Feb. 11, 1930. M. KOPPELMAN 1,746,838

PACKING HOLDER FOR FRAGILE ARTICLES

Filed Aug. 9, 1929 2 Sheets-Sheet 1

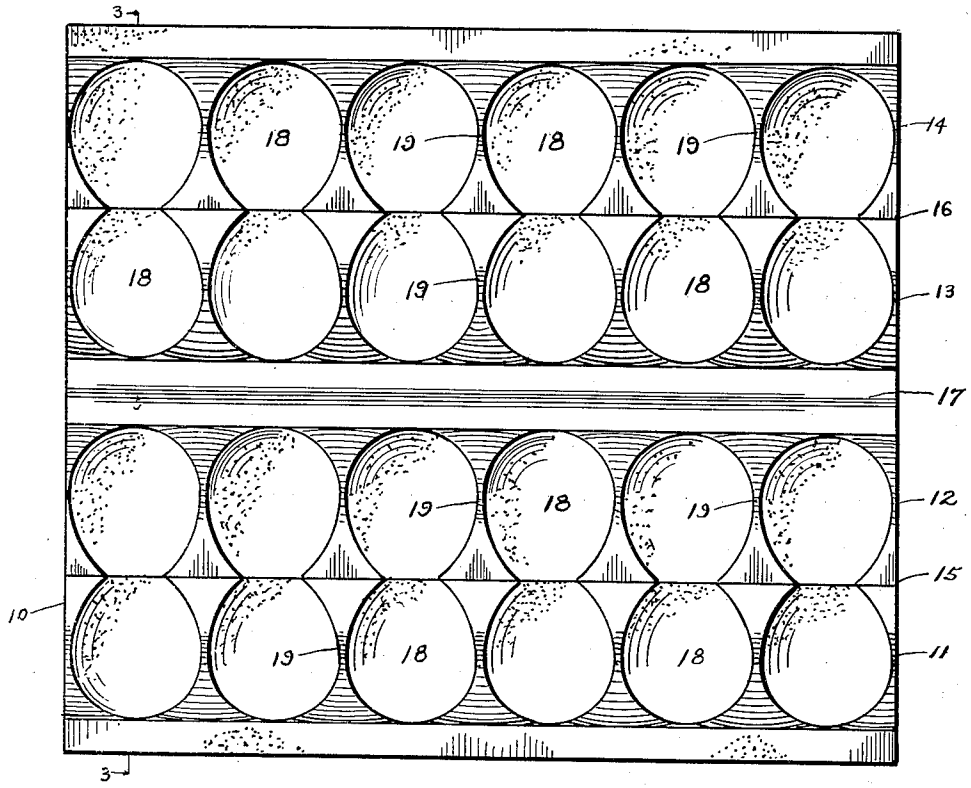


Fig. 1

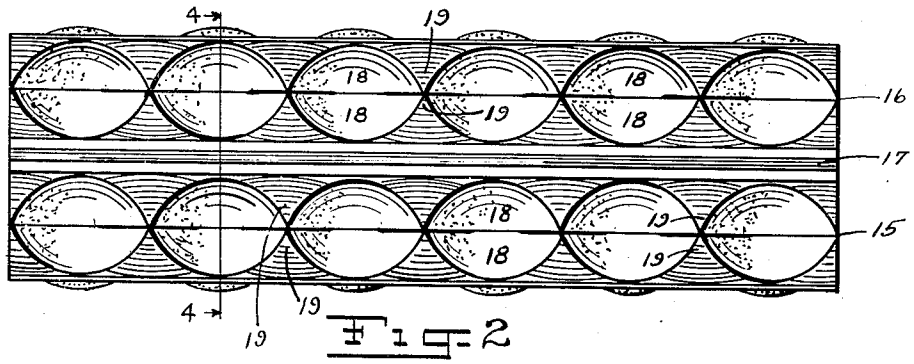


Fig. 2

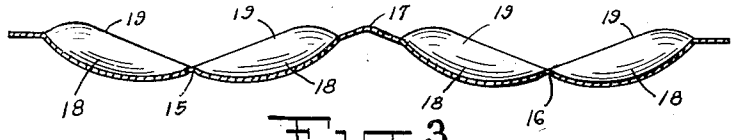


Fig. 3

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PACKING HOLDER FOR FRAGILE ARTICLES

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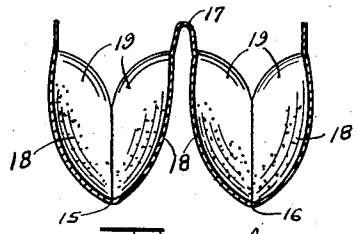


