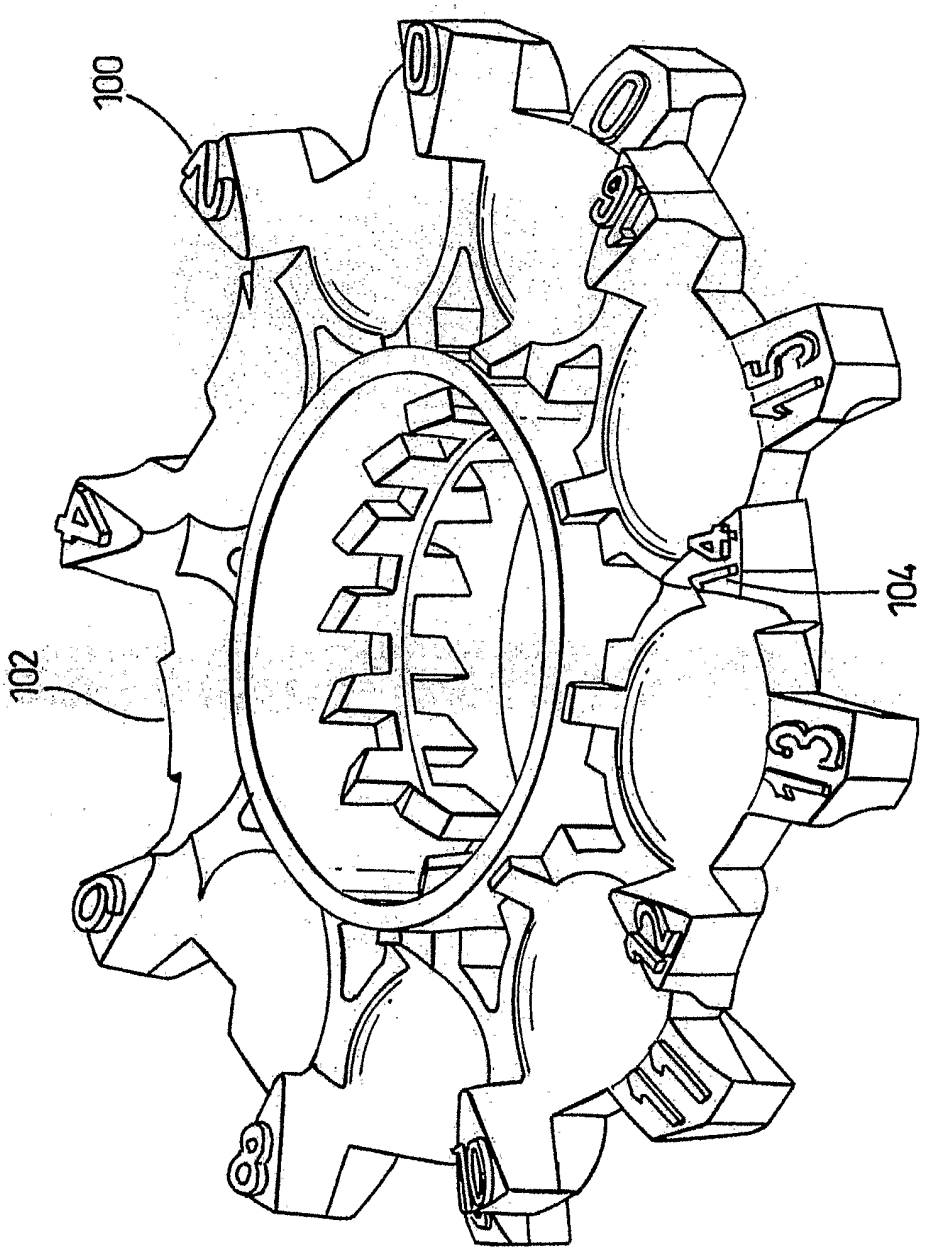

Fig. 5

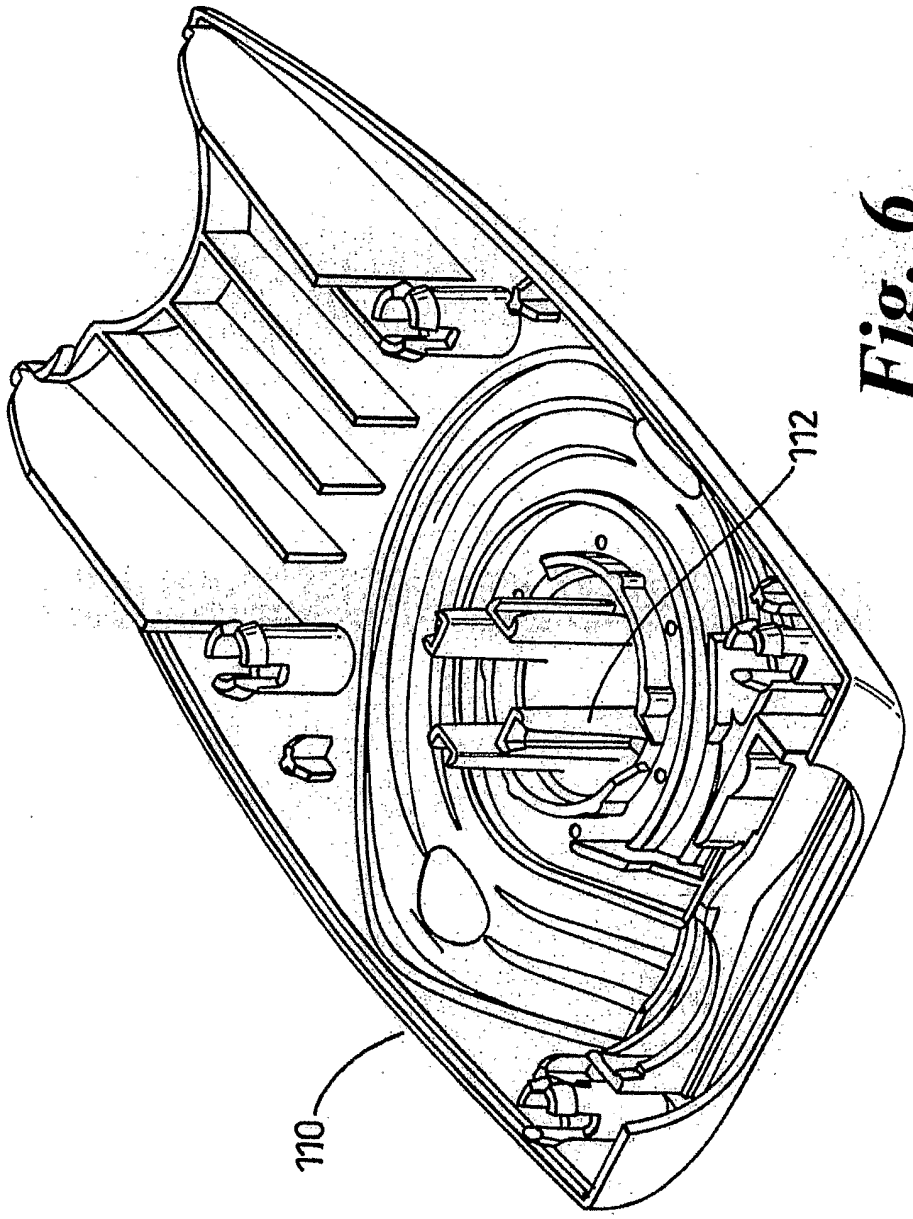

Fig. 6

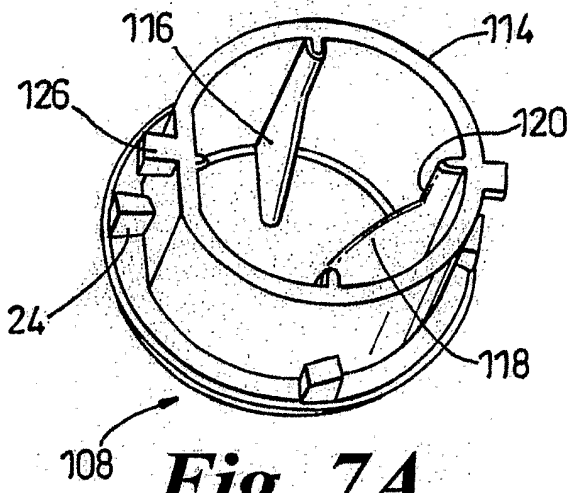

Fig. 7A

