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MOLDED HINGE STRUCTURE

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fig. 1.

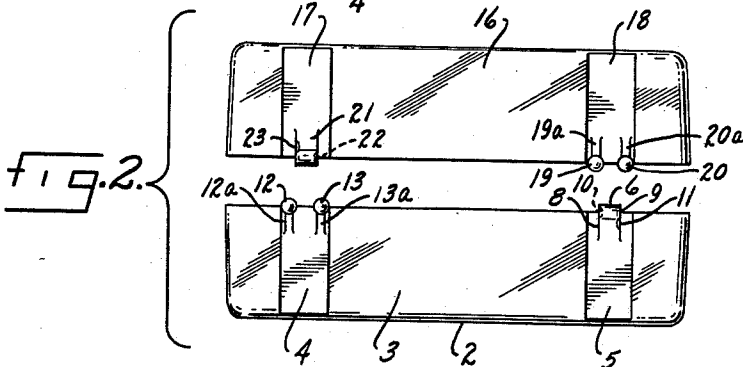
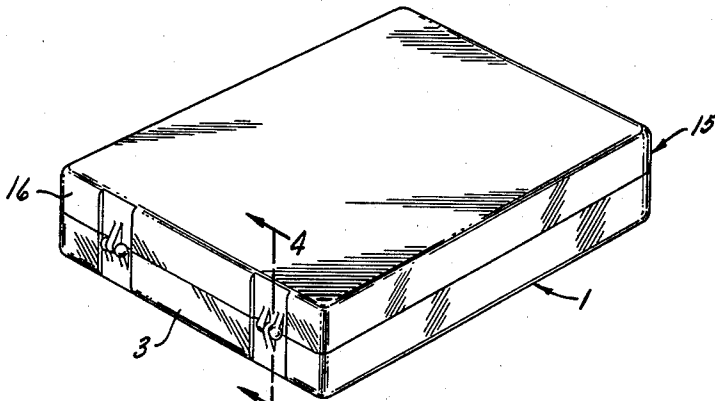


fig. 3.

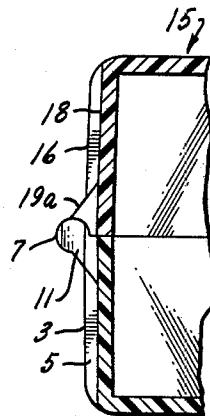
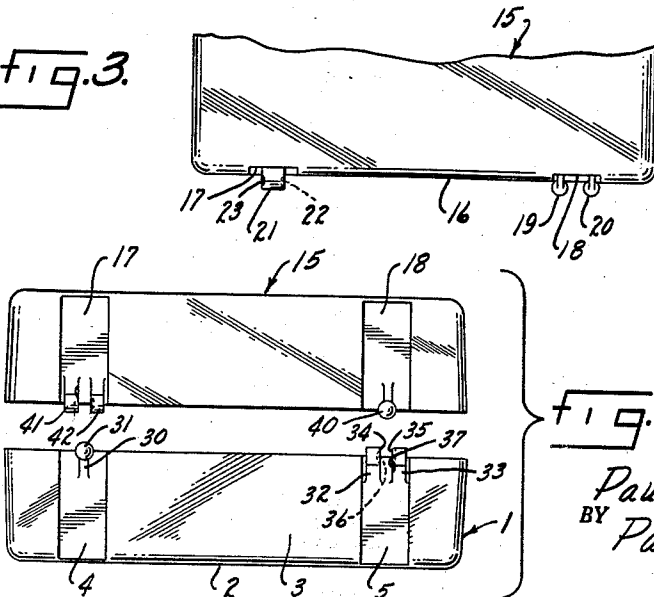


fig. 5.

fig. 4.  
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3,077,282  
**MOLDED HINGE STRUCTURE**  
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This invention relates to hinge mechanisms and has particular relation to a hinge structure formable by molding integrally with portions of molded plastic containers.

One purpose of the invention is to provide mating hinge segments which may be easily and simply assembled to form an effective hinge by means of pressure alone.

Another purpose is to provide a hinge structure effective to movably secure together two elements of a plastic container.

Another purpose is to provide a hinge and container-cover combination wherein the parts of the container are maintained in close juxtaposition when the cover is rotated away from said container.

Another purpose is to provide a hinge structure of maximum economy and simplicity in manufacture.

