Feb. 21, 1956 R. E. PAIGE 2,735,606

SHIPPING VESSELS FOR TELEVISION TUBES

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Fig. 1.

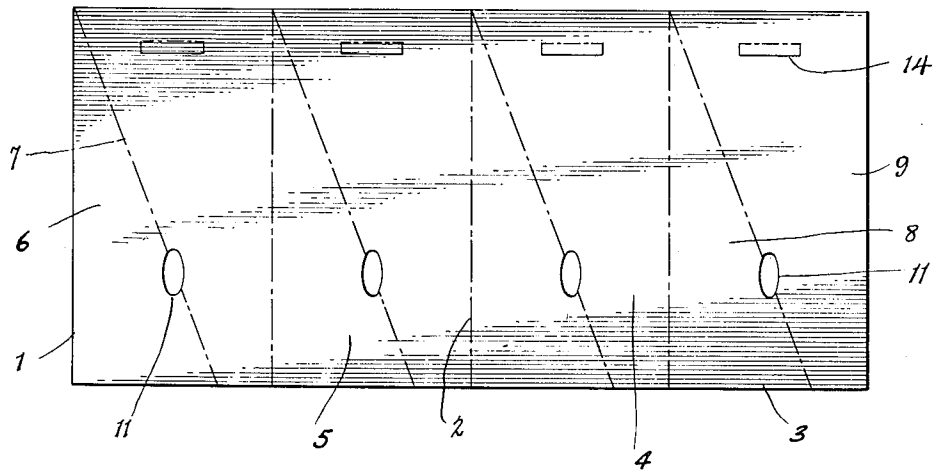


Fig. 2.

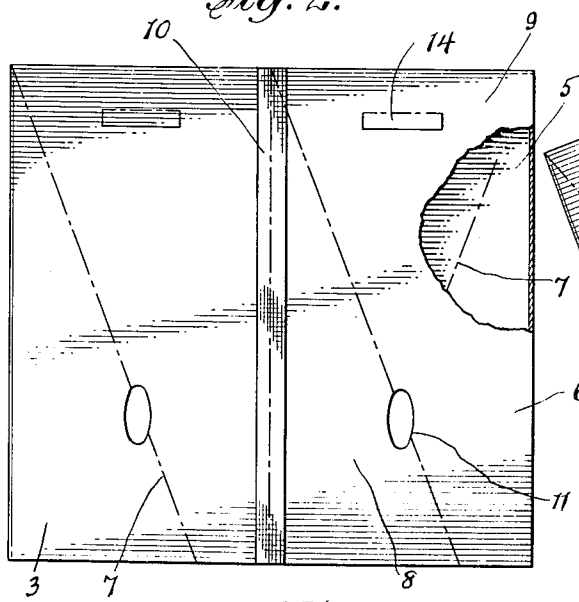


Fig. 3.

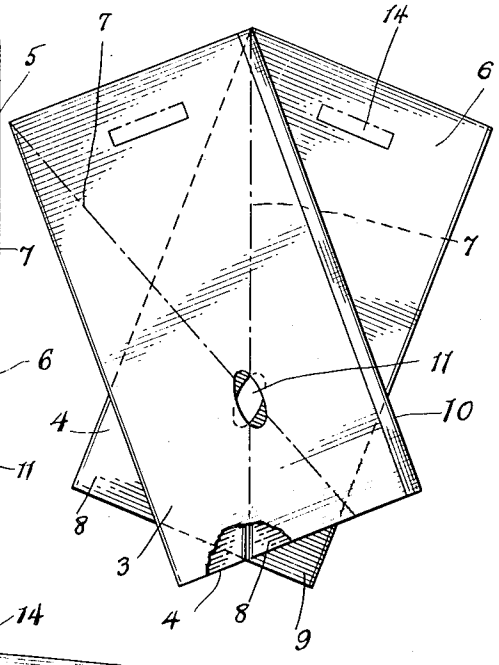
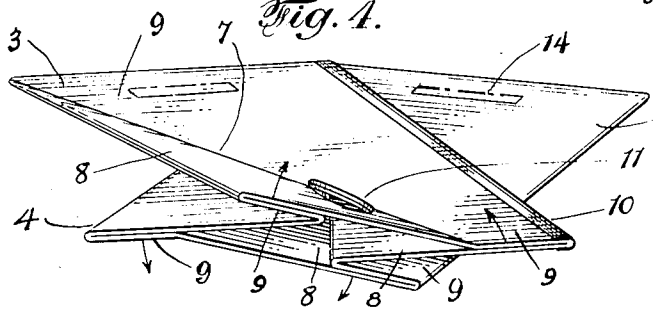


