

Feb. 27, 1973

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3,718,230

CHILD PROOF CONTAINERS

Filed May 13, 1971

FIG.1

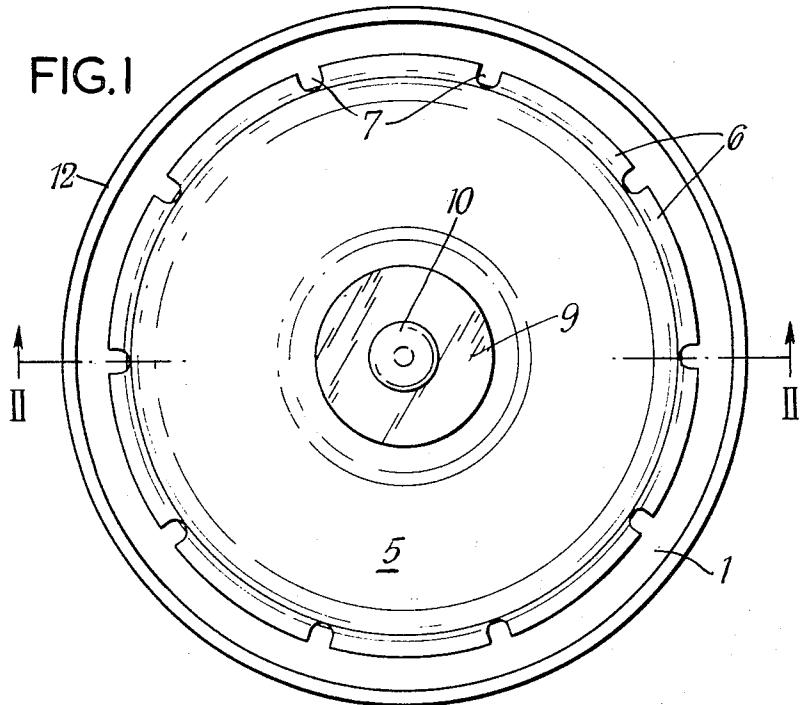
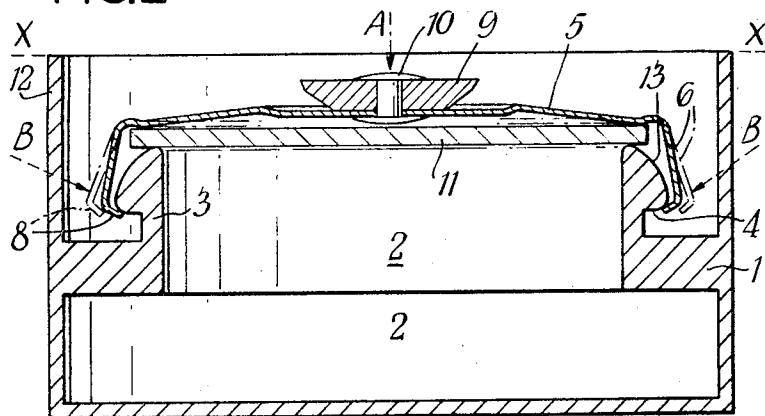


FIG.2



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### CHILD-PROOF CONTAINERS

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Filed May 13, 1971, Ser. No. 143,043  
Claims priority, application Great Britain, May 14, 1970,  
23,515/70  
Int. Cl. B65d 43/10

U.S. CL. 220—60 A

9 Claims

### ABSTRACT OF THE DISCLOSURE

A child-proof container for medications and other potentially injurious substances which comprises an unbreakable body having a mouth fitted with a snap action or other safety closure cap and also comprises a wall which closely surrounds the fitted cap so that the plane of its free edge is above the mouth and fitted cap when the container is standing upright on a horizontal surface.

This invention relates to containers for medicines and injurious substances. A primary object of the invention is to provide a container whose closure cannot be removed by young children (particularly of pre-school age) who might otherwise mistake pills, capsules, ointment or other medicaments inside the container for sweets, candy or food.

The many accidental poisonings of young children which have occurred as a result of their being able easily to open pill boxes, medicine bottles and the like are all too well known and a large number of attempts have been made to provide child-proof containers that will solve this problem. However, the problem cannot be solved satisfactorily by providing a container whose closure is fixed so tightly that only the full strength of a healthy adult person is sufficient to open it because such containers must frequently be used by aged, infirm, manually crippled or temporarily weakened persons who would thus need assistance each time access to the interior of such a container was required. A number of the attempts to solve this problem that have been made have failed, or proved to be little better than containers with conventional closures, because it has not been realised that, whilst most adults instinctively attempt to open an unfamiliar closure with their hands, the great majority of young children attempt to open closed containers with their mouths. Since young children often have sharp teeth, and since their jaws are very much stronger than their hands, past experience has proved that they are frequently capable of tearing or breaking off lids, caps and the like if only they can get their teeth under a lip or other projection thereof.

