

[54] **CONTAINER WITH SPRINGLOADED CLOSURE**

[75] Inventors: **Donald J. Miller**, Costa Mesa; **Gil G. Rolie**, Wilmington, both of Calif.

[73] Assignee: **Synergex Corporation**, Santa Clara, Calif.

[22] Filed: **Apr. 8, 1974**

[21] Appl. No.: **458,569**

[52] **U.S. Cl.** **220/335**

[51] **Int. Cl.²** **B65D 43/24**

[58] **Field of Search** 220/264, 283, 326, 334, 220/335, 336, 337, 340

[56] **References Cited**

UNITED STATES PATENTS

2,014,696	9/1935	Pitman.....	220/335
2,319,346	5/1943	Rathbun	220/335
2,632,684	3/1953	Anderson.....	220/335
3,082,865	3/1963	Nemsky	220/335
3,233,820	2/1966	Williams	220/335
3,355,088	11/1967	Young	220/335

Primary Examiner—George T. Hall

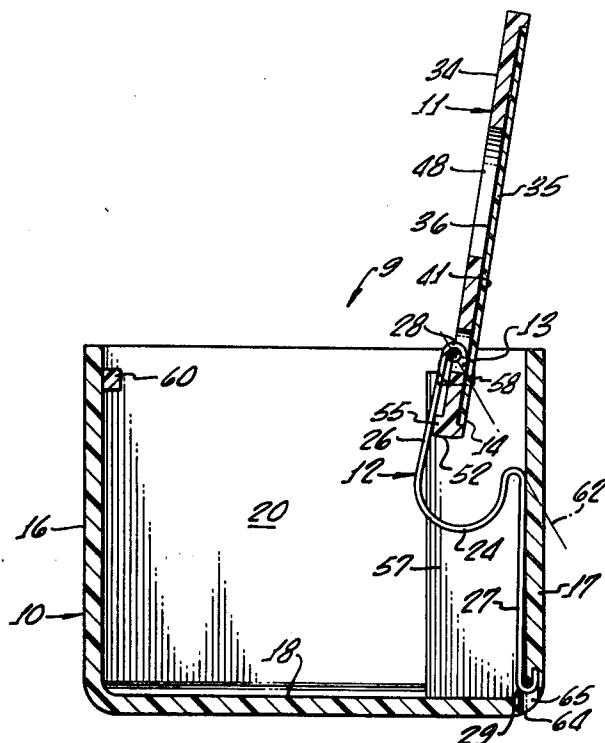
Assistant Examiner—Ro E. Hart

Attorney, Agent, or Firm—Gausewitz, Carr & Rothenberg

[57] **ABSTRACT**

A closable box includes a cover which, by a substantially planar, recurved wire spring, is urged toward an open or closed position when it is partially opened or closed, and is retained in an open or closed position when either of these positions is reached. The cover is hinged forward of its back edge to allow the region rearward of the hinge line to be pressed inwardly to open the box with one hand. The outer cover is transparent and has a detachable outer layer for installing and protecting a paper or card upon which information concerning the contents of the box may be written. In one variation the container is partitioned to include an inner container having a springloaded inner cover hinged forward and below the outer cover and truncated back of its hinge line to provide clearance for the outer cover. In another variation a tray is formed of an array of such covered boxes having covered inner containers.

14 Claims, 12 Drawing Figures



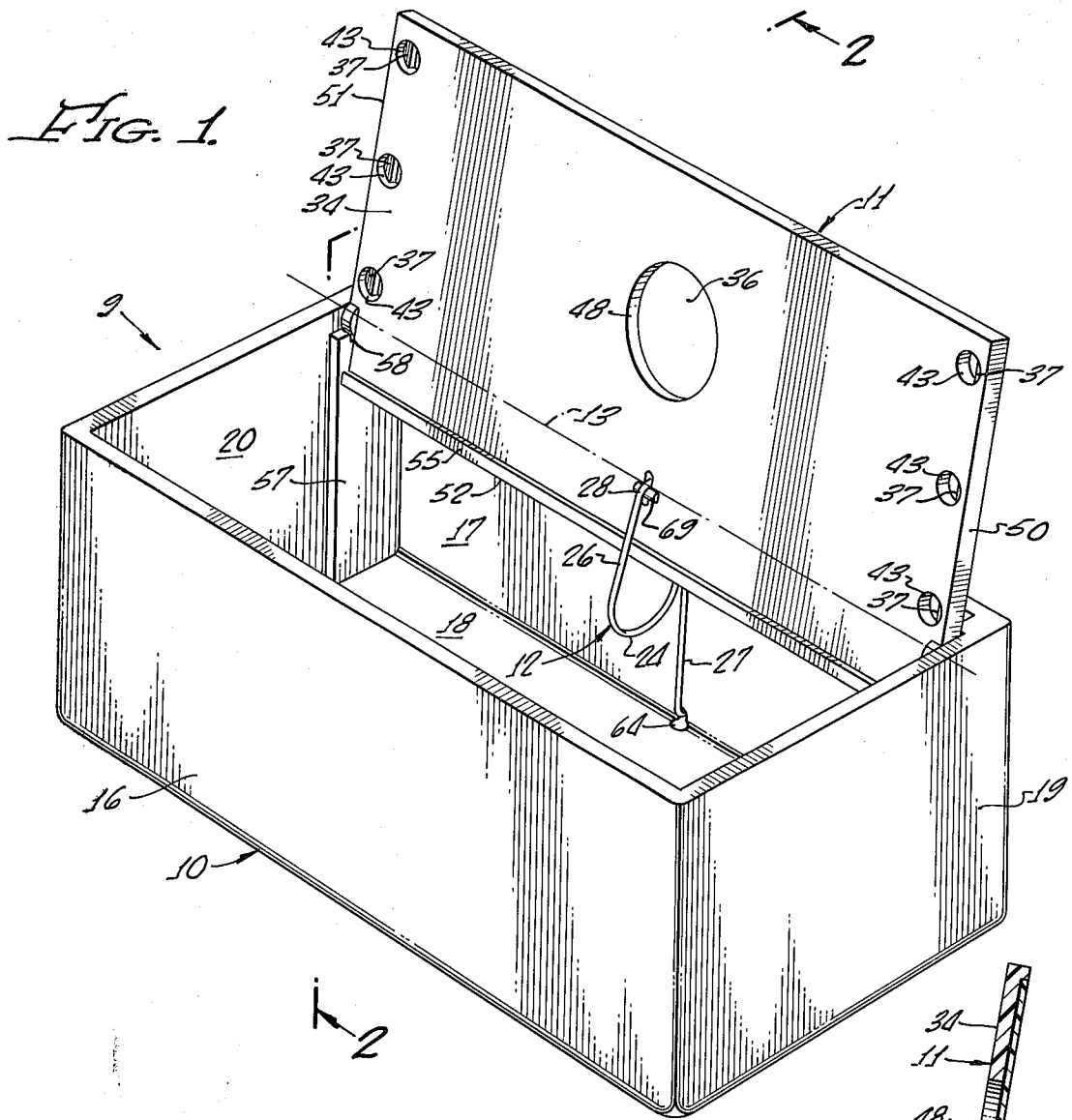
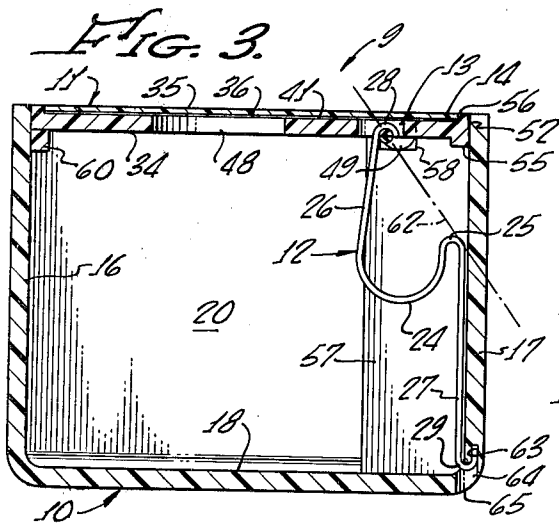
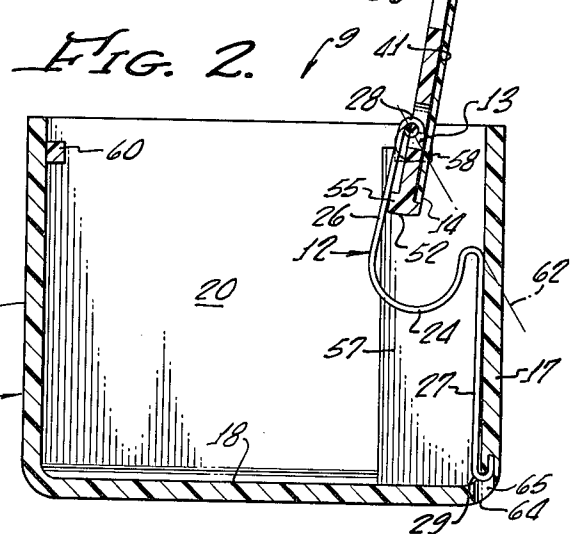


