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PACKAGING

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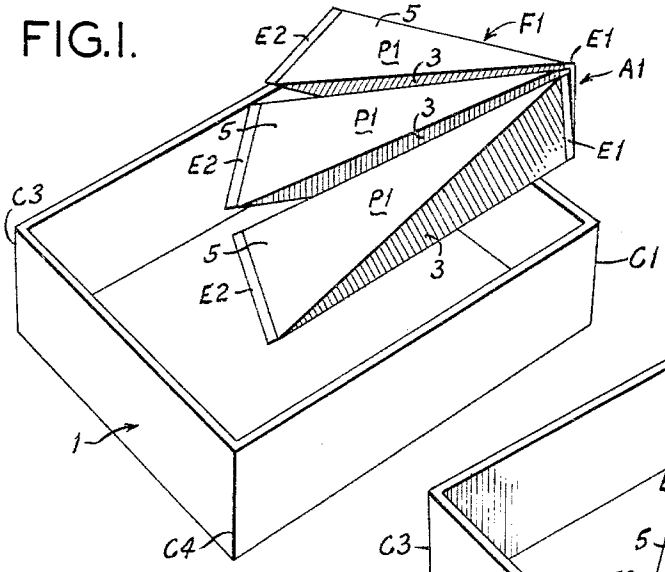
FIG. 1.



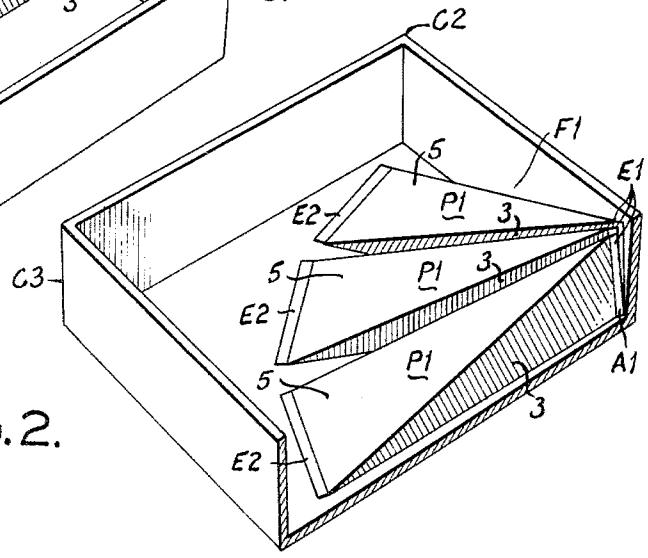


FIG. 2.

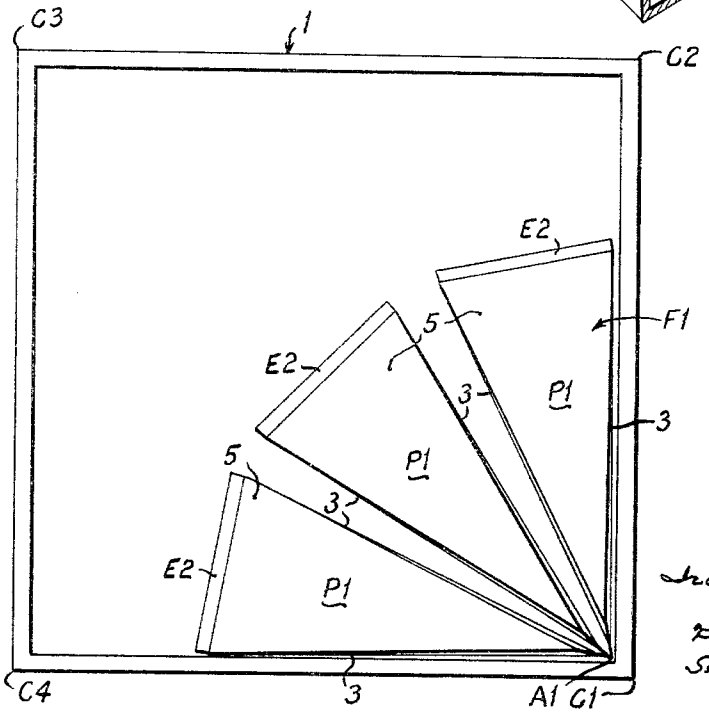


FIG. 3.

