July 24, 1928. 1,678,358

W. H. SCHNEIDER

CHRISTMAS TREE ORNAMENT AND THE LIKE AND METHOD FOR THE MANUFACTURE THEREOF

Filed March 14, 1925 4 Sheets-Sheet 1

Fig. 1.

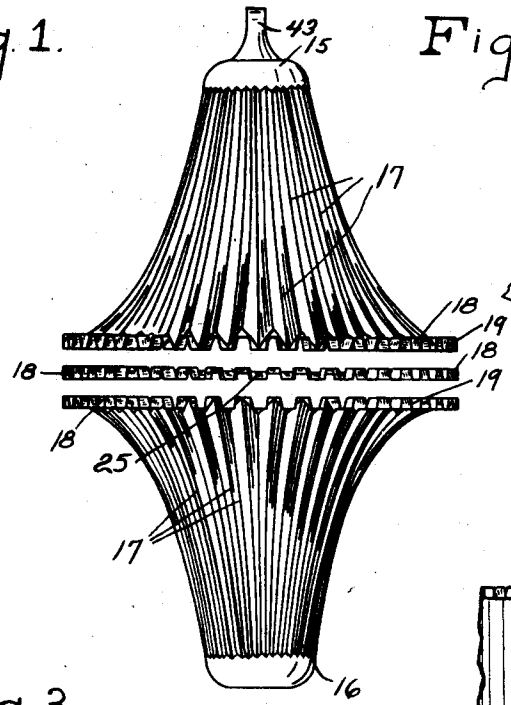


Fig. 2.

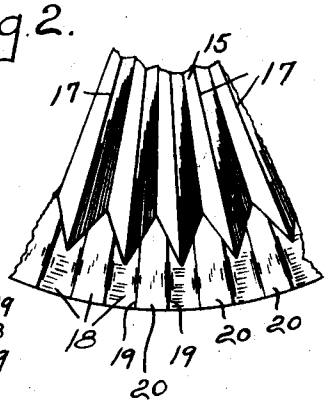


Fig. 4.

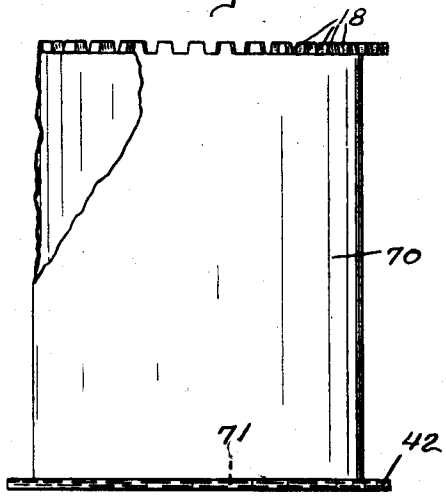
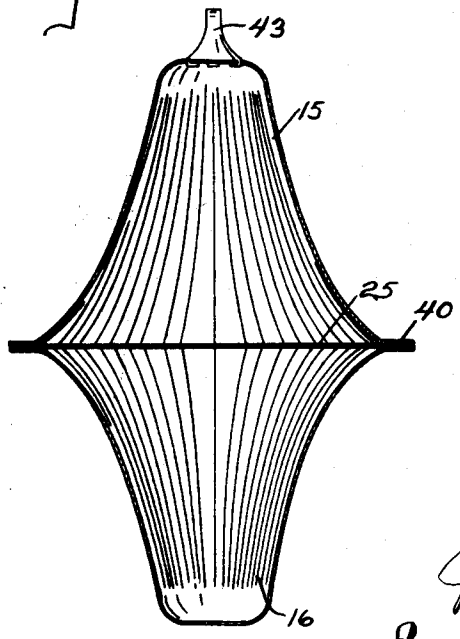


Fig. 3.



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Fig. 5.

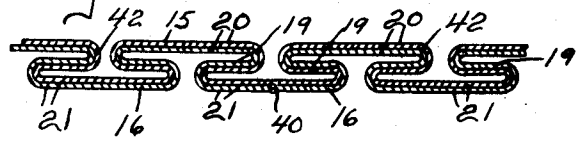


Fig. 6.

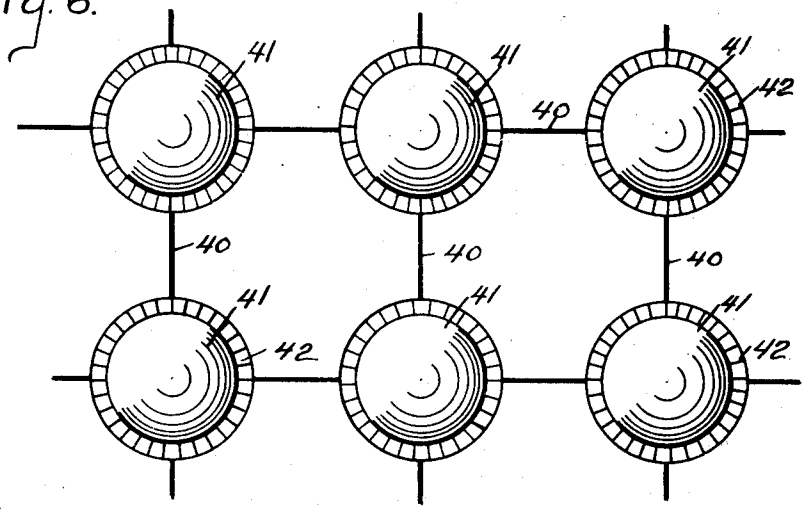


Fig. 7.

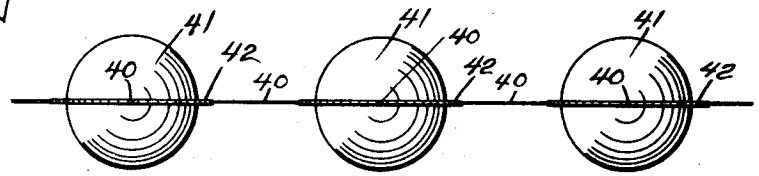
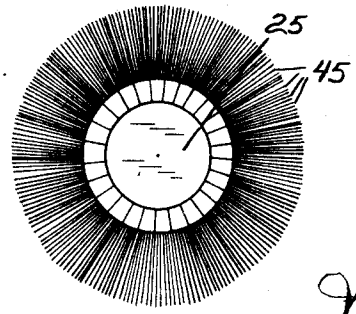


Fig. 8.



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Fig. 9.

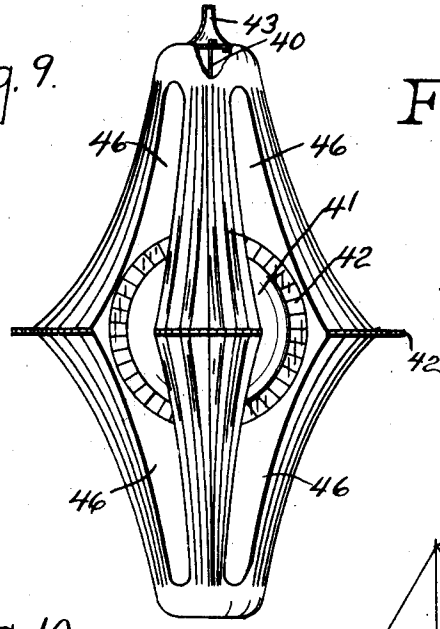


Fig. 12.

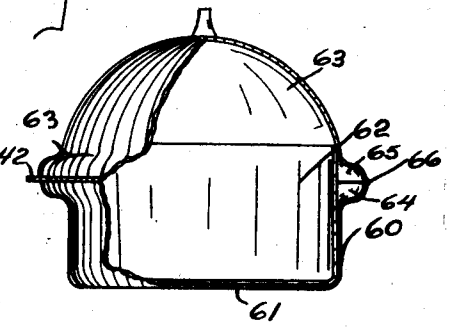


Fig. 10.

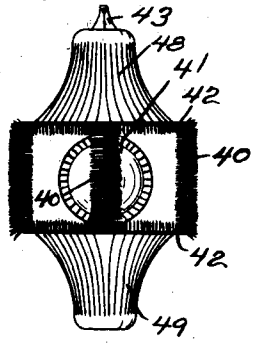
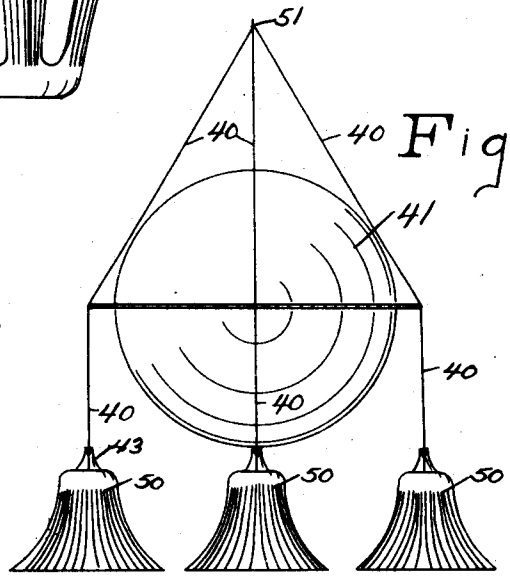


Fig. 11.



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Fig. 13.

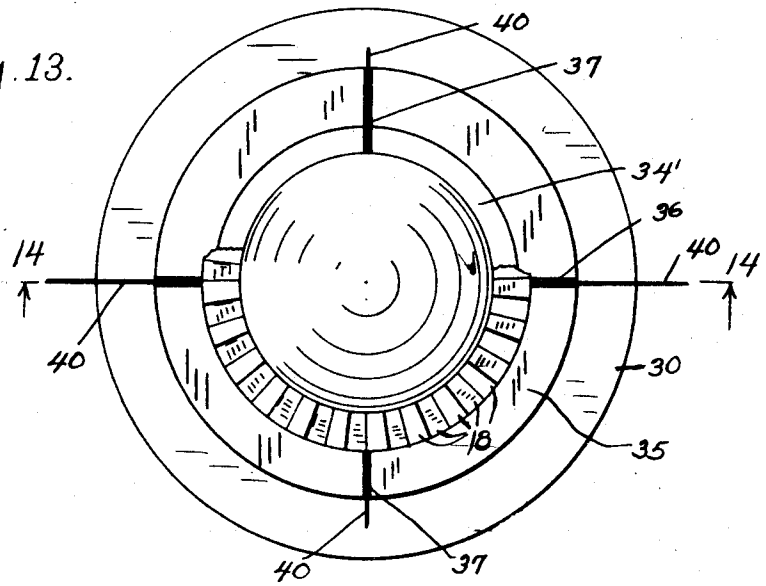
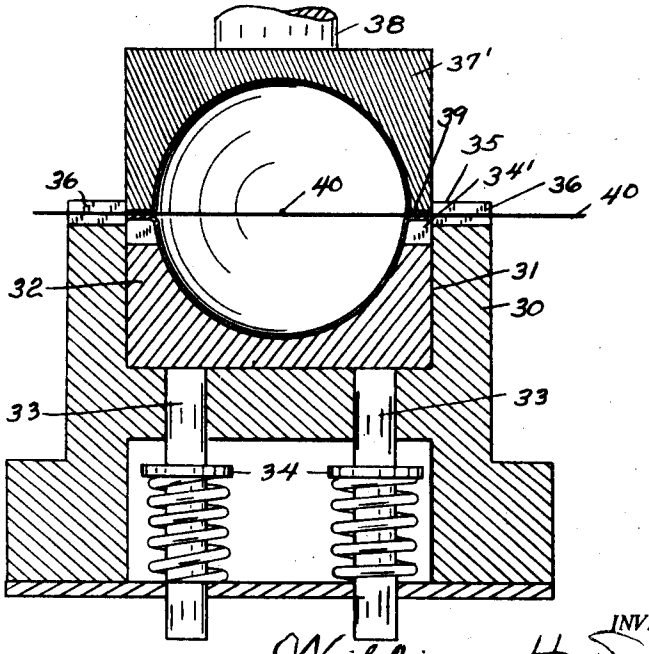


Fig. 14.



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UNITED STATES PATENT OFFICE.

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CHRISTMAS-TREE ORNAMENT AND THE LIKE AND METHOD FOR THE MANUFACTURE THEREOF.

Application filed March 14, 1925. Serial No. 15,483.

This invention relates to improvements in Christmas tree ornaments and the like and methods for the manufacture thereof.

A variety of different means have been devised heretofore for the connection of annular margins of objects of substantially like diameters. It is one of the primary objects of this invention to provide a novel and improved means for uniting such margins economically, ornamentally, and in a manner which lends itself to the interconnection of such objects with other objects of a similar nature.

More particularly stated the present invention contemplates the formation of convolutions in the margins of the two members which are to be united, such convolutions having substantially parallel sides so that when they are nested together with similar convolutions and are subjected to pressure the two sets of convolutions will collapse to produce a kind of dovetailed joint which will securely hold together the two objects of which the margins are thus united.

Any number of objects may be simultaneously united in this manner and it is a further object of this invention to provide a construction and method making possible the union of more than two objects having corresponding marginal portions.

It is further object of this invention to devise a method and a mechanical structure which are useful in uniting radially extending elements to a single or to a plurality of objects having margins convoluted in the manner above indicated.

Further objects of this invention relate to the manufacture of improved articles of manufacture, one of which comprises an extremely light weight hollow body of comparatively great strength, another of which relates to devices suitable for use as shipping containers, another of which relates to a novel ornamental fabric, and another of which relates to an ornamental package of a non-refillable character.

In the drawings:

Figure 1 represents in side elevation the several parts of a novel and improved Christmas tree ornament as assembled preparatory to their permanent interconnection.

Figure 2 is a detail view on an enlarged scale in plan of a portion of the margin of one of the parts shown in Figure 1.

Figure 3 is a vertical axial section through a device completely assembled from the parts shown in Figure 1.

Figure 4 is a side elevation of a shipping container made in accordance with this invention.

Figure 5 is a detail view on a greatly enlarged scale showing in section the character of joint or union produced in accordance with this invention.

Figure 6 is a fragmentary view in plan of a novel fabric embodying this invention.

Figure 7 is a side elevation of the fabric structure shown in Figure 6.

Figure 8 is a view in plan of a novel ornament or medallion made in accordance with this invention.

Figure 9 is a side elevation of an improved Christmas tree ornament embodying this invention.

Figure 10 is a side elevation of a different type of ornament.

Figure 11 is a side elevation of a further type of ornament embodying this invention.

Figure 12 is a side elevation partially broken away and a vertical axial section to show a non-refillable container embodying this invention.

Figure 13 is a plan view of a die for use in the practice of this invention.

Figure 14 is a sectional view of a die taken on line 14—14 of Figure 13.

Like parts are identified by the same reference characters throughout the several views.

Any two bodies whether they are hollow like a bell or a hemisphere or whether one or both of them are disk-like in character may be interconnected rigidly and permanently by means of the method and structure herein to be disclosed. Furthermore, a third or even more additional bodies may be simultaneously connected with the first two. By way of illustrating the above fact, I have shown in Figure 3 two hollow bodies and one plane body united together, in Figure 4 I have shown a cylindrical body and a plane body interconnected, in Figure 7 I have shown two hemispherical bodies, in Figure 8 I have shown a plane body to which a plurality of radial elements have been connected in accordance with this invention and in Figure 12 I have shown a body of generally cylindrical contour connected with a body of hemispherical contour.

These various illustrations may be taken as typical of the great variety of forms which may be united.

In all of the various constructions illustrated in the accompanying drawings the union of two or more parts or bodies depends upon the formation of substantially square sided convolutions in one or more of the several parts or bodies and the subsequent flattening of the convolutions to fold the side walls thereof into clamping relation with each other and with the walls of adjacent convolutions.

In Figure 1 there is illustrated a bell 15 and a similar bell 16. The two bells may be formed in the well understood manner from sheet metal, preferably aluminum foil or some other highly pliable substance such as paper, tin, copper, or the like. Any substance which is ductile and comparatively inelastic will prove very satisfactory for the purposes of this invention.

It will be noted that each of the bells 15 and 16 has been formed with radially extending flutings 17. The same dies which form the bodies of the bells are preferably constructed to form convolutions 18 in their margins. These convolutions lie in general in a common plane to which the vertical axis of the bell is normal. The vertical sides 19 of the convolutions are preferably substantially parallel. The more nearly parallel these side portions 19 can be made, the more uniform will be the resulting joint in the completed device. Preferably the upper surfaces 20 of the convolutions will extend into the valleys between adjacent flutings 17 of the body of the bell. There is a comparative excess of material in the valley portions of the convolutions which may be used to form the elevated portions 20 of the flutings with a minimum displacement of material during the stamping operation. This arrangement is very clearly brought out in Figure 2.

It will be understood, of course, that the convolutions of bell 15 are complementary to the convolutions of bell 16 so that the convoluted margins of the two bells may be nested together. The two bells may either be directly united together or a re-enforcing disk or web 25 may be interposed in the manner suggested in Figures 1 and 3. If the disk 25 is used it will have formed in its margin by suitable dies or otherwise a set of convolutions 18 corresponding exactly with those already described. When the disk is used its convolutions will nest with the convolutions of the two bells upon either side of it.

After the convoluted margins of the several parts are in nested relation they are subjected to pressure in a direction tending to flatten the convolutions which thereupon appear as shown in Figure 5. In practice the entire periphery of the bodies so joined will not be as regular as the illustration in Figure 5 although there will usually be parts of the periphery in which the flattening will occur to produce dovetailed or interlocked portions of practically perfect regularity. As is clearly shown in Figure 5 the side walls 19 of the two articles 15 and 16 have collapsed. Thereby the abutting upper surfaces 20 of adjacent convolutions are brought into close proximity and so likewise are the under surfaces 21 of each convolution brought into close proximity with the corresponding surfaces of convolutions upon either side thereof. Due to the great pressure with which this operation is preferably performed and due to the inelasticity of the preferred materials for the articles thus joined the result is a very rigid joint inherently re-enforced along radial lines and having great tensile strength due to the multiplicity of points at which the two articles are interlocked.

The interlocking operation is preferably performed in a die similar to that shown in Figures 13 and 14. The die illustrated is one for joining hemispherical articles but it will of course be understood that the form of the articles to be joined is broadly immaterial. A base member 30 for the die is provided with an interior recess 31 in which a die plunger 32 is reciprocable. The plunger is provided with downwardly extending rods 33 which are spring supported as illustrated and tend to lift the plunger 32 to the limited extent to which movement is permitted by the spring seats 34. When the spring seats 34 contact with the adjacent under surface of the block or base 30 the upper surface 34′ of plunger 32 will be in substantial registry with the flat surface 35 of the die block 30. The die block 30 and plunger 32 may conveniently be provided respectively with suitably positioned corresponding grooves 36 and 37 adapted to receive transverse cords or wires hereinafter to be described. A second die plunger 37′ complementary to die plunger 32 is operated by a suitable connecting rod 38. The plunger 37′ has a flat surface 39 adapted to co-operate with the flat surface 34′ of plunger 32 to compress convolutions or folds of material therebetween.

In practice the two bodies to be joined are placed with their convoluted margins in nested relation on die plunger 32, die plunger 37′ being then elevated out of the way. Die plunger 37′ is now lowered until its surface 39 contacts with the convolutions of the interposed bodies whereupon the flattening of the convolutions is commenced. When the resistance to this flattening operation develops to a sufficiently high degree the yieldable plunger 32 is impelled downwardly within die block 30 and any surplus of

material overhanging surface 35 of the die block is cut therefrom by the shearing action of the plunger 37′ as it enters said block.

The downward movement of the plunger 32 has a further function of limiting the initial degree of pressure which it is possible to apply to the work. With different materials it may be found necessary to vary the compression of the springs which support plunger 32. It will be obvious that during the downward movement of the die plunger 37′ toward the extreme position in which it is illustrated in Figure 14 the pressure upon the work cannot exceed the degree of compression exerted by the spring supporting plunger 32. Ultimately the nested convolutions may be subjected to heavy pressure to clench them in dovetailed relation as shown in Figure 5 but due to this arrangement for limiting the initial pressure to which the convolutions are subjected, time is afforded for the displacement of the metal or other material of the convolutions without exceeding the tensile strength of such material. In this way the operation may be performed successfully under conditions which might result in rupturing or tearing the material if the full pressure of the die were applied all at once.

Wherever two bodies are joined by a flattened convolution of the character herein described it is possible to introduce between them a strand of cord, wire or tinsel. Irrespective of their specific character such strands will be designated herein by reference character 40. It will be noted that the forming die shown in Figures 13 and 14 is provided with grooves extending at right angles to each other and adapted to receive cords 40 and to protect such cords from being sheared during the operation of the die. This makes it possible to form spheres 41 which are constructed from hemispheres in the manner already described, the hemispheres being joined by interlocking convolutions in the form of a radial flange 42, each sphere having strands 40 passing through it at right angles in two directions. Each of the several spheres 41 joins two strands 40 at a point of connection and as a result it is possible to provide a novel and very decorative fabric, the strands 40 of which may comprise wire, string, or tinsel, and the body of which comprises spheres so positioned and constructed as to hold the strands in their proper relation and to present decorative light reflecting surfaces to the eye.

Figure 8 shows a construction in which a single disk such as that shown at 25 in Figure 1 is provided with a series of radially disposed bristles or tinsel strips 45, such strips being laid into the convolutions of the disk and the convolutions being subsequently flattened to retain frictionally the strands 45. Such a device presents a brilliant sunburst or medallion effect as is clearly shown in Figure 8 and is admirably adapted for use as a novel type of Christmas tree ornament.

Figure 9 shows two bells similar to those shown in Figures 1 and 3 and skeletonized by cutting away their side portions at 46. These bells are joined by a radial flange 42 formed in the manner already described by compressing the nested convolutions into dovetailed relation. A staple 43 serves to support the device in a pendant position from a Christmas tree or the like. Within the bells is a sphere 41 formed in the manner already described and having a radial flange 42 in clamping relation upon a strand 40 which extends axially through the united bells and is fastened to their respective ends as is shown at the top of Figure 9. The openings 46 in the hollow article formed by the union of the bells render sphere 41 visible and if fine wire or thread is used for the strand 40 it will have sufficient torsional resilience to permit the sphere 41 to rotate within the bells when a draft of air is directed upon the flange 42 projecting at one side thereof.

In Figure 10 the two bells 48 and 49 are not directly joined but their convoluted margins have been flattened to retain portions of the same strands 40 which, in this view, are illustrated as being formed of tinsel. Since the tinsel is engaged in the flange portions 42 of both of these bells it holds the bells together in spaced relation and renders visible the sphere 41 supported therein in the same manner as the sphere shown in Figure 9.

In Figure 11 two strands 40 have been passed in each direction through the sphere 41. At each point where the strands issue from the flange 42 of the sphere one of the strands has been turned downwardly and used to support a small bell 50 and the other of the strands has been turned upwardly and brought to a common point at 51 where the ends are then knotted and may be used for supporting the entire ornament.

All of the devices thus far described have been peculiarly adapted for use as Christmas tree ornaments but the invention is serviceable in other connections as is shown by Figures 4 and 12. Figure 12 like the Christmas tree ornaments may conveniently be constructed of foil or other extremely light weight metal. It comprises a cup 60 having a flat bottom at 61 so as to be adapted to rest upon a table or like supporting surface. Within the cup is a cylindrical container 62 which is considerably higher than the cup and serves as a guide to position the cover 63. The cover will preferably be constructed of tinfoil or light weight sheet metal like the

cup 60 and after the container 62 has been filled with some article of commerce the cover 63 and cup 60 may be united in the manner already described. In other words, they will initially be provided with fluted margins. The portions 64 and 65 of the cup and cover respectively will be rolled outwardly adjacent such margins to provide sufficient material for the formation of the convolutions without tearing the foil. When the convolutions are compressed a flange 42 will be formed similar to that already described.

Such a package may be sold commercially and used as a shipping container inasmuch as the cup 60 and cover 63 are very strongly joined together.

The purchaser of such a package may readily sever the cover from the cup by taking ordinary shears and cutting away the flange 42 as is shown at 66 at the right hand side of Figure 12. Thereupon the cover 63 may be readily lifted from cup 61 to expose the contents of the liner 62. When a portion of the contents of the liner has been used the cover 63 may be replaced, being positioned on the cup by the liner which extends for a considerable distance above the joint between the cup and cover. Thus the purchaser may keep the contents of the package covered and protected during use but the package cannot again be sealed following the cutting away of flange 42.

The package illustrated is particularly adapted for the shipment and vending of face powder. The liner 62 may be filled with powder and a powder puff fitted within the cover 63. The contents of the package will be made readily accessible to the purchaser when the flange 42 is cut away but when the powder is gone the package cannot again be sealed.

Figure 4 illustrates a can such as is adapted for use in the preservation and shipment of vegetables or the like. It has a cylindrical body 70 to which a disk-like base shown in dotted lines at 71 has been joined by means of the flattening of nested convolutions on the body and base to produce the usual flange 42. The disk-like bottom 71 of the can may correspond exactly to the disk 25 shown in Figure 1 except for the weight of material used. The can will preferably be formed of tin or of some other metal of greater weight than foil.

The top of the can is illustrated as being unsealed, being provided with the open convolutions 18. A disk similar to that shown at 71 at the bottom of the can may be employed as a cover and the can may readily be sealed by the application of pressure to flatten the convolutions 18 on the can and cover. In this manner a joint which is practically hermetically tight may be accomplished without the use of solder and the can may readily be opened with ordinary metal shears by cutting away one of the flanges 42 at its top or bottom.

Most of the articles which may be joined in accordance with this invention are formed by a stamping operation and consequently by suitable modifications of the die which performs the stamping it is possible to form the several parts of these articles with substantially square sided convolutions in accordance with the disclosure herein. Where such convolutions are formed it requires but a single operation to complete the union of two or more parts with a very permanent and strong joint. Thus the invention is suited not only for the manufacture of Christmas tree ornaments but also for the manufacture of shipping containers and packages for goods of commerce. The invention lends itself to the construction of a wide variety of articles of distinctive form and appearance such as it would be difficult and impracticable to manufacture on a commercial scale by methods heretofore known. It will be apparent, therefore, that the objects of this invention are satisfied by the method and structures herein disclosed.

I claim:

1. A new article of manufacture comprising two elements each provided with a portion formed with a plurality of convolutions each opening marginally of said portion and interlocked with a corresponding convolution of the other element.

2. As a new article of manufacture, a device having flattened marginal convolutions and an element having a part engaged in one of said convolutions.

3. A new article of manufacture comprising a plurality of elements each having a flange portion provided with convolutions opening radially thereof and interlocked with the convolutions of the other portion.

4. A new article of manufacture comprising a plurality of elements each having a flange portion provided with convolutions opening radially thereof and interlocked with the convolutions of the other portion, said elements each being composed of thin flexible material, whereby said flange portions may be cut for releasing said elements one from the other.

5. A new article of manufacture comprising a plurality of elements each having a flange portion provided with a plurality of convolutions interlocked with the convolutions of the other portion.

6. As a new article of manufacture, a device having a fluted body terminating in convoluted margins having alternately elevated and depressed portions, the elevated portions of said convoluted margins being in registry with the parts of said body intermediate of flutings therein.

7. As a new article of manufacture, a de-

vice having a fluted body terminating in convoluted margins having alternately elevated and depressed portions, the elevated portions of said convoluted margins being in registry with the parts of said body intermediate of flutings therein, and the parts of said margins intermedate said elevated and depressed portions being substantially in vertical parallelism.

8. A new article of manufacture comprising a pair of elements composed of thin material and each having a flange portion provided with convolutions opening radially thereof, and a re-enforcing web between said elements and having its marginal portion provided with convolutions opening radially thereof, the convolutions of said flange portions and marginal portions being interlocked.

9. A new article of manufacture comprising a pair of elements composed of thin material and each having a flange provided with a plurality of convolutions, and a re-enforcing web between said elements and having its marginal portion provided with a plurality of convolutions, the convolution of said portions being interlocked.

10. A new article of manufacture comprising an element having a flange provided with convolutions opening radially thereof, and a web having its marginal portion provided with convolutions interlocked with the convolutions of said flange.

11. A new article of manufacture comprising an element having a flange provided with convolutions, and a web having its marginal portion provided with convolutions interlocked with the convolution of said flange.

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