May 4, 1937. G. P. DORR 2,078,927

MOLDED FIBER CONTAINER FOR EGGS

Filed May 19, 1933 2 Sheets-Sheet 1

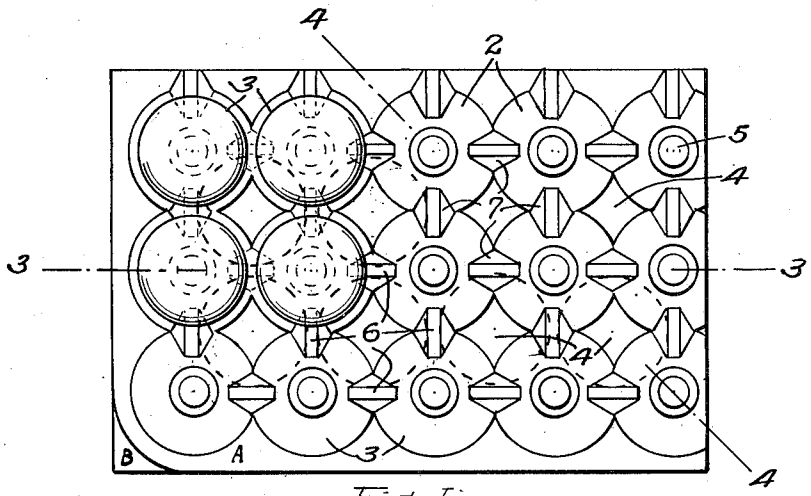

Fig. I

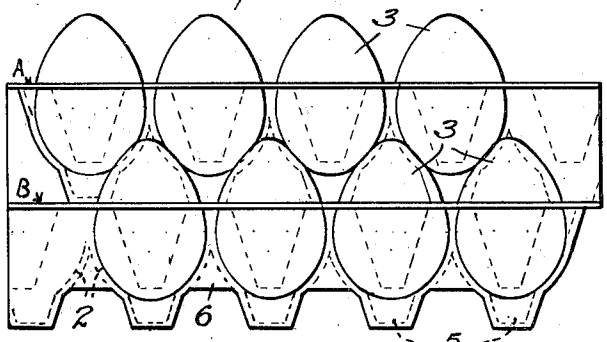

Fig. II

Witness.

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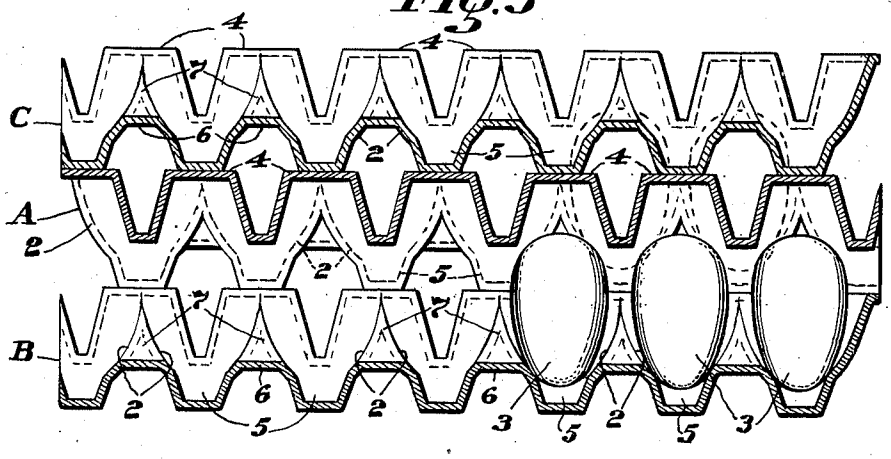
Fig. 3



