Feb. 11, 1964 J. W. BOYD 3,120,901

MOLDED EGG TRAY

Filed Dec. 21, 1962 3 Sheets-Sheet 1

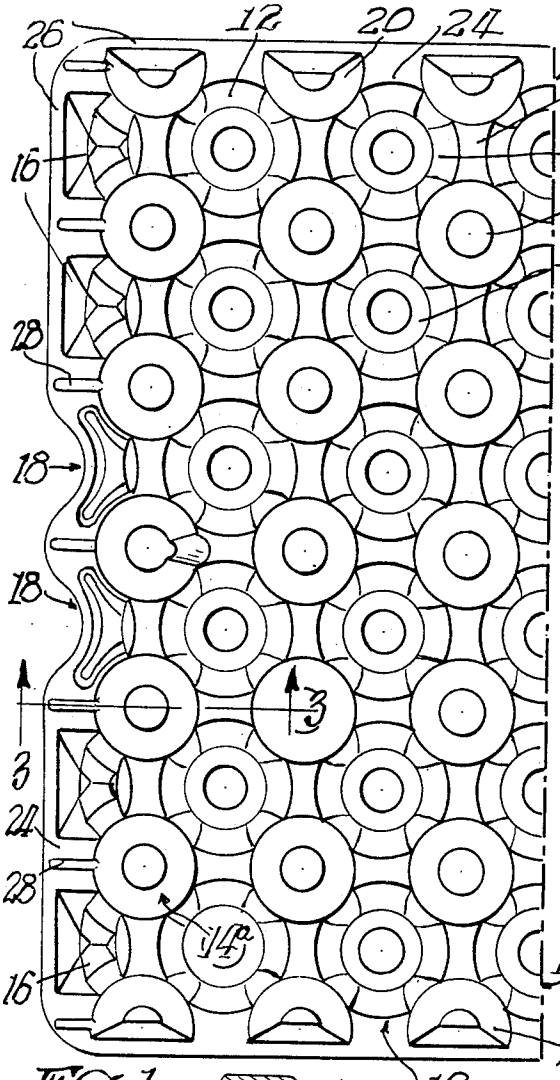

FIG. 1.

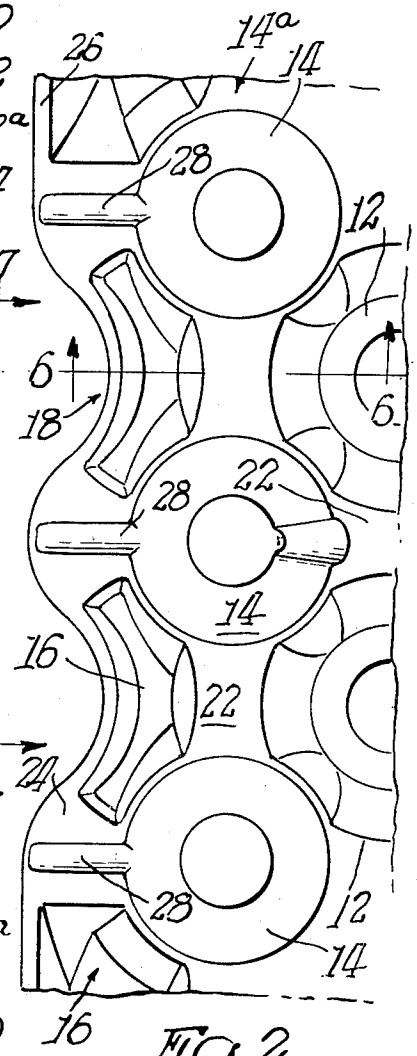

FIG. 2.

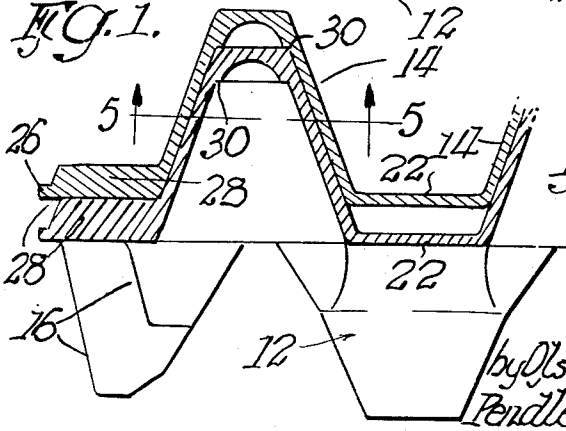

FIG. 3.

