Oct. 7, 1969 S. R. KOVAC 3,471,056

ARTICLE DISPENSER HAVING A RECIPROCATING EJECTOR

Filed Nov. 29, 1967

Fig. 1

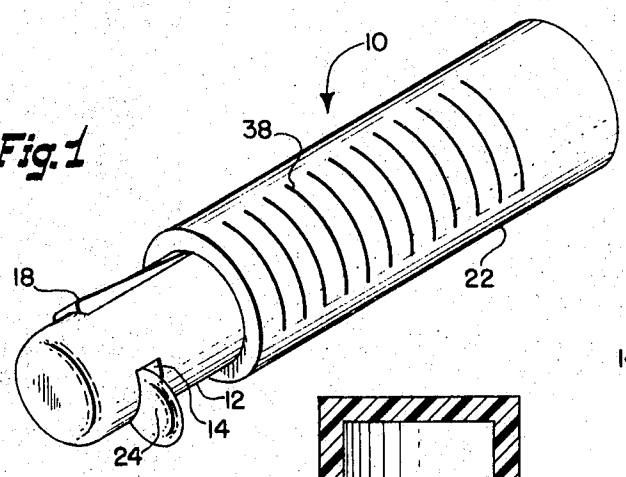
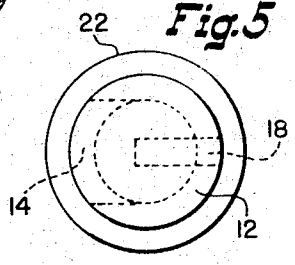


Fig. 5



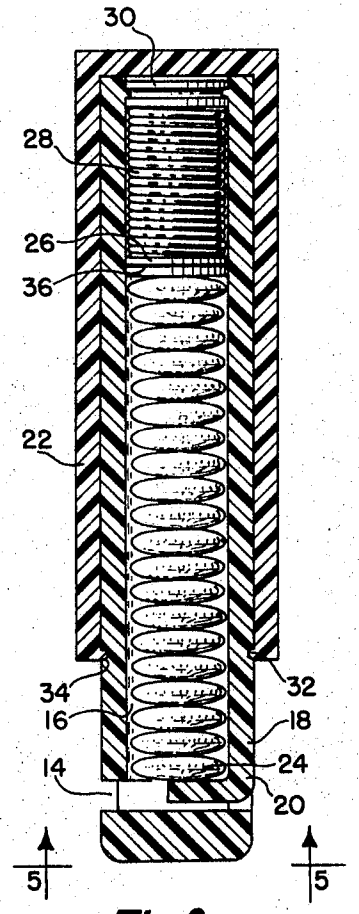


Fig. 2

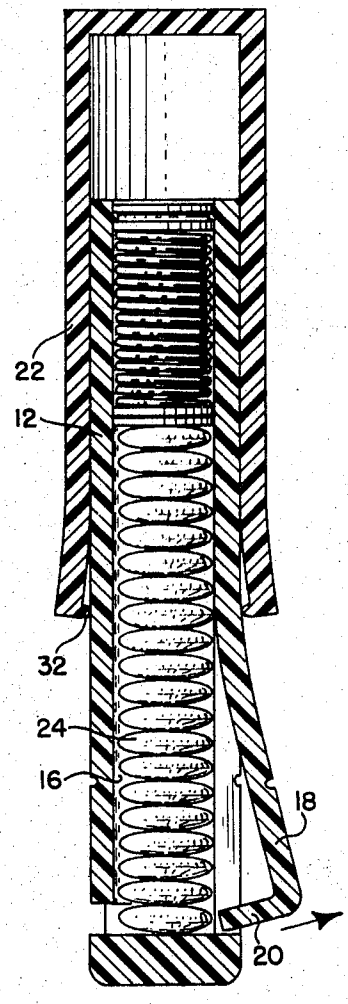


Fig. 3

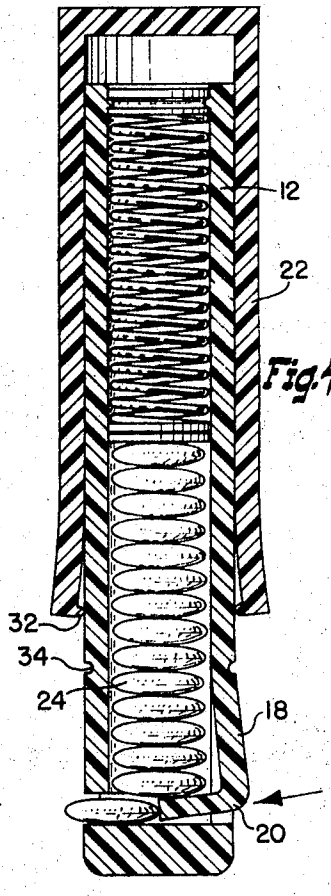


Fig. 4

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ARTICLE DISPENSER HAVING A RECIPROCATING EJECTOR

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ABSTRACT OF THE DISCLOSURE

A pill dispensing device including a hollow casing having a transverse pill discharge opening adjacent one of its ends, and an escapement finger associated with said casing which is operable relative to said transverse pill discharge opening to selectively discharge individual pills therefrom while trapping the remainder of the pills within the hollow casing.

