May 23, 1950 J. C. KAZIMIER 2,508,951

BOX AND HINGE STRUCTURE THEREFOR

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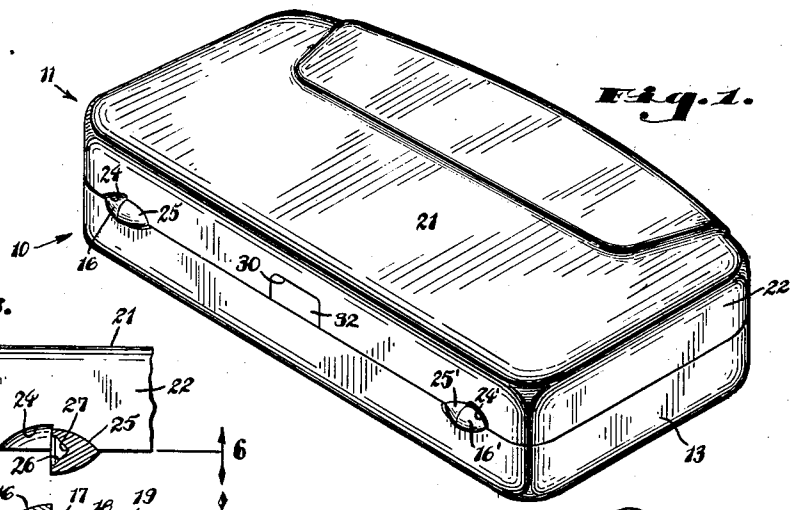


Fig. 1.

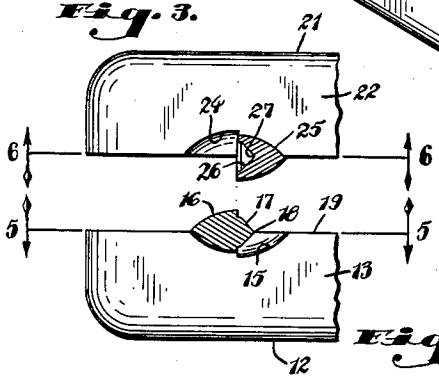


Fig. 3.

Fig. 4.

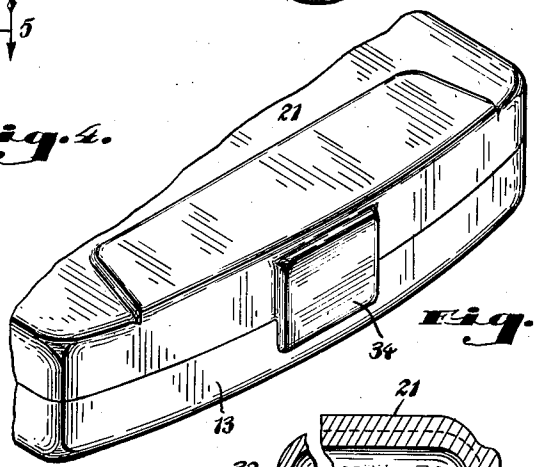


Fig. 2.

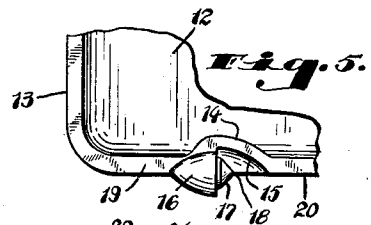


Fig. 5.

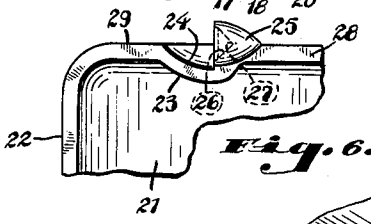


Fig. 6.

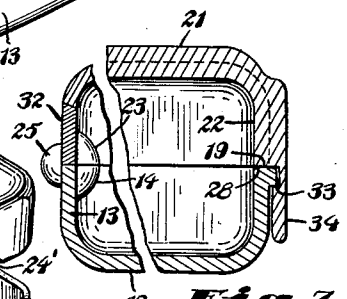


Fig. 7.

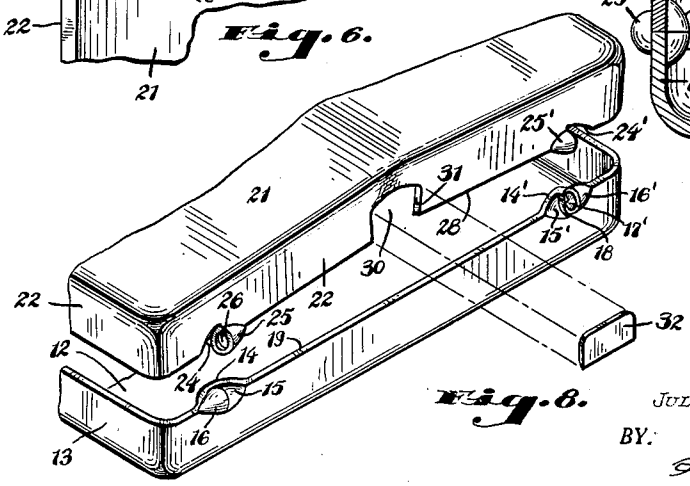


Fig. 8.