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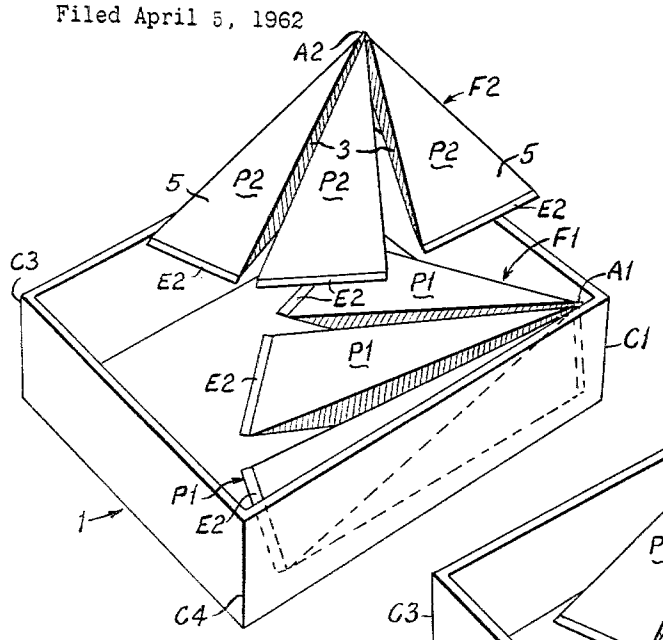

FIG.4.

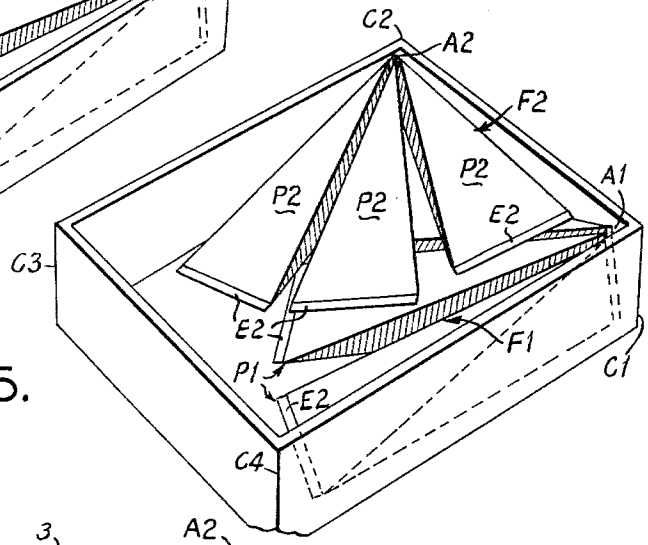

FIG.5.

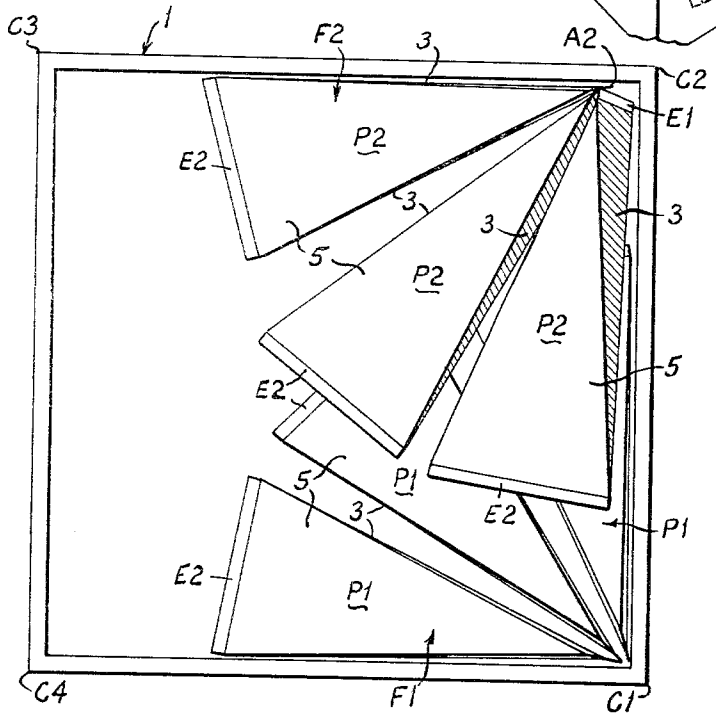

FIG.6.

