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3,391,848

POP-OPEN BOX

Filed Jan. 13, 1967

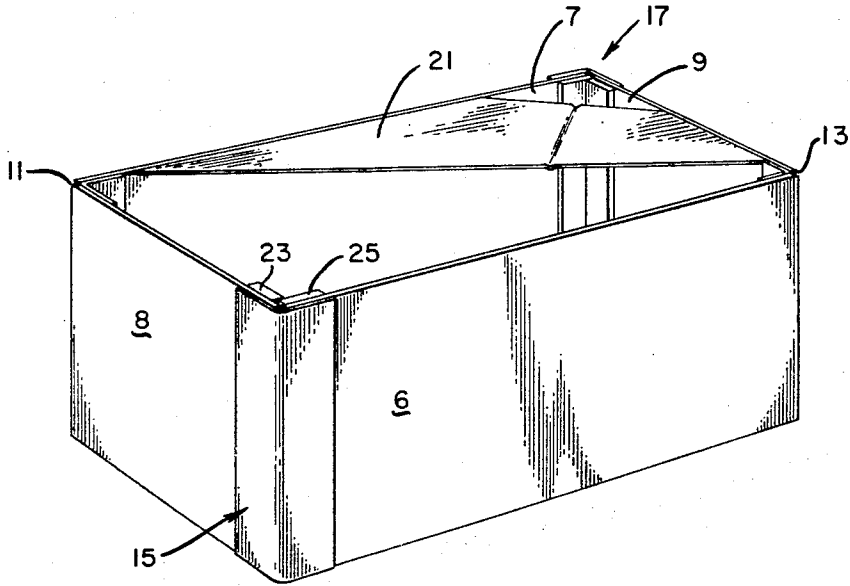


FIG-1

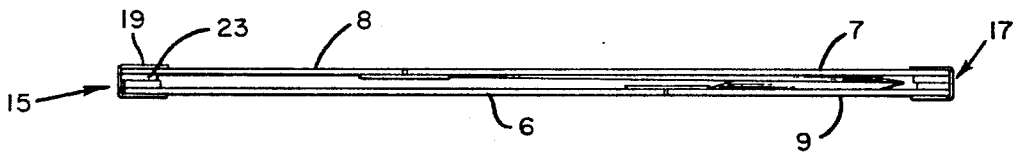


FIG-2

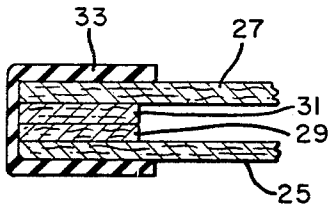


FIG-3

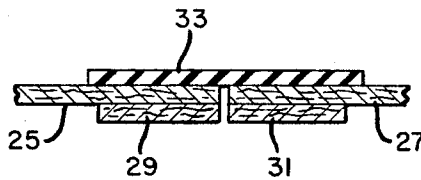


FIG-4

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POP-OPEN BOX

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ABSTRACT OF THE DISCLOSURE

A pop-open box wherein the opening action is achieved by an elastomeric hinge; the hinge is under tension when the box is in the collapsed condition, the tension tending to urge the box open.

BACKGROUND OF THE INVENTION

Field of the invention

The invention relates to a pop-open box wherein an elastomeric hinge provides the opening action.

Description of prior art

All pop-open boxes known to applicant have employed rubber bands under tension each of which had to be individually placed by hand in the structure. The box of the present invention can easily be manufactured on high speed machinery since the elastic hinge is applied while the parts are in the flattened condition and while the hinge is not under tension.

SUMMARY

The invention is directed to a hinge for a pop-open box or similar structure wherein the hinge is elastomeric and is under tension while the box is in the flattened condition, which tension tends to open the box. Although the structure has been described as a box, it is obvious that many configurations embodying this idea are possible and that a rectangular box has only been selected for ease in description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of a box embodying the present invention, showing the box in open form.

FIGURE 2 is a top view of the box shown in FIGURE 1 showing the box in collapsed form.

FIGURE 3 is an enlarged detail in section of a hinge embodying the present invention showing the hinge under tension.

FIGURE 4 is a section similar to FIGURE 3 wherein the hinge is depicted in its most open position with no tension on the elastomeric hinge.

Referring to the drawings by reference characters there is shown in FIGURES 1 and 2 a box having sides 6, 7, 8 and 9 with ordinary flexible hinges at two opposite corners namely 11 and 13. At the other corners elastic hinges embodying the invention are generally designated 15 and 17. The hinges 15 and 17 comprise strips of elastomeric material such as a rubber tape 19. This tape is applied to two adjacent side walls such as 6 and 8 in such a manner that when the box is collapsed, as is shown in FIGURE 2, the elastomeric hinge is under considerable tension. It is obvious that this tension tends to cause the box to assume an open position. If desired, a strip of flexible material 21 can be placed across two adjacent sides of the box to limit the degree of opening. In other words, without the limiting strip 21, the box might move past the fully open position and become at least partially closed in the opposite direction.

If the stock from which the box is made is fairly thick,

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no special treatment of the corners is necessary. However, if the stock of the box is relatively thin, the corners of the box can be built up with the solid members 23 and 25 to give the hinge more leverage at the corner of the box.

FIGURES 3 and 4 illustrate the manner in which the box of the present invention can be made. Here, the side walls of a box or similar structure namely 25 and 27 have strips 29 and 31 applied at the extreme ends thereof. It will be noted that the sides 25 and 27 shown in the fully open position in FIGURE 4 are almost in abutment. An elastomeric tape 33 is then fastened, normally by means of a suitable adhesive, to the side walls 25 and 27; when the box is in this condition there is no tension on the elastomeric tape 33 so that it can easily be applied by high speed machinery. When the side walls 25 and 27 are now moved roughly 180° bringing them adjacent to each other, as is shown in FIGURE 3, it is apparent that the tape 33 has been subjected to a considerable amount of tension and that this effect is enhanced by the greater separation produced by the strips 29 and 31. Thus, the elastomeric member 33 in the position shown in FIGURE 3 will tend to urge the walls 25 and 27 outwardly.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of the invention is shown in FIGURES 1 and 2 wherein adjacent sidewalls are provided with an elastomeric hinge and wherein the interior surface of the hinge is provided with a thickening strip increasing the leverage on the hinge.

I claim:

1. A pop-open box wherein said box can be collapsed to a substantially flat form and wherein the box, when released from restraint will tend to assume a normal open box configuration comprising in combination:

- two adjacent side walls
- an elastomeric hinge applied to the outside surfaces of said side walls connecting two adjacent side walls together
- said hinge being under substantial tension when the adjacent side walls are brought toward each other and lie substantially parallel to each other and
- said tension tending to pull the side walls apart and open the box.

2. The structure of claim 1 wherein elastomeric hinges are applied at two opposing corners of a box having a rectangular configuration.

3. The structure of claim 1 wherein thickening strips are applied on the surface of the said side walls adjacent the ends opposite the side on which the hinge is placed.

4. The structure of claim 1 wherein a limiting member extends between two adjacent side walls, maintaining the open box in a rectangular configuration.

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