April 9, 1935. C. P. WELLMAN 1,996,778

RECEPTACLE

Filed Oct. 18, 1929 2 Sheets-Sheet 1

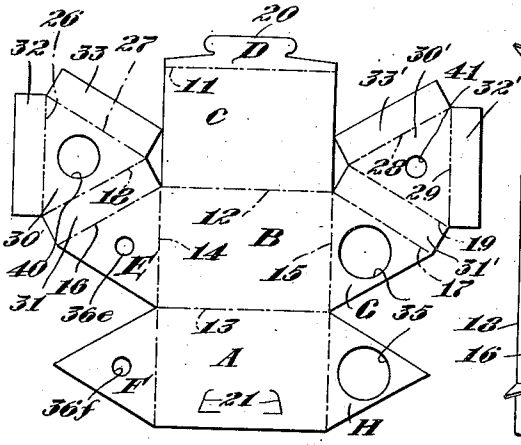


Fig. 1

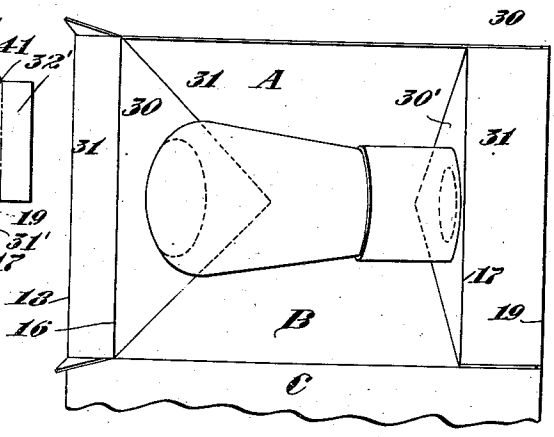


Fig. 2

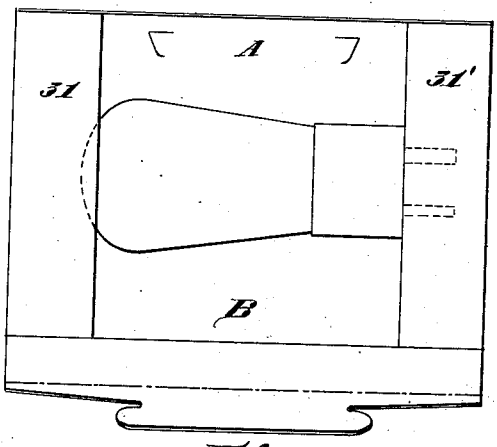


Fig. 3

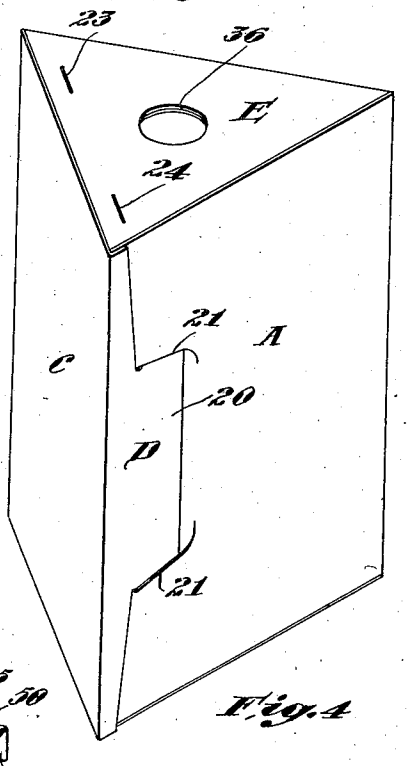


Fig. 4

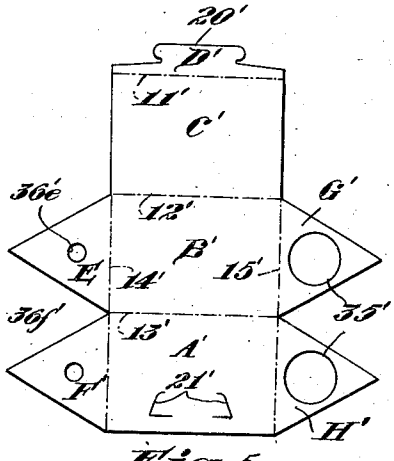


Fig. 5

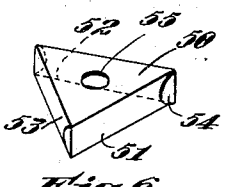


Fig. 6

Inventor
Charles P. Wellman
by Roberts, Cushman & Woodberry
Attorneys

