

[54] **PROGRAMMED PILL DISPENSER**

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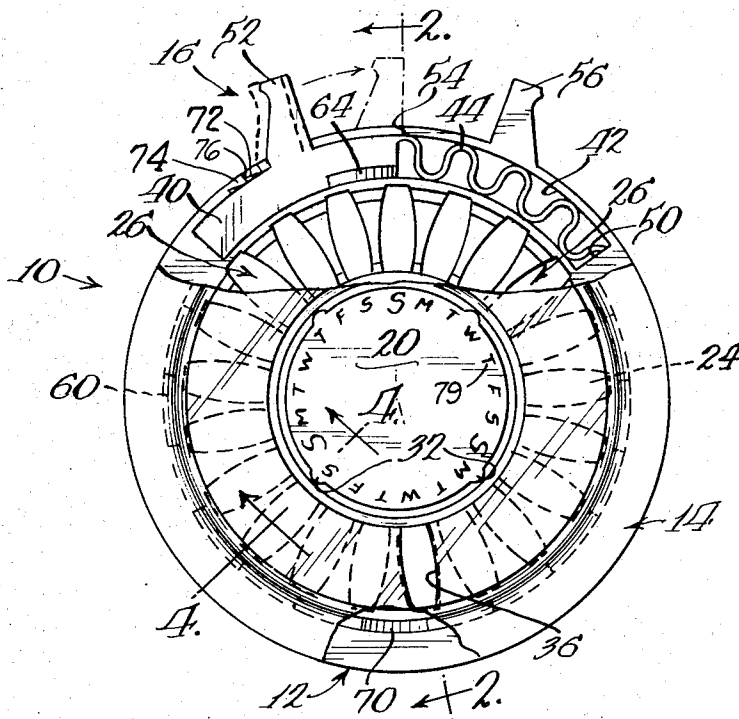
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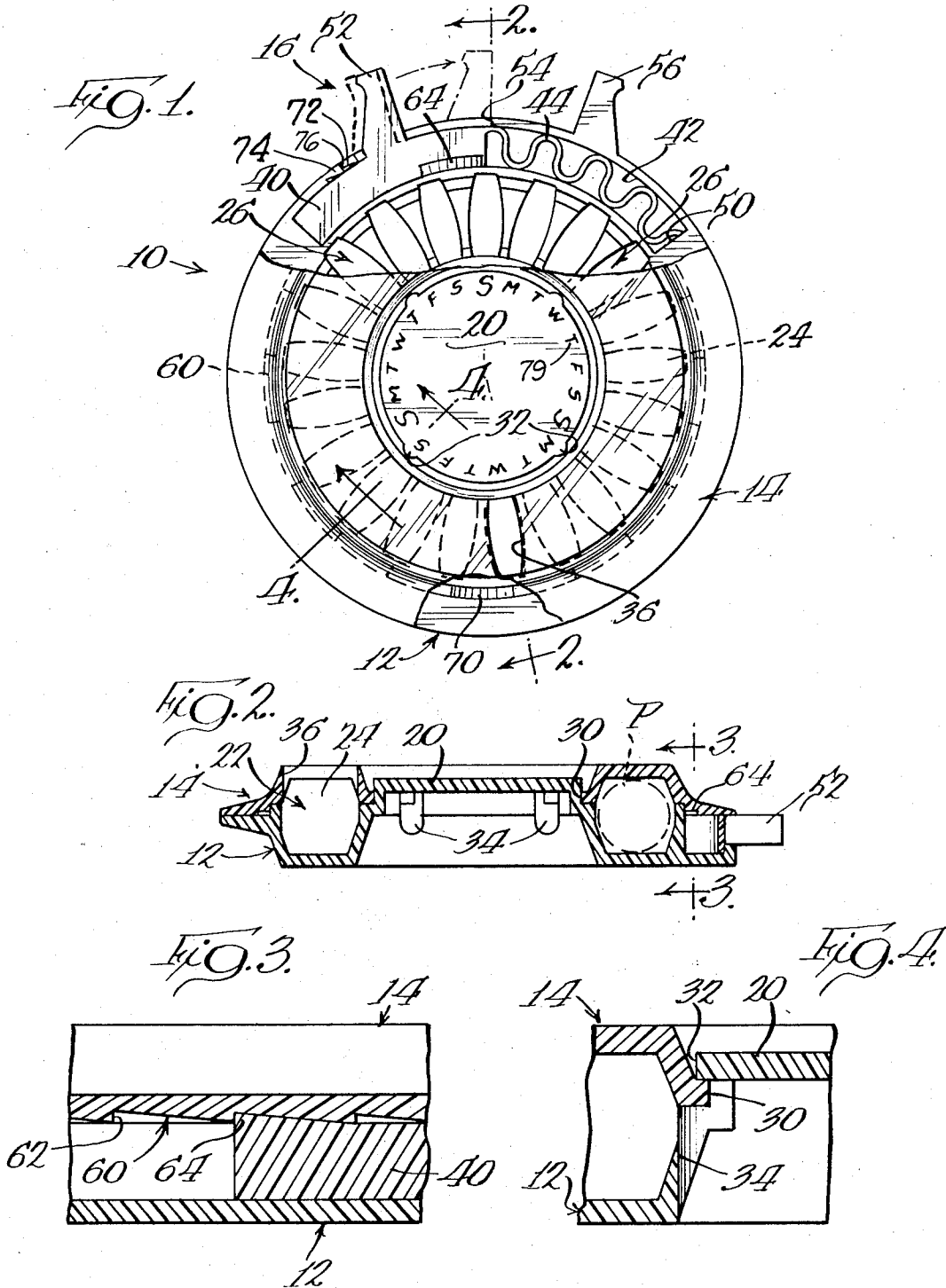
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[57] **ABSTRACT**

