Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 1

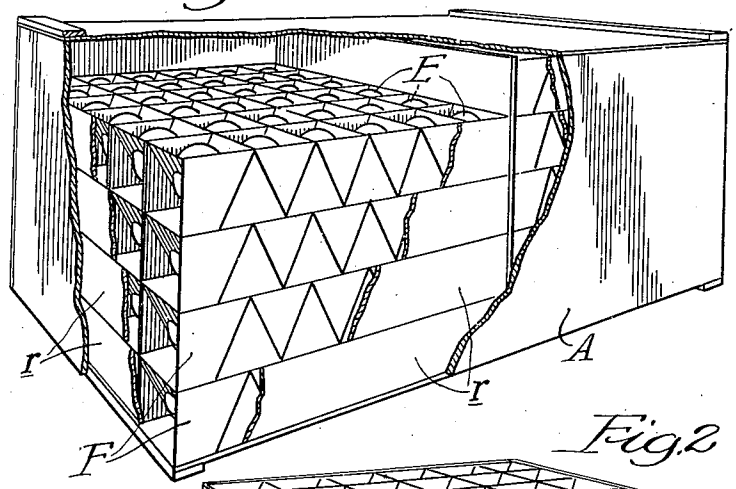


Fig. 2

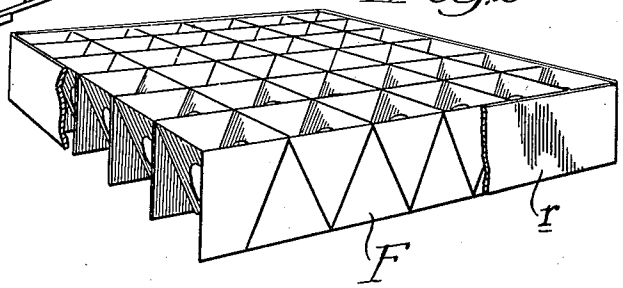
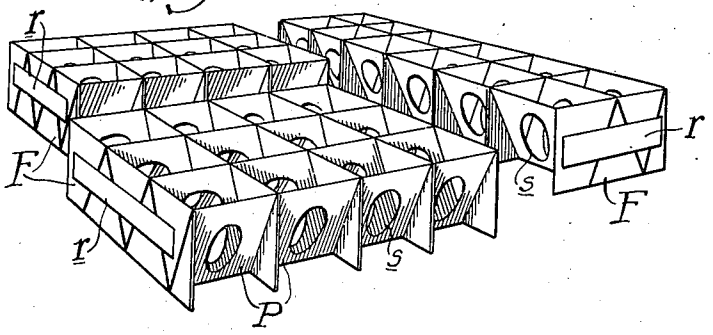


Fig. 3



Inventor:
Adalbert Krauss,
By Reed, Clements
Attorney.

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 5

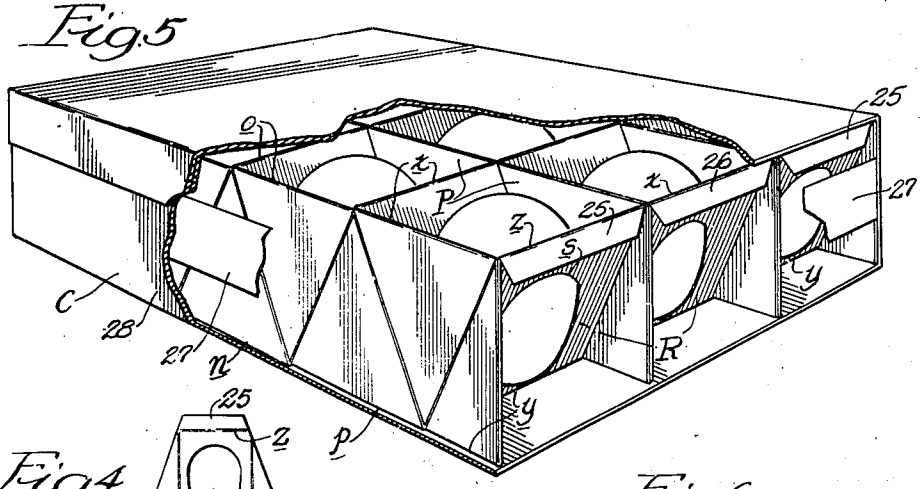


Fig. 4

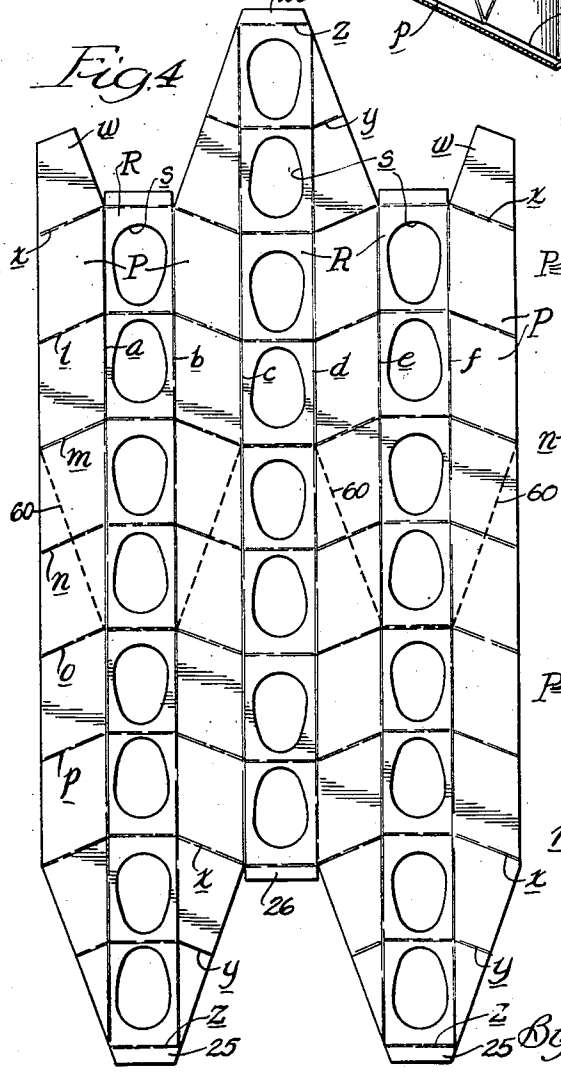


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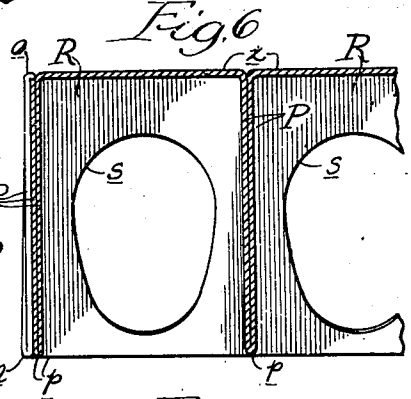
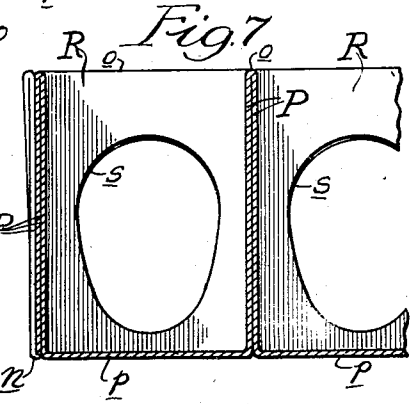


Fig. 7



Inventor.
Adalbert Krauss,
By Wm. J. Clements
Attorney.

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 8

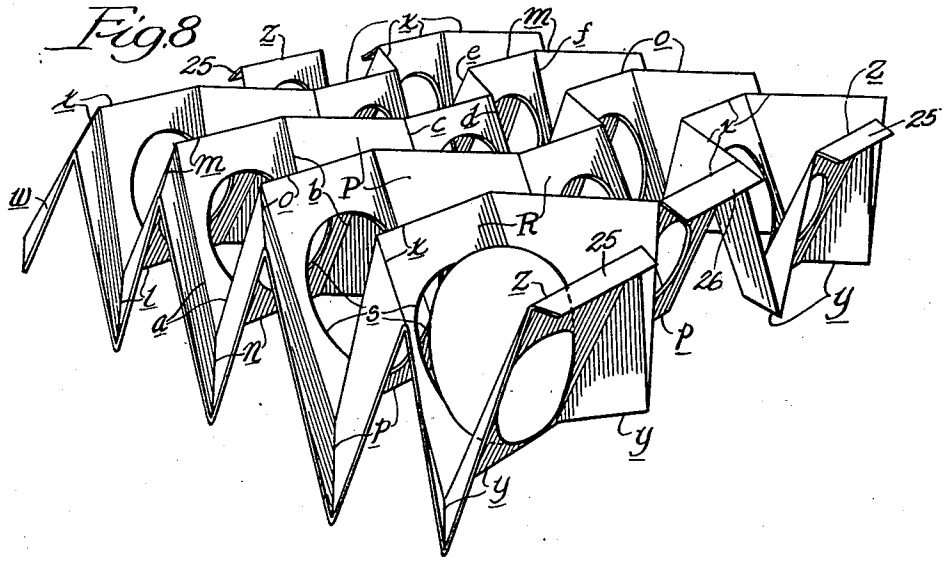
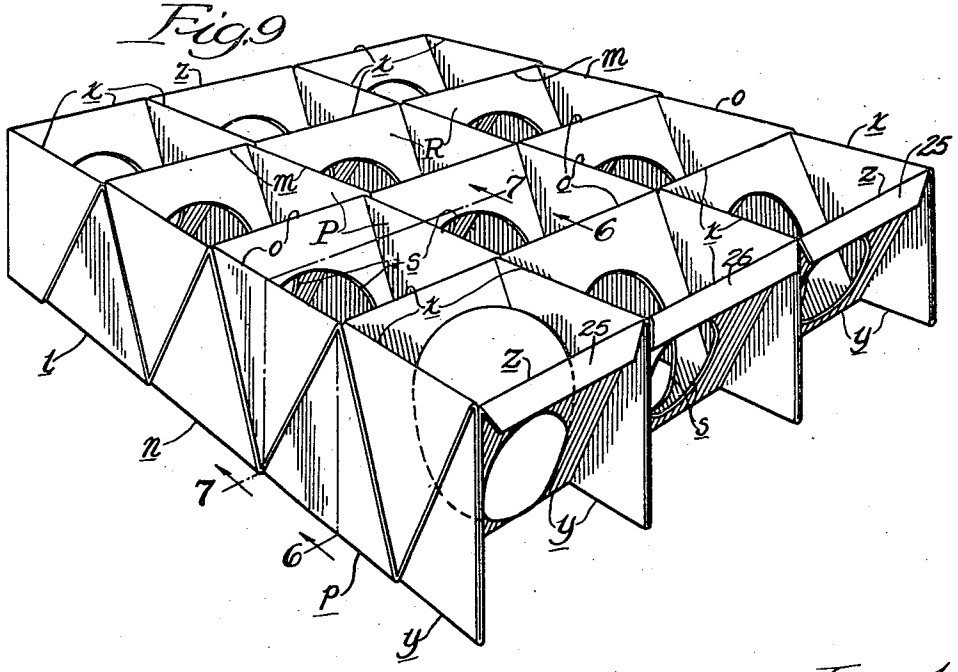


Fig. 9



Inventor:
Adalbert Krauss,
By Jerome C. Clements
Attorney.

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 11

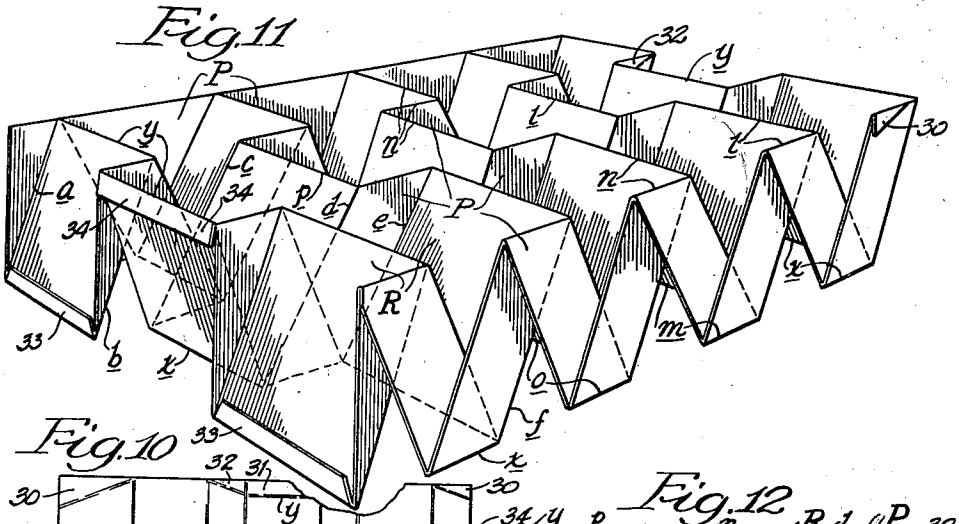


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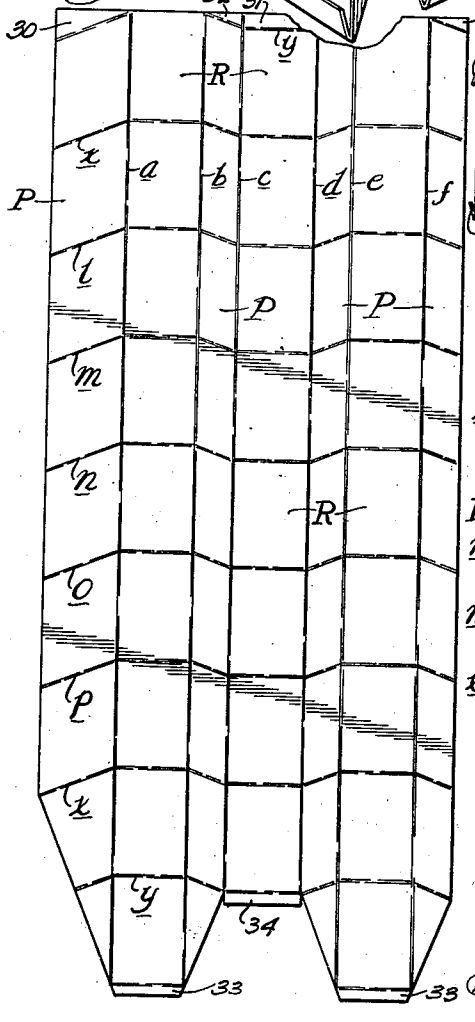


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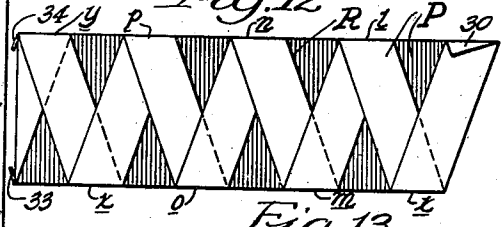
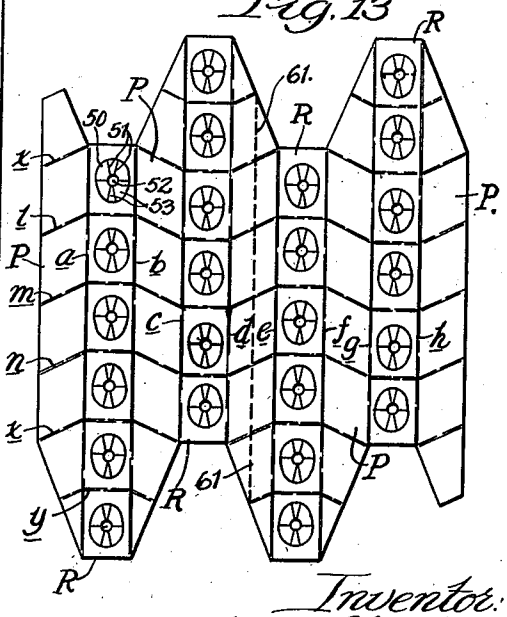


Fig. 13



Inventor:
Adalbert Krauss,
By Geo. C. Clement
Attorney.

