

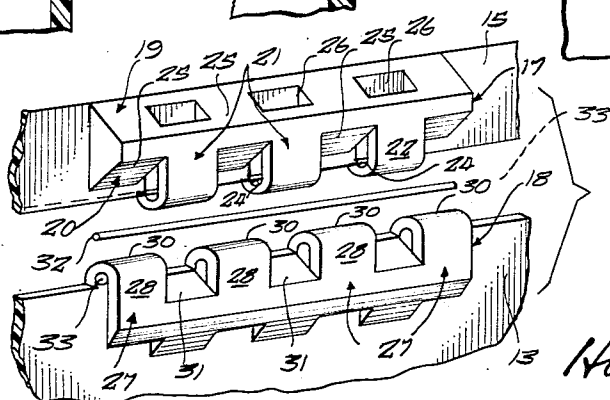
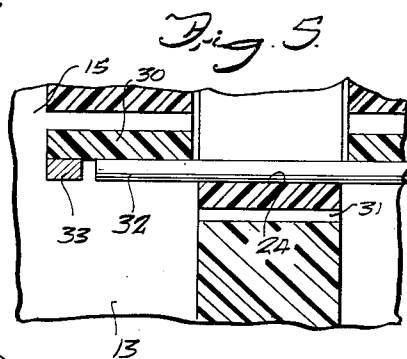
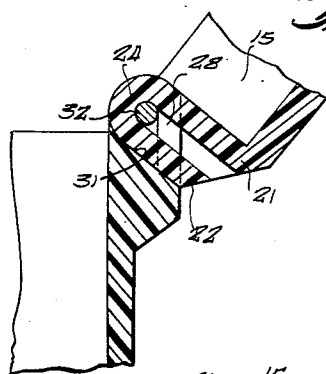
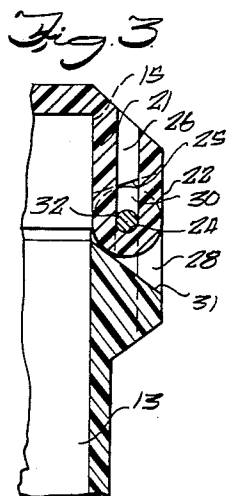
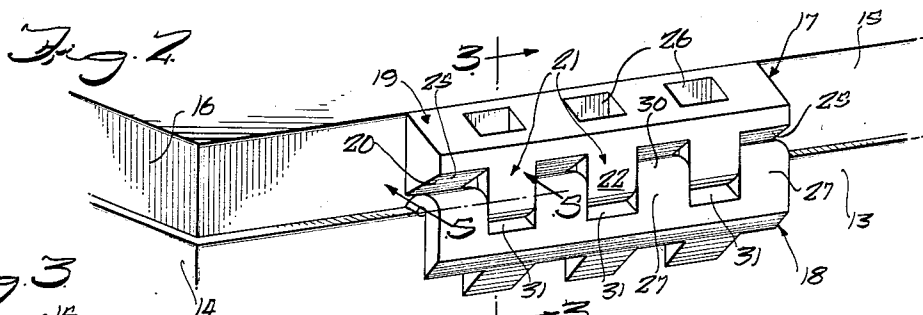
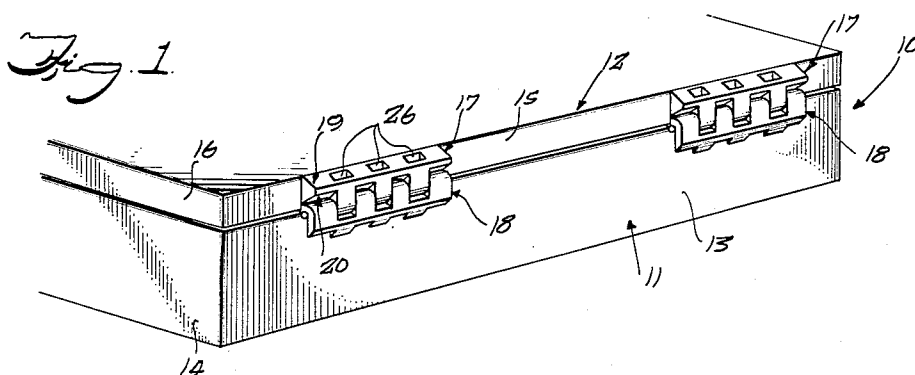
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YONEO KIBA

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PLASTIC HINGE CONSTRUCTION FOR MOLDED PLASTIC RECEPTACLES

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PLASTIC HINGE CONSTRUCTION FOR MOLDED PLASTIC RECEPTACLES

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9 Claims. (Cl. 16—128)

This invention relates to hinge structures for molded plastic boxes. More specifically this invention relates to a plastic hinge which is integral with a receptacle and cover the said hinge being molded simultaneously with the plastic molding of the box.

