

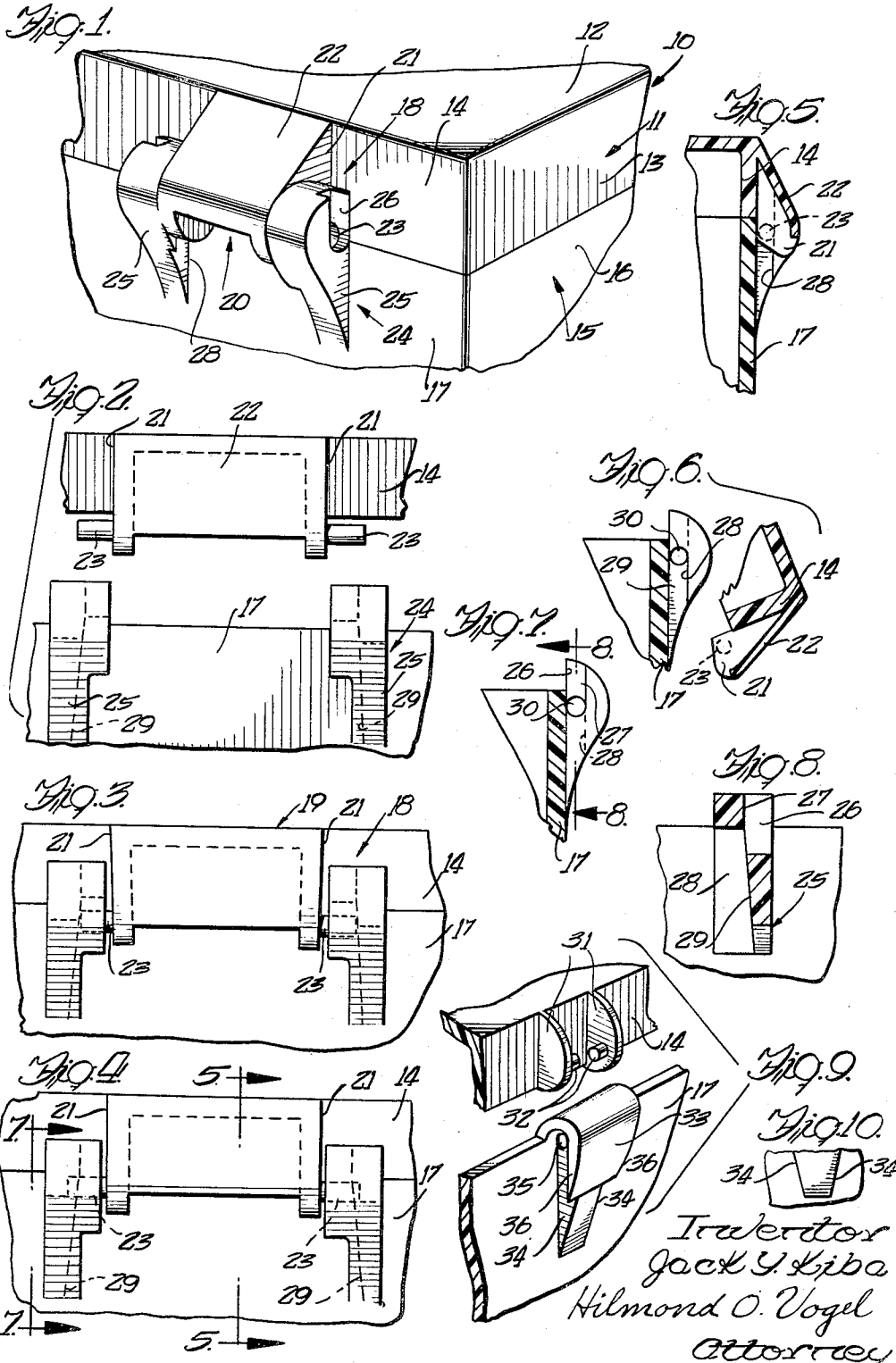
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FLEXIBLE HINGE CONSTRUCTION FOR PLASTIC BOXES

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FLEXIBLE HINGE CONSTRUCTION FOR PLASTIC BOXES

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4 Claims. (Cl. 220-31)

This invention pertains to plastic boxes or receptacles. More specifically the invention relates to an improved hinge construction particularly adaptable for plastic molded boxes.