FIG. 5.

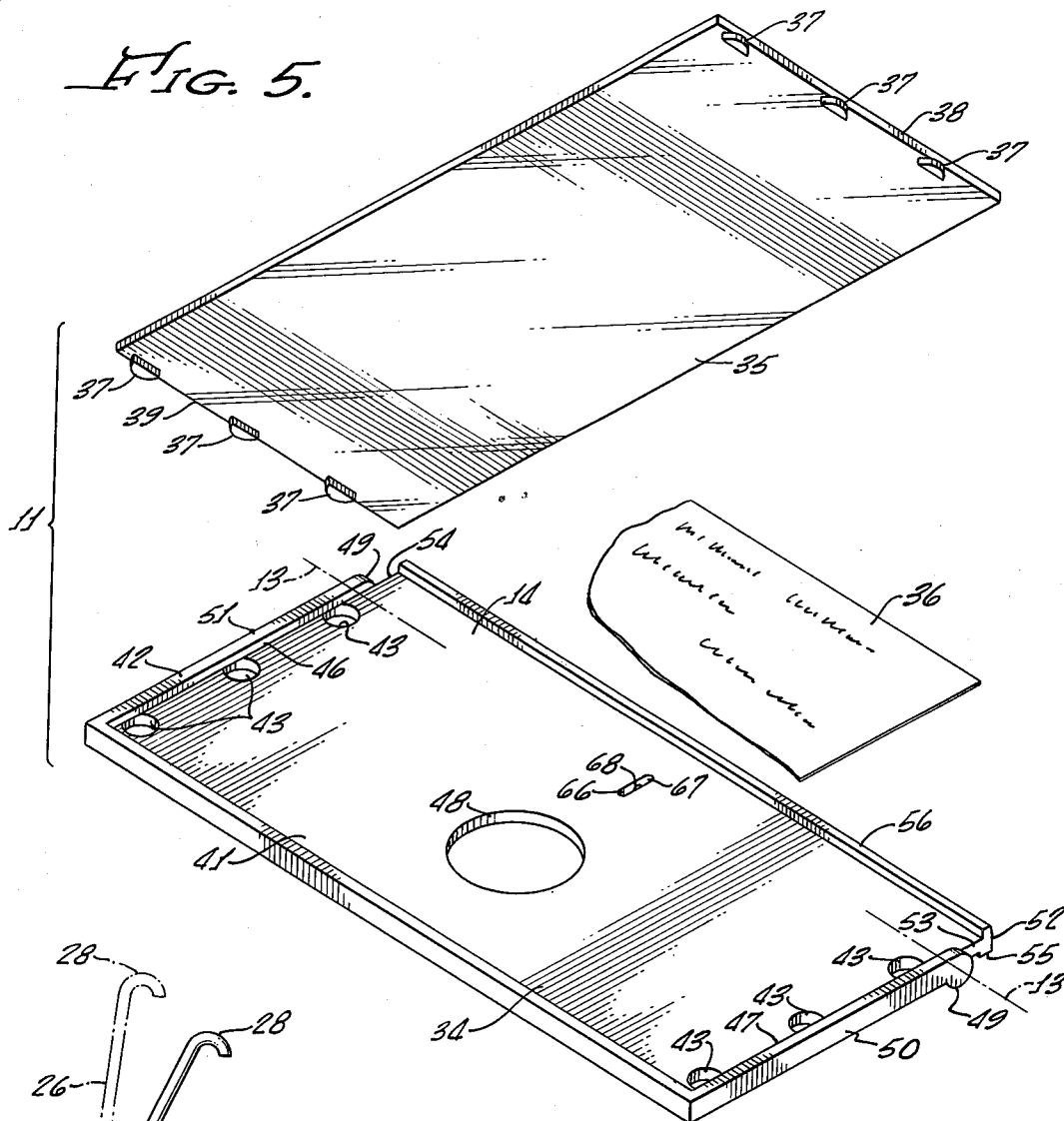


FIG. 4.

