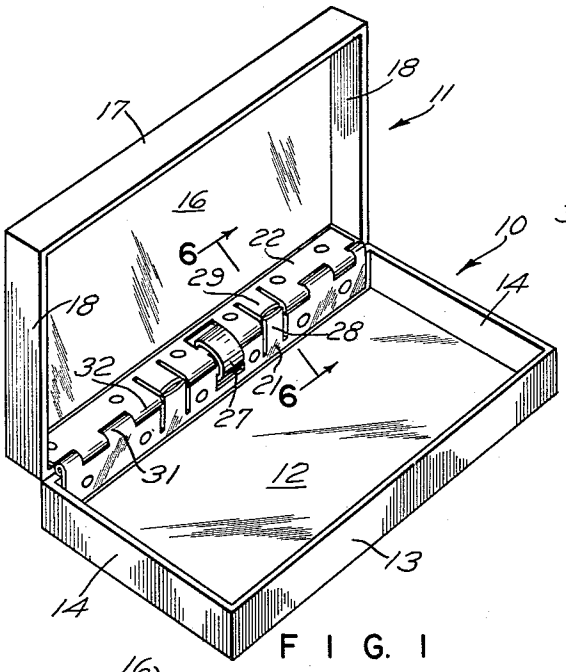
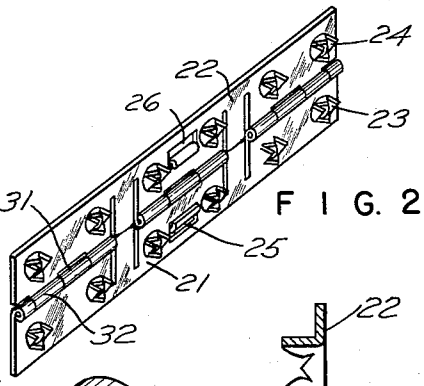
Feb. 25, 1964 L. D. YOUNG 3,122,303

CARDBOARD BOX WITH METAL SPRING HINGE

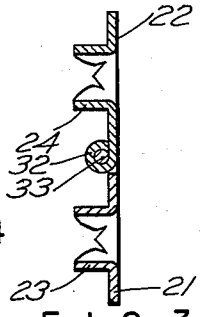
Original Filed Oct. 26, 1960



F I G. 1



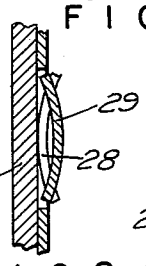
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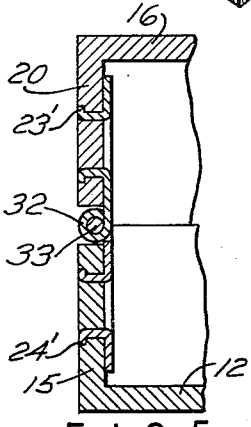
F I G. 3



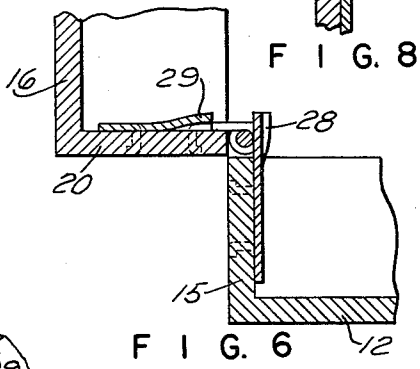
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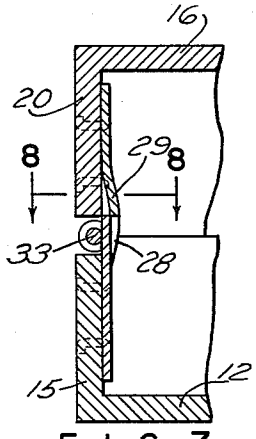
F I G. 8



