United States Patent

Heitzman

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[54] MEDICINAL TABLET BREAKER

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[73] Assignee: **Wilmer Mechlin,** Chevy Chase, Md. a part interest

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[52] **U.S. Cl.** **225/93,** 225/91

[51] **Int. Cl.** **B26f 3/02**

[58] **Field of Search** 225/93, 91, 1; 9/254, 267, 9/283; 206/42; 215/44

[56] **References Cited**

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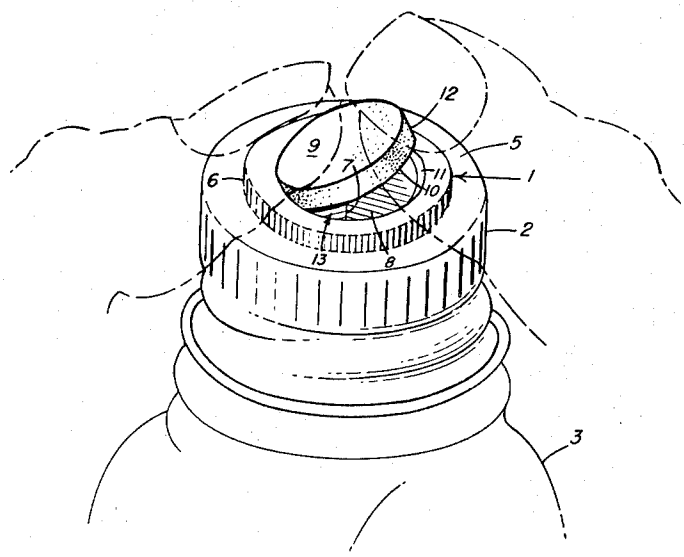
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Assistant Examiner—Leon Gilden
Attorney—Wilmer Mechlin

[57] **ABSTRACT**

A device readily formable in a bottle cap for breaking medicinal tablets into parts suitable for reduced dosages.

