

[54] **DISPENSING DEVICES**
 [72] Inventor: **John J. Stifter**, 33084 Lake Road, Avon Lake, Ohio 44012
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 [21] Appl. No.: **875,660**

3,043,483 7/1962 Vogt141/322 X
 2,957,503 10/1960 Stifter222/490 X

Primary Examiner—Robert B. Reeves
Assistant Examiner—James M. Slattery
Attorney—J. H. Slough

[52] **U.S. Cl.**.....**221/310, 221/288, 222/490, 141/321**
 [51] **Int. Cl.**.....**A47f 1/00**
 [58] **Field of Search**.....**221/310, 189, 288; 222/490, 222/482, 501, 522, 562; 141/112, 322, 320, 321, 319, 378, 380, 381**

[57] **ABSTRACT**

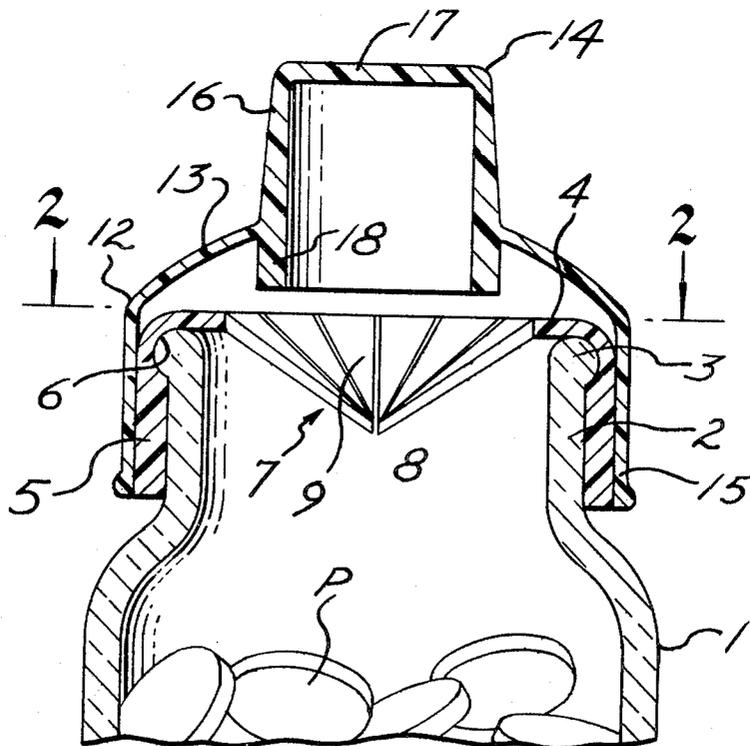
A pill or other particle container has a transverse diaphragm adjacent to its open end having a conical central portion radially slotted outwardly from the center to provide converging tongues which normally close the container and retain the pills or particles therein. A cap for the container has a flexible end wall and a downwardly open socket with an inwardly projecting annular wall whereby the container is inverted, the end wall is depressed to insert the annular wall through the tongues which flex outwardly, and pills or particles in a predetermined amount drop into the socket.

[56] **References Cited**

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3,480,182 11/1969 Rigor222/490 X
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6 Claims, 12 Drawing Figures