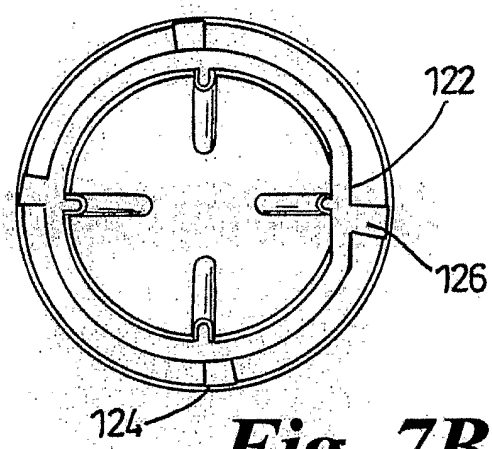

Fig. 7B

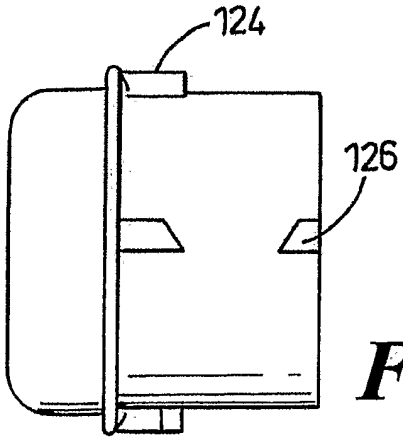

Fig. 7C

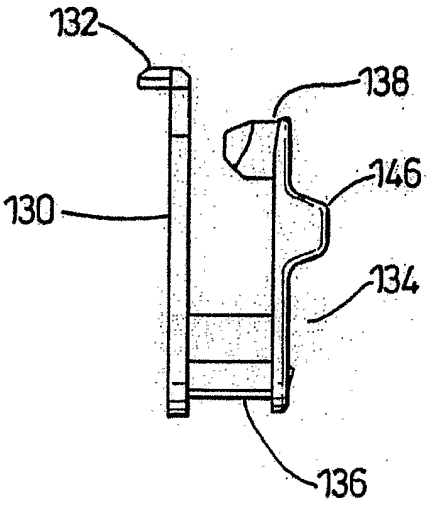

Fig. 8A