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 15

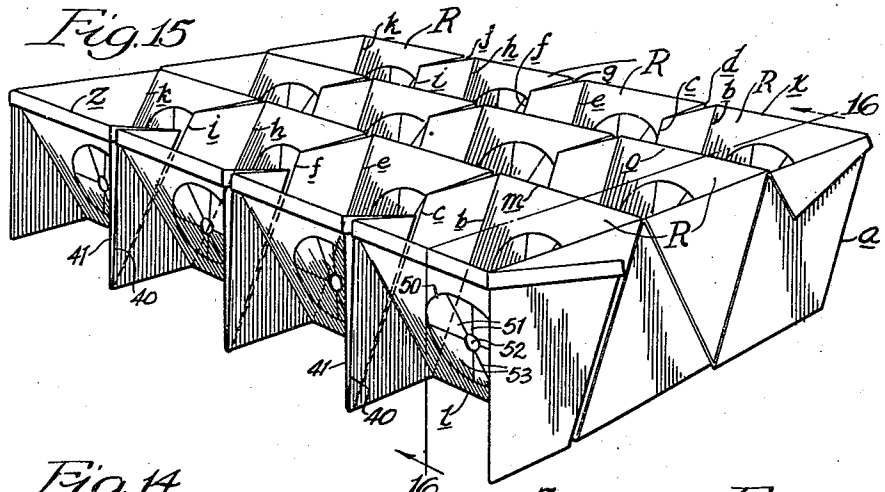


Fig. 14

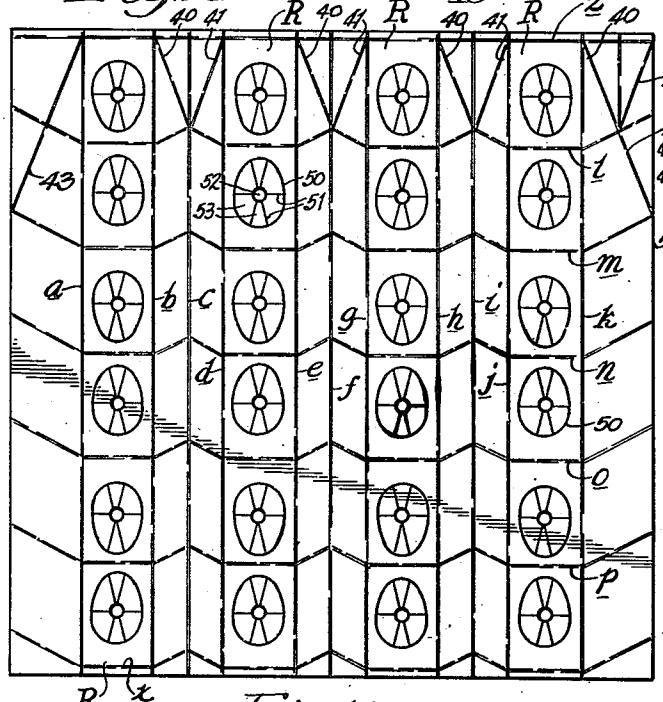


Fig. 17

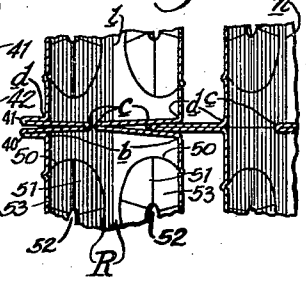
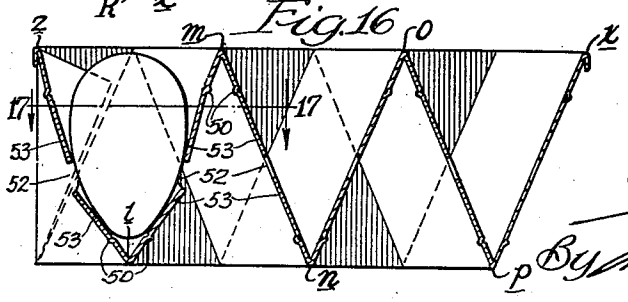


Fig. 16



Inventor:
Adalbert Krauss,
By Clarence J. Clements
Attorney.

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 18

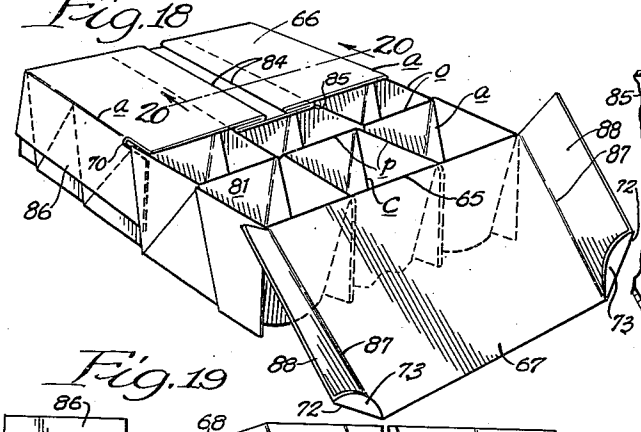


Fig. 20

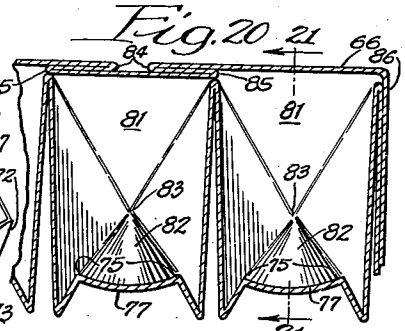


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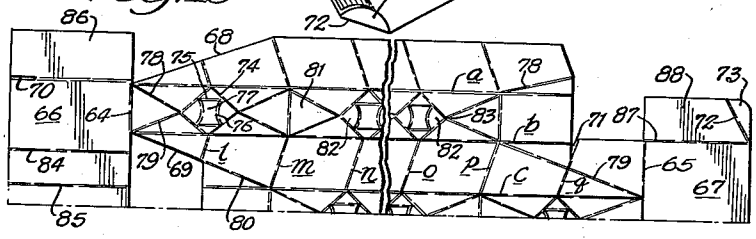


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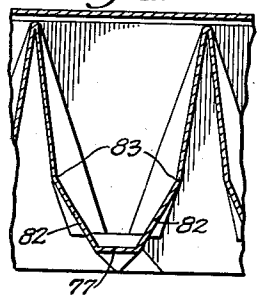


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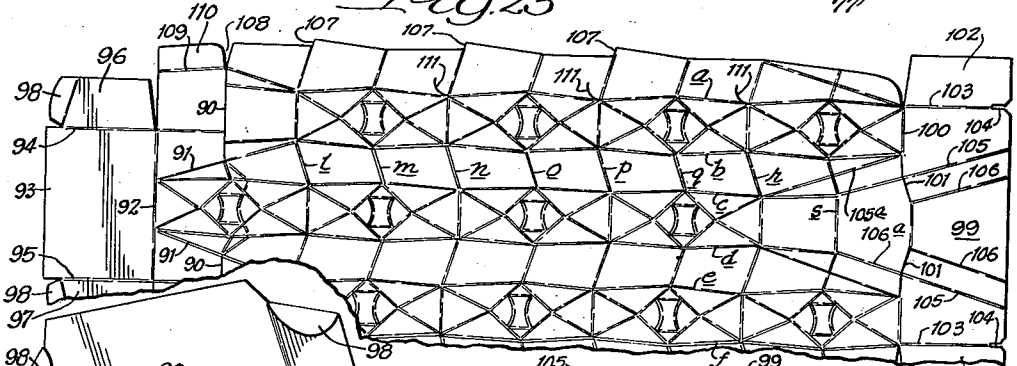


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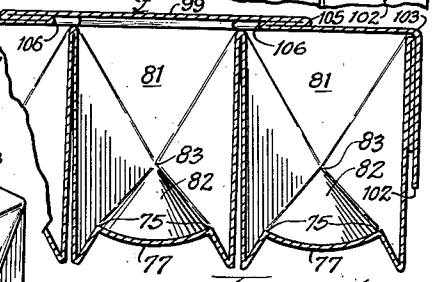
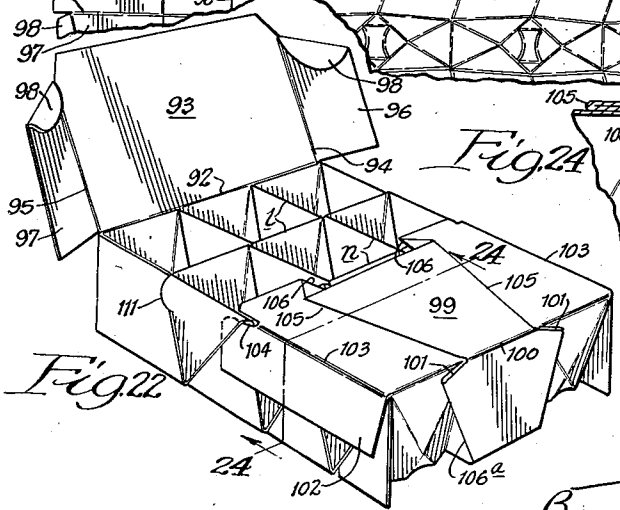


Fig. 22



Inventor:
Adalbert Krauss,
By Clement & Clement
Attorney

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 25

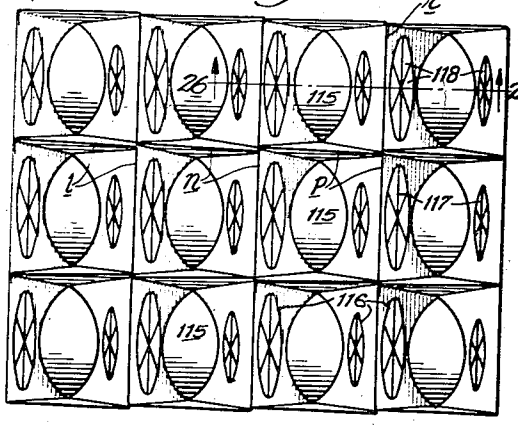


Fig. 26

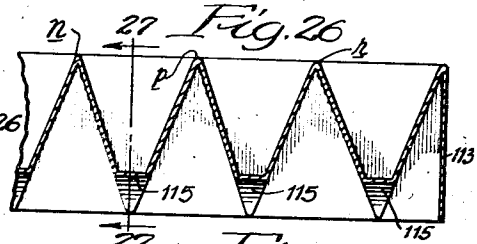


Fig. 27

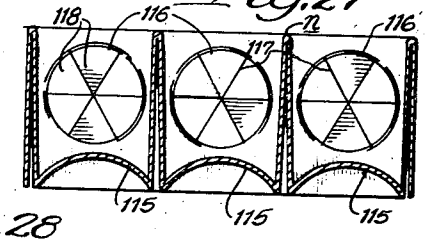


Fig. 28

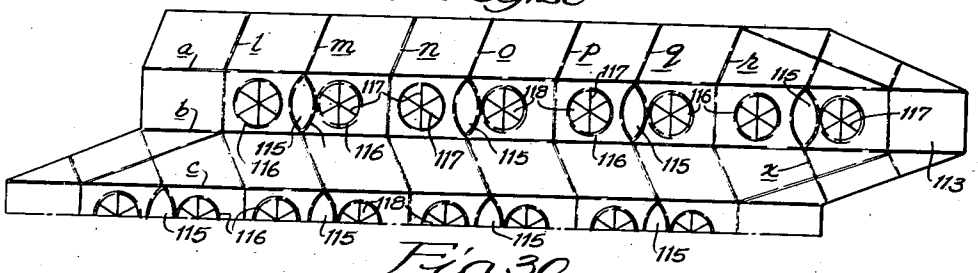


Fig. 30

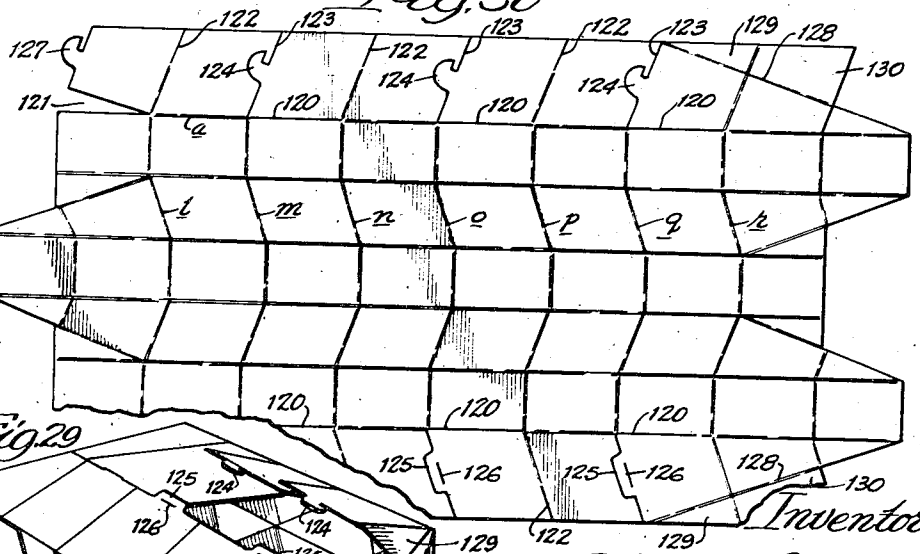
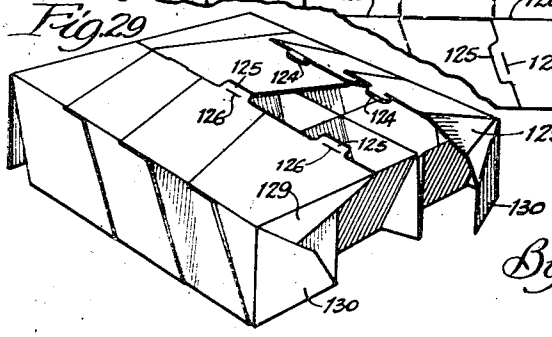