8 Claims, 5 Drawing Figures



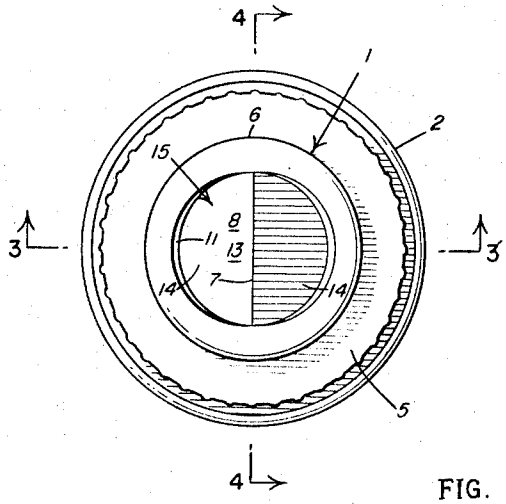


FIG. 1

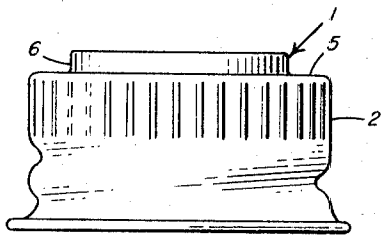


FIG. 2

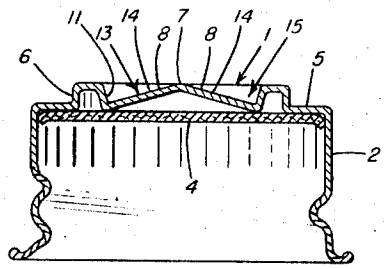


FIG. 3

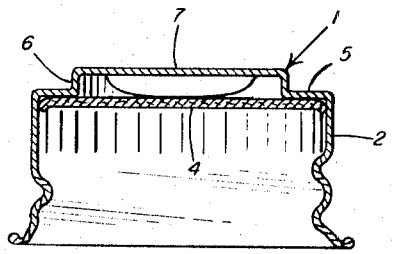


FIG. 4

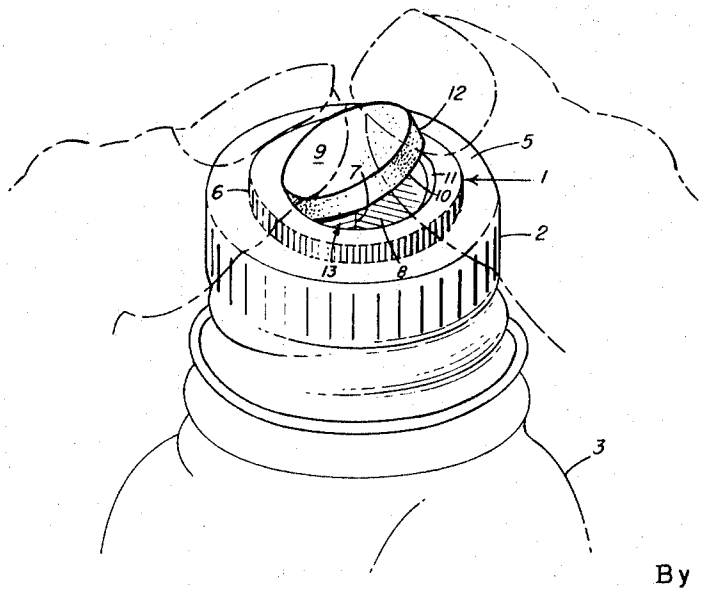


FIG. 5

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MEDICINAL TABLET BREAKER

BACKGROUND OF THE INVENTION

While pills marketed in coated or capsule form, usually to delay their action or prevent the taker from tasting their medicine, do not lend themselves to division, most pills are plain or uncoated medicinal tablets formed from medicated masses either in pill presses or by rolling and cutting. Each such tablet contains a particular medication, ordinarily in a measured dosage suitable for taking singly or in multiples by the average person. However, for many children and other persons the average dosage is too much and, if not available in a smaller size, the tablet must be broken into halves or smaller parts containing the required reduced dosages. In such cases the tablet must be broken by the person giving or taking it, usually by cutting the tablet with the knife or other sharp instrument, with the division and cutting sometimes facilitated by scoring the pill during manufacture. But even with scoring, the fracture or cleavage in breaking seldom is clean or sharp and there ordinarily is attendant partial crushing, with the result that one or more of the parts into which the tablet is broken must often be discarded. It is with this problem that the present invention is particularly concerned.

SUMMARY OF THE INVENTION

The primary object of the present invention is to provide an improved cap for a bottle of medicinal tablets incorporating a breaker for breaking the tablets into parts suitable for reduced dosages.

Another object of the invention is to provide a medicinal tablet breaker formable either as part of the bottle cap or as a separate device and including a breaking edge over which a tablet is adapted to be broken and means for positioning a lateral centerline of the tablet on the breaking edge during breaking.

In its preferred form in which it has a bottle cap as a base and is stamped or molded thereinto, the improved medicinal tablet breaker has in the top of the cap an upwardly opening recess of a shape and size to accommodate a side of any of the tablets in the bottle and divides the recess centrally into a pair of seats by an upwardly facing wedge, whose leading edge forming the breaking edge extends diametrically across the receptacle and sides slope downwardly on opposite sides of the edge to the recess'periphery.

With the preferred breaking edge sharply defined but too dull or wide-angled to cut a user and no undercut surfaces to retain waste particles, the breaker may be put to use by holding the bottle with the cap applied upright in one hand, fitting half of the tablet into the seat at one side of the breaking edge and, while holding that half tightly in its seat with a finger of that hand, applying sufficient downward pressure with a finger of the other hand to the unsupported other half to break the tablet in half. If quarter dosages are needed, each half may then be halved in the same way. As opposed to cutting by a knife with the tablet supported on a flat surface, the break will be clean with negligible waste and follow almost exactly the line of engagement with the breaking edge, thus ensuring the usability of both parts.