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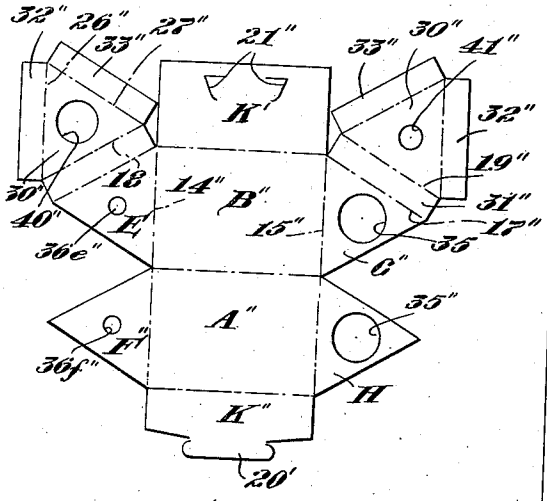


Fig. 8

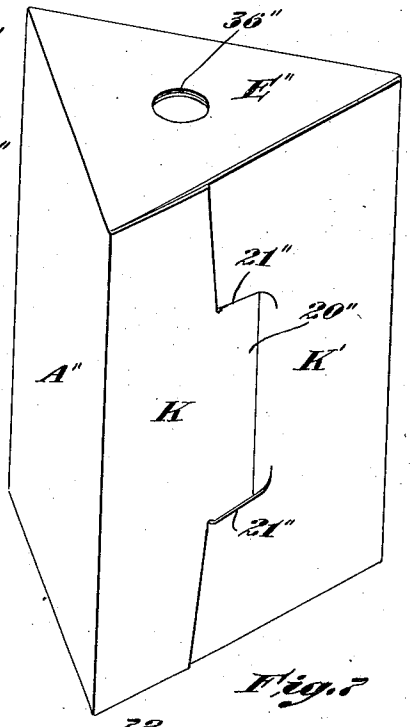


Fig. 7

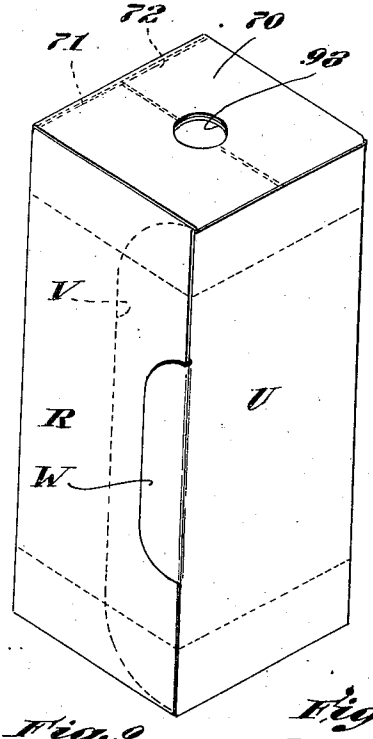


Fig. 9

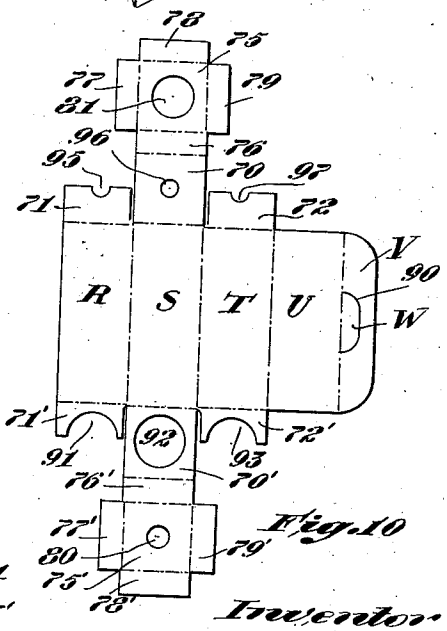


Fig. 10

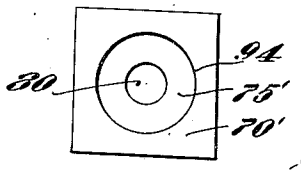


Fig. 11

Inventor.
Charles P. Wellman
by Roberts, Cushman & Woodberry
Attorneys

Patented Apr. 9, 1935 1,996,778

UNITED STATES PATENT OFFICE

1,996,778

RECEPTACLE

Charles P. Wellman, West Medford, Mass.