Fig. 29



Inventor:
Adalbert Krauss,
By Geo. P. Clements
Attorney

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 31

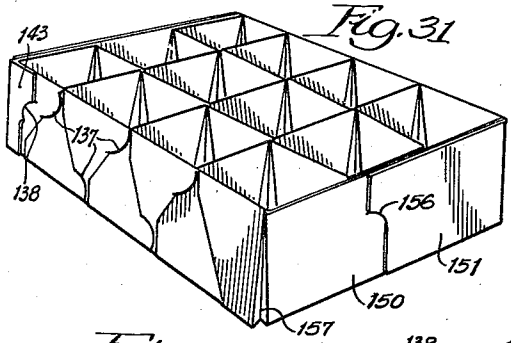


Fig. 32

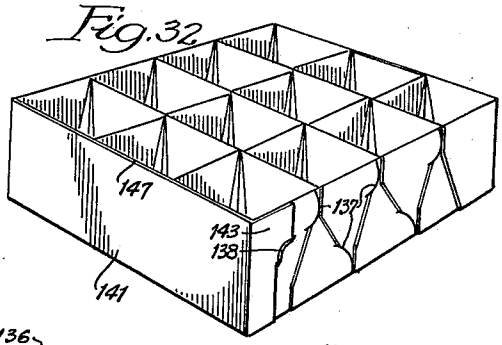


Fig. 33

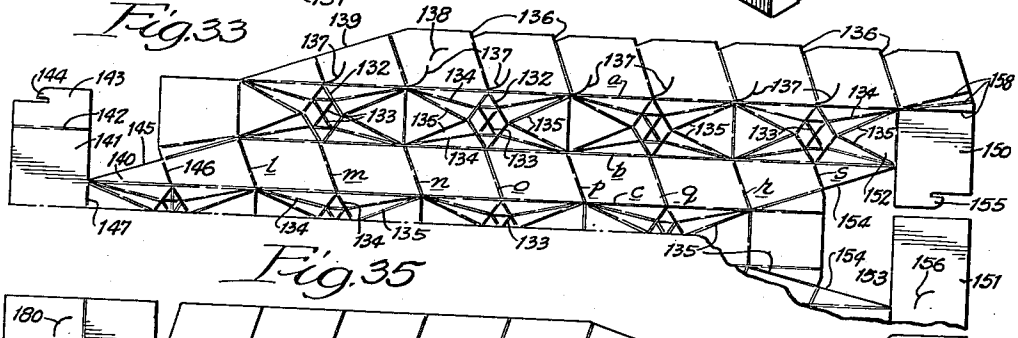


Fig. 35

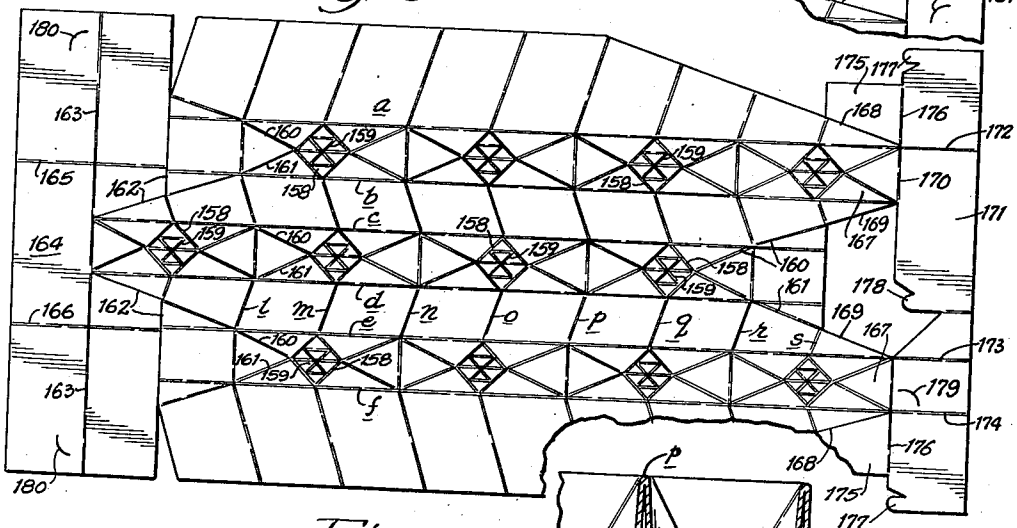
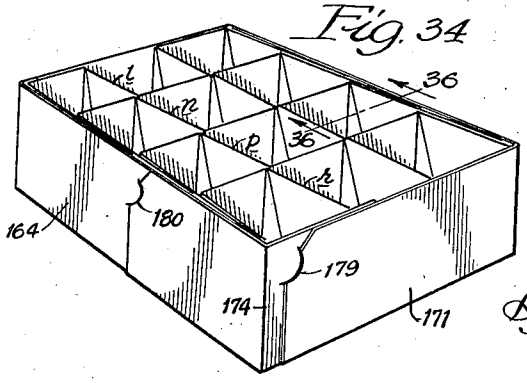


Fig. 34



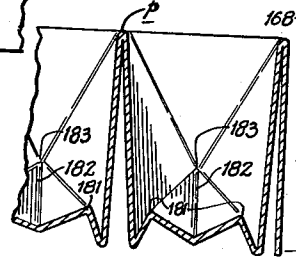


Fig. 36

Inventor:
Adalbert Krauss,
By Jean L. Clements
Attorney.

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 37

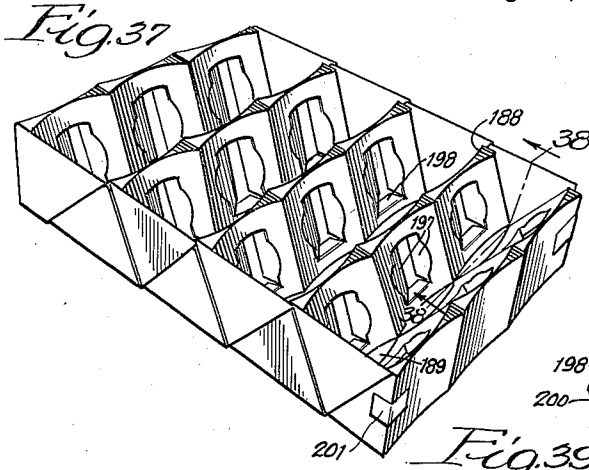


Fig. 38

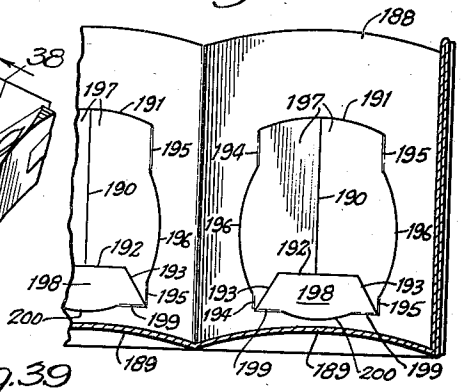


Fig. 39

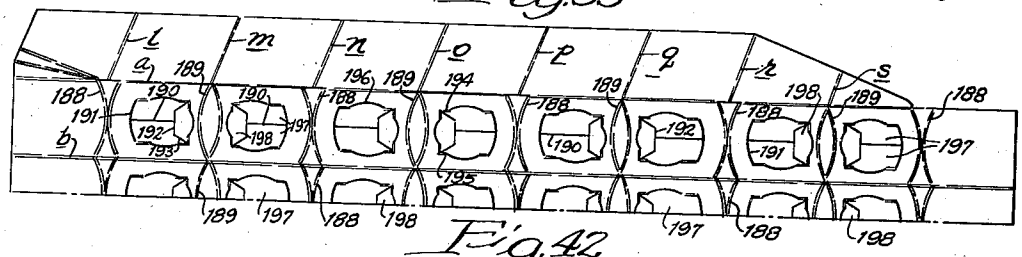


Fig. 42

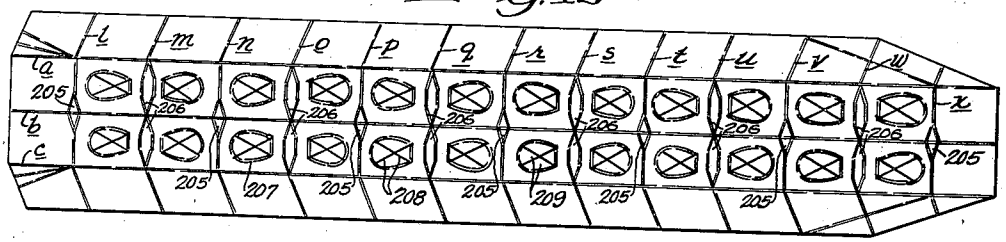


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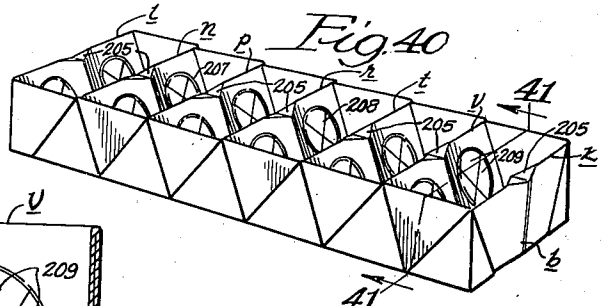
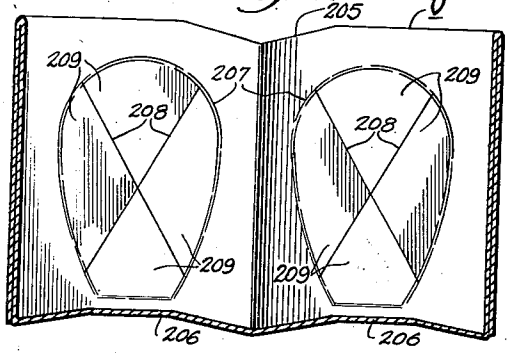


Fig. 41



Inventor:
Adalbert Krauss,
By Jesse J. Clements
Attorney.

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 43

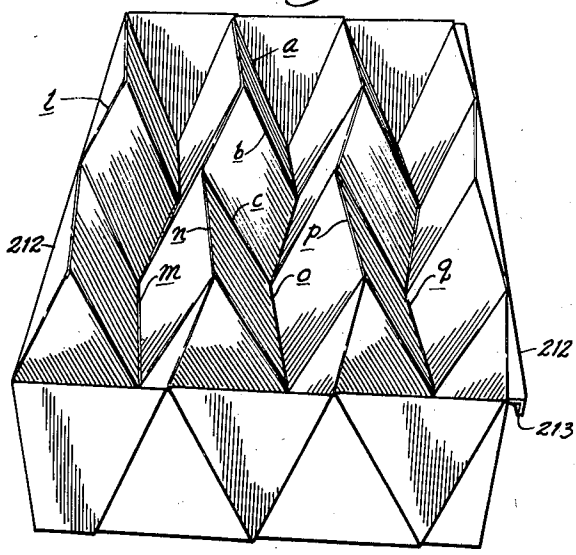


Fig. 44

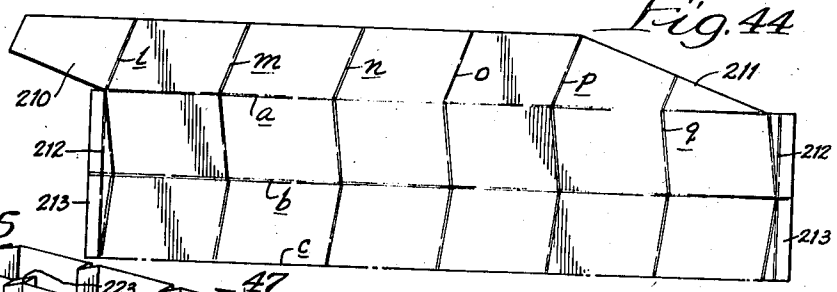


Fig. 45

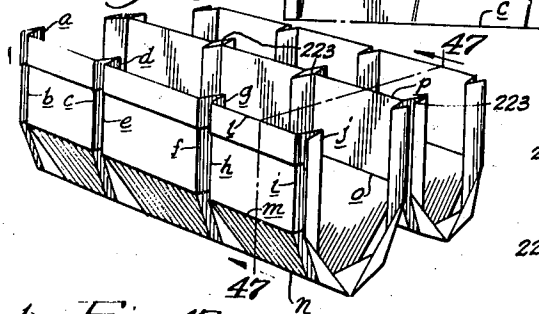


Fig. 46

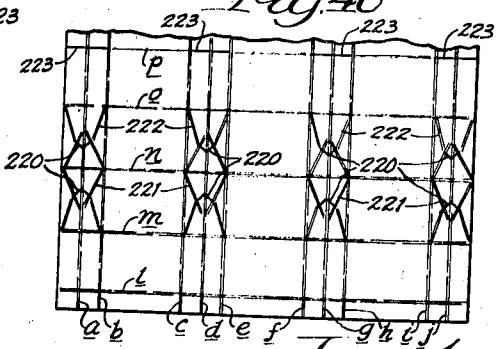
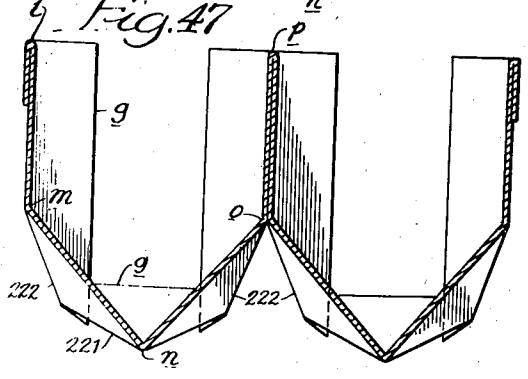


Fig. 47



Inventor:
Adalbert Krauss,
By Serrell & Clements
Attorney.

