This application is a continuation-in-part of our patent application Serial No. 376,763, filed June 22, 1964, now abandoned, with which this application copended.

The present invention relates to dispensing means for pharmaceutical preparations in solid dosage form and similar materials, and, more particularly, to devices from which such materials are dispensed in a program for administration and use thereof according to daily and other time-related schedules.

As is well known, certain pharmaceutical preparations are frequently prescribed for or recommended to be used by patients on definite dosage schedules over relatively lengthy time periods but at relatively infrequent intervals, and careful adherence to such dosage schedules is essential or highly desirable. However, a patient may experience uncertainty, confusion or other difficulty in having and retaining clearly in mind when the next previous tablet had been used or the next subsequent tablet is to be used, or when a course of scheduled medication is to begin or end. For example, under a regime calling for the total of six tablets to be administered serially at two hour intervals, most patients will be likely to remember and know the correct times to administer each such tablet; on the other hand, under a regime calling for the total of twenty tablets at the rate of one tablet per day, many patients may be apt to forget whether, on any particular day during the twenty, a tablet was used or omitted. In the latter situation, such patients may either unintentionally elide one or more days or, conversely, use more than one tablet on a single day. Such departures from the dosage schedule are likely to impair or defeat the purpose of the tablets and are uneconomic. With the present invention such omissions, excesses, and the uncertainty which they are founded, are substantially obviated.

An object of the invention is to provide a device wherein from solid form pharmaceutical preparations may be conveniently and safely dispensed and which affords a graphic and readily understandable chronologic schedule for the time-spaced administration of such pharmaceutical preparations. The invention serves both record-making and reminding functions relative to when pharmaceutical preparations have been and are to be dispensed. The invention enables patients easily and with confidence and assurance to follow and adhere to a prescribed dosage schedule and to know when a cycle or course of medication is to commence and terminate.

Another object of the invention is to afford a reusable structure for the programmed dispensing of tablets and similar pharmaceutical preparations. Although, as hereinafter appears, certain elements are intentionally destructed in the course of their usage, other portions are readily adaptable to repeated use, thus promoting the economies of its utilization.

A further object of the invention is to take particular advantage of recent advancements in the packaging art relative to solid-form pharmaceutical preparations. Only relatively recently, it is believed, have manufacturing techniques been developed which make feasible the packaging or encapsulation of individual pharmaceutical tablets in individual deformable blister elements which, after each has received a tablet, are combined with a thin sheet of frangible material, such as metal foil. When and as so combined, the blister-type elements appear as being on the frangible sheet, and the combination results in a unit of spaced, tablet-containing chambers, each such chamber having a deformable raised portion (the blister element) and a readily, but restrictively, rupturable lower portion (the blister element). The devices of the present invention enable special utilization of tablets so packaged or encapsulated.

The invention is exceedingly well adapted to the programmed dispensing of oral contraceptive drugs in tablet form, because, with such drugs, the careful adherence to a daily dosage schedule of tablets and, in some instances, a particular sequence of tablets, is a paramount concern. However, the adaptability of the invention is in no wise limited to this particular field.

In the co-pending application for United States Letters Patent Serial No. 376,763, filed June 22, 1964, now abandoned, and entitled, "Dispensing Device for Solid-Form Pharmaceutical Preparations," one preferred embodiment of a dispensing device of the invention is shown, and the purpose of the instant application is to present that same embodiment and also, in equal detail, a modified version of the invention that comprises another preferred embodiment.

The invention is explained in the following description and illustrated in the accompanying drawings:

FIG. 1 is a plan view of one embodiment of the dispenser base.

FIG. 2 is a plan view of the dispenser base of FIG. 1 carrying a supply of encapsulated pharmaceutical tablets.

FIG. 3 is an exploded sectional elevation view of a dispenser base carrying a supply of pharmaceutical tablets and a cover, as along section 3–3 of FIG. 2.

FIG. 4 and FIG. 6 are enlarged fragment sectional elevations showing the supply of tablets on a dispenser base.

FIG. 5 depicts the manner in which a tablet is expressed from the invention.

FIG. 7 is a plan view of an alternative embodiment of the dispenser base.

FIG. 8 is a plan view of the planar member bearing a supply of encapsulated pharmaceutical tablets, such planar member having peripheral conformation corresponding to the base of FIG. 7.

FIG. 9 is a perspective view of the dispenser base of FIG. 7 carrying the planar member of FIG. 8.

