March 21, 1961 J. P. H. LEAVITT 2,975,892

CONTAINER FOR PACKAGING YARN CONES

Filed June 16, 1958 3 Sheets-Sheet 1

Fig. 1

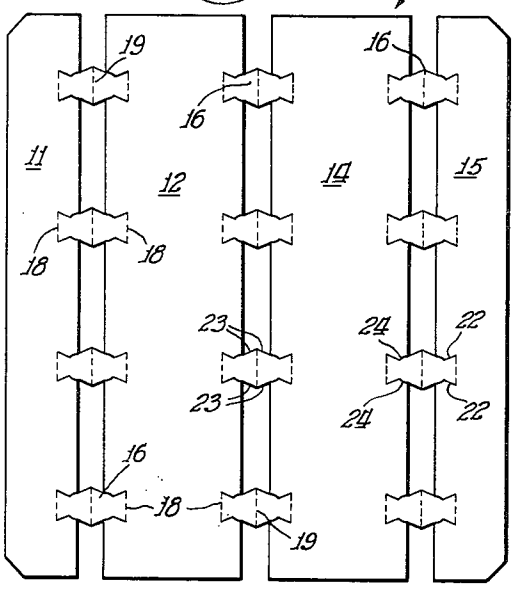


Fig. 2

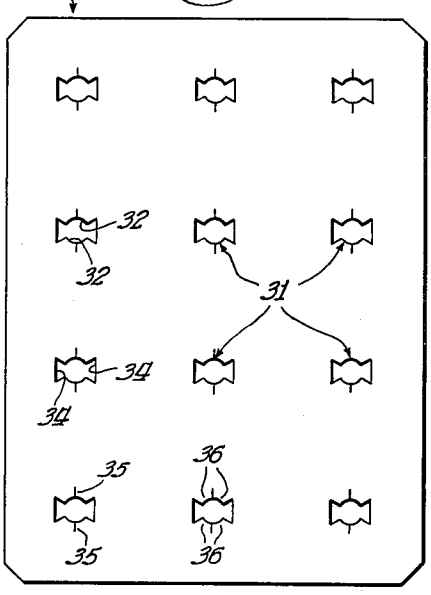


Fig. 3

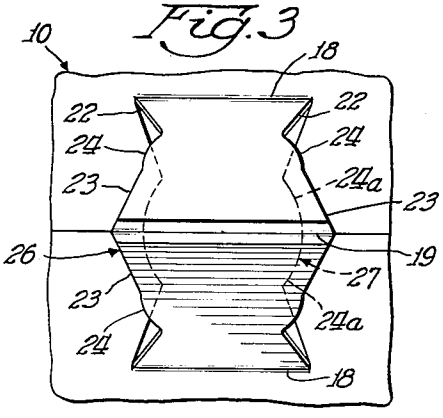
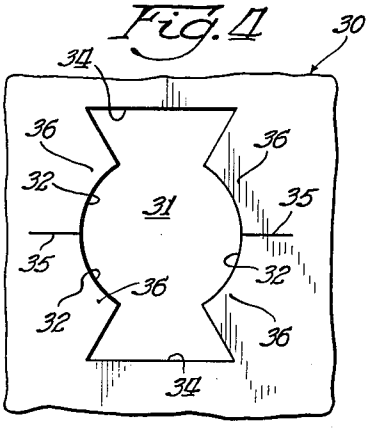


Fig. 4



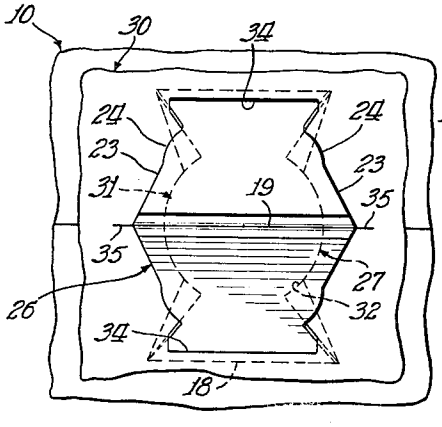


Fig. 5

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CONTAINER FOR PACKAGING YARN CONES

