May 12, 1959 H. J. SINCLAIR 2,886,208

SPECIAL DISPENSING PACKAGE

Filed May 21, 1956

Fig. 1.

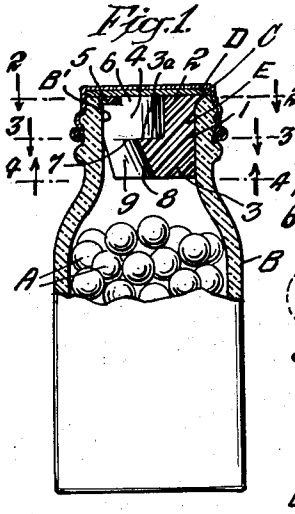


Fig. 5.

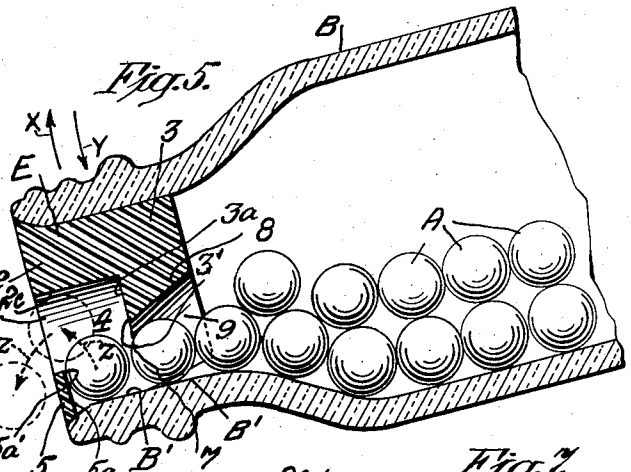


Fig. 6.

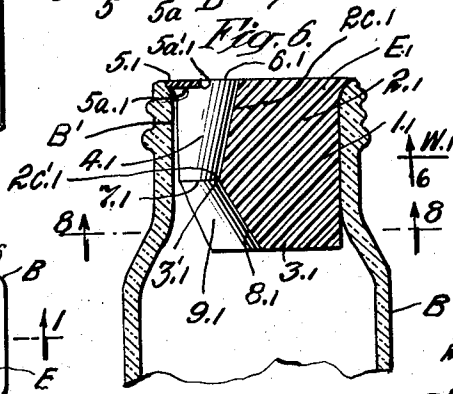


Fig. 7.

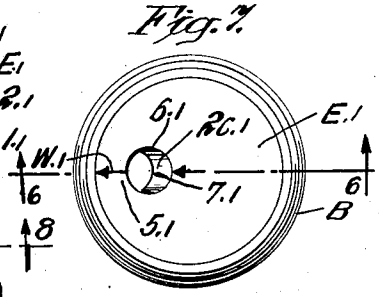


Fig. 2.

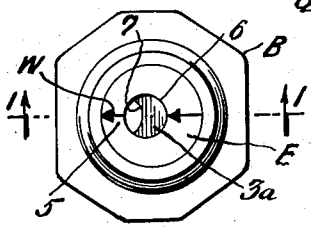


Fig. 8.

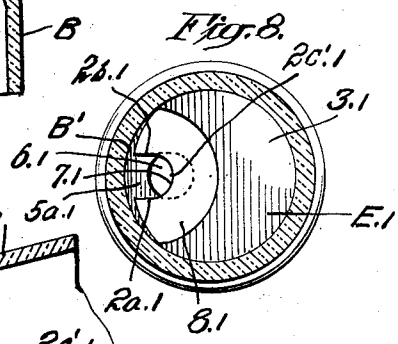


Fig. 3.

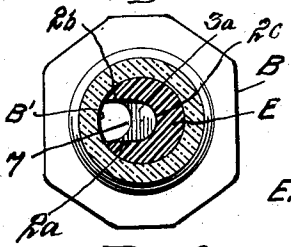


Fig. 9.

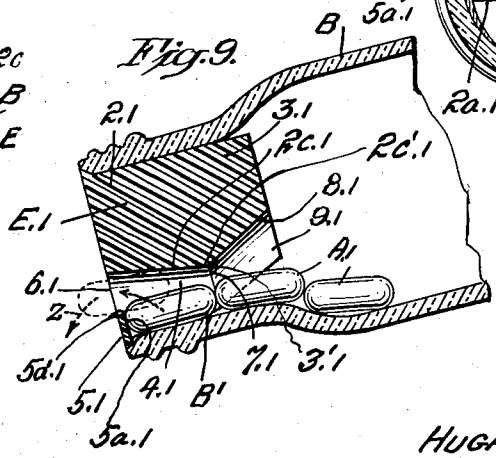
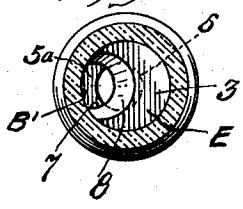


Fig. 4.