Application October 18, 1929, Serial No. 400,626

4 Claims. (Cl. 229—16)

This invention relates to receptacles for packaging, storing and shipping, and particularly to receptacles adapted to protect and display frangible articles. My invention is particularly applicable to receptacles for hollow frangible articles of which a typical example is an electric vacuum tube or lamp, incandescent or thermionic.

An object of my invention is to provide a receptacle adapted to hold securely for shipment, and when open, to display nearly the entire length of the article retained therein.

Another aspect of my invention relates to an improved construction adapted to facilitate the inserted or removal of the contained article. A further object of my invention is therefore to provide in a receptacle parts serving as article positioning members adapted to retain the article and guide it into an axial position within the receptacle. Another object is to provide article positioning members of such construction that force applied by an operator to the article serves to bring the article and the article positioning members into their ultimate positions within the receptacle. Another object is to provide means for the retaining and guiding functions exercised by article positioning members, in such a way that force exerted in placing the article and said members need not be accurately directed or carefully applied, so that the operation of filling the receptacle may be performed quickly and by an unskilled operator, and so that the article may be removed by a simple operation and without destroying the freshness or attractive appearance of the receptacle.

A further object of my invention is to provide a receptacle in which an article may be securely retained by mechanical interlocking with parts of the receptacle, without the necessity of sealing the receptacle. Another object is to facilitate the testing of a tube without unsealing its protecting receptacle.

With these objects in view, my invention provides a package having an improved end structure comprising an end fixed to the side walls and an article positioning member cooperating therewith. In the improved construction the parts are related in a manner which permits an endwise force to be applied by the receptacle to the contained article for retaining it securely in position, without danger of distortion or opening of the receptacle.

A receptacle made in accordance with my invention may be made from a flat blank of carton stock or other material and when complete has strength and rigidity. Additional features of advantage and novelty will be apparent from the following explanation of specific instances of the invention shown in the accompanying drawings by way of examples only.

In the accompanying drawings,

Fig. 1 shows a blank used in the manufacture of a receptacle embodying my invention;

Fig. 2 is an elevation of an assembled box made from the blank of Fig. 1, showing the manner in which a tube is placed with respect to the article positioning members during the operation of loading the receptacle with a tube;

Fig. 3 is an elevation of an assembled receptacle with the tube in place therein;

Fig. 4 is a perspective view of the receptacle with its removable side closed and in condition for shipping or storing;

Fig. 5 is a plan of a blank for making a similar receptacle adapted to receive separate article positioning members;

Fig. 6 is a perspective view of an article positioning member formed separately for use with a receptacle formed from the blank of Fig. 5;

Fig. 7 is a perspective view of a receptacle similar to the receptacle of Fig. 4 but provided with an alternate form of closure;

Fig. 8 is a plan of a blank for the manufacture of the receptacle of Fig. 7;

Fig. 9 is a perspective view of a receptacle of somewhat different shape than the receptacle shown in the previous figures;

Fig. 10 is a plan of a blank for the manufacture of the receptacle of Fig. 9; and

Fig. 11 is a bottom view of the receptacle of Fig. 9.

Referring to Fig. 1 which shows a blank for forming a receptacle of prismatic shape and triangular section, the blank comprises a single sheet of suitable material, such as cardboard, cut into the form shown and creased at 11, 12, 13, 14, 15, 16 and 17 to form three side wall portions A, B, and C, an overlapping and interlocking portion D, and triangular end closures E, F, G, and H. By folding the blank along the creases 11, 12 and 13 the side wall portions A, B and C may be angularly disposed to form a prismatic receptacle of triangular shape. One end of this receptacle is closed by the double thickness of the end members G and H which are bent at 90° to the side wall portions to which they are respectively attached, and are overlapped and secured together in any desired manner. The relation of the side wall and end portions of the

assembled receptacle is illustrated in Fig. 4 in which the end section E overlaps the end section F and is connected thereto by any suitable connection, such for example, as the rivets 23 and 24. The opposite end of the receptacle is closed in a similar manner by end members G and H which are likewise overlapped and secured together. In this manner the receptacle is rendered rigid. The side wall section C is movably related to the remainder of the receptacle and may be open during the filling of the receptacle and closed thereafter in the manner of a door by swinging it on the crease 12. I therefore refer to this side wall section as a removable side wall, for, while it is preferably attached along one edge to the remainder of the receptacle, it is removable from its closed position to provide the receptacle with an open side and expose the interior thereof. A projecting tongue 20 on the flap D is adapted to engage slots 21 in the side wall section A to retain the section C in a closed position, when desired.