Fig. 4.



INVENTOR.
Richard E. Paige.

BY William F. Nickel

ATTORNEY.

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Fig. 5.

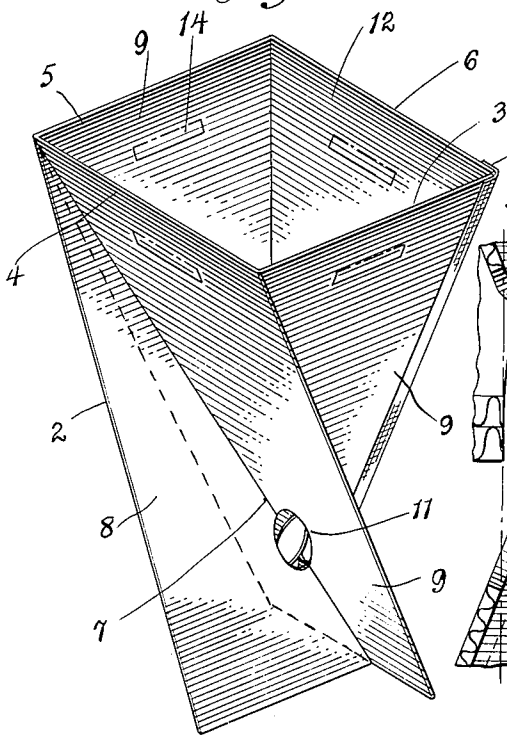


Fig. 10.

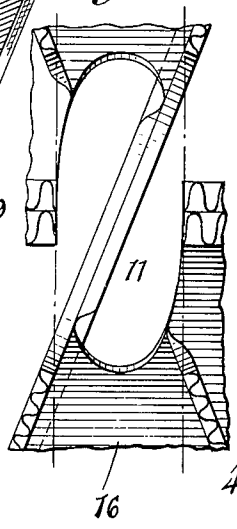


Fig. 6.

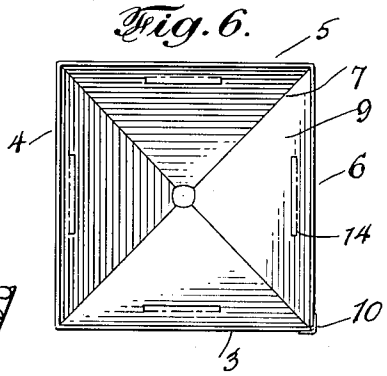


Fig. 7.

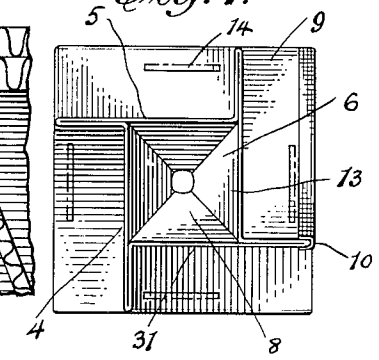


Fig. 8.