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Fig. 6

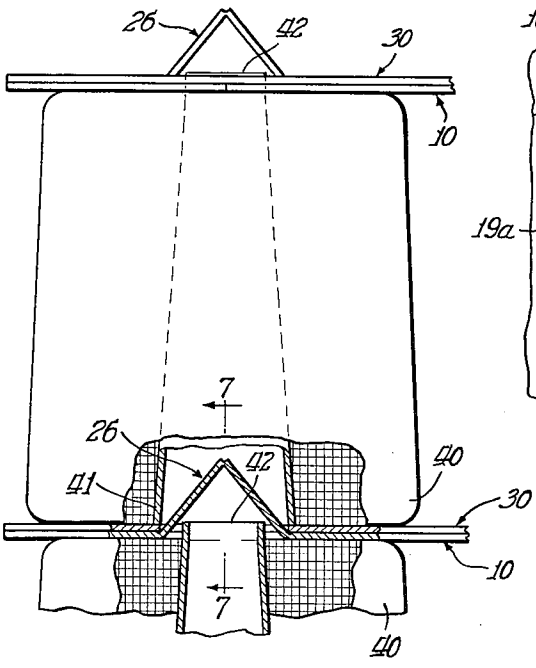


Fig. 9

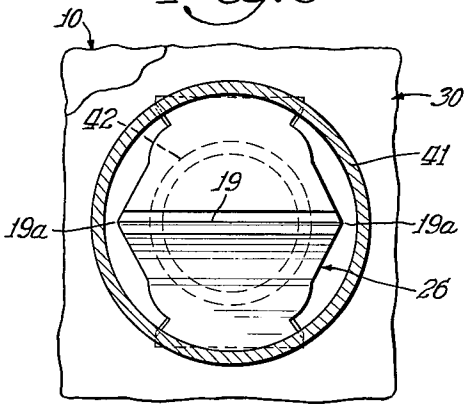


Fig. 8

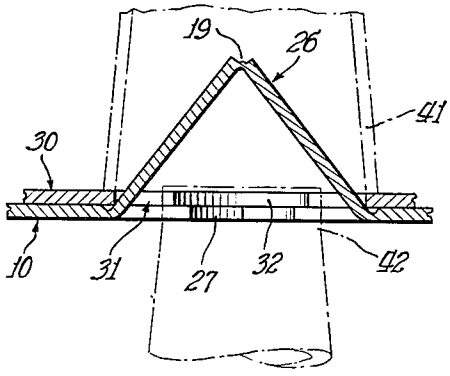
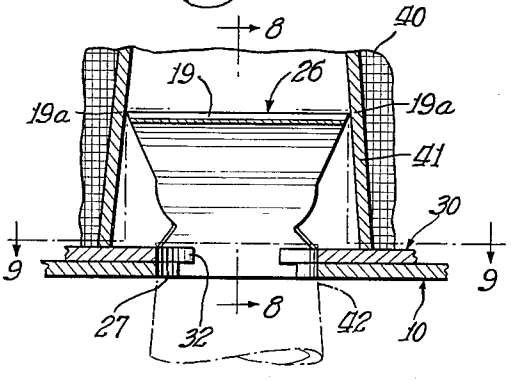


Fig. 7



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CONTAINER FOR PACKAGING YARN CONES

