

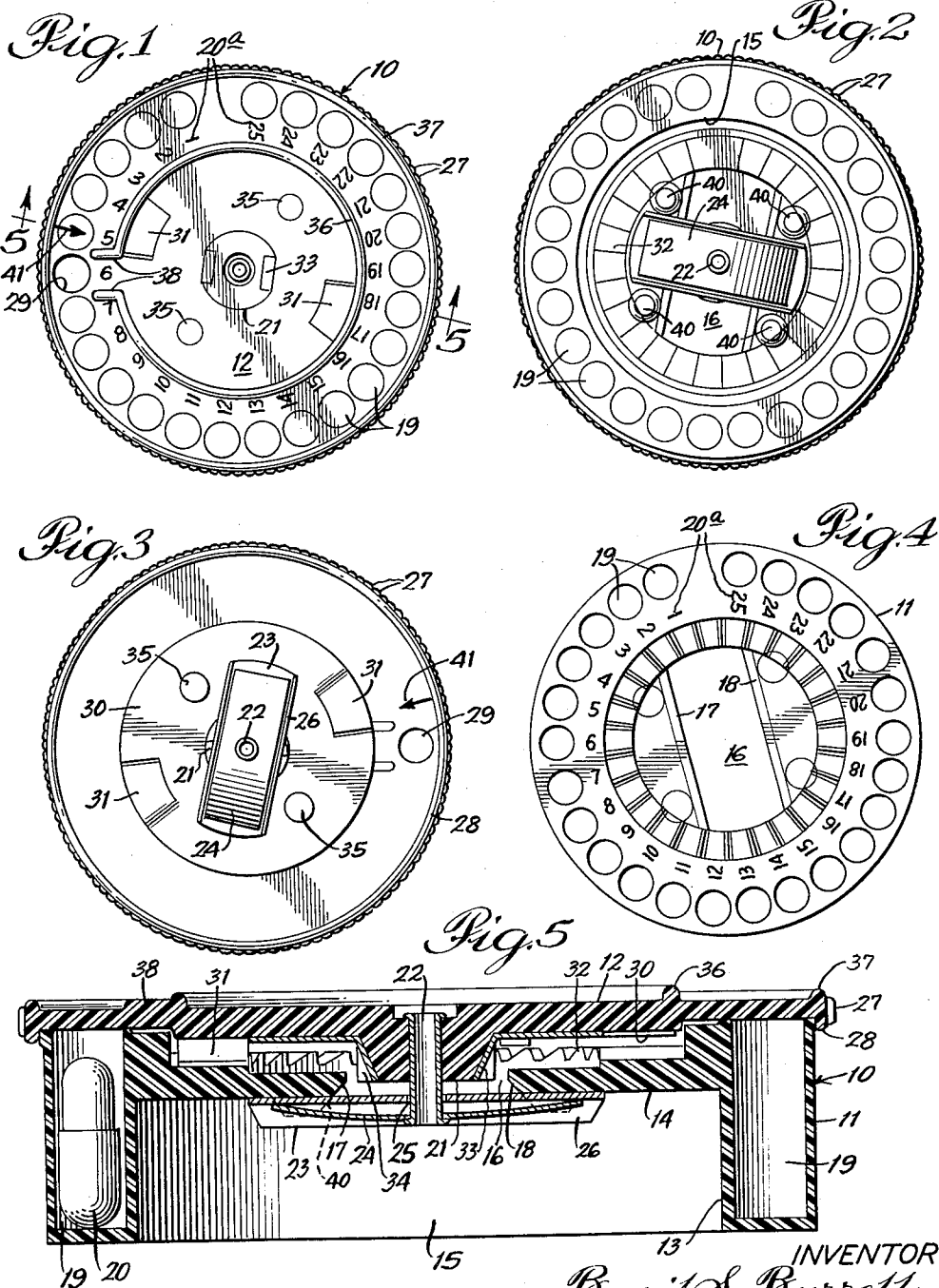
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DISPENSER

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DISPENSER

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9 Claims. (Cl. 206—42)

This invention relates to a dispenser, and more specifically, to an improved device for holding tablets, capsules, and the like, and for dispensing these items one at a time. The invention is particularly suitable for use in dispensing drugs or other medicaments in capsule or tablet form so that an accurate count may be kept of the number of items dispensed and administered.