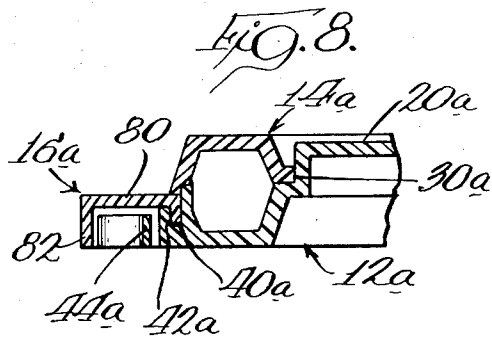
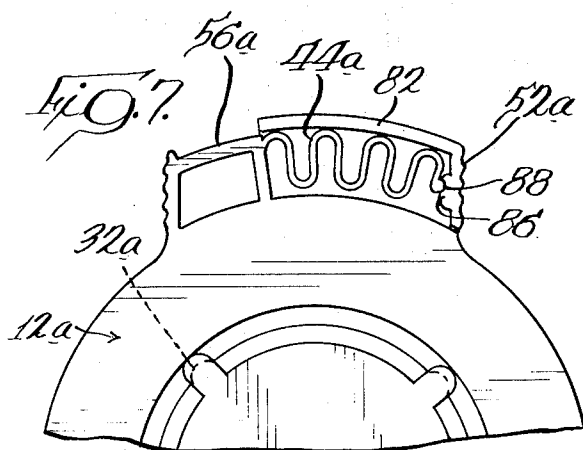
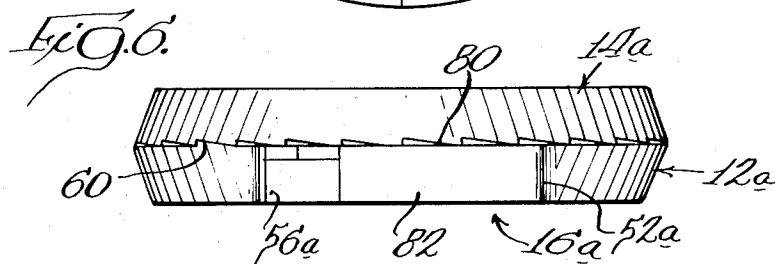
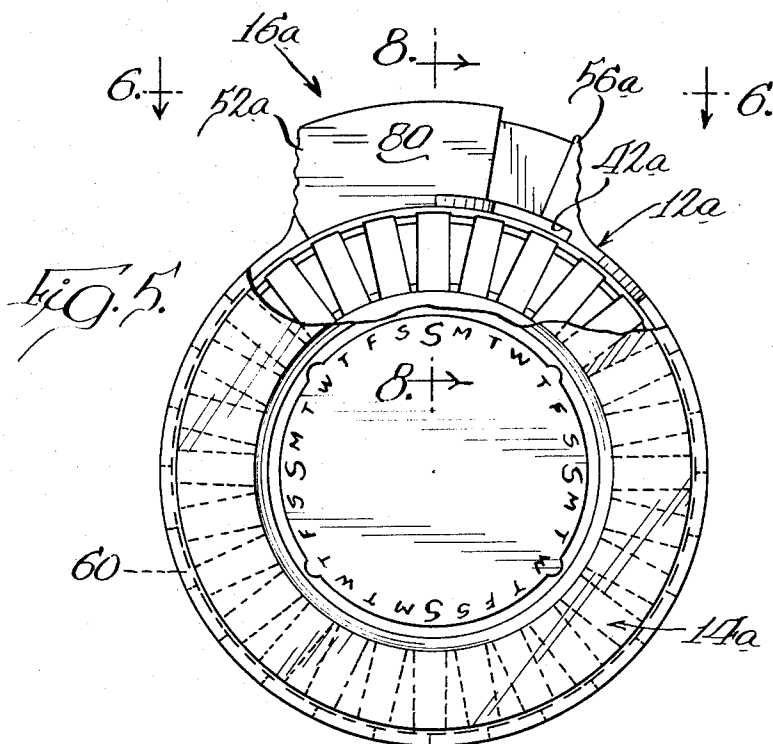
A pill dispenser consisting of a circular base having a plurality of circumferentially spaced pockets defined therein with a cover rotatable on the base. The pockets are preferably upwardly opening. The cover has a single pill exit, and the device incorporates drive means for advancing the pill exit into alignment with successive pockets to allow removal of individual pills from the respective pockets.

