Nov. 22, 1955 E. F. SCHWEICH 2,724,538

PACKAGING MATERIALS

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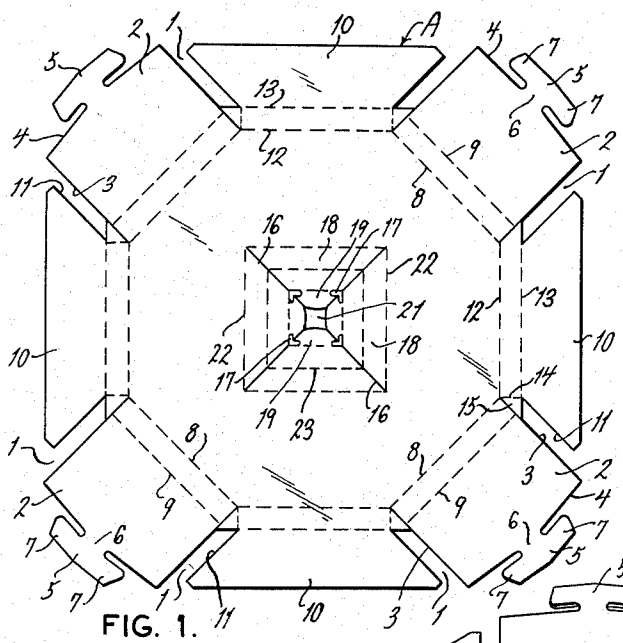

FIG. 1.

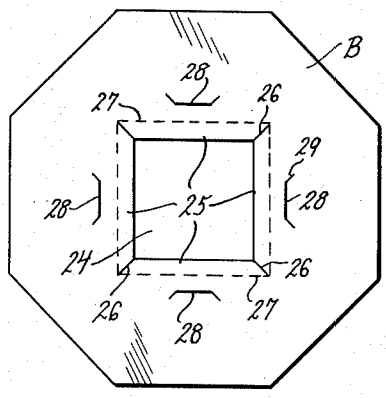

FIG. 2.

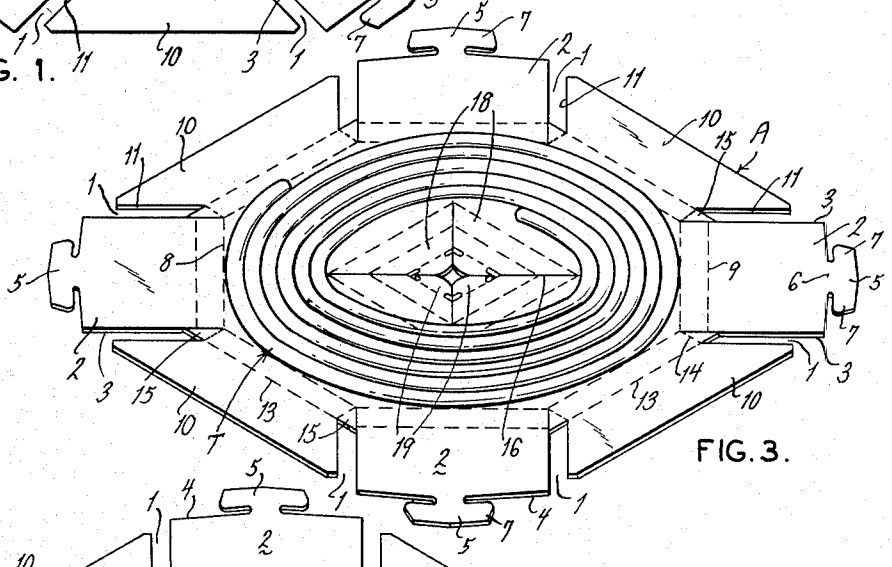

FIG. 3.