This application is a continuation of my copending application, Serial No. 715,464, filed February 14, 1958.

An important object of the present invention is to provide an improved dispenser having only two parts which are normally held firmly together under tension but which may easily and quickly be disconnected for loading, cleaning, sterilization, etc. In this connection, it is a specific object to provide a dispenser with positive locking means which urges the cover and body thereof into tight engagement so that the contents of the dispenser will be maintained in sanitary and orderly condition. Another object is to provide locking means which may be easily manipulated for selectively connecting or detaching the cover and dispenser body, but which is adapted to prevent detachment of the respective parts in response to forces tending to urge or pull them apart.

A further object is to provide a tablet or capsule dispenser having positive ratcheting means for permitting relative rotation of the parts only in one direction, the latching or locking means coacting with the ratcheting means to insure proper operation of the device.

Other objects will appear from the specification and drawings in which:

FIGURE 1 is a top plan view of an assembled dispenser embodying the present invention;

FIGURE 2 is a bottom view of the dispenser illustrated in FIGURE 1;

FIGURE 3 is a bottom view of the dispenser cover;

FIGURE 4 is a top plan view of the body or carrier of the dispenser; and

FIGURE 5 is an enlarged sectional side view taken along line 5—5 of FIGURE 1.

In the embodiment of the invention illustrated in the drawings the numeral 10 generally designates a two-piece dispenser comprising a carrier or body 11 and a cover 12. The body, as illustrated most clearly in FIGURES 4 and 5, has a generally cylindrical shape and is preferably molded in one piece from a suitable plastic material such as polystyrene. In the illustration given, the plastic material is clear or transparent, to afford a view of the dispenser's contents, although it will be understood that translucent or opaque materials may be used.

The cylindrical body 11 is provided with an annular outer portion 13 and an inner transverse wall 14 spaced from the lower end of the body to provide a cylindrical lower cavity 15. Inner wall 14 has a central opening 16 extending axially therethrough and this opening is diametrically elongated and is generally rectangular in shape. The parallel edges 17 and 18 of opening 16 are beveled to facilitate manipulation and operation of the locking means, as will be described shortly.

The annular portion 13 of the cylindrical carrier is provided with a plurality of circumferentially-spaced and longitudinally-extending pockets or cavities 19 for holding capsules 20 or other items to be dispensed therefrom. The cavities or pockets are open at the upper end of

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the cylindrical carrier and, in the illustration given, 25 of such pockets are arranged in a circumferential series. Except for the distance between the first and last pockets of the series, all of the pockets or bores have their centers spaced equally apart about the circumference of carrier 11. Preferably, consecutive reference numerals 20a are provided upon the upper surface of the carrier adjacent each of the pockets 19 so that a user may readily identify the number of pockets which remain filled at any given time. It will be observed in FIGURE 5 that the indicia-bearing surface portion of the carrier is spaced a slight but definite extent from the under surface of cover 12 so that numerical indicia 20a will not wear away as the cover is rotated.

The cover 12 comprises a transparent circular plate or disk of slightly greater diameter than the cylindrical carrier 11. A depending central hub 21 is formed integrally with the cover and projects downwardly into opening 16 of the carrier when the parts are connected. The hub portion is provided with a central bore which slidably receives a vertical pin 22 of greater length than the vertical dimensions of the hub. The pin is flared at its upper and lower ends to retain it within the bore of the cover as well as to provide a secure connection to the remaining elements of the locking means.

The locking means which firmly connects the cover and carrier comprises pin 22 in combination with channel member 23 and leaf spring 24. The channel member 23 is horizontally elongated and has a rectangular shape corresponding with but slightly smaller than the opening 16 of the carrier. Intermediate its ends, the channel member is provided with an aperture 25 which slidably and rotatably receives vertical pin 22. The elongated and arcuate leaf spring 24 is similarly apertured intermediate its end and is disposed within the channel defined by the depending side flanges 26 of member 23. Thus, the normally arcuate leaf spring urges the pin 22 downwardly into the opening 16 of the carrier while at the same time urges the channel member with its smooth upper surface into tight engagement with the undersurface of the carrier's inner wall portion 14 (FIGURE 5).