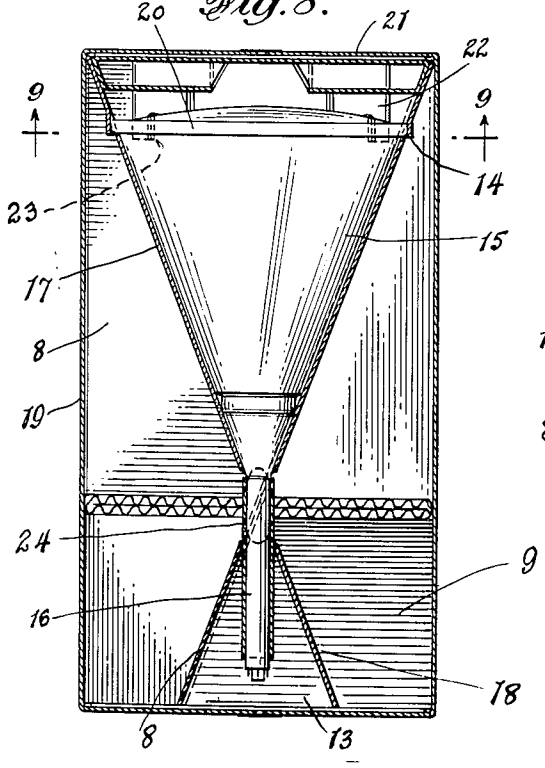
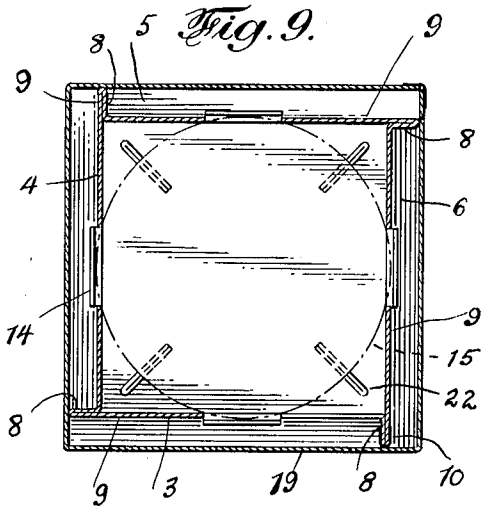


Fig. 9.



INVENTOR.
Richard E. Paige.

BY
William F. Nickel
ATTORNEY.

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SHIPPING VESSELS FOR TELEVISION TUBES

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Fig. 11.

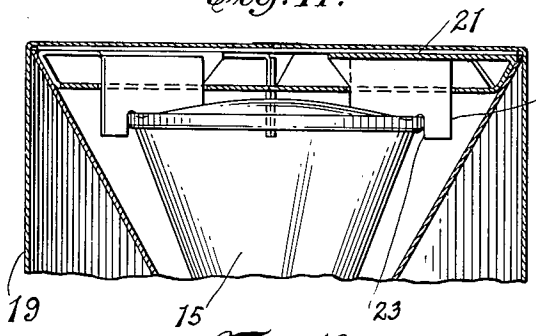


Fig. 12.

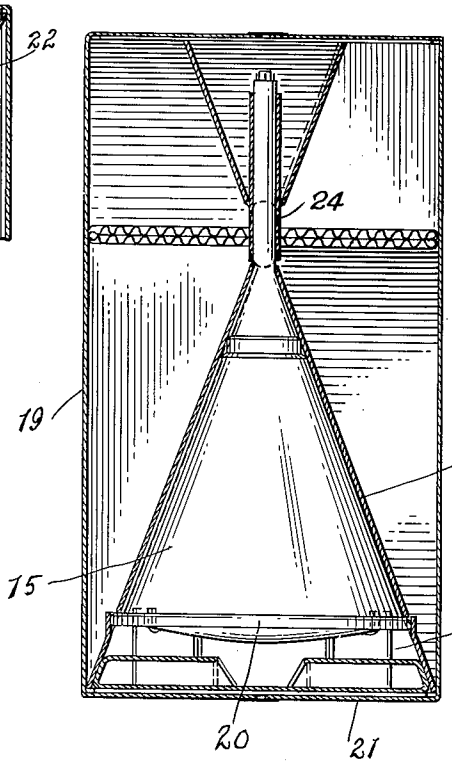


Fig. 13.