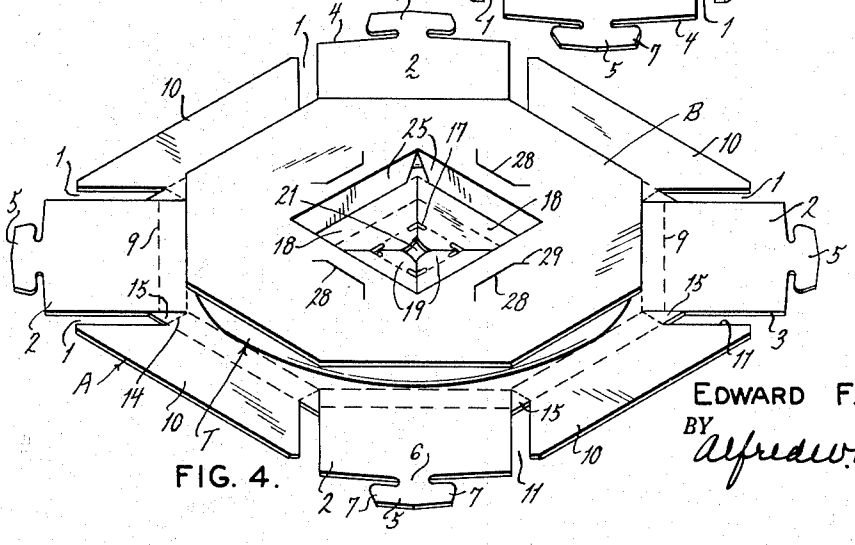

FIG. 4.

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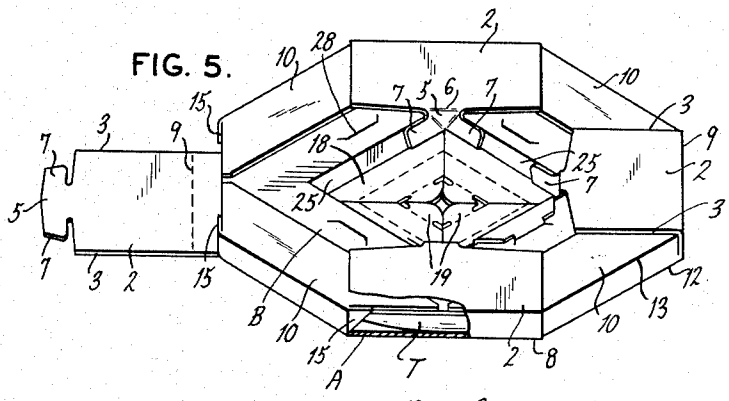
FIG. 5.



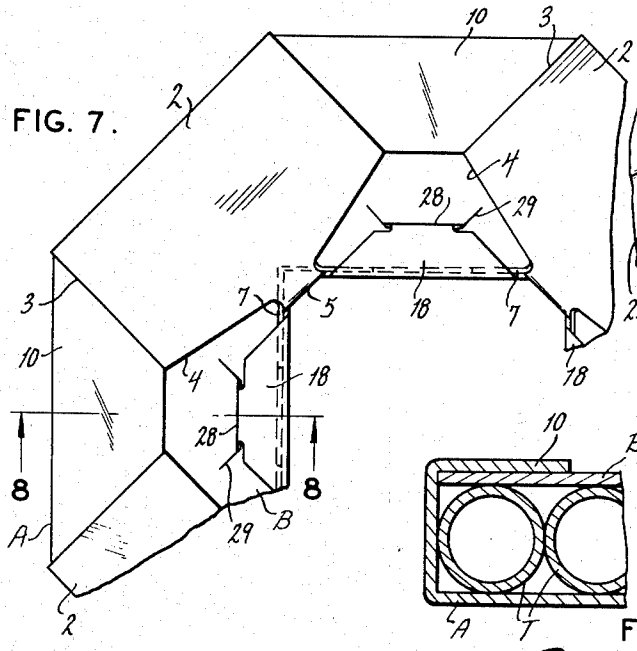


FIG. 7.