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Fig. 10

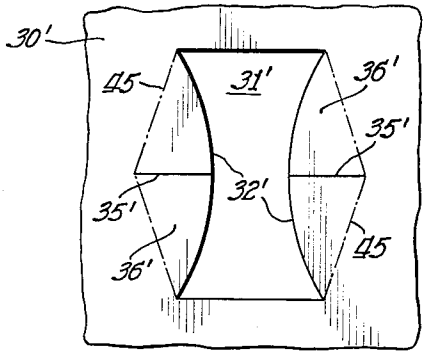


Fig. 11

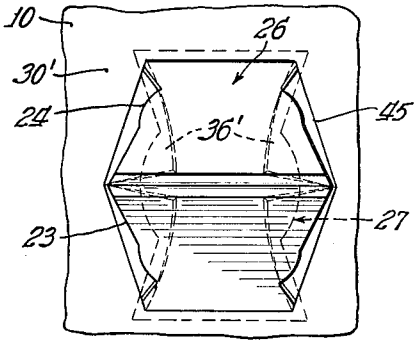


Fig. 12

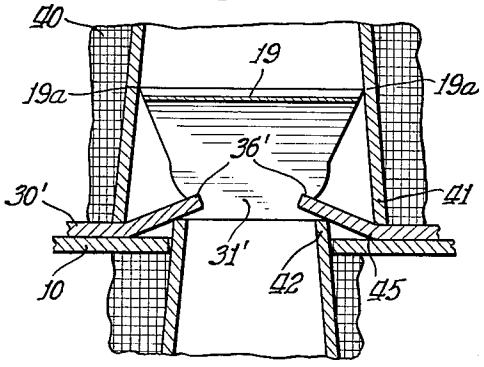


Fig. 13

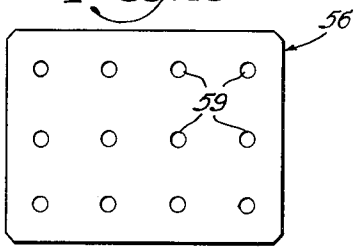


Fig. 14

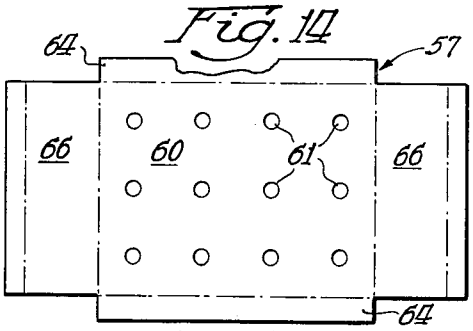


Fig. 15

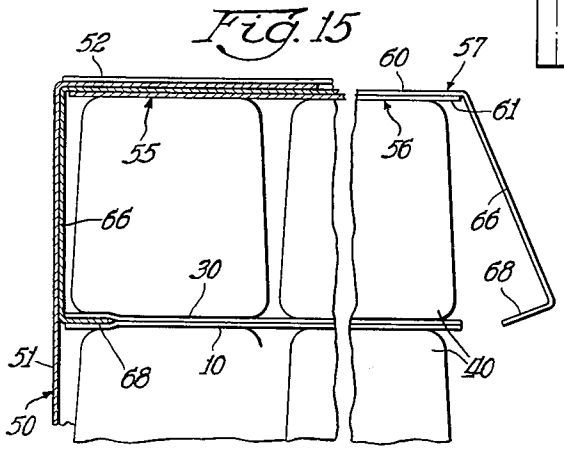
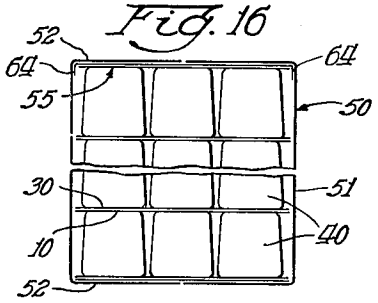


Fig. 16



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CONTAINER FOR PACKAGING YARN CONES

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4 Claims. (Cl. 206—65)

This invention relates generally to shipping containers, and more particularly to improved partition or tray construction therein for positioning and retaining cones of yarn, or like material.

It is the general object of the present invention to provide a shipping container having inner tray construction designed to retain and support cones of material in separate and fixed positions, whereby said material is held free from contact with the tray, walls of the container, and other cones of material.

An important object of this invention is to provide in a shipping container having inner tray construction as described, trays or partitions arranged alternately with cones of material whereby trays of cones are disposed in a stacked or layer positionment and wherein each tray is formed to permit disposition of the top terminal portions of a layer of cones within the base portions of an adjacent layer of cones.