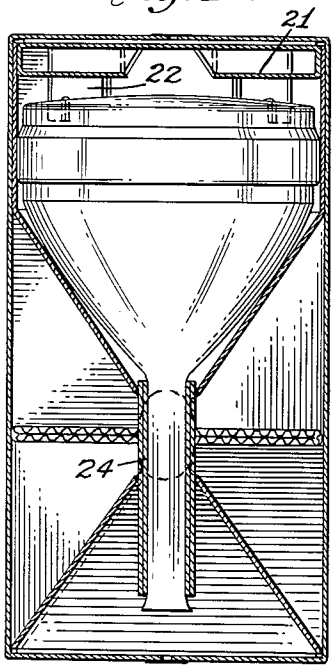
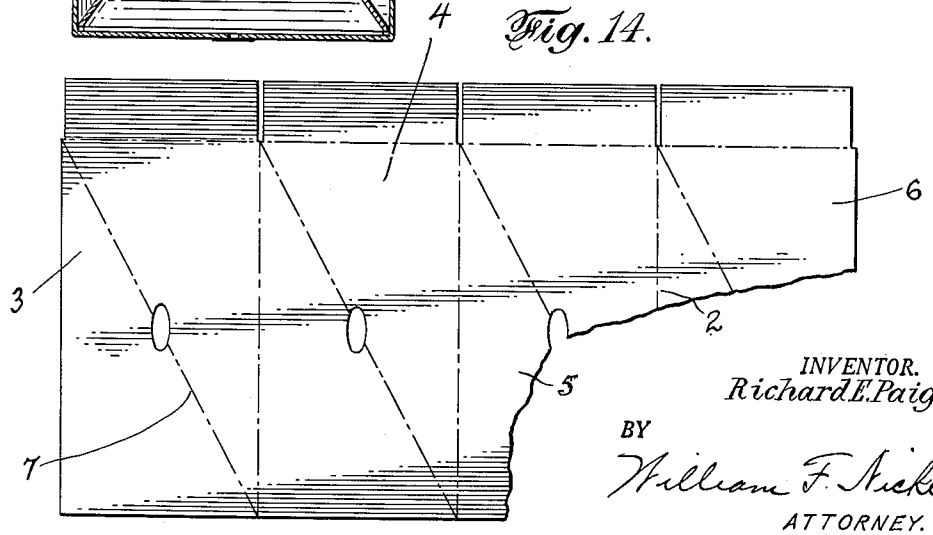


Fig. 14.



INVENTOR.
Richard E. Paige.

BY
William F. Nickel
ATTORNEY.

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SHIPPING VESSELS FOR TELEVISION TUBES

Richard E. Paige, New York, N. Y.

Application November 4, 1950, Serial No. 194,047

3 Claims. (Cl. 229—14)

This invention is an improvement in supports, and particularly supports for holding articles safely and securely in a shipping or storing vessel, to prevent breakage and other damage when such a vessel is moved or handled.

An important object of this invention is to provide a support which can easily be fashioned out of sheet material that can be folded and made to conform to an article which has considerable breadth or thickness at one end and very little at the other; such as the large cathode tubes used in television. Such tubes are generally funnel-shaped, with one end wide and flaring and having a stem or shank connected thereto; they are also weighty and bulky and their entire structure must be well protected against shock when they have to be boxed or crated.

Another object is to provide a support which, when the parts are in proper position, will have a form which expands at each end, but is contracted between the ends, so as to engage the article at separate points and thus hold it firmly against movement in a closed package.

In the main the support comprises a sheet of suitable flexible material with its opposite ends united to each other, and scored or creased so that it can be bent and set up to receive the article, such as the television tube, by insertion thereof into one end. In its preferred embodiment the support has the form of two pyramids joined apex to apex, and constituting a single integral unit; one of the pyramids being larger of the right size to enclose the large conical end or body of the tube, and the other to serve as a base upon which the support may temporarily stand. The junction of the two members has a perforation to center the stem or shank of the tube.