In the manufacture of plastic containers such as plastic boxes and the like it has become customary to mold hinge elements for the container and the container-cover integrally therewith. The respective hinge elements are then pressed together to join the cover to the container body. The hinge elements must then be effective to retain the cover on the container body as the cover is rotated between open and closed positions. In the past, one of such elements has been formed of ball-like portions and the other of said elements has similarly been formed of ball-like portions, the latter elements having opposed recesses or socket segments to receive the first-named ball-like elements. Such hinges have proved less than satisfactory, however, since the small area provided resulted in ease of breakage and a tendency toward unintentional separation. In an effort to avoid these and other difficulties another expedient has been the employment of elongated elements having oppositely directed overlapping slots, each of which had an open end and a closed end with a pair of ball-like portions forming a cooperating hinge element. This, too, was subject to certain drawbacks primarily in the area of assembly and manufacture. Accordingly, it is another purpose of the invention to achieve the desirable features of both a ball and socket arrangement and, simultaneously, to provide for a major contact area of opposed hinge elements.

Other purposes will appear from time to time during the course of the specification and claims.

I illustrate the invention more or less diagrammatically in the accompanying drawings wherein:

FIGURE 1 is a perspective view;

FIGURE 2 is a rear end view;

FIGURE 3 is a detail top plan view;

FIGURE 4 is a view in partial cross section taken on the line 4—4 of FIGURE 1; and

FIGURE 5 is a rear end view of a variant form of the invention.

Referring now to the drawings. The numeral 1 generally designates a container or box body. The body may be of various configurations having a bottom wall 2 and a side wall or side walls rising upwardly from the perimeter of the bottom wall 2. Since only the rear wall, indicated at 3, is of major interest herein, it alone will be discussed. The rear wall 3 has a pair of recesses 4, 5 formed therein, the purposes of which will appear hereinafter.

Extending rearwardly or laterally from the recessed portion 5, and formed integrally with the rear wall 3 is a rectilinear element or arm 6 having a rear surface 7 and a pair of elongated side surfaces 8, 9. It will be ob-

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served that the side surface 9 faces outwardly or away from the vertical center line of rear wall 3 and the side surface 8 faces inwardly toward the vertical center line of rear wall 3. Formed at a point intermediate the upper and lower and inner and outer edges of surface 8 is a socket 10. Formed intermediate the rear and forward edges of surface 9 and extending throughout the vertical length thereof, is a slot 11.

Extending rearwardly from the recessed portion 4 and in horizontal alignment with each other and with socket 10 and slot 11 are a pair of spaced ball-like portions or pintle elements 12, 13 respectively supported by spaced ears 12a, 13a. It will be observed that the ball portions 12, 13 are spaced apart a distance substantially equal to that portion of member 6 which extends between the inner wall of socket 10 and the inner wall of slot 11.

A cover for box 1 is indicated generally at 15. The cover 15 may take a variety of plan configurations normally such as to mate with the plan configuration of box body or container body 1. So far as material herein the cover 15 has a rear wall 16 with a pair of spaced recesses 17, 18, the latter being spaced apart a distance equal to that between the recesses 4, 5 of body 1.

Extending laterally or rearwardly from recess 18 are ball portions or pintle elements 19, 20 supported by ears 19a, 20a respectively. It will be observed that the elements 19, 20 are spaced apart a distance identical to that between members 12 and 13.

Extending laterally or rearwardly from recess 17 is a rectilinear hinge element or arm 21 having a socket 22 formed in the inwardly directed surface thereof and a slot 23 extending throughout the vertical length of, and intermediate the rear and forward edges of, the outwardly directed surface. It will be understood that the member 21 corresponds identically with member 6 and that members 19, 20 correspond identically with members 12, 13.

It will be observed that the rectilinear hinge elements 6, 21 and the ball portions 12, 13 and 19, 20 are reversed in position on the members 1 and 15. Thus the members 19, 20 are positioned to mate with the member 6 and the members 12, 13 are positioned to mate with the member 21. With this arrangement, and considering the members 1 and 15 to constitute containers having the same plan configuration, it will be understood that container-cover combinations of various depths may be formed by mating two covers 15 of identical or various depths or two bodies 1 of identical or various depths. It will be further understood that the body 1 could carry the members 6, 21 and the cover 15 could carry the members 12, 13 and 19, 20 for mating therewith without departing from the nature and scope of my invention.

Referring now to FIGURE 5, the box body 1 and cover 15, with rear wall recesses 4, 5 and 17, 18 respectively, are shown as provided with a variant form of my invention. Recess 4 has extending rearwardly therefrom a single ear 30 which supports an integral spherical or ball-like end member or pintle 31. Recess 5 has rearwardly extending therefrom a pair of spaced rectilinear members or arms 32, 33, the inner opposed, spaced surfaces of which are shown at 34, 35 respectively.

The face or surface 34 has formed intermediate its edges, and in alignment with ball 31, a socket 36. The face or surface 35 has a slot 37 extending vertically in alignment with socket 36 and ball 31 and intersecting the upper and lower edges of member 33.