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3 Sheets-Sheet 2

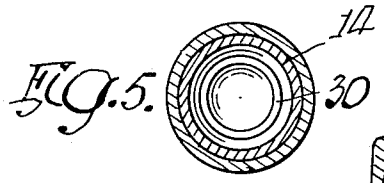

FIG. 5.

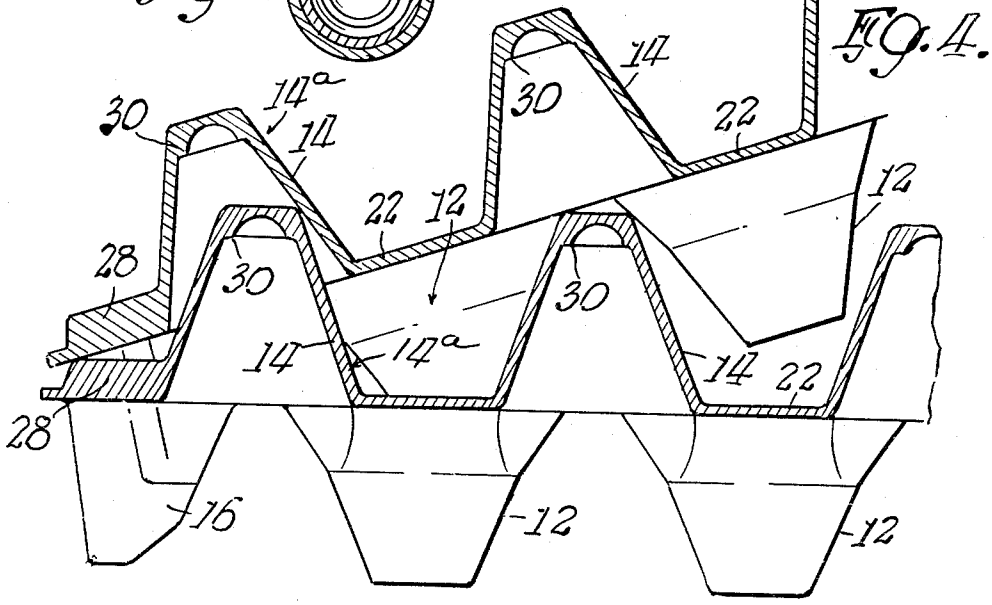

FIG. 4.

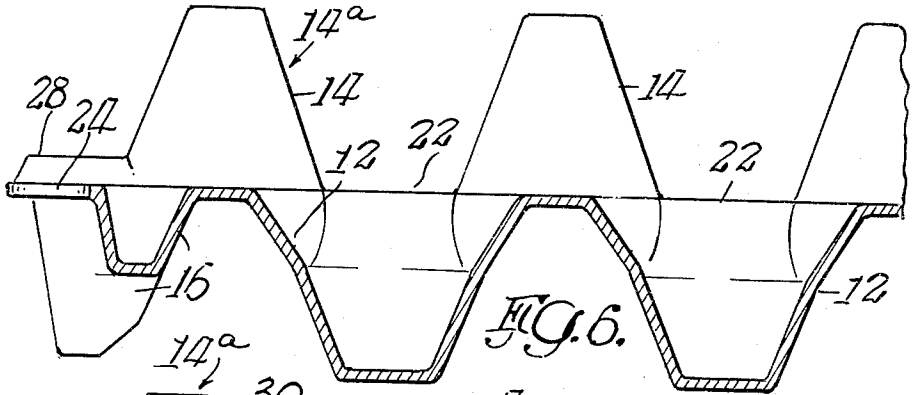

FIG. 6.

