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DISPENSER WITH INDICATING MEANS

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2 Sheets-Sheet 1

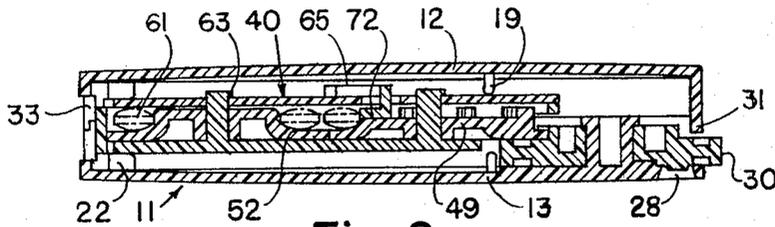


Fig. 2

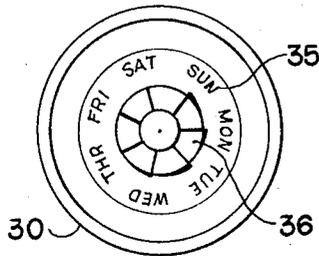


Fig. 4

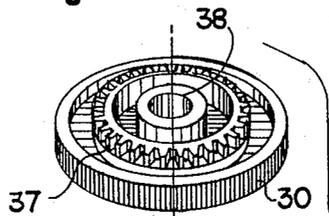


Fig. 3

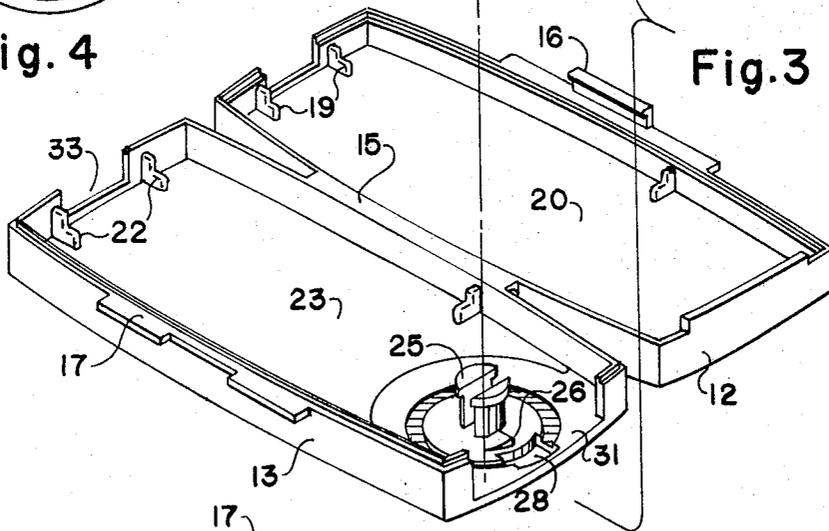


Fig. 1

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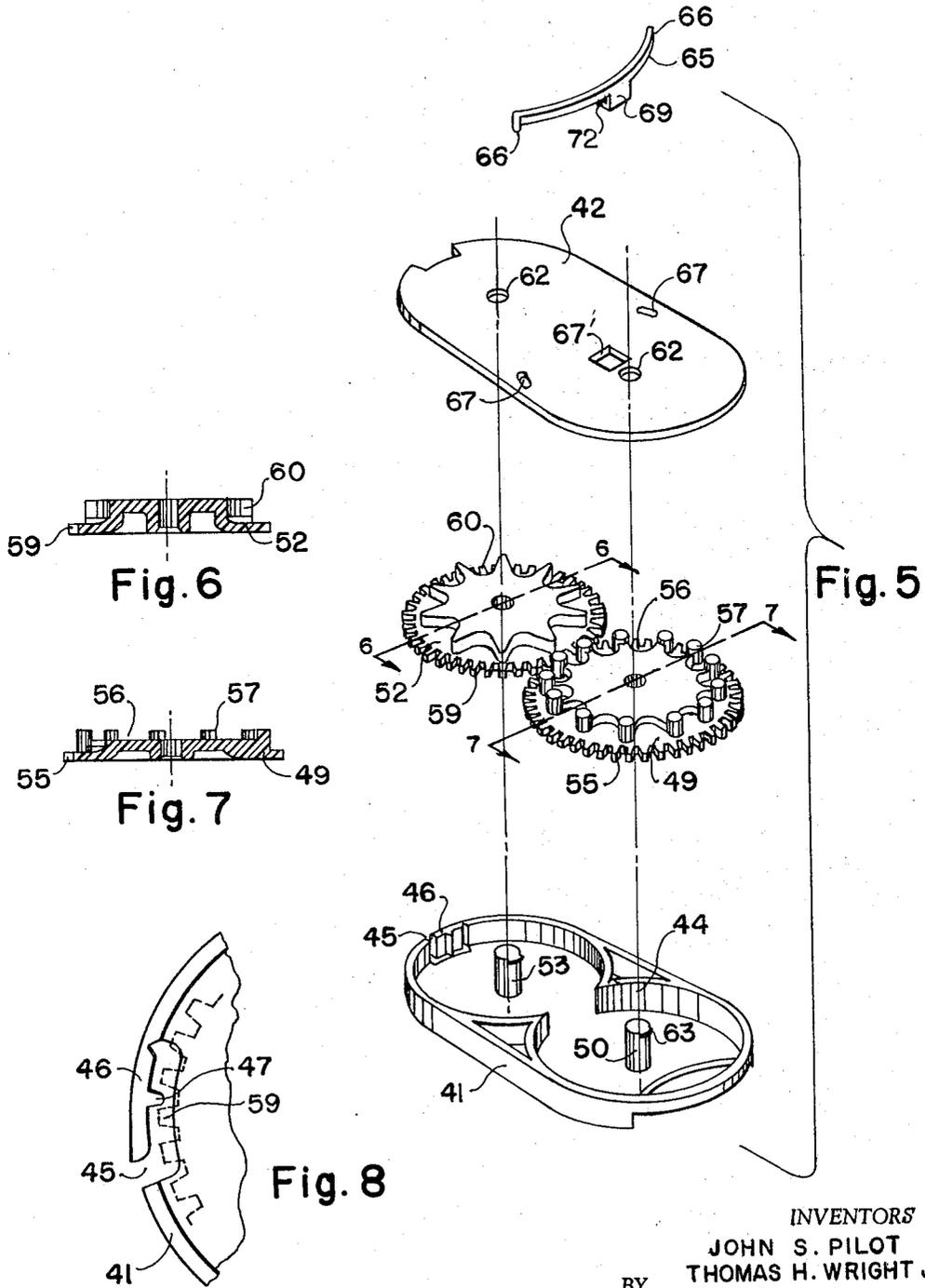
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DISPENSER WITH INDICATING MEANS

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2 Sheets-Sheet 2



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3,332,575

**DISPENSER WITH INDICATING MEANS**

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7 Claims. (Cl. 221—8)

This invention relates to a dispenser for medicaments in the form of pills, tablets, capsules and the like, and in particular to a dispenser having a medicament-containing cartridge and means for indicating the removal of each medicament dosage from the dispenser.

In writing out prescriptions it is generally the practice of physicians to specify that the medicament (hereafter referred to as a pill) should be taken at prescribed intervals. Such interval may be only a matter of hours, or, on the other hand, may be on the basis of one per day, or perhaps one every other day. In any event, it is essential that the patient be able to determine whether or not he has taken a pill for that interval since it is quite possible that his memory will fail him. Various devices have been contrived in which the patient, upon taking a pill from the dispenser or container, will, in a separate physical action, record this fact. For those patients who are always able to remember to make a recording mark or other similar act, such a procedure is sufficient. However, many a person forgets to enter on his own personal record the fact that he has taken a pill at the specified time. Thus, he is confronted with the problem of trying to remember whether or not he actually took a pill for that interval.