Nov. 4, 1941. A. KRAUSS 2,261,164

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Fig. 48

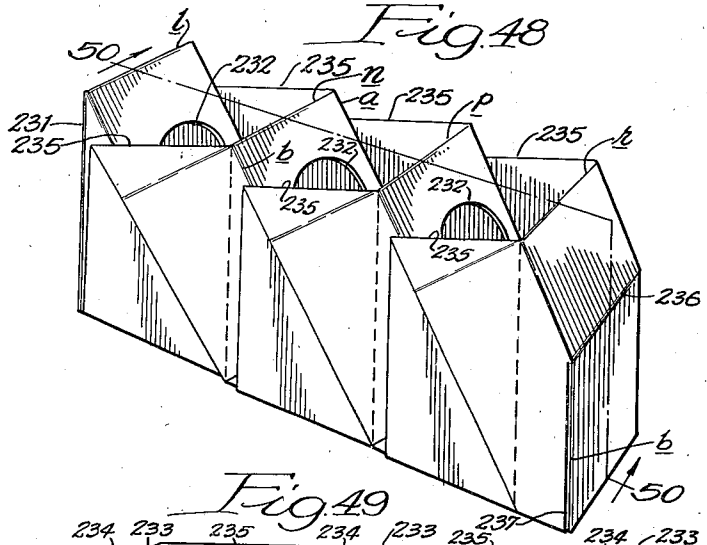


Fig. 49

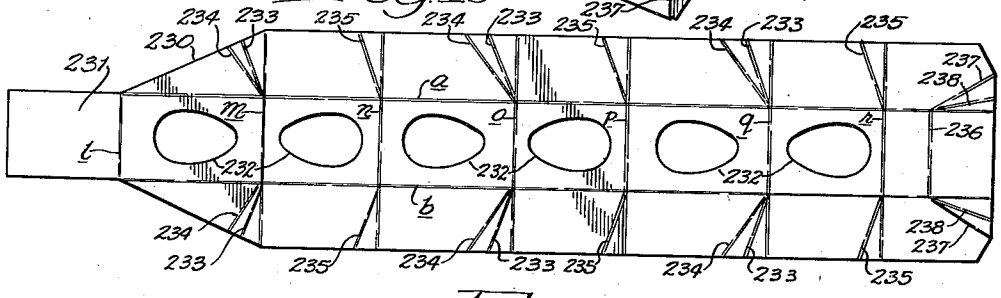
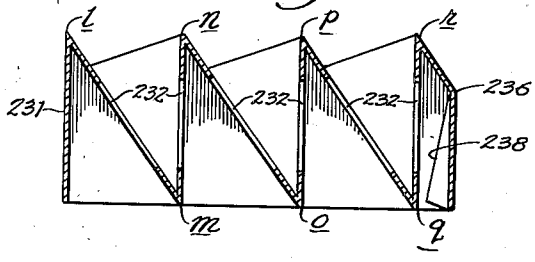


Fig. 50



Inventor:
Adalbert Krauss,
By [illegible]
Attorney.

Patented Nov. 4, 1941 2,261,164

UNITED STATES PATENT OFFICE

2,261,164

FILLER PACKAGE

Adalbert Krauss, New York, N. Y., assignor, by mesne assignments, to Egg-Safety Carton Corporation, New York, N. Y., a corporation of Delaware

Application August 25, 1939, Serial No. 291,979

35 Claims. (Cl. 217—23)

My present invention relates to a filler package comprising one or more cells each adapted to receive and protect whatever article or object is placed therewithin. The present application is a continuation-in-part of my application filed August 16, 1937, Ser. No. 159,261 for a Filler package, and the structure herein disclosed will serve as a package which, with others, complete with intended contents, may be stored or shipped in packing cases or other containers, and, when removed therefrom, be delivered to customers in quantities of one package or multiples or fractions thereof.

The filler package herein described may be advantageously produced from a single sheet of paper or other suitable material which provides in an integral structure a number of individual load sustaining cells each having capacity for a single egg or other like article which requires protection. The sheet itself, in its initial stage, is desirably scored along lines whereon the sheet is to be bent for erection into a filler. In this operation the overall size of the sheet contracts. Owing to its inherent resiliency or otherwise, the sheet may tend either to flatten out again, thus expanding toward its original size and shape, or to further contract. Such a filler, in certain of the exemplifications disclosed, may require in its assembly a second element, viz., a securing means by which to retain the filler structure in a fixed condition of erection. Such a securing means may be of various kinds, as for example a sticker applied to one or more sides of the filler, a band, an enclosing carton, or any like device.

The present filler package is advantageous on account of its simplicity of construction, the ease with which it may be produced and erected, and the low cost which is involved in its manufacture. Additionally, the filler, which is of one-piece construction, may be shipped or stored substantially flat in knocked-down condition, requiring for its erection only a pressure applied to its opposite sides by which to produce a bending of the sheet along the lines of its preformed scorings; or it may be stored or shipped in a partially or completely erected condition, nested with others so as to occupy a minimum of space. When fully erected, the filler is contracted to a minimum, its multi-lateral cells being then reduced to their smallest size although of maximum depth; when erected only partially, however, the filler contraction is somewhat less, the size of the cells being then increased with a consequent lessening of their depth. It is accordingly possible to utilize the filler for the accommodation of articles of varying sizes depending upon the extent to which the filler is contracted or expanded. A cushion support is furnished to the articles contained within the cells so as to afford adequate protection against breakage. Being made of a single piece of paper, there are no operations of pasting or assembling with a consequent increase in time, effort and expense; the weight of the filler is also kept down to a minimum. The form of the cells is such that the filler may, if desired, be reversed, in which event other cells are afforded on the under side of the filler. I may provide in the cells spring seats for the sustained articles which also hold them securely in place, so that if the filler is tilted or overturned there will be no loss of contents. The construction also lends itself to severability along lines which may in large part be non-coincident with the bend lines of the sheet, thereby obviating any excess of weakness in the filler when it is to be handled as a unit.

It is possible to variously embody my invention while still retaining the features of advantage and improvement which have been set forth herein and which will be more fully developed later. By way of exemplification, the accompanying drawing illustrates filler packages or filler units in the manner following:

Figure 1 is a view in perspective of a packing or shipping case with the walls broken away to exhibit a plurality of filler packages arranged therewithin; Fig. 2 is a perspective view of a filler package, size 6 x 6, a portion of the retaining element being broken away; and Fig. 3 is a perspective view of the filler package sub-divided into three smaller units, two of which are 3 x 4 and the other 2 x 6.

Fig. 4 is a development view of a sheet which is shaped and scored (or otherwise acted upon) for producing one form of a 3 x 4 filler unit; Fig. 5 is a view in perspective of the completed package in which the filler unit is made from a sheet according to Fig. 4, dual retaining elements (a carton and a band) being associated therewith; Figs. 6 and 7 are details in section taken on lines 6—6 and 7—7 respectively of Fig. 9; Fig. 8 is a perspective view of the filler unit in a state of partial erection; and Fig. 9 is a similar view showing the filler unit completely erected.

Fig. 10 is a development view of a sheet which is shaped and scored (or otherwise acted upon) for production of a 3 x 4 filler unit of modified form; Fig. 11 is a view of the completely erected filler unit made from a sheet according to Fig.

10; and Fig. 12 is a side elevation of the same filler unit.

Fig. 13 is a development view of a sheet which is shaped and scored (or otherwise acted upon) for the production of a 3 x 4 filler unit having vertical walls at its ends instead of at its sides as in the two filler units of the preceding figures.

Fig. 14 is a development view of a rectangular sheet which is shaped and scored (or otherwise acted upon) for the production of a 3 x 4 filler unit of still different form; Fig. 15 is a perspective view of the erected filler unit made from the sheet according to Fig. 14; Fig. 16 is a transverse section taken on line **16—16** of Fig. 15; and Fig. 17 is a detail in section taken on line **17—17** of Fig. 16.

Fig. 18 is a view in perspective of a filler package 3 x 4 in size, which is complete with its own covers, one of which is opened to expose some of the cells therewithin; Fig. 19 is a development view of the sheet which is shaped and scored (or otherwise acted upon) for the production of the filler package shown in Fig. 18; and Figs. 20 and 21 are detail views thereof in vertical section, the former taken on line **20—20** of Fig. 18, and the latter taken on line **21—21** of Fig. 20.

Fig. 22 is a view in perspective of another form of filler package 3 x 4 in size, complete with covers, one of which is opened to expose some of the cells interiorly thereof; Fig. 23 is a development view of the sheet which is shaped and scored (or otherwise acted upon) for the production of the filler package shown in Fig. 22; and Fig. 24 is a detail thereof in section taken on line **24—24** of Fig. 22.

Fig. 25 is a top plan view of another form of filler unit 3 x 4 in size, having a special cellular structure; Figs. 26 and 27 are details thereof in section taken respectively on lines **26—26** of Fig. 25 and **27—27** of Fig. 26; and Fig. 28 is a development view of one half the sheet which is shaped, scored (or otherwise acted upon) and slitted for the production of the filler unit shown in Fig. 25.

Fig. 29 is a view in perspective of another form of filler package 3 x 4 in size, complete with covers of its own, the sheet from which this package is produced being illustrated in a development view in Fig. 30.

Figs. 31 and 32 are perspective views of another form of filler package, 3 x 4 in size, opposite side and end walls being shown in these figures; and Fig. 33 is a development view of one-half the sheet which is shaped and scored (or otherwise acted upon) for the production thereof.

Fig. 34 is a view in perspective of another form of filler package, 3 x 4 in size, producible from a sheet which is shaped and scored (or otherwise acted upon) as illustrated in the development view of Fig. 35, a detail of the cellular structure thereof being shown in Fig. 36, which is a section taken on line **36—36** of Fig. 34.

Fig. 37 is a view in perspective of another form of filler package, 3 x 4 in size; Fig. 38 is a sectional detail taken on line **38—38** of Fig. 37; and Fig. 39 is a development view of one-half the sheet which is shaped, scored (or otherwise acted upon) and slitted for the production thereof.

Fig. 40 is a view in perspective of another form of filler package, 2 x 6 in size; Fig. 41 is a sectional detail thereof taken on line **41—41** of Fig. 40; and Fig. 42 is a development view of the sheet which is shaped, scored (or otherwise acted upon) and slitted for the production thereof.

Fig. 43 is a view in perspective of another form of filler unit, 3 x 4 in size, producible from a sheet which is shaped and scored (or otherwise acted upon) as illustrated in the development view, Fig. 44.

Fig. 45 is a view in perspective of another form of filler unit, 2 x 3 in size, producible from a sheet which is shaped and scored (or otherwise acted upon) as illustrated in the development (fragmentary) view, Fig. 46, a transverse section thereof, taken on line **47—47** of Fig. 45, being shown in Fig. 47.

Fig. 48 is a view in perspective of another form of filler unit, 1 x 3 in size, producible from a sheet which is shaped and scored (or otherwise acted upon) as illustrated in the development view, Fig. 49, a longitudinal section thereof, taken on line **50—50** of Fig. 48, being shown in Fig. 50.

Referring to Figure 1, I have shown a case A such as is customarily used for the packing of thirty dozen eggs. According to general practice, a succession of flats and 6 x 6 bottomless fillers are arranged in tiers with an egg accommodated within each of the filler cells so as to provide a separation and protection as well. When so packed, the case may be stored or shipped. It is convenient herein to refer to eggs by way of illustration, and in the ensuing description I shall so proceed, it being understood, however, that the filler package of this invention is adapted for advantageous use with articles other than eggs and often in environments which are entirely foreign thereto.

In the case shown in Fig. 1, the eggs E are sustained within the individual cells of packages each comprising a 6 x 6 filler unit F and an associated retainer *r*. Upon opening of the case, each filler package which is removed therefrom will appear as in Fig. 2. For convenience in retail sales, it may be desirable to sub-divide each filler package into smaller units of one dozen capacity, such for example as are shown in Fig. 3. When so sub-divided, the filler units may each require an associated retainer *r*. The precise form of the retainer is relatively unimportant; it may be an enclosing carton C (as shown in Fig. 5), a band (as shown in Figs. 1 and 2), or it may be a sticker (as indicated in Figs. 3 and 5), or even a piece of string (not shown). The purpose of the retainer is to maintain the filler unit in a fixed size and shape such as is required for the safe accommodation of the articles contained therewithin.

The construction of the filler unit having the form illustrated in Figs. 4 to 9 will now be described. As already indicated, the fillers may be of various forms, each produced from a sheet which is specially prepared therefor. The sheet of Fig. 4 is generally rectangular with opposite sides straight and unbroken. Parallel with the sides are certain straight lines of bend, *a*, *b*, *c*, *d*, *e*, and *f*, here shown as equally spaced, and produced conveniently as by scoring of the material. Any other way of producing lines along which the sheet material is induced to bend may also be employed—perforations, for example. By using six bend lines, as shown in Fig. 4, I define seven rows extending lengthwise of the sheet. Crossing the sheet so as to intersect the straight bend lines are other bend lines, *l*, *m*, *n*, *o*, and *p*, which proceed in zigzag fashion. By way of distinction I shall refer to these zigzag lines as "angular." Each angular bend line traverses the first row obliquely, the second row transversely, the third row obliquely at a complementary an-

gle, the fourth row transversely, the fifth row obliquely at an angle the same as in the first row, the sixth row transversely, and the seventh row obliquely the same as in the third row. The sections of all angular lines within the same vertical row are parallel, and in consequence the horizontal rows between each pair of angular lines are of constant width from end to end. The terms "vertical" and "horizontal" are here used in a location sense in relation to the position of the parts as shown in Fig. 4 of the drawings.

The crease of each angular bend line is unidirectional, but the direction of crease of each angular line is reversed with respect to those adjacent, i. e., there is no alternation from end to end; the straight bend lines, however, are alternately creased between the several angular bend lines, i. e., each section of a straight bend line between one pair of angular bend lines is creased for a bend in one direction and then in the next adjacent section is creased for bending in the opposite direction, and so on alternately throughout its length. This alternate creasing arrangement of the straight bend line *a*, for example, is duplicated for the next adjacent straight bend line *b*, but is reversed for the next two straight bend lines *c* and *d*, and again is reversed for the last two straight bend lines *e* and *f* whose creasing arrangement is the same as that for the lines *a* and *b*.

By the provision of intersecting sets of bend lines, one straight and the other angular, there is defined over the surface of the sheet a plurality of panels in rows, those in one row lengthwise of the sheet, designated as P, being parallelograms in the form of rhomboids, and those in the next row, designated as R, being rectangular, and so on alternately crosswise of the sheet.

As already indicated, the shape of the sheet illustrated in Fig. 4 is generally rectangular. While its opposite sides are straight and unbroken, the two ends are otherwise formed. One, shown at the top, is characterized by a pair of wings *w* one being extended beyond the end of each outermost row of parallelograms and separated from the adjacent parallelograms and separated from the adjacent parallelogrammatic panel by an angular bend line *x* and by a truncated extension piece with triangular wings which continues beyond the three center rows for a distance slightly more than two of the rectangular panels. Between this extension piece and the body of the sheet the angular bend line is extended, being coincident with the sheet ends opposite the outer rows of rectangular panels, and proceeding in parallelism with the remaining angular bend lines. The extension piece is traversed by an angular bend line *y* which crosses its triangular wings and two rectangular panels, this line being parallel with the others just referred to. Near the end of the extension piece is a small end flap **25** defined by a bend line *z*.