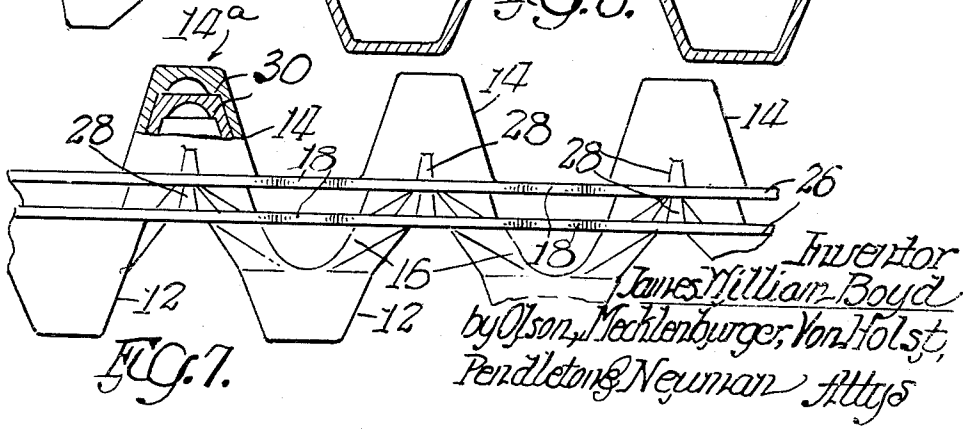

FIG. 7.

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MOLDED EGG TRAY

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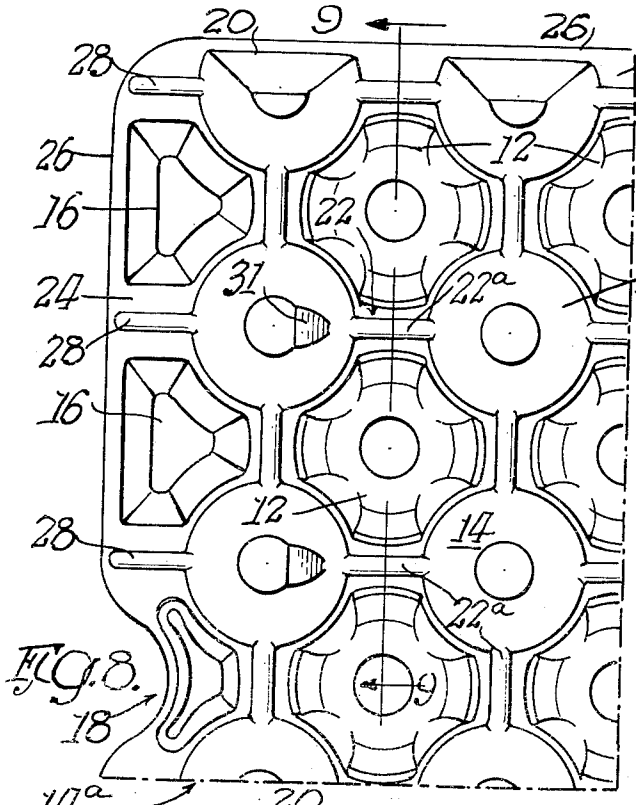

FIG. 8.

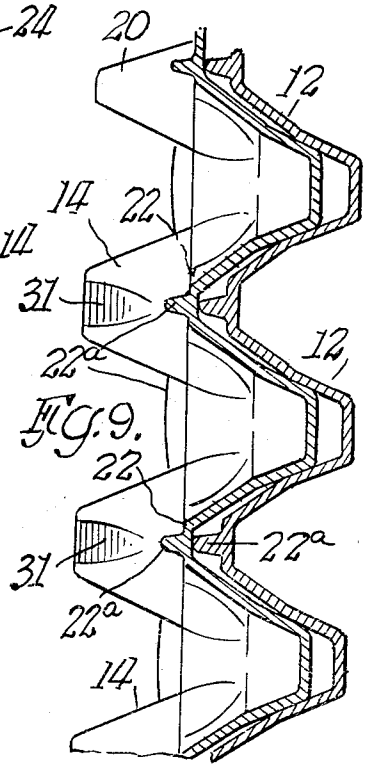

FIG. 9.