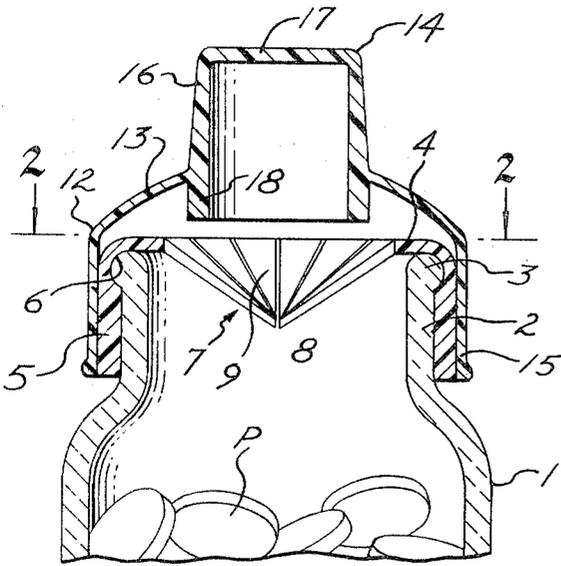


Fig. 1

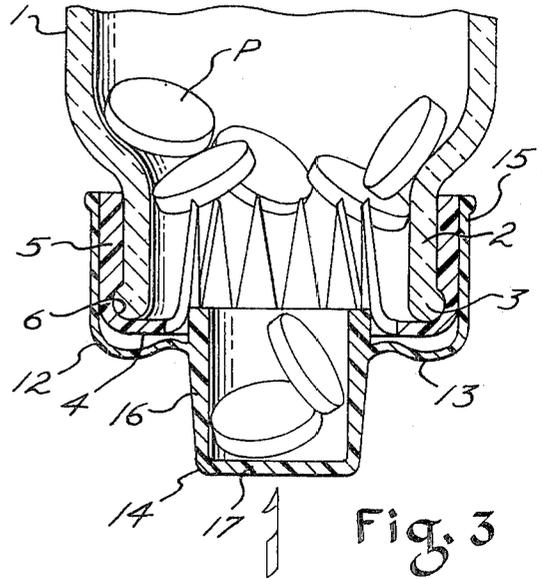


Fig. 3

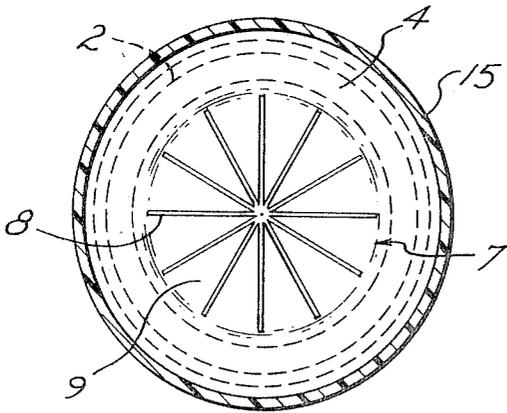


Fig. 2

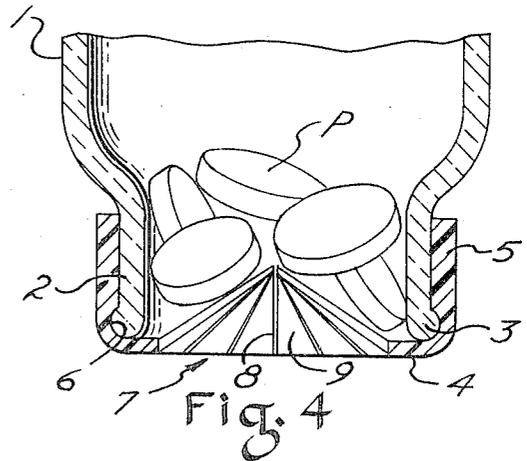


Fig. 4

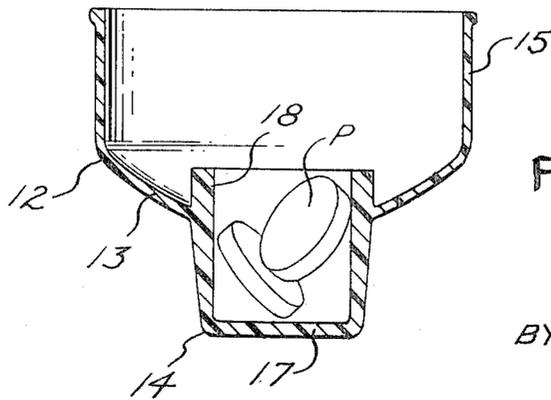


Fig. 5

INVENTOR
 John J. Stifter
 BY *J. H. Slough*
 J. H. SLOUGH
 ATTORNEY

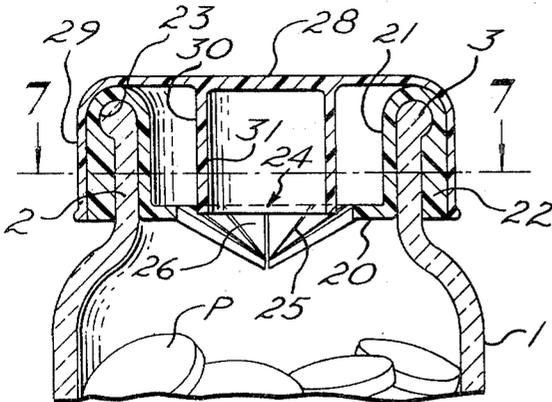


Fig. 6

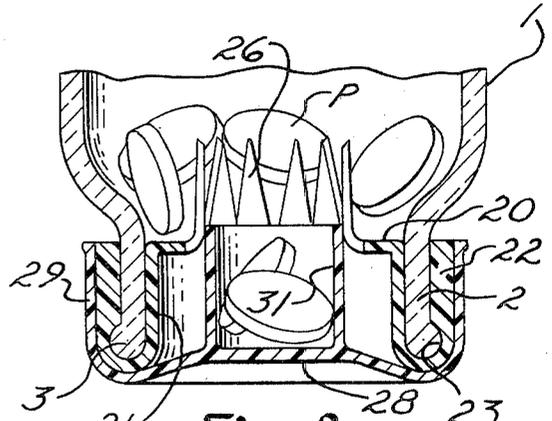


Fig. 8