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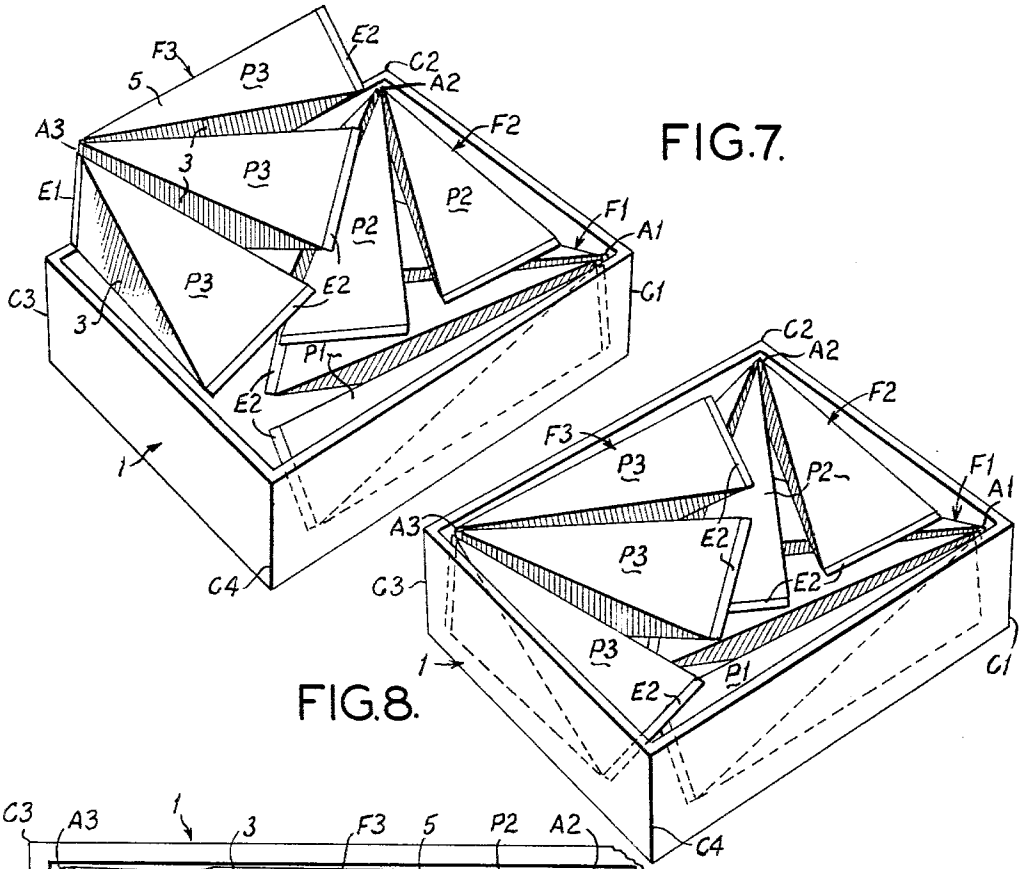

FIG.7.

FIG.8.

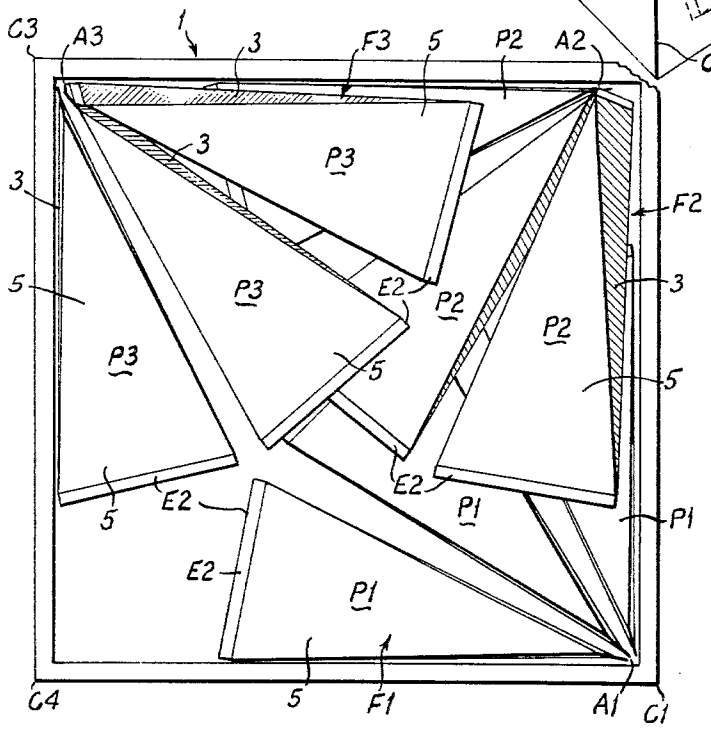

FIG.9.