For the purpose of retaining an article, for example, a radio tube, within the receptacle, I have provided article positioning members at opposite ends of the receptacle and which may be attached to the receptacle and formed from the same blank as the side and end walls. In order to facilitate the placing of an article within the receptacle or its removal therefrom, I prefer to provide article positioning members which are movable with respect to the receptacle and which may be brought into operative relationship within the receptacle by being moved through the open side of the receptacle. Accordingly, in the receptacle of Figs. 1 to 4 each of the article positioning members is hingedly connected to one of the end closure members at the edge which, after assembly, is adjacent the open side of the receptacle. In Fig. 1 the article positioning members embodying these features comprise generally triangular web portions 30 and 30' of the blank having sides corresponding in dimensions with the width of the side wall portions of the blank, and are hingedly connected respectively to the triangular end closure members E and G by means of rectangular spacing sections 31 and 31'. After the end closure sections E, F, G and H have been folded over and overlapped to close the ends of the receptacle, the article positioning members 30 and 30' may be swung, by bending the material at the creases 16, 17, 18 and 19, to positions within the receptacle, as shown in Fig. 2. In this position the flanges 31 and 31' serve as spacing members to space the transverse webs of the article positioning members from the adjacent fixed ends of the receptacle.

I prefer to provide additional spacer members 32, 33 and 32', 33', respectively, hingedly connected to the article positioning members at creases 26, 27, 28 and 29. When the article positioning members 30 and 30' are swung into the interior of the receptacle to the position of Fig. 2, these spacing members 32, 33, 32' and 33' are bent toward the respective closed ends of the receptacle and lie in contact with the side walls A and B. The article positioning members 30 and 30' may be swung into parallel relation with the fixed end walls of the receptacle, as shown in Fig. 3, and in this position their web portions are spaced from the adjacent end walls of the receptacle by the spacing members 31, 32, 33 and 31', 32', 33' respectively. By means of this construction force exerted longitudinally between the two article positioning members is transmitted through the spacing members to the fixed end walls of the receptacle.

The article positioning members are adapted to perform either or both of the following article positioning functions, as desired, first, spacing the article from the ends of the receptacle, and, second, retaining the article in the desired position with respect to the side walls of the receptacle. Accordingly I prefer to provide each of the article positioning members with a hole for engaging a portion of the article. In the case of a receptacle for radio tubes, a hole 40 is provided in article positioning member 30 of the proper size to retain, but to prevent passage of the spheroidal outer glass end of the tube, and a hole 41 is provided in the article positioning member 30' of the proper size to embrace the socket prongs of the tube but not to permit passage of the socket portion of the tube. I prefer to form the spacing elements 31, 32, 33 and 31', 32', 33' of the proper height to space the article positioning members a sufficient distance from the end walls of the receptacle to prevent either the spheroidal outer end or the socket prongs of the tube from contacting with the end walls of the receptacle. I also prefer to form the side walls of the receptacle of sufficient width to prevent the tube from contacting therewith. In this manner the tube is spaced from each of the walls of the receptacle and contacted only by the article positioning members, and thus protected from shock. The article positioning members are somewhat elastic and hence support the tube in a resilient suspension.

My improved receptacle is well adapted for speedy loading. In a method which I prefer to utilize, the blanks of Fig. 1 are folded into a receptacle in the form shown in Fig. 2, with the end closure members secured to form fixed end walls for the receptacle. With the removable side wall C in an open position, each of the article positioning members 30 and 30', with its respective spacing members, is folded into the receptacle in approximately the angular positions shown in Fig. 2. Spacer members attached to each of the article positioning members frictionally engage the side walls A and B of the receptacle and retain the article positioning members substantially in the angular positions in which they are placed. In this condition the receptacles may be moved in rapid succession past an operator who inserts the socket prongs of a radio tube within the hole 41 in one article positioning member, with the socket end of the tube structure abutting article positioning member 30', and rests the outer spheroidal glass end of the tube in contact with the edge of the hole 40 in the opposite article positioning member 30, as shown in Fig. 2. By applying a slight force to the side of the tube the operator then forces the tube into the substantially axial position shown in Fig. 3, and this movement of the tube forces the article positioning members 30 and 30' into positions parallel to the fixed ends of the receptacle where they abut, through their spacing members, against the adjacent end walls. By thus engaging the tube with an article positioning member and subsequently moving the tube and article positioning member to their ultimate positions in the receptacle, the operation of inserting a tube is facilitated. During this movement the tube is retained and guided by the article positioning members and the outer spheroidal glass end of the tube partakes of an angular movement with respect to its adjacent article