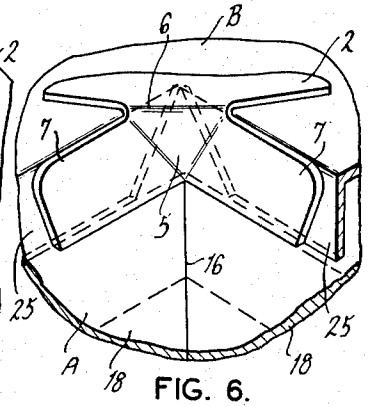


FIG. 6.

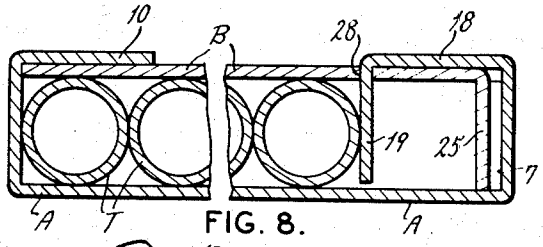


FIG. 8.

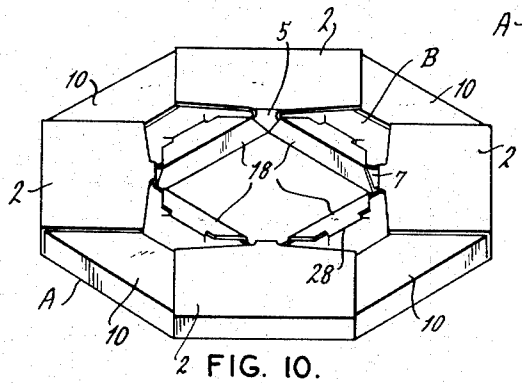


FIG. 10.

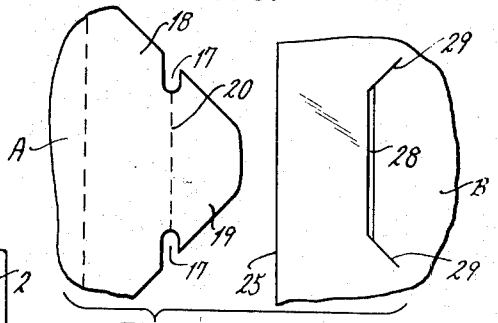


FIG. 9.

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2,724,538

PACKAGING MATERIALS

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Application September 10, 1952, Serial No. 308,855

4 Claims. (Cl. 229—23)

This invention relates to certain new and useful improvements in packaging materials and, more particularly, to a box or carton for packaging, shipping, and storing of flat, circular articles, such as coils of tubing, hose, and the like.

It is one of the principal objects of the present invention to provide a box or container which is particularly well adapted for housing flat circular objects, such as coils of tubing, coils of hose, or any other similar article which in its overall or assembled shape is relatively flat and circular.

It is a further object of the present invention to provide a container of the type stated, which is uniquely provided with a central hub-forming construction adapted to support a coil of relatively heavy weight deformable material from a plurality of central support points, thereby materially assisting in supporting the weight of the material when the container is set up on end or dropped on one of its corners.

It is also an object of the present invention to provide a container of the type stated having a central hub-forming construction which is fully and completely closed when the container is set up for use, thereby efficiently protecting the material housed within the container.

It is an additional object of the present invention to provide a container of the type stated, which will conform more closely to a circular coil or other similarly shaped object housed therein.

It is also an object of the present invention to provide a container of the type stated, which will withstand the ordinary stress and strains to which a container of this type is subjected during shipment and will not readily become dented or otherwise broken at its corners.

It is also an object of the present invention to provide a container of the type stated which may be fabricated from rectangular board stock or other suitable material of construction with a minimum of wastage thus achieving an unusual economy in manufacturing.