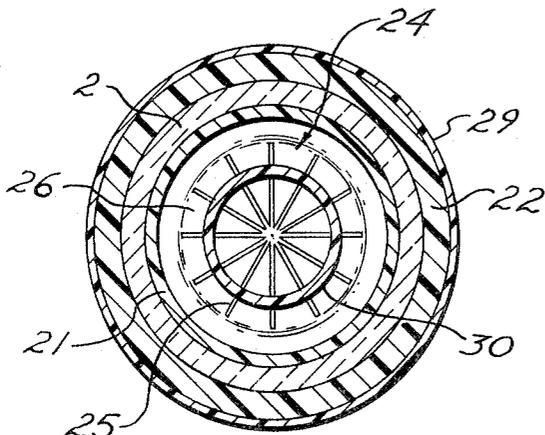


Fig. 7

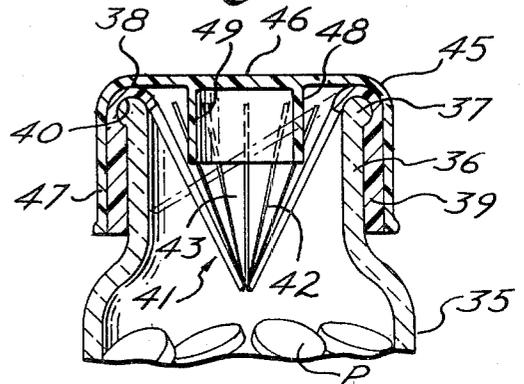


Fig. 9

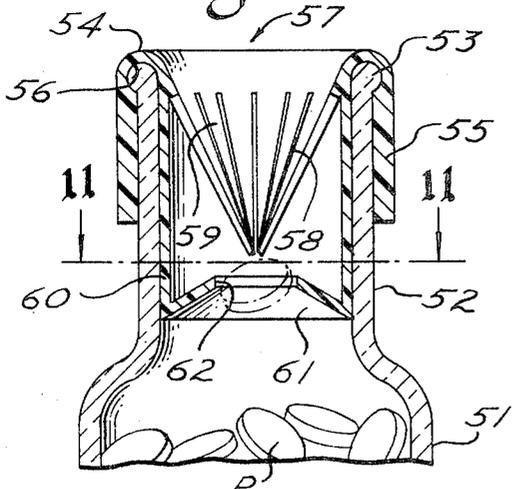


Fig. 10

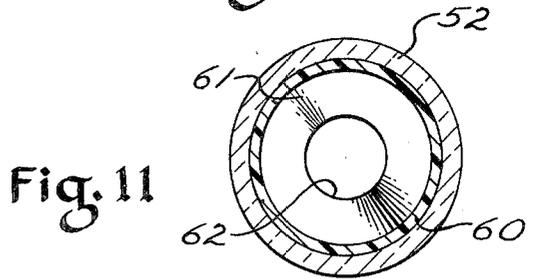


Fig. 11

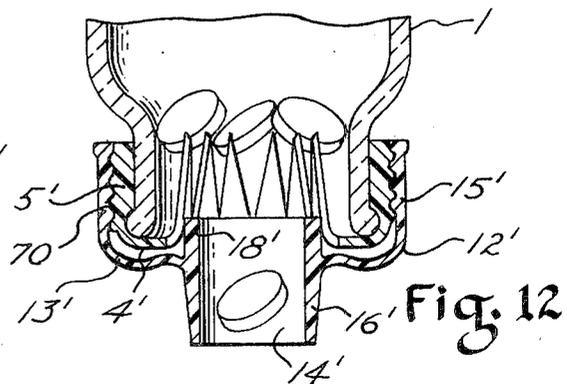


Fig. 12

DISPENSING DEVICES

This invention relates to dispensers for dispensing pills or other particles and is directed to improvements over the structure disclosed in my U.S. Pat. No. 2,957,503, dated Oct. 25, 1960.