The nature of the invention is fully set forth herein and the novel features are defined in the appended claims. The drawings illustrate the construction of the support; and I of course reserve the right to make changes in details without deviation from the general design of the stand.

On the drawings:

Figure 1 is a plan view of a blank of sheet material such as cardboard, cut and scored to produce the stand when the sheet is properly folded and set up.

Figure 2 is a view of the blank collapsed and with its ends connected.

Figure 3 shows the blank in the first stage of manipulation to be set up.

Figure 4 illustrates the relative movement of the various parts of the blank in this operation.

Figure 5 shows the support in its completed form.

Figures 6 and 7 are respectively top and bottom views of the finished support.

Figure 8 is a longitudinal sectional view thereof.

Figure 9 is a transverse sectional view on the line 9—9 of Figure 8; seen in the direction of the arrows.

Figure 10 shows a detail taken in longitudinal section through the stand at the junction of the two members.

Figure 11 is a sectional view showing the top of what

is presented in Figure 8, on an enlarged scale; showing a different tube therein.

Figure 12 is a view similar to Figure 8 showing the support inverted, and supported in a receptacle.

Figure 13 is a sectional view similar to Figure 8 showing a modification of the support; and

Figure 14 is a plan view of a blank out of which the support of Figure 13 is made.

The blank of sheet material for the stand is indicated by the numeral 1; it has an oblong or rectangular configuration and it is divided by transverse parallel score lines 2 into several substantially equal rectangles, 3, 4, 5 and 6. These rectangular sections which are four in number, for example, have their adjacent shorter sides in alinement along the opposite long sides of the blank; and their longer sides are equal to the width of the blank. Each section is further divided by a diagonal score line 7 into a triangular part 8 and a trapezoidal part 9. The triangular parts 8 are all of the same size and shape, the lines 7 being parallel to one another; and each part 8 has its apex in a corner of the section at one and the same side of the blank 1, and its base at the opposite side, where the lines 7 terminate between the adjacent corners of each section. The parts 9 have their longer parallel sides at the apex of the adjacent triangle, and their shorter of the parallel sides at the opposite side of the blank in line with the base of the triangle in the same section. One of the sections 3 at one end of the blank is united to the section 6 at the other end by a strip 10, held by adhesive or other fastening means. Thus, when the blank is flattened, it is folded along the lines 2, 3 and 4, and ready to set up, the sections 3 and 6 should overlie and coincide with the sections 4 and 5 respectively. The junction 10 is then in mid-position. Each section has an elliptical aperture 11, which the score line 7 thereof intersects. The holes 11 are all at the same distance from the edge of the blank containing the bases of the triangular parts 8.

Hence, if the blank as it appears on Figure 1 is folded downward along the lines 2, 3 and 4, and the two folded halves are then turned over sidewise from right to left with the section 3 leading, the parts will have the relative positions shown in Figure 2.

The blank is given its form by taking it with the parts all in the positions shown in Figure 2 and moving them into the positions shown on Figure 3. To this end, the blank is manipulated to fold the section 6 about its line 7 and carry the triangular part 8 thereof over upon the other part 9; and at the same time the section 4 beneath the section 6 is similarly folded to bring its parts 8 and 9 together with the latter uppermost. The section 5 under the section 3 is still kept flat. Next the two parts 8 and 9 of the section 3 are lifted along the lines 2, as indicated by the arrows on Figure 4 to bend this section up along the line 7; and the sections 4 and 5 are also bent along the lines 7, or down, in the opposite direction. The blank thus assumes the formation illustrated on Figure 5. Each part 8 of one section is now in contact with the part 9 of an adjacent section and makes a flat inclined rib that extends downward from an upper corner of the support; the lines 7 converge from their upper ends, intersect with one another at the apertures 11, and diverge from there to the opposite end. The score line 7 of each section marks off on the part 9 of an adjacent section has a triangular area 12 with its apex turned downward and located at the apertures 11. These triangular interior surfaces constitute the sides of an inverted pyramid. Also the lines 7 below the apertures 11 mark off on the lower portions of the triangular parts 8 of each section containing the line 7 a triangular area 13 that is upright and also has its apex at the aperture 11, defining another pyramid joined to the apex of the first. The upper and lower

