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LOCKING MEANS FOR CARTON COVERS

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2 Sheets-Sheet 1

Fig. 1.

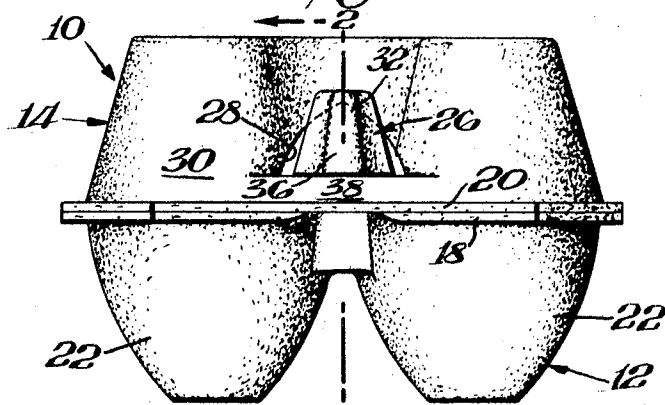


Fig. 2.

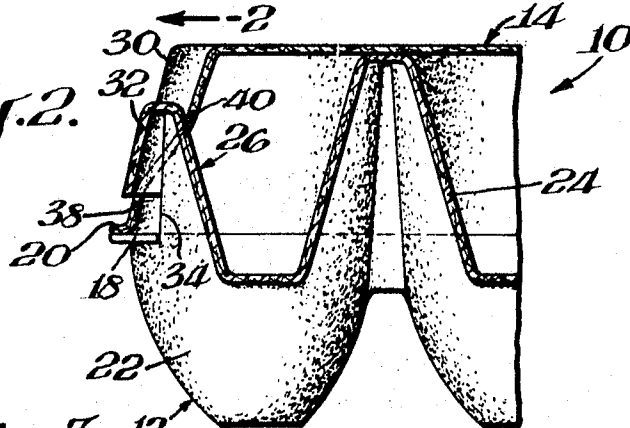
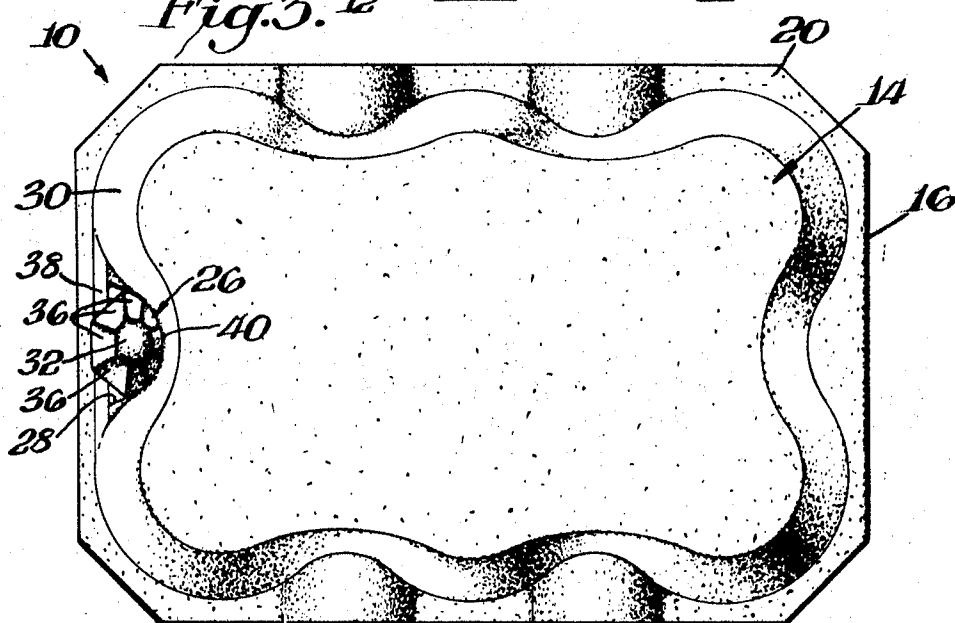


Fig. 3.





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## LOCKING MEANS FOR CARTON COVERS

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10 Claims

### ABSTRACT OF THE DISCLOSURE

Containers molded of fibrous pulp material comprising upper and lower halves with a post latch on one of the container halves and a locking aperture in the upstanding side wall portion of the other half arranged to receive the post latch when the container is closed. The locking aperture defines a forward edge portion in the side wall beyond which the post latch laterally extends when the container halves are latched together and a rear edge portion in the side wall that limits rearward flexing of the post latch in a direction away from the forward edge portion.