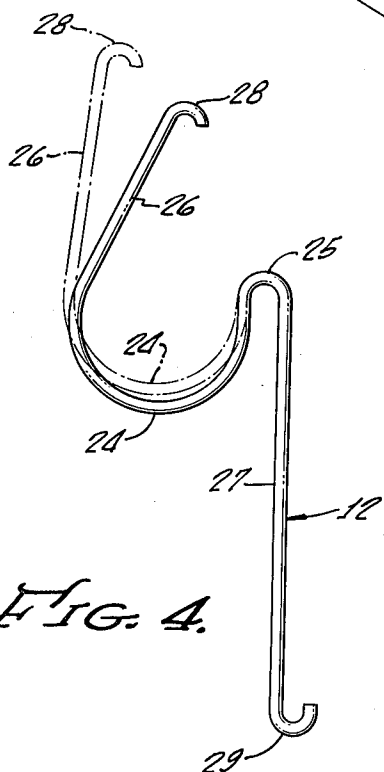
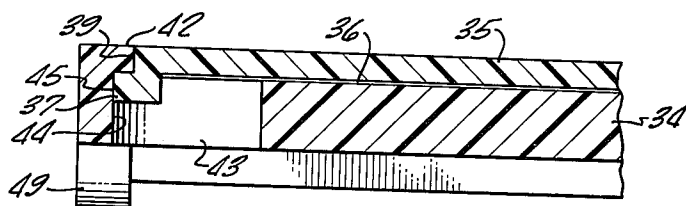


FIG. 6.

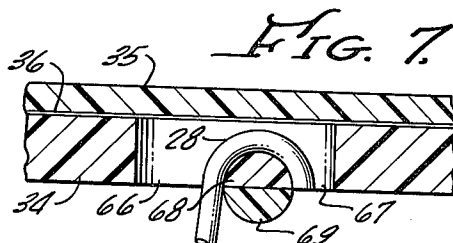


FIG. 7.

FIG. 8.

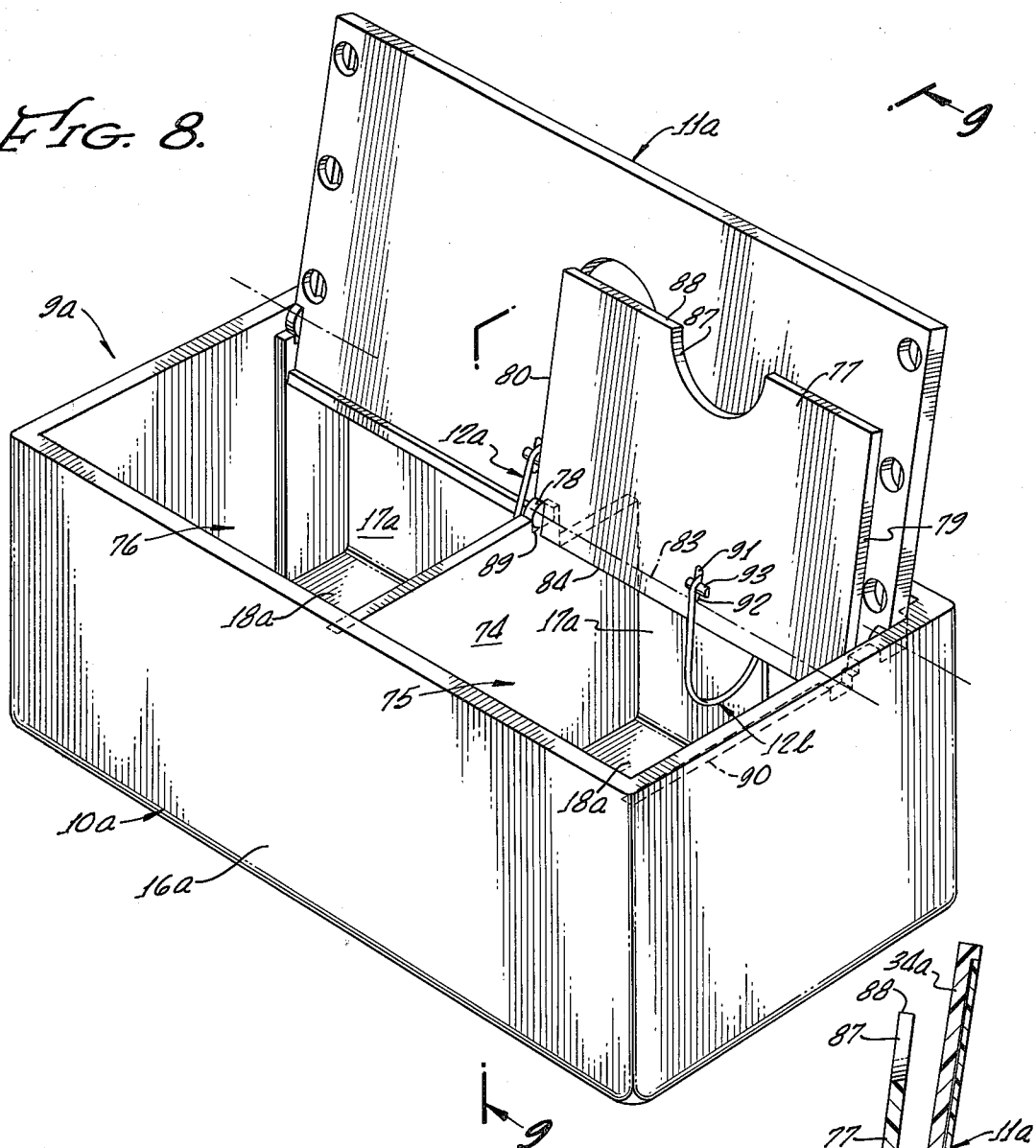


FIG. 10.

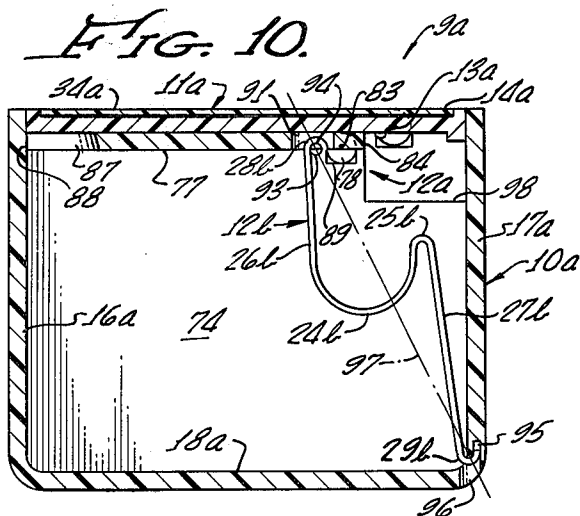
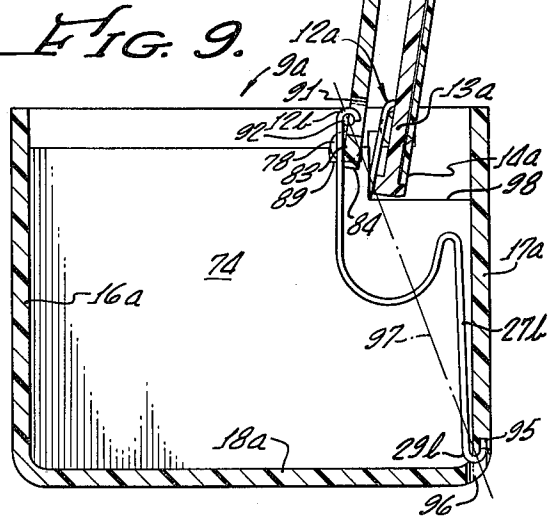


FIG. 9.



