United States Patent [19]

Stevens

[11] **3,815,802**

[45] **June 11, 1974**

[54] **SCORED TABLET BREAKER**

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[73] Assignee: **American Home Products Corporation,** New York, N.Y.

[22] Filed: **Sept. 29, 1972**

[21] Appl. No.: **293,714**

[52] **U.S. Cl.** **225/93,** D9/261, 225/96.5

[51] **Int. Cl.** **B26f 3/00**

[58] **Field of Search** ..... 225/93, 91, 96.5; 206/42, 206/46 P, 38 R, 47 R; D9/254, 261; 215/38 R, DIG. 3

[56] **References Cited**

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2,627,640	2/1953	Garnich	225/96.5
3,371,833	3/1968	Sutton	225/96.5 X
3,507,426	4/1970	Bielen et al.	225/96.5 X
3,650,445	3/1972	Heitzman	225/93

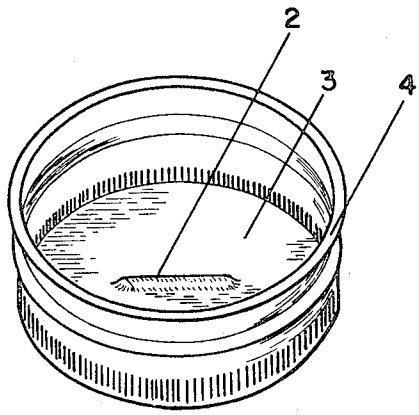
Primary Examiner—Frank T. Yost

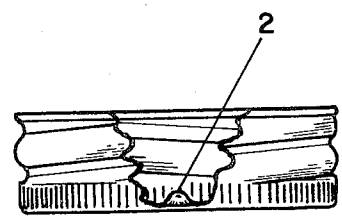
Attorney, Agent, or Firm—Richard K. Jackson

[57] **ABSTRACT**

A tool for subdividing a scored medicinal tablet which comprises base means and a rigid ridelet projecting from said base, said ridgelet presenting an arcuate apex and providing fulcrum means to receive an opposing force applied between the portions of said scored tablet.