The opposite or lower sheet end is configured in a way which is complementary to the extension pieces along its top end, i. e., by the provision of two extension pieces with end flaps **25**, one adjacent each side of the sheet and each separated from the other opposite the center row of rectangular panels Each extension piece which is traversed by an angular bend line *y* is joined to the body of the sheet along an angular bend line *x*, the same as is the extension piece at the top of the sheet. In the center between the two extension pieces, beyond a bend line *x*, is a small flap **26**. The material for the sheet from which the filler is to be made may be paper having some degree of resiliency Any other material which will meet satisfactorily the requirements of this invention may also be used. The bend lines may, however, be formed otherwise than by scoring. If desired, they may be partially slitted, or be perforated or otherwise weakened. It is desirable, however, that lines of bend be provided so that in the ensuing operation of erection the several panels of the sheet will take up predetermined positions in which they serve as walls to define cushion cells each capable of sustaining an intended load. It may be found advantageous to impart to the sheet initial bends when the bend lines are first produced, in which event the sheet will no longer remain perfectly flat. Such an initial bend, however, need be only slight in order to facilitate the further bending that is required for complete erection of the filler. The bending movements following the initial bend just described may be induced manually by applying to opposite sides of the sheet a contracting pressure whereby to cause a further bending in the direction of the creases with a consequent repositioning of the panels for defining multi-lateral cells.

In commercial practice the sheets with bend lines thereon may be stacked one upon another so as to occupy a minimum of space. It makes little difference whether the sheets be perfectly flat or whether they have an initial bend, when so stacked. In this condition they may be conveniently shipped to a packing plant or other point of use where erection takes place.

A sheet according to Fig. 4 is designed, while undergoing erection, to pass through a stage which is indicated in Fig. 8; with continued contraction of the sheet, a final stage of erection will be reached, as shown in Fig. 9. The erected filler is thereupon conditioned for association with its retainer *r* which may be of any of the forms already suggested, such as a small band **27** or a carton C, or both, as shown in Fig. 5. When erected and so retained, the filler unit and retainer become a complete package with a plurality of load sustaining cells each providing a cushion support and protection for the articles contained therewithin.

In the erected structure (see Fig. 9) all of the parallelogrammatic panels in the outside rows are arranged in pleats to form two of the outer sides of the filler. Each panel which is in interlapped relation with the one adjacent provides along the top and bottom edges of the filler a discontinuous line which is made up of the several angular bend lines *l*—*p* with the bend lines *x* also occurring in the same longitudinal row. Each cell of the filler is formed by two adjacent rectangular panels in diverging relation with a line of joinder in the bottom plane of the filler, and by opposite side walls each made up of interlapped parallelogrammatic panels from adjacent rows of the sheet. Each cell is multi-lateral in that it comprises a plurality of sides, four being the number shown. One of the diverging rectangular walls of each cell is joined to the adjacent parallelogrammatic panels which extend in substantially vertical planes, there being a continuous top edge, formed by a fold along the bend lines, extending around three sides of the cell. The top edge for the remaining side is formed by a fold along the bend line between

the other diverging wall of the same cell and the diverging wall in the next adjacent cell.

The ends of the filler may be left substantially open, as shown in Figs. 5 and 9, where the flaps **25** and **26**, of which there are several, are downturned to exert an outward pressure against any adjacent walls—an enclosing carton for example. In this way the filler is adequately cushioned against external shocks.

As suggested in Fig. 8, the filler passes through an intermediate stage before reaching a condition of complete erection. In this intermediate stage the cells of the filler are partially distended as well as open. The depth of the cells is also somewhat less than when complete erection has taken place. Owing to the fact that the cells are of different size than when the filler is completely erected, it is possible to accommodate within such distended cells articles whose shape or character may adapt them for fitting therewithin. Under such conditions the retainer may be applied to the filler so as to hold it at the desired point of erection. By so proceeding, it is possible to utilize a single set of dies or other instruments for producing bend lines in the sheet which may thereafter be erected to whatever extent is desired, according to the nature and size of the articles to be contained therewithin.

The filler just described is produced from a sheet which is other than rectangular. Another form of the filler, made from a sheet having three straight unbroken edges, is illustrated in Figs. 10–12. Inasmuch as this sheet is provided with six straight bend lines parallel with each other and with opposite sides of the sheet, I have designated them as *a* to *f*, respectively, the same as in Fig. 4. Also, angular cross lines *l* to *p*, the same as those shown in Fig. 4, are employed to define with the other set of lines rows of parallelogrammatic panels P in alternation with other rows of rectangular panels R. In addition, other angular cross lines *x* and *y* beyond the lines *l*—*p* are provided, as shown. At the end of the sheet which is straight and unbroken, a triangular flap **30** is defined opposite each outside row of parallelograms; a rectangular flap **31** extends beyond the outer row and adjacent thereto are other triangular flaps **32** opposite the adjacent rows.

The opposite end of the sheet is formed with spaced extension pieces, much the same as those illustrated along the lower end of the sheet of Fig. 4, with small rectangular flaps **33** at the end of each. Between these extension pieces is a flap **34**. In the sheet of Fig. 10, however, there is a change in the proportions to the extent that the rows of parallelogrammatic panels are somewhat narrower than the adjacent rows of rectangular panels, with the exception of the row of parallelograms along the left side of the sheet. In the erected filler (see Fig. 11) the narrower rows of parallelograms provide only a partial separation between adjacent rows of multi-lateral cells, there being open communication between these cells in their upper region. This may be of advantage in many cases, for example where ventilation is an important consideration. The wide row of parallelograms along the left side of the sheet provides a completely closed wall along one side of the filler, the same as shown in Fig. 9. Along the opposite side, however, the filler wall is not completely enclosed, but is open in its upper region due to the absence of a complete interlap between the narrower parallelograms. In all other respects, the filler illustrated in Figs. 10 to 12 is the same in characteristics and formation as the one first described.

In the two forms of 3 x 4 filler units already described, the parallelogrammatic panels are extended vertically in pleated fashion along the longer sides of the structure. This is one way of doing it. Another way is to have such pleated parallelogrammatic panels form vertical walls along the shorter sides or ends of the filler. A sheet from which such a filler may be produced is illustrated in Fig. 13. Here it will be noted I employ the same arrangement of straight bend lines *a*—*h* in intersection with angular bend lines *l*—*n*, defining alternate rows of parallelograms P and rectangles R, the number of such rows, extended transversely of the sheet, being nine instead of seven as in the sheet previously considered. Beyond a bend line *x* at each end are extension pieces each having an angular bend line *y*. The resulting proportions of the sheet are somewhat altered. In all other respects, however, the construction is substantially the same as has been described in connection with Fig. 4. When erected, the sheet will produce a filler having its ends formed from the outer rows of parallelograms which interlap in pleated fashion.

Coming now to Figs. 14–17 inclusive, I have here shown a construction which is produced from a rectangular sheet each of whose sides is straight. As with the other sheets, I provide two sets of intersecting bend lines, one straight and the other angular. The straight lines are designated in order as *a to k* and the angular lines as *l to p*. In addition, near one end of the sheet I provide a further angular bend line *x* and near the opposite edge of the sheet a straight bend line *z*. The outermost rows of panels on opposite sides of the bend lines *a* and *k* are of the same width as the two intermediate rows of rectangular panels between the lines *d*—*e* and *g*—*h*. The remaining six rows, however, which are made up of parallelogrammatic panels, are shown as of substantially one-half this width. The panel row proximate to the bend line *z* is further defined by certain oblique bend lines **40** and **41** arranged in pairs each of which extends from a common point, at the juncture of one of the bend lines *c*, *f*, and *i* with the angular bend line *l*, to the next adjacent straight bend line at its juncture with the line *z*.

In the row of parallelograms to the outside of the bend line *k*, the line **40** continues on at **42** to the edge of the sheet at the end of the line *m*. From the opposite end of this line *m* a bend line **43** extends obliquely to the juncture of the lines *a* and *z*.

Each angular bend line is creased uni-directionally, but the direction of the crease in one such line alternates with that of the next adjacent angular bend line. The straight bend lines, on the other hand, are creased in reverse directions as they proceed from the space between two angular bend lines to the next adjacent space, such reverse arrangement being the same for all the straight bend lines except those designated as *c*, *f* and *i* which, while creased in alternate directions between successive spaces, are reversed with respect to the creases in the next adjacent straight lines. The arrangement is substantially the same as that already described in connection with Fig. 4.

In response to forces of compression, the sheet panels are bent as induced by the direction of its several creases to provide walls which define a plurality of cushion cells each of which is load

sustaining. When fully erected, the adjacent rows of parallelogrammatic panels on opposite sides of the lines *c*, *f* and *i* will form V-walls interfitting in the lower portion of the filler so as to separate the cells at such points by four plies. Above this zone of interfitting there is open communication between all cells in the same row. The ends of the filler are constituted by the outermost rows of parallelograms which interfit in pleated fashion. The sheet edges adjacent the bend lines *x* and *z* may be turned outwardly and downwardly from the marginal edge, as shown. The triangles at the outside of the bend lines **42** and **43** may be bent over and downwardly. In this manner I am enabled to use effectively a sheet which is rectangular in form, without having to specially configure any of its edges.

In the several forms of described filler units there are two sets of bend lines, one straight and the other angular, defining alternate rows of rectangles and parallelograms. The direction of creases of the bend lines are so faced as to induce movement of the panels to positions where they define multi-lateral cushion cells. In the erected filler, the outside walls upon two opposite sides (or ends) as well as the cell-defining walls parallel therewith, are all pleated. Each panel between the bend lines by which it is defined is endowed with life so as to be resilient to an appreciable degree; there is accordingly capacity on the part of several walls of each cell to yield, as required for the accommodation of articles of varying size and contour. A tensional engagement is maintained in consequence. Each filler unit, regardless of its form, is expansible or contractible in directions parallel with its sides and ends, all such movements proceeding concurrently. The top edges of the several cells lie in a common plane and are folded in every instance. The same is true of the bottom edges of the filler, all such bends being at an acute angle. In every case the separating walls between the cells comprise at least two plies. The number of these plies may be increased, as in the case of parallelogrammatic panels, which are doubled and then interfitted (see Figs. 15 and 17 for example).

It may be found desirable to form in each filler cell a seat in which the egg or other accommodated article may be better fitted. Such a seat is shown in several figures of the drawings. For example, in Figs. 4 to 9, the seat *s* in each case comprises an oval cutout in one of the rectangular panels so that when the filler unit is erected two such openings will lie opposite each other to receive therebetween an egg or other article which is to be accommodated therewithin. In this manner the flexibility of each rectangular panel is somewhat enhanced, and it is permitted to make with the egg or other article an edge engagement which conforms with the article surface to a considerable extent. Another form of seat which may also be used to advantage is illustrated in the sheets of Figs. 13 and 14, where each rectangular panel is provided with an oval or circular bend line **50** from which radiate inwardly other slit lines **51** to a common central opening **52** to define a plurality of fingers **53** all of which yield sufficiently to accommodate between them the egg or other article which is to be sustained (see Fig. 16). Due to the pleated character of the filler unit in which all of the cell walls retain a considerable degree of resiliency, a constant engagement may be maintained with the eggs or other accommodated articles at various points upon its surface entirely apart from the tensioned or frictional engagement which is afforded by the seats just referred to. An immovable retention of the eggs or other articles is accordingly assured, and, in practice, a loaded filler package may be tilted or even inverted without loss of the contents.

As indicated in Figs. 1, 2 and 3, the filler packages may be of various sizes. For commercial purposes, 6 x 6, 3 x 4 and 2 x 6 filler units would probably be the most common. The filler units may be initially produced in any of these sizes, or they may be subsequently broken down to any of the smaller sizes. This may be accomplished conveniently with the aid of lines of severance which are provided in the sheet without, however, weakening the cell structure of the erected filler unit. As an example, reference is made to Fig. 4, where a severance line **60**, indicated by a succession of dashes, is shown as extending transversely across the sheet in angular fashion. It starts at one end of the angular bend line *m*, proceeding obliquely to the juncture of the second removed angular bend line *o* with the straight bend line *a*, thence coincident with the latter across the proximate row of rectangles, thence obliquely back to the line *m* at its juncture with the bend line *c*, thence in coincidence with the latter across the proximate row of rectangles, thence obliquely once more to the oblique line *o* at its juncture with the straight line *e*, thence coincident with the former across the proximate row of rectangles, and thence obliquely to the end of the line *m* opposite to the starting point. A bend line so proceeding is characterized by seven sections, one for each of the rows of panels which are extended transversely of the sheet; and by an oblique extension of every alternate section for a distance of two panel rows. The result in the completed filler unit is a continuous line of severance which extends vertically and horizontally but always in a single plane transversely across the filler unit at a central point. If the filler be severed along such a line, two smaller filler units, each 2 x 3 capacity, will be provided, each complete in itself and capable of use, with an associated retainer, for the support and protection of eggs or other contained articles.

It is to be noted that the line of separation just described traverses for the most part an area of the sheet which is not traversed with bend lines; it is only throughout the three of its shorter sections that the line of severance is coincident with any bend lines. The strength of the sheet is accordingly not impaired, nor is the action of its several panels at their respective lines of bend appreciably affected. The severance line may be variously formed as for example by a heavy scoring of the sheet material or by a slitting thereof, partial or otherwise, by perforations, etc., and it may be discontinuous where in coincidence with bend lines, in which event the filler would be required to separate along the latter without further treatment.

Application of a severance line to the filler unit may be otherwise arranged, as suggested for example in Fig. 13, where I have shown lengthwise of the central row of panels (parallelograms) extending longitudinally of the sheet a line of severance **61** which continues straight from end to end. This line is preferably located centrally of the panel row referred to. In the erected 3 x 4 filler this line of severance will extend angularly from top to bottom along each parallelogrammatic panel which is comprised in

the pleated wall extending centrally between six cells on one side and six cells on the other, so that if the filler be severed along this line, two 2 x 3 fillers will be produced in consequence. A severance line arranged as in Fig. 13 has the advantage that it does not at any point coincide with lines of bend, and therefore cannot weaken the erected filler in any way. This severance line is in fact so located as not to initiate tearing of the filler in two unless it be handled in a special manner which those whose business it will be to dispense and make use of such fillers will readily learn with a little practice.