Various types of plastic hinge designs have been devised in the art of making plastic boxes. Hinge designs in this field have been such that they are simultaneously molded with the molding of the plastic box thereby forming integral parts thereof. Generally the type of hinges designed are rather fragile but they nevertheless serve the purpose since the boxes are usually discarded immediately after the object contained therein has been removed. Thus the frangible or fragile nature of such hinge design has been no deterrent and they have worked satisfactorily. The present hinge design however contemplates rigidity and strength so that the box can be utilized in the form of a dispenser. Thus the box to which the present hinge design is applied may be utilized for instance as a dispenser for dispensing cigars. Thus a storekeeper may dispense cigars from the plastic box and the hinge structure is sufficient strong to withstand the numerous opening and closing of the box during such dispensing. Furthermore as is generally known a storekeeper will generally open the cover and hold the filled box by the said cover while the customer removes cigars or other items from the box at his selection. Thus a hinge structure to withstand this type of use must be exceedingly strong and durable. It is a prime object of this invention therefore to provide an improved hinge structure for plastic boxes the said hinge structure having great strength and durability.

Still another object is to provide a hinge structure for plastic boxes the hinge structure including separate hinge elements which are assembled in hinging relation by means of a suitable separate hinge pin.

A still further object is to provide a durable plastic hinge for a molded plastic box the hinge including means whereby a hinge pin is retained within hinge members against endwise displacement thus locking the hinge pin in place during the life of the box.

These and further objects will become more readily apparent from a reading of the description when taken in connection with the accompanying sheet of drawing.

In the drawing:

Figure 1, is a perspective view of a portion of a box showing a pair of integral plastic laterally spaced hinge constructions;

Figure 2, is a fragmentary perspective view of a portion of a box showing a plastic hinge construction;

Figure 3, is an enlarged detailed view taken particularly along the line 3—3 of Figure 2;

Figure 4, is a view similar to Figure 3 showing a cover of a plastic box in an open position;

Figure 5, is a fragmentary sectional view taken along the line 5—5 of Figure 2; and

Figure 6, is a perspective view, enlarged, showing a pair of hinge members and a hinge pin in separated relation prior to their assembly.

Referring now particularly to Figures 1 and 2 a receptacle or box is generally designated by the reference character 10. The box 10 includes a receptacle part 11 and a cover part 12. The receptacle 11 comprises a sidewall 13 and endwalls 14 only one of which is shown.

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The cover part 12 comprises a sidewall 15 and endwalls 16 only one of which is shown.

An upper hinge part is designated generally by the reference character 17. As indicated in Figure 1 two hinge constructions may be provided each such construction being laterally spaced upon the box 10. Any number of course can be provided or the hinge structure may be continuous across the side of the box. However for the purpose of the present description one of said hinge constructions will thus be described. A lower hinge part is generally designated by the reference character 18. The upper hinge part 17 comprises an upper wall 19 and a lower wall 20. The upper wall 19 and the lower wall 20 project outwardly from the sidewall 15 the said walls 19 and 20 being tapered or converging outwardly. As indicated the upper hinge part 17 and lower hinge part 18 are integral with the box 10 and each may be molded simultaneously with the formation of the receptacle part 11 and the cover part 12.

The upper hinge part 17 is provided with a plurality of U-shaped hooks 21, the said hooks 21 being laterally spaced relative to one another. Each U-shaped hook 21 includes an outer wall 22 which is connected at its lowermost point to a bight 24. Each bight 24 is connected to the lower edge of the sidewall 15 and is integrally formed therewith. As indicated above the U-shaped hooks 21 are relatively laterally spaced and the lower wall 20 includes a plurality of bight bearing portions 25 which are integral with and disposed between the hooks 21. The upper wall 19 includes a plurality of spaced openings 26, these openings communicating with the spaces defined by the wall 15 and the outer walls 22 which are laterally spaced with respect to the wall 15.

The lower hinge part 18 is provided with a plurality of U-shaped hooks 27 which are relatively laterally spaced. Each hook 27 includes an outer wall 28 which is parallel to and laterally spaced with respect to the side wall 13 of the receptacle part 11. Each outer wall 28 is connected at its upper end to a bight 30 which in turn is connected to the upper edge of the side wall 13 as particularly indicated in Figure 6. As indicated above the hooks 27 are U-shaped and laterally spaced with respect to each other. The lower hinge part 18 includes a plurality of solid and integral bight bearing portions or members 31 which are disposed between the hooks 27. As best shown in Figure 5 a hinge pin 32 is disposed within the bights 24 and 30 to maintain the hinge parts 17, 18 in hinging assembly. As best shown in Figures 5 and 6 laterally spaced stops or retainers 33 are positioned at the outermost ends of the hinged parts 17 and 18, the said stops or retainers 33 being suitably connected adjacent the bights of the most outwardly disposed hooks 27.