### Background of the invention

The present invention relates to containers and more particularly to molded pulp containers having upper and lower halves, and a latching arrangement for releasably locking the halves together.

Prior to the present invention, numerous arrangements have been proposed for releasably locking container halves together. These locking arrangements must be simple in design, reliable and easy to operate properly. With containers molded of fibrous material, frequent opening of the container to inspect or obtain its contents often damages or destroys the locking mechanism thereby rendering that mechanism unsuitable for its intended purpose. For example, in Hartmann Patent 3,276,656, dated Oct. 27, 1964, a locking device is described for releasably connecting upper and lower container portions together. A projection on one of the container halves has a hook-shaped head that cooperates with an aperture or recess in the other half to lock the container closed. Once locked, the hook-shaped head must be urged away from the edge of the aperture to open the container. Often, the force exerted on the locking projection to open the container causes a rupture at the junction between the hook-shaped head and the remainder of the projection which renders the locking arrangement useless.

Friday Patent 2,873,057, dated Feb. 10, 1959, describes a container having a cover lock wherein the locking arrangement is extremely weak due to the lack of vertical wall structure at the locking edge of the locking aperture. Moreover, the rear edge of the locking aperture is positioned so as to encourage destruction and rupture of the post when rearward unlatching pressure is applied.

Accordingly, an object of the present invention is to provide a fibrous pulp container having a simple and highly reliable arrangement for releasably locking the container halves together.

### Summary of the invention

In accordance with the present invention, a container molded of fibrous pulp material has upper and lower halves with a post latch on one of the halves and a locking aperture in the upstanding side wall of the other half arranged to receive the post latch when the container is closed. The locking aperture defines a forward edge portion in the side wall beyond which portion the post latch laterally extends when the container halves are latched

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together. Additionally, the aperture defines a rear edge portion in the side wall and this portion functions to limit rearward flexing of the post latch in a direction away from the forward edge portion.

The post latch is dimensioned slightly larger than the locking aperture so that the head portion of the latch must be collapsed slightly during latching and unlatching of the container. Preferably, the post latch is only larger than the locking aperture in the direction between the forward and rear edge portions defined by the aperture. Moreover, the post latch may include a head portion with a polygonal cross section comprising a plurality of inclined side walls each of which is slightly concave in configuration.

A pair of post latches may be provided on one of the container halves with locking apertures disposed in the other half arranged to receive the latches when the container is closed. The lower half can include a plurality of article receiving pockets with spaced apart half-post formations in the side wall between the pockets. Additionally, each post latch can be formed as an upward extension of selected half-post formations.

### Brief description of the drawing

Novel features and advantages of the present invention will become apparent to one skilled in the art from a reading of the following detailed description in conjunction with the accompanying drawing wherein similar reference characters refer to similar parts and in which:

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FIGURE 1 is an end elevational view of a container according to the present invention;

FIGURE 2 is a sectional elevational view taken along line 2—2 of FIGURE 1;

FIGURE 3 is a top plan view of the container shown in FIGURE 1;

FIGURE 4 is a top plan view of another container according to the present invention with portions of the cover broken away to show detail;

FIGURE 5 is a front elevational view of the container shown in FIGURE 4; and

FIGURE 6 is a sectional elevational view taken along line 6—6 of FIGURE 5.

### Detailed description of the invention

Referring in more particularity to FIGURES 1—3 of the drawing, reference numeral 10 represents a container molded of fibrous pulp material by suction deposition of fibers suspended in an aqueous medium on a suitably configured open-face molding die. The container includes a lower half or bottom section 12 integrally connected to an upper half or cover section 14 along a pulp hinge 16. The bottom section has a peripheral rim 18 that engages a similar rim 20 on the cover when the container is in the closed position illustrated in the drawing.

The lower half 12 of the container is divided into a plurality of individual article receiving pockets 22 by suitable rib structure so that individual items such as eggs, for example, can be positioned in these pockets. As evident from the drawing, an upwardly extending hollow post formation 24 is disposed in the center of each group of four pockets and the lid rests against the top of this formation when the container is closed. Alternatively, without departing from the scope of this invention, the lower half of the container may take the form of a tray having a bottom wall with an upwardly extending side wall connected thereto.