INVENTOR.
HUGH J. SINCLAIR
BY
Byerly, Townsend & Watson
ATTORNEY

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2,886,208

SPECIAL DISPENSING PACKAGE

Hugh J. Sinclair, New York, N.Y., assignor of one-half to Charles Morgan Hussey, Bronxville, N.Y.

Application May 21, 1956, Serial No. 586,101

1 Claim. (Cl. 221—288)

This invention relates to a special dispensing package for pills and other similar objects and aims to provide easy, inexpensive and sanitary dispensing of pills or objects one at a time from such a package.

Prior to the present invention there has not been any package providing dispensing of pills one at a time which has permitted ready application of a primary closure. Generally accepted standards of the drug industry require that a pill container should have a primary closure, at least until purchase by the consumer, and that the primary closure be one that may be readily used by the consumer throughout the life of the container and pills. In the drug industry the primary closure is best known as the usual metal cap and liner covering the mouth of the usual pill bottle in the well-known manner.

Although the dispenser described in applicant's earlier application, Serial No. 558,691, has advantageous closure aspects, that dispenser does not, by itself, meet the drug industry requirement for a primary closure for a pill container. And the use of the seal there described for sealing the openings in said dispenser and its connection with the container does not make that dispenser such a primary closure. While it is true that a container using said earlier dispenser could be adapted to use a primary closure cap to cover the dispenser, such a cap probably would be dispensed with by the consumer after purchase, as its use would detract from the convenience of applicant's earlier dispenser.

Furthermore, although applicant's earlier dispenser is itself inexpensive and easy to mass produce and apply to pill containers, nevertheless, in a field as competitive as the drug business even fractions of cents may become significant and in some applications applicant's earlier dispenser might still be too expensive.

Also, the spring strip preferably employed in applicant's earlier dispenser might have the capability of reacting chemically with some drugs, and although the possibility of any contact which might make this a significant factor is minimal, nevertheless it is preferable to avoid the use in a dispenser of any material which may react chemically with the drug to be dispensed.

Applicant has overcome these limitations by providing a special dispensing package, capable of utilizing a primary closure and of providing easy and inexpensive dispensing of pills or other similar objects one at a time. The package includes a container for the pills or objects which is preferably of a type having a primary closure, and may be the usual pill bottle having the usual metal cap and liner covering the mouth of the bottle in the usual way. The one at a time dispensing of the pills or objects is provided by a simple and inexpensive dispenser which may be made in one piece with no moving parts from material which does not react chemically with the pills or other objects in the container. The dispenser comprises a housing providing a trap chamber having staggered inlet and outlet holes at opposite ends. It is preferably located in the mouth of the container

where, in the case of the preferred container having a primary closure cap, its outlet hole is covered by said cap.

The housing of the dispenser in addition to providing a trap chamber having staggered inlet and outlet holes at opposite ends preferably provides a feed passage to said inlet hole. The trap chamber and the staggered inlet and outlet holes form a two-cornered zigzag passage through the housing. Standing across the passage opposite the inlet hole in the trap chamber is a barrier. The barrier is of sufficient height so that it will prevent an object which passes through the inet hole from passing out of the chamber without movement of the barrier. The chamber is preferably dimensioned so that at most the entire body of only one object may lie between the barrier and the inlet hole.

In order to dispense pills one at a time from my new package, the primary closure cap is removed and the container is inverted at an inclined angle with the barrier downmost. The container is then moved in a manner to cause the barrier to move downward relative to the first object. This operation results in dispensing of the first pill by means of gravity, and it may be repeated as often as is necessary to dispense the proper number of pills. It should be noticed that the pills need not be touched by human hands; and no more pills need be dispensed than are actually needed so that the hygienic security of the contents of the container may be readily preserved.

Applicant's new dispenser may be made in one piece, for example by molding it in a plastic which is chemically non-reactive with the pills. Thus, it is so easy to manufacture that the cost of quantity manufacture would be little more than the cost of the material necessary to make it. Furthermore, it can be easily inserted in existing pill bottles in the course of bottling of the pills without expensive special equipment.