Another object of this invention is to provide in a shipping container having alternately stacked trays and cones of material therein as described, a tray or partition designed to position and support adjacent layers of cones on either side of said tray.

A further object of this invention is to provide in a shipping container having inner tray construction designed to retain and support cones of material in separate and fixed positions, a tray formed to accommodate on the upper side thereof the base of a cone, and on the under side the top terminal portion of an underlying cone.

A still further object of this invention is to provide a tray of the character stated which is formed of two blanks cut and scored in a complementary manner to afford interlocking portions which are adapted to retain and support cones of material.

To achieve the foregoing objects it is contemplated that a shipping container be provided with multiple inner trays, each of which accommodates a plurality of cones of yarn, said trays being arranged in stacked or layer positionment whereby each immediate overlying tray is supported by the cones of yarn positioned on the underlying tray. Each tray is formed from a base sheet and a top sheet interlocked in a complementary manner to provide a plurality of upwardly extending projections, each projection being adapted for disposition of the base portion of an overlying cone thereupon and the insertion of the upper portion of an underlying cone therein. The interlocking arrangement of said base and top sheets is such as to permit shipment of the sheets in flat condition, and upon assembly afford positive engagement therebetween to provide a unitary tray member. The projections of each tray resulting from and comprising interlocking elements of the sheets are designed to present suitable surfaces for engaging and positioning cones of yarn on both sides of the tray. After the shipping container is properly packed with layers of cone bearing trays, inner cover means are provided which cooperate with the top tray to engage and position the top layer of cones, whereby to permit closure and securement of the container cover flaps for complete shipping container assembly.

Further objects, features and advantages of the invention will appear or be apparent to one skilled in the art from the following description, reference being made to the accompanying drawings, in which:

Fig. 1 is a plan view of the blank from which the base sheet of the tray is formed.

Fig. 2 is a plan view of the blank or top sheet of the tray and which is designed to overlie the base sheet.

Fig. 3 is a fragmentary plan view on an enlarged scale of a portion of the blank of Fig. 1 showing rectangular members in abutting position and the connecting strips therebetween buckled upwardly.

Fig. 4 is a fragmentary plan view on an enlarged scale of a portion of the blank of Fig. 2 showing the cut out portion which is adapted to receive and interlock with the buckled connecting strip.

Fig. 5 is a plan view of the projection formed through assembly of the complementary base and top sheet portions of Figs. 3 and 4, respectively.

Fig. 6 is an elevational view, with portions broken away of a plurality of cones of material in stacked relation with trays.

Fig. 7 is an enlarged vertical sectional view of a tray projection, with the underlying cone shown in dot dash line, taken on line 7—7 of Fig. 6.

Fig. 8 is a vertical sectional view taken on line 8—8 of Fig. 7.

Fig. 9 is a horizontal sectional view taken substantially on line 9—9 of Fig. 7.

Fig. 10 is a fragmentary plan view on an enlarged scale of a top sheet, showing a modified cut out portion adapted to receive and interlock with the buckled connection strip.

Fig. 11 is a plan view of the projection formed through assembly of the complementary base and top sheet portions of Figs. 3 and 10, respectively.

Fig. 12 is a vertical sectional view of the tray projection of Fig. 11, shown in operative position with overlying and underlying cone portions.

Fig. 13 is a plan view of the base sheet of an inner cover locking assembly.

Fig. 14 is a plan view of the top sheet of the inner cover locking assembly.

Fig. 15 is a sectional view of the top portion of an assembled shipping container showing the inner cover locking assembly.

Fig. 16 is a vertical sectional view of a shipping container having inner tray construction according to the teaching of this invention.