Like the body or carrier, cover 12 is preferably formed from a stiff transparent plastic material although other materials might be used. Its peripheral edge 27 is serrated or knurled to facilitate relative rotation of the coaxial body and cover. As shown most clearly in FIGURE 5, the cover is provided with a depending peripheral lip 28 which projects downwardly about the upper edge of the carrier or body and not only maintains the parts in alignment but also assists in maintaining the pockets or cavities 19 as well as the space between the cover and the indicia-bearing surface portion of the carrier in sealed condition. In addition, the under surface of the cover is stepped downwardly along the inner limits of annular portion 13 to further assist in maintaining the indicia-bearing surface portion in clean and protected condition.

It will also be noted in FIGURE 5 that the under surface of the cover which overlies the annular portion 13 of the carrier is smooth and flat and that, since the upper surface of the carrier's central portion 14 is stepped down and is spaced below the top surface of annular portion 13, the top surface of the annular portion makes sealing contact with the under surface of the cover. The result is that the cavities 19, filled with tablets or capsules, are maintained in sealed condition by snug contact between the parts but that since the cover is in surface contact with the carrier only along the narrow annular portion 13, the limited frictional engagement between the parts allows the cover to slide easily over the carrier upon relative rotation thereof.

As illustrated most clearly in FIGURE 3, the cover is

provided with a vertical opening or aperture 29 adjacent the peripheral edge thereof. This aperture is of substantially the same diameter as cavities 19 and has the same radial distance from the rotational axis as the series of pockets or cavities. Thus, by rotating the cover with reference to the carrier, opening 29 may be brought into register with each of the pockets for dispensing the contents thereof. It will be noted that only one pocket is opened at any given time (when the dispenser is assembled) and that the remaining pockets of the series are sealed by the rotatable cover until the cover is turned to release successively the contents thereof.

An additional feature of the invention lies in the provision of ratchet means for limiting relative rotation of the cover and carrier to a single direction and for stabilizing the parts at each position of alignment of opening 29 and pockets 19. The ratchet means includes a spring plate 30 secured to the undersurface of the cover and equipped with downwardly inclined spring arms 31 adapted to engage the indentations of an annular ratchet track 32 provided by the upper surface of the carrier's inner wall 14. The circular spring plate 30 is provided with a central opening through which the hub 21 of the cover projects and is provided with spring ears 33 which seat tightly within diametrically-disposed recesses 34 in the periphery of the hub. If desired, the spring plate may be additionally secured against relative rotation with reference to the cover by means of depending nubs 35 (FIGURES 3 and 5) which extend through openings in the plate.

The diametrically disposed spring arms 31 extend downwardly and rearwardly in a direction opposite to the direction of the cover's rotational movement. When the cover and carrier are assembled, the spring tension of arms 31 urges them into the V-shaped notches of track 32 and permits rotation of the cover in only one direction. Since the carrier has a notch corresponding with each of the cavities or pockets 19, it is believed apparent that the ratchet means performs the additional function of stabilizing the cover and carrier in each of the positions wherein opening 29 of the cover is in register with one of the pockets.

In FIGURES 1 and 5 it will be seen that the upper surface of the cover is provided with a pair of concentric ridges 36 and 37, the outer ridge 37 being disposed along the periphery of the cover while the inner ridge 36 is disposed inwardly from the cover's aperture or opening 29. Thus, the opening 29 is located in an annular area between the two concentric ridges. The inner ridge 36 is interrupted adjacent opening 29 and provides a pair of radial extensions 38 which define a path leading to opening 29.