**21 Claims, 8 Drawing Figures**





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## PROGRAMMED PILL DISPENSER

## BACKGROUND OF THE INVENTION

The present invention relates generally to pill dispensers, and more particularly to a simple and inexpensive programmed pill dispensing device.

The dispensing of pills or tablets and the like has received increased attention in recent years due to the many advances in medical research that have resulted in numerous medicines in pill or tablet form. There are now available on the market, in addition to the conventional bottles and closures, many mechanical dispensing devices. In addition, there are numerous types of blister, skin and foil packaging techniques which are associated with apertured supporting boards, dispensing cartons and the like for the manual removal and separation of pills therefrom.

One particular area which has recently received considerable attention is the packaging of oral contraceptive pills, and various devices have been proposed for packaging and dispensing such pills. One of the problems encountered in the use of oral contraceptives is that the pills must be taken on a daily basis for a certain period of time, and a certain number of pills must be taken during a given time period to produce the desired results.

## SUMMARY OF THE INVENTION

The pill dispenser constructed in accordance with the teachings of the present invention allows for accurate dispensing of pills, and gives a clear indication of the number of pills that have been taken from the group as well as the number of pills remaining to be taken. The device or unit is extremely compact and pleasing in appearance, and can be manufactured at a minimum expense.

The dispensing device of the present invention consists of a circular base having a central hub portion with a plurality of circumferentially spaced pill receiving pockets surrounding the hub on the base. In a preferred form of this dispenser, the pockets open upwardly, being produced by partitioning an annular recess into a plurality of compartments of equal size, with the partitions extending upwardly and having upper edges located in substantially the same plane as the top surface of the hub.