Fig. 4

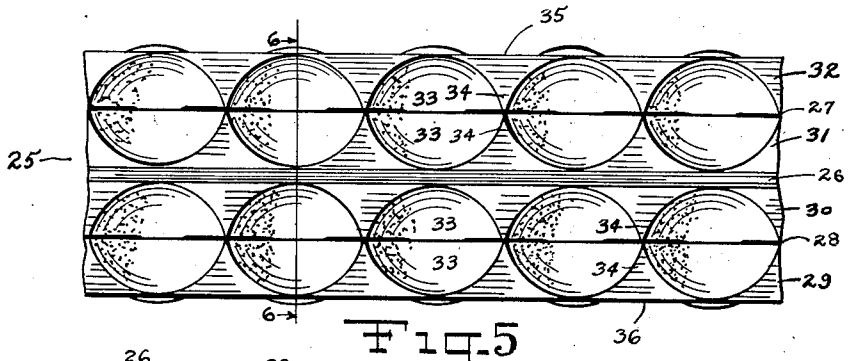


Fig. 5

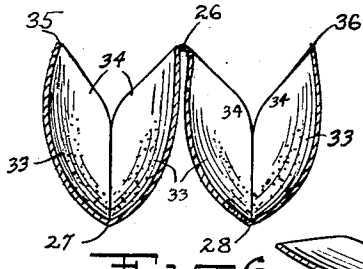


Fig. 6

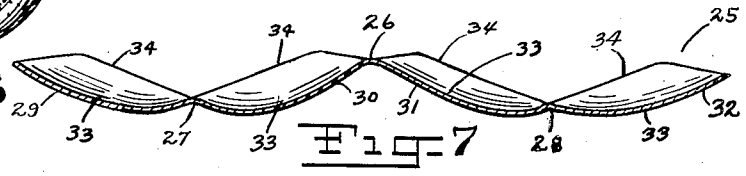


Fig. 7

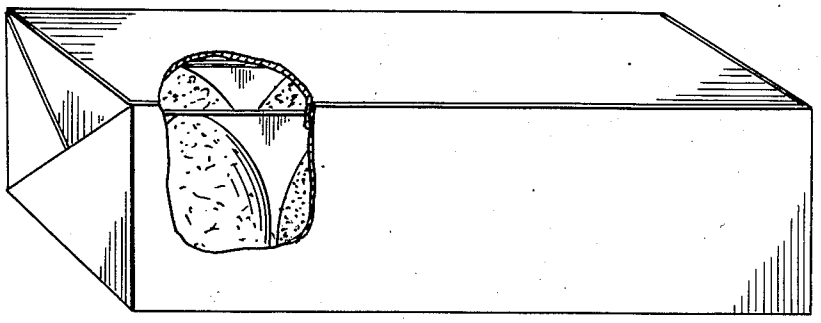


Fig. 8

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Patented Feb. 11, 1930

1,746,838

UNITED STATES PATENT OFFICE

MORRIS KOPPELMAN, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HOLED-TITE PACKING CORPORATION, A CORPORATION OF NEW YORK

PACKING HOLDER FOR FRAGILE ARTICLES

Application filed August 9, 1929. Serial No. 384,591.

The present improvements relate to packing holders for fragile articles such as eggs and for fruits, and numerous other globular articles and have as their primary object, among others, the provision of a foldable holder or filler adapted to be used as a container or in other cartons or containers.

A further object is to provide a novel one piece holder, which, with a few folding operations, will provide a plurality of individual article compartments or cells. Another object is to provide a holder which completely protects the packed articles from all sides and separates same from other articles in the holder.

A still further object is to provide a novel article holder having body portions which are devoid of flat portions likely to be weakened by shocks or strains, and one which comprises a continuous series of depressions and projections merging with one another, so that the entire holder is greatly strengthened and resistance to crushing and shock is increased.

A further object is to provide a holder of the type indicated wherein the depressions and projections extend from hinge to hinge and protrude on opposite sides of the plane of said hinges.

Another object is the production of a novel article holder of such material and shape, that the strength, durability, cushioning effect and usefulness of the holder is increased and the cost of production decreased.