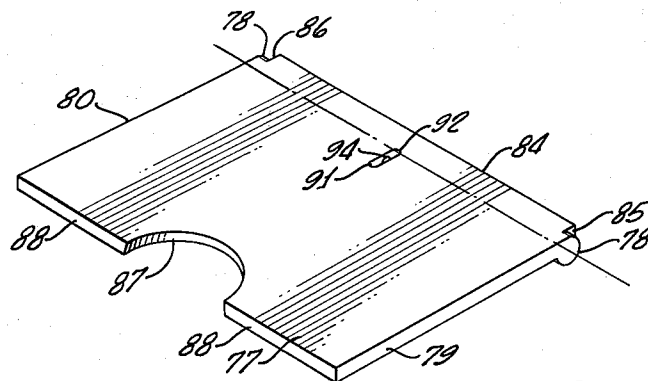


FIG. 11.

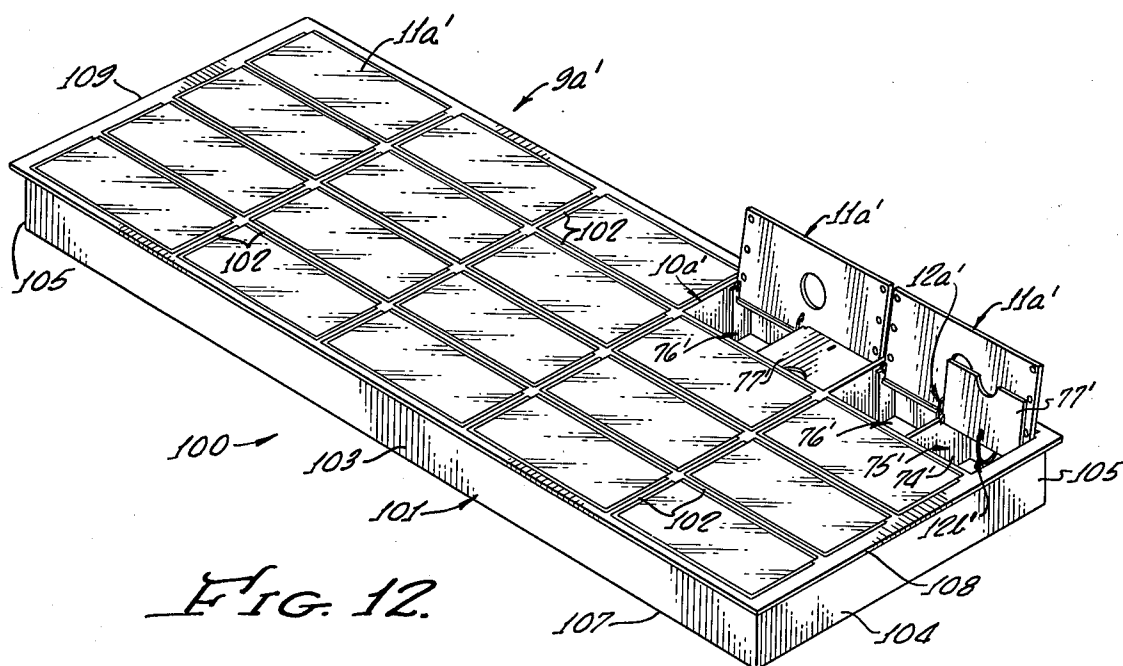


FIG. 12.

CONTAINER WITH SPRINGLOADED CLOSURE

BACKGROUND OF THE INVENTION

The invention relates to the field of closable boxes with springloaded layered covers, and more particularly concerns an interconnected array of such boxes.

DESCRIPTION OF THE PRIOR ART

A variety of closable boxes or containers with springloaded covers which are urged to, and retained in, open and closed positions by springs have been designed. Various types of springs have been used, including wires used in tension or torsion and flat springs used in bending. The springs in some boxes are located internal to the container and in others they are externally located. A typical use for small boxes of this nature is for packaging jewelry items such as rings, watches or bracelets.

One common feature of the prior art has been that the boxes generally require two hands to open, one hand to hold the container portion and the other hand to raise the cover. While such two handed operation may not be a disadvantage in the typical use mentioned, it is a definite drawback when the user has only one free hand and must frequently open the container, as is generally the case, for example, where springloaded boxes are used for dispensing medicines in a hospital or nursing home.

Many springs, for example leaf or coil springs, heretofore used have comparatively extensive exposed surfaces and most springs require recessed spring retaining regions within the container. These springs and retaining regions collect dust, dirt and foreign material and are difficult to clean once dirty or contaminated. Boxes employing such springs and retainers are thus inappropriate for containing medicines.

Also most springs heretofore employed have been comparatively complicated, and thus expensive to fabricate, and many are relatively space consuming within the container.

Nor have springloaded boxes been designed which are internally divided into separate containers, at least one of which has its own separate springloaded cover, such as is desirable for storing a back up dosage of medicine for use in the event that the normal or primary dosage is spilled or lost.

Thus, there has heretofore, to the applicants knowledge, been no springloaded boxes suitable for such critical use as dispensing medicines, which use may additionally require an array of such boxes formed into a tray arrangement so that medications for a number of patients may easily be carried without danger of spilling the contents.

In addition, none of the boxes heretofore designed have covers which are adaptable for protecting an easily replaceable paper or card having information related to the use of the contents of the box, for example in the case of medicines, the patient's name, his doctor, his room number, hours of medication, and so forth. Because of the criticality of each patient receiving the correct dosage of his own medicine at the correct time, it is essential that the information card be legible, protected from defacement, loss or transposition, and be easily removable and reinstallable so that the information may be changed as required. Use of adhesive labels, which may be stuck to the cover or box, has proven unsatisfactory because the information printed

thereon is subject to defacement by repeated handling and the labels are subject to being peeled off and lost or being interchanged.

SUMMARY OF THE INVENTION

In carrying out the principles of the present invention according to a preferred embodiment, a closable box comprises a cover hinged to a container forward of the back of the container, to allow the cover to be opened by pressing inward on the portion rearward of the hinge line. A recurved wire spring, attached at one end to the back of the container and at the other end to the cover, holds the cover to the container, thereby eliminating hinge pins, and urges the cover to, and retains it in, either a closed or opened position.

More specifically, in one embodiment of the invention a wire spring is recurved into the general shape of a figure "2" with elongate projecting ends. The spring is substantially planar to minimize space usage within the box, to present a minimal surface for collecting dirt and foreign materials, and for ease in fabrication. The cover is transparent and comprises an inner layer hinged to the container and to which the spring is attached, and an outer layer, having ears which fit into holes in the inner layer for attachment. The outer layer is easily detachable by flexing so that a paper or card containing information regarding the contents of the box may be inserted between the layers and be thereby protected.