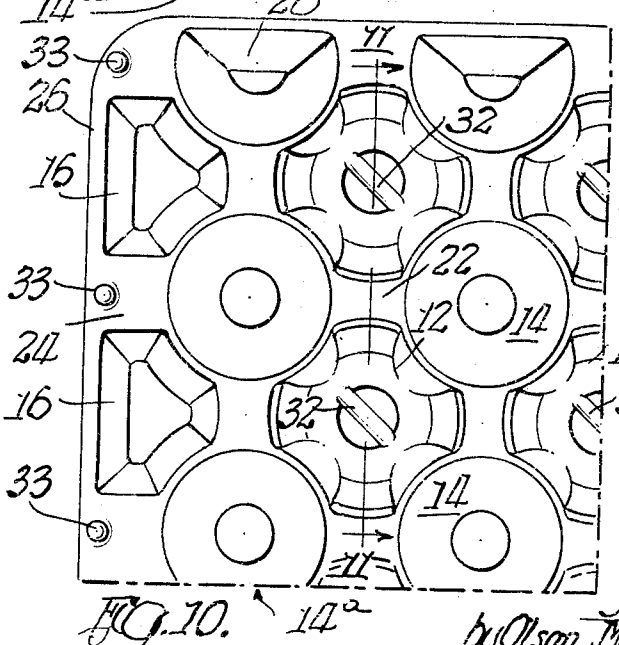

FIG. 10.

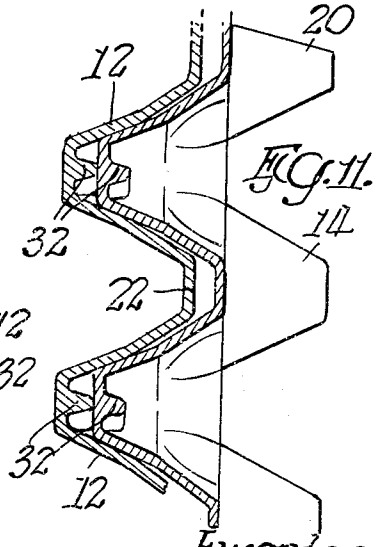

FIG. 11.

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United States Patent Office 3,120,901 Patented Feb. 11, 1964

3,120,901

MOLDED EGG TRAY

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Filed Dec. 21, 1962, Ser. No. 246,506
7 Claims. (Cl. 217—26.5)

This invention relates to a molded egg tray and more particularly to an egg packaging filler flat having means thereon for facilitating the denesting of the filler flats from a stacked relationship.

In order to package eggs into standard egg cases, filler flats are employed. These filler flats are formed of an absorbent cushioning material such as molded pulp and have alternate rows of pockets and posts which combine to maintain each egg in protective isolated relationship with respect to the adjacent eggs in the case. As the filler flats are manufactured, they are stacked in nested relationship in order to provide for compact storage and shipment, and it is customary to actually compress these filler flats in their nested condition so that the most compact unit may be achieved. However, when the nested filler flats are received by the egg packaging plant, they must be separated or denested so that they may be placed individually into the egg case as the eggs are packed. Since the tightly nested portions of the filler flats tend to frictionally engage and resist separation, some means must be provided for preventing or overcoming this frictional jamming. Heretofore, it has been proposed that this tendency toward jamming be minimized by maintaining sufficient spacing between overlying filler flats to reduce excessive frictional engagement of the nested portions thereof. United States Patent No. 2,997,196 dated August 22, 1961, suggests that the desired spacing may be maintained by means of lugs molded on the sides of the posts in the area between the pockets, i.e., on the ribs which connect the posts together. United States Patent No. 1,919,028 dated July 18, 1933, suggests that the top portions of the ribs of a molded pulp egg receptacle may be filled in or thickened, which of course not only will tend to maintain the desired spacing between nested structures but will also tend to increase the rigidity of the structures. While such devices do serve to maintain a minimum spacing between stacked filler flats, thus reducing excessive initial frictional engagement of the nested portions thereof, they have not been uniformly successful in eliminating the subsequent jamming tendencies of the stacked filler flats.

It is, therefore, one object of this invention to provide a filler flat having improved means thereon for facilitating the separation therefrom of a second and similarly constructed filler flat which has been initially placed in overlying nested relationship with respect thereto.

It is another object of this invention to provide a filler flat having means thereon which will not only maintain the desired spacing between that filler flat and a similarly constructed overlying filler flat, but which will facilitate the proper and unhindered removal of the overlying filler flat therefrom.