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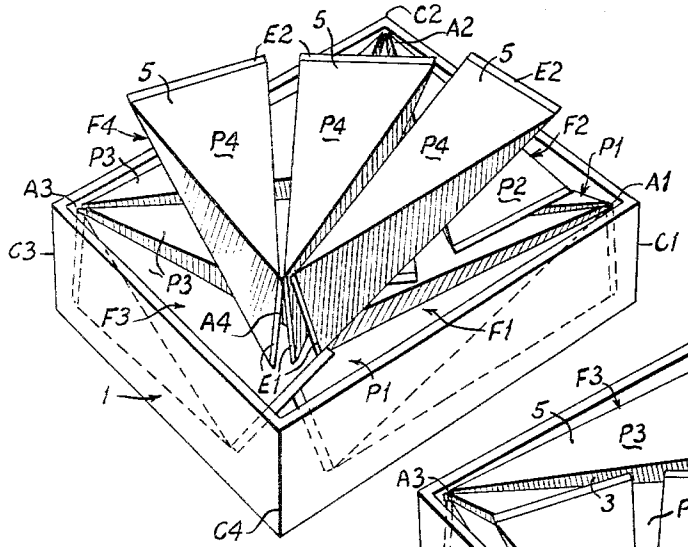

FIG.10.

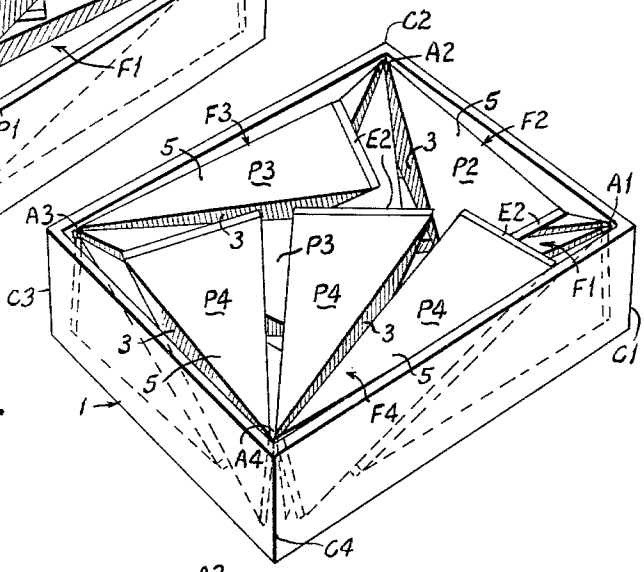

FIG.11.

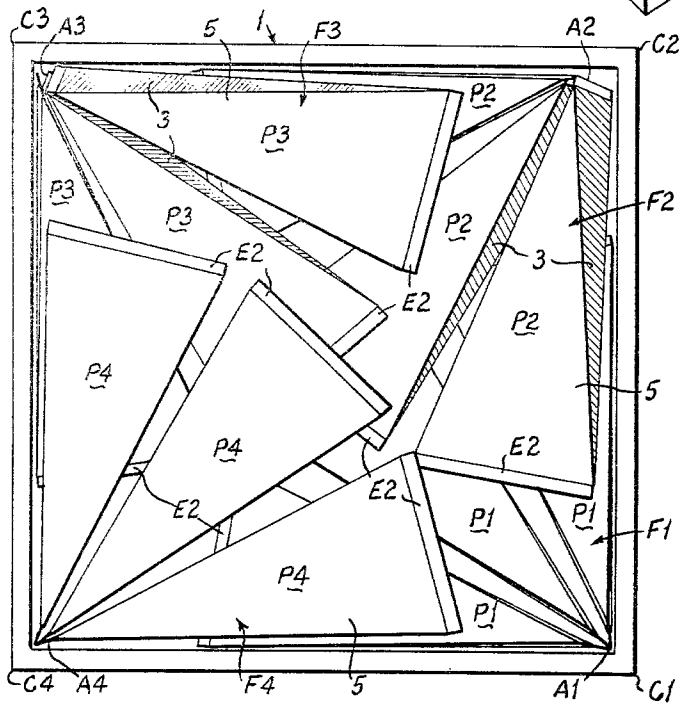

FIG.12.

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PACKAGING

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Filed Apr. 5, 1962, Ser. No. 185,326
4 Claims. (Cl. 206—65)

This invention relates to packaging, and more particularly to the containerization of tetrahedron-shaped packages.