In one variation of the preferred embodiment, the box is partitioned into a first and second inner container, having a springloaded inner cover covering the first inner container. The springloading for the inner cover is substantially the same as that of the outer cover of the box. The inner cover is hinged forward and below the outer cover and is truncated rearward of its hinge line to provide clearance between the outer and inner covers when either is opened.

A second variation of the preferred embodiment joins multiple boxes, each having separate springloaded inner and outer covers into a tray suitable for dispensing medicines in a hospital or nursing home.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the preferred embodiment showing the box with its cover in the open position;

FIG. 2 is a sectional view along line 2—2 of FIG. 1, showing the box with its cover in an open position;

FIG. 3 is a sectional elevation view along the plane of FIG. 2 showing the box with its cover in a closed position;

FIG. 4 is an enlarged plan view of the spring;

FIG. 5 is an exploded view of the cover showing inner and outer layers;

FIG. 6 is a sectional view showing attachment of the inner and outer layers of the cover;

FIG. 7 is a sectional view showing attachment of the spring element to the cover;

FIG. 8 is a perspective view showing the box with inner and outer covers, both in an open position;

FIG. 9 is a sectional view along lines 9—9 of FIG. 8 showing the box with inner and outer covers in an open position;

FIG. 10 is a sectional view along the plane of FIG. 9 showing the box with inner and outer covers in a closed position;

FIG. 11 is a perspective view of the inner cover;

FIG. 12 is a perspective view of an array of boxes, with inner and outer covers, joined to form a tray.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment, illustrative of the invention, as best seen in FIG. 1, comprises generally a box 9 having a rectangular container 10 of square cross section, with a cover 11 hinged thereto for covering the open top of the container. A spring 12, attached between container 10 and outer cover 11, retains, by an over-center locking action, cover 11 in either a closed or a fully open position, and urges the cover to either of these positions depending to the degree of openness of the cover. Spring 12, which is continuously tensioned, also holds cover 11 to container 10, thereby eliminating the need for hinge pins.

Cover 11 is hinged along a hinge line 13 which is substantially forward from the back of the box such that a region 14 of the cover, rearward of hinge line 13, is defined. When cover 11 is opened, region 14 projects into container 10. A closed cover may thus easily be opened with one hand by pressing inward (toward the inside of container 10) anywhere along region 14, thereby lifting the front portion of the cover to the point that it may easily be grasped by the same hand and fully opened.

Container 10 has a front 16, and a back 17, a bottom 18, a first side 19 and a second side 20, which are joined together, as by cementing or being molded together in one piece, to form a hollow receptacle, having an open top. The container is preferably, but not necessarily, of rigid transparent plastic (so the contents of the box may easily be seen).

DESCRIPTION OF THE SPRING MEANS

The spring 12, as illustrated in FIG. 4, performs the important triple function of holding cover 11 to container 10, urging the cover to either a closed or a fully open position (hereinafter generally referred to merely as an open position) depending on the position of the cover, and retaining the cover in either the closed or open position. Spring 12 is formed of high tensile strength spring wire, such as music or piano wire, into a planar, recurved element with elongate ends, which resembles, in one orientation, a figure "2."

A larger radius curve 24 is formed adjacent a small radius curve 25. An end region 26 projecting from the larger radius curve is somewhat shorter than an end region 27 projection from the smaller radius curve. Ends 26 and 27, pointing generally in opposite directions, are at an acute angle to each other when spring 12 is unflexed and not under tension, as shown in solid lines in FIG. 4. When the spring is installed and under tension, however, the ends are pulled apart so as to be nearly parallel (as shown by phantom lines in FIG. 4, and also as seen in FIG. 3). Small radius, semi-circular attachment hooks 28 and 29 are formed on ends 26 and 27, respectively. Hooks 28 and 29 are formed such that hook 28 is on the same side of end 26 as larger radius curve 24 while hook 29 is on the opposite side of end 27 from smaller radius curve 25.

For ease in construction and installation, and for other reasons to become more apparent, spring 12 is formed entirely in a single plane. The scope of the invention, however, encompasses variations, such as hooks 28 and 29 which are formed at angles to the plane of curves 24 and 25. The spring 12 has particular advantages which will become more apparent from the

ensuing description, particularly when its installation and functions are described.

DESCRIPTION OF THE COVER

The cover 11 is hinged to container 10, being pivotable about hinge line 13 between a closed position in which the open top of container 10 is covered and an open position in which there is free access to the interior of the container.

Cover 11 is thin and flat. When closed, it fits within the rim of container 10, that is, the upper surface of the cover is flush with the upper edges of the front, back, and sides of the container, such that a completely flat surface is formed for stable stacking of the boxes (or of the trays into which the boxes may be formed, as described below).

The cover is preferably of layered construction with provision for installation between layers of paper or card bearing information (for example a patient's name, room number, etc.) relating to the contents of the box. Accordingly, as best seen in FIG. 5, cover 11 comprises an inner layer 34, having the size and shape of the open top of container 10, and a transparent, thin outer layer 35. The outer layer is detachable for the inner layer for installation of a thin card 36 between the two layers. Outer layer 35 serves to protect the writing on card 36 without, because of its transparency, obscuring the writing.

The outer layer is a flat rectangular sheet smaller in size than inner layer 34 into which it is recessed. Plural, thin semicircular ears 37 are provided for attaching outer layer 35 to inner layer 34. Ears 37 project laterally (toward sides 19 and 20 of container 10 when the cover is assembled and installed) from the inner surface of opposite side edges 38 and 39. In the preferred embodiment there are three ears on each edge, one at each end and one in the center, although a greater or fewer number of ears may be used. For attachment, as described below, ears 37 fit into mating holes in the inner layer.

The inner layer is formed of a sheet somewhat thicker than outer layer 35 so that the outer layer and card 36 may be recessed within a recess 41 in the upper surface thereof. Recess 41, substantially the size of outer layer 35 and of a depth equal to the combined thicknesses of outer layer 35 and card 36, is surrounded along its sides and front edge by a narrow strip or flange 42 which defines the recess.

Plural holes 43 (six in the preferred embodiment), of larger diameter than the semicircular diameter of ears 37, are provided in inner layer 34 along side edges of recess 41 (defined by strip 42) and into which ears 37 of outer layer 35 fit for installation of the outer layer. Holes 43, while extending through the bottom of recess 41, do not extend through strip 42. That is, the depth of holes 43 from the inner surface of the inner layer is only the thickness of the region under recess 41 (FIG. 6). Thus, viewed from the top, outer portions 44 of holes 43 are obscured by strip 42.