It is likewise an object of the present invention to provide a container of the type stated having a hub formed up from the top and bottom walls by endwise interfitting flaps to form a strong, shock-resistant structure which will support a circular coil or similar packaged article at three or four points even when the package is dropped due to accident or mishandling and will therefore materially offset the tendency of the packaged material to deform itself under impact by reason of its own weight.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement and combination of parts presently described and pointed out in the claims.

In the accompanying drawings—

Figure 1 is a plan view of the bottom-forming element of a container constructed in accordance with and embodying the present invention;

Figure 2 is a plan view of the top forming element

of a container constructed in accordance with and embodying the present invention;

Figure 3 is a perspective view of the bottom-forming element with a coil of tubing placed thereon, illustrating the first step in the packaging of such objects;

Figure 4 is a perspective view of the bottom-forming element, coil, and the top-forming element illustrating the second step in the packaging of the coil;

Figure 5 is a perspective view of the container in partially completed or formed position around the coil;

Figure 6 is an enlarged fragmentary perspective view of the internal or hub-forming corner construction;

Figure 7 is a fragmentary top plan view of the container in fully formed, coil-encasing position;

Figure 8 is a fragmentary transverse sectional view taken along line 8—8 of Figure 7;

Figure 9 is a fragmentary exploded view of the tab-lock construction forming a part of the present invention; and

Figure 10 is a perspective view of the container in closed position.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of the present invention, A designates a bottom-forming element or member which is die-cut or otherwise formed out of a square section of suitable container board stock, such as corrugated board, fiberboard, or any other similar material. The member A is provided along each of its four edges with inwardly converging slots **1**, which are disposed at angles of 45° to the longitudinal margins of the member A and subdivide the member A into four corner-flaps **2**, each having diagonally extending straight edges **3** and a transverse or outer margin **4** centrally provided with a locking tab **5** connected to the main body of the corner-flap **2** by an integral neck **6** and having symmetrical ears **7**. The corner-flaps **2** are integrally connected to the main body of the member A across a score line **8** and are further provided with a second score line **9** disposed in outwardly parallel relation to the score line **8**.

Between each pair of corner-flaps **2**, along each straight-edge of the member A, is an intermediate flap **10** having angular margins **11** disposed in parallel relation to the corner-flap margins **3**, being joined integrally to the body of the member A across a score line **12**. The flap **10** is further provided with a second score line **13** disposed in inwardly spaced parallel relation to the score line **12** and joining at its ends with the score lines **8** of the adjacent corner-flaps **2**.

The score lines **12, 13**, furthermore, are transversely connected at their outer ends by right-angularly disposed score lines **14** which serve to define small, triangular, internal flaps **15**, lying between the flaps **10** and the corner-flaps **2** at the inner ends of the slots **1**.

In its central portion the bottom-forming member A is die-cut with four diagonal slits **16**, each such slit **16** being coincident with a line running from the geometrical center of the member A, radially outwardly through the geometrical corner-point of the blank from which the member A is cut. In other words, each slit **13** lies along one of the diagonals of the member A. Intermediate its ends, each slit **16** is enlarged to form a cut-out area **17** and is curved around at its inner extremity to meet the next adjacent slit **16** on either side. Thus, the four slits **16** define four trapezoidally shaped flaps **18** integrally provided on their free margins with locking ears **19** having reduced necks **20** and being separated from each other by a somewhat rectangular central cut-out or aperture **21**.

The slits **16**, at their other ends, are connected by score lines **22** forming, in effect, a rectangular pattern and the flaps **18** are sub-divided midway of their width by a score line **23** in parallel relation to the score line **22**.

It should be noted in this connection that the distance between the score lines **22**, **23**, is substantially equal to the distance between the score lines **8**, **9**, for purposes presently more fully appearing.

Provided for co-operation with the bottom-forming member A is a top-forming member B, which consists of an octagonal sheet of container-forming material preferably the same type of stock as that used in the bottom-forming member A.