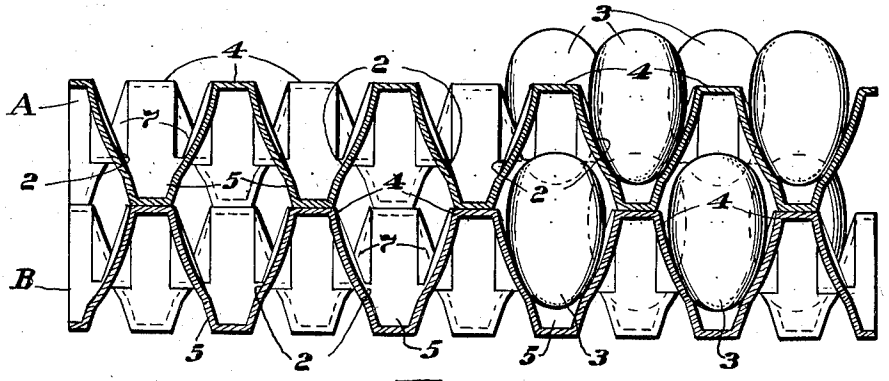


Fig. 4

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Patented May 4, 1937

2,078,927

UNITED STATES PATENT OFFICE

2,078,927

MOLDED FIBER CONTAINER FOR EGGS

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Application May 19, 1933, Serial No. 671,845

1 Claim. (Cl. 217—26.5)

This invention relates to packages for use in storing, handling, and shipping eggs.

It has been heretofore, and still is, the common custom to pack eggs for shipment in crates in which cardboard flats are used, each flat having square cells to receive the individual eggs and adjacent flats being separated by sheets of cardboard which form the tops of the cells in one flat and the bottoms of the cells in the next flat above it. The same construction is also used in smaller packages. While such packages have been in common use for many years, they have not afforded satisfactory protection for the eggs, a very considerable breakage being accepted as a matter of course.

The present invention aims to improve the construction of egg packages and the flats used in them with a view to protecting the eggs far more effectually while still maintaining the expense for the shipping containers within entirely reasonable limits.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claim.

In the drawings,

Figure 1 is a plan view of a portion of an egg flat embodying features of this invention;

Fig. 2 is a side elevation showing portions of two superposed flats with eggs supported in them;

Fig. 3 is a vertical, sectional view through a series of superposed flats, the section being taken substantially on the line 3—3, Fig. 1; and

Fig. 4 is a view similar to Fig. 3 but taken substantially on the line 4—4, Fig. 1.

Each of the flats illustrated in the drawings is substantially a duplicate of the others. They are made most conveniently by molding suitable sheet material, such as paper pulp, to the desired form, the pulp having sufficient inherent strength, when dry, so that when molded to a shape such as that shown, each flat will be a relatively rigid body. The molding operation may be performed by the methods heretofore practiced in molding articles of pulp.

Each flat has a series of cup-shaped cells 2 molded in it, each cell being adapted to receive and support an egg 3. As illustrated in Fig. 1, these cups or cells are arranged in rows extending at right angles to each other, and they are spaced apart by substantially uniform distances. The term "cup" or "cell" is herein used to designate the space provided for the support of an individual egg. These rows of cups are partly separated from each other by intervening rows of upwardly projecting hollow bodies 4, which may aptly be termed "domes", the domes being staggered with reference to the cups. It will be evident from an inspection of Fig. 1 that throughout the greater part of any flat each dome 4 lies between, and is partly surrounded by, four cells or cups 2. Also, that each cup lies between, and is partly surrounded by, four domes, the domes preferably being curved transversely so that their outer surfaces form portions of the walls of the cups 2. The cups are so tapered that when an egg is inserted in an upright position in any one of them it will not rest on its extreme lower end, but it will be engaged by the walls of the cup at points above its end and its weight will be supported by such engagement. The extreme lower end of each egg, however, is left free and it projects more or less into a pocket 5 which extends downwardly below the egg receiving space in the cup and provides a space between the lower end of the egg and the extreme bottom of the cup, if the pocket be considered as an extension of the cup. This support for the egg enables it to withstand jolts and jars during shipment which would be very likely to break it if it rested directly on the bottom of the cup. As best shown in Fig. 4, the outer inclined walls of the domes afford lateral support for the eggs in the respective cells or cups, and, in fact, form portions of the walls of the cups.

The lower portions of adjacent domes are connected by short ribs 6, the top of each rib being joined to the two domes at opposite sides of it by inclined portions 7—7. Or, stating the matter somewhat differently, the inclined surfaces 7—7 form portions of the sides of the domes and these surfaces between adjacent domes extend downwardly until they meet the upper surface of the intervening rib 6, said upper surface forming the bottom of a valley between adjacent domes and the surfaces 7—7 forming the sides of said valley. Throughout most of the flat each cup 2 has four of these ribs or flat surfaces 6 radiating from it. They connect and form parts of the walls of adjacent cups, and they cooperate with the cups and the domes to provide a shape which tends to stiffen the entire flat. Such stiffening action is augmented by the arrangement of the ribs in lines extending transversely to each other, as shown in Fig. 1.