Other objects and a fuller understanding of my invention may be had by referring to the following description and claim taken in conjunction with the drawings in which:

Fig. 1 is an elevation section view of a preferred embodiment of my special package containing my dispenser, said section being taken on a line 1—1 of Fig. 2;

Fig. 2 is a plan section view of my special package containing my dispenser, said section being taken on line 2—2 of Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is an enlarged section on line 1—1 of Fig. 2 showing the container inverted and at an angle permitting the pills to flow through the inlet hole of the dispenser into the chamber;

Fig. 6 is an elevation section view of another embodiment of my dispenser inserted in the neck of a container, said section being on line 6—6 of Fig. 7;

Fig. 7 is a plan view of the embodiment of my dispenser inserted in the neck of a container which is shown in section in Fig. 6;

Fig. 8 is a section taken on line 8—8 of Fig. 6; and

Fig. 9 is a section taken on line 6—6 of Fig. 7 showing the container inverted at an angle permitting the pills to flow through the inlet hole of the dispenser into the chamber.

Fig. 1 shows pills A enclosed in a container B, in this case a pill bottle of a well-known type having a metal cap C with the usual liner D. When the cap C is screwed on to the container B in a manner which is well known, the mouth of the container is securely covered by the liner D as the result of the pressure of the cap C which is maintained in position by its

frictional connection with the container in a manner which is well known. This is an example of a container with a primary closure cap. At the mouth of the container B is a dispenser E which in this case is so located in the neck thereof that it is completely inside the closure of the mouth of the container formed by the liner D. Dispenser E is preferably formed in one piece of material which will not react chemically with pills A.

As shown in Figs. 1–5 a preferred embodiment of my dispenser E comprises a housing 1 having an upper portion 2 and a lower portion 3. The upper portion 2 is shaped to form a chamber 4 between its top part 5 and lower portion 3. The walls of the chamber are respectively its top end 5*a*, its bottom end 3*a* and its sides 2*a* and 2*b* and a middle wall 2*c* and the neck B′ of the container B. An outlet hole 6 from said chamber is provided in top part 5. At the junction of the lower portion 3 and the upper portion 2 these portions are shaped to form with neck B′ of container B an inlet hole 7 to said chamber. Lower portion 3 is shaped to provide a feed portion 8 forming with neck B′ of container B a feed passage 9 to said inlet hole. Feed passage 9 is preferably of a shape to feed pills one at a time to inlet hole 7, for example a cone-like shape.

The normal operating position for the dispenser E is one in which the container B is inverted and inclined, for example, as shown in Fig. 5. The relationship of the various parts of the dispenser for proper operation can best be described with reference to this position. It can be seen from Fig. 5 that in this position the lower border of outlet hole 6 formed by inner edge 5*a*′ of top end 5*a* is offset vertically from the lower border of inlet hole 7 formed by neck B′ of bottle B so that top end 5*a* forms a barrier to pills A passing into chamber 4 through inlet hole 7. As so related, the staggered inlet and outlet holes 6 and 7 and trap chamber 4 form a two-cornered zigzag-shaped passage through which pills A may pass, the first corner being that formed by the edge 3′ of lower portion 3 bordering inlet hole 7, and the second corner being that formed by the edge 5*a*′ of top end 5*a* bordering outlet hole 6.

Holes 6 and 7 and chamber 4 should be large enough to pass pills A and the degree of offsetting of the lower borders of said holes should be such that the barrier 5*a* is made sufficiently high (or wide, for example when looking at Fig. 1) to prevent pills A which pass into the chamber 4 by gravity from passing out outlet hole 6. In addition, to assure one at a time operation the following conditions should be observed: Inlet hole 7 should be small enough so that it can pass but one such pill at a time. Also, the width of the chamber 4 between barrier 5*a* and inlet hole 7 should be small enough to pass but one such pill at a time. The distance between barrier 5*a* and the inlet hole 7 should preferably be such that at most the entire body of only one pill can lie between the barrier 5*a* and inlet hole 7.