In the use of the dispenser embodying the present invention, the two parts are first cleaned and cold sterilized and the series of pockets are then filled with tablets or capsules, one for each pocket. The dispenser may be loaded either while the cover is in place or while it is removed from the carrier 11. Where the items to be dispensed are of relatively large size, such as the capsule 20 illustrated in FIGURE 5, it has been found that loading of the dispenser is most easily performed while the cover is removed from the carrier. However, if the items to be dispensed consist of small tablets or pills, it is desirable to first lock the cover in position upon the carrier and then place a number of such tablets upon the cover's flat top surface within the area defined by inner ridge 36. The dispenser may then be filled by urging the tablets with the aid of a suitable stick or other instrument along the path provided by ridge extensions 38 and through the cover opening 29 into the exposed pockets, at the same time successively rotating the cover to expose all of the pockets and load each of them with a single tablet. In this way, the person filling the dispenser may easily and quickly load all of the pockets without touching any of the tablets or pills with his hands.

From the foregoing, it is believed evident that the cover

and body of the two-piece dispenser may be readily assembled by simply aligning the channel member 23 rotatably carried by the cover with the transversely elongated opening in the carrier or body and then urging the parts together so that the channel member passes downwardly through the opening. The channel member 23 and spring 24 carried thereby are then rotated 90 degrees into the locking position illustrated in FIGURES 2 and 5. As the channel member is rotated into locking position, it is cammed downwardly away from the cover by the inclined or beveled surfaces 17 of the carrier's inner portion 14 so that when the parts are locked together spring 24 is under tension. Preferably, the undersurface of wall 14 is provided with a group of four integrally formed knobs 40 arranged in pairs adjacent each of the parallel edges of carrier opening 16. The knobs of each pair are spaced apart to receive and anchor therebetween when it has been rotated into locking position, thereby restraining rotational movement of the channel as the cover is turned to each of its selected dispensing positions. However, since the knobs 40 are tapered, the channel may be readily twisted into releasing position by simply forcing it over the knobs and into longitudinal alignment with opening 16. During this operation, it will be noted that the sloping sides of the tapered knobs force the channel member further downwardly and thereby increase the existing tension of spring 24 until the channel has reached its releasing position.

The tension of spring 24 when the parts are assembled provides a continuous force urging the smooth undersurface of the cover adjacent the periphery thereof into sealing contact with the smooth upper surface of the carrier's annular portion 13. At the same time, the spring 24 of the locking assembly maintains the spring arms 31 of the spring cover plate 30 in operative relation with reference to the ratchet track 32 of the carrier. Consequently, the locking and ratcheting means cooperate to provide an extremely effective dispenser structure of relatively simple construction.

In the illustration given, the cover is provided with a peripheral reference mark or arrow 41 alignable with the numerals 20a of the carrier to indicate the number of cavities remaining to be opened by rotation of the cover. For this purpose, the mark is disposed the equivalent of one position ahead of cover opening 29 (with reference to the direction of rotation of the cover) so that when the dispenser is completely filled the arrow will point to the numeral 25, thereby indicating that twenty-five items are disposed within the carrier pockets. Since the cover is restrained from reverse rotation, no error in the above indication is possible. Thus, a nurse or other person using the dispenser may tell at a glance exactly how many tablets or capsules the dispenser holds.

While in the foregoing an embodiment of the invention has been disclosed in considerable detail for purposes of illustration, it will be understood by those skilled in the art that many of these details may be varied without departing from the spirit and principles of the invention.

I claim:

1. A dispenser for capsules and the like comprising a cylindrical body having a plurality of circumferentially spaced cavities and having an axial opening therethrough, a cover plate in surface contact with one surface of said body to provide a closure for said cavities, and locking means including a locking member of generally rectangular shape engaging an opposite surface of said body substantially parallel with said first-mentioned one surface and being secured to said cover for relative axial and rotational movement by a pin extending through said axial opening, said means also including a spring for urging said cover and member towards each other in opposite axial directions to clamp said body therebetween, said cover having an aperture therethrough for successive alignment with individual cavities upon relative rotation of said cover and body, said axial opening

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being of generally rectangular cross section for permitting axial movement of said member through said opening for separating the cover and body when the member and opening are aligned with each other, said member being rotatable into a position out of alignment with the opening of said body for locking said cover and body together, and means provided by said body for restraining relative rotation of said member in locking position until said member is moved axially away from said body and against the force of said spring.