A cover is rotatably supported about the hub and completes the enclosure of each of the pill receiving compartments or pockets. The cover has a single pill exit aligned with the annular recess, and the cover and base having cooperating means to advance the pill exit into alignment with successive pockets to allow the removal of individual pills from the respective pockets.

The cooperating or drive means may consist of an actuator that is slidably supported between first and second positions on the base and has an actuating finger cooperating with ratchet teeth defined on the periphery of the cover. The circumferential spacing between the first and second positions of the drive means is approximately the same as the spacing between adjacent partitions defining the pockets, so that movement of the actuator from the first to the second position will move the pill exit from one pocket to the next adjacent pocket. The ratchet teeth may also be spaced in substantially the same way.

The actuator is biased to its first position by the plastic spring which in one embodiment is integral with the actuator and in another embodiment is integral with the base, so that the entire unit includes a minimum number of pieces, each of which can be molded in a single step molding process.

The hub is located in close proximity to the respective pockets, and is capable of receiving indicators for each of the pockets so that the user of the pills may readily determine whether a pill has been taken for any given time interval.

The entire unit is extremely compact so that it can be easily packaged for shipment and can be carried in a purse, occupying a minimum amount of space.

## BRIEF DESCRIPTION OF SEVERAL VIEWS OF DRAWINGS

FIG. 1 is a plan view of the pill dispenser with portions of the cover broken away;

FIG. 2 is a section taken generally along line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken generally along line 3—3 of FIG. 2;

FIG. 4 is an enlarged fragmentary section taken generally along line 4—4 of FIG. 1;

FIG. 5 is a plan view similar to FIG. 1 showing a slightly modified form of pill dispenser;

FIG. 6 is a side elevation view as seen along line 6—6 of FIG. 5;

FIG. 7 is a fragmentary bottom view of the pill dispenser shown in FIG. 5; and

FIG. 8 is a fragmentary sectional view taken generally along line 8—8 of FIG. 5.

## DETAILED DESCRIPTION

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail two specific embodiments, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiments illustrated.

FIG. 1 illustrates the dispensing device generally designated by the reference numeral 10 consisting of three molded plastic pieces, including a base 12, a cover 14 and an actuator 16.

The base 12 is substantially circular in cross section and has a central portion or hub 20 and an annular recess 22 (best seen in FIG. 2) surrounding the hub. The annular recess 22 has a plurality of partitions or vertical walls 24 that extend upwardly above the surface surrounding the recess and have their upper edges terminating in a substantially common plane with the upper surface of the hub 20, for a purpose which will be described later. The partitions or walls 24 divide the annular recess into a plurality of pill receiving pockets 26 each being substantially the same size and specifically configured to receive a pill of a given dimension.

The cover 14 is supported for rotation on the central portion or hub 20 of the base, and for this purpose the cover has an opening 30 substantially equal to the diameter of the hub 20. In the illustrated embodiment, the cover 14 is maintained on the base for rotation about the hub by a plurality of circumferentially spaced outwardly extending projections 32 (FIGS. 1 and 4). As shown in FIG. 2, the hub portion 20 of the base is hollow and the projections 32 are aligned with recesses

34 in the peripheral wall of the hollow hub. This arrangement simplifies the molding of the projections onto the periphery of the hub 20.

The transparent cover 14 also has a single pill exit 36 defined therein that is in alignment with the annular recess and has a size substantially equal to the size of the respective pill receiving pockets 26.

According to one aspect of the invention, the cover and base have cooperating drive means for advancing the pill exit 36 into alignment with successive pockets and thereby allow removal of individual pills from the respective pockets. The cooperating means includes the actuator 16 that has an arcuate segment 40 slidably supported within an arcuate slot 42 defined adjacent the periphery of the base. As clearly shown in FIG. 1, the arcuate slot is concentric with the center of the base. The actuator and more specifically the segment 40 of the actuator has one end normally biased into engagement with one end of the slot 42 by biasing means in the form of a spring 44 that is formed integral with the segment 40. The spring is a sinuous thin integral extension extending from one end of the segment 40 and has its free end engaging the opposite end 50 of the slot 42. The actuator 16 further has a gripping portion 52 extending through a cutout portion 54 on the periphery of the base so as to be readily grasped by the user, for a purpose which will be described later. In addition, the base 12 also has a gripping portion 56 extending from the periphery thereof adjacent the slot.