ends of the support thus have the configuration presented respectively in Figures 6 and 7. The edges of the lower end thus enclose a figure, the edges of which are parts of the bases of the triangular parts **8** of each section of the blank; the remainder of the lengths of the base edges of the parts **8** extending outward beyond the periphery of the figure and being folded against the adjacent shorter one of parallel edges of the parts **9** of an adjacent section of the blank. The manner in which the triangular part of one section is folded against the part **9** of an adjacent section is fully shown in Figure 7. The other end of the support is depicted in Figure 6, where the edges enclose a similar figure. Near the upper edges the sections have flaps **14** cut free at their sides and outer ends.

Between the connected pyramidal members of the support the apertures **11** more or less coincide, giving a perforation that puts the interior of said members into communication. The embodiment herein disclosed has square ends, and one member envelops the conical portion or body **15** of the television tube; while the stem or shank **16** of the tube projects through the perforation into the other member. The upper end of the support is square, and the lower end would require a square of the same area to enclose it, if placed in the same relative position, with its sides parallel to the sides of the upper end, and with the outer edges of the ribs touching its sides; and the planes of the ribs perpendicular to the sides of a square enclosing said end. The upper member is indicated at **17** and the lower at **18**.

In other words, four planes each containing the outer edge of one rib and one of the edges of the upper pyramidal member (indicated at **17** in Figure 8) would be mutually perpendicular to each other and enclose a space square in outline and of constant cross-sectional area; and of the same size as the upper end of the support as it is presented in Figure 5. Such a square would also be of the same size as the lower end of the support seen in Figure 7, and its sides would be perpendicular to the base edges of the parts **8**. The lower member has the numeral **18** attached in Figure 8, and when one looks through the support lengthwise, the elliptical apertures **11** are foreshortened, and become circular in appearance; see Figure 7. Hence the shank **16** is tight in the perforation and cannot shift or swing laterally. Each rib thus extends along a pair of alined edges of the members **17** and **18**, and all points on the outer edge of each rib are at the same distance from a plane perpendicular to the rib and containing the longitudinal central axis of the support. The ribs along the edges of the two members **17** and **18** grow wider from the top down.

The support, with the tube therein will therefore fit snugly and nicely within a shipping or storage vessel that is square in cross section, as illustrated in Figures 8 and 9. The ribs made by the connected edges of the parts **8** and **9** in contact will abut the inner faces of sides of the vessel throughout its length. The support and tube cannot rock or move sidewise in the vessel, and the member **18** of the support will rest squarely on the bottom of the vessel. The closed top of the vessel **19** will rest within the upper edges of the support, and the openings made by the flaps **14** will receive the rim **20** of the tube. If the support is longer than the tube and projects above the top of the body **15** of the tube, a filler **21** made of folded cardboard is put into one end of the support against the face of the body to prevent the tube from moving lengthwise. This filler has bevelled edges to fit against the inner faces **12**, and it also has projections **22** with shoulders **23** to fit the rim of the tube and press upon it. The projections **22** will be in the corners of the support. The tube or other article will thus be immovable in the receptacle, whether the tube is upright or inverted, or even if the tube is smaller in diameter than the upper part of the support, as shown in Figure 11.

In Figures 8, 13 and 14, the apertures **11** receive one or more reinforcing sleeves **24**, to make a tight fit for the shank **16**.

The support can of course be produced in other ways to include two members having the form of pyramids joined at the apex and having their interiors in communication with ribs along the exterior, as described. It does not necessarily have to be made of flexible material and the number of sections may be altered.

The support can of course be made of either plain or corrugated material. The construction is particularly suited to be made out of corrugated cardboard of course, but as will be understood any kind of foldable sheet material can be utilized.