The dispensing of pills, tablets, wafers and the like has received increasing attention in recent years due to the many advances which medical researchers have made and have reduced to practice in the easy to take pill, tablet or wafer form. There is now available on the market, in addition to the conventional bottle and closure, many types of dispensing devices for pills, tablets, wafers and the like including mechanical dispensing devices such as are found in the birth control pill dispenser market, and manual dispensing devices which include various types of blister, skin and foil packaging techniques which are associated with aperture supporting boards, dispensing cartons and the like for the manual removal or separation of pills therefrom. The present invention is generally directed to mechanical dispensing devices such as those which have been recently available in the birth control pill market, although the dispensing device of the present invention has broader applications throughout the ethical drug field.

It is one object of the present invention to provide an improved mechanical dispensing device for pills, tablets, wafers and the like.

Another object of the present invention is to provide a mechanical dispensing device which is capable of selectively dispensing individual pills, tablets, wafers and the like in an extremely simple and faultless manner.

A further object of the present invention is to provide a mechanical dispensing device which can be economically manufactured, is capable of fully protecting the pills, tablets or wafers from contamination and undesirable temperature changes, which is extremely compact and easy to operate, is capable of providing a visual indication of the product quantity contained in the dispensing device or give a numerical indication of the quantity of product contained therein, and is otherwise well adapted for the purposes intended.

These and other objects and advantages of the present invention are attained through the provision of a pill dispensing device which includes a hollow casing having a transverse opening extending therethrough, an escapement finger associated with the casing for movement into and out of the casing interior within the transverse opening, the escapement finger being removable from the interior of the casing to permit a pill to be positioned within the transverse opening and then being reinserted within the transverse opening to selectively discharge the pill therewithin while trapping the remainder of the pills within the hollow casing.

Reference is now made to the drawings wherein:

FIG. 1 is a perspective view of one type of dispensing device constructed in accordance with the teachings of the present invention;

FIG. 2 is a vertical sectional view of the dispensing device depicted in FIG. 1 with the various components thereof in a rest position;

FIG. 3 is a vertical sectional view of the dispensing device illustrated in FIG. 1, but showing the manner in which the escapement finger of the dispensing device is moved laterally outwardly to permit the positionment of pills for subsequent discharge or removal therefrom; and

FIG. 4 is a vertical sectional view of the dispensing device illustrated in FIG. 1 and specifically depicting the manner in which the escapement finger of the dispensing device functions to engage and discharge a pill from the device;

FIG. 5 is a bottom plan view of the dispensing device showing the escapement finger and the discharge opening thereof in dotted lines.

In the discussion that is to follow, the term "pill" is intended to cover any and all forms of pills, tablets, wafers and the like which are used for medicinal purposes or simply as general food products such as candy confection and the like. In the embodiment of the invention illustrated in the drawing, the "pill" is preferably of the flat wafer or tablet type, although it will be understood that the dispensing device may be designed for use with any type, size or shape of "pill."

The pill dispensing device generally designated **10** in the various figures of the drawing preferably has all of the components thereof formed from a plastic material such as polystyrene, polypropylene or other suitable plastic materials. The various components of the pill dispensing device are generally adaptable to conventional injection molding techniques, although it is not inconceivable that one or more of the components may be sheet formed. It will be understood that while the components of the pill dispensing device are formed from a plastic material such as described above, one or more of the components may be formed from other materials as may be desired.

The pill dispensing device **10** illustrated in the various figures of the drawing, includes a hollow casing **12** having a transverse opening **14** adjacent one of its ends which communicates with the interior **16** of the hollow casing. The hollow casing **12** further includes, in the illustrated embodiment, an integral escapement finger **18** having a portion **20** thereof which is adapted to be positioned within and removed from the interior **16** of the hollow casing **12** in its movement relative to the transverse opening **14**. The escapement finger **18**, as best depicted in FIG. 3 of the drawing, is normally urged outwardly away from the interior **16** of the casing **12** such that the forward or entering end of the finger portion **20** is located outside the confines of the interior **16** of the casing **12**. The escapement finger **18** is normally spring biased outwardly to the position shown in FIG. 3 of the drawing, but is capable of having the portion **20** thereof inserted within the transverse opening **14** of the casing by various means

such as the telescoping collar 22 which is slidably mounted on the hollow casing 12. Specifically, it will be noted that the telescoping collar 22 is capable of being moved or disassociated relative to the hollow casing 12 from the position shown in FIG. 2 to a position such as shown in FIG. 3 where the escapement finger 18 is shown as being normally resiliently urged outwardly from the interior 16 of the casing 12, the escapement finger 18 can thereafter be trapped or captured by the telescoping collar 22 as the telescoping collar 22 is moved relative to the hollow casing 12 from the FIG. 3 to the FIG. 4 position.