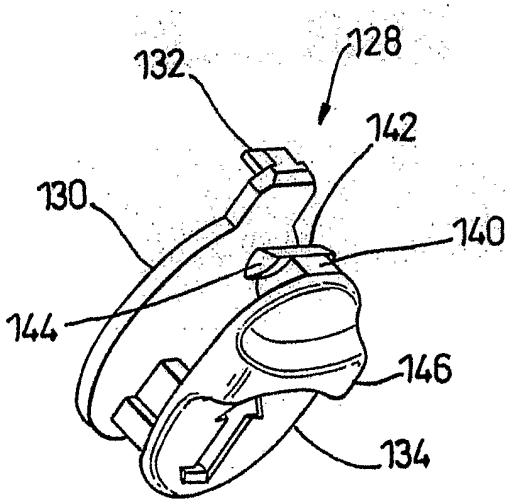

Fig. 8B

13/13

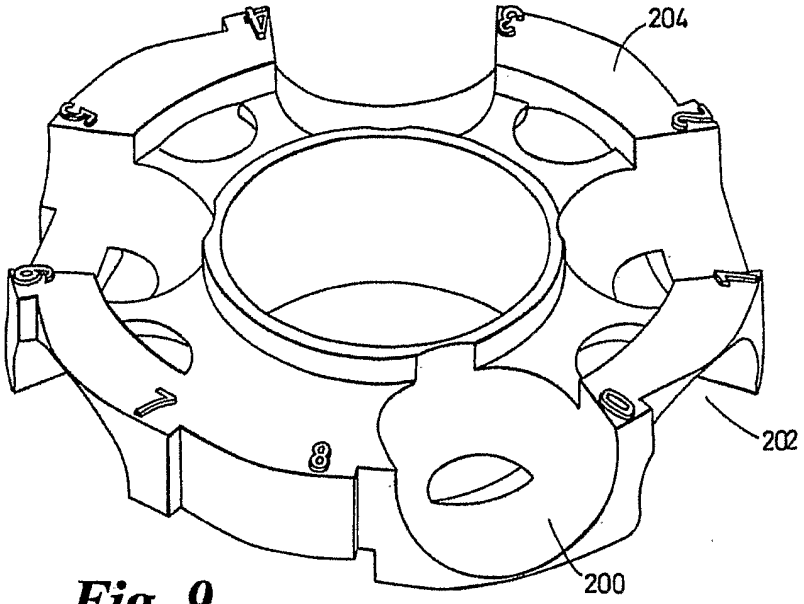

Fig. 9

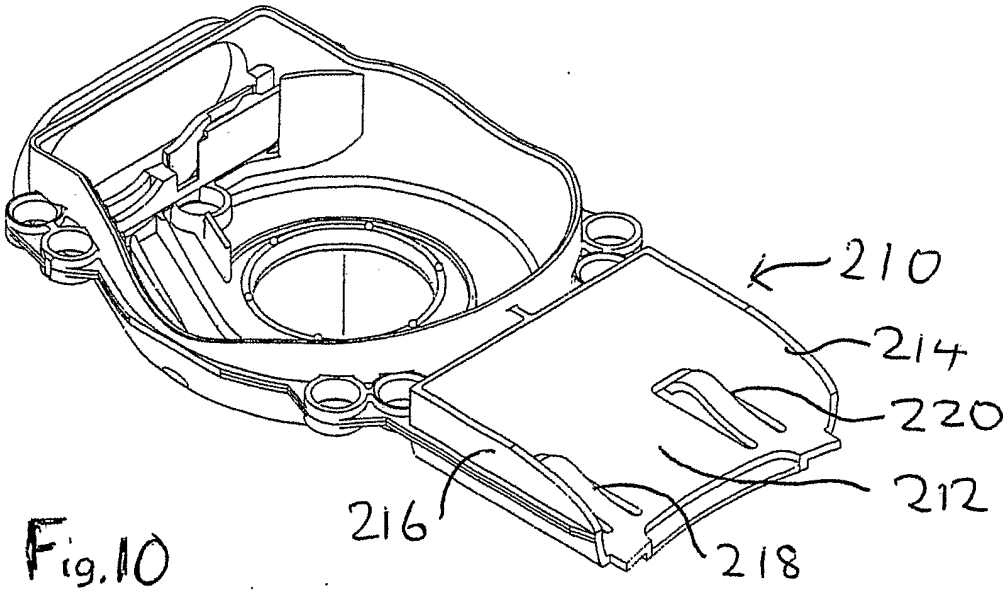

Fig. 10