Referring now to the drawings, and particularly Fig. 1, the reference numeral 10 indicates a one-piece paperboard blank of rectangular shape from which the base sheet of the tray is formed. The blank is cut and scored to provide spaced apart rectangular members 11, 12, 14, and 15, connected by a plurality of strips 16, each strip being hingedly connected to adjacent rectangular members along scorelines 18 and having a centrally located transverse cut-score 19. Each connecting strip is formed to present similarly shaped portions on either side of the cut-score 19, comprising side edges 22 converging away from the scorelines 18 and side edges 23 converging away from the cut-score 19, said edges 22 and 23 having an arcuate edge portion 24 therebetween. The spaced apart rectangular members are displaced or pushed together to place the edges of adjacent members in a position of abutment, thereby buckling the connecting strips 16 upwardly to form inverted V-shaped projections 26, see Fig. 3. Also, as shown, upon displacement of the connecting strip upwardly and abutment of the adjacent rectangular members, arcuate edges 24a of said mem-

bers are exposed, said edges of adjacent rectangular members being aligned and cooperating to present composite arcuate edge 27.

Referring now to Fig. 2, the reference numeral 30 indicates a one-piece paperboard blank or top sheet, adapted to overlie the base sheet 10 in assembly, having a plurality of cut out portions 31 formed therein. Each cut out portion or pocket 31 has oppositely disposed arcuate edges 32 and, arranged at right angles thereto oppositely disposed angulate edges 34. For a purpose to be explained, each arcuate edge 32 is bisected by a slit 35.

As seen in Figs. 1 and 2, top sheet 30 has a plurality of pockets 31, which in number and relative disposition are designed to coincide with the number and disposition of projection 26, formed when the base sheet 10 is manipulated to displace connecting strips 16 upwardly. Placing the top sheet upon the erected base sheet will cause projections 26 to extend upwardly through pockets 31, superposing the arcuate edge 32 of the top sheet upon the arcuate edge 27 of the base sheet, see Fig. 5. It is noted that the width of the projection 26 at cut-score 19 is greater than the pocket opening 31 defined by opposing arcuate edges 32, and in this respect slits 35 permit distortion upwardly of the pocket peripheral portions 36 upon insertion of the projection into the pocket. In effect, portions 36 are cammed upwardly and outwardly by projection edges 23 and 24, whereupon when the projection 26 is fully seated, i.e., when top sheet 30 rests upon base sheet 10, said portions 36 are free to and do return to their original planar disposition, as illustrated. The pocket peripheral portions 36 extending under the inverted V-shaped projection act as locking tabs preventing the collapse or withdrawal of said projection from the pocket.

In the assembly of the shipping container for packaging cones of yarn 40, see Fig. 16, the tray construction for separating, supporting, and positioning layers or tiers of cones, is utilized in the following manner. With base sheet 10 in erected position and top sheet 30 disposed thereon and interlocked therewith, each projection 26 is suited to accommodate two yarn cones, one overlying the projection, and one underlying the projection. Such accommodation and disposition of tray and yarn cones is illustrated clearly in Figs. 6, 7, and 8.

As shown, a yarn cone base 41 is disposed over projection 26, with the terminal portions 19*a* of the projection apex at cut score 19 being in frictional engagement with the cone inner surface, thereby maintaining the cone in position against lateral movement. An underlying yarn cone apex 42 is disposed in cut-out portion or pocket 31 and is engaged by the arcuate edges 32 and 27 of the top sheet 30 and base sheet 10, respectively, the taper of the cone limiting insertion of the cone apex into and through the cut-out portion. It is preferred that the normal taper of the cone be interrupted at the cone apex to provide a cylindrical portion, as shown, whereby to afford a snug fit with the arcuate edges 32 and 27, although it is obvious that even if the normal taper of the cone continues to the cone apex the cut-out portion would accommodate said apex.

Fig. 9, which is a horizontal sectional view taken through the base of a yarn cone, shows the relative disposition of the cone base 41, which encircles projection 26, and cone apex 42, which is disposed within the projection.