The above described elements of the illustrated embodiment permit the selective dispensing or discharge of pills located within the interior 16 of the hollow casing 12. As shown in the drawing, the pills 24 are flat wafer-like elements which are superpositioned one above the other within the interior 16 of the casing 12. The diameter of the chamber or compartment comprising the interior 16 of the hollow casing is designed such that the pills 24 are capable of freely moving therein without permitting lateral or transverse movement thereof to a degree which could cause jamming of the pills 24 within the hollow casing 12. A plurality of pills 24 are located within the confines of the interior 16 and are preferably prevented from moving relative to one another within the casing interior 16 by a spring pad device 26. The spring pad device 26 is mounted within the interior 16 of the casing 12 at an end of the casing 12 remote from the transverse opening 14 and includes a coil spring 28 or other equivalent structure which normally urges the spring pad 26 in a direction toward the transverse opening 14 of the hollow casing 12. In this way, the spring pad device 26 will prevent axial movement of the pill 24 within the interior 16 of the hollow casing, and at the same time maintain the pills 24 in readiness for discharge from the dispensing device 10 by the escapement finger 18.

The pills 24 are loaded into the open end of the hollow casing 12, and then the spring pad 26 and coil spring 28 are inserted to maintain the pills 24 in the manner aforementioned. The coil spring 28 is positioned intermediate the spring pad 26 and a snap-in insert plate member 30 adjacent the open end of the hollow casing. The coil spring 28 thus has a fixed reference point in the insert plate member 30 enabling it to move the spring pad 26 in an axial direction toward the transverse opening 14 as pills 24 are removed from the dispensing device. When the pills 24 and the spring pad device are assembled within the interior 16 of the hollow casing 12, the telescoping collar 22 is then positioned over the exterior of the hollow casing 12. Preferably, the telescoping collar 22 includes means such as the inwardly extending bead 32 which is capable of releasably locking within a complementary aperture or groove formed in the exterior of the hollow casing. The locking of the telescoping collar 22 to the hollow casing 12 should be such that the parts will be kept readily assembled to one another, but can be easily disassembled by a slight hand pressure.

With the pills 24 located within the hollow casing 12 and the telescoping collar mounted in assembled relation to the hollow casing, the dispensing device 10 is now capable of selectively discharging individual pills 24 from the interior 16 of the hollow casing 12. The various components or elements of the dispensing device 10 will be located in the position shown in FIG. 2 of the drawing. When it is desired to dispense a pill 24, the telescoping collar 22 is first disassociated relative to the hollow casing 12, thus permitting the escapement finger 18, which is spring urged outwardly, to move its pill engaging portion 20 outside of the interior 16 of the hollow casing 12 as shown in FIG. 3 of the drawing. This will cause a lowering in the stack of pills 24 for positioning the lowermost pill within the transverse opening or passageway 14. The next step in the dispensing procedure is the reinsertion or telescoping of the telescoping collar 22 relative to the hollow casing 12. This will cause the escapement finger 18 to be moved from the FIG. 3 to the FIG. 4 position causing the pill engaging portion 20 thereof to be moved within the transverse opening or passageway 14 causing the discharge or dispensing of the lowermost pill 24. When the telescoping collar 22 and the hollow casing 12 have completed their relative interfitting or telescoping movement relative to one another, the bead 32 of the telescoping collar 22 is preferably then in a position for locking within the groove 34 formed in the exterior of the hollow casing 12.

With the above discussion fully in mind, it will be readily apparent to those skilled in the art that many modifications of the present invention are possible. Of course, it will be readily apparent that the size and shape of the various components forming the dispensing device 10 may be changed to suit the particulars desired. In certain cases, the telescoping collar 22 may form a much smaller component or be disregarded in its entirety. Obviously, an annular band of small axial height may be used in connection with the hollow casing 12 in the same manner as the telescoping collar 22. The function of the telescoping collar 22 may be replaced by designing the escapement finger 18 relative to the hollow casing such that it can be moved and held in various positions shown in FIGS. 2–4 of the drawing. For example, some sort of fastening means could be employed between the escapement finger 18 and the hollow casing 12 to normally maintain the escapement finger in the position shown in FIG. 2 of the drawing but enabling the escapement finger to be moved radially outwardly from the hollow casing by disengaging the fastening means. It will be understood that many and different types of such fastening means may be employed, and the present invention is not intended to be limited with respect to any specific type of fastening means.