In practicing the present improvements the holder is preferably made of light weight material, such as cardboard, unfinished pulp and the like. The projections and depressions are preferably formed in the sheet simultaneously with the formation thereof at the time of manufacture. In forming the holder with projections and depressions thereon, wood pulp, cellulose or other fibrous material is employed, the fibres being first placed in a liquid bath. Macerated paper, thoroughly disintegrated and mixed with water until it has the consistency of thick soup may be employed, as may other similar materials. The formation of the holders may then be accomplished by molding or felting by means of suitable dies or molds, whereby a holder of relatively yieldable material results, with the aforementioned projections and depressions therein, all consisting of intimately matted fibres.

Further objects and advantages of the improvements will be apparent to those skilled in the art upon reference to the accompanying specification and drawings in which—

Fig. 1 is a plan view of the improved holder, in unfolded position;

Fig. 2 is a top plan view of the holder, in folded position;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a section on line 4—4 of Fig. 2;

Fig. 5 is a top plan view of a folded holder, illustrating a preferred embodiment;

Fig. 6 is a section on line 6—6 of Fig. 5;

Fig. 7, is a section of the holder shown in Fig. 6, in unfolded position;

Fig. 8, is a perspective of a carton or container, with part broken away to show the holder therein.

The holders illustrated may be formed of relatively yieldable unfinished fibrous material by the pulp sucking process. In this process, the relatively short and wet pulp fibres are drawn onto foraminous forms, to form a coating or sheet in which the fibres are felted or matted together in overlapping, interengaging and superposed relation with slight regard to organized arrangement. By reason of the above described texture of the entire holder, the dried fibres will form a relatively rigid holder but at the same time will give it an inherent elasticity. Therefore this method of making the sheet insures proper and accurate form when dry and the preservation of that form in use since any pressure on the sheet or any part thereof will tend to move its fibres from their normal position and will be constantly resisted thereby, to the end that all the parts of the holder will always have a tendency to return to their original position, which causes them to exert a counter pressure when slightly pressed or drawn therefrom.

Accordingly the entire holder and the projections and depressions thus formed therein, have great strength and will preserve their shapes under ordinary conditions of use and

when unfolded or folded to form the holder, a great amount of inherent elasticty is found to be present therein.

Referring to Figs. 1 to 4 wherein one embodiment of the present improvements is illustrated, the sheet 10, formed in the above described manner, comprises the sections 11 to 14. The sections 11 and 12 are united by a connecting portion in the form of a fold line 15, while sections 13 and 14 are similarly united by a connecting portion or fold line 16. These pairs of sections are furthermore united, as illustrated by a central connecting portion or hinge 17. Each of the aforementioned sections is made up of a plurality of cup-like depressions 18 and projections 19. As more clearly seen in Figs. 2 to 4, said depressions protrude on one side of the plane of the connecting portions 15 to 17 while the projections 19, protrude in an opposite direction beyond said plane.

The projections 19 are of pyramidal form, the walls however being curved in all directions. Upon reference to Figs. 3 and 4 it is seen that these projections originate at the fold lines 15 and 16 and increase in size across the sections 11 to 14 until they approach a point adjacent the opposite edges of the section whence they curve back toward the sections and merge with the edges thereof.

It is notable that these projections 19 rise from the sections and are located in between each cup-like depression 18. Accordingly the walls of the projections slope away in graceful curves and merge with the adjacent depressions so that the longitudinal extent of the sections 11 to 14 comprise a series of continuously curved depressions and projections merging one with another.

Upon reference to Figs. 2 and 4, the sheet 10 may be seen in folded relation to form an article holder. By folding the sheet downwardly along connecting portions 17, and again in an opposite direction at fold lines 15 and 16, it is seen that a W-shaped holder results. Two connected V-shaped rows are thus formed with sections 11 to 14 forming inclined walls thereof. By this folding operation, the projections 19 and depressions 18 are brought into juxtaposition, the former meeting at the center of the rows and forming, with the depressions with which they merge, rounded individual cells or compartments.

Accordingly the connecting portions 15 and 16 (Fig. 4) serve as the base for the holder, with the articles to be packed enclosed and supported by the cup-like depressions and projections. The articles are thus completely separated one from another and efficiently cushioned and protected throughout due to the form and texture of the holder. As illustrated in Fig. 8, the holder may be placed in a surrounding carton for shipment or display.

In Figs. 5 to 7 the preferred embodiment is illustrated wherein the sheet 25 is divided by fold lines or hinges 26 to 28 into sections 29 to 32. In this form the cup-like depressions 33 and projections 34 extend across the sections from hinge to hinge, occupying the entire width thereof. The longitudinal extent of each section comprises depressions 33 and projections 34 alternately formed and merging with one another so that each section has continuously curved walls, being entirely free of any flat portions.