To attach outer layer 35 to inner layer 34, ears 37 along one edge (for example edge 39) are fitted into the matching holes 43 in the inner layer (along an edge 46 of recess 41), with a projecting portion 45 of each ear 37 under strip 42 (FIG. 6). The outer layer is flexed to bring the other edge (edge 38) closer to the first edge and the other row of ears 37 is inserted into matching holes 43 (along an edge 47 of recess 41). The outer layer is then unflexed to also position the project-

ing portions 45 of ears 37 (along side 38) under strip 42. The outer layer 35 is thus secured to inner layer 34 by the portions 45 of ears 37 recessed below strip 42 of the inner layer.

A large diameter hole 48 is provided in the central region of recess 41 so that the outer layer may be flexed outward at its center for easy removal to allow replacement or alteration of card 36.

Inner layer 34 is preferably transparent so that with a small card 36 (or no card) the contents of container 10 may be seen through the closed cover.

An opposing pair of arcuate ears 49 are provided on inner layer 34 for hinging the inner layer (and hence the cover) to container 10. Ears 49 depend from opposite sides 50 and 51 of inner layer 34, this position defining hinge line 13. Ears 49 are thus located forwardly of a back edge 52. Ears 49 are the width of strip 42, which is terminated at, and forms the rear portion of, ears 49. Regions 53 and 54 of the inner layer are inset the width of strip 42 rearwardly of ears 49 to provide clearance with hinge support regions of the container (described below) when the cover is opened.

The rear edge 52 of the inner layer is stiffened by an inwardly projecting ridge or flange 55 and an outwardly projecting ridge or flange 56, the latter being substantially the same width and height as strip 42 and forming the rear edge of recess 41.

ASSEMBLY OF THE PREFERRED EMBODIMENT

As best seen in FIG. 1, a strip 57, having a depression or cutout 58 for ears 49 of the inner layer, is provided at sides 19 and 20 of the container 10, adjacent back 17. Depression 58 are such that ears 49 may pivot in them and that the upper surface of inner layer 35 (and hence cover 11) is flush with the upper edges of the container when the outer cover is closed. Strips 57, the thickness of ears 49, may be cemented to, or formed integrally with, sides 19 and 20.

One or more small stops 60 may be affixed within container 10, for example on front 16 (FIGS. 2 and 3), at a level of the inner surface of the cover when the cover is closed, to restrain the front portion of the cover from entering the container.

The spring 12, as depicted in FIG. 1, 2 and 3, is attached at end 27 (by hook 29) to back 17 of the container, near bottom 18, and at end 26 (by hook 28) to inner layer 34 of cover 11, just forward of hinge line 13. A line 62 along the line of force of the spring (as later discussed) is forward of hinge line 13, that is, forward of a line through the pivotal axis of the cover, when the cover is closed (FIG. 3) and is rearward of hinge line 13 when the cover is fully open. The cover is, by this over-center locking means, retained in either the closed or open position and is urged to either of these positions depending on the position of line 62 in respect to hinge line 13.

Although the method of spring attachment may be widely varied without exceeding the scope of the invention, the method below described is not only simple but also confines the spring entirely within the confines of box 9 so there are no projecting ends of the spring to catch on other objects, or to project into adjacent boxes when the boxes are in tray form as described below.

Hook 29 of spring 12 attaches at a shaped hole comprised of a small hole 63 and a larger hole 64 at a lower central region 65 of back 17. Larger hole 62 is drilled (or formed) partially in bottom 18 and up into back 17.

It is of a sufficient diameter that hook 29 of spring 12 may be inserted into it. Within hole 64, but axially offset rearward, hole 63, slightly larger than the wire diameter of first spring 12, is drilled (or formed) up into back 17. For installation of end 27 of spring 12, hook 29 is inserted into hole 64 and then withdrawn so that the end of the hook is inserted upward into hole 63 (FIGS. 2 and 3).

As best seen in FIG. 7, two small holes 66 and 67, each of a diameter in excess of the wire diameter of the spring, and spaced apart the diameter of hook 28, are drilled (or formed) in inner layer 34 slightly forward of hinge line 13 and on a line perpendicular to hinge line 13. The region between holes 66 and 67, at the upper surface of inner layer 34, is recessed the wire diameter of the spring. The remaining region 68 is convex upward to provide a radiused hinge point for the inner diameter of spring end 28. A short, semicylindrical reinforcement 69 is provided adjacent region 68 on the lower surface of inner layer 34 to reinforce the spring attachment.

Hook 28 is inserted through holes 66 and 67 such that when the cover is closed (FIGS. 3 and 7) hook 28 extends through both holes. As the cover pivots about the inner surface of hook 28 in opening, the end of hook 28 is withdrawn from hole 67. When the cover is fully open, hook 28 extends only through hole 66, the inside of hook 28 being supported by region 68 and reinforcement 69 (FIGS. 1 and 2).

The shape of spring 12, and its method of attachment, are such that end 27 of the spring lies along back 17, extending nearly from the bottom to the top of the back. The line 62 of spring force is thus directed between the center of hook 28 at the cover and the portion of end 27 adjacent the smaller radius curve 25 (as seen in FIGS. 2 and 3).

Line 62 of the spring line of force passes through hinge line 13 just before the cover is fully open. Any significant movement of the cover when it is fully open moves line 62 forward of hinge line 13 to cause spring closure of the cover. This feature is beneficial in protecting the contents of the container, and also allows removal of objects from the container without pivoting the cover to a position where it is spring urged and retained open.

When the cover is open, region 14 rearward of hinge line 13 extends into larger curve 24, thereby preventing interference between the spring and cover. Flange 55, projecting at edge 52 of the inner layer, contacts ends 26 of spring 12 and acts as a stop to keep the outer cover at slightly more than a right angle to the container when the cover is fully open (FIGS. 1 and 2).

Although the preferred embodiment comprises a rectangular container having a generally square cross section and employing a rectangular cover, it is to be understood that the scope of the invention embraces other shapes of containers and covers. The container may, for example be made cylindrical in shape and the cover made round or each may be made wedge or pie-shaped, without exceeding the scope of the invention.

FIRST VARIATION OF THE PREFERRED EMBODIMENT — BOX WITH CLOSABLE INNER CONTAINER

In one variation of the preferred embodiment, as illustrated in FIG. 8, a box 9a (reference numbers with the suffix "a" correspond to previously described identical reference numbers without an "a" suffix) com-

prises a container 10a having a cover 11a and having also an inner partition 74 which divides container 10a into two substantially identical inner containers or compartments: a first inner container 75 and a second inner container 76. Partition 74 is perpendicular to a front 16a, a back 17a and a bottom 18a of container 10a.

First inner container 75 is provided with an inner cover 77 (which is hinged and springloaded in a manner similar to that of cover 11a (and as described for cover 11)). A second spring 12b, identical in all respects to spring 12a used for the cover 11a, is used to springload the inner cover.

Thus the first inner container is suitable, for example, for containing and protecting a back up dosage of medicine which will be immediately available in the event that the normal or primary dosage contained in the second inner container is spilled.

As best seen in FIG. 11, inner cover 77 comprises a thin, rigid sheet, preferably of transparent plastic so that the contents of the first inner container may be seen when the inner cover is closed, at least when cover 11a is open.