In FIGS. 1–6 numeral 10 is a base (shown as having circular form); numeral 11 represents each of a number of radially and concentrically disposed holes in base 10; numeral 12 is a central retaining member on and integrally formed with base 10; numeral 13 is the post portion of retaining member 12; numeral 14 is the overhang arm of retaining member 12; numeral 15 represents each of a number of small, concentrically disposed pegs on base 10; numeral 16 is an opening that may appear near the center of base 10; numerals 17, 18, 19, 20, 21, 22 and 23 represent chronologic indicia of sequence and periodicity (shown as days of the week), appearing near the periphery of base 10 and respectively disposed to refer to and indicate a group of radially arranged holes 11; numeral 24 is a thin sheet of frangible material (shown in the form of a disc); numeral 25 is a central hole in thin sheet 24, through which the said thin sheet is adapted to be engaged by retaining member 12; numeral 26 represents each of a number of concentrically arranged holes in thin sheet 24, each such hole corresponding with one of the small pegs 15 of base 10; numeral 27 represents each of a number of radially disposed blisters, of deformable and transparent material, on one face of thin sheet 24, the relative disposition whereof corresponds with the disposition of the holes 11 in base.
The invention may be utilized simply, with facility, and in a variety of forms as well, as shown in FIG. 2, the invention is immediately ready to fulfill dispensing, reminding and record-making functions, as of any particular day. To use the embodiment of the invention with the base 10, a person, on the day when the course of medication is to begin, selects the outermost tablet 28 for such use, according to the chronologic indicia on base 10, and presses downward on blister 27 containing such tablet. This deforming force may be exerted with a finger, as depicted in FIG. 5. The pressed blister 27 deforms, and with slight and brief continuation of the deforming force, the therewithin tablet 28 ruptures the portion of thin sheet 24 defined by the said deformed blister and is expressed through the corresponding hole 11. The next day the same procedure is followed with respect of the ensuing blister 27 in the same concentric ring of blisters. At the end of a seven day period, the user shifts to the next inner concentric ring of blisters 27. The sequence is repeated again as long as the base of tablets has been dispensed. At that time, the device may be discarded, especially when the device has been fabricated for a sufficiently low cost to render such disposition economic.

The invention is also well adapted for other specific modes of use. Although, in the course of utilization, the blisters 27 of thin sheet 24 are intentionally destructed, base 10, especially when substantially constructed, is not subject to destruction and can continue to function indefinitely for many courses of medication. Thus, base 10 can provide a permanent device adapted for refilling of expendable thin sheets 24. Such refilling is readily accomplished, as follows: With cover 30 removed and after an expended thin sheet 24 has been removed from base 10, a fresh thin sheet 24 is emplaced on base 10 by slipping central hole 25 of the said thin sheet over and upon retaining member 12 of the said base, and rotating the said thin sheet about post portion 13 of the said retaining members to the position where the concentrically arranged holes 26 in the said thin sheet are proximate the small, concentrically disposed pegs 15 of said base. In the embodiment of the invention shown in FIG. 1, FIG. 2 and FIG. 3, when thin sheet 24 is appropriately prepositioned with respect to base 10, the retaining retention would not exceed two or six degrees. Then, each hole 26 is pressed over its corresponding peg 15; typically, the holes 26 may be of slightly smaller diameter than the pegs 15 and the friction between each hole's edge and the peg contributes to retaining thin sheet 24 on base 10. The principal function of pegs 15 and the holes 26, however, is to ensure correct coordinate positioning of each blister 27 with a corresponding hole 11 in base 10 and with the chronologic indicia, such as 17, 18, 19, 20, 21, 22 and 23 on base 10. Thin sheet 24 is retained positively on and in functional proximity with base 10 by the overhang arm 14 of retaining member 12, the length of such arm being greater than the radius of central hole 25 of the said thin sheet. And after base 10 is thus refilled, the patient begins a new course of tablets, as hereinbefore described.

In addition to such refilling capability, special provision may be made for prospective use of the invention. This feature is advantageous in circumstances such as when the first tablet 28 of a particular course or cycle of medication is not to be dispensed until some number of days after the user first obtains the dispenser or elements thereof, or when the course or cycle of medication is to commence only after some intervening (and perhaps presently indeterminate) event. Under such circum-

stances, when preparing or refilling the device by emplacing thin sheet 24 on base 10, in the manner hereinbefore described, the user may refer to and employ imprinted key 29 on thin sheet 24, prospectively coordinating such key (and thus the relative position of blisters 27 and tablets 28) with the chronologic indicia of base 10 to indicate the future day when the course of medication is to commence. For example, the two legends of imprinted key 29 shown in FIG. 2—"Day Blending Starts" and "Take First Tablet"—are specifically intended for situations when tablets 28 are to be dispensed on a daily dosage schedule coordinate with the menstrual cycle or similar periodicity. Alternatively, a user may employ an imprinted key—as, perhaps, a color code further to indicate particular sequence—are readily apparent.