Passing on to the filler package of Fig. 18, the half blank illustrated in Fig. 19 is formed with two sets of intersecting bend lines, one straight extending lengthwise and designated in order as *a* to *c*, the other set of bend lines *l* to *q* being angular and extended transversely of the blank. Straight transverse bend lines **64** and **65**, one near each end of the blank, are also provided to define cover sections **66** and **67**, respectively, as will presently be explained. Opposite sides of the blank are slanted inwardly, as at **68**, from the transverse line *m* to the line **64**, and between the lines **64** and *l* I cut out an opening whose remaining sides **69** are divergently related. The longitudinal bend line *a* continues on through the cover **66** which is also formed with a pair of slits **70** extending inwardly from its end, one coincident with each outermost longitudinal bend line of which one, designated as *a*, appears in the half blank illustrated. The cover **67** is of lesser width, its opposite sides terminating substantially in line with the outermost longitudinal bend lines. Between the line **65** and the adjacent transverse line *q* the blank is cut away adjacent opposite sides to a depth approximately of the longitudinal bend line *b*, thus providing, in effect, a neck which connects the cover sections **67** to the main body of the blank. At the juncture of this neck with the blank body is a pair of inwardly extending notches **71** of which only one appears on the half blank illustrated. The outer corners of the cover section **67** are formed with oblique bend lines **72** to define ears **73**.

The alternate transverse bend lines commencing with *m* and ending with *p* extend continuously and angularly, each in the form of a single line, and in the erected filler extend in the form of folded edges around the tops of the walls which define the cells therewithin. The remaining transverse lines, however, commencing with *l* and ending with *o*, proceed angularly but straight from each blank side to the outermost longitudinal bend line *a*; between this bend line and the next adjacent bend line *b*, these transverse bend lines *l* et al. divide to form substantially a diamond figure **74** having a pair of parallel bend lines **75** extending between opposite sides of the diamond with a pair of inwardly bowed bend lines **76** extending therebetween at their points of juncture with the diamond, the inner figure **77** thus enclosed within the diamond being in the general form of a square with two of the opposite sides concave; these transverse bend lines *l* et al. continue thusly across the blank, with spaced divisions each in the form of a diamond enclosing a concave square, one occurring in each alternate panel row defined by the longitudinal bend lines. In these same panel rows are other bend lines **78** and **79** extending angularly in an easy zigzag course lengthwise thereof between the adjacent longitudinal bend lines, as *a* and *b*, proceeding oppositely and inwardly from each to the proximate corner of the nearest diamond figures. From the opening side **69** and in substantial alignment therewith is a bend line **80** which continues on to the longitudinal bend line *c* with which it meets at the point of crossing of the transverse bend line *m*, and near the opposite blank end the zigzag bend lines **78** and **79** extend on, the former to the blank end and the latter through the neck to the bend line **65** where the cover section **67** commences. Because of the complementary relationship of the angular lines **78** and **79** there is formed a set of diamond figures **81** all disposed within a single longitudinal panel row and each touching at its opposite ends the diamond figures **74** previously described.

While the form and arrangement of the bend lines on this specially shaped blank may appear complicated, it is very inexpensive to provide and easy to erect into a cellular filler complete with covers, as shown in Fig. 18. Here it will be noted I have provided a plurality of cells in rows (3 x 4 being the size illustrated) with the folds produced along the alternate transverse bend lines *m*, *p*, et al. forming the top edges for the inclined walls which define cells, all as explained in connection with the structures previously described. The concave squares **77** are located at the bottoms of the cells with bends produced along the parallel lines **75** which in consequence stand up as spaced ridges symmetrically with respect to the longitudinal center line of each cell bottom. Between these ridges the concave square is downwardly bowed to provide in effect a shallow pocket at the center of each cell bottom. The figures **82** defined by the two angular lines and an arc adjacent each concave line **76** are bowed into each cell along the opposite inclined walls thereof, and adjacent each such figure, completing the same call wall, are three triangles having a common meeting point **83** which is coincident with the angle of the figure **82**. These meeting points tend to flex outwardly or away from the interior of the cell so that each of the two slanting walls thereof is, in effect, outwardly bowed in a transverse plane (see Fig. 21) with the exception of the inwardly bowed figure **82** adjacent the bottom, which latter is downwardly bowed between its spaced ridges. A cell so formed is advantageous in that it has (1) a cushion bottom which is (2) raised above the folded edges which extend in a common plane to define the bottom of the filler, the cushion bottom of the cell being (3) wide, (4) so shaped that the load will tend to distribute itself, and (5) free from incisions or slits which tend to weaken the structure.

In the erected filler the two cover sections may be swung over the cells and there secured to complete an enclosure. The cover **66**, being of full width, requires to be pleated in order that it may conform to the reduced width of the structure when it is contracted in the process of erection. For this purpose I provide a pair of parallel bend lines **84** and **85** along which the cover section is adapted to be folded in reverse directions, thus forming a longitudinal pleat (see Fig. 18). A second similar pair of bend lines may also be provided, with the consequence that the excess material is disposed of whereby the two bend lines *a* of the cover are shifted to remain in alignment with the folds extending longitudinally along the outside edge of the filler at the top. The end panels **86** of the cover section may thereupon be folded down and inserted within one of the pleats along the outside of the filler,

the slit 70 facilitating this operation which assures locking of the cover section in place. The other cover section which is already of reduced width requires no pleat extending longitudinally thereof in order that certain bend lines 87 formed therein shall align with the folds extending along the top of the filler at its outside edge. Flaps 88 defined by these bend lines may be folded down, the ears 73 being then turned inwardly to lie within one of the pleats along the outside of the filler whereby the cover section is locked down in place. In the construction just described I have provided from a single piece of sheet material a filler package complete with covers, the cells having the cushion feature which is so important for the protection of fragile articles such as eggs.

Considering now the filler package of Figs. 22–24, the blank body (see Fig. 23) may be generally similar to the one last described, and, except as to points of differentiation, will not be described in detail. One of these features is the angular disposition of the several longitudinal bend lines *a*—*f*, each of which proceeds in an easy zigzag course, with points of direction alternating at each intersection with one of the transverse bend lines *l*—*s*. Beyond the endmost bend line *l* is a pair of aligned transverse incisions 90, one extending inwardly from each side to a slanting bend line 91 which corresponds in position to the blank edge 68 in Fig. 19; and beyond the aligned incisions is a transverse bend line 92 which defines one cover section 93 having a width about equal to the outermost longitudinal bend lines *a* and *b*, the cover section being further provided with two longitudinal bend lines 94 and 95, about in line with the longitudinal bend lines *b* and *e* respectively, to define side flaps 96 and 97 each having an ear 98 adapted to be reversely bent with respect to its associated flap in the manner presently to be explained.

A complementary cover section 99 at the opposite blank end is defined by the angular transverse bend line 100 which is slitted at 101 in certain portions thereof between the bend lines *b*—*c* and *d*—*e*, respectively. This cover section, which may be full width, is provided with a pair of side flaps 102 defined by longitudinal bend lines 103, each of which terminates in a notch or slit 104 at its outer end. In addition, I provide for two pleats as by pairs of oppositely creased bend lines 105 and 106 having offset lines 105ª and 106ª, the one pair, by preference, being extended divergingly with respect to the other. One other special feature is the optional angular disposition of the opposite sides of the blank whose edges may be so shaped as to proceed in slightly different directions, the angles occurring at the ends of the transverse bend lines *l*—*r*, and a shoulder 107 being provided at the end of the alternate in-between bend lines. At each end of the bend line 90 is a notch 108 extending inwardly as far as a bend line 109 which proceeds in a generally longitudinal direction to provide a flap 110. I also form an arcuate cut 111 extending in the outermost longitudinal panel row from the intersection of the longitudinal bend line *a* with the transverse bend lines *n*, *p*, and *r*.

Such a blank is adapted, upon erection, to produce the filler package of Fig. 22 in which the cells are characterized by substantially the same features as those which have been pointed out in connection with the filler package of Fig. 18. By reason of the angularity of the longitudinal bend lines, however, the several cells in each longitudinal row are somewhat wider at the bottom (see Fig. 24), the longitudinally extending walls which define such cells being more nearly vertical and lying closer to each other than when disposed at a greater angle of divergence, as in Fig. 20 for example. This may be desirable, especially when lateral pressure upon the articles contained within the cells should be avoided. The cover section 99, when folded over to closure position, is contracted as to width, by the two pleats produced by the two sets of bend lines 105, 105ª, and 106, 106ª, with the consequence that its side flaps 102 may be folded down to engage the notches 104 within one of the pleats formed along the package sides, thereby securing the cover section in place. The remaining cover section 93 is substantially the same in form and manner of locking as the cover 67 already described in connection with Fig. 18. In the erected package the shoulders 107 appear as short single ply top edges along the outer sides of the filler, lying adjacent the arcuate cuts 111 which, when opened slightly, will permit such shoulders to enter, thereby holding the several pleats along the package sides in aligned relation.

The showing in Figs. 25—28 is of a filler unit in which the blank (only one-half of which is illustrated in Fig. 28) is characterized by straight parallel longitudinal bend lines *a*—*c* et al. and by angular transverse bend lines *l*—*r*, the contour of the blank being much the same as the one of Fig. 4 which has already been described in detail. The point of distinction to which attention is directed is the shape of the cells produced by dividing each alternate transverse bend line *m*, *o*, *q*, and an additional bend line *x* adjacent an end extension piece 113, into two facing bows which define a pointed ellipse 115 whose major axis extends crosswise of the alternately occurring longitudinal panel rows between the bend lines *a*—*b*, etc. Adjacent each ellipse, in the same panel row therewith, is a pair of circular bend lines 116, one (slightly smaller) preferably closer to the ellipse than the other (slightly larger), and each circular bend line defining the outer terminus of certain radial slits 117 which form between them a plurality of fingers 118 which may yield to accommodate between them an egg or other article which is to be sustained. In the erected filler the ellipses will be bowed upwardly longitudinally (see Fig. 27), thus providing elevated bottoms for the cells, and the yielding areas on the adjacent diverging walls, defined by each group of fingers 118, will afford cushion supports laterally upon opposite sides of the article which is placed within the cell. By forming one such yielding area larger than the other I induce a suspension of the article with its axis disposed obliquely instead of vertically, thereby economizing on space.

Proceeding on to Figs. 29—30, I have shown a structure which is generally similar in contour to that of Fig. 4 but modified to the extent of providing in one and the same blank means which will afford to the erected filler a set of covers whereby it becomes a completed package. For this purpose the outermost longitudinal bend line *a* is slitted at 120 between alternate transverse rows of panels defined by the lines *m*—*n*, *o*—*p*, and *q*—*r*, with a further diverging slit 121 at one end. Each alternate transverse bend line *l*, *n*, and *p* is slitted inwardly at 122 at its end for perhaps the width of the outermost side panel row, and the remaining transverse bend lines *m*, *o* and *q* are inwardly slitted at 123 for the full width

of the same rows to form, in one outermost side panel row, hooks 124 which extend across into the next adjacent transverse panel row, and, in the opposite outermost end panel row, tongues 125 each internally slitted as at 126. A hook 127 similar to the hooks 124 is provided beyond one end of the outermost side panel row.

When the blank of Fig. 30 is erected it will produce the filler package shown in Fig. 29 wherein the ends of alternate transverse panel rows, between the bend lines *m—n*, *o—p*, and *q—r*, become flaps free to swing around upon the next adjacent panel row ends. The piece which carries the hook 127 also becomes one such flap. With the filler in erected condition, the flaps on one side may be folded over toward the flaps which extend from the other side, the several flaps on each side lapping in part over each other, and those on one side lapping in part over those on the other side, so as to place the hooks 124 and 127 in register with the slits 126 with which they are adapted to engage so that an interlock may be provided. It will be observed that at one end I have provided a pair of diverging bend lines 128, one adjacent each side of the blank so that when erected a pair of flaps, one triangular 129, and the other truncated 130, will be infolded from the top and side along the proximate end portion of the package.

Another form of filler unit, shown in Figs. 31—33, will now be described. The blank, of which only one-half (for the major part) is shown in Fig. 33, is characterized by straight longitudinal bend lines *a*, *b*, *c*, et al., and angular transverse bend lines *l—s*, there being other bend lines in the alternate longitudinal rows of panels defined by the bend lines *a*, *b*, et al., in the form of diamonds 132, each of which is subdivided into four smaller diamonds by a pair of crossed bend lines 133. In addition there are two bend lines 134, each of which passes through the diamond 132 at a point which bisects one of the smaller diamonds therein, and continues in opposite directions therefrom to the point of intersection of the next adjacent transverse bend lines with the proximate longitudinal bend line; and further radiating bend lines 135 proceed from two of the longitudinally spaced corners of the large diamond 132 to the corners provided by intersection of the proximate transverse and longitudinal bend lines.

The transverse bend lines proceed angularly through the outermost longitudinal rows of panels, and adjacent their outer ends the blank is cut away to provide shoulders 136. Arcuate slits 137 extend into the outermost longitudinal panel row, commencing at the longitudinal bend line *a*, one at the intersection of each of the transverse bend lines *m*, *s*, and in addition one further arcuate slit 138 is formed in the outermost longitudinal panel row between the transverse bend lines *n* and *o*, slightly spaced from the proximate slit 137 and curved reversely thereto.

The blank for this filler is furthermore slanted inwardly at 139 toward one end, starting with the point near the transverse bend line *n*, the blank continuing on to form one additional transverse panel row beyond the transverse bend line *l*, from which is extended a neck 140 connecting with a head 141 adapted to provide an end wall for the erected filler. The head is characterized by a pair of longitudinal bend lines 142 defining flaps 143 each having a notch to provide a hook 144.

The neck sides 145 diverge outwardly as they proceed toward the body of the blank, and the end of the proximate transverse panel row bends close to this neck so as to meet therewith at a right angle, there being a bend line 146 in line with this bend end, continuing in angular formation transversely across the blank, the same as the remaining transverse bend lines except for its shorter length which is occasioned by the reduced width of the neck. The bend lines 134 and 135, which radiate from the diamond figure as hereinbefore explained, continue on into the neck to meet the diamond figure which is formed therein, so that this schematic arrangement of bend lines is carried out clear up to the transverse bend line 147 which is the juncture point of the head 141.

The opposite end of the bank is characterized by two heads 150 and 151 carried by separate necks 152 and 153 respectively, and between these necks is an open space extending beyond the transverse bend line *s* for the full width of one transverse panel row. Opposite sides of this opening, defined by the sides 154, are divergingly related, each being in line with one of the bend lines 135 which radiates from a diamond figure in substantially the middle longitudinal panel of the blank. Each of the heads 150 and 151 approaches but does not meet the other, one of the heads at its end proximate to the other being notched to provide a hook 155. In the remaining head is an arcuate slot 156, the purpose of which will presently appear. The outermost longitudinal bend lines continue through these two heads, as do also the outermost proximate bend lines 134 and 135 which proceed from the nearest diamond figure.