The tetrahedron-shaped package is a modern type of package, made by a form-fill-seal technique, essentially comprising a length of tubing having a transverse seal at one end in a first plane and a transverse seal at its other end in a second plane at such an angle to the plane of the first transverse seal (usually at an angle of approximately 90° to the plane of the first transverse seal) that the package has four triangular sides, two of which have the first transverse seal as their base and the other two of which have the second transverse seal as their base. While it may superficially appear that such packages would readily fit together for nested packing of a plurality of packages in a container, efforts to nest-pack them in a container (such as a rectangular carton) will readily demonstrate that the matter of packing them in a container with efficient utilization of the volume of the container (i.e., minimizing of voids in the container) is not a simple matter. This is particularly so in the case of packages of equilateral tetrahedron shape (i.e., packages as to which all four triangular sides are identical). Accordingly, among the several objects of this invention may be noted the provision of a method of containerizing tetrahedron-shaped packages, and particularly packages of equilateral tetrahedron shape, with efficient utilization of the volume of the container in which the packages are contained; the provision of such a method for containerizing such packages in rectangular cartons or trays; and the provision of a container packed with tetrahedron-shaped packages in such manner as efficiently to utilize the volume of the container. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions and methods hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

FIGS. 1 and 2 are perspectives showing certain initial steps in the method of this invention for containerizing tetrahedron-shaped packages in a rectangular tray, one wall of the tray being broken away in FIG. 2;

FIG. 3 is a plan of FIG. 2, showing all four walls of the tray;

FIGS. 4 and 5 are perspectives showing further steps in the method;

FIG. 6 is a plan of FIG. 5;

FIGS. 7 and 8 are perspectives showing further steps in the method;

FIG. 9 is a plan of FIG. 8;

FIGS. 10 and 11 are perspectives showing further steps in the method, FIG. 11 showing a completed assembly; and

FIG. 12 is a plan of FIG. 11.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, there is indicated at **1** a rectangular container, open at the top, in which a plurality of tetrahedron-shaped packages are to be containerized. This container, as shown, has the form of a shallow rectangular tray. Since the container or tray **1** is rectangular, it has four vertical corners, which are designated C1, C2, C3 and C4. Corner C1 is diagonally opposite corner C3; corner C2 is diagonally opposite corner C4.

Referring now more particularly to FIGS. 1–3, there is indicated at F1 what may be referred to as a fan of three somewhat elongated tetrahedron-shaped packages. Each package in the fan F1 is designated P1. Each package comprises a length of tubing having a transverse seal E1 at one end in a first plane and a transverse seal E2 at the other end in a second plane at an angle of 90° to the plane of seal E1, so that the package has four triangular sides. Two of these triangular sides, each of which is designated **3**, have seal E1 as their base; the other two triangular sides (only one of which appears in FIGS. 1–3, and which is designated **5**) have seal E2 as their base. As shown, seals E1 and E2 are made at right angles to the longitudinal axis of the tubing, hence each package is of equilateral tetrahedron shape, i.e., all four triangular sides of the package are identical.

As will be apparent from FIGS. 1–3, the fan F1 is formed by bringing the three packages P1 into side-by-side fan-shaped relation with one end of each package in the fan (for example, the end sealed by seal E1) at the apex A1 of the fan, and the other ends of the packages (for example, the ends sealed by seals E2) constituting the outer edge of the fan. To simplify the drawings, the triangular sides of the packages are illustrated as flat throughout their area, but it will be understood that ordinarily each side will be of somewhat rounded contour particularly adjacent its apex.

Having formed the fan F1, it is positioned in the tray **1** with its apex at the corner C1 of the tray (see FIGS. 2 and 3). The outer sides of the fan F1, constituted by the outer triangular sides **3** of the two outer packages of the three packages in the fan, lie in vertical planes generally at right angles to one another contiguous to the sides of the tray which meet at corner C1. With seals E1 made at right angles to the longitudinal axis of the tubing as shown herein, apex A of the fan is inclined slightly off vertical at corner C1. The sides of the tray are somewhat longer than the length of the long edge of a triangular package side.

Now referring to FIGS. 4–6, there is shown a second fan of three tetrahedron-shaped packages, identical to fan F1, and designated F2 to distinguish it from fan F1. The packages in fan F2 are identical to packages P1, and are designated P2 to distinguish them from packages P1. The apex of fan F2 is designated A2. Having formed the fan F2, as shown in FIG. 4, it is positioned in the tray **1** overlying fan F1 and with its apex A2 at corner C2 of the tray, as shown in FIGS. 5 and 6.

