

Feb. 18, 1930.

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1,747,979

FOLDING PAPER CARTON

Filed Dec. 28, 1925

3 Sheets-Sheet 1

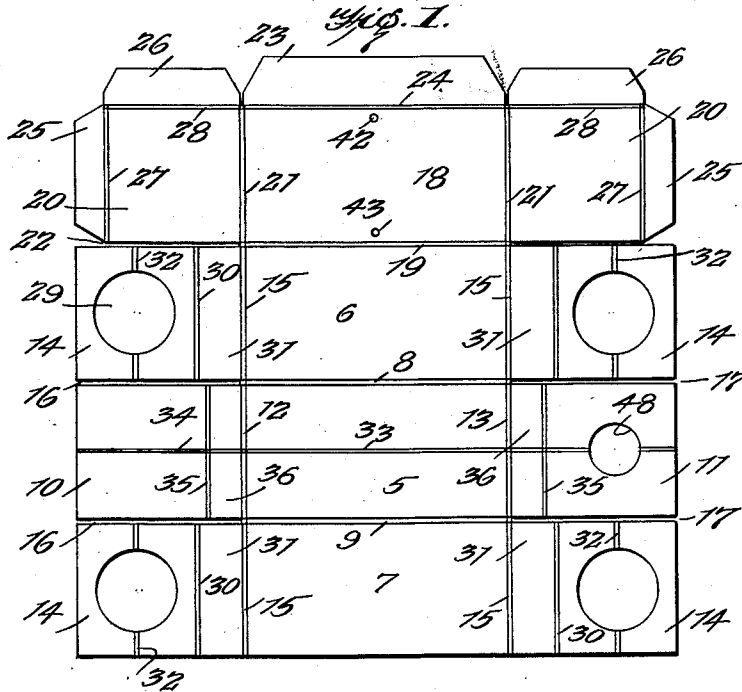


Fig. 2.

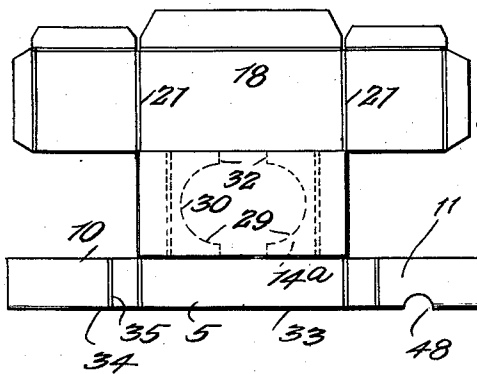
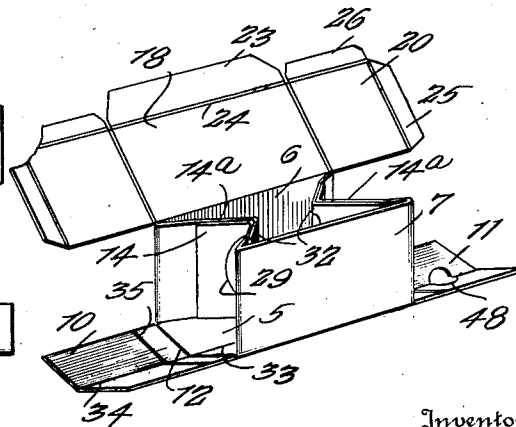


Fig. 3.



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Fig. 8.

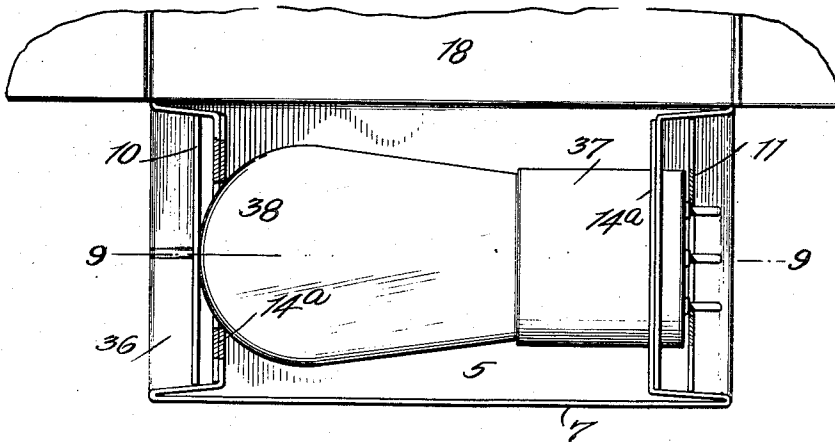


Fig. 9.