A number of pill dispensers have been designed to provide automatic or semiautomatic recording of pill consumption. In many instances the pill dispenser is discarded after the last pill has been taken. Generally speaking, it is preferable that the medicament be placed in the dispenser by the manufacturer rather than by the patient. Consequently, the normal procedure is to sell pre-loaded dispensers containing medicament, then discard the dispensers once they are empty.

It is apparent that with such a procedure there is waste of the dispenser, and the result is an increase in cost and price. In an effort to overcome this disadvantage a portion of the dispenser of this invention is adapted to be re-used by the patient an indefinite number of times. This is accomplished by providing a cartridge containing pills which is readily inserted into the dispenser. Thus, the dispenser can be re-loaded by the user with a cartridge filled with pills which are pre-packaged by the manufacturer under the appropriate sanitary and other safeguards.

In addition, there are some instances where the physician desires to prescribe a sequence of pills comprising at least two different types. Thus, he may wish to prescribe ten pills initially of one hormone to be followed by eleven pills of a different hormone. In such instances it is essential that the patient take the pills precisely as prescribed. Therefore, it is desirable to have a pill dispenser which may be easily filled with two different types of pills in a prescribed sequence, and which will assure the dispensing of the pills in accordance with the physician's instructions.

Briefly, the dispenser of this invention comprises a cover and a base with an indicating dial. The cover and base are hinged together for receiving a pill cartridge. The pill cartridge which will be discarded after the consumption of its contents includes two or more pill-carrying gear wheels which are adapted for engagement with the indicating dial in the dispenser's case. Rotation of the indicating dial will automatically dispense the pills from the two gear wheels.

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It is therefore one object of this invention to provide a new and improved pill dispenser.

Another object of this invention is to provide for a new and improved pill dispenser adapted for receiving pre-loaded pill cartridges.

Another object of this invention is to provide a pill cartridge for a pill dispenser in which the pills may be prearranged in a prescribed sequence.

Another object of this invention is to provide a new and improved pill dispenser having a disposable cartridge engageable with an automatic indicating means.

Other objects and advantages of this invention will be made apparent upon reading the following specification in connection with the drawings in which:

FIG. 1 is a plan view of the dispenser of this invention;

FIG. 2 is a sectional view taken along the longitudinal center line 2—2 of the dispenser of FIG. 1;

FIG. 3 is a perspective view in exploded relationship of the pill dispenser's case and indicating dial;

FIG. 4 is a plan view of the indicating dial;

FIG. 5 is a perspective view in exploded relationship of the disposable cartridge for the dispenser of this invention;

FIG. 6 is a sectional view taken along line 6—6 of FIG. 5;

FIG. 7 is a sectional view of the first gear wheel taken along line 7—7 of FIG. 5; and

FIG. 8 is an enlarged partial view of the pill exit in the cartridge of FIG. 5.

Referring to FIGS. 1-4, it is to be noted that all of the illustrated components can be formed from a plastic material such as polypropylene or polystyrene. Thus, all of the parts of the pill dispenser 11 of this invention are readily fabricated by using conventional injection molding techniques, making the dispenser 11 relatively inexpensive to produce. Although materials other than plastic are suitable it has been found that plastics are the most advantageous from an economical standpoint as well as being compatible with the particular medicament to be contained in the dispenser.

Dispenser 11 has a cover 12 and base 13 which are hinged together by means 15 which in the particular embodiment can comprise a thin web of plastic material. However, if the cover and base are not to be formed in one molding operation, the hinging means 15 can comprise a pair of conventional ball and socket elements. Cover 12 has a latch element 16 which engages a complementary latch element 17 on base 13. A plurality of spacing shoulders 19 can be formed integrally with the interior surface 20 of cover 12.