By virtue of the structure of the hinge parts 17 and 18 as shown, it is of course readily apparent that a very substantial and durable construction is disclosed. It must be understood that the hinge parts are molded with the molding of the cover and receptacle part and are integral therewith. After the parts have been molded, the hinge parts 17 and 18 as best shown in Figure 6 are placed in hinging relation and the hinge pin 32 is placed in the position shown in Figure 5 whereupon the stops or retainers 33 prevent the said hinge pin from any endwise displacement thus securely locking the hinge members in assembly. By virtue of the construction shown it is also apparent that the bight portions suitably and adequately engage the bight bearing members the engagement being secured by the position of the hinge pin 32 relative to the bight portions. Furthermore by virtue of the tapering surfaces of the bearing portions 31 as best shown in Figure 4 the cover part 12 may be maintained in an open position with the outer wall of

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the U-shaped hooks 21 in resting engagement on the said bearing portions 31. In the closed position of the box 10 the bights also will engage the bearing portion so that a solid construction is maintained this also greatly adding to the strength of the box. This is particularly shown in Figure 3 wherein the bight 24 is in engagement with the bearing portion 31. Furthermore such engagement or bearing engagement is shown in Fig 4 wherein the cover part is placed in an open position. The arrangement is such that the cover and receptacle part are securely locked together and no displacement of the hinge pin from the structure is possible during opening of the cover part with respect to the receptacle part. The hinge pin, in other words, is securely locked in position.

The durability of this plastic hinge structure is particularly a result of the strength resulting from the substantially continuous and thick section afforded by the upper hinge part 17 which has its hooks 21 connected integrally with the plastic receptacle cover. In other words the hooks are interconnected by the portions disposed between walls 19 and 20 to provide a strong durable structure.

Thus it is believed that an improved substantial hinge construction for plastic boxes has been disclosed and it must be understood that changes and modifications may be made without departing from the spirit of the invention as disclosed nor the scope thereof as defined in the appended claims.

What is claimed is:

1. A hinged structure for molded plastic boxes including a receptacle part and a cover therefor, both having side walls lying in the same plane, comprising an upper hinge part integrally connected to the wall of the cover, said hinge part comprising an upper hinge member projecting laterally outwardly from said wall of the cover, normally upper and lower walls on said upper hinge member tapering outwardly toward each other, a plurality of upper hinge hooks projecting downwardly from the lower wall, said upper hinge hooks being relatively transversely spaced, each upper hinge hook including an upper hook wall substantially parallel to the side wall of the cover and spaced laterally with respect thereto, an upper arcuate bight connecting the lowermost ends of said upper hook wall to the side wall of the cover, said upper wall having a plurality of openings in communication with the spaces defined by said spaced upper hook walls relative to the side wall of the cover, portions of said lower wall disposed between said hooks providing upper bearing surfaces, a lower hinge part integrally connected to the side wall of the receptacle, said lower hinge part comprising a lower hinge member, said lower hinge member projecting laterally outwardly from said receptacle, a plurality of lower hooks on said lower hinge member, said lower hooks being relatively laterally spaced, each lower hook including a lower hook wall laterally spaced with respect to said side wall of the receptacle, a lower arcuate bight connecting said lower hook wall to said side wall of the receptacle, said lower hinge member having solid portions disposed between said lower hooks and connected thereto to provide lower bearing surfaces, said lower hinge member having openings in communication with the spaces defined by said lower hook walls and the side wall of the receptacle, said upper bight being in bearing relation with said lower bearing surfaces, said lower bight being in bearing relation with said upper bearing surfaces, a hinge pin extending laterally within said hooks, and retainer elements disposed at the ends of said hooks adjacent said bights for retaining said hinge pin against endwise movement relative to said hinge member.