2. A dispenser for capsules and the like comprising a cylindrical body having a plurality of circumferentially spaced cavities and having an axial opening of non-circular cross section extending therethrough, a cover plate in surface contact with one surface of said body to provide a closure for said cavities, and locking means including a locking member bearing against an opposite surface of said body substantially parallel with said one surface, a pin extending through said opening and permanently connecting said cover and locking member for independent relative rotation and for limited axial movement toward and away from each other within the axial limits of said pin, spring means for urging said cover and locking member toward each other along the axis of said pin to clamp said body therebetween, said locking member having a non-circular shape corresponding with but slightly smaller than the cross sectional shape of said opening and being movable axially through said opening upon rotation into register therewith, and means provided by said body for restraining relative rotation of said locking member into register with said opening until said member is moved away from said body against the force of said spring means.

3. The structure of claim 2 in which said opening is of generally rectangular cross section and said locking member is of generally rectangular shape.

4. The structure of claim 2 in which said means for restraining relative rotation of said locking member and said body comprises knobs on said opposite surface of said body, said knobs being spaced apart to restrain said locking member therebetween.

5. A separable two piece dispenser for capsules and the like comprising a cylindrical body and a rotatable cover therefor, said body having upper and lower faces and having an axial opening of non-circular cross section therethrough, said body having a circumferential series of axially aligned pockets in the upper face thereof, said cover being rotatably disposed upon the upper face of said body and having an aperture therethrough alignable with the pockets of said body, and means permanently attached to said cover for connecting said body and cover together, said means including a locking member of non-circular shape corresponding with but slightly smaller than the cross sectional configuration of said opening, said locking member being disposed beneath said body, a pin extending through said opening and permanently connecting said cover and locking member for relative rotational and limited axial movement, a spring cooperating with said member to urge the same into contact with the lower surface of said body, said locking member being rotatable between a locking position wherein said member is out of alignment with said opening and bears against the lower surface of said body and an unlocking position wherein said member is in register with said

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opening and is movable axially therethrough, and means provided by said body for restraining rotation of said member from locking to unlocking positions until said member is moved axially away from said body against the force of said spring.

6. The structure of claim 5 in which said means for restraining rotation of said member comprises projections on the under surface of said body, said projections being spaced apart to retain said locking member therebetween.

7. The structure of claim 5 in which said locking member is generally rectangular in shape and said axial opening is generally rectangular in cross section.

8. A dispenser for capsules and the like comprising a cylindrical one-piece plastic body having a plurality of axially-extending and circumferentially-spaced cavities, said body having a top surface provided with a plurality of openings for said cavities and having an annular indicia-bearing surface portion adjacent said openings, a transparent plastic cover detachably secured to said body and revealing the numerical indicia of said indicia-bearing surface portion therethrough, said cover being mounted for rotation about the axis of said cylindrical body and having an aperture alignable with the openings of said cavities, one of the opposing surfaces of said cover and body being stepped to define an annular space between said annular indicia-bearing surface portion and the opposing surface portion of said cover, said cover being provided with a peripheral lip extending downwardly about the peripheral upper edge of said body.

9. A dispenser for capsules and the like comprising a cylindrical one-piece plastic body element having a plurality of axially-extending and circumferentially-spaced cavities, said body element having a top surface provided with an annular series of openings for said cavities and having an annular indicia-bearing surface portion adjacent thereto, a transparent plastic cover element detachably secured to said body and extending over the top surface thereof, said cover element being mounted for rotation about the axis of said body and having an opening therethrough alignable with the openings of said body element upon rotation of said cover element for the dispensing of capsules from said cavities, the indicia of said annular indicia-bearing surface portion being visible through the transparent annular portion of said cover element directly above said indicia-bearing surface portion, one of said elements being stepped away from the other of said elements in the annular zone of said indicia to define an annular spacing between said indicia-bearing surface portion and the undersurface of said annular portion of said cover element.

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