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BOX AND HINGE STRUCTURE THEREFOR

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10 Claims. (Cl. 220—31)

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The present invention relates to a box and more particularly to a hinge structure therefor. The primary object of the invention is to provide a hinge structure for a box of such character that the two sections of the box may be formed from molded plastic, being provided with integral hinge means capable of ready association. A further object of the invention is to provide, in such a device, means whereby, although the hinge elements of the respective box sections may be readily brought into operative association, they may be blocked against disassembly. More specifically, it is an object of the invention so to construct one section of a box that it may be readily flexed about an axis traversing the line joining a pair of hinge elements integral therewith, and to provide means, associable with said section, after its hinge elements have been operatively engaged with the integral hinge elements of a companion box section, to prevent, or at least to inhibit, such subsequent flexure of said one section about such axis as would permit disengagement of the hinge elements.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific construction illustrated and described, so long as the scope of the appended claims is not violated.

Fig. 1 is a perspective view of a box constructed in accordance with the present invention, showing the hinge elements in operative association;

Fig. 2 is a fragmentary perspective view of the front edge of the box;

Fig. 3 is an enlarged elevation of a fragment of the cover section of the box, showing a socketed hinge element in longitudinal section;

Fig. 4 is a similar view of a fragment of the base member of the box, showing a projecting hinge element in longitudinal section;

Fig. 5 is a plan view of a fragment of the base member taken substantially on the line 5—5 of Fig. 4;

Fig. 6 is a similar view of the cover member taken substantially on the line 6—6 of Fig. 3;

Fig. 7 is a broken transverse section through a box constructed in accordance with my invention; and

Fig. 8 is an exploded, fragmentary perspective view, showing the parts of a box constructed in accordance with my invention, with the cover section flexed for assembly.

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Referring more particularly to the drawings, it will be seen that I have illustrated a box comprising a base section 10 and a cover section 11. The base member 10 comprises a body 12 having an upstanding perimetral flange 13. Near one end of the rear portion of the flange 13, and at the free edge thereof, said flange is distorted as at 14 to provide a substantially quarter-sphero-conical socket 15 opening through the free edge of the flange and the outer face thereof. Immediately at that end of the socket 15 adjacent the end of the box section, the flange is formed with a sphero-conical bulge 16, upon whose inner face is provided a conical hinge projection 17. The apex 18 of said projection 17 lies substantially in the plane defined by the free edge 19 of the flange 13, and substantially in the plane of the outer surface 20 of said flange. At a point correspondingly located relative to the opposite end of the rear portion of the flange 13, said flange is similarly distorted at 14' to provide a socket 15', and is provided with a bulge 16' having a hinge element 17' whose apex 18' is similarly located. The parts 14' to 18' are in all respects identical with the parts 14 to 18, but allochirally related thereto.

The cover section 11 comprises a body 21 having a depending peripheral flange 22 proportioned and designed to register with the flange 13. Near one end of the rear portion of the flange 22, said flange is distorted as at 23 to provide a socket 24 similar to the socket 15; and said flange is provided with a bulge 25 in which is formed a conical hinge socket 26 whose apex 27 is disposed substantially in the plane defined by the free edge 28 of the flange 22, and substantially in the plane of the outer surface 29 of said flange. The spacing of the socket 24 and bulge 25 from the adjacent end of the cover section 11 is such that when the cover section is brought into registry with the base section 10, the plane faces of the bulges 16 and 25 lie substantially in a common plane and the apices 18 and 27 of the projection 17 and socket 26 lie in a common line parallel with that plane.

Near its opposite end, the flange 28 is formed to provide a socket 24' and a bulge 25' in all respects identical with the socket 24 and bulge 25, but allochirally related thereto. When the flanges 13 and 22 are in registry, the parts 16' and 25' will be related in the same manner in which the parts 16 and 25 are related.