positioning member, riding smoothly on the edge of the hole 40. Inserting a tube in this manner causes a slight distortion of the two article positioning members due to the longitudinal thrust of the tube tending to separate these members, and this distortion is preferably of such an amount that the tube is held by the cooperative action of the side and end walls under a slight compression when in place in an axial position in the receptacle. This manner of retaining a tube insures that it will remain securely positioned during the shocks incurred in transit and handling. The slight distortion of the article positioning members and the manner of securing the tube under slight compression insures that a snug fit will be made even though the size of the tube, or the size of the various elements of the receptacle, varies slightly from predetermined standards. When held under a slight compression in this manner, the tube exerts a longitudinal force against each of the article positioning members, and the resultant stress is transmitted to the fixed end walls which effectively resist any tendency toward a distortion of the receptacle as a whole. As shown in Fig. 3, a portion of the outer spheroidal glass end of the tube projects through one article positioning member and the socket prongs of the tube project through the opposite article positioning member, while the tube itself retains the two article positioning members in spaced relation. Hence there is no danger of the tube falling out of the receptacle even though the removable side wall C is open. In addition, the shocks incurred in transit can not displace the tube through either end of the receptacle, since these ends are securely affixed to the side walls. At the same time, a tube may be readily removed from the receptacle and replaced therein without in any way damaging the receptacle or impairing its freshness and attractive appearance. Each article positioning member and its cooperating spacing members serve to strengthen and prevent distortion of the side walls of the receptacle and strengthen the receptacle transversely.

By merely opening the removable side of the receptacle, the tube contained therein is displayed to good advantage since the receptacle affords an uninterrupted view of nearly the whole length of the tube.

In order to permit the testing of a tube without its removal from a receptacle, I may provide holes 35 in the lower end closure portions which upon assembly coincide to form a hole through which electrical conductors may be inserted to engage the socket prongs of the tube and illuminate the filament therein. In order to permit this illumination to be observed, I may provide a hole 36 in the upper end of the receptacle, formed by the coincidence of holes 36e and 36f in the end closure portions E and F of the blank.

The modified form of receptacle of Figs. 5 and 6 is similar to that of Figs. 1 to 4 with the exception that the article positioning members, one of which is shown in Fig. 6, are formed separately from the remainder of the receptacle. In this construction I prefer to form the article positioning members, designated by the numeral 50, with integral spacing members 51, 52 and 53 united to each other by suitable glue laps, such as indicated at 54 to form a crate having rigid sides. A hole 55 of suitable size is provided in the article positioning member to engage the article as in the form of Figs. 1 to 4. The blank for the modified form of receptacle, shown in Fig. 5, is similar to the blank of Fig. 1 except that the article positioning members and their adjacent spacing members are omitted. Hence, where possible, the corresponding elements of this blank are designated by the same reference characters employed in Fig. 1, with the addition of a prime. The receptacle of Figs. 5 and 6 may be assembled into the form of the receptacle of Fig. 3, the article positioning members however being first applied to opposite ends of the tube and the tube and article positioning members then inserted as a unit into the receptacle, preferably with the article positioning members slightly stressed to hold the tube under slight compression.

The receptacle of Figs. 7 and 8 is similar to that of Figs. 1 to 4 with the exception that instead of providing a removable side wall in a single section, I have divided the removable side so that when closed it has two parts joined adjacent the center thereof. Accordingly, the removable side is made in two sections K and K' connected respectively to side wall sections A and B and provided respectively with an interlocking tongue 20'' and slots 21''. The elements of the receptacle which correspond to those of the receptacle of Figs. 1 to 4 are indicated by the same reference characters employed in Fig. 1 with the addition of double primes.