The pill dispenser of the prior patent provides an upper end closure for a pill bottle or container including a horizontal diaphragm of flexible material radially slotted outwardly from the center to form a plurality of inwardly extending tabs. A closure is provided which has a tubular member closed at one end and having an open end portion adapted to be projected through the diaphragm to flex the tabs outwardly. With the container inverted, a predetermined number of pills drop into the tubular member which is then withdrawn allowing the tabs to again close the top of the container to prevent additional pills from spilling out of the container. In one form of the invention, a closure and socket member is inserted into the opening in the diaphragm and normally holds the tabs in an outwardly flexed position until a pill is to be dispensed.

The present invention utilizes the slotted diaphragm and socket principle but adds several safety features particularly directed to protecting small children from removing pills from the dispenser. One such change involves making the slotted portion of the diaphragm in the form of an inverted cone; that is, a cone with the apex directed downwardly into the pill bottle or container. This causes the tabs or tongues between the slots to close on a child's finger as he withdraws it from the bottle thereby removing or stripping off any pill which the child might have grasped.

Another change is the use of a less flexible, generally form sustaining material for the diaphragm, such as a semiresilient plastic, whereby it is more difficult for the child to put a finger into the bottle or remove a pill therefrom.

Other improvements include lengthening the tabs or tongues whereby upon pivoting or flexing them outwardly of the container, said tongues will hit the opposite side of the container thereby making it virtually impossible to turn the diaphragm inside out.

A still further improvement includes providing a secondary barrier below the slotted diaphragm in the form of a non-slotted, upwardly frustoconical wall having a central opening only large enough for a single pill to pass therethrough at one time and small enough to stop a child's finger.

It is, therefore, an object of the invention to provide a pill or particle dispenser of the type set forth above which will dispense a predetermined number of pills or particles by depressing the top of the container while holding it in the inverted position and then releasing the same.

Another object of the present invention is to provide an improved pill dispenser which is simple and convenient to use and which has improved safety characteristics with respect to preventing children from removing the contents of a pill container.

Still another object of the invention is to provide a pill dispenser having the above characteristics wherein the diaphragm opening is shaped to prevent manual removal of pills from a container.

Yet another object of the invention is to provide a pill dispenser having the above features and characteristics which provides a secondary barrier for preventing a child from inserting his finger into a pill container and removing medicine therefrom.

Other objects and advantages of the present invention will be apparent from the following description thereof and the accompanying drawings, which which said drawings:

FIG. 5 is a longitudinal section of the upper dispensing end of the pill dispenser of this invention in normal, closed position, the same being shown on an enlarged scale;

FIG. 2 is a transverse section of the pill dispenser taken along the line 2-2 of FIG. 1;

FIG. 3 is a longitudinal section of the dispensing end in inverted position showing the dispenser cap in the depressed position;

FIG. 4 is a longitudinal section of the dispensing end in inverted position with the cap removed;

FIG. 5 is a longitudinal section of the cap alone in inverted position;

FIG. 6 is a longitudinal section similar to FIG. 1 of the upper dispensing end of a modified form of the present invention;

FIG. 7 is a transverse section taken along the line 7-7 of FIG. 6;

FIG. 8 is a longitudinal section similar to FIG. 3 showing the modified form of FIG. 6 in the inverted position with the cap depressed;

FIG. 9 is a longitudinal section of the upper end portion of another modified form of the present invention the same being shown on a slightly smaller scale than FIGS. 1-8;

FIG. 10 is a longitudinal section of the upper end portion of still another modified form of the present invention drawn to the scale of FIG. 9;

FIG. 11 is a transverse section taken along the line 11-11 of FIG. 10; and,

FIG. 12 is a section similar to FIG. 3 showing a further modified form of the invention drawn to the scale of FIGS. 9-11.