It will be observed that cover 15, in FIGURE 5, has a single ball-like structure or pintle indicated generally at 40 in recess 18 and a pair of spaced members 41, 42 in recess 17. The member 40 corresponds identically with member 30, 31 and member 41, 42 correspond identically with members 30—37 inclusive. While body 1 and cover 15 are shown as having each a male member 31

or 40 and a female member 30—37 or 41, 42, either member 1 or 15 could be provided with two male members and the other provided with two female members without departing from the nature and scope of my invention.

While the socket elements 10, 22 are shown as being formed on the inside surfaces of members 6 and 21 and the slots 11 and 23 are shown on the outside surfaces thereof, it will be realized that these positions could be reversed without departing from the nature and scope of the invention. It should further be kept in mind that the boxes 1 and covers 15 are assembled in a vertical plane, i.e. the covers 15 and boxes 1 are pressed together with the cover in direct alignment with the box as illustrated in FIGURE 2. Alternatively the cover could be rotated until it lay in a horizontal plane corresponding essentially to a fully opened position. In any case the hinge elements are assembled by movement thereof toward each other in a plane parallel the rear walls 16, 3. Thus the slot 11 is available for engagement in either direction paralleling the rear wall 3.

The use and operation of my invention are as follows:

The members 19, 20 are pressed, by manual or machine pressure, downwardly on opposite sides of the member 6 and, simultaneously, the member 21 is pressed, by manual or machine pressure, downwardly between members 12, 13. As this is done the member 20 will slide easily within the open-ended slot 11 and the member 12 will slide easily within the open-ended slot 23. The member 19, however, will be forced slightly outwardly away from the member 20 as it traverses that portion of surface 8 above the socket 10. Similarly the member 13 will be forced away from member 12 as it approaches the socket 22. This separation is only momentary, however, and the members 19, 13 soon snap into engagement with the sockets 10, 22 and the hinge structure is then formed and completed.

The slots 11, 23 are effective to provide a maximum contact area for the opposed ball segments 20, 12 to permit rotation thereof within such slots and to retain the cover and body against misalignment or separation in a direction paralleling the rear walls 3, 16. Similarly, the sockets 10, 22 are effective to retain the ball elements 19, 13 for rotation therein, against such parallel separation of the cover 15 and body 1 and also, during the relatively limited periods in which the cover is open, to retain the cover against vertical misalignment with respect to the body 1.

Respecting the form of the invention illustrated in FIGURE 5, the ball members 31, 40 are pressed, respectively, between members 32, 33 and 41, 42. It will be observed that the bottom of slots 37 is spaced from the bottom of sockets 36 a distance equal to the diameter of ball members 31, 40. The members 31, 40 slide easily into open-ended slots 37 but the members 32, 33 and 41, 42 are forced apart slightly as the ball members enter therebetween, the resiliency of the female members being such as to cause them to snap back into the original position as the ball members are aligned with sockets 36 to pivotally grip ball members 31, 40.

The recesses 4, 5, 17 and 18 permit maintenance of rear walls 16 and 3 in close juxtaposition when the cover 15 is in completely open position on body 1.

Whereas I have described and claimed an operative device, I wish it to be understood that this showing is to be taken in an illustrative or diagrammatic sense. There are many modifications of the invention that will fall within the scope of the invention that will be apparent to those skilled in the art. The scope of the invention, therefore, should be limited only by the scope of the hereinafter appended claims.

I claim:

1. A plastic container which includes, in combination, a body member and a cover member therefor, each of said members having a rear wall, two hinge members spaced on the rear wall of the cover member, two hinge members spaced on the rear wall of the body member, said spaced members on the rear walls forming two hinge units when the cover member is joined to the body member, each hinge unit having a male hinge member extending from one rear wall and a female hinge member extending from the other rear wall, said male hinge member having a pair of ball-like pintles, said female hinge member having a rectilinear element with a pair of opposed first and second spaced surfaces, a socket formed completely within the edges of said first surface, a continuous vertical slot extending throughout the second surface, said slot being open at its opposite ends and extending in parallel relationship with its rear wall, and said pintles on the male element spaced apart a distance substantially equal to the distance between the bottom of said socket and the bottom of said slot.

2. A plastic container which includes, in combination, a body member and a cover member therefor, each of said members having a rear wall, a pair of spaced recesses in each rear wall, a rectilinear element extending from one recess and a pair of spaced pintles extending from the other recess on each rear wall so that a rectilinear element on the cover member is aligned with spaced pintles on the body member and a rectilinear element on the body member is aligned with spaced pintles on the cover member when the cover member is joined to the body member, each of said rectilinear elements having opposed first and second spaced surfaces, a socket formed within the edges of the first surface, and a continuous vertical slot extending throughout the second surface, said slot being open at its opposite ends, and said pintles being spaced apart a distance sufficient to provide for snap fit into said slot and said socket.

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