5 Claims, 7 Drawing Figures





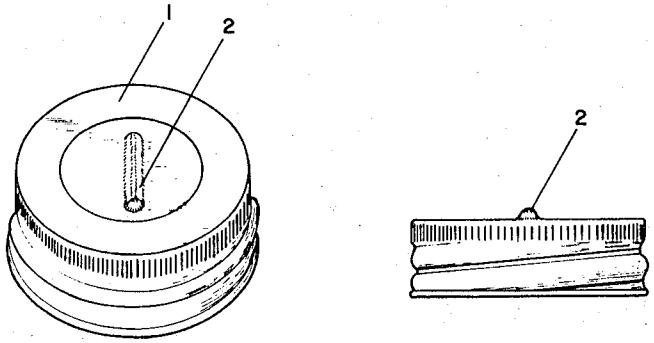


FIG. 1

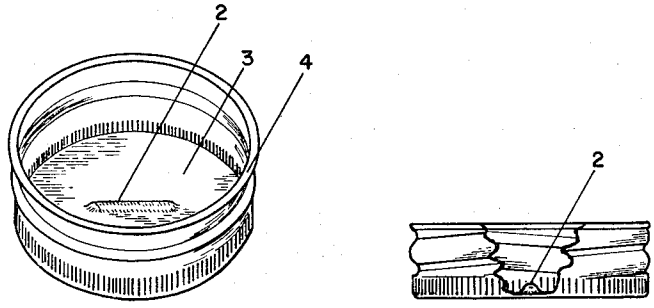


FIG. 2

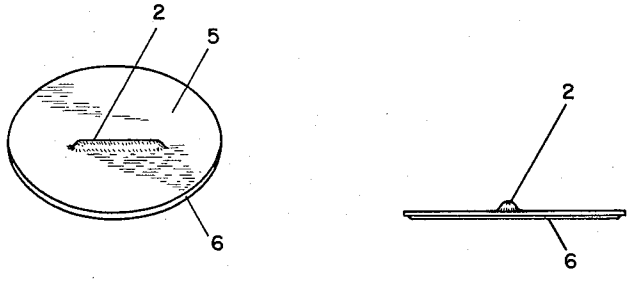


FIG. 3

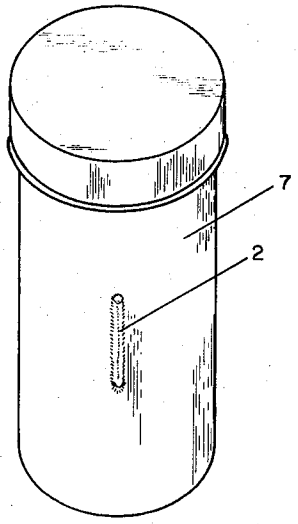


FIG. 4

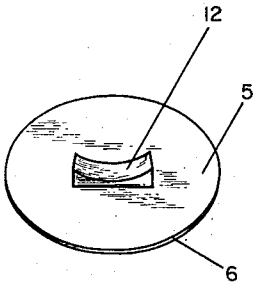


FIG. 5

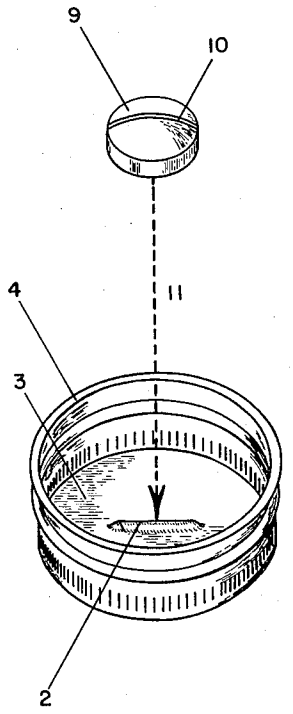


FIG. 6

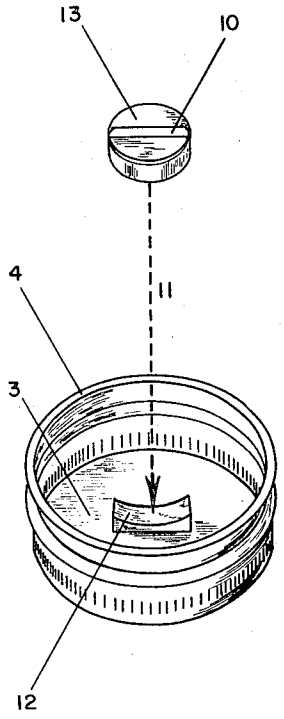


FIG. 7

SCORED TABLET BREAKER

BACKGROUND OF THE INVENTION

Compressed tablets are widely employed as means of marketing many products of the pharmaceutical industry in which individual dosage units are required. To form compressed tablets, a suitable granulation is prepared and fed to a tablet press. The press may operate with a single set of punches or a high speed rotary tablet press may be employed in which a large series of punches operate on a high speed rotary head. The shape of the surfaces of the punches and dies between which the granulation is compressed determines the shape of the tablet which is formed. An infinite variety of shapes and monogrammed surfaces may be produced. Aside from the variations in the peripheral shape of such compressed tablets, these tablets most commonly are either flat-faced or provided with convex surfaces. For ease of subdivision many tablets are centrally scored across one surface. Over the past years, pharmaceutical tablet production technology has developed formulations providing superior compaction strength of the ultimate product. This has been necessitated by the abuse inherently attending high speed tablet press operations, mechanized packaging equipment, and the exigencies of modern transportation means. Such tablets are not amenable to subdivision by ordinary manual pressure and usually are difficult to precisely subdivide into pre-determined fractional dosage units. Pharmaceutical manufacturers frequently receive complaints from patients and members of the medical profession pertaining to the difficulty experienced in breaking compressed tablets to provide fractional dosage units for certain individuals.

There are three basic methods normally used to subdivide a compressed tablet. One method is to hold one-half of the total tablet between the tip of the thumb and the first joint of the forefinger while the remaining fingers form a fist. Pressure is applied to the over-hanging portion of the tablet by the thumb of the other hand thereby fracturing the tablet at the score line. Another method requires grasping each half of the total tablet between the tips of the thumb and the forefingers of each hand using the thumbs as a fulcrum and applying pressure to snap the tablet in half. A third method frequently followed is to place the tablet on a flat surface and use a sharp instrument such as a knife to apply a downward pressure at the score line cutting the tablet in half. In each method, there are obvious disadvantages. In the first method, patients who are weakened by sickness do not have the necessary strength to fracture the tablet at the score line. In the second method, small tablets do not present enough surface area to adequately provide a grasping point for the thumb and forefinger. In the third method, the sudden fracturing of the tablet may cause a portion of the medication to rebound and thereby be lost.