Referring now to Fig. 10, there is shown a fragmentary plan view of a top sheet having a modified cut out portion or pocket 31'. The modified pocket 31' while having a similar shape and function as that described for pocket 31, is distinguished therefrom by the edges 32' which are arcuate in a manner and direction opposite to the arcuate edges 32 of pockets 31, i.e., edges 32' extend inwardly to reduce the pocket opening and do not define an arcuate surface for accommodation of the cone apex. Slits 35', which function as do slits 35 to permit insertion of a projection into the pocket, cooperate with scorelines 45 to define displaceable peripheral portions 36'. Upon insertion of the projection 26 into pocket 31', the portions 36' are cammed upwardly and outwardly by projection edges 23 and 24, and upon full insertions of the projection said portions return to their original planar disposition underlying the projection, see Fig. 11.

As seen in Fig. 12, disposition of the base 41 of a yarn cone upon a projection will result in terminal portions 19*a* of the projection apex at cut-score 19 frictionally engaging the cone inner surface. Insertion of a yarn cone apex 42 from under the projection into the pocket 31' will result in the cone apex displacing portions or tabs 36' upwardly about their scorelines 45. Such displacement of the portions 36' upwardly, wedges said portions against the projection undersurface, thereby presenting a firm abutment or stop arrangement for the cone apex. This modified construction is most useful when the cone apex is a continuation of the cone taper and is adaptable to cones of various sizes.

Having described the tray construction which provides for layer stacking of yarn cones, reference is now made to Fig. 16 wherein the layers of yarn cones are shown enclosed in a container 50. The container, as shown, is of well known construction, having a four sided tubular body 51, wherein each side panel has end flaps which cooperate to form end closures 52.

When packing the yarn cones in the container, whether from a side opening panel or the top, the alternate stacking of trays and yarn cones results in the final or top layer of cones being unsupported by an overlying tray construction. To provide support for the top layer of cones an inner cap construction 55 is utilized, comprising a pad 56 and a wrapper or locking sheet 57. Referring to Figs. 13 and 14, there is shown plan views of the blanks from which the pad and wrapper, respectively, are formed.

Pad 56 is simply a rectangular sheet of paperboard conforming in outside dimensions to that of the underlying tray constructions. A plurality of holes 59 are formed therethrough, spaced and disposed to coincide with cone disposition, whereby to rest upon the top layer of cones with the apex of each cone being disposed within a hole.

Wrapper 57 has a rectangular main panel 60 having a plurality of holes 61 formed therethrough, whereby, in assembly, panel 60 will rest upon pad 56, being coextensive therewith, and holes 61 will be aligned with holes 59. It is contemplated that whereas the cone apex will be disposed in both aligned holes, the combined thickness of material of the pad and wrapper will prevent said cone apex from extending up and beyond the wrapper top or outer surface. The main panel 60 has oppositely disposed side flaps 64 hingedly connected thereto, and oppositely disposed side flaps 66 hingedly connected thereto, the latter flaps each terminating at their free edge in a tab 68 articulate therewith. When main panel 60 is positioned upon pad 56, side flaps 64 and 66 are folded downwardly to lay adjacent the inner surface of the container side walls. As see in Fig. 15, flaps 68 extend downwardly to and adjacent a tray construction, tab 68 being tucked inwardly to disposition between the base sheet 10 and top sheet 30. It is intended that such inner cap construction will retain the top layer of cones as a unit, and will prevent individual movement of said top cones when initial packing compression has been dissipated, due to settling and crushing of the packed contents after long storage, either in inventory or in transit.

From the foregoing description it is apparent that trays constructed according to this invention will retain and support layers of yarn cones in separate and fixed position, each cone being suitably secured at its base and at its apex. Each tray is formed to accommodate the apex of an underlying cone and the base of an overlying cone, such accommodation being provided by an

inverted V-shaped projection extending upwardly to disposition within the base of an overlying cone and which receives the apex of an underlying cone therein, each tray being constructed of superposed sheets of paperboard interlocked by and at said projection. This interlocking of the superposed sheets at the projection while easily accomplished provides a positive locking action preventing separation of said sheets, said projection maintaining the adjacent cones from movement.