The foregoing and other objects and features of the invention will appear hereinafter the detailed description, be particularly pointed out in the appended claims, and be illustrated in the accompanying drawings.

FIGURE DESCRIPTION

FIG. 1 is a plan view of a bottle cap incorporating a preferred embodiment of the improved medicinal tablet breaker of the present invention;

FIG. 2 is a side elevational view of the cap of FIG. 1;

FIG. 3 is a vertical sectional view taken along lines 3—3 of FIG. 1;

FIG. 4 is a vertical sectional view taken along lines 4—4 of FIG. 1; and

FIG. 5 is a fragmentary perspective view of a bottle with the cap applied and the breaker being used to break a tablet.

DETAILED DESCRIPTION

The improved tablet breaker of the present invention, while particularly designed for breaking uncoated medicinal tablets and inappropriate for pills in the form of capsules containing medicinal powders, if need be, can be used on coated tablets if the coating is to render the tablet tasteless rather than to delay its action. Also, the improved breaker may be stamped, pressed, or molded, as appropriate, into a metal or plastic disk or other base attachable against loss or misplacement to a key chain or bracelet. However, as particularly lending itself to incorporation in either metal or plastic bottle caps, the breaker presumably will mainly be marketed in that form. It therefore is as based on and part of a bottle cap that the improved breaker has been illustrated as exemplary of the invention.

Designated as 1, the improved tablet breaker may have as its base 2 any bottle cap suitable for use in closing a bottle 3 packaging medicinal tablets. Thus, the cap 2 may be made of metal or plastic and adapted to be screwed or snapped on or otherwise releasably connected to the bottle for closing the top or other opening through which the bottle is filled with and discharged of its contents. The illustrated cap 2 conveniently is of the screw type and contains the usual compressible liner or sealing gasket 4 for sealing against the top of the bottle when the cap is applied.

The cap usually will be formed by stamping or pressing, if metal, and by molding, if plastic. The tablet breaker 1, too, can be metal or plastic and, like the previously described separate form, can have as a base or disk fixed to the top of the cap or even fitted loosely therein for use whenever needed. However, the latter alternative should rarely be used, since the breaker in its preferred form is so readily cleanable and so much more convenient for use when presented or exposed as a fixed part at the top of the cap. And a separately formed breaker fixed to the top of the cap should be almost as rare in view of the readiness with which the breaker can be formed as an integral part of the cap by suitably configuring the die or mold in which the cap is made, and the illustrated cap integrally incorporating the breaker contemplates this mode of manufacture.

Suitably centered on the upper surface or top 5 of the cap 2, and, as desired, either insert therein or in a boss 6 projecting thereabove, the latter if, as illustrated, the liner 4 is in the form of the usual substantially flat unapertured disk, the improved breaker 1 is comprised of an upwardly facing or exposed breaking splitting or cleaving edge 7 and means for positioning or locating a lateral centerline of a tablet on or along the breaking edge, with at least one of the tablet halves on opposite sides of the centerline unsupported. Straight, horizontally or crosswise or laterally of the cap 2, the breaking edge 7 is of a length to contain a diameter or, if noncircular, a central width or length or transverse or longitudinal dimension of the tablets 9 packaged in the bottle 3. If the particular tablets are scored across their centers, fitting of the breaking edge into the scoring of any tablet will automatically center the breaking edge on the tablet and it then is only necessary that half of the tablet on one side of the breaking edge be unsupported by and clear of or spaced above any underlying structure. However, at least for unscored tablets, the breaker requires inbuilt positioning means and that preferred is an upwardly opening seat, socket or pocket 8 at a side of and terminated or bounded along an adjoining edge or end by the breaking edge. Of a size and shape to seat, receive, or accommodate half or a half portion of a side or face 10 of one of the tablets along a central lateral dimension thereof normal to that contained by the breaking edge, the seat 8, outwardly of or away from the breaking edge 7, is bounded laterally in part or whole by a rim or side wall 11. Conforming substantially in contour to the corresponding portion of an edge 12 of a tablet half seated in the seat 8, the rim 11 is of sufficient length and depth, as, when engaged with that edge portion, to position or locate a diameter or other lateral centerline of the tablet's presented face on or along the breaking edge 7.