In the erected filler shown in Figs. 31 and 32, the head 141 is folded downwardly so as to extend across one end, its two flaps 143 being turned around the proximate corners so that the hooks 144 thereof may lock within the arcuate slots 138. The remaining arcuate slots will be arranged along the sides of the filler, which is of pleated formation, with one set of such slots disposed relatively high, and the other set relatively low, in positions to engage the edges of the turned ends of the transverse panel rows which provide the side walls for the filler.

The two heads 150 and 151 at the opposite filler end are folded down in partially overlapping relation so that the hook 155 of the one may be locked within the arcuate slot 156 of the other. An infold 157 may be provided at two adjacent corners of the filler, by forming bends 158 along the lines 134—135, with a reverse bend along an intermediate bend line 138. This corner infold may be provided wherever desired, two such formations being shown by way of example.

In the erected condition of the filler, the side edges of the blank are engaged within the arcuate slots, both upper and lower sets, so as to secure all the pleats in aligned relation. The cells which are formed in this filler are characterized by bottoms much the same as shown in Fig. 36, a description of which will follow at a later point.

The slanting walls of the cells comprise in each instance five triangular panels defined by the bend lines 134—135 in conjunction with the proximate longitudinal and transverse bend lines, and in consequence these slanting walls tend to bow outwardly away from each other so as to provide between them cells whose maximum width is in the center line thereof. This construction has advantage where it is desired to accommodate articles whose contours should be closely followed by the enclosing walls of the cells.

Adverting now to Figs. 34 to 36, the filler unit here shown utilizes a blank having longitudinal and transverse bend lines, *a*—*f* and *l*—*s*, respectively, much the same as those in the construction last described, and insofar as there is correspondence thereto like reference numerals are applied. There is also a diamond figure **158** within each alternate longitudinal panel row in line with each alternate transverse bend line, each of such diamond figures being subdivided by crossed bend lines **159** in the manner already explained. From the opposite corners of each large diamond figure, bend lines **160** and **161** proceed on to the intersection of the proximate longitudinal and transverse bend lines in much the same manner as already described in connection with Figs. 19 and 23.

One end of the main blank is defined by a pair of angle slits **162**, each of which proceeds inwardly from opposite sides to substantially the center of the longitudinal panel rows defined by the lines *b*—*c* and *d*—*e*, each slit then proceeding outwardly in diverging relation to a further transverse bend line **163** which is spaced from the line **162** the same distance as the remaining transverse bend lines *l*—*s* are spaced apart from each other, the slits **162** ending at the juncture of the longitudinal bend lines *c* and *d* with the transverse bend line **163**. The part of the blank which is confined between the diverging slits constitutes a neck whereon is carried a head **164** having longitudinal bend lines **165** and **166**, which nearly register with the longitudinal bend lines *b* and *e*. It will be noted that the head extends along the neck for the distance of the diverging portions of the two slits **162**, but, as will presently be explained, the bend line **163** constitutes a fold, when the filler is erected, so as to produce a two-ply end wall therefor.

The opposite end of the blank is extended outwardly to provide two necks **167** each defined by opposed diverging sides **168** and **169**, the latter being a continuation of the bend lines **160**, **161** proceeding from the diamond figure **158** in the central longitudinal panel row at the intersection of the transverse bend line *q*. A bend line **170**, which is located beyond the transverse line *s* a distance equal to the spacing between the remaining transverse bend lines, establishes a juncture with the head **171** which is extended for the full width of the blank. Certain bend lines extend across the head, i. e., longitudinally of the blank, one, **172**, in line with the bend line *a*; another, **173**, in line with the bend line *e*; and another, **174**, in line with the bend line *f*. In addition, a pair of flaps **175** are connected by bend lines **176** with the head, each flap extending toward the main body of the blank, from which it is separated by the slit **168**. Near each end of the head is a notch defining a hook **177**; a further notch defines a hook **178** about in line with the longitudinal bend line *e*; and an arcuate slot **179** is provided in the head at a point between the bend lines **173** and **174**.

A blank so formed is adapted to be erected for the production of a 3 x 4 filler unit as shown in Fig. 34. Here it will be noted that the head **164** is folded along the line **163** to provide an end wall of two plies in the outer one of which a pair of arcuate slots **180** remain exposed. The parts of this end wall beyond the bend lines **165**—**166** are folded around the sides of the carton so that these arcuate slots **180** are disposed at a point substantially midway of the length of the filler. The opposite head is folded down along the bend line **170** with its two ends swung around upon the bend lines **172**—**173** so as to lie along the sides of the carton in partially overlapping relation to the ends proceeding from the other head. When so positioned, the hooks **177** may enter the slots **180** so as to lock therewith whereby to secure the two end walls to each other. In this way I provide a filler which is complete in and of itself, self-sustaining, and adapted to be used independently of any outer enclosure or other fastening device by which to maintain it in erected and operative condition.

The interior of the cells in the construction last described is characterized by a bottom having eight triangles defining between them four ridges. Two ridges **181** extend in a horizontal plane in spaced relation longitudinally of the cell, and the other two ridges **182** extend from the lowermost point in the center of the cell bottom, diverging upwardly toward a meeting point **183** where three triangles, forming one of the slanting walls of the cell, come together. Due to the presence of these triangles which form the walls of the cell, an outward bowing tendency is set up whereby the interior of the cell is rounded out so as to better conform to the contour of a similarly shaped article when accommodated therewithin.

Passing on to the filler unit of Figs. 37–39, it will be observed from the half blank shown in Fig. 39 that I employ a plurality of straight longitudinal bend lines *a*, *b*, et al., intersected by transverse bend lines *l*—*s*, each of which proceeds angularly across the outermost longitudinal panel rows. These outermost angular sections of the transverse lines are each interconnected by double sets of curved lines, alternating in character lengthwise of the blank. The transverse bend line *l* proceeds across the longitudinal panel row *a*—*b*, in the form of two bowed lines in back to back relation, repeating the same double convex formation **188** throughout each of the remaining longitudinal panel rows until juncture is made with the angular section at the opposite end of this bend line. In the next adjacent bend line *m*, however, the form is that of a pair of bows which face each other, thereby defining a pointed ellipse **189** extending crosswise of each longitudinal panel row *a*—*b*, et al., until juncture is made with the angular section of the bend line in the outermost panel row at the opposite blank side. By reason of this opposite disposition of the bowed lines, the point of maximum width between them occurs at the longitudinal bend lines in the case of one set of bend lines, and in the case of the other set of transverse bend lines, intermedially of adjacent longitudinal bend lines.

In this blank I have also shown in each panel defined by the intersecting longitudinal and transverse bend lines a longitudinal slit **190** which connects at one end with a bowed slit **191**, and at the other end with a straight slit **192** having oblique end extensions **193**. Both of the two slits last named extend transversely of each panel. In addition, I provide bend lines **194**, **195** connecting opposite ends of the slits **191**, **192**, there being a pair of outwardly bowed slits **196** intermedially of the ends of the bend line. By this arrangement of slits and bend lines I provide three flaps, two of them, designated **197**, being alike and disposed on opposite sides of the slit **190**, and the third, **198**, being defined in large

part by the slit **192** and oblique extensions thereof. Between the ends of the oblique extensions I provide a pair of aligned bend lines **199** each proceeding toward the other and connected by an outwardly bowed slit **200**.

In erected condition, the cellular filler will be characterized by a plurality of troughs extending continuously crosswise of the unit, the bottom of each trough consisting of several pointed ellipses **189** in end to end relation, each upwardly bowed (see Fig. 38) so as to be raised above the bottom plane of the filler. The diverging walls which proceed upwardly from the bottoms of these troughs are outwardly bowed in conformity with the contour of the pointed ellipses with which they join, with the result that these walls undulate as they proceed transversely across the carton. This relationship of the slanting cellular walls is maintained in part by the peculiar form of the ridge which extends transversely across the filler between adjacent troughs, this ridge consisting of the several double convex figures **188**, in end to end relation, as previously described. Opposing curvatures are thus provided in each pair of slanting walls which form the trough in which the walls are located, these curvatures being sufficient to produce a partial separation at intervals lengthwise of the trough so as to form, in effect, cells in each of which an article may be individually accommodated. A set of these flaps **197**, **198** is disposed in each diverging wall of the cells so as to afford, in effect, a yielding seat against which may be fitted the article that is to be accommodated. It will be noted that by reason of the bowed slits along the hinged edge of each flap I provide thereon a piece which is swung into the cell as the flap is pushed out, whereby a retarding action is set up to resist complete outward yielding of the flaps, these pieces so projecting inwardly acting to engage the article at opposite points so as to further center it in position within the cell. The filler unit just described is one which may be retained in erected position as by the application of small pieces of gummed tape **201** to certain of the corners thereof. Either this means of maintaining the filler in erected position, or any of the others which have heretofore been suggested, may be employed.

In Figs. 40–42, I have shown a 2 x 6 cellular filler which differs in only a minor degree from some of those which have been previously described. The longitudinal bend lines *a*, *b*, and *c* proceed straight from end to end of the blank, and the transverse bend lines *l*—*x* extend transversely thereacross with angled portions confined to the outermost rows of panels. In the intermediate panel rows the alternate transverse bend lines *l*, *n*, *p*, *r*, *t*, *v*, and *x* are divided in their central region each to provide a single diamond **205**, whereas the remaining transverse bend lines are divided each to provide two pointed elliptical figures **206** in end to end relation, one located in the longitudinal panel row *a*—*b*, and the other in the longitudinal panel row *b*—*c*. In addition, each panel defined by the intersecting longitudinal and transverse bend lines may be provided with an elliptical bend line **207** traversed by a pair of crossed slits **208** whereby to define four tines or fingers **209** each having capacity to yield outwardly in response to pressure.

In the set-up filler shown in Fig. 40, a plurality of transversely extending troughs are provided each having for its bottom two of the pointed ellipses **206** in end to end relation, and each upwardly bowed (see Fig. 41) so as to be raised above the bottom of the filler. The slanting walls which rise from the bottom of each trough are each bowed inwardly, in conformity with the contour of the two ellipses, so as to define, in effect, a pair of cells within the trough. This bowed formation of the slanting walls is insured in part by the diamond figure **205** which occupies the intermediate position lengthwise of the ridge along the top between the adjacent troughs. An egg or other article which is introduced into one of the cellular spaces may push back the yielding fingers **209**, as far as necessary, for its more perfect accommodation within the cells. This form of filler is another example of one in which troughs are provided each having slanting side walls which are bowed oppositely toward each other so as to define between them spaces which function as cells.

Referring now to Figs. 43 and 44, the filler unit here shown is made from a blank (of which one-half is shown in Fig. 44) having straight longitudinal bend lines *a*, *b*, *c*, et al., with angular transverse bend lines *l*—*q*, each proceeding in an easy zigzag course across the blank, the outermost sections of these lines being disposed at the greatest angle. Flaps **210** extend beyond the corners at one end, the opposite end being extended inwardly as at **211**, and transverse bend lines **212** being formed close to each end whereby to define lips **213**. In the erected filler (see Fig. 43) three troughs are provided each extending in a zizgag course across the filler. The bottom of each trough is a relatively sharp angle, as is also the ridge at the top between two adjacent troughs, the angles at the bottom and top being the same so that the slanting walls on opposite sides of the trough are each composed of a series of panels, those facing each other being at the same angle and divergingly related to the next adjacent panels. By reason of the zigzag contour of the troughs having opposing slanting side walls which proceed angularly but always in parallelism, I provide cells each of which is adapted to receive individually an article of some kind. It will be observed that the ends of this cellular structure comprise walls which are pleated, and the sides are margined by the lips **213** which when downturned proceed in a straight line so that the structure in its entirety is of quadrilateral contour.

Coming now to Figs. 45–47, the blank (of which one end portion is shown in Fig. 46) may be rectangular with straight longitudinal bend lines *a*—*j* intersected by transverse bend lines *l*—*p* et al. There is a grouping, however, of the longitudinal bend lines, those designated as *a*, *b*, being close to each other and to the adjacent longitudinal side of the blank *c*, *d*, and *e* being another group spaced equidistantly from each other, *f*, *g*, and *h* being still another group spaced equidistantly from each other, and *i* and *j* constituting a fourth group which is disposed adjacent the opposite side of the blank. The endmost transverse bend line *l* is relatively close to the proximate end of the blank, but the remaining transverse end lines are secured substantially an equal distance therefrom. By this arrangement I provide a series of panels of relatively large size, each lying between a group of longitudinally extending bend lines and each separated by a single transverse bend line the creasing of which is oppositely disposed in alternation lengthwise of the blank.

The longitudinal bend lines *a*, *d*, *g*, and *j* form the center of a plurality of angle slits **220**, one

being arranged between the bend lines *m* and *n*, and another in facing relation thereto between the bend lines *n* and *o*, with a gap of two panel rows (not shown) before occurrence of the next similar set of facing angle slits. A diamond figure **221** of bend lines, having for its major axis the longitudinal bend lines *a*, *d*, *g*, and *j*, is also provided for each pair of facing angle slits, the ends of the diamond figure intersecting the ends of the angle slits and continuing therebeyond to their point of junction. In addition, I provide other bend lines **222**, one extending from each end of the angle slit to the transverse bend line rearwardly thereof at the juncture with the outside longitudinal bend line of the associated group of three. The bend line *p* is also characterized by certain incisions **223** occurring at spaced intervals, each such incision extending transversely of the group of longitudinal bend lines hereinbefore described.

With the blank so produced it is possible to erect a filler unit having the form which is illustrated in Fig. 5. Here it will be noted that I have provided a plurality of troughs each having a V-bottom, and each trough being transversely divided by walls in the form of flanges which proceed part way therein to define partially enclosed cells. In reaching this position the blank is bent one way along the bend line *a* and then reversely along the bend line *b*, with the consequence that a two-ply flange is provided adjacent one end of the filler. A similar reversal in the direction of bend occurs alternately at the three lines *c*, *d*, and *e*, and again at the lines *f*, *g*, and *h*, and once more at *i* and *j*. Each time this takes place there is formed along the outer wall of the filler an inwardly extending V-shaped two ply flange, and in the wall which separates adjacent troughs these two-ply flanges extend inwardly so as to occupy opposed positions in each of the adjacent troughs. At the bottom of the troughs, between the spaced angle slits, there is a similar inwardly protruding two-ply flange, the material in the V-notch accommodating the lower end of the two-ply flange which extends vertically within the trough. Pinching and crimping of the paper stock is thereby avoided by this ingenious provision for mutual accommodation of the meeting walls

Passing on to the single row filler which is set forth in Figs. 48–50, it will be noted that the blank is characterized by two longitudinal bend lines *a* and *b* traversed by a series of transverse bend lines *l* and *r*. At one end the blank may be inwardly tapered at **230** between the transverse lines *m* and *l*, a single panel **231** continuing on to form in the erected filler an end wall as will be presently described. If desired, openings **232** may be provided in the panels in the central longitudinal row to furnish seats for the articles which are to be accommodated within the cells of the erected filler.