At a point between the positions of the bulges

25 and 25', and preferably midway therebetween, the flange 22 is formed with a notch 30 whose mutually facing walls flare toward the outer surface 29 of said flange, as at 31. The provision of the notch 30 weakens the resistance of the cover section 11 to flexure about an axis extending transversely of said cover and passing between the mutually facing walls of the notch 30. Thus, the cover section may be flexed about such an axis, bending the ends of said cover section downwardly relative to the midportion thereof, whereby the bulges 25 and 25' are brought closer to each other; and I have found that the cover section may readily be so flexed to a sufficient degree to cause the plane surfaces of the bulges 25 and 25' to clear the apices 18 and 18' of the projections 17 and 17' as the two sections are brought into registry. When the bulges 25 and 25' have been moved into alignment with the bulges 16 and 16', while the cover section is so flexed, release of the cover section will permit the same to spring back into its normal position, whereby the sockets 26 and 26' (not shown) will be caused to settle snugly into enshrouding relationship with the conical projections 17 and 17', respectively. Concurrently, a portion of the bulge 25 enters the socket 15 and a portion of the bulge 16 enters the socket 24, while the bulges 16' and 25' similarly enter the sockets 24' and 15', respectively. Thereafter, of course, the two sections 10 and 11 will move readily about the common axis of the hinge element apices 18, 27, 18' and 27' (not shown).

In order that the box sections may be solidly retained against separation, after initial assembly, I prefer to provide a wedge block 32 shaped and proportioned to fit snugly within the notch 30, the end walls of said block being flared to conform to the flare 31 of the end walls of the notch. When the block is seated in the notch, it will be clear that the cover section is firmly braced against such flexure as would release the projections 17 from the sockets 26. Preferably, the block will be secured in place in the notch by means of any suitable adhesive; but it will be apparent that, if the flare of the end walls 31 is not too sharp, and particularly if the block is designed to exert a stress tending to flex the cover in a direction opposite to the direction of flexure above referred to, the block may be retained in place frictionally. Still further, it may be desirable to form the walls 31 with grooves of V cross section, and to shape the ends of the block 32 similarly, whereby the block may be snapped into place after assembly of the box parts, whereafter it will be held in position without the use of any adhesive.

In order to hold the box sections against accidental opening, I prefer to form a lip 33 on the front edge of the flange of the bottom section 10, and to provide an integral finger 34 on the corresponding portion of the flange of the top section 11. The inherent resiliency of the finger 34 will permit the box to be opened and closed, as desired.

While the box herein disclosed may be formed of any material having a suitable degree of inherent resiliency, I prefer to make it of molded plastic material.

I claim as my invention:

1. In a device of the class described, a base member having a body and a perimetral flange angularly related thereto and a cover member having a body and a perimetral flange angularly related thereto and adapted to register with the flange of said base member, one of said members being provided, at spaced points adjacent the edge of its flange, with two aligned sockets facing away from each other, and the other of said members being provided, at correspondingly spaced points adjacent a registering portion of its flange, with two aligned projections facing toward each other and adapted to be received, respectively, in said sockets, the flange of said one member further being provided, intermediate the positions of said sockets, with a notch opening through said edge of said flange.

2. The device of claim 1 including a block proportioned and designed to fit and fill said notch and secured therein to stiffen said flange and inhibit flexure of said one member about an axis traversing said notch after assembly of said base and cover members.

3. The device of claim 1 in which the common axis of said sockets lies substantially in the plane defined by the free edge of the flange of said one member and the common axis of said projections lies substantially in the plane defined by the free edge of the flange of said other member.

4. The device of claim 3 in which each of said common axes further lies substantially in the plane of the outer surface of the portion of the flange with which it is associated.

5. The device of claim 1 in which said sockets and said projections are complementarily conical.

6. The device of claim 5 in which the apex of each conical portion lies substantially in the plane defined by the free edge of its associated flange.

7. The device of claim 6 in which the apex of each conical portion further lies substantially in the plane of the outer surface of the flange portion with which it is associated.

8. In a device of the class described, a base member having a body and a perimetral flange angularly related thereto and a cover member having a body and a perimetral flange angularly related thereto and adapted to register with the flange of said base member, one of said members being provided with a pair of socket hinge elements disposed upon a common axis at spaced points adjacent the free edge of the flange of said one member and the other of said members being provided with a pair of projection hinge elements disposed upon a common axis at correspondingly spaced points adjacent the free edge of a registering portion of the flange of the other member and adapted to be received in said socket elements, respectively, the elements of one of said pairs facing toward each other and the elements of the other of said pairs facing away from each other, the flange of that member whose hinge elements face away from each other being provided, intermediate such hinge elements, with an opening therethrough penetrating the free edge of such flange.

9. The device of claim 1 in which the mutually facing edges of said notch flare toward the outer surface of the flange in which it is formed, and including a wedge-shaped block proportioned and designed to fit and fill said notch and secured therein to stiffen said flange and inhibit flexure of said one member about an axis traversing said notch after assembly of said base and cover members.

10. The device of claim 8 in which the mutually facing edges of said opening flare toward the outer surface of the flange in which it is formed, and including a wedge-shaped block proportioned and designed to fit and fill said opening and se-

cured therein to stiffen said flange and inhibit flexure of said one member about an axis traversing said opening after assembly of said base and cover members.

JULIAN C. KAZIMIER.

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