It is still a further object of this invention to provide a filler flat having means thereon which will permit a similarly constructed filler flat to be withdrawn with unhindered ease from overlying nested relationship with respect thereto simply by raising one edge of the overlying filler flat.

Other objects will be seen, and a fuller understanding of the invention may be had by referring to the following description and claims taken in conjunction with the accompanying drawing.

The molded filler flat constructed in accordance with this invention comprises a sheet having a plurality of alternate rows of upwardly extending posts and downwardly extending pockets. Disposed outwardly of the terminal row of posts at each of two opposite sides of the filler flat is a row of partial pockets, and a plurality of solid projections are provided, these projections extending upwardly from the plane of the sheet and at least portions of the projections being disposed outwardly adjacent the peripheral edge of the filler flat. It is preferred that these outwardly extending portions of the projections actually extend beyond the outermost extremities of the half pockets. Thus, the projections act as fulcrums to permit the nested filler flats to be pivoted apart quite easily, even if compressed, by merely lifting at one edge of each overlying filler flat. The provision of these outwardly and upwardly extending solid projections which extend as close to the very edge of the sheet as possible in order to provide a fulcrum as high above the plane of the sheet and as far from the nested pockets and posts as is possible, is an important feature of this invention.

Means may be provided intermediate the terminal row of posts for maintaining the spacing of the nested portions of the filler flats in sufficiently spaced relationship to prevent any possible jamming of these intermediate portions.

With reference to the drawings:

FIGURE 1 is a top plan view of one-half of a filler flat embodying the invention, the other half of the filler flat being a duplicate thereof;

FIG. 2 is an enlarged fragmentary top plan view of the filler flat shown in FIG. 1;

FIG. 3 is an enlarged sectional elevation view of the filler flat taken substantially along lines 3—3 of FIG. 1 and showing a plurality of filler flats in superposed nested relationship;

FIG. 4 is an enlarged sectional elevation view similar to FIG. 3 showing the manner in which the previously nested filler flats may be denested or separated;

FIG. 5 is a sectional view taken along line 5—5 of FIG. 3 and showing the underside portion of one of the posts;

FIG. 6 is an enlarged sectional view taken substantially along line 6—6 of FIG. 2;

FIG. 7 is a fragmentary end elevation view taken in the direction indicated by the arrows 7—7 of FIG. 2;

FIG. 8 is a fragmentary top plan view on an enlarged scale of a filler flat of slightly modified design;

FIG. 9 is a sectional elevation view of the modified filler flat illustrated in FIG. 8 taken substantially along line 9—9 of that figure;

FIG. 10 is a fragmentary top plan view on an enlarged scale of still a further modification of the filler flat embodying the invention; and

FIG. 11 is a sectional elevation view of the filler flat illustrated in FIG. 10 taken substantially along line 11—11 of that figure.

With more particular reference to the drawings, the filler flat 10 is generally of the type described in Patents No. 1,970,436 and No. 2,872,062. The filler flat consists of a continuous piece of sheet material preferably molded pulp having alternate rows of pockets 12 and posts 14. The pockets 12 are generally frusto-conical in shape extending downwardly from the plane of the sheet, and they are aligned in two transverse directions, generally parallel to the peripheral edges of the sheet. The posts 14, which are approximately as high as the pockets 12 are deep, are also of generally frustro-conical shape although somewhat narrower and steeper than the pockets, and these posts are also aligned in two transverse directions generally parallel to the peripheral edges of the sheet.

At each of two opposite sides of the filler flat 10 is a

terminal row **14***a* of posts **14**, and disposed outwardly of and extending partially between the posts in the terminal rows **14***a* are half or partial pockets **16**, which like pockets **12** extend downwardly from the general plane of the sheet. A pair of finger grip recesses **18** are provided in the half pocket area at the opposite sides of the sheet and these facilitate manipulation of the filler flat within the egg case. Extending transverse to the rows of partial pockets **16** along each of the two adjacent edges of the sheet is a row of half or partial posts **20** which are disposed outwardly of each of the two terminal rows **12***a* of full pockets **12**. A 1/16 of an inch radius is provided between the planar top and the conical sloping sides of each post **14** and each half post **20**. Thus, sharp edges are avoided at the tops of the posts and half posts and the tendency toward jamming during subsequent removal of the filler flats from nested relationship.