Although no "child-proof" closure can be absolutely relied upon under all conceivable circumstances, the present invention takes into account the factors discussed above and provides inexpensive containers for medicines and injurious substances which containers can be opened easily by any adult who is aware of the extremely simple manipulation employed whilst nevertheless baffling the attempts of young children to open them in almost every case.

According to the present invention, there is provided a container for medicines and injurious substances comprising a substantially rigid hollow body that is formed from an unbreakable material and which has a mouth provided with a safety closure cap that requires procedural knowledge to enable a user to release it from said mouth, wherein the container body also includes a substantially rigid wall formed integrally with said body which closely surrounds the mouth and the cap (when

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fitted to the mouth), the general plane of the free edge of said wall being located above both the mouth and the fitted cap when the closed container is standing upright on a horizontal surface.

5 The expression "unbreakable material" as employed in this specification is to be interpreted as meaning a material such (for example) as metal, a strong synthetic plastic or thick glass which will not shatter or fracture when given the kind of treatment which a young child 10 might employ in attempting to open the container. A young child might, perhaps, bang the container several times against the floor, against a wall or against a cot or the like and it will be appreciated that the container would not serve its intended purpose unless its body 15 were formed from a material capable of withstanding mechanical shocks of this kind without breakage. The expression "safety closure cap" is to be interpreted in this specification as meaning a cap which incorporates a safety feature that prevents it from being removed accidentally or with a single simple movement. Thus, a cap 20 which was a simple frictional push-on fit on its container would not fall within the ambit of the expression "safety closure cap" as used in this specification nor would a cap having a simple screw-thread that co-operates with 25 a matching screw-thread around the mouth of the associated container.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

FIG. 1 is a plan view of a closed pill box constructed in accordance with the invention, and

FIG. 2 is a section taken on the line II—II of FIG. 1.

Referring to the drawings, the pill box which is illustrated 35 as an example of a container in accordance with the invention has a squat broad-based body 1 that may be formed from any convenient unbreakable material (as hereinbefore discussed) such, for example, as a strong substantially rigid synthetic plastics material which could 40 be polypropylene. Various metals, thick glass and ceramic materials that will not shatter easily can also be employed. The body 1 has a hollow interior 2 that will contain a supply of pills, capsules or other medicines, the body 1 having an upright cylindrical lip 3 formed with an outwardly directed surrounding flange 4. It will be apparent from FIG. 2 of the drawings that the flanged lip 3 defines a mouth of the body 1.

The mouth of the body 1 has a safety closure cap 50 in the form of a domed metal cap 5 whose margin integrally carries a plurality, such as ten, of downwardly-directed fingers 6 that are spaced apart from one another around said margin by narrow gaps 7. The lowermost extremities of the fingers 6 are formed with inwardly bent-over claws 8 that all engage grippingly beneath the flange 4 when the domed cap 5 occupies a first raised 55 stable position that will be referred to again below and that is shown in FIG. 2 of the drawings in full lines.

A synthetic plastics knob 9 is secured centrally to the upper surface of the domed cap 5 by a rivet 10 and 60 downward pressure on the knob 9 in the direction indicated by an arrow A in FIG. 2 of the drawings will cause the cap 5 to move rapidly with a "snap" action between the first stable raised position that is shown in broken lines and a second stable depressed position that 65 is illustrated in broken lines in which latter position the fingers 6 and their gripping claws 8 are displaced outwardly to clear the flange 4 and allow removal of the cap 5. It will be noted that a cardboard or other sealing disc 11 is mounted on the lower surface of the cap 5 (preferably with the aid of an adhesive) and this disc 11 will 70 keep the interior 2 of the body 1 sealed from the atmosphere when the cap 5 occupies its operative position. The

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provision of the sealing disc 11 is desirable because many medicines lose their potency or otherwise deteriorate more rapidly when constantly in contact with the ambient atmosphere.

Safety closure caps that are similar to the cap 5 (except for the provision of the knob 9) have been used for very many years and are still employed as closures for tins of motor oil, pill containers and for other like purposes. It is thus believed that the "snap" action movement between first and second stable positions of such caps is already sufficiently well known and documented to render further detailed description of the "snap" action of the cap 5 unnecessary.

In contradistinction with the known containers that have caps similar to the cap 5 and in accordance with the invention, the body 1 of the pill box has an upstanding substantially rigid wall 12 which cylindrically surrounds the mouth of that body and the cap 5 when fitted thereto. The general plane X—X (FIG. 2) of the free edge of the wall 12 is located above both the mouth of the body 1 and the cap 5 and its knob 9 when fitted to that mouth. The pill box is opened by pressing downwardly in the direction A upon the knob 9 to cause the cap 5 to "snap" from its first stable raised position to its second stable depressed position in which the fingers 6 and their claws 8 are disengaged outwardly from the flange 4. The knob 9 can then be gripped between finger and thumb to enable the cap 5 and its sealing disc 11 to be lifted away from the body 1 thus providing ready access to the hollow interior 2 in which the required pills or the like are kept.

