

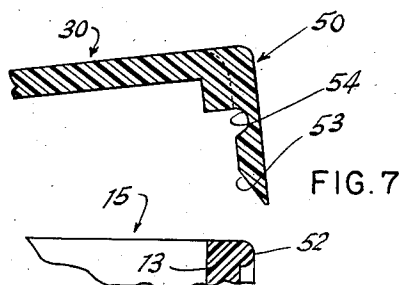
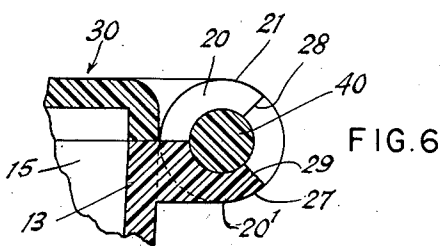
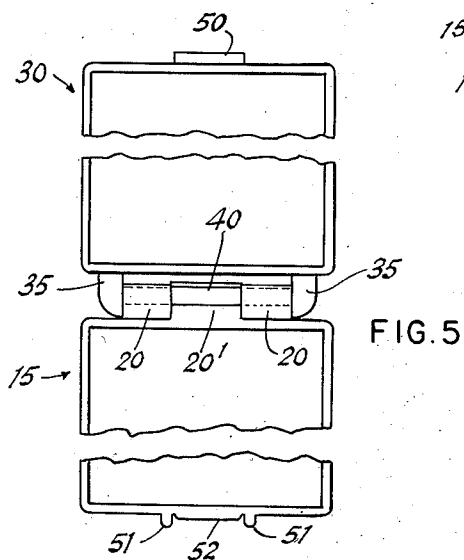
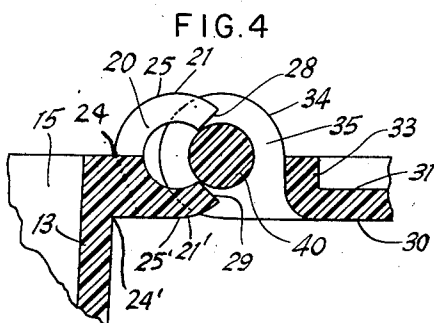
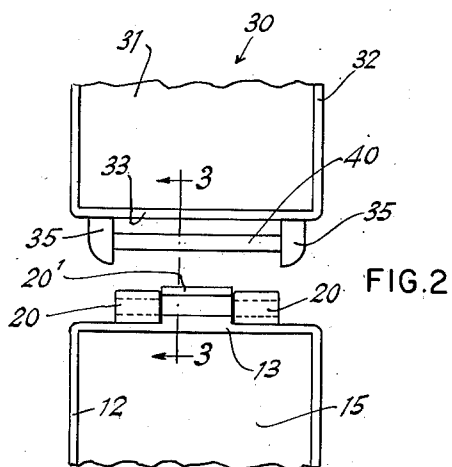
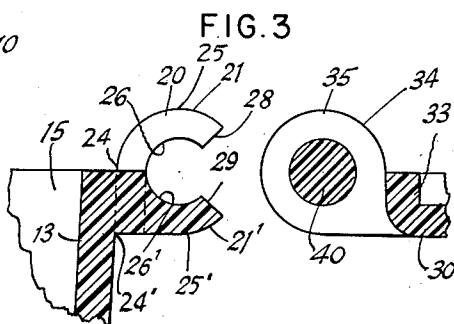
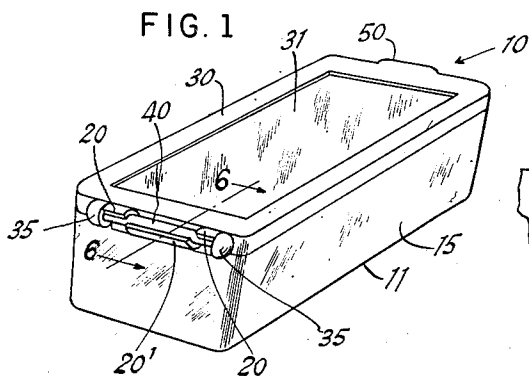
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R. K. GIBBS

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CONTAINER, HAVING A HINGED COVER

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INVENTOR
Robert K. Gibbs
 BY *Raymond*
 ATTORNEY

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2,797,840

CONTAINER, HAVING A HINGED COVER

Robert Kenneth Gibbs, Evansville, Ind., assignor, by mesne assignments, to Tri-State Plastic Molding Co., Inc., Henderson, Ky., a corporation of Kentucky

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5 Claims. (Cl. 220—31)

This invention relates to boxes or containers having hinged covers and, more particularly, to an improved hinge construction for a container and cover folded from a plastic composition material.