With this construction, every other loaded filler flat in the egg case is rotated 90 degrees on its vertical axis relative to the underlying loaded filler flat, so that the bottoms of the pockets **12** of the overlying filler flat will rest upon and be supported by the tops of the post **14** of the underlying filler flat. The eggs, of course, rest in the pockets **12** of each underlying filler flat and extend upwardly partially into the hollow posts of the overlying filler flat. It will be noted that dividing portions **22** remain between the pockets **12** and lands **24** remain between the half posts **20** and half pockets **16**; also, a continuous peripheral rim **26** is disposed outwardly of the half pockets and half posts. In the embodiments of the invention illustrated in FIGS. 1–7 and 10–11 the tops of the dividing portions **22** are all disposed in the plane of the sheet. In the embodiment of the invention illustrated in FIGS. 8 and 9, and as will be more fully described, the dividing portions are shown as being raised above the plane of the sheet while the lands and peripheral rim remain in the plane of the sheet. Insofar as this description is concerned, the "plane of the sheet" may be considered to be that plane defined by the lands **24** and the peripheral rim **26** or the highest of these.

The filler flats **10** are formed by the usual vacuum pulp process. That is, pulp floating in a slurry is drawn by vacuum against a screen form or mold which passes through the slurry, thus forming the entire sheet with the pockets **12**, the posts **14** and all other portions in a single operation. The thus formed filler flats are then dried and they are stacked in nested relationship in order to provide a compact unit for storing and shipping. To assure this compactness, the stacked and nested filler flats are usually compressed mechanically in a direction normal to the planes of the sheets, and because of the relatively steep angles of the side portions of the pockets **12** and posts **14** and the consequent susceptibility of these portions to jam when nested, difficulty may be encountered by the egg packing plant in attempting to separate the filler flats unless some means is provided for properly facilitating the denesting of these stacked filler flats.

For this purpose a plurality of solid projections **28** are provided on each filler flat. These solid projections **28**, which may be formed by crowding the fibers into a narrow fold of the screen form at that point, extend upwardly from the plane of the sheet, and at least portions of these projections are disposed outwardly of the terminal rows **14***a* of posts **14** a distance at least equal to half the distance between these posts and the peripheral edge of the filler flat. Each projection **28** is preferably attached to a corresponding post in the terminal row, and in the illustrated embodiments of the invention these projections extend outwardly from these posts to at least approximately the outermost extremities of the half pockets **16**, and preferably beyond. It is preferred that the height of the projections **28**, that is, the elevation of these projections from the plane of the sheet of the filler flat, be on the order of one-fourth the height of the posts **14** above that plane. Since the height of the posts in the preferred embodiment is between about 7/8 of an inch and 1 inch, the height of the projections **28** should be between about 7/32 of an inch and to about 1/4 of an inch, although reasonably satisfactory results can be obtained if the height of the projections is on the order of 1/8 of an inch or better above the plane of the sheet. Actually, it is preferred that the projections extend upwardly as high as possible, but this is limited by the pulp forming process, for if the height of the projection is increased much over that of 1/4 of an inch a corresponding groove or channel tends to form on the opposite (under) side of the sheet.

The outward extension of each projection **28** is preferably as great as possible, although again this is limited by the manufacturing process and usually the end of the projection must be recessed from the edge of the sheet on the order of about 3/32 of an inch to permit withdrawal of the wet filler flat from the vacuum mold in the manufacturing process. For best efficiency the projections **28**, however, should extend outwardly from the posts **14** in the terminal row **14***a* by a distance at least about one-half the height of the posts or between about 7/16 of an inch and 1/2 of an inch for the illustrated embodiments.

With the projections **28** thus formed the stacked and nested filler flats **10** may be easily separated by raising one edge of the filler flat so that the projections **28** serve as an outwardly disposed fulcrum or pivot for the top filler flat, thus preventing the edge of the top filler flat at this pivot point from dropping or tilting into jamming engagement with the filler flat immediately therebelow, see FIG. 4. The projections **28** thus serve the dual function of spacing the stacked filler flats at the oppositely disposed edges and of facilitating the proper and unhindered denesting of the filler flats.