2. A hinged structure for molded plastic boxes including a receptacle part and a cover therefor, both having side walls lying in the same plane, comprising an upper hinge part connected to the side wall of the cover,

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said hinge part comprising an upper hinge member projecting laterally outwardly from the side wall of the cover, normally upper and lower walls on said upper hinge member, a plurality of upper hinge hooks projecting downwardly from the lower wall, said upper hinge hooks being relatively laterally spaced, each upper hinge hook including an upper hook wall laterally spaced with respect to the side wall of the cover and in the plane of the side wall of the cover, an upper arcuate bight connecting the lowermost end of said upper hook walls to said side wall of the cover, said upper wall having a plurality of openings in communication with the spaces defined by said upper spaced hook wall and the side wall of the cover, portions of said lower wall disposed between said upper hooks providing upper bearing surfaces, a lower hinge part connected to the side wall of the receptacle comprising a lower hinge member, a plurality of lower hooks on said lower hinge member, said lower hooks being relatively laterally spaced, each lower hook including a lower hook wall laterally spaced with respect to said side wall of the receptacle, a lower arcuate bight connecting each lower hook wall to the side wall of the receptacle, said lower hinge member having portion disposed between said lower hooks and connected thereto to provide lower bearing surfaces, said lower hinge member having openings in communication with the spaces defined by said lower hook wall, and the side wall of the receptacle said upper bight being in bearing relation with said lower bearing surfaces, said lower bight being in bearing relation with said upper bearing surfaces, a hinge pin extending laterally within said hooks, and retainer elements disposed at the ends of said hook adjacent said bights for retaining said hinge pin against endwise movement relative to said hinge member.

3. A hinged structure for molded plastic boxes including a receptacle part and a cover therefor, both having side walls lying in the same plane, comprising an upper hinge member on the side wall of the cover, normally upper and lower walls on said upper hinge member, a plurality of upper hinge hooks projecting downwardly from the lower wall, said upper hinge hooks being relatively laterally spaced, each upper hinge hook including an upper hook wall laterally spaced with respect to the side wall of the cover, an upper arcuate bight connecting the lowermost end of said upper hook walls to said side wall of the cover, said upper wall having a plurality of openings in communication with the spaces defined by said upper spaced hook wall and the side wall of the cover, portions of said lower wall disposed between said upper hooks providing upper bearing surfaces, a lower hinge member, a plurality of lower hooks on said lower hinge member, said lower hooks being relatively laterally spaced, each lower hook including a lower hook wall laterally spaced with respect to said side wall of the receptacle, a lower arcuate bight connecting each lower hook wall to the side wall of the receptacle, said lower hinge member having portion disposed between said lower hooks and connected thereto to provide lower bearing surfaces, said lower hinge member having openings in communication with the spaces defined by said lower hook wall and the side wall of the receptacle, said upper bight being in bearing relation with said lower bearing surfaces, said lower bight being in bearing relation with said upper bearing surfaces, a hinge pin extending laterally within said hooks, and retainer elements disposed at the ends of said hook adjacent said bights for retaining said hinge pin against endwise movement relative to said hinge member.

4. A hinged structure for molded plastic boxes including a receptacle part and a cover therefore, both having side walls lying in the same plane, comprising an upper hinge member on the side wall of the cover, normally upper and lower walls on said upper hinge member, a plurality of upper hinge hooks projecting downwardly from the lower wall, said upper hinge hooks being relatively

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laterally spaced, each upper hinge hook including an upper hook wall laterally spaced with respect to the side wall of the cover, an upper bight connecting the lowermost end of said upper hook walls to said side wall of the cover, said upper wall having a plurality of openings in communication with the spaces defined by said upper spaced hook wall and the side wall of the cover, portions of said lower wall disposed between said upper hooks providing upper bearing surfaces, a lower hinge member, a plurality of lower hooks on said lower hinge member, said lower hooks being relatively laterally spaced, each lower hook including a lower hook wall laterally spaced with respect to said side wall of the receptacle, a lower bight connecting each lower hook wall to the side wall of the receptacle, said lower hinge member having portions disposed between said lower hooks and connected thereto to provide lower bearing surfaces, said lower hinge member having openings in communication with the spaces defined by said lower hook wall, and the side wall of the receptacle said upper bight being in bearing relation with said lower bearing surfaces, said lower bight being in bearing relation with said upper bearing surfaces, and a hinge pin extending laterally within said hooks.