In FIG. 7, FIG. 8 and FIG. 9 of the drawings there is shown an alternative preferred embodiment of the dispenser base and thin sheet; for convenience of explanation and to avoid unnecessary repetition, those elements of such alternative embodiment that are identical to or substantially identical to corresponding parts of the first described embodiment are not separately described in this specification and are set forth in FIGS. 7–9 and in the remainder of this specification by primes of the numerals previously used to designate such parts.

Two modifications characterize base 10' when contrasted with base 10. Base 10' does not have any pegs corresponding to the pegs 15 of base 10, and base 10' does provide several inwardly disposed projections designated by numeral 40. Also, thin sheet 24' has neither the circular perimeter nor the small holes 26' that characterize thin sheet 24, but has a number of peripheral indentations designated by numeral 41. Thus, when thin sheet 24' is emplaced about central retaining member 12' (in the manner hereinbefore described), engagement is enabled between projections 40 of base 10' and the extreme portions of thin sheet 24' demarked by indentations 41, and this positive engagement restrains thin sheet 24' from undesired rotational movement relative to base 10' and maintains blisters 27' in registration with holes 11'. Each projection 40 fulfills substantially the corresponding ant littention and coordinate-positioning function of the pegs 15, and each such projection 40 may be regarded as a geometric equivalent of a peg of greatly enlarged transverse section positioned at a considerably increased distance from the central retaining member. Although, in FIG. 7 projections 40 are shown as having scallop-like form, and in FIG. 8, indentations 41 are shown as having a conforming cutout, these particular forms are representative only, and other contours that enable engagement between the base and the thin sheet are equally acceptable and with the scope of the invention. In all other respects the manner of and capability of utilization of the two embodiments of the invention herein disclosed are the same.

As shown in FIG. 1, opening 16 of base 10 does not have functional relationship to the utilization of the invention for its ultimate purpose; however, inasmuch as base 10 may advantageously be fabricated of plastic material, by molding, and an opening such as opening 16 facilitates the molding process, and particularly the forming of retaining member 12, such opening 16 also appears in the drawings.

What is claimed is:

1. A dispensing container for a course of solid pharmaceutical dosage units comprising, in combination, (a) a base having a central recess and a plurality of radially arranged apertures therein; (b) chronologic indicia on the base; (c) a planar member having a plurality of radially arranged frangible sections and adapted to be received in the central recess of the base and selectively emplaced with respect to the chronologic indicia and, when so emplaced, to be carried in fixed position on the base with the frangible sections of the planar
member in registration with the apertures in the base;
(d) a plurality of erect deformable blisters on one face of the planar member, each such blister defining a frangible section of the planar member; and
(e) a solid form pharmaceutical dosage unit within at least one of the deformable blisters wherefrom such pharmaceutical dosage unit may be expressed via an aperture in the base, by applying to the blister external force sufficient to rupture the frangible section of the planar member thereby defined.

2. A dispensing container for a course of pharmaceutical tablets comprising, in combination,
(a) a base providing a raised margin and having a plurality of apertures;
(b) at least one projection extending inwardly from the raised margin of the base each such projection and portions of the raised margin defining a central recess;
(c) a retaining element on the base;
(d) a planar member having an indented margin and adapted to be selectively emplaced in the central recess and, when so emplaced, to be restrained from rotational movement relative to the base by marginal engagement with at least one projection thereof and to be held proximate the base by the retaining element;
(e) a plurality of erect deformable blisters on one face of the planar member arranged to correspond with the arrangement of apertures in the base and, when the planar member is emplaced in the central recess, to be in registration with the said apertures, each such blister defining a frangible portion of the planar member;
(f) a pharmaceutical tablet within at least one of the blisters wherefrom such tablet, via the aperture with which such blister is in registration, may be expressed by applying to the blister external force sufficient to rupture the frangible portion of the planar member thereby defined; and
(g) chronicologic indicia of sequence and periodicity on the raised margin of the base referable to the apertures therein.