In the embodiment shown in Fig. 5, which is particularly adapted to spherical pills of uniform size, these conditions are met. Outlet hole 6 is round and inlet hole 7 is also round or U-shaped to the points where its sides meet the curvature of the neck B′ of the bottle B. Both holes are just big enough to pass easily but one pill at a time. The chamber 4 is formed by the projection of said holes parallel to each other as can be seen from the section views shown in Figs. 2, 3 and 4. This construction limits the width of the chamber between barrier 5*a* and inlet hole 7 to the width of the inlet hole 7. The length of the chamber between the barrier 5*a* and the inlet hole 7 is slightly more than the diameter of the pill A. The barrier 5*a* is of sufficient height to prevent the pills from passing out hole 6 over a wide range of angles of inclination of the container B, and it can be seen from Fig. 5 that its effective height is about one-half the height of the inlet hole. As indicated above the outlet hole 6 is about the same size as the inlet hole 7 and the construction of the chamber 4 above described limits the height of the chamber to the height of the top periphery of the outlet hole 6 and limits the width of the portion of the chamber above the top of the barrier 5*a* to the width of the outlet hole. However, it should be noted that while such dimensions for the outlet hole and the portion of the chamber above the top of the barrier represent a preferred embodiment, they may be deviated from without sacrificing proper operation, provided they are kept large enough to pass the pills.

In order to dispense pills A from container B, the cap C and liner D are first removed in the usual way, and then the container is inverted and inclined at an angle, for example as shown in Fig. 5. To assure the orientation of dispenser E necessary to give proper operation, the container B should be moved to this position through a path in which the arrow W on the top 5 of dispenser E, as shown in Fig. 2, points in a downward direction. The proper angle of inclination of container B will depend mainly on the height of the barrier 5*a* relative to the size of pill A, but as indicated above where height of the barrier is about half the diameter of pill A the dispenser will operate satisfactorily over a wide range of angles of inclination.

In the inclined position shown in Fig. 5, for example, the pills A are permitted to flow under the influence of gravity into feed passage 9, through inlet hole 7 and into chamber 4 where the first pill is stopped by barrier 5*a*. Then, while maintained substantially in the orientation shown in Fig. 5, for example, the container B is preferably moved upward and then sharply downward in the direction of arrows X and Y, respectively, as shown in Fig. 5. This may be accomplished, for example, by action of the user's wrist. This movement causes the first pill to follow the path outlined by the dotted arrows Z shown in Fig. 5, both because of the inertia of the first pill and because of the tendency of gravity to force the second pill to take the place of the first pill thus urging it out of the chamber. This operation, which results in dispensing but one pill at a time, may be repeated in order to dispense successive pills individually in a like manner.

Figs. 6–9 show another embodiment E.1 of my dispenser which is particularly adapted to the type of pill A.1 having a long cylindrical body with rounded ends. This embodiment is constructed in accordance with the principles of my invention and comprises a housing 1.1 having an upper portion 2.1 and a lower portion 3.1. The upper portion 2.1 is shaped to form a chamber 4.1 between its top part 5.1 and lower portion 3.1. The walls of the chamber are respectively its top end 5*a*.1 and its sides 2*a*.1 and 2*b*.1 and a middle wall 2*c*.1 and the neck B′ of the container B. There is no wall corresponding to bottom end 3*a* in embodiment E due to the nature of the construction of chamber 4.1 which is described in detail below. An outlet hole 6.1 from said chamber is provided in top part 5.1. At the junction of the lower portion 3.1 and the upper portion 2.1 these portions are shaped to form with neck B′ of container B an inlet hole 7.1 to said chamber. Lower portion 3.1 is shaped to provide a feed portion 8.1 forming with the neck B′ of container B a feed passage 9.1 to said inlet hole. Feed passage 9.1 is preferably of a shape to feed pills one at a time to inlet hole 7.1, for example a cone-like shape.

As in the case of dispenser E, the normal operating position for the dispenser E.1 is one in which the container B is inverted and inclined, for example, as shown in Fig. 9, and the relationship of the various parts of the dispenser E.1 for proper operation can best be described with reference to this position. It can be seen from Fig. 9 that in this position the lower border of outlet hole