The lower half of the container carries a post latch 26 formed as an upward extension of the side wall between the end pockets in the lower container half. The post latch is located between the end pockets of the container opposite the pulp hinge 16 and cooperates with a locking

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aperture 28 in the upstanding side wall portion 30 of the cover 14 to lock the container closed. The post latch includes a head 32 with a polygonal transverse cross-section and directly below the head a notch 34 is provided to facilitate the latching operation. The head of the post latch comprises a plurality of side walls 36 each of which is inclined inwardly in a direction away from the lower half of the container. In the embodiment of the invention illustrated in FIGURES 1-3, the head has an octagonal cross-section and each of the eight side walls 36 is slightly concave in configuration to assist in deforming the head slightly during latching and unlatching of the container halves.

As explained above, the locking aperture 28 positioned in the upstanding side wall 30 of the container cover 14 is arranged to receive the post latch 26 when the container is closed. The aperture is defined in part by a horizontal forward or hooking edge portion 38 beyond which the head 32 of the post latch laterally extends when the container halves are latched together. Additionally, the aperture defines a rear edge portion 40 which prevents or substantially limits rearward flexing of the post latch in a direction away from the forward edge portion. As shown in FIGURE 2, the rear edge portion 40 is positioned directly behind the upper portion of the post latch when the container halves are latched together whereby rearward flexing of the latch is prevented.

The major horizontal cross-section of the post latch 26 is slightly larger than the locking aperture in at least one direction, this direction being illustrated as the horizontal direction between the forward and rear edge portions 38, 40 in the upstanding side wall 30 of the container cover 14. Thus, in moving the post latch through this locking aperture, the latch is deformed slightly, and after passing through the aperture it reassumes its original shape. The head 32 of the post latch is thereby positioned directly over the horizontal forward edge portion 38 in the side wall of the cover 14 to lock the container halves together.

FIGURES 4-6 illustrate another embodiment of the present invention wherein a container 100 comprises a lower half or bottom member 102 and an upper half or top member 104. The bottom member 102 includes upstanding side wall portions such as end walls and a front wall 106 and a rear wall 108, each having a plurality of inwardly contoured half-posts 110 integrally formed at spaced intervals to help define a plurality of article-receiving pockets 112. Rib means 114 intersecting with the half-posts and with a series of full posts 116 located interiorly of the container complete the definition of the plurality of downwardly dished article-receiving pockets 112 in the bottom member 102. As can readily be seen, the pockets 112 are adapted to hold ten articles, such as eggs, for example, and in the illustrated embodiment, they are arranged in two rows of five articles each. The rows extend parallel with the front and rear walls 106, 108 of the bottom member.

The ribs and posts and half-posts of the bottom member 102 not only define the plurality of article-receiving pockets 112, but also impart a great deal of strength to this portion of the container, and thus hold the front and rear walls 106, 108 of the bottom member in relatively fixed relationship to each other even under the stresses and strains encountered under normal handling of the container.

The cover half 104 of the container 100 includes a substantially planar base portion 118 suitable for carrying indicia such as printed advertising material, flat labels glued or otherwise adhered thereto which in turn carry pre-printed advertising material, or the like. The cover further includes an upstanding front wall 120 and rear wall 122 integrally connected with the planar base portion 118. An elongated molded pulp hinge 124 connects the lower edge of the top member rear wall 122 with the upper edge of the bottom member rear wall 108 to

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enable the top member to be folded down over the bottom member from an opened to a closed position.

A series of generally vertically disclosed buttress ribs 126 are integrally formed as inwardly extending indentations in the upstanding front and rear walls 120, 122 of the top member 104. The buttress ribs 126 serve to resist vertically directed forces and thus strengthen the top half of the container in the same manner that the half-posts 110 strengthen the bottom portion of the container against vertically directed forces. Additionally, the integrally formed buttress ribs 126 in the upstanding side walls of the top member merge with the planar base portion 118 of the top.

In the embodiment of the invention illustrated in FIGURES 4-6, two post latches 128 and two locking apertures 130 are provided for locking the bottom and top members together. Each post latch 128 is advisably formed as an upward extension of one of the half-posts 110 in the front wall 106 of the bottom member 102. One post latch is positioned on the half-post that separates the first and second article-receiving pockets 112 of the front row, and the other is positioned on the half-post between the fourth and fifth pockets of the front row. Each post latch 128 includes a head 132 having a polygonal transverse cross-section and directly below the head a notch 134 is provided to facilitate latching of the container members together, as explained more fully below. The head 132 of the post latch 128 comprises a plurality of side walls 136 each of which is inclined inwardly in a direction away from the lower half of the container.