This invention concerns plastic boxes wherein the box consists of a cover having an integral hinge portion and a receptacle also likewise having an integral hinge portion. These boxes are molded of a plastic material which has, immediately after molding, an inherent resiliency which generally decreases later on during the life of the box. The hinge parts of boxes of this type are generally designed to accommodate this inherent resiliency immediately after molding and therefore the hinge parts are designed so that the cover and the receptacle parts may be easily and quickly assembled after molding. The parts are so designed that supplemental hinge portions may be sufficiently sprung by various means to inter-engage and become firmly locked in hinging position. After the plastic material has aged a short time these parts then become integrally connected together. It is a prime object of this invention to provide an improved hinge designed for plastic molded boxes.

A further object is to provide a pair of hinge parts respectively connected to the cover and a receptacle of a plastic box, the said hinge part being designed to permit great flexibility and resiliency immediately after molding so that the parts can be assembled into permanent hinging relation.

A more specific object of the invention is to provide an improved hinge design for plastic boxes said hinge design including flexible hinge support members having inner tapered surfaces which can readily be spread apart to permit quick and efficient assembly immediately after a molding operation.

A more specific object of the invention is to provide an improved hinge assembly for plastic boxes the said assembly comprising a pair of hinge members designed to permit easy flexing of the said parts during and immediately after a molding operation so that the parts can be assembled the assembly however being permanent after the parts are thus assembled.

These and other objects of the invention will become more readily apparent from a reading of the description when examined in connection with the accompanying sheets of drawings.

In the drawings:

Figure 1 is a perspective view of a plastic box portion having an improved hinge design;

Figure 2 is an elevational view of a pair of hinge portions in separated condition just prior to their assembly;

Figure 3 is a view similar to Figure 2, showing in elevation a pair of hinge portions, the said view showing a stage in the assembly of the hinge portions;

Figure 4 is a view similar to Figure 3, showing in elevation the assembled hinge portion;

Figure 5 is a cross sectional view taken substantially along the line 5-5 of Figure 4;

Figure 6 is a cross sectional view showing a pair of hinge portions or members immediately prior to their assembly;

Figure 7 is a cross sectional view taken along the line 7-7 of Figure 4;

Figure 8 is a cross sectional view taken substantially along the line 8-8 of Figure 7;

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Figure 9 is a perspective fragmentary view of a pair of modified hinge members; and

Figure 10 is a fragmentary or detailed view in elevation of a portion of a modified hinge member.

Referring now particularly to Figure 1, a plastic box portion is generally designated by the reference character 10. The plastic box portion 10 comprises a cover 11, having a top wall 12 and opposite side walls 13, only one of which is shown. Furthermore the cover 11 comprises a vertical back or rear wall 14.

The plastic box 10 further comprises a receptacle generally designated at 15 which includes a pair of side walls 16, only one of which is shown, and a rear or back wall 17, extending in a vertical direction. A hinge assembly is generally designated at 18. Only one hinge assembly has been shown and it must of course be understood that the plastic box 10 may consist of one or more of these particular assemblies. The hinge assembly 18 comprises an upper hinge member 19 which is integrally formed with the plastic cover 11. The hinge member 19 comprises a hollow pin support designated at 20, the said support including a pair of laterally spaced side walls 21 and a rear wall 22. The walls 21 and 22 are integrally connected to form the hollow pin support 20. A hinge pin 23 projects outwardly in opposite directions from the side walls 21.