6.1 formed by inner edge 5a'.1 of top end 5a.1 is offset vertically from the lower border of inlet hole 7.1 formed by neck B' of bottle B so that top end 5a.1 forms a barrier to pills A.1 passing into chamber 4.1 through inlet hole 7.1. As so related, the staggered inlet and outlet holes 6.1 and 7.1 and trap chamber 4.1 form a two-cornered zigzag-shaped passage through which pills A.1 may pass, the first corner being that formed by the edge 3'.1 of lower portion 3.1 bordering inlet hole 7.1, and the second corner being that formed by the edge 5a'.1 of top end 5a.1 bordering outlet hole 6.1. Holes 6.1 and 7.1 have the same shape as holes 6 and 7, respectively. Both holes are big enough to easily pass pills A.1 lengthwise and are small enough to pass lengthwise but one such pill at a time. The chamber 4.1 is formed by the projection of the inlet hole 7.1 directly toward the outlet hole 6.1 to form middle wall 2c.1 of chamber 4.1 and by carrying walls 2a.1 and 2b.1 tangentially from the projection of said inlet hole to the neck B' of the container B leaving top end 5a.1 to form a barrier opposite inlet hole 7.1. As a result middle wall 2c.1 is inclined so that its end 2c'.1 abuts the edge 3'.1 of lower portion 3 forming the top border of inlet hole 7.1. This is best seen in Figs. 6 and 9. As so formed the chamber 4.1 has its width between barrier 5a.1 and inlet hole 7.1 limited to that of the inlet hole 7.1. The length of the chamber between barrier 5a.1 and inlet hole 7.1 is approximately the same as the length of the pill A.1. The remaining dimensions of the chamber are limited by the outlet hole and the manner of construction above described. The height of the chamber is limited by the height of wall 2c.1 and the width of the chamber above the top of barrier 5a.1 is limited by the width of outlet hole 7.1. The barrier 5a.1 is of sufficient height to prevent pills A.1 from passing out hole 6.1 over a wide range of angles of inclination of container B, and it can be seen from Fig. 9 that its effective height is approximately one-half the height of the inlet hole 7.1. The use of the inclined wall 2c.1 between the tops of the peripheries of holes 6.1 and 7.1 instead of a wall like 2c in the embodiment first described has the advantage of tending to avoid the possibility of a long pill A.1 pivoting about its end in the vicinity of barrier 5a.1 to any substantial extent when it is moved relative to barrier 5a.1 for dispensing from chamber 4.1 through hole 6.1. In such a case the next succeeding pill might become jammed under the first pill and block the chamber 4.1.

In order to dispense pills A.1 from the container B by means of the embodiment E.1 of my dispenser the container B is inverted and inclined at an angle, for example as shown in Fig. 9. To assure the orientation of the dispenser E.1 necessary to give proper operation, the container B should be moved to this position through a path in which the arrow W.1 on the top 5.1, as shown in Fig. 7, points in a downward direction. After moving the container to its operating position in this manner the same procedure is followed as that described with respect to the embodiment shown in Fig. 5.

In practicing my invention it is not necessary that the inlet hole and the trap chamber be located at the side of the housing so as to be partially formed by the neck B' of the container B. As long as the relationship between the inlet hole, trap chamber and outlet hole are maintained in accordance with the above-described principles of my invention the passage which they form in accordance with my invention may take any position in the housing which is substantially parallel to the position I have described. Specifically, the inlet hole and chamber may be formed wholly by the housing itself. This is also true of the feed passage.

It will be apparent that embodiment E.1 of my dispenser may be properly dimensioned for use with spherical pills A, and that embodiment E of my dispenser may be properly dimensioned for use with long cylindrical pills A.1. However, as to the latter, care should be taken to avoid by proper dimensioning the possibility of jamming which embodiment E.1 avoids. Also, it will be apparent that other types of pills than the two just mentioned may be used with my dispenser, and that my dispenser may take forms other than those represented by embodiments E and E.1. Although the general relative dimensions referred to in connection with embodiments E and E.1 and pills A and A.1 respectively should be adhered to for certain one at a time operation, small deviations from these relative dimensions may nevertheless result in an operation of the dispenser which is sufficiently reliable. As one example, I have found that ellipsoidal pills having a maximum diameter about the same as the diameter of the spherical pill A may be dispensed satisfactorily with my dispenser E. However, in dimensioning the dispenser relative to the shape and size of the pills to achieve certain one at a time operation, or performance approaching such reliability, the principles of my invention should be adhered to.

What I claim is:

A special dispensing package for the sanitary storage of pills or similar objects and the dispensing of them one at a time, comprising pills or similar objects and a container therefor having a primary closure cap and a dispenser fitted in the neck of said container comprising a housing providing the side walls, a middle wall, and a barrier wall of a trap chamber having an inlet hole at one end communicating with the interior of the container and an outlet hole at the opposite end of the chamber covered by the primary closure cap, said outlet hole being formed between the inner edge of said barrier wall and said middle wall and said inlet hole being small enough to pass only one such object at a time and located substantially parallel to the outlet hole with its edge on a line substantially perpendicular to said barrier wall and extending from the outer edge thereof and at a distance from the barrier wall small enough so that at most the entire body of only one such object may lie in said chamber between the barrier wall and the inlet hole and said barrier wall having an effective width in the direction of the outlet hole about one-half that of the inlet hole and large enough to prevent such an object which passes through the inlet hole when the container is inverted and inclined from passing out of the chamber without movement of the barrier wall relative to the object.

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