With a breaker having both the breaking edge 7 and the seat 8, it is still essential for breaking a tablet that the tablet half not seated in the seat be unsupported and clear of any underlying structure, so that downward pressure applied to the unsupported half away from the breaking edge will be resisted only by the tablet itself. Thus, if, as in the illustrated embodiment, a seated tablet is tilted upwardly beyond the breaking edge, and the latter is flush with or on the level of the top of the cap or a boss thereon, the surface at the opposite side of the breaking edge may be a flat surface flush and merging with the breaking edge. Alternately, a tablet may lie horizontally in the seat with its unsupported half suspended over a suitable recess on the opposite side of the breaking edge. In any case, the breaking edge 7, while sharply defined, should be too blunt or broad-angled to cut a user.

Incorporating the foregoing essentials, the preferred embodiment of the breaker 1 has the breaking edge 7 centered between a pair of the seats 8, one on each side of the breaking edge, and forms the breaking edge as the upwardly pointing or directed leading edge of a wedge 13, whose preferably flat opposite sides 14 are inclined or slope downwardly and outwardly from their junction along the breaking edge to the rims 11 of the seats. Together now forming a recess 15, interrupted centrally by the breaking edge 7, and having as their bottoms the sloping sides 14 of the 13, the preferred seats 8, for the usual circular tablet, are oppositely inclined, upwardly divergent, semi-cylindrical segments, whose angularly related axes intersect at the center of the breaking edge and whose surfaces, and those of the breaking edge, are all upwardly exposed for preventing entrapment of any small particles of a tablet broken off during breaking thereof. Over a breaker having the bare essentials, the preferred breaker has the advantage of enabling a user to seat or insert a tablet half in either seat, with the other seat then not only providing the essential non-support for the unseated tablet half, but adapted to catch the latter as the tablet breaks.

For tablets whose sides 10 are arcuately convex rather than flat, the breaking edge 7 and bottom 14 of a seat 8 of any embodiment of the breaker 1 may be correspondingly arcuately concave to provide surface instead of line contact with the presented side of a tablet. However, even for tablets having curved sides, a straight breaking edge and flat-bottomed seat ordinarily will suffice.

In use for breaking or splitting a medicinal tablet, the improved breaker 1, whether formed as part of a bottle cap 2 or as a separate member with its own base, may be placed on a table or other suitable support. However, if part of a bottle cap, it usually will be more convenient to use the breaker with the cap screwed on or otherwise releasably attached to the bottle. In such case, the bottle can readily be held upright in one hand and no supporting surface is needed. But, whether supported through the bottle or on a separate supporting surface, the breaker in use will be positioned with its seat or seats 8 upwardly facing and its breaking edge 7 upwardly exposed or presented for engagement with a presented, then under or lower, side or face of a tablet, so that, in breaking, the tablet will be broken downwardly over or against the breaking edge by a downward force simultaneously applied to the tablet at both sides of the breaking edge, rather than, as usual, being broken on a supporting surface by downward force applied to a knife or other cutting edge.