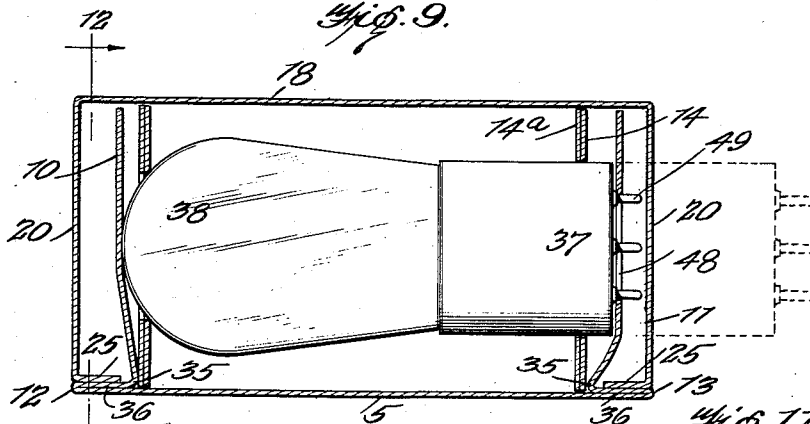


Fig. 10.

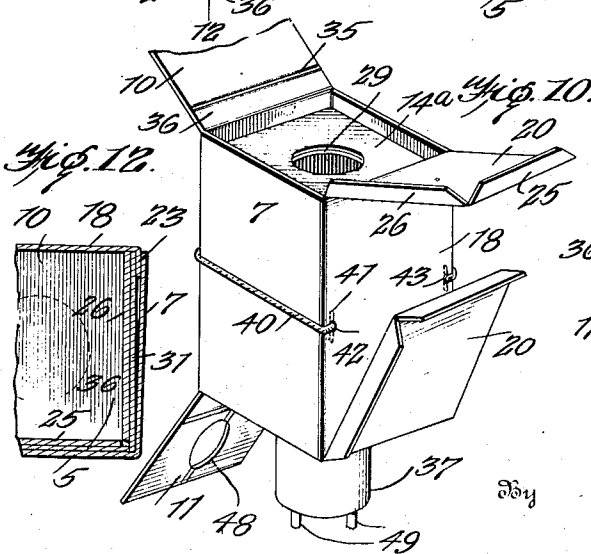
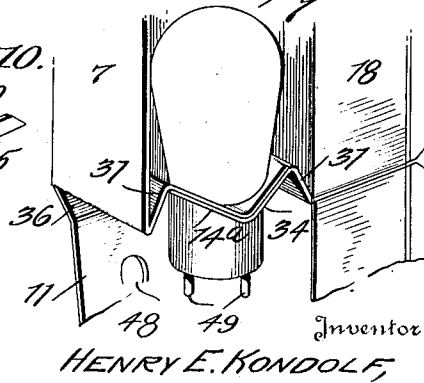


Fig. 11.



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FOLDING PAPER CARTON

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This invention relates to an improvement in folding paper cartons, and one of the principal objects thereof is to provide a carton which may contain an article to be vended, the construction of the carton being such that the article contained therein may be inspected, or, where the article requires to be tested, may be tested, while in the carton, but cannot be withdrawn therefrom without destroying the carton, with the result that fraudulent substitution of a defective article for a good one, and return of such defective article to the vendor, with the plea that the article sold was defective, may be avoided.

A further object of the invention is to provide a carton of the nature above referred to, so made as to be capable of being shipped from the manufacturer to the user in flat, folded form, to thereby occupy a minimum of space, such carton being capable of quick conversion from folded to extended or article-receiving condition.

Another object of the invention is to provide a carton of the nature above set forth, so constructed as to transport its contents in a condition cushioned against the effect of shocks and jars in transit or handling.

A further object of my present invention is to provide a carton, adaptable amongst other uses, to the safe transportation and fraudulent substitution prevention, of electron tubes.