The hinging of inner cover 77 is similar to that of cover 11a (that is, of inner layer 34a). A pair of arcuate ears 78 projects perpendicularly from the inner surface, one from a side 79 and the second from a side 80, along a hinge line 83 which is closely adjacent a rear edge 84. Ears 78 are similar to ears 49a of cover 11a. A short region 85 and a short region 86, immediately rearward of ears 78, along edges 79 and 80 respectively, are inset in the manner of region 54a of cover 11a (FIG. 8) to provide clearance when the inner cover is opened, the short regions rearward of the ears projecting into first inner container 75 when the inner cover is opened.

The inner cover may be lifted for opening by using a semicircular cutout 87 centrally provided along a front edge 88 of the inner cover. It will become apparent that this method of opening is more advantageous for the inner cover than would be a method previously described for the outer cover.

ASSEMBLY OF THE FIRST VARIATION OF THE PREFERRED EMBODIMENT

Ears 78 of inner 77 fit into matching depressions or cutouts 89 at the upper edge of inner partition 74 (FIG. 8) and at the upper edge of a strip 90 (which is similar to strip 57a) attached to the inner surface of end 19a and which projects to front 16a. This assembly is similar to that of cover 11a (FIG. 8), which is as described above.

In order that the cover 11a may be opened while the inner cover remains closed, and in order to maximize the available volume in first inner container 75, hinge line 83 of inner cover 77 is located just forward and below hinge line 13a of cover 11a (FIGS. 9 and 10). This allows the upper or outer surface of inner cover 77 to be closely adjacent the lower or inner surface of cover 11a (inner layer 34a) when both covers are closed (FIG. 10) and to be close thereto when both covers are open (FIG. 9).

To provide clearance for rearward region 14a of the cover 11a, inner cover 77 is truncated just rearward of hinge line 83. The rear portion of first inner container 75 is thus not completely covered by the inner cover. However, when both the inner cover and covers 11a are closed, this portion of inner container 75 is covered

by the cover 11a. When cover 11a is open most of this portion of the first inner container is covered by region 14a which projects into the first inner container.

By hinging the inner cover sufficiently below the outer cover, it is possible to have an inner cover which completely covers the first inner container. This is, however, at a sacrifice of usable volume in the first inner container. Such a variation, as well as variations in which the hinge line 83 of the inner cover may be toward front 16a of the box or in which hinge line 83 is at an angle, rather than parallel, to hinge line 13a, is within the scope of the invention.

The second spring 12b is attached between inner cover 77 and first inner container 75 in a manner identical to that of attaching first spring 12a between outer cover 11a (inner layer 34a) and container 10a. A hook 28b of the second spring is inserted in holes 91 and 92 in inner cover 77 just forward of hinge line 83. A reinforcement 93, similar to reinforcement 36a, strengthens a region 94 between holes 91 and 92 (FIGS. 8 and 10). A hook 29b of the second spring is inserted into a small hole 95, through a hole 96 at the bottom edge of back 17a in the central region of the first inner container.

As second spring 12b is attached forward of hinge line 83, end 27b of the second spring does not lie along back 17a. Thus, a line 97 along the line of spring force lies between the centers of hooks 28b and 29b (FIGS. 9 and 10). Over-center locking and urging of the inner cover is provided by line 97 being either forward or rearward of hinge line 83, depending upon the position of the inner cover.

Springs 12a and 12b, being planar, occupy minimum space within the container. No substantial surface area is presented for collecting dirt, foreign material, or spilled material in the container, and once dirty, the springs are easily wiped clean.

Spring 12a is offset so as to be within the second inner container, close to the partition (FIG. 8). Partition 74 is cutout at an upper rear region 98 to avoid interference with region 14a when cover 11a is opened.

Edge 80 of the inner cover overlies the upper edge of inner partition 74 and edge 79 overlies the upper edge of strip 90. There is thus no need for a stop to prevent the forward part of the inner cover from being drawn into the first inner container by second spring 12b.

A first variation comprising a covered box 9a having two inner containers, one of which has a springloaded cover, has been described and illustrated. However the scope of the invention includes variations in which there may be more than two inner containers of any shape and/or in which more than one inner container is covered.

SECOND VARIATION OF THE PREFERRED EMBODIMENT — A TRAY FORMED OF BOXES

A second variation of the preferred embodiment, illustrated in FIG. 12 comprises a tray 100 formed of a number of boxes 9a, identified in FIG. 12 as 9a' (primed numbers being used to identify previously described parts identified by identical, unprimed reference numbers). Each box 9a' comprises a container 10a', a cover 11a', and a first inner container 75' covered by an inner cover 77'.

Tray 100 has the advantageous feature that a number (20 in the preferred embodiment, though more or less may be used) of covered boxes 9a' may easily be carried and thus available, as is desirable for dispensing

medicines in a hospital or nursing home. The boxes in tray form are more easily carried than are the same number of individual boxes and are less likely to become mixed up, lost or spilled.

Although tray 100 may be formed by joining, as by use of an adhesive, adjacent walls of individual boxes 9a', the second variation of the preferred embodiment preferably comprises a molded tray body 101 in which individual containers 10a' and first and second inner containers 75' and 76' are formed by integral partitions 102 and 74' respectively. Simultaneously, a front 103, a first side 104, a second side 105, a back 106 and a bottom 107 are formed.

Hinge recesses for the outer and inner covers, as well as holes for attaching first and second springs (both recesses and holes not shown) are also molded into the tray body.

Tray body 101 includes a flanged edge 108 along the upper edge of side 104 and a similar flange 109 along the upper edge of side 105. These flanges project a sufficient distance to provide for easy carrying of the tray.

Although tray 100 has been described and illustrated as comprising an array (twenty being shown) of identical containers 10a', it is to be appreciated that such a tray may be formed of containers or compartments of various sizes and shapes, with or without inner covers. For example, one or more larger containers may be included for containing common medicines not requiring prescriptions. Also, different container arrangements may be provided, for example, a circular tray comprised of a plurality of wedge-shaped containers embodying the principles of boxes 9 or 9a may be constructed. All such variations are within the scope of the invention.

In the foregoing use has been made of such directional terms as "forward," "rearward," "front," "back," "upper," "lower," and "bottom," particularly in respect to the illustrations provided, so that the preferred embodiment and its variations could be clearly described. It is to be understood that use of such terms is in no manner restrictive, as the preferred embodiment and its variations may be used in any orientation.

And, although the invention has been described and illustrated in detail, it is to be clearly understood that the same is by way of illustration and example only, and is not to be taken by way of limitation, the spirit and scope of this invention being limited only by the terms of the appended claims.