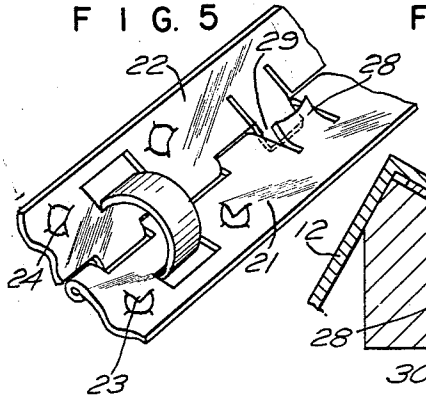
F I G. 5



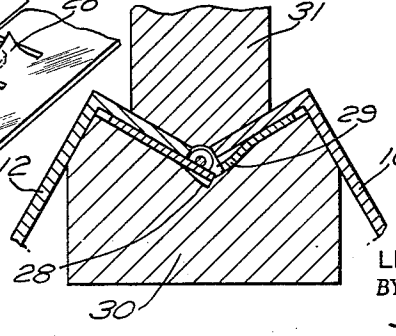
F I G. 6



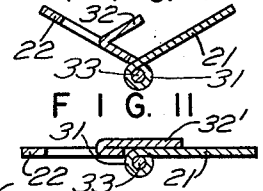
F I G. 7



F I G. 9



F I G. 10



F I G. 11

F I G. 12

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United States Patent Office 3,122,303 Patented Feb. 25, 1964

3,122,303

CARDBOARD BOX WITH METAL SPRING HINGE

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Continuation of application Ser. No. 65,170, Oct. 26, 1960. This application Jan. 17, 1962, Ser. No. 166,829
2 Claims. (Cl. 229—44)

This invention relates to a cardboard box having a spring hinge to close the same and is a continuation of application, Serial No. 65,170, filed October 26, 1960.

Heretofore in the use of a metal hinge to hinge together the body and cover sections of a cardboard box, the spring which urged the two plates of the hinge to cause them to move the sections to closed position was frequently so much stronger than the cardboard back walls of the box that the plates of the hinge would swing beyond a single plane and cause an outward bulging of the back walls of the box. Since it was necessary to swing the plates of the hinge beyond the position assumed at closing which is a single plane in order to assemble the spring, no stops had been heretofore put into the hinge plates to cause them to align.

One of the objects of this invention is to provide a hinge which may have stops so as to prevent the outward bulging of the rear walls of the box.

Another object of the invention is to provide a hinge which, in its first position, before attaching to the box may have the stop means so that it will permit assembly of the hinge spring but which stop means will be moved into a position to provide a stop as the hinge is assembled in place on the box.

Another object of the invention is to provide a hinge which may be treated for assembly with the box the same as the usual metal hinge but which will change said relationships as it is assembled so that the hinge will have abutting surfaces as the hinge moves the covers to closed position so as to prevent the spring from moving the hinge plates to concave inwardly and consequently bulge the rear surface of the hinged walls of the box.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

FIG. 1 is a perspective view of the box in open position with my improved hinge in position;

FIG. 2 is a perspective view of the hinge alone;

FIG. 3 is a sectional view through the attaching spurs of the hinge alone;

FIG. 4 is a perspective view of the spring;

FIG. 5 is a sectional view of the box and hinge through the attaching spurs;

FIG. 6 is a section on line 6—6 through the abutments on the hinge plates;

FIG. 7 is a view similar to FIG. 6 but illustrating the cover and body sections in closed position and the abutments on the hinge plates as in engagement;

FIG. 8 is a section on line 8—8 of FIG. 7;

FIG. 9 is a perspective view of the fragmental portion of the hinge prior to its assembly on the box illustrating the abutting tabs as in a position sufficiently raised out of the plane of the plates to swing clear of each other as the plates are swung toward position for assembly of the spring thereon;

FIG. 10 is a sectional view illustrating the box sections as positioned on an anvil for assembly of the hinge plates in position which at the same time bends the abutting tabs into a position for engagement one with the other;

FIG. 11 is a sectional view of a modified hinge in position for spring assembly; and

FIG. 12 is a sectional view thereof with the abutment bent into stop position.

In proceeding with this invention I form the hinge plates with attaching spurs and I cut from either one or both hinge plates tabs and raise these tabs out of the surface of the hinge plates sufficiently so that the hinge plates may swing about their pintle pin pivot substantially through 360° so that in one position the spring may be assembled on the hinge plates. The hinge plates with their spurs for assembly to the box sections are then positioned on the anvil, the box sections placed in position and the hammer dropped to secure the spurs in the box and at the same time the shaping of the anvil and hammer is such that the abutment tabs are bent into a position so that they will engage and align the hinge plates in a single plane preventing the plates from moving beyond this plane as the box is moved to the closed position shown in FIG. 7.