Although only a single chamber or compartment defining the interior 16 of the hollow casing 12 is shown in the dispensing device 10, it is conceivable that a plurality of such chambers or compartments may be provided, each having an escapement finger for dispensing pills located therewithin. The pill dispensing device in the illustrated embodiment is shown as very closely resembling a lipstick case. However, the present invention is intended to cover a broad range of sizes and shapes for the dispensing device 10 as may be desired. As an example, it is contemplated that the hollow casing 12 may comprise a doughnut or toroidal shaped element having the pills 24 disposed therein. An escapement finger 18 may be associated with this doughnut or toroidal shaped casing 12 for dispensing pills 24 within the central opening thereof. Various other shapes and designs other than the illustrated embodiment are thus possible by utilizing the principles of the present invention.

In certain instances, it is desirable to give a visual indication or reading of the number or amount of pills still remaining in the dispensing device 10. One way in which this can be accomplished is by providing a reference line 36 or the like on the spring pad 26 which is capable of registering with reference lines 38 provided on the telescoping collar 22. Thus, the number or quantity of pills contained within the dispensing device 10 can be easily determined. In addition to providing a visual indication, there may be a desire in certain instances to protect the pills 24 from decontamination. In the illustrated embodiment, this may be accomplished by insuring that at least a portion of the telescoping collar 22 covers or spans the transverse opening or passageway 14 in its normal or at rest position.

I claim:

1. A pill dispensing device comprising a hollow casing having a transverse opening extending therethrough and communicating with the interior thereof, an escapement finger associated with said casing for movement into and out of the casing interior within said transverse opening, said escapement finger being spring urged outwardly for

movement away from the interior of said casing to permit a pill to be positioned within said transverse opening and also being reinsertable within said transverse opening to selectively discharge the pill therefrom while trapping the remainder of pills within said hollow casing, said escapement finger being maintained within said transverse opening during non-use by means associated with said hollow casing.

2. The device as set forth in claim 1 wherein said escapement finger is integral with said hollow casing.

3. The device as set forth in claim 1 wherein said last mentioned means is capable of being releaseably locked to said hollow casing.

4. The device as set forth in claim 1 wherein said last mentioned means comprises a telescoping collar mounted for movement relative to said casing and being adapted to engage and maintain said escapement finger within said transverse opening.

5. The device as set forth in claim 1 wherein said hollow casing comprises an elongated cylindrical element.

6. The device as set forth in claim 1 wherein said hollow casing includes a plurality of elongated passageways for receiving pills therein, each of said elongated passageways having an escapement finger associated therewith in the aforementioned manner.

7. The device as set forth in claim 1 wherein said hollow casing includes a spring urged pad for urging said pills located within the interior of said hollow casing in a direction toward the transverse opening formed therein.

8. The device as set forth in claim 7 and including visual indicating means associated therewith including a reference point provided on said spring pad device which is capable of registering with reference lines provided on a telescoping collar mounted on said hollow casing for movement relative to said escapement finger.

9. A pill dispensing device comprising a hollow casing having a transverse opening extending therethrough and communicating with the interior thereof, an escapement finger associated with said casing for movement into and out of the casing interior within said transverse opening, said escapement finger being removable from the interior

of said casing to permit a pill to be positioned within said transverse opening and then being reinserted within said transverse opening to selectively discharge the pill therefrom while trapping the remainder of pills within said hollow casing, said escapement finger being maintained within said transverse opening by means associated with said hollow casing, said last mentioned means including a telescoping collar mounted for movement relative to said casing and being adapted to engage and maintain said escapement finger within said transverse opening.

10. A pill dispensing device comprising a hollow casing having a transverse opening extending therethrough and communicating with the interior thereof, an escapement finger associated with said casing for movement into and out of the casing interior within said transverse opening, said escapement finger being removable from the interior of said casing to permit a pill to be positioned within said transverse opening and then being reinserted within said transverse opening to selectively discharge the pill therefrom while trapping the remainder of pills within said hollow casing, said hollow casing including a spring urged pad for urging said pills located within the interior of said hollow casing in a direction toward the transverse opening formed therein, and visual indicating means associated therewith including a reference point provided on said spring pad device which is capable of registering with reference lines provided on a telescoping collar mounted on said hollow casing for movement relative to said escapement finger.

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