When the downward breaking force is applied to the upper side or face of a tablet, the breaking edge 7 acts as a fulcrum and concentrates the opposing upward force along a corresponding cross-line or, more precisely, cross-plane of the tablet. Consequently, since medicinal tablets are compacted from powdered masses and neither fibrous nor crystalline, a tablet under such force will break along the line or plane of contact with the breading edge. Thus, the crushing inevitably obtaining when an edge however sharp, is pressed downwardly against a tablet, is practically non-existent. At the same time the positioning or locating of the center of the tablet on the breaking edge of the seat 8 in which half of the tablet is seated during breaking, ensures that the tablet will break, split, cleave or be divided substantially exactly in half and with practically no waste, so that, after the breaking, both halves will be available for half dosages of the medicine of which the tablet is composed.

To ensure a clean break along the center of the tablet, it is necessary that the downward force on the halves be simultaneously applied away from and not over the breaking edge. But this necessity is readily fulfilled, even on small pills, by using two fingers as the force-applying means, one for each half of the tablet. Thus, in the exemplary use illustrated in FIG. 5, the fingers are thumbs, one holding the seated half of the tablet firmly in its seat and the other applying the companion downward force to the unsupported half. If covered, the seat itself could hold the seated half in place during breaking and a downward force applied by one finger to the unsupported half would suffice. However, contrary to the preferred embodiment in which all surfaces of the breaker are exposed, this possible alternative would mitigate against the ability of the breaker to be rid of any minor waste that may be produced in the breaking, simply by blowing into the breaker or inverting and tapping against it.

Although the division may not be quite so exact as when a tablet is halved, because the seat 8 will not automatically position the center along the breaking edge 7, a tablet can be quartered into substantially equal quarter-dosages by first dividing each half into quarters. In this case the half-tablet will have one quarter seated in one side of the seat with its outer edge engaged by the rim 11 thereof and its broken inner edge disposed normal to the breaking edge 7, whereupon a downward force, applied simultaneously to both the seated and unsupported quarters, will break the tablet half along the line therebetween.

From the above detailed description it will be apparent that there has been provided an improved medicinal tablet breaker, which, whenever necessary, enables the tablet to be broken into usable halves or smaller parts. It should be understood that the described and disclosed embodiment is merely exemplary of the invention and that all modifications are intended to be included that do not depart from the spirit of the invention and the appended claims.

Having now described my invention, I claim:

1. A device for breaking a medicinal tablet into parts, comprising a base, an upwardly directed exposed breaking edge on said base for engaging a presented underside of said tablet, and upwardly opening seat means on said base and having and at least partly bounded by upwardly directed means engageable with an edge portion of said tablet for positioning said tablet on said base during breaking with said underside laterally centered on said breaking edge and the parts of said tablet on opposite sides of said breaking edge respectively supported on and unsupported by and clear of said base, whereby downward pressure applied to an upper side of said tablet on opposite sides of said breaking edge will break said tablet thereon along said centerline.

2. A device according to claim 1, wherein the seat means includes an upwardly opening seat on a side of the breaking edge for receiving the supported part and holding said part against lateral movement relative to the base during breaking of the tablet.

3. A device according to claim 2, wherein the base is a cap of a bottle containing medicinal tablets, the breaking edge is straight laterally of said cap and of a length to contain a central lateral dimension of one of said tablets, the tablet parts are halves, and the seat is of a size and shape to receive and fit one of said halves.

4. A device according to claim 3, wherein the breaking edge is inset in the cap, and including a recess in the cap and extending below the breaking edge on a side thereof opposite the seat for clearing the unsupported half of the tablet.

5. A device according to claim 3, wherein there are a pair of the seats at opposite sides of the breaking edge, and the seats together form an upwardly opening socket in a top of the cap centrally interrupted by the breaking edge.

6. A device according to claim 5, wherein the breaking edge is the leading edge of an upwardly facing wedge, and downwardly and oppositely sloping sides of the wedge form bottoms of the seats.

7. A device according to claim 6, wherein all surfaces of the breaker are upwardly exposed for preventing entrapment of any tablet particles therein.

8. A device according to claim 7, wherein each seat is adapted alternately to seat half of a tablet during breaking and to receive on breaking an unsupported half of a tablet having a half seated in the other seat.

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