The receptacle of Figs. 9, 10 and 11 is quite similar to the receptacle of Figs. 1 to 4 and may be assembled and filled in the same manner but is square in section and is provided with four side wall sections R, S, T and U and an overlapping portion V. In this receptacle side wall section U constitutes the removable wall or door which provides an open side during filling. One end of the receptacle is closed by the double thickness of the end closure members 70, 71 and 72 which are secured together in any suitable manner with member 70 overlapping members 71 and 72, as shown in Fig. 9, and the opposite end of the receptacle is closed in the same manner by similar end closure members 70', 71', and 72'.

Article positioning members 75 and 75' are hingedly connected by means of rectangular spacing sections 76 and 76' respectively to the edges of end closure members 70 and 70' which are, when assembled, adjacent the open side of the receptacle. The article positioning members are provided with additional spacer members 77, 78, 79, and 77', 78', 79' respectively. The receptacle is folded from the blank and may be loaded in a similar manner to the receptacle of Figs. 1 to 4. A hole 80 in the article positioning member 75' is adapted to receive the socket end of a radio tube and a hole 81 in the article positioning member 75 is adapted to receive the spheroidal glass end of the tube.

The overlapping portion V is provided with a hinged sealing flap W, separated therefrom by the slit 90. After filling the receptacle the overlapping portion is preferably tucked into the receptacle, as shown in Fig. 9, and the sealing flap W is glued onto the side R of the receptacle. In this manner the receptacle may be effectively sealed. Access may be had to the receptacle by breaking the seal, and thereafter the receptacle may be opened or closed in the usual manner. The fact that the flap W is unbroken and sealed to the receptacle assures the customer that the tube in the receptacle has not been removed therefrom.

In order to permit the tube to be tested without removal from the receptacle, or breakage of

the seal, I prefer to provide cutaway portions 91, 92 and 93 in the lower end closure members 71', 70' and 72' respectively, which cutout portions cooperate upon assembly of the receptacle to form a hole 94 through which electrical conductors for supplying a testing current may be inserted to engage the socket prongs of the tube and illuminate the filament therein. Smaller cutaway portions 95, 96 and 97 are provided in the upper end closure members 71, 70 and 72 respectively, and upon assembly cooperate to form a hole 98 through which the illumination of the tube may be observed.

I claim:

1. A receptacle of foldable material for electric bulbs, comprising opposed end walls and a plurality of side walls, one of said side walls being adapted to be open for insertion of the bulb into the receptacle, opposed members each hingedly connected to a respective end wall of the receptacle and swingable into the receptacle through the open side thereof into a position transverse to the side walls, one of said members having a hole shaped to receive the socket end of the bulb, and the other of said members having a hole shaped to receive the outer portion of the glass end of the bulb, said holes being positioned and shaped to suspend the bulb in a fixed position out of contact with the walls of the receptacle, the bulb being locked by such engagement against displacement in any direction.

2. A receptacle of foldable material for electric bulbs, comprising opposed end walls and a plurality of side walls, one of said side walls being adapted to be open for insertion of the bulb into the receptacle, opposed members adapted to lie at right angles to said side walls within and spaced from the said end walls, connecting sections flexibly and integrally connecting said members to the edges of the respective end walls on the open side of the receptacle, and spacing sections constituting extensions of said members, at least one spacing section extending from each of said members into abutting contact with the adjacent end wall of the receptacle, one of said members having a centrally disposed hole shaped to receive the socket end of the bulb, and the other of said members having a centrally disposed hole shaped to receive the outer portion of the glass end of the bulb, whereby when the bulb is inserted in said holes, the bulb locks the said members and sections in place and the bulb is suspended out of contact with the walls of the receptacle and held against displacement.

3. A container of foldable material for a frangible article, comprising a plurality of side walls, opposite transverse members disposed inwardly of the ends of said side walls, one of the side walls being movable, an extension on said movable side wall shaped to be inserted between another side wall and a said transverse member to retain the container closed, in combination with outer end walls each rigidly related to at least two side walls, and spacing means on at least three sides of each of said transverse members acting to brace said transverse members against said rigidly related outer end walls, thus providing at each end of the container a box-like cushion for the contained article.

4. A container comprising side walls, an end wall section directly and integrally hinged to the end of one of the side walls, a spacing member constituting an extension of said end wall, an inner transverse member comprising an extension of said spacing member, and at least two other longitudinal spacing members extending from different sides of said inner transverse member, said end wall section and said inner transverse member having apertures adapted to register with the longitudinal axis of an article placed in the erected receptacle.

CHARLES P. WELLMAN.