It is notable that the projections and depressions merge with the hinge portions and extend to the opposite edges of the sections. As in the form first described, the projections 34 are of pyramidal form with sides curving in all directions. Likewise the projections rise from the edges of the sections and in traversing same, increase in height.

The preferred form is shown in folded relation in Figs. 5 and 6 wherein a W-shaped holder results, comprising two V-shaped rows. It is notable that the depressions 33 extend to one side of the planes passing through adjacent hinges 26 and 27, and 26 and 28, as well as on one side of planes passing through the base hinges 27 and 28 and the upper outer edges 35, 36 of the holder. Likewise the projections 32 protrude in an opposite direction beyond such planes.

When the sheet is folded to form the holder, see Figs. 5 and 6, opposite projections 34 meet at the center of the rows and together with the oppositely disposed depressions 33, form individual article compartments or cells. Each article is thus completely separated from the others, and is cushioned and protected from shocks by the shape and texture of the holder.

The width of the sections 29 to 32 of the holder is such that when folded, as shown in Fig. 6, the upper edges 35, 36 and central hinge 26 extend above the upper limits of the packed articles so that shocks or blows from above will be borne by the walls of the holder and not by the articles. The protection will be increased by having the central hinge 26 slightly higher than the outside edges of the holder, which form is also contemplated in the present embodiment.

The strength of the holder and the cushioning effect resulting in the present form cannot be overemphasized. The holder is adapted to be placed in a surrounding carton and container for shipment or display. When containers of this type are stacked one upon the other, the weight and pressure exerts a crushing effect on the container. This is not borne or experienced by the packed articles due to the form of the holder. The weight is experienced by the central hinge 26 and the upper outer edges 35, 36 of the holder. It is thus resisted by the inclined walls of the holder and by the lower hinge

portions forming the base thereof and resisted by the continuously arched merging walls of the projections and depressions. In this manner the entire holder, rather than parts thereof, resist the pressure. Additional strength is also given to the holder and the walls thereof by having the upper limits (Fig. 6) of the depressions and projections merge directly into the central fold line 26 and directly into the upper outer edges 35, 36, of the holder. This feature greatly strengthens these upper areas of contact, so that pressure from above is borne by them and dissipated through the holder rather than by flat portions which may bend or crush. Obviously therefore, pressure brought to bear on these upper edges is transmitted directly to and resisted by the curved walls of the depressions 33 and projections 34 individually as well as collectively by reason of their meeting at the center of the V-shaped rows.

It is to be noted that the entire holder is formed in one manufacturing operation with the projections, depressions and hinge portions integral therewith, all consisting of intimately matted fibres thereby providing a sturdy and durable holder for cushioning and protecting packed articles. No cut or broken portions are present in the holder, which is also free of flat portions.

Various modifications of the present improvements may occur to those skilled in the art and may be made without departing from the scope of the improvements.

I claim:

1. A holder for fragile articles comprising a sheet of material created with article holding portions and connecting portions, said sheet being foldable along said connecting portions to form a W-shaped holder, the inclined walls of said sheet being continuously curved with alternate depressions and raised formations for providing article cells.

2. An article of manufacture comprising a sheet of material having fold lines defining hinges for folding same into a plurality of inclined walls defining V-shaped rows, said walls comprising a continuous series of depressions and projections merging with one another and extending to the lower limits of the rows.

3. A foldable holder comprising a sheet of material having hinges for folding same into a plurality of oppositely disposed inclined walls, projecting members extending laterally toward each other from complementary walls, said members extending to the lower edges of the walls, and depressions in said walls between said members, said depressions extending to the lower edges of the walls.

4. An article of manufacture comprising a sheet of material having longitudinal fold lines forming hinges for folding said sheet into a W-shaped holder, complementary sides of the holder having opposed depressions and projections originating at the bottoms of said sides and extending upwardly thereon.

5. A holder for fragile articles comprising a sheet of material having parallel fold lines dividing same into parallel strips, each strip having depressions and projections alternating throughout the length of the strips, said depressions and projections extending across the strips from fold line to fold line, and respectively protruding in opposite directions beyond a plane passed through said fold lines.

6. A holder for fragile articles comprising a sheet of material having parallel fold lines dividing same into parallel strips, the entire area of each strip comprising continuously curved depressions and projections merging with one another, said depressions and projections respectively protruding in opposite directions beyond a plane passed through adjacent fold lines.