Now referring to FIGS. 7–9, there is shown a third fan of three tetrahedron-shaped packages, identical to fans F1 and F2, and designated F3 to distinguish it therefrom. The packages in fan F3 are identical to packages P1 and P2 and are designated P3 to distinguish them from packages P1 and P2. The apex of fan F3 is designated A3. Having formed the fan F3 as shown in FIG. 7, it is positioned in the tray **1** overlying fan F2 and with its apex A3 at corner C3 of the tray, as shown in FIGS. 8 and 9.

Finally, referring to FIGS. 10–12, there is shown a fourth fan of three tetrahedron-shaped packages identical to fans F1, F2 and F3, and designated F4 to distinguish it therefrom. The packages in fan F4 are identical to packages P1, P2 and P3 and are designated P4 to distinguish them from packages P1, P2 and P3. The apex of fan F4 is designated A4. Having formed the fan F4 as shown in FIG. 10, it is positioned in the tray **1** overlying fan F3 and with its apex A4 at corner C4 of the tray, as shown in FIGS. 11 and 12.

Referring to FIGS. 11 and 12, it will be seen that the

completed pack comprises the rectangular tray 1 with the four sets F1, F2, F3 and F4 of tetrahedron-shaped packages P1, P2, P3 and P4 packed therein. Each set F1, F2, F3, F4 is shaped like a fan, consisting of three packages with one end (seal E1) of each package in the fan at the apex (A1, A2, A3 or A4) of the fan and with the other ends (seals E2) of the packages in the fan constituting the outer edge of the fan. Successive sets are positioned in the tray with their apices at successive corners of the tray (corners C1, C2, C3, C4) and overlying one another. This provides an orderly arrangement with efficient utilization of the volume of the tray.

While the tray 1 as herein shown is a relatively shallow tray packed with four fans, it will be understood that a deeper container may be used packed with a greater number of fans, by continuing the deposition of fans in the container with the apices of successive fans at successive corners of the container. Thus, eight fans may be packed in a deeper rectangular container by positioning four fans as herein shown, positioning the fifth fan overlying the fourth fan and with its apex at corner C1, positioning the sixth fan overlying the fifth fan and with its apex at corner C2, etc.

It will also be understood that the number of packages in an individual fan may vary, depending on the particular shape of the packages, the fan of three packages being particularly appropriate for elongate equilateral tetrahedrons such as herein disclosed.

The container or tray 1 may be made of any suitable material, such as the usual boxboard. If desired, the walls thereof may be provided with holes as where the packages contain a liquid which is to be frozen after the packages have been packed in the container.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions and methods without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. The method of containerizing tetrahedron-shaped packages in a rectangular container having four vertical corners as to which a first and third corner are diagonally opposite one another and a second and fourth corner are diagonally opposite one another, said method comprising forming a first fan consisting of a plurality of packages in side-by-side fan-shaped relation with one end of each package in the fan at the apex of the fan and the other ends of the packages in the fan constituting the outer edge of the fan, positioning said first fan after the forming thereof in the container with its apex at the first corner of the container, forming a second fan identical to the first fan, positioning the second fan after the forming thereof in the container with its apex at the second corner of the container and with said second fan overlying said first fan, forming a third fan identical to the preceding fans, positioning the third fan after the forming thereof in the container with its apex at the third corner of the container and with said third fan overlying said second fan, forming a fourth fan identical to the preceding fans, and positioning the fourth fan after the forming thereof in the container with its apex at the fourth corner of the container and with said fourth fan overlying said third fan.

2. The method of claim 1 wherein each fan consists of three packages.

3. A container packed with tetrahedron-shaped packages, said container being rectangular and having four vertical corners as to which a first and third corner are diagonally opposite one another and a second and fourth corner are diagonally opposite one another, said packages being arranged in sets each shaped like a fan, each set consisting of a plurality of packages with one end of each package in the set at the apex of the fan and the other ends of the packages in the set constituting the outer edge of the fan, a first set being positioned in the container with its apex at the first corner of the container, a second set being positioned in the container overlying the first set with its apex at the second corner of the container, a third set being positioned in the container overlying the second set with its apex at the third corner, and a fourth set being positioned in the container overlying the third set with its apex at the fourth corner of the container.

4. A container packed with tetrahedron-shaped packages as set forth in claim 3 wherein each set of packages consists of three packages.

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