July 4, 1967 J. S. FIORE, JR 3,328,831

HINGE CONSTRUCTION FOR BOXES

Filed Oct. 21, 1965

FIG. 1

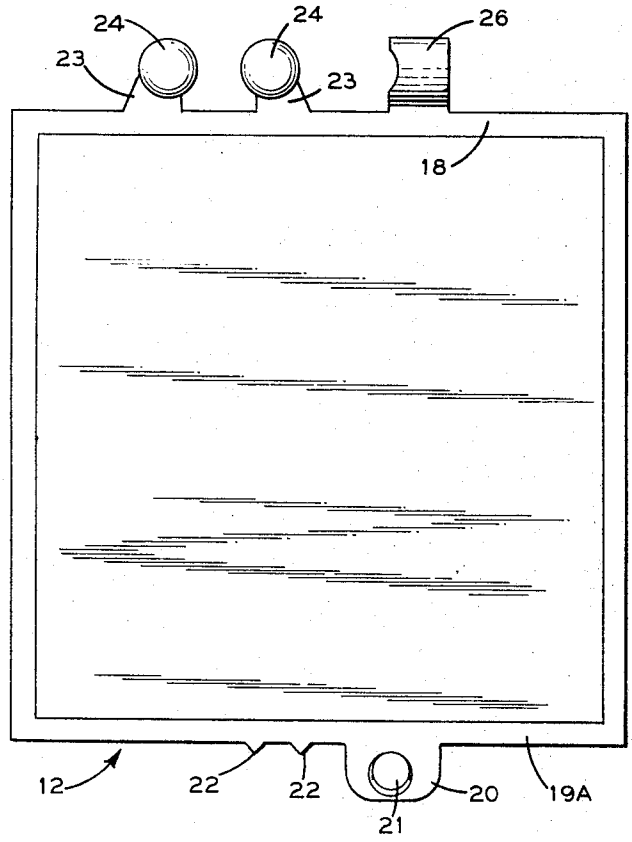


FIG. 4

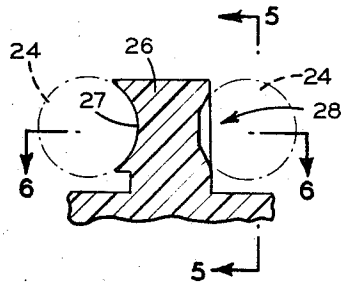


FIG. 5

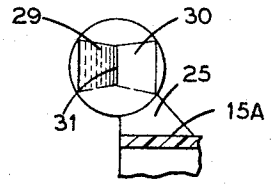


FIG. 6

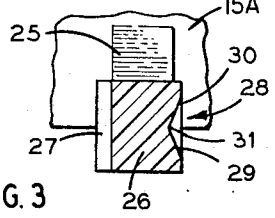


FIG. 2

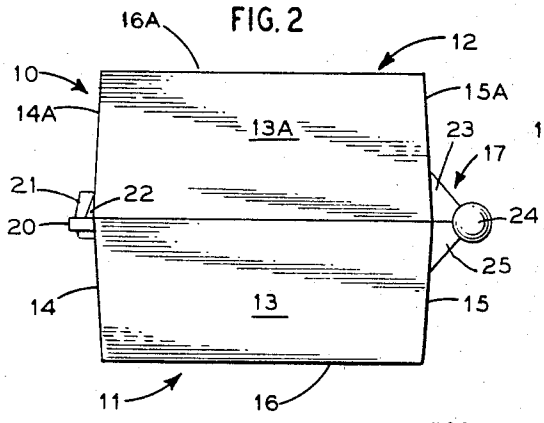


FIG. 3

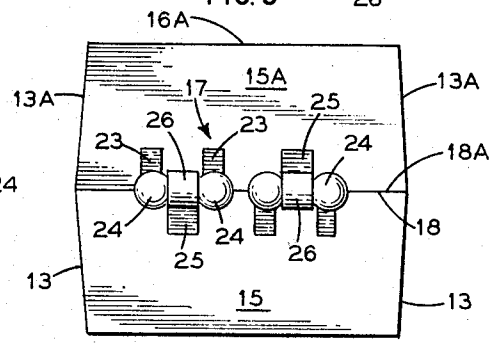
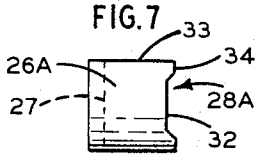


FIG. 7



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HINGE CONSTRUCTION FOR BOXES

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This invention relates to molded plastic boxes and a novel hinge construction for interengaging a pair of box sections forming the box.

Boxes for small items including pills, jewelry, etc. have been made by molding from synthetic plastic, similar box sections, wherein each section includes integral hinge portions which are adapted to be snapped into engagement, thereby hinging the box sections. Such hinge portions comprise a pair of closely spaced bosses of spherical contour and a single lug longitudinally displaced from the pair of bosses and having arcuate grooves formed on opposite sides thereof.

Such box sections are arranged so that the single lug of one box section can be received between the pair of bosses of the other box section, the spherical surface portions of the bosses being received in the arcuate grooves of the single lug.

Such hinge construction, as well as variants thereof have been found to be a somewhat non-uniform in respect to maintaining their hinged relation. A substantial proportion of a given number of such boxes will have a tendency to involuntarily disengage the hinged sections, thus adversely affecting box filling operations as well as actual use of the box.

Accordingly, an object of this invention is to provide a box having an improved hinge construction which tends to resist unhinging forces and maintains the hinged relation of the box sections during filling operations and in actual use of the box.