As explained above, each of the locking apertures 130 positioned in the upstanding front wall 120 is arranged to receive one of the post latches 128 when the container is closed. These apertures are positioned in the buttress ribs 126 directly above the post latches. Each aperture 130 is defined in part by a horizontal forward or hooking edge portion 138 beyond which the head 132 of the post latch laterally extends when the container halves latch together. Additionally, each aperture defines a rear edge portion 140 which prevents or substantially limits rearward flexing of each post latch in a direction away from the forward edge portion 138. As shown in FIGURE 6, the rear edge portions 140 in the upstanding front wall 120 defined by the locking apertures 130 are positioned directly behind the upper portions of each post latch 128 when the container members are latched together whereby rearward flexing of the latch is prevented.

As evident from the drawing, the major horizontal cross-section of each post latch 128 is slidably larger than its associated locking aperture in at least one direction, this direction being the horizontal direction between the forward hooking edge 138 and the rear edge 140 in buttress ribs 126 of the top member 104. Accordingly, in moving each post latch through its associated locking aperture, the latch is distorted slightly, and after passing through the aperture it reassumes its original shape.

In operation, the container locking arrangement according to the present invention relates to an improved container construction. For instance, after the open container has been filled with articles, such as eggs, usually by means of an automatic filling machine, the filled container is conveyed through an automatic lid closing machine where the container halves are latched together. Such machines are of several varieties, and they generally manipulate the various functional portions of the container in the same manner that these portions would be manipulated by hand, but at much higher speeds. Concerning the containers of the present invention all that is necessary after the articles are positioned within the article-receiving pockets is that the cover member be moved downwardly about the hinge means so as to close the container. The post latch or post latches, if plural latching arrangements are used, then enter the locking apertures disposed in the upstanding side wall of the cover member. Since the head portion of each post latch is slightly

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larger than the locking aperture into which it is inserted in the horizontal direction between the forward and rear edge portions defined by the aperture, the head portion is deformed, compressed or collapsed slightly as the cover section continues to close. Finally, the marginal rims of the cover and bottom members abut one another and the head portion of the post latch clears the forward hooking edge portion of the aperture. The resilient nature of the molded pulp material from which the container is made causes the head portion of the post latch to reassume its normal shape, or in other words its configuration prior to deformation whereby the container members are releasably latched together. To unlock the container, the head portion of each post latch is deformed slightly until its cross-sectional outline is smaller than the locking aperture. The cover half of the container can then be moved away from the bottom half to its open position.

What is claimed is:

1. A container molded of fibrous pulp material comprising upper and lower halves, a post latch of the type having a latching ledge and a head portion therebeyond on one of the container halves, a side wall portion on the other container half and a locking aperture in the side wall portion arranged to receive the post latch when two halves of the container are in the closed position, the locking aperture being defined by a forward edge portion in the upstanding side wall over which the latching ledge of the post latch laterally extends when the container halves are latched together and a rear edge portion in the side wall that limits rearward movement of the head portion of the post latch in a direction away from the forward edge portion.

2. A container molded of fibrous pulp material as in claim 1 wherein the post latch is dimensioned slightly larger than the locking aperture whereby the latching ledge of the post latch must be collapsed slightly during latching and unlatching of the container halves.

3. A container molded of fibrous pulp material as in claim 2 wherein the post latch is only larger than the locking aperture in the direction between the forward and rear edge portions defined by the locking aperture.

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4. A container molded of fibrous pulp material as in claim 3 wherein the head portion of the post latch has a substantially polygonal cross-section.

5. A container molded of fibrous pulp material as in claim 4 wherein the head portion of the post latch comprises a plurality of inclined side walls.

6. A container molded of fibrous pulp material as in claim 5 wherein the side walls are slightly concave.

7. A container molded of fibrous pulp material as in claim 6 wherein the post latch is on the lower half of the container and the lower half includes a plurality of article-receiving pockets.

8. A container molded of fibrous pulp material as in claim 3 including a second post latch on one of the container halves and a second locking aperture in the side wall portion of the other container half arranged to receive the second post latch when the container is closed.

9. A container molded of fibrous pulp material as in claim 8 wherein each post latch is on the lower half of the container and the lower half includes a plurality of article-receiving pockets.

10. A container molded of fibrous pulp material as in claim 9 wherein the side wall portion of the lower container half includes spaced apart half-post formations and each post latch extends upwardly from one of the half-post formations.

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DAVIS T. MOORHEAD, Primary Examiner

U.S. Cl. X.R.

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