To eliminate difficulty of tablet sub-division, a number of suggestions have been proposed which relate to redesign of the tablet shape whereby one surface is convex or flat and the other is concave. When a tablet is placed on a flat plane with the convex or flat surface upwardly exposed, the concave surface forms a bridge to the flat plane. Moderate finger pressure is required to fracture the tablet at the score line. An example of this is seen in U.S. Pat. No. 3,336,200. Disadvantages attending the production of tablets in accordance with

the disclosure of the above cited U.S. patent include those of production economics, packaging problems due the increased fragility of the concave edge of the tablet, possible shingling in the filling equipment and poor packing in the bottle. Within the context of economics of tablet production there must be made special comment on the problems attending tablet production of a deep scored tablet in which the quantity of binding agent is necessarily increased by as much as four times the normal amount to circumvent the increase fragility of the final tablet after compression. Furthermore, failure of the mechanized filling system frequently may lead to destruction of the lower punch resulting from contact by the upper punch. This is an especially serious problem where inscribed lower punches are employed to identify the tablet producer. In any situation where an insufficient amount of composition has been fed to the tablet die, the upper punch, providing the deep scored top of the tablet, may strike the lower punch in such manner as to irreparably damage the inscription of the lower punch. Even without an inscribed lower punch, whenever the upper punch strikes the lower punch as it is want to do in the production of deep scored tablets the lower punch must be re-tooled before production can be resumed.

Subdivision of unscored tablets has been recently dealt with in U.S. Pat. No. 3,650,445 by providing a device for centering an unscored tablet on one plane from which the tablet may be forcibly broken over a cleaving or splitting edge. This device must be specifically adapted for the tablet size provided in the dispensing container. Each container having tablets of a different size must provide a different dividing tool. Furthermore, the disposition of such tools with a retaining wall positioning means on the top of a tablet container is undesirable from the standpoint of dust collection during shelf storage.

Thus, where several different dosage schedules may be recommended to a patient, it is most desirable that a uniform tablet size by amenable to subdivision to conform to the dosage regimen rather than to require the production of several different tablet sizes in a specific given medication.

BRIEF DESCRIPTION OF THE INVENTION

In accordance with this invention there is provided a tool or device for sub-dividing a scored medicinal tablet which comprises base means and a rigid ridgelet projecting from said base, said ridgelet presenting on arcuate apex and providing fulcrum means for dividing an opposing force between the portions of said scored tablet.

In a preferred embodiment, there is provided an improvement in a molded pharmaceutical tablet container cap closure whereby an integral tool or dosaging device is provided comprising a rigid ridgelet projection from base means, preferably in the interior of said cap as the sealing liner, which enables sub-division of scored tablets with minimal applied force.

BRIEF DESCRIPTION OF THE DRAWING

The invention may best be understood with reference to the accompanying drawings in which:

FIG. 1 provides a perspective and side view of a bottle cap structure formed with a ridgelet molded in the center flat outer surface of the cap;

FIG. 2 presents a perspective and side sectional view of a bottle cap liner structure formed with a rigid ridgelet molded in the center flat inner surface of the cap;

FIG. 3 presents a perspective and side view of an ancillary structure formed with a rigid ridgelet projection from a base possessing an adhesive underside;

FIG. 4 illustrates the provision of a rigid ridgelet projection molded in the outer surface of a glass or plastic pharmaceutical tablet container;

FIG. 5 illustrates a modification of a rigid ridgelet projection in that a concave arcuate apex is provided as the tablet sub-dividing means;

FIGS. 6 and 7 depict the method used whereby a compressed scored tablet is placed against the rigid ridgelet projection to facilitate tablet sub-division.

In the accompanying drawings, like numerals indicate like parts in the several views.

DETAILED DESCRIPTION OF THE INVENTION

With reference to the accompanying drawings, and more particularly with reference to FIG. **1**, there is provided a tablet container cap closure which, on its' outer face **1** possesses an integrally united rigid ridgelet projection **2** embossed on its interior plane. The rigid tool may be up to about two inches long, but is preferably about one half inch to about one inch in length. The breaking edge or fulcrum may be up to about 0.065 inches high, but is preferably about 0.036 inches to about 0.051 inches in height. The sides of the fulcrum means form an angle of about 25° to 35° at the apex which is preferably slightly rounded to avoid injuring the finger of a person breaking a tablet thereon.

While the bottle cap structure depicted in FIG. 1 shows the angular ridgelet molded to the outer surface, FIG. 2 depicts the fulcrum tool means **2** in the interior of a bottle cap structure **4** containing a bottle cap sealing liner **3** in which he fulcrum is molded. Using the bottle cap structure in this fashion provides the user with a cup in which the subdivided pharmaceutical tablet is retained after breakage. Used in this fashion, the portion of the subdivided tablet which is not ingested can be directly returned to the container thereby minimizing handling of the product.