The cooperating or drive means further includes means for advancing the pill exit 36 from one pocket to a next succeeding pocket when the actuator is moved from its first to a second position. This latter means consists of a ratchet 60 defined on the bottom surface of the peripheral portion of the cover which overlies the arcuate segment 40 of the actuator 16. A plurality of teeth 62 of the ratchet 60 that may be spaced by a circumferential dimension that is equal to the spacing of the respective partitions or walls 24. The segment 40 of the actuator has a finger 64 that is in vertical alignment with the ratchet 60 and engages the respective teeth as the actuator 16 is moved from the first position or solid line position of FIG. 1 to the phantom line position shown therein. In order to prevent the cover from rotating in an opposite direction as the actuator is moved from its second to its first position by the spring 44, the base further includes an integral finger 70 (FIG. 1) that is also aligned with the ratchet 60 but has its vertical wall facing in the opposite direction from that of the finger 64.

According to another aspect of the invention, the dispensing device is constructed so that the spring is maintained in an unstressed or relaxed condition until the device is ready to be used by the purchaser. Thus, as shown in FIG. 1, the outer surface of the arcuate segment 40 has an override ratchet or projection 72 extending therefrom. This projection is received in a complementary recess 74 on the inner surface of the slot 42. With this arrangement the actuator is initially held in the dotted line position shown in FIG. 1 where the free end of the spring is spaced from the adjacent end of the slot (not shown).

Upon initial movement of the actuator 16 the resilient side wall of slot 42 is flexed outwardly and, the projection is moved out of the complementary recess 74 and the gripping portion 52 is moved from the dotted line position to the solid line position of FIG. 1 to cause

the end of spring 44 to engage the end of slot 42 and compress the spring. When the actuator is released the spring 44 will move the actuator to the left and the projection will ultimately engage the end wall 76 of the cut out portion 54 to define the first position for the actuator. The projection 72 and recess 74 define cooperating means between the base and the actuator to maintain the actuator in a stored position where the spring is in a relaxed condition.

The pill dispensing device 10 further includes indicia means of periodicity that has indicators that are respectively aligned with the respective pockets. For example, if the device is used for contraceptive pills, the indicator would be the respective days of the week. The indicator means can readily be in the form of a circular tab substantially the dimension of the hub or central portion 20 so as to be adhesively or otherwise secured to the hub and have its respective indicators 79 aligned with respective pockets. In the specific embodiment illustrated, the annular recess 22 is divided into 21 pockets, equal to the number of pills taken for one given period of time. With this arrangement, the indicator can be permanently affixed or even molded in with the hub portion, as will become apparent hereinafter.

In operation, the cover may initially be removed by the application of an upward force and the resiliency of the plastic pieces will allow the opening 30 to be expanded sufficiently so that the projections 32 may pass through the opening 30 in the cover. Twenty one pills are then inserted into the respective pockets and the cover is placed on the hub. The pill exit is closed by some suitable type of adhesive tape or other closure means so that the package can be shipped to the merchandiser. When the pill taking cycle is to begin, the actuator is operated so as to locate the pill exit with the date corresponding to the date for the first pill. The enclosure means for the pill exit can then be removed and the first pill taken. Thereafter, on successive days, the actuator is moved from the first to the second position to locate the pill exit with the next succeeding pocket allowing for the removal of the individual pill in that pocket. The rotation of the actuator is accomplished by grasping the two gripping portions and forcing them towards each other and the finger 64 engages one of the teeth 62 to move the cover with the actuator as the actuator is moved from its first to its second position. While the actuator is returning from the second to the first position, by the bias of the spring 44, the finger or retainer 70 prevents the cover from returning to its previous position by engaging one of the teeth 62.