Likewise, a plurality of spacing means 22 can be formed on the interior surface 23 of base 13. A dial spindle 25 is molded on the interior surface of the base and is split to provide a fair degree of flexibility. An anti-reverse ratchet 26 is formed at the base of spindle 25. A reference means 28 is also provided on base 13 and in the particular embodiment comprises an aperture. This reference means is positioned to coincide with an indicating dial 30. A narrow passageway 31 is defined by the cover 12 and base 13 to permit a portion of indicating dial 30 to extend beyond the dispenser's periphery. At the opposite end a pill exit 33 is defined by complementary cutouts in the case and base.

As shown in FIG. 4, the indicating dial 30 is circular and on one face has indicia 35 inscribed which in the particular embodiment are the seven days of the week. A circular pattern of ratchet teeth 36 complementary to the anti-reverse ratchet 26 are provided on the same face of the dial to assure advancement of the dial in only one direction. On the opposite side of dial 30 a circular ring of gear teeth 37 is molded. Dial 30 has a hub 38 which is dimensioned for a rotatable fit on spindle 25.

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Disposable pill cartridge 40 is illustrated in its assembled form in FIG. 2 and is more easily understood from the exploded view of FIG. 5. Cartridge 40 comprises a bottom section 41 and a top section 42. These two sections are dimensioned for proper positioning between the spacing means 19 and 22 on the dispenser's cover and base. The inner surface of bottom section 41 has a wall 44 which defines a figure 8 or pair of connected circles. At one end of bottom section 41 a pill exit 45 is defined upon the removal of tear-out tab 46. Tear-out tab 46 may be provided with a V-shaped tooth for reasons to be explained later. At the other end of bottom section 41 there is an opening 48 for exposure of a portion of a first gear wheel 49 which is rotatably mounted over spindle 50 and within wall 44. A second gear wheel 52 is mounted over spindle 53 in a similar manner.

Gear wheel 49 has a series of gear teeth 55 about its perimeter which mesh with teeth 37 on dial 30. Pill compartments 56 are defined between small posts 57 which are positioned coincidentally with gear teeth 55.

The second gear wheel 52 also has a plurality of gear teeth 59 about its perimeter. Pill compartments 60 are inwardly spaced from the wheel's periphery. The illustrated embodiment shows ten pill compartments for gear wheel 52 whereas gear wheel 49 has eleven pill compartments. Thus, in this instance the dispenser has been designed for containing two types of pills 61 of which ten of one type are first dispensed to be followed by eleven pills of the other type.

Gear wheels 49 and 52 are positioned in the cartridge's bottom section 41 with their gear teeth 55 and 59 engaged. Tooth 47 on the tear-out tab 46 rests between a pair of gear teeth 59 and assures alignment of a pill compartment 60 with pill exit 45. Likewise, a pill compartment 56 will be aligned with an adjacent pill compartment 60. In addition, tooth 47 will prevent rotation of gear wheels 49 and 52 until tear-out tab 46 is broken off. This temporary locking of wheels 49 and 52 is particularly helpful during the filling of the pill compartments.

After pills have been loaded by the producer into the two gear wheels 49 and 52, the top section 42 is positioned over bottom section 41. Coupling holes 62 are provided in top section 42 for alignment with spindles 50 and 53. The top section can be finally secured to the bottom section with the gear wheels therein by a snap fit which is obtained upon forcing holes 62 over the small extending lips 63 on spindles 50 and 53.

As shown in the upper portion of FIG. 5, a thin resilient and flexible biasing means 65 is mounted on top section 42. This biasing means has a pair of projections 66 at opposite ends which extend into slots 67 on the top section. A pill driver 69 projects from biasing means 65 and through opening 67' in the top section. Referring to FIG. 2, pill driver 69 has a small flange 72 which is in contact with a pill on the first gear wheel 49. The positioning of slots 67 and opening 67' in the top cover is such that the biasing means must be slightly flexed in order for pill driver 69 to extend into opening 67'. Consequently, biasing means 65 is always urging a pill on the first gear wheel into an adjacent pill compartment 60 of the second gear wheel 52.