5. A hinged structure for molded plastic boxes including a receptacle part and a cover therefor, both having side walls lying in the same plane, comprising an upper hinge member on the side wall of the cover, normally upper and lower walls on said upper hinge member, a plurality of upper hinge hooks projecting downwardly from the lower wall, said upper hinge hooks being relatively laterally spaced, each upper hinge hook including an upper hook wall laterally spaced with respect to the side wall of the cover, an upper bight connecting the lowermost end of said upper hook walls to said side wall of the cover, upwardly tapering portions of said lower wall disposed between said upper hooks providing upper bearing surfaces, a lower hinge member, a plurality of lower hooks on said lower hinge member, said lower hooks being relatively laterally spaced, each lower hook including a lower hook wall laterally spaced with respect to said side wall of the receptacle, a lower arcuate bight connecting each lower hook wall to the side wall of the receptacle, said lower hinge member having downwardly tapering portions disposed between said lower hooks and connected thereto to provide lower bearing surfaces, said upper bight being in bearing relation with said lower bearing surfaces, said lower bight being in bearing relation with said upper bearing surfaces, and a hinge pin extending laterally within said hooks.

6. A hinged structure for molded plastic boxes including a receptacle part and a cover therefore, both having side walls lying in the same plane, comprising an upper hinge member connected to the side wall of the cover, a plurality of upper hinge hooks laterally spaced with respect to each other and connected to said hinge member, said hinge hooks each being of U-shaped configuration and having an upper hook wall laterally spaced from said side wall of the cover, a bight connecting each wall to the side wall of the cover, upper bight bearing members disposed between said hooks and integral therewith, a lower hinge member on said side wall of the receptacle, lower hooks laterally spaced on said lower hinge member, said lower hooks being U-shaped and having a wall laterally spaced with respect to the side wall of the receptacle, a lower bight connecting each lower wall to the side wall of the receptacle, the bights being disposed substantially adjacent to the upper edge of the side wall of the receptacle, lower bight bearing members disposed between said lower hooks, a hinge pin disposed within said hooks, and means adjacent end portions of said bights for retaining said hinge pin against endwise movement, said upper bights engaging said lower bearing members in bearing relation, and said lower bights engaging said upper bearing members in bearing relation.

7. A hinged structure for molded plastic boxes includ-

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ing a receptacle part and a cover therefor, both having side walls lying in the same plane, comprising an upper hinge member connected to the side wall of the cover, a plurality of upper hinge hooks laterally spaced with respect to each other and connected to said hinge member, said hinge hooks each being of U-shaped configuration and having an upper hook wall laterally spaced from said side wall of the cover, a bight connecting each wall to the side wall of the cover, upper bight bearing members disposed between said hooks and integral therewith, a lower hinge member on said side wall of the receptacle, lower hooks laterally spaced on said lower hinge member, said lower hooks being U-shaped and having a wall laterally spaced with respect to the side wall of the receptacle, a lower bight connecting each lower wall to the side wall of the receptacle, the bights being disposed substantially adjacent to the upper edge of the side wall of the receptacle, and lower bight bearing members disposed between said lower hooks, a hinge pin disposed within said hooks, said upper bights engaging said lower bearing members in bearing relation, and said lower bights engaging said upper bearing members in bearing relation.

8. A hinged structure for molded plastic boxes including a receptacle part and a cover therefor, both having side walls lying in the same plane, comprising an upper hinge member connected to the side wall of the cover, a plurality of upper hinge hooks laterally spaced with respect to each other and connected to said hinge member, said hinge hooks each being of U-shaped configuration and having an upper hook wall laterally spaced from said side wall of the cover, a bight connecting each wall to the side wall of the cover, upwardly tapering upper bight bearing members disposed between said hooks, a lower hinge member on said side wall of the receptacle, lower hooks laterally spaced on said lower hinge member, said lower hooks being U-shaped and having a wall laterally spaced with respect to the side wall of the receptacle, a lower bight connecting each lower wall to the side wall of the receptacle, and downwardly tapering lower bight bearing members disposed between said lower hooks, a hinge pin disposed within said hooks, said upper bights engaging said lower bearing members in bearing relation, and said lower bights engaging said upper bearing members in bearing relation.

9. A hinged structure for molded plastic boxes including a receptacle part and a cover therefor, both having side walls lying in the same plane, comprising an upper hinge member connected to the side wall of the cover, a plurality of upper hinge hooks laterally spaced with respect to each other and connected to said hinge member, said hinge hooks each having an upper hook wall laterally spaced from said side wall of the cover, a bight connecting each hook wall to the side wall of the cover, upper bight bearing members disposed between said hooks, a lower hinge member on said side wall of the receptacle, lower hooks laterally spaced on said lower hinge member, said lower hooks having a wall laterally spaced with respect to the side wall of the receptacle, a lower bight connecting each lower wall to the side wall of the receptacle, the bights being disposed substantially adjacent to the upper edge of the side wall of the receptacle, and lower bight bearing members disposed between said lower hooks, a hinge pin disposed within said hooks, said upper bights engaging said lower bearing members in bearing relation, and said lower bights engaging said upper bearing members in bearing relation.

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