Appreciable downward pressure in the direction A is required to cause the cap 5 to snap from its first to its second stable position and this pressure is beyond the capabilities of young children even if they have unwisely been allowed to see an adult opening the pill box and have thus gained the procedural knowledge required to enable the cap to be released from the mouth of the body 1. Since the cap 5 is a "safety closure cap" as hereinbefore defined, and since the required action differs from that needed to open most closures, very few small children indeed will appreciate the necessary manipulation without a prior demonstration and even then, as mentioned above, they lack the manual strength that is needed to depress the knob 9 in the direction A. The cap 5 is returned from its second stable position to its first stable position by pressing on fingers 6 at opposite sides of the cap in the directions indicated by arrows B in FIG. 2 of the drawings or, alternatively, by pressing centrally upon the lower surface of the cap 5 in a direction opposite to the direction A. This latter action is effected before replacing the cap which is then pushed downwardly over the flanged lip 3 by applying light pressure at points close to the margin of the cap. The claws 8 slide downwardly over an outer cam surface 13 of the flange 4 until they eventually spring into the gripping positions thereof that are shown in full lines in FIG. 2 of the drawings. The container is then securely re-closed with its hollow interior 2 sealed off from the ambient atmosphere by the disc 11.

Certain persons, such as those suffering from arthritic hands, may not be able to apply the required pressure to the knob 9 by thumb or finger but this difficulty can be overcome quite easily by such a patient who may present the knob 9 to the corner of a table or chair, or to a furniture handle or the like, and subsequently push the container towards said article of furniture, handle or the like with the weight of their body. This is immediately effective in causing the cap 5 to move with a "snap" action from its first to its second stable position whereafter access can be obtained to the hollow interior 2 of the body 1 by lifting or shaking off the cap 5 or by inverting the whole pill box so that the cap 5 falls away from the flanged lip 3. Obviously, care must then be taken to prevent the contents of the pill box from falling

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out and becoming lost. If desired, a positive connection, such as a light check chain, may be provided between the internal end of the rivet 10 and an internal anchorage at the bottom of the body 1. This will prevent the cap 5 from being lost. The disc 11 would be replaced by an annulus under these circumstances but there would still be an airtight seal when the pill box was closed provided only that the rivet 10 and knob 9 provided a sealed closure for the central hole in the material of the cap 5.

The provision of the wall 12 of the body 1 is designed to overcome the disadvantages of known childproof containers and serves two primary purposes. Firstly, the wall 12 surrounds the flange 4 of the body 1 and the fingers 6 of the cap 5 with only just sufficient clearance to ensure that the cap 5 can be raised clear of the mouth of the body 1 when its fingers 6 are displaced outwardly as illustrated in broken lines in FIG. 2. This makes it a physical impossibility for a child to engage his or her teeth with the fingers 6 or their claws 8 so that the principal source of strength of small children cannot be employed. Secondly, the fact that the general plane X—X containing the upper free edge of the wall 12 is located above the cap 5 and its knob 9 causes said wall to act as a stop and ensures that a child banging the pill box against a wall, floor, cot bar or the like will not accidentally impact the knob 9 in the direction A with sufficient force to cause "snap" action movement of the cap 5 from its first to its second stable position.

Caps similar to the cap 5 (without its knob 9) are already commercially available in a number of standard sizes and, therefore, very little expense is involved in providing caps suitable for use in putting the present invention into practice. The knob 9 is not normally provided in a conventional cap because, in the use of a conventional cap, there will not be a part equivalent to the wall 12 which prevents the cap from being gripped to raise it clear of the mouth of the container body which it closes. It is not, in fact, essential to provide the knob 9 since the cap 5 could always be shaken free or dropped off by inverting the pill box. However, it will be evident that this is not really desirable and it would be possible, without the knob 9, to employ a weak helical compression spring located beneath the cap 5 which would expand and push the cap 5 upwardly beyond the wall 12 after pressing downwardly upon the centre of the cap 5 at the point which is occupied by the knob 9 in the example illustrated in the drawings. The provision of a light check chain or the like as previously described would not interfere with such an arrangement.