It should be noted that one of the advantages of the structural arrangement of parts of the pill dispenser allows for the use of any type of plastic that is compatible for dispensing medicines in molding the base as well as the cover. The actuator, which is completely isolated from the pills, is the only part that need be formed of a resilient plastic material, such as Nylon, Delrin, etc. This arrangement considerably decreases the cost of manufacturing the entire dispensing device. Also the cover and base cooperate with each other to substantially seal the pockets and the partitions extend into the annular recessed portion of the cover to completely separate individual pills.

A slightly modified embodiment of the invention is disclosed in FIGS. 5 through 8. Since the various parts and their cooperation with each other is substantially identical, common reference numerals will be used

from the embodiment of FIGS. 1 through 4 with the addition of the suffix "a". The only significant difference between the two embodiments is the structural configuration of the actuator and the spring as well as the configuration of the gripping portion on the base. In the modified embodiment illustrated in FIGS. 5 through 8, the actuator 16a consists of an arcuate segment 40a located in the arcuate slot 42a in the base with a major portion 80 extending from the base beyond the cover 14a. The gripping portion 52a is defined on one end of the major portion 80 extending beyond the cover and the base. Also, the portion 80 has a downwardly directed flange 82 (FIG. 8) for a purpose which will be described later.

In the embodiment of FIG. 5 through 8, the spring 44a is formed integral with the base gripping portion 56a and engages the inner surface of the gripping portion 52a on the actuator 16a. As will be seen from an inspection of FIGS. 7 and 8, the downwardly directed flange 82 on the actuator substantially encloses the spring. Preferably, in order to maintain the free end of the spring in a substantially fixed position, the gripping portion 52a has a projection 86 that has a small recess 88 for receiving the free end of the spring. While not specifically disclosed, the mechanism for maintaining the spring in an unstressed, condition, described above can also be incorporated into this embodiment.

Since the modified form of the invention is operated in an identical manner to that in the previous embodiment, it is believed that no detailed description thereof appears to be necessary.

As can be appreciated from the above description, the present invention provides a simple, inexpensive, esthetic, compact dispensing device that can be utilized for controlled use of various types of pills, particularly oral contraceptive pills.

What is claimed is:

1. A pill dispenser comprising a substantially circular base having a plurality of circumferentially spaced pill receiving pockets therein; a cover for said pockets, said cover having a single pill exit therein; means supporting said cover for rotation on said base, said base having an elongated arcuate slot opening toward said cover and concentric with said base; ratchet teeth on said cover aligned with said slot; and an actuator reciprocable in said slot and cooperating with said teeth for rotating said cover on said base to sequentially align said pill exit with successive pockets and allow removal of pills from individual successive pockets while keeping the remaining pockets covered.

2. A pill dispenser as defined in claim 1, in which said actuator is reciprocated between first and second positions, said positions being circumferentially spaced by a dimension equal to the increment of spacing of said pockets; and biasing means normally maintaining said actuator in said first position.

3. A pill dispenser as defined in claim 2, in which the spacing between adjacent teeth is substantially equal to the spacing of said pockets so that movement of said actuator from said first position to said second position will advance said pill exit in one direction from one pocket to the next adjacent pocket.

4. A pill dispenser as defined in claim 3, further including means on said base engaging said ratchet teeth for preventing rotation of said cover in the opposite direction.

5. A pill dispenser as defined in claim 1, in which said pill receiving pockets open upwardly.

6. A pill dispenser comprising a substantially circular base having a plurality of circumferentially spaced pill receiving pockets therein; a cover for said pockets, said cover having a single pill exit therein; means supporting said cover for rotation on said base; and drive means for rotating said cover on said base to sequentially align said pill exit with successive pockets and allow removal of pills from individual successive pockets covered, said drive means including an actuator; guide means on said base defining an arcuate slot with at least a segment of said actuator slidable in said slot for guiding said actuator between first and second positions, said positions being circumferentially spaced by a dimension equal to the increment of spacing of said pockets; and biasing means normally maintaining said actuator in said first position.