Referring now to the drawings in all of which like parts are designated by like reference numerals, and referring particularly to FIGS. 1-5, the dispenser of this invention is particularly adapted for use as a pill dispenser and as herein described and illustrated comprises a bottle or container 1 which is provided with a diametrically reduced neck 2 having an annular bead 3 at the upper open end. The bottle or container 1 may be made of any suitable, well-known material such as glass or plastic. The upper end of the neck 2 is closed by a transverse diaphragm 4 having a depending, annular skirt 5, and an annular recess 6 into which the bead 3 is seated. The diaphragm 4 fits tightly over the upper end of the neck with the bead 3 engaging the annular recess 6 to prevent easy or accidental removal of the diaphragm from the upper end of the bottle 1.

A central, circular portion of the transverse diaphragm 4, generally indicated at 7, is substantially conical in shape with the apex thereof projecting downwardly into the neck 2 of the bottle 1. As best seen in FIG. 2, the conical, central portion is provided with a plurality of radial slots 8 all of which intersect at the apex of the cone thereby dividing the wall of said cone into a plurality of downwardly and inwardly converging, complementary tongues or tabs 9. The diaphragm 4 is preferably made from a moderately flexible, generally form sustaining material such as one of the well-known plastics which, although resilient, provides a discernible stiffness and resistance to bending.

The upper end of the bottle 1 and the diaphragm 4 are covered by a cap 12 which comprises an upwardly convex transverse wall 13, a centrally disposed integral socket 14, and an annular depending skirt 15 adapted to fit snugly over the skirt 5 of the diaphragm 4. The socket 14 is of smaller diameter than the central portion 7 of the diaphragm 4 and has an upper annular wall portion 16 which projects upwardly above the transverse wall 13 and is closed at the upper end by a transverse wall 17. A lower annular wall portion 18 projects downwardly from the transverse wall 13 and is normally disposed in upwardly spaced relation above the central portion 7 and the tongues 9 thereof. The cap 12 is also made of a resilient material such as a plastic whereby the upwardly convex wall 13 is flexible to allow the socket 14 to be depressed inwardly of the bottle 1 in the manner illustrated in FIG. 3. In such depressed position, the lower annular wall portion 18 of said socket engages the tongues 9 and causes them to flex or pivot radially outwardly at the lower ends thereby opening up the central portion 7. The bottle or container 1 is adapted to contain pills P which, when the socket 14 is depressed and the bottle 1 is inverted as shown in FIG. 3, will drop through the open central portion 7 into the socket 14. When the socket is released with the bottle 1 still inverted, the tongues 9 return to the normal position of FIGS. 1 and 4 thereby preventing more pills from escaping through the central portion 7. The cap 12 may then be removed from the container and the pills which have dropped into the socket 14 are now readily available to the user. By adjusting the size of the socket 14 in relation to

the size of the pills and the dosage prescribed, the pill dispenser of the present invention will dispense only the required dosage for the convenience of the user.

The pill dispenser of the present invention is particularly adapted as a safe means of keeping medicines in pill form inaccessible to children. By using a stiffer, less resilient plastic and providing the central portion 7 in the form of a cone, it is particularly difficult for a small child to get his finger into a medicine bottle and remove the pills therefrom. It will be readily understood that a small finger pushed through the central portion 7 would separate the tongues 9, but said tongues would tend to grip the fingers upon withdrawal thereof making it literally impossible to remove the finger with a pill gripped thereby. Thus, although the child may stick his finger into the pill dispenser, he would not be able to remove a pill therefrom.

In use of the more preferred, stiffer plastics, a problem arises due to the fact that such stiffer plastics have a tendency to take a temporary set when held in the flexed position for a long period of time and under those conditions are slower to return to their original shape. This can afford an opening through which pills can be dispensed for a period of time after the closure member is removed. With the present invention, the tongues 9 are never held in the open position for any length of time due to the fact that the socket 14 is disposed above the said tongues and does not contact them except for the brief period necessary to dispense one or two tablets, after which the tongues instantly close. Therefore, in the present pill dispenser a more generally form sustaining material such as the stiffer plastics can be used with assurance that the tongues will instantly close.

Referring now to the second form of the invention illustrated in FIGS. 6-8, the same is shown applied to a bottle or container 1 of the type shown in the first form, said bottle being provided with a reduced neck 2 and an annular bead 3 as hereinbefore described. In this form of the invention, the bottle is provided with a transverse diaphragm 20 which is recessed inwardly from the open end of the neck 2. Said diaphragm has an upwardly directed, inner annular wall 21 the upper portion of which curves outwardly over the bead 3 and continues downwardly to form an annular skirt 22. The upper end of the skirt 22 is provided with an annular recess 23 which engages the bead 3 in the manner set forth in the first embodiment to firmly retain the diaphragm 20 in place on the neck of the bottle.