With reference to the drawings 10 designates generally the body section of the box and 11 the cover section. The body section has a bottom wall 12, front wall 13, side walls 14 and a back wall 15. The cover section has a top wall 16, a front wall 17, side walls 18 and a back wall 20. The rear walls are designed to be maintained in substantially a single plane, and it is to these rear walls that the hinge is attached.

The hinge comprises a pair of plates 21 and 22 which are of metal with aligned rolled eyes 31, 32 through which a pintle pin 33 extends to hinge the plates together, and from the sheet metal stock spurs 23 are bent from plate 21 and spurs 24 are bent from plate 22. There are four evenly spaced spurs shown about each generally circular opening although the number may be varied. Each spur is arcuate in cross section so as to stiffen it and inclines slightly outwardly so as to be deflected outwardly away from the center of the opening as it engages an anvil. These spurs are adapted to pierce the rear walls of the cardboard box and be turned over as at 23', 24' (FIG. 5) for attaching the plates to the inner surface of the rear walls 15 and 20. The plates are also provided with slots 25 in plate 21 and 26 in plate 22, in which a C-shaped spring 27 engages by the hook ends of the spring hooking over the edges of the slot.

Additionally, I have formed tabs 28 on plate 21 and 29 on plate 22, and in the cutting of these tabs which exist in two sets on either side of the spring, they are raised from the general plane of the plate a distance beyond that shown in FIGURES 1 and 7, the distance raised being illustrated in FIG. 9 which is shown as sufficient so that the tabs 28 and 29 will clear each other when the inner surfaces of the plates 21 and 22 are swung toward each other beyond a single plane such as shown in FIGURE 3. By swinging the plates beyond this plane to a position somewhat analogous to that shown in FIGURE 9, the hook ends of the spring 27 may be positioned over the edges of the slots 25 and 26. The plates may then be swung back into a position such as shown in FIGURE 10, and the rear walls 15, 20 of the box sections positioned thereon as shown in FIGURE 10, all upon the anvil 30, and then the hammer 31 may descend so as to force the spurs 23 and 24 through the rear walls 15 and 20 and clinch them over as in FIG. 5, and at the same time the surface of the anvil and hammer will be such that the tabs 28 and 29 will be bent from their raised position such as shown in FIGURE 9 to the position shown in FIGURES 1, 7 and 8, thus positioning the tabs so that they will engage and provide an abutment means to prevent the spring from swinging the hinge sections beyond the aligned position such as shown in FIGURE 7 and preventing the spring from being disengaged, thus preventing rearward bulging of the walls 15 and 20 but

rather maintaining the plates 21 and 22 in a single aligned plane.

As an alternate arrangement, a single tab 32 as seen in FIGURE 11 may be raised from one plate such as plate 22 and bent to the position shown in FIGURE 11 in which position the two plates 21, 22 may be swung with their inner surfaces approaching each other sufficiently for the spring 27 to be assembled in slots 25, 26 (FIG. 2) and thereafter the plates may be assembled on the box section as above described and illustrated in FIGURE 10. In the assembly the tab 32 will be bent from the position shown in FIGURE 11 to the position shown in FIGURE 12 in which latter position 32' it will engage plate 21 and cause the plates 21, 22 to align in substantially a single plane as shown in FIGURE 12, thus maintaining the rear walls 15, 20 as shown in FIGURE 7.

I claim:

1. In a cardboard box a body section and a cover section, said sections both having flat rear walls of relatively soft material with their edges abutting, a hinge comprising a pair of metal plates pivoted together, one plate secured to the rear wall of one section and the other plate secured to the rear wall of the other section, a spring urging the plates about their pivot axis to close the box, abutments on said plates engaging when the rear walls and plates are in substantially a single plane so as to prevent the bulging outwardly of the rear walls by action of the spring swinging plates beyond the closed position to concave their inner surfaces, said abutments comprising tabs one on each of said plates, said tabs being raised out of the plane of its respective plate.

2. In a cardboard box as in claim 1, wherein the spring is C-shaped and its ends hook into openings in said plates.

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