The projections, therefore, eliminate the problem of jamming of the stacked filler flat, although in some instances it may be desirable to distribute the compression load and spacing chore more uniformly over the filler flat by providing additional means intermediate the oppositely disposed rows of projections **28** for maintaining the spacing between the nested intermediate portions of the filler flat. This may be done by providing a shoulder **30**, see FIGS. 3 and 5, in the underside of the posts adjacent the top thereof. This shoulder **30** may be formed by means of a finishing die which moves into engagement with the underside of the still wet filler flat on the screen form or mold just after the pulp has been drawn against the mold and before the wet filler flat has been ejected from the mold and sent to the drier. The formation of the shoulder **30** thus is not a matter of crowding fibers into a narrow fold in the screen form or mold as was the case in the formation of the projections **28**, but this shoulder is formed by selectively compressing the top portion of each post in such a manner as will leave the shoulder portion of the posts uncompressed by the bottom forming or finishing die. Thus, when the filler flats **10** have been dried and stacked in their nested relationship as illustrated in FIG. 3, the top of the posts of each underlying filler flat will engage and support the shoulder portion **24** of the corresponding post in the overlying filler flat.

Another means for achieving this spacing of the intermediate portions of the filler flat is illustrated in FIGS. 8 and 9. In this embodiment of the invention, the top parts **22***a* of at least some of the dividing portions **22** project above the upper edges of the pockets **12** and thus above the plane of the sheet in a manner such as suggested in Koppelman Patent No. 1,919,028. These upwardly extending parts are rendered solid as a result of drawing the pulp fibers into the narrow space between the folds of the screen form or mold at that point, and these solid parts extend between the adjacent posts **12** thereby adding a degree of rigidity to the entire filler flat structure. In addition, the solid parts **22***a* act as spacers for assuring that the desired spacing will be maintained

between the nested intermediate portions of the stacked filler flats. This is best illustrated in FIG. 9.

In the embodiment illustrated in FIGS. 8 and 9 an interiorly disposed portion **31** of each post **14** in the terminal row **14***a* (except the center post which is usually a guide post) is angularly disposed with respect to both the top portion and the conical side portions of these posts. The angular disposition of this portion may be about 30 degrees with respect to the vertical or 60 degrees with respect to the plane of the sheet whereas the normal taper of the sides of the conical posts is 18 degrees with respect to the vertical or 72 degrees with respect to the plane of the sheet.

Still another modification of this intermediate spacing means is illustrated in FIGS. 10 and 11. This modification consists in the formation of a narrow vertical solid web or lug **32** which diametrically spans the bottom of the pocket and extends upwardly from the bottom to a level which is below that occupied by an egg within the cup. These webs **32** engage the underside of the pockets in the overlying filler flat in the stack, as illustrated in FIG. 11, and serve to assure that the intermediate nested portions of the stacked filler flats will be properly spaced to prevent any possible jamming of these portions.

Also in the embodiment illustrated in FIGS. 10 and 11, the projections **33** are of slightly different configuration, and they are not connected to the sides of the posts in the terminal row as was the case with the projections **28** of the previously illustrated embodiments. However, the height, the outward positioning and the functions of these projections **33** are the same as for the projections **28**.

From the foregoing it may be seen that filler flats constructed in accordance with this invention may be stacked and compressed for the most compact unit in shipment and storage and yet these filler flats may be easily separated and denested by the egg packaging plant. Denesting of each overlying filler flat may be accomplished by merely lifting one edge of that filler flat and permitting the outwardly extending edge projections **28** to act in unison as a single outwardly disposed fulcrum to assure that all nested portions of the overlying filler flat will be raised from the underlying filler flat even though only one edge of the overlying filler flat is being elevated. Thus, the denesting of the filler flats may become a one-hand operation in the egg packaging plant.

Although the invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that many modifications and changes in various details may be resorted to without departing from the spirit and scope of the invention, as hereinafter claimed.