In connection with the particular adaptation of the invention here illustrated, the carton is so constructed that the electron tube may be inspected and tested while contained within the carton, and while the carton is in sealed condition, it being necessary, in order to withdraw the tube from the carton, to mutilate the latter. The substitution of a defective tube, for the perfect tube sold while contained within the carton, would therefore become at once apparent.

With these and further objects in view, which will become apparent as the descrip-

tion proceeds, the invention resides in the construction, combination and arrangement of parts hereinafter more fully described and claimed.

In the drawings,—

Figure 1 represents a plan view of the blank from which the carton is formed.

Figure 2 represents a plan view of the carton partially formed, and in flat condition for shipping.

Figure 3 represents a view in perspective of the carton, partially extended from the condition illustrated in Figure 2 to the fully extended condition illustrated in Figure 4.

Figure 4 represents a view in perspective of the carton in extended position ready to receive its contents.

Figure 5 represents a view similar to Figure 4, with the end flaps folded into position in the ends of the carton.

Figure 6 represents a view in perspective of the carton completely formed and sealed.

Figure 7 represents a transverse sectional view of the carton completely formed, with an electron tube therein, a sealing cord, with anchor ends being illustrated as retaining the carton in sealed condition.

Figure 8 represents a plan view of the carton with an electron tube therein, the cover of the carton being thrown back.

Figure 9 represents a vertical sectional view along the line 9—9 of Figure 8, the cover being in place.

Figure 10 presents a view in perspective of the carton partially opened for the inspection of the electron tube, and shows the tube withdrawn to its testing position while contained within the carton.

Figure 11 represents a view similar to Figure 10, the cover of the carton being thrown back, showing the extended position that one of the partition walls may take when partially folded along its lines of creases when the tube is moved while within the carton to the position for testing.

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Figure 12 represents a fragmentary sectional view along the line 12—12 of Figure 9.

Referring more particularly to the drawings, the blank, illustrated in Figure 1, from which the carton is formed, is cut and creased to form a section 5, which forms the bottom of the completed carton, such section being flanked by sections 6 and 7, which respectively form the rear and front walls of the carton. Section 5 is connected to section 6 along the crease 8 and to section 7 along the crease 9.

The bottom section 5 is continued at each end to form end flaps 10 and 11, respectively, such flaps being connected with the bottom section along the creases 12 and 13, respectively. The rear wall section 6, and the front wall section 7, likewise are extended as at 14 to form partition wall flaps, such partition wall flaps being connected to the respective front and rear wall sections along the creases 15. The end flap 10, on one side of the blank is separated from the flanking partition wall flaps 14 by cuts 16 which extend the length of the partition wall flaps, and similarly the end flap 11 on the opposite side of the blank is separated from its flanking partition wall flaps by similar cuts 17.

Along the opposite edge of the rear wall section from the bottom section 5 is a cover section 18, such section being connected to the rear wall section along the crease 19. End wall sections 20, form continuations of the cover section 18, being connected thereto along the creases 21. The end wall sections are separated from the adjacent partition wall flaps 14 along the cuts 22. The cover section 18 at its free edge is provided with an insert flap 23 connected with the cover section along the crease 24, and each of the end wall sections at its ends is provided with an insert flap 25 and at its outer edge with a similar flap 26, such flaps being connected to the end wall sections along the creases 27 and 28, respectively.

The particular example of the invention herein set forth, is designed for the accommodation of electron tubes, and in this form of the invention I utilize the partitions formed by the partition wall flaps, as hereinafter set forth, to support and carry the tube, and hold it out of contact with the main body walls of the carton, to thereby cushion and protect it against the effects of shocks and jars in transportation and in handling. To this end, the partition wall flaps, from which the partition walls are to be made in the instant illustration, are provided with openings 29, in which openings, when the partition walls are formed, the base portion and head portion of the electron tube are received. An opening 48, also, is provided in the end flap 11 to snugly receive the prongs or leads of the tube as will later appear.

The openings 29, it will be noted, are loca-

ted centrally of the quadrangular portions of the partition wall flaps formed by the three free edges of such flaps, and the creases 30. These creases are arranged parallel with the ends of the flaps and are spaced from the creases 15, which connect the rear and front wall sections with the partition wall flaps, to form hinge portions 31, the purpose of which will be hereinafter set forth. Longitudinally of the blank, i. e., transversely of the partition walls (when formed), the partition wall flaps are creased as at 32, such creases being arranged preferably diametrically with respect to the openings 29.