What is claimed is:

1. A closable box, comprising:

a. a container, having at least two sides, a back, a bottom, and an open top,

b. a cover, having a hinge line,

c. hinge means for hinging said cover to said container for pivotal movement about said hinge line between a closed position at which said open top of said container is substantially covered and an open position at which there is substantially free access to the inside of said container,

said hinge means including hinge points on said hinge line at opposite sides of said container, said hinge points being spaced forwardly of the back ends of said sides to cause the portion of said cover rearward of said hinge line to project into said container when said cover is in its open position, thereby permitting opening of said cover when it is in its closed position by pressing in-

wardly on said portion of said cover rearward of said hinge line, and

d. spring means for urging said cover into either of said closed and open positions when said cover is close thereto and for retaining said cover in either of said positions when said positions are reached, said spring means including an elongate spring element contained within said container and attached at one end to said cover forwardly of said hinge line and at its other end to said container, said spring element being continuously tensioned to hold said cover in position relative to said container, and spring element being shaped and connected to cause a line along the spring line of force to be rearward of said cover hinge line when said cover is in said open position, and to be forward of said hinge line when said cover is in said closed position.

2. The closable box of claim 1, wherein said spring element recited in clause 1(d) comprises a substantially planar, recurved wire.

3. The invention as claimed in claim 2, in which said wire is formed in the general shape of a figure "2."

4. The invention as claimed in claim 3, in which said wire has adjacent larger and smaller curves and substantially straight, projecting ends, said ends being at an acute angle to each other when said spring element is unstressed and being substantially parallel to each other when said spring element is installed and tensioned.

5. The closable box of claim 4, wherein said projecting ends of said spring element terminate in relatively small attachment hooks,

the one of said hooks on said end adjacent to said smaller curve being hooked to said container through a hole in said back, whereby portions of said spring element and said back are substantially parallel to and closely adjacent each other, the other of said hooks being attached to said cover, forwardly of said cover hinge line, by hooking through at least one of two spaced holes in said cover.

6. The closable box of claim 1, wherein said cover recited in clause 1(b) comprises an inner layer, substantially the size of said open top of said container and a smaller, thin, flexible, substantially transparent outer layer detachable therefrom, whereby a card may be inserted between said layers to contain information concerning the contents of said container,

said inner layer being hinged to said container by said hinge means, and said spring element being attached to said inner layer,

said outer layer having plural ears depending from an inner surface thereof at opposite edges, said ears projecting laterally beyond said edges,

said inner layer having a recessed region into which said outer layer and said card fit and also having plural holes into which said ears of said outer layer may be inserted when said outer layer is flexed outwardly at its center to bring closer together said edges along which said ears are mounted,

said ears projecting under a region of said inner layer to lock said outer layer to said inner layer when said outer layer is unflexed.

7. The closable box of claim 1, wherein said container includes at least one inner partition dividing said container into at least first and second inner containers having sides, a back and a bottom, said partition being

11

substantially perpendicular to said bottom of said container and extending from said bottom substantially to the inner surface of said cover when said cover is in its closed position, to cause said first and second containers to be substantially noncommunicating, and partition having a cutout to provide clearance for said rearward portion of said cover when said cover is opened.

8. The closable box of claim 7, wherein at least said first inner container comprises:

- a. an inner cover, having a hinge line,
- b. means for hinging said inner cover to said first inner container for pivotal movement about said inner cover hinge line between a closed position in which at least a portion of said first inner container is covered and an open position in which there is substantially free access to the inside of said first inner container, said inner cover hinge line being substantially parallel to, forward of and below said outer cover hinge line, said inner cover being truncated rearwardly adjacent said inner cover hinge line, whereby said inner cover, when it is in its closed position, does not interfere with movement of said first-mentioned cover between the open and closed positions thereof, and whereby said inner cover may move between its open and closed positions without interference with said first-mentioned, cover, and

- c. second spring means for urging and inner cover into either of said closed and open positions when said inner cover is close thereto, and for retaining said inner cover in either said closed and open positions when such positions are reached.

9. The invention as claimed in claim 8, in which said second spring means including an elongate, substantially planar, recurved second spring element, formed generally in the shape of a figure "2."

10. The closable box of claim 1, wherein:

- a. said means for hinging said cover recited in clause 1(c) comprises arcuate ears separately inwardly projecting from said cover at opposite sides thereof and along said hinge line, said ears fitting into matching concave depressions in said container sides.

11. A multi-compartment tray comprising:

- a. an open tray body having sides and a bottom and multiple partitions dividing said tray body into individual containers, said containers each having at least two sides, a back and an open top surface and being formed in a planar array by said multiple partitions to have their open tops in a common plane,
- b. cover means for separately covering said individual containers, including separate covers for each said individual containers, each said separate cover having a hinge line located away from its back edge,
- c. hinge means for individually hinging each said cover at said hinge line to its respective individual container, for individual pivotal motion about said hinge line between a closed position at which said open top of said individual container is substantially covered, and an open position at which there is substantially free access to the inside of said individual container,

12

said back edge of each said cover projecting into said respective individual container when each said cover is at its open position, whereby each said cover may be opened from its closed position by pushing inwardly on the region rearward of said hinge line, and

- d. spring means for individually urging each said cover into either of said closed and open positions when said cover is closed thereto, and for retaining said cover in either of said closed and open positions when said cover reaches said positions,

said spring means including individual spring elements for each said individual container, each said spring element comprising a substantially planar, recurved wire formed in the general shape of the figure "2" having adjacent larger and smaller curves and having two substantially straight, projecting ends which are an acute angle with each other when said spring element is unstressed and which are substantially parallel with each other when said spring element is installed and tensioned,

said spring ends terminating in small attachment hooks,

the one said of hooks on the end of said spring element adjacent to said smaller curve hooking for attachment through a hole in said back, whereby said spring end is substantially parallel with said back, the other of said hooks being attached to said cover of said individual container forward of said hinge line by hooking through at least one of two spaced holes in said cover.

12. The multi-compartmented tray of claim 11, wherein each said individual container has a transverse inner partition dividing said container into first and second inner containers,

said first inner container including an inner cover having a hinge line closely adjacent forward and below said hinge line of said first mentioned cover and second spring means for retaining said inner cover to said first inner container and for urging and inner cover to, and retaining said inner cover in, an open or closed position,

said inner cover being truncated rearwardly adjacent to said inner cover hinge line to provide clearance for said first mentioned cover,

said second spring means including a recurved wire second spring element in the general shape of a figure "2", having elongate ends which are at an acute angle to each other when said second spring element is unstressed, said ends having small attachment hooks for attaching said second spring element to said first inner container and said inner cover in a manner to cause a line connecting said hooks is to one side of said inner cover hinge line when said inner cover is open and is to the opposite side of said inner cover hinge line when said inner cover is closed.

13. The multi-compartmented tray of claim 12 wherein all said individual containers are substantially the same size and are rectangular and wherein said first and second inner containers are square and are the same size.

14. The multi-compartmented tray of claim 12 wherein said tray body and said inner covers are substantially transparent.

* * * * *