While the foregoing specification sets forth the invention in specific terms, it is understood that many variations and modifications may be resorted to without departing from the broad aspects of the invention as defined in the appended claims.

Having now described the invention, what is claimed is:

1. A yarn cone package comprising a plurality of superposed layers of spaced yarn cones, each of such cones being of hollow, frusto-conical form, a plurality of trays interposed between adjacent layers of cones, each tray comprising a base sheet and a top sheet of paperboard, the base sheet being cut and scored to provide a plurality of upwardly extended, inverted, V-shaped projections, the lower ends of the legs of which are hingedly connected to the base sheet along parallel fold lines, such projections being cut from within the contour of the base sheet, whereby apertures are formed when the projections are folded upwardly, marginal edge portions of concave, arcuate shape formed in the base sheet at such apertures and disposed in circular relation symmetrically below the apex of each of the V-shaped projections, the top sheet being disposed in flatwise relation upon the base sheet, said top sheet being cut to provide a plurality of pocket-forming apertures in registration with the projections and through which the projections are disposed, the marginal portions of the top sheet around the apertures therein including portions extending below the legs of the inverted V-shaped projections and in interlocking contact with the lower end portions of such legs near their hinged connection with the base sheet, the lower ends of cones above the tray being arranged telescopically over the projections, and the upper ends of cones below the tray being received into the circular apertures formed by said arcuate, marginal edge portions in the base sheet disposed below the projections.

2. A yarn cone packaged as defined in claim 1, in which the inverted V-shaped projections are of such widths along their apexes as to engage frictionally inside the yarn cones when such cones are arranged telescopically over the projections with their lower ends resting on the top sheet of the tray.

3. A tray construction for packaging superposed, aligned yarn cones, comprising: a base sheet and a top sheet formed of paperboard; said base sheet being cut and scored to provide a plurality of upwardly extending, inverted, V-shaped projections having legs with lower ends hingedly connected to the base sheet along

parallel fold lines, such projections being cut from within the contour of the base sheet, so that apertures are formed when the projections are folded upwardly; marginal edge portions of concave, arcuate shape formed in the base sheet at said apertures and disposed in circular relation symmetrically below the apex of each of the V-shaped projections; said top sheet being disposed in parallel abutting relation upon the base sheet and being cut to provide a plurality of pocket-forming apertures through which said projections are disposed; and marginal portions formed in the top sheet at said last mentioned apertures including portions extending inwardly beneath the legs of the inverted V-shape projections and in interlocking contact with lower portions of said legs near their hinged connections with the base sheet operable to engage said leg portions and thereby maintain the base and top sheets in abutting relation.

4. A tray construction for cooperation with superposed, aligned yarn cones packed within a shipping container, such yarn cones being of hollow, frusto-conical form, the tray comprising a base sheet and a top sheet of paperboard, the base sheet being cut and scored to provide a plurality of spaced, upwardly extending, dihedral angle portions constituting inverted V-shaped projections formed in substantially identical half-sections, the ends of the lower portions of the legs of the projections being hingedly connected to the base sheet along parallel fold lines and the upper ends of the legs being foldably joined at the apex, the lateral edges of the lower portions of the legs being cut symmetrically at an inclination toward each other at a small angle relatively to a line normal to the fold line connection with the base sheet, thus providing downwardly and outwardly flaring lower end portions, the top sheet being in overlying relation to the base sheet and being formed with a plurality of spaced, pocket-forming apertures in registration with the spaced, V-shaped projections and through which the projections are disposed, each aperture being defined by a central, circular portion, for receiving from below the reduced upper end portion of a yarn cone, and by opposed, communicating, open portions which are symmetrical and which have contours similar to, but smaller than, the lower portions of the legs of the V-shaped projections, the narrower part of each leg portion being sufficiently small to be receeived into the wider parts of said individual opposed open portions of the top sheet, whereby forcing the lower parts of said leg portions upwardly through said open portions results in a binding engagement of the legs within such individual opposed openings, tending to hold the base and top sheets in close, flatwise relation.

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