The peripheral shape and size of the member B is substantially identical with the shape of the octagonal area defined in the member A by the several score lines **8** and **13**. The member B is die-cut in its central area to provide a rectangular central aperture **24** having four marginal flaps **25**, separated at their corners by angular slits **26**, arranged so as to overlie, and be substantially coincident with, the slits **16**. At their inner ends, the slits **26** are connected by score lines **27**, which define a rectangular pattern substantially similar to, and adapted to be coincident with, the rectangular pattern defined by the member A and the score lines **22**.

The member B is further provided with four locking slits **28**, each of which is disposed in outwardly spaced parallel relation to one of the score lines **27**, and is more or less centered with respect to the ends thereof.

It should be noted in this connection that the distance between the geometrical center point of the rectangular aperture **21** and each slit **28** is substantially less than the distance from such geometrical center to the outer end of each slit **26**, so that if a circle were to be circumscribed about the rectangle defined by the score lines **27**, it would completely enclose the slits **28** and would not be intersected by them. Radiating outwardly from the ends of each slit **28** toward this theoretically circumscribed circle are terminal slits **29** for facilitating locking engagement with the ears **19**.

In use, the bottom-forming member A is laid down flatwise upon a suitable table, floor, or other flat surface, which may be conveniently available, and a coil of tubing T is laid down flatwise and concentrically upon the bottom-forming A. It should be noted that the bottom-forming member A is laid out and designed for the type of coil T, which is to be packaged therein, so that the coil T, when properly centered on the bottom-forming member A, will be substantially tangent to the center points of the score lines **8** and **13**.

Furthermore, the distance between the score lines **8**, **9**, and the score lines **12**, **13**, is substantially equal to the thickness of the coil T. Similarly, the dimensions of the inside rectangle formed by the score line **22** is such that the corners of this rectangular pattern will approximately be tangent to the interior circle of the coil.

The top-forming member B is thereupon placed on top of the coil T with its marginal edges in substantial registration with the octagonal pattern formed by the score lines **8**, **13**, substantially in the manner shown in Figure 4. Thereupon, the flaps **10** are folded up, so that the area lying between the score lines **12**, **13**, will, in effect, become a short vertical wall and the remainder of the flap **10** folded over likewise on top of the forwardly presented face of the top-forming member B. The small triangular flaps **15** are, thereupon, folded inwardly to lie in the plane of the next adjacent side of the octagon, substantially as shown in Figure 5. Next, the marginal flaps **25** are folded down. Thereupon, the corner-flaps **2** are folded up around the score lines **8** and then bent over around the score lines **9** so as to lie flatwise upon the upwardly presented face of the top-forming member B, and the locking tabs **5** folded down into the corners of the central hub-forming aperture with the ears **7** folded outwardly to overlie the lateral end portions of the marginal flaps **25** of the top member B, as best seen in Figure 6. Then the flaps **18** are folded upwardly about the score lines **22** to form multiple thickness, interior vertical walls, substantially as shown in Figure 8.

Finally, the flaps **18** are folded about the score lines **23** and the locking ears **19** are inserted through the slits **28** to complete the container and enclose the coil T, substantially as shown in Figure 10.

Suitable adhesive, such as silicate of soda may, if desired, be applied beneath the folded over portions of the under faces of the flaps **2** and **7** and preferably, though not necessarily, along the inside rectangular opening in the region of the flaps **18**.

It should be noted that when the container is completely pasted together the triangular flaps **15** will close the outer corner and the corner-flaps **2** will overlie and be pasted down upon the triangular projecting portions of flaps **10** in the regions of the angular margins **11** thereof, forming a complete interlock at each outer corner and the flaps **5** will be securely held between the flaps **25** and **18**, thereby imparting unusual rigidity and strength to all corners of the finished container.