What is claimed is:

1. A molded pulp filler flat comprising a substantially flat sheet having a plurality of alternate rows of pockets and hollow posts extending from the plane of said sheet, a predetermined number of said hollow posts each having the interior thereof provided with a solid inwardly extending projection spaced from the upper end of said hollow interior, and a plurality of solid second projections extending upwardly from said sheet plane and disposed outwardly of a terminal row of posts; each of said second projections having at least a portion thereof disposed in closer proximity to the periphery of said sheet than to an adjacent post in said terminal row; said second projection portions being engageable with the underside of a filler flat arranged in superposed nested relation, and such nested filler flats being denestable when one of such flats is pivoted relative to the other about all of the engaging second projection portions acting as a fulcrum.

2. A molded pulp filler flat comprising a substantially flat sheet having a plurality of alternate rows of pockets and hollow posts extending from the plane of said sheet, a predetermined number of said pockets each having a solid projection extending upwardly from the bottom of said pocket, and a plurality of solid second projections extending upwardly from said sheet plane and disposed outwardly of a terminal row of posts; each of said second projections having at least a portion thereof disposed in closer proximity to the periphery of said sheet than to an adjacent post in said terminal row; said second projection portions being engageable with the underside of a filler flat arranged in superposed nested relation, and such nested filler flat being denestable when one of such flats is pivoted relative to the other about all of the engaging second projection portions acting as a fulcrum.

3. The filler flat recited in claim 1 wherein at least said predetermined number of said hollow posts each has an exterior configuration of a substantially truncated cone.

4. The filler flat recited in claim 1 wherein each second projection is elongated and extends from a post in said terminal row and is disposed transversely of said terminal row.

5. A molded pulp filler comprising a substantially flat sheet having a plurality of alternate rows of pockets and hollow posts extending from the plane of said sheet, adjacent pockets of each row being in spaced relation and adjacent posts of each row being in spaced relation, a plurality of solid first projections extending upwardly from said sheet plane and interconnecting corresponding sections of certain of said adjacent posts, and a plurality of solid second projections extending upwardly from said sheet plane and disposed outwardly of a terminal row of posts; each of said second projections having at least a portion thereof disposed in closer proximity to the periphery of said sheet than to an adjacent post in said terminal row; said first and second projections being engageable with the underside of a like filler flat arranged in superposed nested relation; such nested filler flats being denestable when one of such flats is pivoted relative to the other about all of the engaging second projection portions acting as a fulcrum.

6. A molded pulp filler flat comprising a substantially flat sheet having a plurality of alternate rows of pockets and hollow posts extending from the plane of said sheet, and a plurality of solid projections extending upwardly from said sheet plane and disposed intermediate the peripheral edge of said sheet and a terminal row of posts adjacent thereto; each of said projections having at least a portion thereof disposed in substantially closer proximity to said sheet peripheral edge than to an adjacent post in said terminal row; said projection portions being engageable with the underside of a like filler flat arranged in superposed nested relation; such nested filler flats being denestable when one of such flats is pivoted relative to the other about all of the engaging projection portions acting as a fulcrum and said projection portions are in continuous engagement with the underside of such superposed flat during pivoting of one of such flats relative to the other to effect denesting.

7. A molded pulp filler flat comprising a substantially flat sheet having a plurality of alternate rows of pockets and hollow posts extending from the plane of said sheet; a plurality of solid first projections disposed intermediate terminal rows of posts and adapted to engage surface portions of a like filler flat arranged in superposed nested relation; and a plurality of solid second projections extending upwardly from said sheet plane and disposed outwardly of a terminal row of posts, each of said second projections having at least a portion thereof disposed in substantially closer proximity to the periphery of said sheet than to an adjacent post in said terminal row and being engageable with the underside of such superposed filler flat; such nested filler flats being denestable when one of such flats is pivoted relative to the other about all of the engaging second projection portions acting as a fulcrum, said second projection portions being in continuous engagement with the underside of such super-

posed filler flat during such pivoting of one of such flats relative to the other to effect denesting.

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2,347,658	Bourne	May 2, 1944
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2,997,196	Emery	Aug. 22, 1961

OTHER REFERENCES

Modern Packaging, Issue 1959, page 117, Article, Onions in Thermoforms.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,120,901 February 11, 1964

James William Boyd

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 12, strike out "hollow"; column 6, line 18, after "filler" insert -- flat --.

Signed and sealed this 30th day of June 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents