Oct. 31, 1950 J. B. JANNEY 2,527,819

PACKAGING MEANS FOR ANNULAR DEVICES

Filed May 20, 1947 2 Sheets-Sheet 1

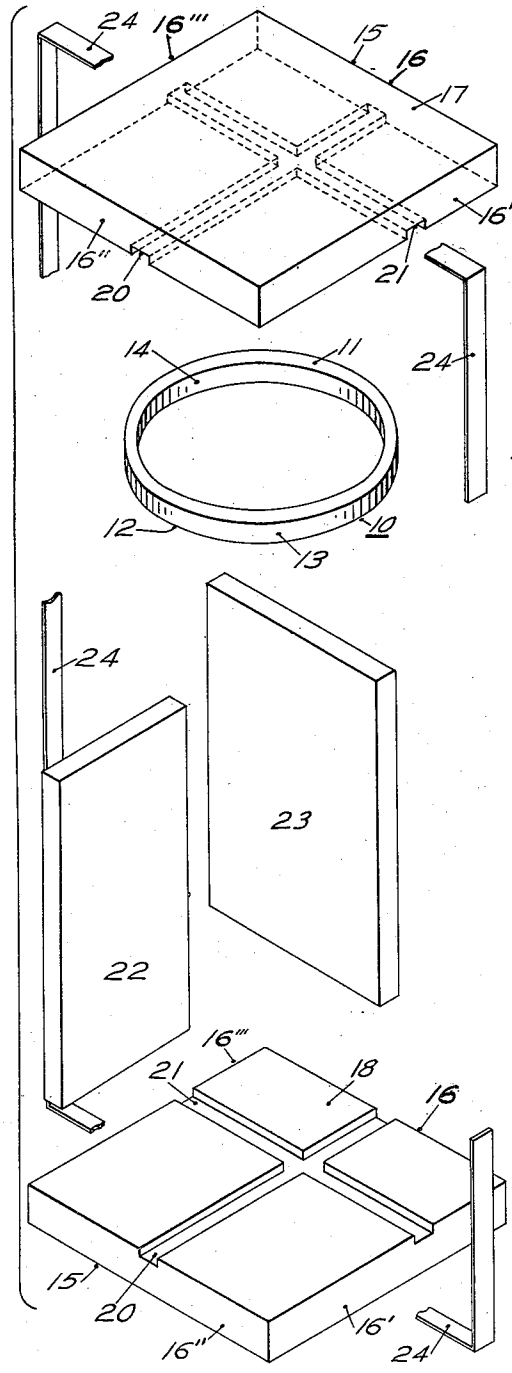

Fig. 1.

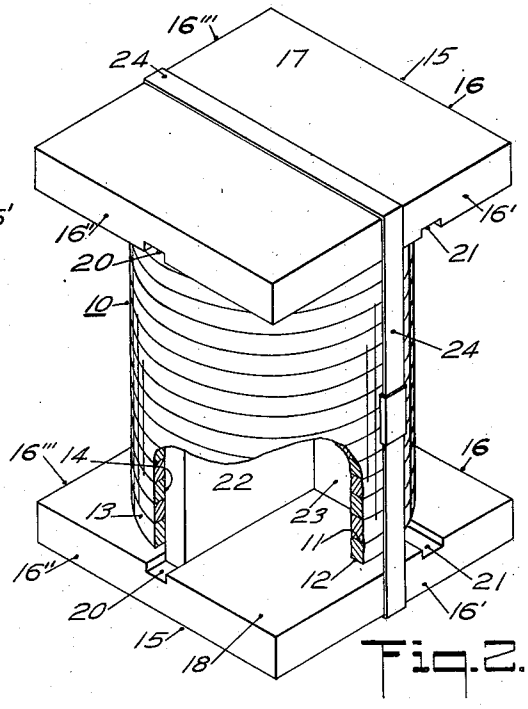

Fig. 2.

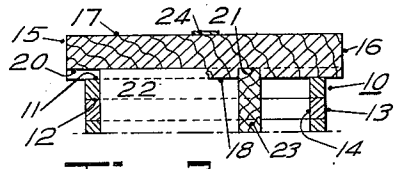

Fig. 3.

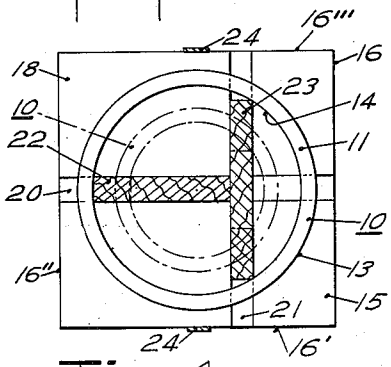

Fig. 4.

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PACKAGING MEANS FOR ANNULAR DEVICES

Filed May 20, 1947 2 Sheets-Sheet 2

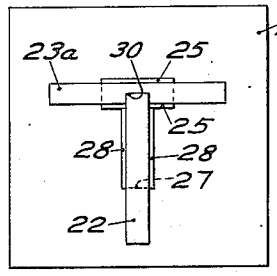

Fig. 5.

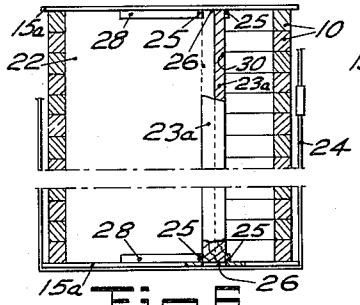

Fig. 6.

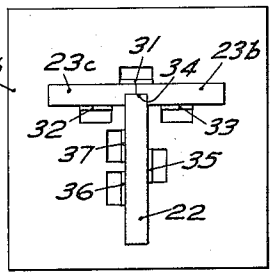

Fig. 7.

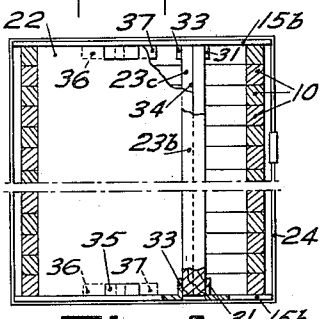

Fig. 8.

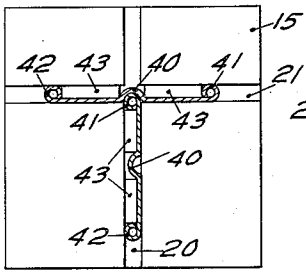

Fig. 9.

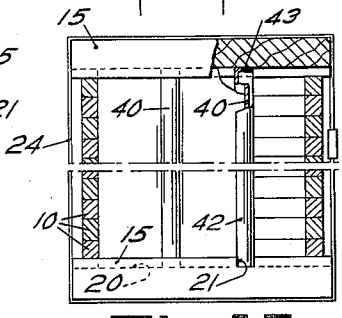

Fig. 10.

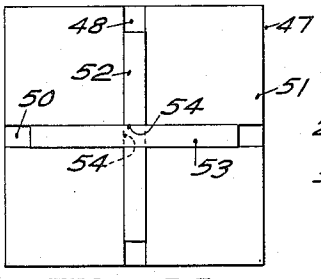

Fig. 11.

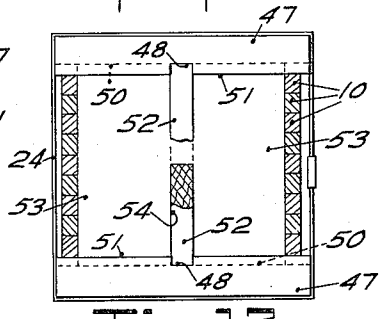

Fig. 12.

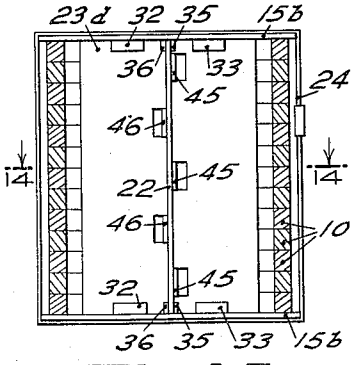

Fig. 13.

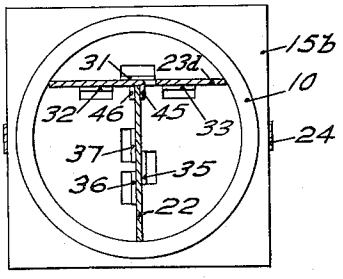

Fig. 14.

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UNITED STATES PATENT OFFICE

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PACKAGING MEANS FOR ANNULAR DEVICES

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Application May 20, 1947, Serial No. 749,213

5 Claims. (Cl. 206—65)

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This invention relates to methods and means for packing, transporting and storing articles.

Packing systems as developed hitherto have involved appreciable expense, storage space, and difficulty of assembly and disassembly.

It is among the objects of this invention to improve and simplify the art of packing; to obviate certain defects in the prior art of packing; to provide a readily assembled or disassembled structure by means of which a plurality of more or less identical articles can be packed sturdily and rigidly, shielded against impacts and similar undesired contacts with or upon the surfaces of the articles, and which enables easy and free inspection at all times; to reduce the cost of packaging articles; to provide components for packaging with which various sizes of supplementary components can be operatively associated to take care of different sizes of articles to be packaged; and to provide other objects and advantages as will become more apparent as the description proceeds.

In the accompanying drawings:

Fig. 1 represents an exploded perspective of the assembly;

Fig. 2 represents a perspective of the assembled package, partly broken away;

Fig. 3 represents a fragmentary vertical section through the upper end of the assembled package;

Fig. 4 represents a transverse section through the assembled package, showing in dotted lines the post assembly for the ring of smaller diameter also shown in dotted lines;

Fig. 5 represents a plan of an assembled post and lower base or end plate, with the upper end plate removed, in which interlocking pillars are engaged by upstanding flanges on the lower end plate as a modified form of groove therein;

Fig. 6 represents a fragmentary vertical section of an assembly of packaged rings and the package elements of Fig. 5;

Fig. 7 represents a fragmentary plan of a further modified form of interlocking pillar arrangement in operative engaged association with a modified form of upstanding flanges comprising clamp-like elements for supporting the pillar elements on the end plates;

Fig. 8 represents a fragmentary vertical section of an assembly of packaged rings and the package elements of Fig. 7;

Figs. 9 and 10 represent respectively a transverse section through a modified form of interlocking pillar arrangement forming the post of the package, and a fragmentary vertical section through a package of rings and the post components shown in Fig. 9;

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Fig. 11 represents a plan of a modified form of post on a modified form of supporting base;

Fig. 12 represents a fragmentary vertical section, partially in elevation, of a ring package assembly with the pillars or post component shown in Fig. 11;

Fig. 13 represents a fragmentary vertical section through a modified form of interlocking pillar arrangement forming the post of the package in operative engaged association with a modified form of end plate;

Fig. 14 represents a transverse section taken on line 14—14 of Fig. 13.

Purely for illustrative purposes the invention will be disclosed in its use as a packing and storing assembly for pluralities of identical rings 10, for which it is particularly valuable. The rings 10, illustratively, are rectangular in cross section having upper and lower planar parallel faces 11 and 12, an outer periphery 13 meeting the faces 11 and 12 in a right angle on any diametrical section, and having the inner periphery 14. It will be understood that these rings may be of widely different diameters and other sizes, proportions or shapes, although each series to be shipped or stored will be preferably of the same order. The articles to be packaged by this invention need not be closed circles, as will be clear.

The packaging unit of the invention comprises upper and lower platens, end plates, or bases 15, which are identical but are reversed and made complemental to each other in assembly. Each end plate 15 is made of some relatively cheap material, such as plastics, wood, wall board, sheet or cast metal or the like, or combinations of some of these, and the area and outer configuration or contour thereof will be as desired, and preferably such as to effect a protecting extension of the plates relative to the ultimately associated rings, and each plate also is so formed, on two opposite sides at least, as to receive and satisfactorily hold against lateral shifting a subsequently attached baling strip, to be described. Illustratively, and preferably, the plates in all of the forms disclosed are polyangular, each having a plurality of angularly divergent side edges, respectively 16, 16', 16'', and 16'''. Each plate is provided with a preferably planar outer face 17, and an inner preferably parallel generally planar face 18, which is actually or effectively grooved. It will be seen that the grooves may be either actual sub-surface recesses or grooves formed in the faces 18, or may extend above the surface 18, being delineated by guide or restraining portions extending generally perpendicularly to the faces 18, and so disposed and spaced as to form retaining devices for the

subsequently attached post components or pillars, to be described.

As shown in Figs. 1, 2, 3, and 4, the face 18 of the plates 15 shown is provided with two relatively perpendicular, substantially linear grooves, of which one recess or groove 20 extends across the plate 15 in or adjacent to the center thereof, and which is therefore generally symmetrical thereof. The symmetrically disposed groove 20 is intersected perpendicularly by a substantially linear groove 21, which is asymmetrical of the plate surface 18, being formed predeterminedly closer to one edge 16 than to the other opposite, preferably generally parallel, side edge 16''. As noted, in ultimate assembly, these plates will be provided in duplicate, arranged for complemental use, with the effective grooves presenting toward each other in relative parallelism. When the end plates are made of wood or the like, it may be found expedient to form them of two or more relatively cross grained laminations.

The foundation of the package, so far as the actual ring-contacting element is concerned, is a post formed of two post components comprising webs or pillars 22 and 23 of varying relative widths according to the internal diameter of the articles to be mounted thereon. The post components or pillars may be formed of any material, such as wood, wall board, plastic, sheet or cast metal, or combinations thereof, and may be of any desired formation, although rectangular formation is preferred. It is only necessary that the longitudinally extending side edges of the respective webs or pillars be parallel, and that the end formations be such as to cooperate with the effective grooves of the plates as to have restrained anchorage therewith. Usually this is secured by providing the faces of the pillars in parallelism at least at or adjacent to the ends thereof, so as to have portions of the parallel pillar faces extend in their effective grooves to hold the pillar or web against lateral shift, transversely of a groove. Thus, the extreme edge surfaces of each pillar, although preferably planar and at 90° to the side faces, may be at any other angle, or may be curved or otherwise formed as desired. So far as the formation of the pillar between the ends thereof is concerned, it is only necessary that both webs 22 and 23 respectively have parallel side edges, and that the web 23 include a planar or grooved face for engagement by an edge of the web 22 in post assembly. The engagement may be a mere abutment, or may represent a form of interengagement, as will be pointed out. It is simpler and cheaper and, as noted, for some purposes it is preferred to provide the webs as planar rectangular members, as shown in Figs. 1 to 4 inclusive. The post is preferably of a general T formation, of which the pillar 22 forms the leg of the T while the pillar 23 forms the cross piece thereof. The T formation is accomplished by bringing an edge of the pillar 22 against the substantial central planar section of the pillar 23, in which formation the pillars are more or less frictionally fitted into the respective effective grooves of one end plate 15 serving as a base, either together, or seriatim, with T leg element pillar 22 disposed in the median slot or groove 20 of the base plate, and with the T cross pillar 23 fitted into the transverse asymmetrical groove or slot 21. As, within the limits of the dimensions of the end plates, it may be desired to provide for packaging various diameters of rings, while maintaining substantial concentricity thereof relative to the centers of the respective end plates, it will be seen in the dotted line disclosure of Fig. 4 that the leg pillar 22 will be wider than the cross piece pillar 23 when arranged for association with the smaller ring indicated in dotted lines in that figure, while the outer edges of the smaller ring are substantially evenly spaced from all of the edges 16, 16', 16'', and 16''' of the end plates. In other words, the small ring is centered on the end plate. On the other hand, to maintain the substantial concentricity and centering of the larger ring on the end plate, shown in full lines in that figure, the cross piece 23 will be a wider pillar than the leg pillar 22. Such assemblies of relatively proportioned pillars or webs of relatively different widths is contemplated, in association with a given size of end plates, as the elongated slots or grooves therein will take care of pillars of a wide range of relative widths. In any given case, with the diameter of the rings or analogous articles known, the pillars will be properly predetermined in relative sizes, so that while being of proper thickness as to have frictional fit in the respective grooves, the extremities of the cross piece and the free edge of the leg will be so related as to have sliding engagement by the internal surface of the ring so that in assembly of a ring over and upon the post formed of the two independent but mutually cooperating pillars, the latter are held against relative movement transversely by the ring, while the ring is similarly held by the post against transverse movements.

The post-forming pillars are predetermined in length to accord with the known proportions of the respective rings so that after allowing a distance on each end sufficient to substantially seat the pillars in the slots or grooves of the respective end plates, the pillars are long enough to receive a series of a given predetermined number of the rings in a stack surrounding the post and held against axial movement on the post by the end plates mounted on the ends of the post-forming components. In this connection it is pointed out as a feature of the invention that in one cheap embodiment the pillars used for forming the posts are mere substantially rectangular boards, as of wood, or the like, which do not necessarily need even surface finish, and have no slots, saw cuts, or expensive modifications in order to permit their association in the ring-supporting post formation.

In the assembly of the rings and the package of Figs. 1 to 4 inclusive, a base 15 is provided, laid on the floor or a support with the grooves up, a pillar 23 is pushed into the groove 21 in the plate 15, then the pillar 22 is pushed into its groove 20 with one edge in abutting engagement with the substantial center of the first pillar 23, although the order of application of pillars 22 and 23 is not particularly important. The series of rings 10 is then applied by placing one or more at a time over the T shaped upper end of the post assembly, with gentle guidance by the operator to the bottom of the post, and upon the upper surface 18 of the bottom plate. Finally, the entire series of rings will have been so guided and placed, until the post is filled. At this point, the only contact between adjacent rings will be with the juxtaposed faces 11 and 12 respectively thereof in planar contact in the case of the rings illustrated, or of transversely tangential contact if round rings are involved, so that the outer peripheries 13 of the respective rings will merge visually into a substantial cylinder of metal, as the T shaped post engages the inner peripheries 14 of the rings to maintain

their substantial alignment. Owing to the relatively tight engagement of each of the respective rings upon the surfaces of the composite post, the components of the latter are rigidly held together, while also the rings are held against any lateral shifting relative to the post.

With the sizes of the rings known and the number to be associated in each series also known, the pillars **22** and **23** will be properly formed or cut for length so as to position the last and upper ring of the series close to the end of the post so that when the upper complemental end plate **15** is inverted so that the grooves thereof face downwardly, the upper ends of the boards **22** and **23** will just slide into their respective upper grooves, while the face **18** of the plate will, at the same time, engage the upper surface **11** of the top ring, to prevent axial motion of any rings along the post. After the top plate **15** is applied a single strand of baling strap or tape **24** is fastened about both of the end plates and between same in parallel but spaced relation to the rings mounted therebetween, squeezing and holding them together against any relative motion of the end plates, and thus anchoring the entire assembly.

While in many situations the T formation of post described above is perfectly satisfactory, it is found that under certain conditions an appreciable amount of relative motion may accompany certain pillar or post assemblies of packaged rings. Usually it is the asymmetrically disposed pillar member, i. e., the pillar **23**, which shifts in groove **21**, with a consequent asymmetrical and eccentric positioning of the mass of rings relative to the end plates. This occasional defect can be readily and easily cured by establishing in any desired manner an interlocking or interengagement between the respective pillars comprising the post. In the T shaped post under discussion, a simple remedy is the provision of one or more nails or similar fastening devices passing through the flat of the pillar **23** into the edge of the pillar **22** or any other nailing can be used. The nailing can be repeated at each operative association if desired, or can be provided as a permanent thing in which the T shaped post is formed and secured independently of the base assembly, so that in all of the subsequent uses the T assembly is attached and detached as a unit.

As has been suggested, the grooves in the end plates may be actual sub-surface grooves, or may be super-surface grooves delineated above the surface of the plate by upstanding members defining between them the effective grooves. To both of these ends the modifications shown in some of the later figures are directed.

Referring to Figs. 5 and 6, end plates **15***a* are formed of sheet metal or the like from which complemental and opposite tongues or ears **25—25** are struck, on opposite sides of a slot **26** disposed asymmetrically in the plate **15***a*, and each of relatively short linear extent, as compared with the width of pillars to be associated with it. This slot opening is intersected perpendicularly by the leg slot **27** of the T from which similar opposite and complemental upstanding lugs, ears, or tongues **28** are struck. It is to be noted that the upstanding ears or tongues which define between them effective grooves or complemental clamping portions are all preferably clustered close to the center of the plate **15***a* so that they are out of any possible contact with any superposed ring mounted on the plate. At the same time, they are of sufficient length as to anchor and give stability to the pillars to be associated therewith, and also to take care of different widths of pillars. In order to cause interlocking engagement of the pillars comprising the post components, the pillar **23***a* is provided with a vertical median slot or groove **30** into which the complemental T leg-forming pillar **22** has sliding entrance to interlock the components and to prevent sliding of the pillar **23***a* in its guide anchor in the plate. It will be seen that various sizes of pillars may be operatively associated with the respective end plates disclosed in Figs. 5 and 6, and also that various forms of post assemblies can be disposed therein, whether as disclosed in those figures, or as disclosed in any other of the figures herein.

It will be seen that in the just described formation of end plate, the complemental clamping elements arise from the plate in confronting relation, which is quite effective and efficient, but may have the effect of limiting the length of the groove thus defined. In Figs. 7 and 8 a modified form of end plate is disclosed at **15***b*, in which a plurality of relatively staggered tongues, tabs, or ears are provided, to define the grooves of the plate, but which are out of mutual contact in the aligned relation of the respective ears. Thus, the asymmetrical slot or groove is defined by a median ear **31** struck out of the plate and facing in one direction of the effective groove or slot of the plate, while a pair of aligned but spaced ears **32** and **33** are provided in transversely spaced relation on the other side of the groove or slot, in staggered relation with and facing the said first mentioned ear **31**. It will be seen that a pillar such as **23***a* of Fig. 5 can be disposed in clamped relation on said end plate, although to illustrate a further modification of pillar, the two complemental pillar portions **23***b* and **23***c* may be provided as independent elements arranged for aligned disposition in the groove formed by the plurality of ears **31**, **32**, and **33**, having complemental cut-out corners to form together the vertically extending angular recess **34**, into which the symmetrical leg-forming pillar **22** engages in a manner similar to the fit into the recess **30** of Fig. 5. To form the symmetrical groove in the plate **15***b* a plurality of staggered ears are provided, comprising at least one ear **35** facing in one direction, in transversely spaced relation to the staggered ears **36** and **37** facing in the other direction and toward ear **35**, and arranged to receive and clampingly to engage more or less frictionally, if desired, the T leg pillar **22** of any of the forms of pillars disclosed, or that may be desired.

In the form of invention shown in Figs. 9 and 10, the plates are disclosed as identical with the grooved plates shown in Figs. 1 to 4 inclusive, so that similar reference characters are used thereon, although as with any of the forms of invention disclosed the plates may be made in accordance with any of the modifications disclosed, as this instant modification is directed toward the post formation. The pillars are illustratively formed from sheet metal or the like and they are similar in formation. A sheet of metal is cut and stamped to form a median longitudinal groove and rib portion **40**, evenly spaced between rolled side edges **41** and **42**, and end flanges **43** may be formed between the rib and the rolled beads at the ends of the pillars. The pillars are placed in the respective grooves of the end plates with the rolled bead edge **41** and **42** of one pillar

fitting into the rib groove **40** in the center of the other pillar to establish the interlocking relation of the parts. The cheapness and efficiency of this type of interlocking pillar construction will be apparent.

In connection with the form of the invention shown in Figs. 7 and 8, in which the plates are provided with staggered ears defining the pillar-receiving groove or effective grooves, it will be apparent that with such plate formation or any other shown herein, it would be practical to utilize similar ear formations on the pillars. Such a modification is shown in Figs. 13 and 14, in which with plates **15***b* similar to those of Figs. 7 and 8, a metal pillar **23***d* arranged for disposition in the asymmetrical slot in the plate **15***b*, between ears **31** on one side and ears **32** and **33** on the other, is provided on opposite sides of the median longitudinal axis of the pillar, with staggered ears respectively **45** on one side and **46** on the other, to form an effective vertical slot to receive the edge of the cooperating or complemental pillar element **22**. If desired, both pillars **23***c* and **22** can be provided with the centrally disposed lugs or ears so as to be relatively interchangeable in use for either the cross piece or element or the vertical or leg element of the T formation of the post.

It has been pointed out throughout that applicant prefers the T formation of post, but it will be apparent that certain features of the invention have wider scope and applicability. Thus, it is a feature of applicant's structure that regardless of the particular cross sectional formation of the post, the ends of the pillars form an area upon which the end plates have a more or less stable support in a generally normal relation thereto, which is anchored in place by merely attaching the baling strap, and this stable support is magnified when the column of rings is in place. This ring column, of course, furnishes the widest area of stable support, so that in the development thereof it is possibly of secondary interest that any particular cross sectional shape be maintained, so long as there are a plurality of points of contact or support for and between the ring and the post. The modification indicated in Figs. 11 and 12 is not the preferred form of device, but it may be used in the connection. In this form of invention an end plate **47** is provided with two relatively normal slots or grooves **48** and **50**, in one face **51** thereof, each of which grooves are symmetrical in the end plate so that their point of intersection is in the substantial center of the end plate. A pair of pillars respectively **52** and **53**, each of substantially similar width as determined by the diameter of the ring to be operatively associated, is provided. Each pillar is provided for substantially one half of its total length with a longitudinal slot **54** of a width such as to receive the thickness of the complemental pillar, and the pillars are arranged to be interlocked in substantially cruciform shape by endwise telescoping association until the pillar extensions in line with the respective slots in the pillars fill the complemental slots to form an interlocked unit of cruciform cross section. Obviously, after such interlocking and disposition in the relatively perpendicular intersecting grooves, the components are held rigidly against any lateral shift, while the rings are furnished four points of support in place of the substantial three of the T shaped post of the other figures. Obviously, the widths of both pillars will be increased or decreased simultaneously in order to receive and support series of rings of different diameters.

The flat end plates **15** of the assembled package permits stacked storage of plural units of the packages in end superposed relation, or otherwise. It will be seen that in the preferred embodiment the cylinder of rings in a series has its outer wall within the side of the edges of the opposite end plates so as to protect the rings, while the package is so easily assembled and disassembled that at the point of use the unitary package is mounted on a support with the ring series extending vertically beside another partial package comprising a base or end plate with the two pillars forming the post, and both adjacent to a point of performing additional processing operations on the rings. Rupture of the baling tape permits easy removal of the top end plate of the packaged series, and the successive removal of rings, for application to the point of work, following which the worked or processed rings are placed successively upon the post of the previously empty or incomplete package assembly, until the entire series of unprocessed rings has been successively worked, and returned to a new package, following which a new, or the previously removed, end plate is applied thereto, a new baling strap is applied, and the packaged unit is then ready for such additional shipping or storage, or subsequent processing, etc., as may be indicated. The same empty packages in duplicate will be provided wherever desired at various points in the fabrication of finished articles from the rings so that the entire handling of the rings before any processing and during and between any additional processing steps can be facilitated by resort to the cheap, knock-down, and facile assembly of this invention.

It will be seen that with the relations of the grooves predeterminedly the same in each of a plurality of end plates, it is a simple matter as noted to provide post component pillars **22** and **23** of predeterminedly varying widths so that in assembly the T shaped post will receive and hold various diameters of rings with the same end plates, limited only by the end plate dimensions.

The individual components in the preferred embodiment are all flat so that storage thereof before or between assemblies is facilitated, and the cheapness and economy of the whole will be appreciated.

Having thus described my invention, I claim:

1. A package comprising complemental similar end plates, each end plate having a composite groove comprising two relatively perpendicularly intersecting linear grooves, post means disposed in the composite groove in the form of a T in transverse section of predetermined dimensions so as to present at the extremities of the T three separated contact points for substantial engagement with the internal surfaces of each of a plurality of annular members of predetermined diameter at three peripherally spaced points on the internal surfaces thereof, and a plurality of annular members mounted between the end plates in anchored relation surrounding and substantially engaging said post means.

2. A package assembly for annular devices of known internal diameter comprising complemental similar end plates, each end plate having two relatively perpendicularly intersecting linear grooves, two planar pillars disposed in the respective grooves in the form of a T in transverse section, of which one pillar comprises the cross piece and the other pillar a leg intersecting

said cross piece and extending across the substantial center of the plate, the groove and its associated pillar forming the cross piece being asymmetrically disposed relative to both of the respective end plates so that the extremities of the T define ring-engaging and supporting surfaces angularly spaced on a circumference about an axis passing substantially through the center of both plates.

3. A package comprising a base plate and a top plate disposed in parallelism, both plates in the face presenting toward the other having a pair of intersecting grooves, with the grooves of the respective plates in parallelism, one of said grooves in each plate being closer to the median center of the plate than the intersecting groove so that the intersection of the grooves is eccentric to said median center, two pillars mounted in the respective grooves with an edge of one pillar in juxtaposed relation to the substantial center of the other to define in cross section a substantial T shape and a plurality of rings enclosing the two pillars, each of the rings in substantial contact with the pillars internally of the ring at three peripherally spaced points.

4. A package assembly for annular devices of known internal diameter comprising complemental similar end plates, each end plate having two relatively perpendicular intersecting grooves, two pillars disposed in the respective grooves in the form of a T in transverse section of predetermined widths so as to present externally of the pillars at the extremities of the T three contact points angularly spaced on a circumference, the grooves in each end plate being respectively symmetrical and asymmetrical of the said end plate with the symmetrical groove extending across the median center of the respective end plates so that the axis of said circumference is in substantial alignment with said median centers of the respective end plates.

5. A package assembly for annular devices, in combination with a plurality of annular devices of substantially uniform known internal diameter comprising complemental similar end plates, each end plate having two relatively perpendicularly intersecting linear grooves, two pillars disposed in the respective grooves and interlocked in the form of a T in transverse section so that the cross piece of the T cannot shift relative to the upright leg of the T, said pillars being proportioned so as to present at the extremities of the T three angularly separated contact points for substantial engagement with the internal surfaces of each of said plurality of devices at peripherally spaced points on the internal surfaces thereof.

JOHN B. JANNEY.

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