The individual who is taking the pills may receive the pill dispenser of this invention with the loaded pill cartridge separate from the dispenser's hinged cover 12 and base 13 containing indicating dial 30. Thus, the pills and their cartridge can be protected from contamination and undesirable humidity by wrapping them independent of the dispenser's case. Prior to placement of the cartridge on base 13, indicating dial 30 is rotated in order to align the proper indicia with the reference means 28. The user then merely unwraps the pill cartridge and places it into base 13 with the bottom section 41 of the cartridge resting on spacing means 22. Once the dial has been properly registered and the cartridge has been

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positioned, cover 12 is snapped down onto base 13. Gear wheels 49 and 52 have been pre-assembled by the producer in torque-transmitting engagement and dial 30 is now in similar engagement with gear wheel 49. Thus, the unit is in condition for dispensing pills.

Tear-out tab 46 is broken off and the first pill which is in the second gear wheel 52 is removed by tilting the dispenser. When it is time for the second pill to be removed, dial 30 is thumbed counter-clockwise to the next day of the week. As shown in FIG. 2, dial 30 has its gear teeth 36 engaged with gear teeth 55 on the first gear wheel 49. This gear train drive continues by the engagement of gear teeth 55 on the opposite sides of those engaged with dial 30 with gear teeth 59 on the second gear 52. Thus, rotation of dial 30 simultaneously advances the two gear wheels for positioning a second pill in front of the aligned pill exits 45 and 33.

As the sixth pill is to be dispensed, a pill compartment which originally contained the first dispensed pill in gear wheel 52 will be advanced to a position adjacent a pill compartment in the first gear wheel 49. Inasmuch as biasing means 65 and pill driver 69 are urging a pill radially outward, it is apparent that when an empty pill compartment of the second gear wheel advances to a position adjacent a biased pill, the pill will travel from the first gear wheel to the second gear wheel. Thus, the pills of a different type in the first gear wheel are transmitted to the second gear wheel for eventual exit through the openings. Although the inclusion of biasing means 65 is preferable, transfer of pills from wheel 49 to wheel 52 may also occur by gravity flow if one wishes to omit biasing means 52. The dial wheel continues to advance with the movement of each gear wheel. After all pills have been removed from the dispenser, the cartridge is discarded and a new cartridge is inserted between cover 12 and base 13.

Although only one embodiment of this invention has been described, it will be apparent to those with skill in the art that other variations may be made without departing from the spirit of this invention and the scope of the appended claims.

We claim:

1. A pill dispenser comprising:

a case having a cover and base defining a pill exit, an indicating dial rotatably mounted between said cover and base with a portion being accessible exterior of said case,

indicia means on said indicating dial positioned in selective alignment with a reference means on said case, a first wheel adapted to contain pills rotatably mounted in said case and in torque-transmitting engagement with said indicating dial,

a second wheel adapted to contain pills rotatably mounted in said case with a portion adjacent said pill exit and in torque-transmitting engagement with said first wheel, and

said first and second wheels being aligned for transmittal of pills from said first wheel into depleted sections of said second wheel upon successive rotation of said indicating dial.

2. A pill dispenser in accordance with claim 1 in which the pills in said first and second wheels are contained in individual compartments.

3. A pill dispenser in accordance with claim 2 in which biasing means is mounted adjacent said first wheel in biasing contact with pills therein in a direction toward said second wheel.

4. A pill dispenser in accordance with claim 3 in which said first and second gear wheels are contained within top and bottom sections forming a cartridge removably mounted within said case.

5. A pill dispenser in accordance with claim 4 in which said biasing means comprises a flexible member mounted on said cartridge top section and having a projection ex-

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tending through said top section in biasing contact with a pill in said first wheel adjacent a pill compartment in said second wheel.

6. A pill dispenser in accordance with claim 5 in which said torque-transmitting engagement between said first and second wheels and said indicating dial comprises meshed gear teeth.

7. A pill dispenser in accordance with claim 6 in which said indicating dial is ratcheted with said case for uni-rotational movement.

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