At the junctures of the bend lines *m*, *o* and *q* with each longitudinal bend line, I provide two additional diverging bend lines **233**, **234**, each preceeding outwardly to the side of the blank. At the juncture of the remaining transverse lines with the two longitudinal bend lines, and in diverging relation thereto, a single additional bend line **235** may proceed toward the proximate side of the blank. At the blank end beyond the transverse bend line *r*, I have provided an additional transverse bend line **236**, the ends of which terminate at the longitudinal bend lines *a* and *b*, from which point additional bend lines **237** and **238** radiate toward the end of the blank.

When erected, a plurality of cells, aligned in a single row, will be provided, each having a vertical wall joining at its bottom with a slanting wall to form in effect a V-trough. Since the middle angle of each trough inclines away from the vertical, any article which is placed in a cell so formed will tend to lie somewhat on its side within one of the seats which is provided by two of the openings **232**. By this arrangement I economize considerably on space. The end panel **231**, when turned down, forms a wall at the filler end. The lower end wall is adapted to rest against the ends of certain infolds which are provided by the bend lines *m*, **233** and **234**. Other sets of lines, including one transverse bend line and two shorter bend lines **233** and **234** associated therewith, are adapted in each case to provide an infold between the pleats at the sides of the filler along the lower edges thereof. The remaining transverse bend lines in conjunction with the angular bend line **235** provide outfolds along the top edges of the filler sides. At the filler end opposite the wall **231** a bend takes place along the line **236**, from opposite ends of which proceed downwardly certain infolds along the longitudinal bend lines and the associated angular lines **237** and **238**.

The filler just described has possible advantages arising from the presence of the infolds along the sides adjacent the bottom, which afford additional plies of material tending to spring away from each other, with the result that a cushion is provided to enhance protection against the transmission of lateral shocks to articles contained within the cells. The outfolds along the top of the filler may function similarly, but in case the filler is sufficiently expanded longitudinally these outfolds will disappear so that the transverse width of the structure is slightly reduced in consequence. A filler having these characteristics may be desirable for certain purposes and is accordingly presented as a showing of one form which my invention may take.

My present invention, regardless of the form the filler may take, is characterized by the use of a single sheet of paper having an appropriate contour and system of bend lines to be erected into a filler affording a suitable container for one or more articles which are to be placed therein. As already indicated, the filler may be of varying capacities, from one cell up, and where a plurality of cells are provided these may be arranged in single or multiple rows. In addition, the filler unit so provided may be self-sustaining so as to require no separate enclosing container therefor, or it may be designed for accommodation within a suitable enclosure which furnishes the necessary sustaining support to prevent collapse, or it may require the cooperation of a tape, bend, or other securing device to prevent collapse, or it may be equipped with covers of its own by which the filler, when erected and locked against collapse, may have a displaceable closure provided over the tops of its several cells. In nearly every case, each cell is protected on at least two of its opposite sides by multi-ply walls usually in the form of pleats having spring tendencies which normally hold such walls in slightly spaced relation so as to enhance the protection which is afforded to articles placed within the cells.

The present filler unit, whether in the form of a single cell or otherwise, may be produced so cheaply and be set up so expeditiously as to be

available for many uses which heretofore have been denied to paper articles of this kind. For example, the paper sheet from which the filler is made may be suitably treated on its surface, as by wax, or paraffine, to serve admirably as a holder for small articles which tend to become sticky, such as various coated candies. In fact, the filler may serve as a multiple mold into which certain candies or other edibles, and even other types of articles as well, may be poured, and allowed to remain up to the time they are removed for consumption or use. When so employed, the filler unit will serve in multiple capacities as well, i. e., as a mold, as a container for shipping and storage, and as a package in which the contained articles are sold and from which they are eventually removed at the time of use or consumption. All handling operations, such as are now required when molded articles must be removed and repacked, are completely avoided if the present filler unit be employed in the manner just suggested.

The present filler unit has the advantages of being formed from a single piece of paper or other material, for providing a structure which is self-supporting, cushioning and collapsible, and also of holding the eggs or other articles in place, without a cover, even when the filler package be inverted. It may be produced in various sizes without requiring any change other than in the number of panels required for defining the various cells of the structure. In Fig. 2 I have indicated a 6 x 6 filler unit; in Fig. 3 smaller filler units of 3 x 4 and 2 x 6 capacity; and with the aid of severance lines the fillers may be further subdivided to sizes of 2 x 3, 1 x 3, 1 x 4, etc. For certain purposes it may be desirable that the filler unit be constructed initially of a half dozen capacity, as for example 2 x 3 or 1 x 6, so I would have it understood that I am not concerned particularly with size inasmuch as the principles of this invention are retained whether or not the capacity of the filler be increased or reduced.

It is desirable to employ a sheet of paper or other material which is endowed with tension to at least some extent so that there will be some resiliency in the resulting cell walls. The normal tendency of a filler unit constructed from a sheet which is not specially treated would be to collapse when the retainer is removed. On the other hand, if a sheet be erected into a filler, and then be given a steam treatment or a heat treatment (if the sheet is still green), the filler unit will tend to remain erected. For packing or storage the filler would then be expanded part way for nesting with other fillers in the same condition. The eggs or other articles contained within the cells would be maintained under a constant tension which would prevent loose movement in case the filler package be inverted. Removal of all the eggs by gravity would then follow expansion of the filler to relieve the eggs from such retentive tensional engagement.

I claim:

1. A scored sheet from which a cellular filler may be erected having intersecting bend lines one set of which are straight and parallel and the other set of which are parallel but obliquely angled from points of intersection to define with the first set rows of rectangles each with an adjacent row of quadrilateral figures having at least two opposite sides which are parallel.

2. A scored sheet from which a troughed filler may be erected having intersecting bend lines one set of which are straight and the other set of which are obliquely angled from points of intersection defining with the first set rows of trough-forming wall panels each with an adjacent row of pleated trough-supporting wall forming panels, one of the latter being disposed along each of two opposite sides of the sheet.

3. A bendable sheet from which a filler may be erected having intersecting bend lines defining rows of rectangles and rhomboids, and a separation line extending substantially across the sheet coinciding for only a portion of its length with two of the bend lines.

4. A one-piece filler made from a sheet which is bent to provide a plurality of multi-lateral cells in rows each defined by a pair of opposed inclined walls which are spaced from the corresponding walls of adjacent cells in the same row except along a juncture line at the top, and by a pair of opposed vertically pleated cell-supporting walls which connect the inclined sides of adjacent corresponding walls of adjacent cells in adjacent rows.

5. A one-piece filler made from a sheet adapted to be bent along continuous score lines which extend in intersecting relationship across the sheet to provide a plurality of multi-lateral cells in rows, and each cell having three of its top edges formed by a single continuous bend line which extends unbrokenly around three of the cell sides.

6. A one-piece filler made from a scored sheet bent to produce a series of cells each having a continuous uninterrupted folded top edge extending both transversely and longitudinally of the filler, the uninterrupted top edges defining a plurality of cells in rows, the filler in its entirety being expansible to the point of collapse both transversely and longitudinally, and means engaging opposite walls of the filler to prevent expansion and consequent collapse thereof.

7. A one-piece filler made from a sheet which is transversely and longitudinally bent to provide a plurality of connected wall portions defining multi-lateral cells in rows, said filler having two adjacent wall portions of the sheet disposed in parallel arrangement between adjacent cells in all rows which extend in one direction and having two diverging wall portions of the sheet disposed between adjacent cells in all rows which extend in the opposite direction.

8. A one-piece filler made from a sheet which is bent transversely and longitudinally to provide a plurality of connected wall portions defining multi-lateral cells in rows, said filler having two adjacent wall portions of the sheet disposed in parallel arrangement between adjacent cells in all rows which extend in one direction and having two diverging wall portions of the sheet disposed between adjacent cells in all rows which extend in the opposite direction, the oppositely extending rows of walls being united in a bend line which extends uninterruptedly around three sides of each cell, and means engaging the parallel wall portions of the filler to prevent expansion and consequent collapse thereof.

9. A one-piece filler made from a sheet which is bent to provide a plurality of multi-lateral cells in rows, two of the opposite sides of each cell comprising diverging rectangular panels joined along the bottom by a bend line and the two opposite sides of each cell comprising rhomboidal panels overlapped in part with adjacent like panels in adjacent cells with which they are joined along the top by a bend line.

10. A one-piece filler made from a sheet which is bent to provide a plurality of troughed cells arranged in a row, each cell being separated from its neighbor by diverging walls which are joined along a bend line at the bottom and each cell being enclosed along its sides by a wall of two plies which are joined along a bend line at the top.

11. A one-piece load sustaining filler formed from a single sheet folded along uninterrupted intersecting bend lines to provide cells in rows and said cells being defined in part by pleated vertical wall forming portions of the sheet adapted to contract or expand with the cells, and in part by diverging trough-forming wall portions which extend at substantially right angles to said vertical wall forming portions.

12. In a filler package, the combination of a one-piece collapsible sheet filler unit bent to provide a plurality of load sustaining cushion cells each defined in part by multi-ply resilient walls, means defining a line of severance extending across the filler in a manner to define a plane of separation therefor which leaves intact the structure of the subdivided filler units, and means for supporting each filler unit against collapse.

13. A one-piece filler made from a sheet of bendable material having two sets of score lines extending continuously thereacross in intersecting relationship, and certain of said score lines being so angled from point to point of intersection with respect to the other bend lines as to produce, when the sheet is folded on said lines, article sustaining cells each having a continuous folded top edge extending both transversely and longitudinally of the filler and a pleated sustaining wall at one side of said cell.

14. A structure as defined in claim 13 in which a pleated sustaining wall is disposed at each side of the cell whereby the cell is expansible both transversely and longitudinally.

15. A one-piece filler made from a scored sheet which is folded along the scored lines to provide a multi-lateral cell of which two sides are single ply and disposed in convergent relation toward the bottom of the filler, and the other cell sides being pleated to form double plies extending in parallelism and adapted to sustain the filler structure vertically by fold connections with the single ply sides of the cell.

16. A manually erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, and the lines of one of said sets reversing their directions of bend between alternate points of intersection.

17. A manually erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of said sets being alternately formed in the sheet to cause the sheet to bend in opposite directions along said lines, and the lines of said other set extending in a zig-zag direction between said points of intersection.

18. A scored sheet from which a cellular filler may be erected having formed therein two sets of intersecting bend lines one set of which changes its linear direction at each point of intersection to define with the other set a plurality of rows of cell forming wall portions each having at least two opposite sides which are parallel, and one of said sets of bend lines being so formed in the sheet between successive points of intersection as to cause successive cell forming wall portions of the sheet to extend in alternately reverse directions from said bend lines.

19. A sheet foldable into a one-piece cellular filler, said sheet having two sets of intersecting bend lines formed therein, one set of bend lines being formed in the sheet to cause the same to bend therealong in one direction only and the other set of bend lines being formed in the sheet to cause the same to bend therealong in alternately reverse directions between successive points of intersection with said first set of bend lines.

20. A manually erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of said sets reversing their directions of bend between alternate points of intersection, the filler in its entirety being expansible both transversely and longitudinally to the point of collapse, and means engaging the material of the sheet at spaced points to prevent expansion and consequent collapse of the filler.

21. A one-piece filler made from a rectangular sheet bent along bend lines formed in the sheet, said bend lines extending in intersecting relationship across said sheet to provide, when the sheet is bent thereon, an article sustaining multilateral cell, said cell having diverging trough forming wall portions connected at their opposite ends to vertically extending pairs of supporting wall portions which lie in overlapping relationship between said diverging wall portions, and means engaging certain of the wall portions of the filler to prevent expansion and consequent collapse thereof.

22. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and the bend lines at opposite ends of the sheet extending in one direction only to provide cover sections with bendable ends adapted to be folded down to lie along the outer sides of the erected filler.

23. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and the bend lines at one end of the sheet extending in one direction only to provide a cover section with bendable ends adapted to be folded down to lie along the outer sides of the erected filler.

24. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and the bend lines at one end of the sheet extending in one direction only to provide a cover section with bendable ends adapted to be folded down to lie along the outer sides of the erected filler, and interengaging means on the cover section and filler structure adapted to secure the cover section in a position of closure over the filler.

25. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and one end of the sheet having

bend lines proceeding in one general direction only with certain of the said lines alternating their directions of bend whereby to provide a pleat, the pleated end of the sheet adapted to form a cover section having bendable portions disposed along the outer sides of the erected filler.

26. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and certain of the bend lines being interrupted by spaced line portions converging at opposite ends with said bend lines adapted in the erected filler to provide upwardly bowed bottoms for the cells thereof.

27. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and one set of bend lines adjacent one edge portion of the sheet being slitted to provide a plurality of bendable flaps each having means for interlocking with another portion of the sheet when extended over the erected filler to provide sustaining wall sections therefor.

28. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and certain of said lines being interrupted by line portions of substantially diamond formation adapted in the erected filler to afford for the cells thereof bottoms having spaced ridges adapted to furnish support to an article which is placed therewithin.

29. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and one set of lines proceeding in alternately angular directions between alternate points of intersection whereby to provide in the erected filler a plurality of troughs each having opposed diverging walls extending angularly from end to end thereof.

30. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of said sets reversing their directions of bend between alternate points of intersection and being arranged in groups adapted in the erected filler to provide a plurality of troughs with two-ply flanges extended inwardly thereof at spaced intervals to define cells therewithin.

31. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of said sets reversing their directions of bend between alternate points of intersection, the sheet at opposite edge portions being provided with bend lines extending in one direction only adapted in the erected filler to form sustaining walls therefor, and interengaging means on said walls and filler structure adapted to secure the walls in place.

32. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of said sets reversing their directions of bend between alternate points of intersection, the sheet at one edge portion being provided with bend lines extending in one direction only adapted in the erected filler to serve as a sustaining wall therefor, there being other bend lines in said edge portion foldable in a direction the reverse of the others whereby to provide an infold into the erected filler.

33. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of said sets reversing their directions of bend between alternate points of intersection, and other lines bendable in a direction the reverse of those adjacent for producing an infold in sustaining the filler in erected position.

34. An erectable cellular filler structure comprising a sheet of bendable material having two intersecting sets of bend lines extending thereacross, the lines of one of the sets reversing their directions of bend between alternate points of intersection, and certain of said bend lines being extended outwardly beyond said intersecting sets to an edge of said sheet to provide a sustaining wall portion, and said wall portion being foldable over an adjacent folded portion of said sheet to provide therewith a reinforcing wall in sustaining said filler in erected position.

35. The structure set forth in claim 34 in which other bend lines extend between pairs of said intersecting sets of bend lines to provide arched bottom wall portions for cellular portions of the erected filler.

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