A simple decorative or informative cover could, if desired, be provided to co-operate with the wall 12 and hide from view the cap 5 and the associated parts until said cover was removed. Although the cap 5 will normally be formed from metal, this is not absolutely essential and it is within the scope of the invention to form it from a synthetic plastics material or any other material having the required degrees of durability, flexibility and strength. Whilst it is convenient to make the body 1 of the pill box in a single piece by moulding it from a synthetic plastics material, this is not essential and said body may be formed from interconnected parts provided that the interconnections are of a kind that could not be released by young children to gain access to the interior of the box. It will be self-evident that both the body 1 and the cap 5, in addition to being "unbreakable" as hereinbefore defined, should be formed from materials which are such as to have a good degree of rigidity. Clearly, a container in accordance with the invention would not serve its purpose if a child could burst it open and obtain access to its interior merely by applying his or her weight to the container by stamping a foot thereon.

Since no child-proof container for general use can ever be absolutely relied upon under all possible circumstances, it is considered desirable to "colour-code" con-

ainers in accordance with the invention to indicate the class of medicine or other substance contained therein. This would be of great assistance to medical practitioners in the prompt treatment of poisoned children. Purely as an example, the bodies 1 and knobs 9 could be coloured red to indicate barbiturates, green to indicate alkaloid drugs, blue to indicate corrosive acids, orange to indicate caustic alkalis and so on. Corrosive acids and caustic alkalis are not normally contained in pill boxes but it will, of course, be understood that a pill box has been described merely as an example of a container to which the invention can be applied. Obviously, larger containers in the form of unbreakable (as hereinbefore discussed) bottles, jars and so on can be made in accordance with the invention provided that they have a mouth, a safety closure cap and a surrounding wall arranged in the same general manner as has been described in connection with the pill box shown in the accompanying drawings. The invention is thus applicable not only to containers for medicines but also to containers for various injurious substances which might attract young children. Such injurious substances that have been the cause of accidents around dwelling houses are paraffin, hydrochloric acid, caustic soda, bleach, antiseptics, liquid detergent, hair cream and various cosmetic substances, lavatory cleaning preparations, motor oil, weed killer, fertiliser, disinfectants and so on.

Whilst it is preferred to employ the simple but effective "snap" action cap 5, this is not essential and other safety closure caps may be substituted. For example, a closure cap which co-operates with the container by way of a bayonet joint would be suitable for many purposes as would a closure cap that co-operates with the container mouth by way of a screw-thread but that first requires inward depression of the cap against resilient opposition before the screw-threads will co-operate to allow release. The flange 4 has been described and illustrated as externally surrounding the lip 3 of the container. Clearly, the exterior of the lip 3 could be plain and a flange or other closure part or parts could be provided internally of the body 1 in which case the periphery of the co-operating safety closure cap would co-operate with said part or parts inside the cylindrical lip 3 instead of at the exterior thereof.

I claim:

1. In a container for medicines and injurious substances comprising a substantially rigid hollow body that is formed from an unbreakable material and which defines a mouth provided with a safety closure cap that requires procedural knowledge to enable a user to release it from said mouth, the improvement which comprises providing the container body with a substantially rigid wall formed integrally with said body which closely

surrounds the mouth and the cap (when fitted to the mouth), the general plane of the free edge of said wall being located above both the mouth and the fitted cap when the closed container is standing upright on a horizontal surface.

5 2. A container as claimed in claim 1, wherein the mouth of the container is of substantially cylindrical configuration and is provided externally with at least one part adapted to co-operate with the periphery of the safety closure cap to enable the container to be opened and closed.

10 3. A container as claimed in claim 2, wherein the safety closure cap is a domed cap which can be moved with a "snap" action between a first stable raised position in which marginal gripping fingers of the cap will grip- 15 pingly engage a flange formed around said mouth, and a second stable depressed position in which the fingers are displaced outwardly and will clear said flange to allow removal of the cap.

20 4. A container as claimed in claim 1, wherein the safety closure cap is provided with a sealing member arranged to seal the interior of the container from the ambient atmosphere when said cap is fitted thereto.

25 5. A container as claimed in claim 3, wherein the upper surface of the safety closure cap is provided with a knob to enable said cap to be lifted clear of said mouth after releasing the cap from the container body.

30 6. A container as claimed in claim 1, wherein the body is formed in a single piece by moulding it from a synthetic plastics material.

35 7. A container as claimed in claim 1, wherein at least one part selected from the safety closure cap and the container body is colour-coded to indicate a class of medicine/injurious substance to which the contents of the container belong.

40 8. A container as claimed in claim 1, wherein a decorative/informative cover is provided to co-operate with the wall and hide the safety closure cap from view until the removal of that cover.

9. A container as claimed in claim 1, and taking the form of a pill box.

#### References Cited

#### UNITED STATES PATENTS

45 3,482,723	12/1969	Esposito, Jr. -----	215—9
1,580,544	4/1926	Spengler -----	220—60 A
3,559,843	2/1971	Kerr -----	226—60 A
2,717,708	9/1955	Martinez -----	215—9

50 ALLEN N. KNOWLES, Primary Examiner

U.S. Cl. X.R.

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