7. A pill dispenser as defined in claim 6, in which said biasing means includes a spring integral with said actuator and located in said slot.

8. A pill dispenser as defined in claim 21, in which said actuator has a gripping portion extending from said slot and said base has a gripping portion, with said biasing means including a spring integral with the base gripping portion and having a free end engaging said actuator gripping portion.

9. A pill dispenser comprising a base having a circular central portion and an annular recess surrounding said central portion; means dividing said annular recess into a plurality of pill receiving pockets of equal size; a cover supported for rotation on said central portion and overlying said annular recess with a single pill exit in said cover, said pill exit having a dimension corresponding substantially to the dimension of one of said pockets; and cooperating means between said base and cover for advancing said pill exit into alignment with successive pockets to allow removal of individual pills from the respective pockets, said cooperating means including an actuator; means defining an arcuate slot adjacent the periphery of said base, said actuator having an arcuate segment slidable in said slot; biasing means cooperating with said actuator for normally maintaining one end of said segment in engagement with one end of said slot and defining a first position for said actuator; said actuator being moveable from a first position to a second position to advance said pill exit from one pocket to another.

10. A pill dispenser as defined in claim 9, in which said actuator has a gripping portion extending from said slot and said base has a gripping portion adjacent said slot.

11. A pill dispenser as defined in claim 10, in which said biasing means includes a spring between the opposite end of said arcuate slot in the base and said slidable arcuate segment of said actuator.

12. A pill dispenser as defined in claim 10, in which said biasing means includes a spring located between said gripping portions.

13. A pill dispenser as defined in claim 12, in which said spring is integrally formed with said actuator.

14. A pill dispenser as defined in claim 9, in which said cover has a portion overlying said slot and said cooperating means includes ratchet teeth on said portion of said cover and a finger extending from said arcuate segment of said actuator and engaging said ratchet

teeth, said base having a finger engaging said ratchet to prevent rotation of said cover in one direction.

15. A programmed pill dispenser comprising a circular base having a central hub extending from one surface thereof and a plurality of pill receiving pockets of equal size and equally spaced around said hub; a cover having an opening receiving said hub and supporting said cover for rotation on said base, said cover having a single pill aligned with said pockets; a plastic actuator for rotating said cover and having a segment with said base having an arcuate slot receiving said segment; biasing means between said base and said actuator, said biasing means normally maintaining said actuator in a first position and accommodating movement to a second position; gripping means on said base and said actuator for moving said actuator from the first to the second position; cooperating means on said cover and said actuator for rotating said cover on said base as said actuator is moved from the first to the second position to align said pill exit with a next adjacent pocket; and retaining means between said cover and base for preventing relative rotation as said actuator is moved from the second to the first position by said biasing means.

16. A programmed pill dispenser as defined in claim 15, in which said base is formed of plastic material and said biasing means includes a resilient plastic spring integral with said gripping means on said base and engages said gripping means on said actuator, said actuator having a major portion extending beyond said base

to substantially enclose said spring.

17. A programmed pill dispenser as defined in claim 15, in which said biasing means includes a resilient plastic spring integral with said actuator and located in said slot with a free end engaging one end of said slot and in which a portion of said cover closes said slot.

18. A programmed pill dispenser as defined in claim 15, in which said cover is formed from a transparent plastic material and said hub has indicia of periodicity serially arranged adjacent the periphery of the upper surface thereof that are aligned with the respective pockets to indicate when a pill has been taken for a given period.

19. A programmed pill dispenser as defined in claim 18, further including a removeable tab having a peripheral dimension substantially equal to the periphery of the hub and secured to the upper surface of the hub with said indicia of periodicity on said tab.

20. A programmed pill dispenser as defined in claim 18, in which said cover is formed of a molded plastic material and the indicia of periodicity are molded into said hub.

21. A programmed pill dispenser as defined in claim 15, further including cooperating means between said actuator and said base for initially maintaining said actuator in a stored position where said biasing means is in a relaxed condition.

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