The rear wall 17 is provided with a pair of hinge supports generally designated at 25. The hinge supports 25 are also integrally formed with the wall 17. As best shown in Figure 8, each hinge support 25 comprises an outwardly opening recess 26 extending partially into the hinge support and including an inner wall 27. Each hinge support 25 also includes an inner wall 27 having an inner recess 28. Each inner recess extends partially upwardly on each hinge support 25 and each inner recess 28 includes an outer wall 29. The recessed walls 27 and 29 meet approximately at the center of each hinge support 25 and at this particular point a pin receiving bore 30 is provided in each hinge support 25. Referring now more particularly to Figures 2, 3 and 4 the stages in the assembly are best shown. Figure 6 also shows the manner in which the cover 11 is assembled with the receptacle 15. The overall dimension or length of the hinge pins 23 is greater than the overall dimension between the meeting point of the inner wall 27 and the outer wall 29.

During assembly the hinge pins are inserted against the walls 29 which as best shown in Figure 2 taper inwardly and in a direction upwardly. By applying upward pressure on the hinge pins the operator wedges and slides the end of the hinge pin against the tapered walls 29 whereupon the hinge supports 25 flex outwardly and also the hollow condition of the hinge supports 20 permits a certain amount of inward flex of the sidewalls 21 so that the hinge pins will snap into position in the bores 30. Thus now a permanent hinge assembly is effected which cannot be dislodged after it is once assembled. The tapered outer wall 29 is also best shown in Figure 8.

Referring now to Figures 9 and 10, a modified hinge assembly for the cover 11 and the receptacle 15 is disclosed. The wall 14 comprises relatively thin hinge ears from which hinge pins 32 project inwardly. A hinge member 33 is provided on the wall 17 the said hinge member having recessed side walls 34, which as shown in Figure 10 which slope upwardly and outwardly. A hinge receiving bore 35 is provided on the hinge member 33 and projections 33 extend outwardly on opposite sides of the walls 34.

In assembly the hinge pins 32 are moved in position to engage the side walls 34. The hinge pins 32 have their ends spaced a dimension which is less than the

dimension between the walls 34 so that when the hinge pins 32 are forced in sliding relation upwardly on the walls 34 the hinge ears 31 flex apart sufficiently until the hinge pins 32 engage the bore 35 whereupon the ears 31 return to their original position and lock the hinge pins 32 within the bore 35. Thus also a permanent hinge is easily effected.

Thus it can be seen that an improved hinge construction has been disclosed which fully accomplishes the objects of the invention. Further modifications may be made without departing from the spirit of the invention as disclosed or the scope thereof as defined in the appended claims.

What is claimed is:

1. A hinge structure for molded plastic boxes including a receptacle part and a cover therefor both having side walls in substantially the same plane; a first hinge member comprising a hollow pin support projecting outwardly with respect to said side walls of said cover, said support including laterally spaced support walls extending substantially perpendicular with respect to the side wall of said cover, a rear wall spaced from the wall of said cover and integrally connected to said support walls, a hinge pin connected to each support wall, said pins projecting laterally with respect to said support walls and substantially parallel to said side wall of said cover, a hinge member connected to said side wall of the receptacle and projecting outwardly with respect thereto, said hinge member comprising a pair of laterally spaced hinge supports, each hinge support projecting transversely outwardly from the wall of said receptacle, each hinge support having an outwardly opening recess extending partially from the upper end of said support, said recess including an inner wall, each hinge support including a second inner recess extending partially from a lower end of said support wall, said recesses opening inwardly toward each other, said second recesses each including an outer wall, said inner and outer walls of said recesses being disposed in vertically offset relation, and having portions integrally joining each other, said hinge supports each including aligned pin receiving bores adjacent the juncture off said inner and outer walls, said inner walls tapering inwardly and upwardly, said overall length of said hinge pins being greater than the distance between said inner walls at said bores, whereby during assembly said pins are forced between and engage said tapered inner walls, and said support walls and inner walls flex to permit entry of said pins into said bores to effect a permanent hinge.