The diaphragm 20 has a circular central portion, generally indicated at 24, which is conical in shape and projects downwardly into the bottle 1. Said central portion is provided with radial slots 25 whereby the same is divided into wedge-shaped tongues or tabs 26 in the manner hereinabove described in connection with the first embodiment.

A cap 27 having a transverse upper wall 28 and a depending, annular skirt 29 is adapted to seat firmly over the upper end of the bottle, the skirt 29 engaging the annular skirt 22 of the diaphragm 20. The transverse wall 28 is substantially flat, its underside being provided with a downwardly open socket 30 defined by an annular wall 31. The lower end of the annular wall 31 is spaced slightly above the central conical portion 24 and the tongues 26 whereby said tongues are normally in the closed position illustrated in FIG. 6.

As shown in FIG. 8, when it is desired to dispense pills from the container 1, said container is inverted and the transverse wall 28 is depressed inwardly of the bottle whereby the lower edge of the annular wall 31 of the socket 30 engages the tongues 26 and causes them to flex radially outwardly to allow a pill or pills P to drop into said socket. It will be readily understood that by releasing the pressure on the transverse wall 28, the socket 30 will return to its normal position thereby allowing the tongues 26 to close before the cap 27 is removed with the pill or pills P disposed within the socket 30.

The second form of the invention provides a lower silhouette for the bottle thereby making it easier to store and less bulky to handle. It also eliminates any protrusion above the top of the bottle which might conceivably be accidentally

struck thereby dispensing a pill into the cap. This might occur upon dropping the bottle. Additionally, the recessing of the diaphragm 20 makes it increasingly more difficult for a child to dig into the bottle with his finger in an attempt to remove pills therefrom.

The form of the invention shown in FIG. 9 is mounted on the upper end of a modified bottle or container 35 having a more elongated diametrically reduced neck 36 surmounted by an annular bead 37. A transverse diaphragm is provided at 38 which has a depending, annular skirt 39 embracing the neck of the bottle and an annular recess 40 engaging the bead 37. The entire central portion of the diaphragm 38 is formed downwardly into a deep cone generally indicated at 41, said cone being radially slotted at 42 to provide downwardly converging wedge-shaped tongues or tabs 43. The diaphragm 38 is enclosed by a cap 45 of the type shown in FIG. 6 having a flat, transverse upper wall 46, an annular skirt 47, and a central depending socket 48 defined by an annular wall 49. The distinctive feature of the form of the invention shown in FIG. 9 over that shown in FIG. 6 is the longer tongues 43 each of which has a length greater than the inner diameter of the neck 36. As shown in broken lines in FIG. 9, the tongues are prevented from flexing outwardly of the bottle by this greater length due to the fact that the tips will strike the opposite side of the neck 36 if a child tries to pull the cone inside out. This further prevents a child from removing pills from the bottle.

The form of the invention in FIG. 10 is shown in connection with a further slightly modified bottle or container 51 having a reduced and ever further elongated neck 52 surmounted by an annular bead 53. A diaphragm 54 similar to the diaphragm 58, has an annular skirt 55 embracing the neck 52, an annular recess 56 engaging the bead 53, and a central portion generally indicated at 57 in the form of a downwardly directed deep cone. Radial slots 58 divide the central portion 57 into downwardly converging wedge-shaped tongues 59.

The form of the invention shown in FIG. 10 differs from that shown in FIG. 9 in that an integral, annular wall 60 extends downwardly from adjacent to the proximal ends of the tongues 59 to a position substantially below the lowermost distal ends of said tongues. The lower edge of the annular wall 60 is provided with an upwardly convex, frustoconical transverse wall 61 which has a central opening 62. The opening 62 is preferably just large enough to allow one pill P to drop therethrough as indicated by the broken line showing in FIG. 10. It will be understood that a cap either of the type shown at 45 in FIG. 9 or one similar to that shown in FIG. 1 would be provided for flexing the tongues 59 to open the central portion 57 whereby when the bottle 51 is in the inverted position, one or more pills P can drop through the aperture 62 and into the socket of the cap. In addition to the safety features of the foregoing pill dispensers, the form of FIGS. 10 and 11 makes it virtually impossible for a child to get his finger into the main body of the bottle 51 due to the presence of the frustoconical wall 61. A finger attempting to reach into the bottle would be stopped at said frustoconical wall.

