C. E. LA FLEUR.

EGG CASE FILLER.

APPLICATION FILED JAN. 9, 1919.

1,337,978. **Patented Apr. 20, 1920.**

Fig. 1

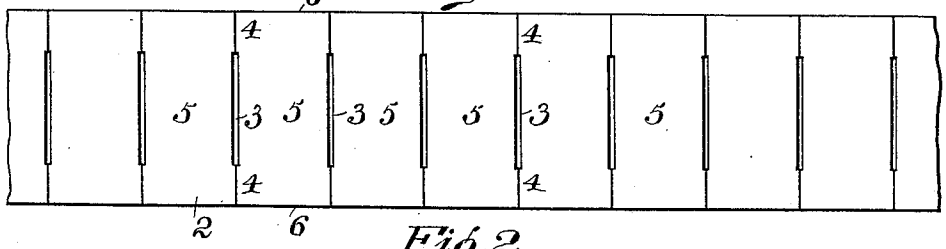


Fig. 2

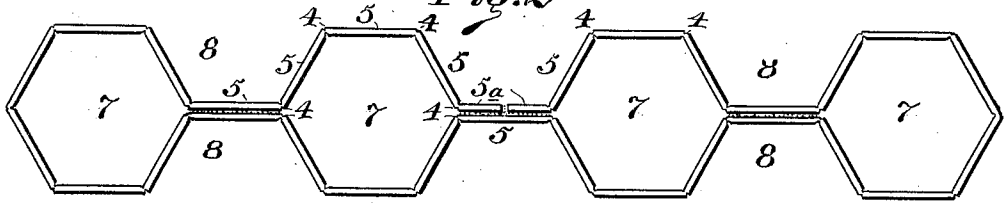


Fig. 3



Fig. 4



Fig. 11



Fig. 12



Fig. 5

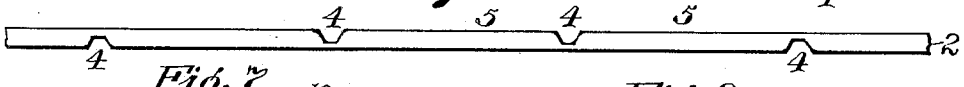


Fig. 7



Fig. 6

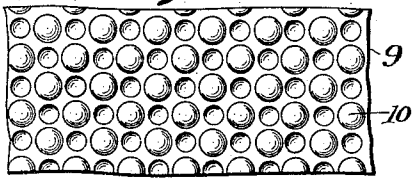


Fig. 8

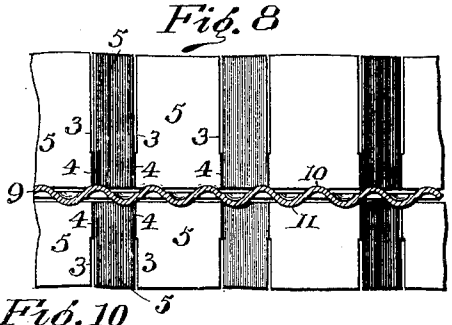


Fig. 9

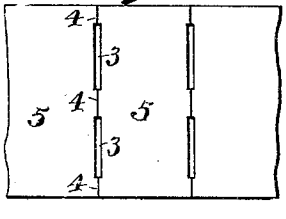
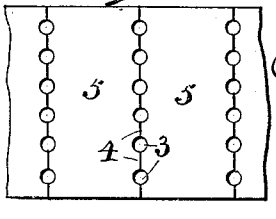


Fig. 10



INVENTOR

Charles E. La Fleur

BY

ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES E. LA FLEUR, OF PHILADELPHIA, PENNSYLVANIA.

EGG-CASE FILLER.

1,337,978. Specification of Letters Patent. Patented Apr. 20, 1920.

Application filed January 9, 1919. Serial No. 270,387.

To all whom it may concern:

Be it known that I, CHARLES E. LA FLEUR, citizen of the United States, and resident of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Egg-Case Fillers, of which the following is a specification.

My invention has for its object the construction of an improved collapsible egg-case filler adapted to be assembled within a suitable case to provide hexagonal cells or pockets for reception of the eggs to be packed for shipment, which is stronger and more easily shaped than devices for this purpose heretofore in use.