There is a considerable demand for inexpensive covered containers, preferably with latching covers, which can be used for convenient storage of miscellaneous items such as spools of thread, needles, bobby pins, jewelry, shell collections, etc. Preferably the containers should be simple, compact, and attractive in appearance. These requirements can be met by molding the containers and covers from suitable plastic composition material which may be transparent, translucent, or opaque, as desired, and which may be either plain or colored.

However, difficulty has been encountered in providing reliable hinge connections between the container and cover in a simple and inexpensive manner. Either the hinge connections have been complicated to fabricate or difficult to assemble, resulting in manufacturing expenses of an amount such that the end product can not be provided at a sufficiently low cost, or they have been unsatisfactory and unreliable in service.

The present invention is, accordingly, directed to a novel integral hinging arrangement for a container and cover molded from plastic composition material. The hinge elements are molded integrally with the container and cover, assembled in a simple manner, and durable and rugged in use.

To this end, the rear or hinge wall of the body of the box is molded with a plurality of laterally adjacent, rearwardly projecting female hinge members, each comprising an arcuate, or concave-convex arm. An odd number of these arms is provided, for example three or five, and alternate arms are concave in opposed directions so as to conjointly provide a receptacle for the male hinge element or pintle. The outer ends of the arms facing in one direction are spaced vertically from the outer ends of the arm or arms facing in the opposed direction to leave a clearance opening somewhat less than the diameter of the hinge pintle.

The cover is formed as a relatively shallow receptacle having a rim around its edges. The rear or hinge rim of the cover is formed with a pair of rearwardly projecting ribs or ears between which is formed a hinge pintle extending in parallel spaced relation to the hinge end of the cover. The spacing between the inner faces of the ears is substantially equal to the overall lateral extent of the arms on the hinge edge of the body. The pintle is cylindrical with a radius substantially equal to that of the concave surfaces of the arms on the cover, for engagement with such surfaces when the body and cover are assembled.

The body and cover are assembled by placing both in the upwardly opening position with the inner surfaces of the ears aligned with the outer lateral edges of the outermost arms on the box. The cover is then forced toward the body so that the pintle slightly spreads the female hinge elements to allow for entry of the pintle thereinto.

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As the pintle passes through the "jaws" of the female hinge elements, with the ears engaging the outer lateral surfaces of the outermost arms on the box, and move into the facing concavities, the female hinge elements spring back into place to embrace the pintle and form the hinging structure.

The cover may now be swung to closed position and, in such closed position, or even a partly open position, cannot be displaced from the body. The cover ears, engaged with the box arms, prevent displacement longitudinally of the hinge line. If it is attempted to slide the cover rearwardly, either parallel to the body, or in any angular relation thereto less than about 90°, the rear cover rib strikes the upwardly projecting convex portion of the upper female element or elements before the pintle can move outwardly between the "jaws" of the female elements. Vertical displacement of the cover is prevented by engagement of the pintle with the overlying and underlying female hinge elements.

For an understanding of the invention principles, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawing. In the drawing:

Fig. 1 is a perspective view of a completed box embodying the invention;

Fig. 2 is a partial plan view of the body and cover just prior to assembly;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 3 showing the body and cover partially inter-engaged;

Fig. 5 is a plan view of the open box after assembly;

Fig. 6 is a sectional view on the line 6—6 of Fig. 1; and

Fig. 7 is a partial side elevation view illustrating the latching arrangement.

Referring to the drawings, the box 10 of the invention comprises a body 15 and a hinged cover 30. Body 15 has a bottom wall 11, side walls 12, and a rear wall 13. The body 15 is molded in one piece from any suitable plastic composition material such as, for example, a polystyrene.

Along its upper edge, rear wall 13 is formed with laterally adjacent female hinge arms or elements 20, 20', three elements being shown in the illustrated example. Each element is in the form of a relatively wide strap having a section 24, 24' joining wall 13 and arcuate, or concave-convex portions 25, 25'. The arcuate portions 25 of elements 20 have downwardly concave arcuate recess portions 26 and upwardly convex outer surfaces 21. The arcuate portions 25' of elements 20' have upwardly concave arcuate recess portions 26' and downwardly convex outer surfaces 21' (Figs. 3, 4 and 6). Arcuate portions 26 and 26' have a common axis and equal radii, the common axis being the box hinge line.

The elements terminate in outer edges 28, 29 which have a vertical spacing somewhat less than the diameter of the circle or cylinder formed by the respective arcuate portions 26, 26'. It should be noted that the plastic composition material is somewhat resilient, so that elements 20, 20' may be sprung apart to increase the gap between outer edges 28, 29.