7. A holder for fragile articles comprising a sheet of material having parallel fold lines dividing same into rectangular sections, said fold lines providing hinges for bending each section in an opposite direction for forming a W-shaped holder whereby said hinges constitute the upper and lower limits of the holder, depressions in each section extending across same from hinge to hinge, and projections protruding from said sections in a direction opposite from that of said depressions, said projections increasing in size from the bottom of the holder towards the upper portion thereof.

8. A holder for fragile articles comprising a sheet of material having parallel rows of cup-like depressions and projections alternately provided, said rows being connected by fold lines constituting hinges for bending said rows in opposite directions, said projections protruding from the same side of the sheet for meeting when the rows are folded, said depressions extending from the sheet in a direction opposite to that of said projections.

9. A holder for fragile articles comprising a sheet of material having parallel rows of cup-like depressions and projections merging with one another and with fold lines of the sheet, said rows being connected by fold lines constituting hinges for bending said rows in opposite directions, said projections protruding from the same side of the sheet for meeting when the rows are folded, said depressions extending from the sheet in a direction opposite to that of said projections.

10. A holder for fragile articles comprising a sheet of material created with article holding portions and connecting portions, said sheet being foldable along said connecting portions to form a W-shaped holder, the inclined walls of said sheet being continuously curved with alternate depressions and raised formations for providing article cells,

said depressions extending on one side and said raised formations extending on the opposite side of the plane of said connecting portions.

11. A holder for fragile articles comprising a sheet of material created with a series of rows of depressions and projections therein, integral hinge means between each of said rows whereby they may be folded toward one another, said rows when folded having complementary projections contacting whereby said rows are inclined between adjacent hinges.

12. A holder for fragile articles comprising a sheet-like member having lines defining hinge portions and wall portions, said wall portions having bulged partitions molded therein and extending from hinge to hinge, cup-shaped depressions molded in said portions and extending from hinge to hinge, said partitions and depressions extending on opposite sides of the plane of adjacent hinges.

13. A holder for fragile articles comprising a sheet of material having rows of raised forms therein, means for folding said sheet flanking said rows, said forms extending across said rows and increasing in height between said folding means, the forms of a row being aligned with those of a contiguous row, whereby said sheet may be folded along said means with said forms substantially contacting.

14. A folded holder for fragile articles comprising a plurality of inclined walls each connected by flexible hinge portions, said walls comprising a plurality of reversed arch formations extending from hinge to hinge and contacting at certain points for insuring inclination of said walls.

15. A folded receptacle for fragile articles having a series of inclined walls with integral cell-forming raised formations and integral depressions, said formations and depressions extending completely across the walls and being in register for providing individual article compartments, said formations contacting for separating and cushioning packed articles and for bracing said inclined walls, flexible hinges flanking each wall for extending said receptacle into flat position.

16. An upstanding **W**-shaped holder having the upper and lower limits of its inclined walls defined by longitudinally extending edge portions, transverse partitions in said walls extending from edge to edge, the upper portions of said partitions being curved upwardly toward said upper edges.

17. In a foldable holder, complementary rectangular portions flanked by longitudinal fold lines, a series of complementary dome-shaped depressions in each portion, peripheral portions of said dome-shaped depressions merging with said fold line whereby the curved walls of each depression converge toward each other at said fold line, and raised formations interposing the depressions.

18. In a foldable holder, a wall member having a body portion flanked by folding means defining hinges for the upper and lower limits of said portion, an unbroken depression traversing said portion, the surface of said depression converging toward the lower limit of the body portion.

19. In a foldable holder, a pair of upstanding wall members united by a common fold line at their lower portions, a depression in each member opposed to each other, said depressions having curved peripheries converging to said fold line, the construction and arrangement being such that the lower complementary surfaces of said depressions provide an ovoidal cavity when the peripheries of said depressions are contacting.

20. In a foldable holder, a wall member having a body portion flanked by bendable areas defining hinges for the upper and lower limits of said portion, an unbroken depression traversing said portion, said depression being wider at its medial portion than at its upper and lower portions, one of said last named portions having its periphery converging to one of said bendable areas.

21. A holder for fragile articles comprising side wall members each having a row of cup-shaped depressions, fold lines arranged longitudinally of the rows of depressions providing hinges for portions between depressions, the lower extremities of the depressions being in proximity to and converging toward said hinges.

22. In a foldable holder having a side wall with a fold line defining a hinge at its lower portion, a cup-shaped depression in said wall, the lower extremities of said depression being contracted and substantially coincident with said hinge.

Witness my hand this 3rd day of August, 1929, county of New York, State of New York.

MORRIS KOPPELMAN.