As far as I am aware, the most satisfactory egg-case filler heretofore in use, is of the type set out in Letters Patent No. 621,609 dated March, 1899; but while the general features therein set out were desirable, the filler elements employed therein contained features of weakness, which it is the object of my present invention to overcome. In the aforesaid egg-case filler, the filler strips of straw or wood pulp board were provided with incisions transversely of their length to permit of the bending necessary to insure the hexagonal cell form required and to provide for the collapsible capacity to the filler for storage or transportation preliminary to use. The straw or wood pulp board is naturally of little strength because of the short fiber of the material employed, and the making of cuts or incisions therein across the entire width adds greatly to the weakness and permits rupture under rough handling which the crates frequently receive. The breaking of the filler itself would not be so serious a matter, but its rupture permits undue strain to come upon the eggs under shock and causes great loss by breakage thereof. The loss from this cause is enormous, when considering the gross output requiring transportation during any year. My object is to overcome this weakness, by providing a special construction of strip from which the filler is formed, as hereinafter set out.

My invention consists of a filler element formed of a strip of straw or wood pulp board having transverse compressed or densified portions which reduce the thickness at such places to provide integral flexible hinge parts capable of being freely bent in either direction without rupture; and in the preferred form of my filler strip I provide the transverse hinge portions each with one or more apertures or cuts entirely through the board to reduce the length of the actual hinge portions and impart increased flexibility, the said apertures or through cuts also providing means for ventilation and permitting the top and bottom edges of the strip to be continuous.

My invention also comprehends other details of construction which, with the features above stated, will be better understood by reference to the drawings, in which:

Figure 1 is an elevation of a portion of a filler strip before being bent into shape; Fig. 2 is a plan view showing the filler strip bent into final shape; Fig. 3 is an enlarged edge view showing the strip with the densified hinge portions; Fig. 4 is a sectional view on line x—x of Fig 1 showing the transverse perforations; Fig. 5 is an edge view of strip showing a modification of the hinge portions; Fig. 6 is a plan view of a suitable partition board to be employed between the fillers; Fig. 7 is a cross section thereof; Fig. 8 is an elevation of the fillers with an interposed partition board, the latter in section; Figs. 9 and 10 are elevations of modified forms of filler strips embodying my invention; and Figs. 11 and 12 are enlarged views illustrating the form of the compressed or densified hinge portions of the strips embodying my invention.

The filler strip 2 is of uniform width and of a length sufficient to provide a predetermined number of panels 5 and two half end panels 5^a. The number of panels 5 required in the strip will be dependent upon the number of cells to be formed therefrom. In the illustration I have shown four cells (Fig. 2) by way of example and this will require 29 panels 5 and two end half panels 5^a. The panels are integrally connected by the hinge portions 4, which are formed by compressing or densifying the strip 2 on a plurality of transverse lines as indicated. The densification may be by depressions from opposite sides equally as shown in Figs. 3, 4, and 11, or from opposite sides, more or less alternately, as shown in Figs. 5 and 12; but no fiber is cut or severed where the hinges are formed and because of this, the dense tough hinge portions provide great flexibility coupled with strength. In Figs. 11 and 12 I have shown the densified hinge portions 4 with a form of reverse curve to make them more freely flexible in either direction.

When the strip is formed with the hinge portions 4 to provide the panels 5, it may also be perforated as at 3 to reduce the length of the densified hinge portions. As will be seen in Fig. 1 the narrow slots 3 are cut in the hinge lines so as to leave hinge portions 4 above and below the slots or apertures. In Fig. 9 I have shown two slotted portions 3 between each of the panels so as to provide three hinge portions 4. In Fig. 10 I have shown a large number of perforations 3 in alinement with the hinge portions between adjacent panels and this provides a still greater number of hinge parts of less individual length. It will be understood that, because of the great toughness of the hinge portions 4, it is possible to shorten their length to give the desired elasticity and this is accomplished by providing the perforations 3; and these perforations moreover, provide means of ventilation between the cells of adjacent filler elements.

When the strip 2 is properly stamped and perforated, it is bent up into the form shown in Fig. 2 and the abutting panels and half panels are glued together as customary. A plurality of such sections are then placed side by side and abutting panels are glued together, so that a honey-comb structure is provided to constitute the filler. This structure is collapsible to fold down flat for shipment or transportation, all of which would be customary practice as set out in my former patent hereinbefore referred to. Similarly, it is customary to set the fillers one upon another with an interposed partition board which performs the dual function of supporting the eggs and the fillers themselves, and I have shown this feature in Fig. 8. The partition board 9 is of straw or wood pulp and stamped with raised portions 10 upon opposite surfaces, those upon one side being staggered with those upon the opposite surface. These raised portions act, more or less, as cushion supports for the eggs and provide an irregular surface which engages the continuous edges 6 of the fillers and holds them firmly in position. In my former patented construction, the edges of the filler were notched for ventilation and thereby provided weak cornered portions which, under violent handling, had a tendency to break down and permit rupturing of the filler, with consequent injury to the eggs.