Cover 30 is also molded, as a one-piece member, from a suitable plastic composition material having some resiliency, a polystyrene being one such material by way of example. The cover is essentially a shallow dish having a flat base 31 merging smoothly into a peripheral rim or flange 32 of some depth. At points along the rear section 33 of rim 32, so spaced laterally as to align with the outermost lateral edges of elements 20, cover 30 is molded with rearwardly projecting vertical arms or ribs or ears 35. Each rib has its upper and lower edges merging smoothly into flange section 33 and flat part 31 of the cover, and the outer ends of the ribs 35 are extended

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downwardly forming annular abutments 34 having radii substantially equal to the outer surface radii of female hinge elements 20, 20'.

Extending between the inner faces of ears 35, and molded integrally with the ears and cover 30, is a hinge pintle 40 having a length equal to the distance between the outermost edges of female elements 20. The radius of pintle 40 is substantially equal to the inner radii of arcuate recesses 26, 26' of the female hinge elements. Consequently, when the body and cover are assembled, a smoothly conforming, closely fitting hinge arrangement is provided.

The cover 30 and body 15 are assembled by placing both in parallel, upwardly open relation, with the body walls and cover rim 32 facing upwardly and the rear edges of the body and cover adjacent and ribs 35 having their inner faces aligned with the outermost edges of female elements 20. The cover and body are then moved toward each other so that ears 35 embrace the outermost edges of elements 20 and pintle 40 engages the outer edges 28, 29 of female hinge elements 20, 20'. As the cover and body are forced toward each other, pintle 40 springs element 20 upwardly and element 20' downwardly so that the pintles enter the respective arcuate recesses 26' and 26, with the elements 20, 20' springing back to position so that the pintle is firmly held by the female hinge elements.

Cover 30 can now be swung about the hinge line relative to body 15, and the hinges can be disengaged only if the cover and body are again swung to the open substantially parallel position and a separating force exerted thereon. However, unless the cover is swung to at least such substantially parallel position, the cover and body cannot be disengaged without breaking the hinge elements, pintles, or ribs 35.

The latching arrangement includes a depending latch element 50 molded integrally with the front rim of cover 30, and a pair of short vertical ribs 51, and a cross rib 52 extending therebetween, molded integrally with body 15. Element 50 is bevelled on its inner surface adjacent its outer end, as at 53, and has a transverse groove 54 on its inner surface adjacent its juncture with the rim of cover 30. Ribs 51 are spaced apart the width of element 50, and serve as restraining guides therefor. As the cover is closed, bevel 53 rides over rib 52 flexing element 50, and rib 52 snaps into groove 54. Unlatching is effected by engaging a finger nail beneath the outer end of element 50.

The box is easily and simply manufactured and assembled. The body 15 and cover 30 can be production line molded simultaneously with each other, with the operation so arranged that a cover and body arrive simultaneously at an assembly point. At this point, or at a station provided with supplies of bodies and covers, the box is simply assembled by the process previously described, without complicated procedures or the employment of highly skilled labor.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles thereof, it should be understood that the

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invention may be otherwise embodied without departing from such principles.

What is claimed is:

1. A box comprising, in combination, a body molded from plastic composition material and having a base and boundary walls, one of said walls having projecting outwardly from its upper edge an odd number of longitudinally spaced female hinge elements in laterally adjacent relation and extending generally parallel to said base; adjacent elements being shaped to provide diametrically opposite, coaxially elongated, and substantially semi-cylindrical hinge pintle bearing surfaces with the alternate female hinge elements having downwardly facing bearing surfaces, and the intermediate female hinge elements having upwardly facing bearing surfaces; and a cover molded from plastic composition material and comprising a flat portion substantially congruent with said base and integral with a peripheral rim coextensive with the upper surfaces of said boundary walls, the rim of said cover having projecting therefrom a pair of ears spaced laterally from each other to embrace the outer lateral edges of the outermost female hinge elements and integral with a substantially cylindrical hinge pintle extending between said ears in spaced parallel relation to the cover rim and having a radius substantially equal to that of said bearing surfaces; the outer ends of adjacent female elements being so related as to provide a circumferential discontinuity in the pintle bearing surfaces of less extent than the diameter of said pintle; said cover being assembled to said body by engaging said pintle in said bearing surfaces by spreading the outer ends of said elements with said ears embracing the laterally outermost female elements.

2. A box as claimed in claim 1 in which said elements comprise resilient straps formed with concave-convex portions providing said bearing surfaces.

3. A box as claimed in claim 1 in which said elements comprise resilient straps formed with concave-convex portions providing said bearing surfaces; at least one of said concave-convex portions extending above said one wall to engage the cover rim to obstruct movement of said cover parallel to said base.

4. A box as claimed in claim 1 in which said elements comprise resilient straps formed with concave-convex portions providing said bearing surfaces; the convex surfaces, of the elements having downwardly facing bearing surfaces, extending above said one wall to engage the cover rim to obstruct movement of said cover parallel to said base.

5. A box as claimed in claim 1 including two outer hinge elements with downwardly facing bearing surfaces and an intermediate hinge element with an upwardly facing bearing surface.

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