The container of the present invention is, furthermore, exceptionally easy to handle in storage and in shipment and is less likely to be handled carelessly or damaged. For example, the package handler can very readily lift a package formed with one of the containers of the present invention by inserting his hand through the central aperture and grasping the inner edges or faces, thus being enabled to carry a package of fairly large size, weight, and bulk, under his arm in a highly convenient manner. Since the hub-forming structure is completely closed, no direct, moisture, perspiration from handling, or other contaminants can reach the coil of tubing T. Finally, containers of the present invention can be very easily handled by being rolled about on their octagonal edges very much in the manner of a disc or wheel. It has been found that even in the case of very heavy packages this rolling action will not, in any way, damage or seriously harm either the container or its contents.

Although in the preferred embodiment herein described reference has been made to the use of corrugated cardboard as the material of construction, it is, of course, obvious that other similar types of material can be used with facility. In fact, containers of the present invention can be fabricated of fiber-board, sheet metal, and a wide variety of other materials depending upon the particular type of object, which is to be packaged therein. It should also be apparent that the containers of the present invention can be varied in size and shape to accommodate various different sizes and types of circular disc-like or coiled objects.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the packaging material may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

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

1. A container for housing torus-shaped articles comprising a pair of flat members, each having the outer peripheral shape of an equilateral octagon, said members being provided with eight marginal flaps, each of said flaps being folded up into upstanding relation to the member with which it is associated, each flap of one member being correspondingly secured facewise to a flap of the other member, said members each being further provided in their central areas with aligned rectangular apertures bordered by four upstanding respectively interlocking flaps forming a four-sided hub for supporting the torus-shaped object housed within the container, one of said flap members further being provided on its outer periphery with four relatively large marginal flaps of sufficient size to be folded upwardly over and around the other flap member and to extend radially inwardly and facewise thereacross so that the inner transverse margins of said flaps are adjacent to the corners of the rectangu-

lar aperture said marginal flaps further being provided with ears for engagement with the interlocking flaps.

2. A container for housing torus-shaped articles comprising a pair of flat members, each having the outer peripheral shape of an equilateral octagon, said members being provided with eight marginal flaps, each of said flaps being folded up into upstanding relation to the member with which it is associated, each flap of one member being correspondingly secured facewise to a flap of the other member, alternate ones of said marginal flaps being provided with ears, said members each being further provided in their central areas with aligned rectangular apertures bordered by four upstanding respectively interlocking flaps forming a plural-sided central aperture and hub for supporting the torus-shaped object housed within the container one of said flap members further being provided on its outer periphery with four relatively large marginal flaps of sufficient size to be folded upwardly over and around the other flap member and to extend radially inwardly and facewise thereacross so that the inner transverse margins of said flaps are adjacent to the corners of the rectangular aperture, said ears being adapted to be engaged with said interlocking flaps when the container is closed.

3. A container for torus-like objects comprising octagonal top and bottom walls disposed in spaced superposed relation and having marginally registering rectangular central apertures, said bottom wall being provided around its outer periphery with eight marginal flaps folded up and over the top wall to form a substantially continuous peripheral outer wall, alternate ones of said marginal flaps being of such size and shape as to extend inwardly into contiguity to the corners of the rectangular aperture and being provided with ears which are folded down into said corners, said bottom wall being further provided with four interior closure-flaps around its rectangular aperture folded up and into interlocking engagement with the ears and with the top wall.

4. A container for torus-like objects comprising octagonal top and bottom walls disposed in spaced superposed relation and having marginally registering rectangular central apertures, said bottom wall being provided around its outer periphery with eight marginal flaps folded up and over the top wall to form a substantially continuous peripheral outer wall, alternate ones of said marginal flaps being of such size and shape as to extend inwardly into contiguity to the corners of the rectangular aperture and being provided with ears which are folded down into said corners, said bottom wall being further provided with four interior closure-flaps around its rectangular aperture folded up and into engagement with the ears and with the top wall, said closure-flaps being provided with interlocking tabs and said top wall being provided with slits for receiving the tabs, said slits having angularly cut terminal portions which diverge outwardly away from the closure-flaps when the latter are in interlocked position.

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