2. A hinge structure for molded plastic boxes including a receptacle part and a cover therefor both having side walls in substantially the same plane; a first hinge member comprising pin support projecting outwardly with respect to said side walls of said cover, said support including laterally spaced support walls, a rear wall spaced from the wall of said cover and integrally connected to said support walls, a hinge pin connected to each support wall, said pins projecting laterally with respect to said support walls and substantially parallel to said side wall of said cover, a hinge member connected to said side wall of the receptacle and projecting outwardly with respect thereto, said hinge member comprising a pair of laterally spaced hinge supports, each hinge support projecting transversely outwardly from the wall of said receptacle, each hinge support having an outwardly opening recess extending partially from the upper end of said support, said recess including an inner wall, each hinge support including a second inner recess extending partially from a lower end of said support wall, said recesses opening inwardly toward each other, said second recesses each including an outer wall, said inner and outer walls of said recesses being disposed in vertically offset relation, and having portions joining each other, said hinge supports each including aligned pin receiving bores adjacent the juncture off said inner and outer walls, said inner

walls tapering inwardly and upwardly, said overall length of said hinge pins being greater than the distance between said inner walls at said bores, whereby during assembly said pins are forced between and engage said tapered inner walls, and said support walls and inner walls flex to permit entry of said pins into said bores to effect a permanent hinge.

3. A hinge structure for molded plastic boxes including a receptacle part and a cover therefor both having side walls in substantially the same plane; a first hinge member comprising a pin support projecting outwardly with respect to said side walls of said cover, said support including laterally spaced support walls, a hinge pin connected to each support wall, said pins projecting laterally with respect to said support walls and substantially parallel to said side wall of said cover, a hinge member connected to said side wall of the receptacle and projecting outwardly with respect thereto, said hinge member comprising a pair of laterally spaced hinge supports, each hinge support projecting transversely outwardly from the wall of said receptacle, each hinge support having an outwardly opening recess extending partially from the upper end of said support, said recess including an inner wall, each hinge support including a second inner recess extending partially from a lower end of said support wall, said recesses opening inwardly toward each other, said second recesses each including an outer wall, said inner and outer walls of said recesses being disposed in and having portions integrally joining each other said hinge supports each including aligned pin receiving bores adjacent the juncture off said inner and outer walls, said inner walls tapering inwardly and upwardly, said overall length of said hinge pins being greater than the distance between said inner walls at said bores, whereby during assembly said pins are forced between and engage said tapered inner walls, and said support walls and inner walls flex to permit entry of said pins into said bores to effect a permanent hinge.

4. A hinge structure for molded plastic boxes including a receptacle part and a cover therefor both having side walls in substantially the same plane; a first hinge member comprising a pin support projecting outwardly with respect to said side walls of said cover, said support including laterally spaced support walls, a hinge pin connected to each support wall, said pins projecting outwardly from said support walls, a hinge member connected to said side wall of the receptacle and projecting outwardly with respect thereto, said hinge member comprising a pair of laterally spaced hinge supports, each hinge support projecting transversely outwardly from the wall of said receptacle, each hinge support having an outwardly opening recess extending partially from the upper end of said support, said recess including an inner wall, each hinge support including a second inner recess extending partially from a lower end of said support wall, said recesses opening inwardly toward each other, said second recesses each including an outer wall, said inner and outer walls of said recesses being disposed in vertically offset relation and having portions integrally joining each other, said hinge supports each including aligned pin receiving bores adjacent the juncture off said inner and outer walls, said inner walls tapering inwardly and upwardly, said overall length of said hinge pins being greater than the distance between said inner walls at said bores, whereby during assembly said pins are forced between and engage said tapered inner walls, and said support walls and inner walls flex to permit entry of said pins into said bores to effect a permanent hinge.

References Cited in the file of this patent

UNITED STATES PATENTS

2,460,488	Brunetti	Feb. 1, 1949
2,677,479	Kiba	May 4, 1954
2,734,222	Kiba	Feb. 14, 1956
2,765,949	Hillman	Oct. 9, 1956