In the construction, as shown, I have made the perforated portions 3 pronounced as to size of opening for the purpose of making the ventilating feature more apparent, but I in no way desire to be restricted, either as to size or number of these open or slotted portions. In other words, a clean through cut or perforation without fiber removal will be capable of ventilation and will reduce the length of the hinge portions 4 and hence is within the scope of my invention. In Figs. 1 and 8, I have shown a single perforation 3 between two hinge portions 4, to increase the flexibility, whereas in Fig. 9 I have shown two perforations 3, 3, with three hinge portions 4 in alinement and in Fig. 10, I have shown six perforations alternating with seven hinge portions 4, all of these being equivalent structures embodying my invention.

In practice, the hinge portions 4 are densified or compressed to reduce their thickness, so that they may be easily bent when forming the filler section, also during collapsing for storage or transportation, or for opening up for actual use in shipping eggs. As none of the fiber is cut or broken, the hinge portions are very strong and capable of rough usage without rupture. This densifying of the strip to form the hinges may be equally performed from opposite faces as indicated in Figs. 3, 4, and 11, or may be mainly performed from one side, as indicated in Figs. 5 and 12. As shown in Figs. 11 and 12, the densified hinged portions 4 may be formed by reverse curve compressions at the place of the densifications, with the result that the hinges are more flexible and less liable to breakage and may be bent outward or inward, as preferred, with equal facility.

It will now be understood that my improved filler section embodies great flexibility and maintains a maximum of strength, may be freely bent in either direction at the hinge joints, is formed with continuous edges at top and bottom, and provided with capacity for free ventilation.

These strips may be conveniently formed by passing the sheets between creasing and perforating rolls, or the board may be in large sheets, which may be subsequently split or slitted into the narrow strips shown. It is also evident that the creasing and perforating may be done as two operations, if so preferred. I do not restrict myself in these respects.

I have described my invention with that particularity which I deemed the best exposition of the improvements, but I do not restrict myself to the exact features set out as these may, within the scope of the claims, be modified without departing from the spirit of the invention.

Having now described my invention what I claim as new and desire to secure by Letters Patent, is:

1. An egg-case filler consisting of a plurality of filler sections each comprising a strip of fibrous material in sheet form having continuous straight edges, said strip having a series of transverse hinge portions each perforated along their length intermediate of its ends to form ventilating means

at a distance from the edges and separating a plurality of short hinges, the structure providing connected panel portions which are relatively positioned by folding to form polygonal pockets connected by two-ply panel portions, the panels of said two ply portions being glued together to retain the strip in its folded form with capacity for being expanded or collapsed as required, combined with intermediate partition boards having their opposite surfaces provided with pliable projecting portions with which the continuous edges of the filler sections engage.

2. An egg-case filler strip comprising a long strip of fibrous sheet material having continuous straight parallel edges, said strip having its length divided into a plurality of panels integrally connected by transverse hinge portions formed of densified fiber to a thickness greatly less than the thickness of the sheet material and compressed with a reverse curve or ogee cross section whereby it may be freely bent in either direction, said strip folded upon itself and having a portion of the abutting panels secured together whereby a filler section is provided capable of being opened to provide polygonal pockets.

3. An egg-case filler strip comprising a long strip of fibrous sheet material having continuous straight parallel edges, said strip having its length divided into a plurality of panels integrally connected by transverse hinge portions, said hinge portions between each pair of panels separated by a ventilating perforation extending entirely through the strip and in alinement with the hinge portions and at a distance from the continuous edges of the strip.

4. An egg-case filler strip comprising a long strip of fibrous sheet material having continuous straight parallel edges, said strip having its length divided into a plurality of panels integrally connected by transverse hinge portions, said hinge portions between each pair of panels separated by a plurality of ventilating perforations extending entirely through the strip and in alinement with the hinge portions and at a distance from the continuous edges of the strip whereby there are both a plurality of hinges and a plurality of apertures in the same alinement and arranged alternately.

In testimony of which invention I hereunto set my hand.

CHARLES E. LA FLEUR.