3. A dispensing container for a source of pharmaceutical tablets comprising, in combination,
(a) a base having a raised outer portion and having a central circular recess and a plurality of apertures therein, such apertures being arranged, radially and concentrically, in groups;
(b) chronicologic indicia of sequence and periodicity on the raised outer portion of the base respectively proximate and referable to each group of apertures in radial arrangement;
(c) a central retaining member comprising post and overhang portions in the circular recess and integrally formed with the base;
(d) a disc of frangible material, having a central hole therein, adapted to be received about the post portion of the central retaining member and selectively emplaced in the circular recess with respect to the chronologic indicia and to be retained on the base by the overhang portion of the central retaining member;
(e) a plurality of erect deformable blisters on one face of the thin disc, the blisters being in radial and concentric arrangement to correspond with the arrangement of apertures in the base, such blisters and the thereby defined portions of the thin disc providing a plurality of chambers, the said chambers being in registration with the apertures in the base;
(f) a pharmaceutical tablet within at least one of the chambers wherefrom such tablet, via the aperture with which such chamber is in registration, may be expressed by applying to the blister portion of such chamber external force sufficient to rupture the portion of the thin disc defined by such blister portion; and
(g) an imprinted key on the thin disc indicating the first tablet to be dispensed.

4. A dispensing container for a course of pharmaceutical tablets comprising, in combination,
(a) a base providing a raised outer portion and having a central recess and a plurality of apertures therein, such apertures being arranged radially and concentrically, in groups;
(b) chronicologic indicia of sequence and periodicity equidistantly spaced about the raised outer portion of the base respectively proximate and referable to each group of apertures in radial arrangement;
(c) a plurality of scallop-like projections extending into the central recess from the raised outer portion of the base, each such projection intermediate two adjacent indicia of periodicity;
(d) a central retaining member comprising post and overhang portions in the central recess and integrally formed with the base;
(e) a thin sheet of frangible material, having a central hole and a plurality of flute-like peripheral indentations, adapted to be selectively emplaced in the central recess with respect to the chronicologic indicia and, when so emplaced, to be held proximate the base by the central retaining member and to be restrained from rotary movement relative to the base by engagement of the scallop-like projections of the base in the peripheral indentations of the thin sheet;
(f) a plurality of erect deformable blisters on one face of the thin sheet, the blisters being in radial and concentric arrangement to correspond with the arrangement of apertures in the base, such blisters and the thereby defined portions of the thin sheet providing a plurality of chambers, the said chambers being in registration with the apertures in the base;
(g) a pharmaceutical tablet within at least one of the chambers wherefrom such tablet, via the aperture with which such chamber is in registration, may be expressed by applying to the blister portion of such chamber external force sufficient to rupture the portion of the thin disc defined by such blister portion; and
(h) an imprinted key on the thin sheet indicating the first tablet to be dispensed.

5. In conjunction with a metal foil disc bearing a number of pharmaceutical tablets contained in individual chambers comprising erect, transparent, deformable blister elements and frangible portions of the metal foil disc circumscribed by such blister elements, which chambers are concentrically and radially arranged, a device for the programmed dispensing of such tablets comprising,
(a) a base providing a raised peripheral portion and having a central circular recess and a plurality of concentrically and radially arranged apertures therein corresponding with the arrangement of the chambers on the said disc;
(b) chronicologic indicia of sequence and periodicity on the peripheral portion of the base referable to the apertures;
(c) a retaining member, centrally situated in the circular central recess of and integrally formed with the base, comprising a short post portion and an overhang portion adapted to receive the metal foil disc about the post portion thereof, to enable the metal foil disc to be rotated and selectively positioned with respect to the chronicologic indicia, and to retain the metal foil disc close to the base by means of the overhang portion thereof; and,
(d) pegs on the base to fix the metal foil disc in the selected placement with respect to the chronicologic
indicia, with the chambers thereof proximate and in
registration with the apertures in the base.
6. In conjunction with a metal foil sheet, having a
plurality of peripheral indentations and bearing a num-
ber of pharmaceutical tablets contained in individual
chambers comprising erect, transparent, deformable blis-
ter elements and frangible portions of the metal foil sheet
circumscribed by such blister elements, which chambers
are concentrically and radially arranged, a device for the
programmed dispensing of such tablets comprising
(a) a base providing a raised peripheral portion and
having a central recess and a plurality of concentrically
and radially arranged apertures therein cor-
responding with the arrangement of the chambers
on the said sheet;
(b) a chronologic datum for indication of sequence and
periodicity on the peripheral portion of the base
referable to the apertures;
(c) a retaining member, centrally situated in the cen-
tral recess of and integrally formed with the base,
comprising a post portion and overhang portions
adapted to receive the metal foil sheet about the post
portion thereof and to be selectively positioned with
respect to the chronologic datum, and to retain the
metal foil sheet close to the base by means of the
overhang portions thereof; and,
(d) projections on the base, extending inwardly from
the raised peripheral portion thereof and cooperat-
ing with the indentations of the metal foil sheet, to
hold the metal foil sheet in the selected placement
with respect to the chronologic datum, with the
chambers thereof in registration with the apertures
in the base.

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