The support is thus well adapted to serve as an interior packing for shipping cases made to contain objects having the shape described above. The two members above and below the openings **11** are pyramidal or funnel-shaped, and the sections may be of equal size or different size depending on the article to be disposed therein. Further, while I have shown the upper and lower sections or members as having the shape of a four-sided pyramid, these pyramidal members may of course have a smaller number of sides such as three or a number larger than four; the general construction being the same regardless of the number of sides or faces present.

Having described my invention, what I believe to be new is:

1. A support comprising a blank of stiff flexible material having a rectangular outline, with transverse score lines extending entirely across the blank from one long edge to the other and being parallel to the short edges of the blank and to one another, and in positions dividing the blank into four substantially equal rectangular sections, each section having a diagonal score line extending from one corner thereof at one and the same long edge of the blank towards the opposite long edge and contacting said last-named edge at a point spaced from the diagonal corner of the respective section, said diagonal lines being parallel and dividing each section into two portions, each section having an aperture intersected by the diagonal score line thereon, the apertures all being at equal distances from one and the same end of each diagonal line, the opposite short edges of said blank being united and said blank being folded so that two sections overlie the other two sections, one overlying section then being bent along its diagonal line and the other overlying section superposed diagonally on said one overlying section, the section under the other overlying section also being folded on its diagonal score line, all said apertures then registering, the blank with the sections in such positions being capable when said sections are bent along their diagonal score lines, of assuming a shape with two enclosed pyramidal spaces having a common apex therein, said apertures all being located and registering at said apex, and each of said portions being laid against another portion to form exterior diagonal ribs, one of said portions in each section having the outline of a trapezoid, and said aperture in each section being closer to the said opposite long edge.

2. A support comprising a blank of stiff flexible material having a rectangular outline, with transverse score lines extending entirely across the blank from one long edge to the other and being parallel to the short edges of the blank and to one another, and in positions dividing the blank into four substantially equal rectangular sections, each section having a diagonal score line extending from one corner thereof at one and the same long edge of the blank towards the opposite long edge and contacting said last-named edge at a point spaced from the diagonal corner of the respective section, said diagonal lines being parallel and dividing each section into two portions, each section having an aperture intersected by the diagonal score line thereon, the apertures all being at equal distances from one and the same end of each diagonal line, the opposite short edges of said blank being

united and said blank being folded so that two sections overlie the other two sections, one overlying section then being bent along its diagonal line and the other overlying section superposed diagonally on said one overlying section, the section under the other overlying section also being folded on its diagonal score line, all said apertures then registering, the blank with the sections in such positions being capable when said sections are bent along their diagonal score lines, of assuming a shape with two enclosed pyramidal spaces having a common apex therein, said apertures all being located and registering at said apex, and each of said portions being laid against another portion to form exterior diagonal ribs, one of said portions in each section being triangular and the other portion in each section having the outline of a trapezoid, each of said apertures being closer to said opposite long edge.

3. A support comprising a one-piece blank of stiff flexible material having a rectangular outline, with transverse score lines extending entirely across the blank from one long edge to the other and being parallel to the short edges of the blank and to one another, and in positions dividing the blank into four substantially equal rectangular sections, each section having a diagonal score line extending from one corner thereof at one and the same long edge of the blank towards the opposite long edge, and contacting said last-named edge at a point spaced from the diagonal corner of the respective section, said diagonal lines being parallel and dividing each section into two

portions, each section having an aperture intersected by the diagonal score line thereon, the apertures all being at equal distances from one and the same end of each diagonal line, the opposite short edges of said blank being united and said blank being folded so that two sections overlie the other two sections, one overlying section then being bent along its diagonal line and the other overlying section superposed diagonally on said one overlying section, the section under the other overlying section also being folded on its diagonal score line, all said apertures then registering, the blank with the sections in such positions being capable when said sections are bent along their diagonal score lines, of assuming a shape with two enclosed pyramidal spaces having a common apex therein, said apertures all being located and registering at said apex, and each of said portions being laid against another portion to form exterior diagonal ribs.

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