Fig. 12 shows a form of the invention which is like the first form shown in FIGS. 1-5 with the exception that the transverse wall of the socket has been eliminated and the cap is thread-fitted upon the diaphragm skirt. Thus, the form of FIG. 12 comprises a bottle or container 1 having a modified diaphragm 4' mounted thereon in the manner described in connection with the first form of the invention. The diaphragm 4' has a skirt 5' which is externally threaded as indicated at 70. A modified cap 12' has a transverse wall 13' carrying an upper annular wall portion 16' and a lower annular wall portion 18' which together define a through bore 14'. Said cap 12' also has an internally threaded skirt 15' engaging the threaded skirt 15'.

As shown in the illustration, depression of the wall 13' causes a pill P to be dispensed directly through the bore 14'. A finger or palm of the hand may be placed over the outer end of the annular wall portion 16' for depressing the wall 13' in which case the pill is dispensed onto the finger or hand of the

user without removing said cap. A pill may also be dispensed by pressing the inverted container against any surface such as a table, tray, or the like for dispensing a pill onto the surface without touching the pill with a hand.

It will be readily understood that the present invention may be utilized for dispensing various small articles and elsewhere.

From the foregoing it will be seen that the present invention provides dispensers which are simple and easy to actuate, convenient to use and incorporate substantial safety features to protect small children by preventing their access to the contents of a bottle of medicine in pill form.

I claim:

1. A safety pill dispensing container, comprising: a container having an open end including a peripheral wall defining an opening in the container; a diaphragm of resilient material mounted to said peripheral wall and transversing said opening, said diaphragm having a plurality of individual flexible tongues defined by a plurality of slots directed radially outward from the center of the diaphragm; said individual tongues forming a conical shaped slotted diaphragm and having the apex of the cone projected downwardly whereby the slotted diaphragm is adapted to close the open end of the container; said slotted diaphragm being made of semirigid plastic providing relatively stiff tongues to inhibit removal of the pills by a child; a cap disposed over said diaphragm and embracing the open end portion of the container; said cap including an upper flexible wall having a centrally disposed depending annular wall secured thereto defining an open socket member in spaced relation to said diaphragm whereby the open socket depends downwardly toward the slotted diaphragm; said flexible upper wall adapted to be depressed inwardly toward the open end of the container whereby the annular wall of said open socket is moved downwardly into contact with said diaphragm and flexes the tongues thereof radially outwardly for allowing pills to drop into the socket when the container is inverted; said flexible upper wall being resilient for retracting the socket to its normal spaced position above the diaphragm

whereby the semirigid tongues retract and close the container.

2. A pill dispenser as set forth in claim 1 said tongues having a length greater than the diameter of said end portion whereby if said tongues are flexed upwardly they will strike the opposite side of the container.

3. A pill dispenser as set forth in claim 1 said upper wall of said cap being normally flat and said annular wall projecting downwardly from the bottom surface of said upper wall; said slotted diaphragm being recessed downwardly from the opening of said open end portion of the container.

4. A pill dispenser as set forth in claim 1 means providing a secondary barrier spaced below said tongues; said secondary barrier comprising a transverse, upwardly convex, frustoconical wall having a central opening of such size as to admit the passage therethrough of only one pill at a time.

5. A pill dispenser as set forth in claim 1 said socket being open at both ends thereof whereby said pill is dispensed through said socket to the outside of said container.

6. A particle dispenser comprising a container having an open end portion; a diaphragm mounted to said end portion transversely thereof; said diaphragm having a central opening therein and a plurality of radial tongues directed toward said central opening to form a cone-shaped particle barrier; said tongues being sufficiently flexible to separate and form a central aperture for a particle to pass through; flexible cap means disposed above said diaphragm transversing said open end and detachably secured to the open end portion of the container; said cap means having a downwardly depending socket member in spaced relation to said diaphragm and being adapted to be moved for contacting and spreading said tongues whereby upon application of an external force to said cap said cap is moved downwardly contacting said tongues whereby said tongues are displaced radially outwardly; and said cap means being resilient for retracting the socket means upwardly to its spaced position for dispensing said diaphragm.

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