The domes and cups are so spaced that any empty flat will nest within another for shipping purposes. In using them a flat is filled with eggs, is placed in a crate, carton, or other receptacle in

which the flats are to be used, and another flat is then placed on top of the filled flat, and the same side up as the first flat, but is turned at 180° from the first one. This brings the domes of the upper flat into register with the cups of the lower flat, and since these domes are hollow, they form caps for the eggs in the cups of the lower flat. In other words, the hollow space in each dome cooperates with its respective cup in the flat immediately under it to form a cell in which an individual egg is housed and which protects the upper as well as the lower end of the egg, as shown in Figs. 2, 3 and 4. In addition, this arrangement also results in positioning the bottom of each cup 2 in any upper flat directly on a dome 4 of the next lower flat, as illustrated in Figs. 2, 3 and 4.

Each upper flat may be filled with eggs either before or after placing it on a lower one, and successive flats are positioned, one on top of the other, in the same manner until the entire box, crate, or other container is filled, an empty flat being placed on top of the uppermost filled flat, after which the box or crate may be closed and the cover nailed, or otherwise fastened, in position.

It should be observed that each flat, except that at the extreme top, contains a complete layer of eggs, but that the eggs in any upper layer are staggered with reference to those in the next layer below it. This is due to the fact that the egg receiving cups of any upper flat register vertically with the domes of the next lower flat. It will also be seen that the eggs of any lower layer project partly into the plane of those in the next layer above it, so that the eggs in adjacent flats overlap each other vertically, this arrangement providing a very economical use of the space in a crate or other shipping container. The invention thus provides a package in which the eggs are effectually protected against breakage. At the same time the flats can be nested for shipment when empty, they are convenient to use, and they can be manufactured economically. While the flats may be made of a variety of materials, the expense of manufacture from paper pulp is so reasonable, and this material answers the requirements for a structure of this kind so well, that I prefer to use this substance. Because, as above pointed out, the bottoms of the pockets of one flat rest on the domes of the next flat below it, and these domes are interspersed thickly throughout the entire surface of each flat, a package of this kind will withstand a very considerable pressure vertically before the pockets or domes will be crushed sufficiently to injure the eggs. Preferably the extreme bottoms of the pockets 5 and the tops of the domes 4 are made relatively broad and flat so that a firm and stable contact between these parts is provided. Each egg rests loosely in an individual cell and is not subjected to the pressure of other eggs above it, all of this pressure being borne by the bottoms of the cups and the tops of the domes on which they rest.

Important advantages produced by this invention are that the flats are all of one construction. Each flat supports a full layer of eggs with the exception of the flat used to cover the top layer. They support the eggs in adjacent layers in a staggered relationship, and when the flats are placed one on top of another, as described, they provide cells for the individual eggs in which each egg is protected from external pressure.

While I have herein shown and described a preferred embodiment of my invention, it will be evident that the invention may be embodied in other forms without departing from the spirit or scope thereof.

Having thus described my invention, what I desire to claim as new is:

A packing for eggs and like ovate objects comprising a fibrous sheet provided with a plurality of spaced, upwardly-projecting, hollow posts adapted to receive the upper ends of a layer of eggs, said posts being arranged in groups of four and each group enclosing a substantially circular cell space which tapers upwardly and outwardly from the bases of said posts toward the tops thereof, said cell spaces adapted to receive and loosely support the lower ends of a second layer of eggs in staggered relation to the first egg layer, the walls of each cell space being constituted in part by the upwardly and outwardly tapering side portions of the four posts surrounding said cell space, said walls being concave and the material of the sheet included by each group of four posts being extended downwardly a substantial distance below the bases of said posts to form a hollow bottom closure disposed in the perpendicular axis of the included cell space, said bottom closure comprising a straight uniformly downwardly tapered side wall of less radius than any radius of the included cell space so as to prevent the lower end of the egg supported in said cell space from entering said bottom closure, and terminating in a substantially horizontal bottom wall which is spaced from the bottom of the included cell space a distance sufficient to cushion the bottom of the egg supported in said cell space against endwise shock.

GEORGE PHINNEY DORR.