FIG. 3 depicts a configuration of the rigid ridgelet projection fulcrum means existing as an ancillary structure **5** in which the fulcrum means is molded to the upper surface of the structure. The lower surface of the structure is coated with an adhesive material **6** to facilitate attachment to any bottle or cap structure used in packaging or dispensing of pharmaceutical tablets. Any adhesive known to the art which provides contact adhesion is applicable to this aspect of the invention. By way of the device depicted in FIG. **3**, existing bottles or caps may be modified to provide any pharmaceutical dosage multiple of the tablets contained therein. Multiple use scored tablet containers provided with a cap may be readily provided with the rigid ridgelet fulcrum means of this invention by attachment to the container or the inner or outer surface of the cap closure means. The ancillary tool may also be dispensed with the pharmaceutical tablet to the patient in a suitable over wrap with instructions as to attachment and patient usage.

In each case the rigid ridgelet fulcrum may be fabricated from any metallic, plastic or glass material which will provide sufficient rigidity.

FIG. 4 depicts a scored medicinal tablet subdividing tool **2** as an integral part of a pharmaceutical dosage container **7**. The tool is molded in the bottle surface in the vertical position.

FIG. 5 presents an alternate structure to the tablet subdividing tool shown in FIGS. **1–4**, in that a rigid ridgelet projection is provided with a concave surface **12**. In practice, the structure is from about 7/16 inch to about 9/16 inch in length and about ⅛ inch to about ¼ in width. The upper surface **12** is concave, being about 1/32 inch high at the center and ⅛ inch high at the ends.

FIGS. **6** and **7** illustrate the use of the scored tablet fracturing tool of this invention. In FIG. **6**, a pharmaceutical tablet **9** of any given shape or size which is scored **9** to indicate a line of possible subdivision, is held between the tips of the thumb and the forefinger and lowered down line **11** to align the score mark **10** with the raised rigid ridgelet fulcrum means **2** molded as an integral part of the cap **4** via liner **3**. The tablet is held in the fingers so that the score line is parallel to the longitude of the breaking tool. On contact with the fulcrum **2**, moderate pressure is applied to the tablet **9** resulting in immediate and easy subdivision of the pharmaceutical tablet.

FIG. 7 illustrates usage of a tablet breaking tool which presents a concave arcuate apex **12**. The pharmaceutical tablet **13** is placed on the concave surface **12** so that the score line is parallel to the longitudinal axis of the concave surface. Moderate pressure is applied to the scored side **10** of the tablet immediately and readily subdividing the pharmaceutical tablet into a plurality of dosage units. In using the tablet breaking device presented in FIG. **7**, limiting factors provided by the concave surface **12** dictate that the tablet to be subdivided is preferably flat with or without a beveled edge on the side opposite the score mark. When convex tablets are used, their diameter must exceed the length of the concave structure while the radius of the convex structure of the table should exceed the radius of the concave surface of the structure in order to facilitate ready subdivision of the pharmaceutical tablet.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made without departing from the true spirit of this invention.

What is claimed is:

1. A device for subdividing a scored medicinal tablet which comprises base means integral with the top of a tablet container closure cap and a rigid ridgelet projecting from said base, said ridgelet presenting an arcuate apical surface providing fulcrum means for dividing an opposing force between the portions of said scored tablet.

2. A device for subdividing a scored medicinal tablet which comprises base means and a rigid ridgelet projecting from said base, said base means being the internal seal liner for a container closure cap and said ridgelet presenting an arcuate apical surface providing fulcrum means for dividing an opposing force between the portions of said scored tablet.

3. A device for subdividing a scored medicinal tablet which comprises base means undercoated with adhesive means for attaching said device to additional base means and a rigid ridgelet projecting from said undercoated base means, said ridgelet presenting an arcuate apical surface providing fulcrum means for dividing an

opposing force between the portions of said scored tablet.

4. The device of claim **3** in which said base means is flexible and adhesively bonded to the exterior surface of a rigid tablet container.

5. A device for subdividing a scored medicinal tablet which comprises base means consisting of a tablet container and a rigid ridgelet projecting from said base as an integral part of the exterior surface of said tablet container, said ridgelet presenting an arcuate apical surface providing fulcrum means for dividing an opposing force between the portions of said scored tablet.

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