Another object of this invention is to provide in molded plastic boxes of the type comprising similar box section having integral hinging portions wherein the hinging portion on each box section comprises a pair of closely spaced hinge members and a single hinge member longitudinally displaced from the pair of hinge members, the box sections being related so that the single hinge member on each box section interfits between the pair of members on the other box section; and each single hinge member being grooved on opposite sides thereof, one of the grooved portions having planar surface portions to engage arcuate surface portions on the pair of hinged members.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

In the drawing, FIG. 1 is a top plan view of a single box section embodying the invention;

FIG. 2 is an end elevational view of a box having hinged sections in accordance with the invention;

FIG. 3 is a rear elevational view thereof;

FIG. 4 is a sectional view showing the novel hinge portion of said box;

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a sectional view taken on the line 6—6 of FIG. 4;

FIG. 7 is a modified form of the invention.

Essentially, the hinged box construction of the instant invention comprises a pair of similar, molded plastic box sections, each section having along one edge thereof a pair of hinge forming bosses of spherical shape and a single lug longitudinally displaced from the pair of bosses. Thus, the box sections are hinged together by snapping each of the lugs between the pair of opposed bosses; the sections being suitably disposed relative to each other to bring each lug in opposed relation to a pair of bosses.

The single lug on each section is formed with oppositely disposed grooves, one of said grooves being of arcuate section while the other groove is a recess having planar surface portions.

Thus, as shown in FIGS. 1–3, the box **10** of the instant invention, comprises substantially similar, molded box sections **11**, **12**; the same being formed of polyvinyl, polystyrene, polyethylene, or other suitable synthetic resin. Box section **11** comprises end walls **13**, front wall **14** and back wall **15**. Correspondingly, box section **12** comprises and walls **13A**, front wall **14A** and back wall **15A**. The box sections **11**, **12** are hinged together by hinge means generally indicated at **17** and located along edges **18**, **18A** of the back walls **15**, **15A** respectively.

The box section **11** further includes a bottom wall **16** while box section **12** has a top wall **16A**. The box sections **11**, **12** are held in a closed condition by conventional latch means along forward edges thereof, such latch means comprising a lateral projection **20** carrying a short pin portion **21** and a pair of keeper forming projections **22** adjacent projection **20**; the latch means being so arranged that the pin portion **21** on box section **12** extends toward box section **11** and frictionally engages keeper **22** thereon; while pin portion **21** on box section **11** extends toward box section **12** and engages keeper **22** thereon. The pin portions **21** are suitably angled to maintain a frictional engagement with keeper **22**, yet permitting the box sections to be opened on their hinge portion **17**.

The hinge means **17** is similar on each of box sections **11**, **12**. Thus, as shown in FIG. 1, box section **12** has integrally molded on the back wall **15** adjacent edge **18** thereof, a pair of projections **23** which may be of substantially triangular shape and carry ball shaped bosses **24** in opposed, spaced relation to each other. Also, in longitudinally displaced relation to bosses **24**, a projection **25** carries a single lug **26**.

Lug **26** is formed on one side thereof with a groove **27** of arcuate cross section, while the opposite side thereof is formed with a groove **28** which comprises a pair of planar flat surface portions **29**, **30** in diverging relation from a midpoint **31**. Grooves **27** extend across one end face of lugs **26** while grooves **28** are in the form of a depression in the opposite end face as illustrated in the drawing.

It will be apparent, that when box sections **11**, **12** are arranged so that the lug **26** on box section **12** can be interposed between bosses **24** on box section **11** while lug **26** on box section **11** can be interposed between bosses **24** on box section **12**, the box sections **11**, **12** are brought into hinged relation. The elasticity of the projections **23** allows sufficient spread of opposed bosses **24** to receive the lug **26** therebetween.

It has been found that the planar flat surface portions on lugs **26** tends to maintain the engagement of the hinged parts and makes the same highly resistant to forces which would be sufficient to unhinge conventional hinged box constructions.

In a modified form of the invention, lug **26A** is similar to lug **26**, except that groove **28A** comprises a single planar surface portion **32** which extends toward the opposite ends of lug **26A** and terminating just short of the outer end **33** of lug **26**. In this case, boss **24** rides over the slight projection **34** when the box sections are snapped together in assembly, and engages surface portion **32**.

As various changes might be made in the embodiments of the herein disclosed invention without departing from the spirit thereof, it is understood that all matter herein shown or described shall be deemed illustrative and not by way of limitation except as set forth in the appended claims.

What is claimed is:

1. In a molded plastic box having a pair of box sections, each box section having integrally molded hinge portions extending from an edge portion thereof, said hinge portions comprising a single member projecting from one edge of a box section and a pair of laterally adjacent members projecting from said one edge of said box section and longitudinally displaced relative to said single member, said box sections being arranged in hinging relation with the single member of one box section adapted to be received between the pair of members of the other box section, each of said pair of members being substantially ball shaped, each single member being formed with recess portions in opposite sides thereof to receive therein the ball shaped portions of said pairs of members, the recess portion in one side of said single member comprising a groove extending across the said one side of said single member and the recess portion in the opposite side of said single member comprising dihedrally related surfaces extending in the same direction as the groove in the said one side.

2. In a molded plastic box having a pair of box sections, each box section having integrally molded hinge portions extending from an edge portion thereof, said hinge portions comprising a single member projecting from one edge of a box section and a pair of laterally adjacent members projecting from said one edge of said box section and longitudinally displaced relative to said single member, said box sections being arranged in hinging relation with the single member of one box section adapted to be received between the pair of members of the other box section, each of said pair of members being substantially ball shaped, each single member being formed with recess portions in opposite sides thereof to receive therein the ball shaped portions of said pairs of members, the recess portion in one side of said single member comprising a groove extending across the said one side of said single member and the recess portion in the opposite side of said single member comprising dihedrally related surfaces extending in the same direction as the groove in the said one side, a flat surface forming the bottom of a groove extending at right angles to the groove in the said one side.

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