Transversely of the blank, i. e., longitudinally of the bottom wall section 5, such section is creased as at 33, to allow the bottom wall to fold upon itself as indicated in Figure 2, and extensions 34 of the crease 33, traverse the end flaps 10 and 11, so that the halves of the end flaps also may fold upon each other, as indicated in Figure 2.

The end flaps 10 and 11 are creased as at 35, at right angles to the creases 34 and at a distance from the creases 12 and 13, respectively, to thereby form bottom hinge portions 36, upon which the end flaps swing to be disposed inwardly of the ends of the box, and against the partition walls (when formed) in the positions indicated for instance, in Figure 5. The creases 35 in the end flaps, are spaced from the creases 12 and 13 a less distance (by substantially twice the thickness of the material from which the blank is formed), than the creases 30 of the partition wall flaps are spaced from the creases 15, to thereby position the end flaps 10, when the box is in the condition illustrated in Figure 5 nearer the ends of the box than the partitions, at the same time allowing the end flaps to snugly engage against the partitions along the creases 35.

While the cartons may, if desired be distributed by the manufacturer to the user in blank form, by the latter to be set up, it is preferable to ship them in the formed and folded condition illustrated in Figure 2. In this condition of the carton, the partitions have been made by swinging the hinge portions 31 in along the creases 15 and bending the partition wall flaps relatively to the hinge portions along the creases 30, then overlapping and gluing the partition wall flaps of the rear wall section to the partition wall flaps of the front wall section, with the openings 29 in registration. To further illustrate, the formed and folded condition of Figure 2 is obtained by flattening the body of the box from the condition in Figure 3, this flattening operation being permitted by the fact that the bottom wall will fold upon itself along the crease 33 and the end flaps will fold upon themselves along the creases 34, the partitions 14* (formed by the partition flaps 14) having been formed and disposed

inwardly of the ends of the boxes through the hinge action of the hinge portions 31, and such partitions having been folded upon themselves along the creases 32. Thus in the condition shown in Figure 2, the partitions are folded upon each other along the creases 32, the bottom is folded upon itself along the crease 33, the end flaps are folded upon themselves along the creases 34 and the front wall 7 is folded down toward the rear wall 6 being separated therefrom by the folded partitions. In this flat condition numerous cartons may be shipped in a compact space.

When a carton is to be used, the front and rear walls may be grasped and moved away from each other, this operation pulling the partition walls out to the position indicated in Figure 3, and also extending the bottom and the end flaps to the position indicated in Figure 3. The carton then resting upon its bottom may be pressed down to straighten the bottom out in a flat condition, and the partitions may be pulled out to a substantially straight position, so that the carton takes the condition indicated in Figure 4. In this condition, it will be noted that the partitions 14^a are disposed inwardly of the ends of the box, the distance of the width of the hinge portions 31, and the carton is ready to receive the electron tube. (Figures 8 and 9 show the tube in place in the box).

The base portion 37 of the tube extends through one of the partitions 14^a, being accommodated by the opening formed by the registering openings 29 in the partition wall flaps which constitute that partition, and the head portion 38 of the tube is similarly accommodated in the opening formed in the opposite partition. The diameter of the opening in the partition which receives the base portion of the tube is equal to the diameter of such base portion to thereby snugly receive the base of the tube, and the opening in the partition which receives the head of the glass portion of the tube may be of the same diameter if desired as the opening in the opposite partition, provided it is smaller than the largest diameter of the head of the tube, to thereby support it and prevent the tube from being withdrawn through the partition which receives its head portion.

The tube having been placed in the carton in the manner described, the end flaps 10 and 11 are disposed in the position indicated in Figures 8 and 9, the bottom hinge portions 36 folding up along the creases 12 and 13, respectively, and the end flaps 10 and 11 folding with respect to the hinge portions along the creases 35. In this position the hinge portions 36, and the bottom portions of the end flaps 10 and 11 bear against the partitions 14^a adjacent the bottom 5 of the carton, as indicated in Figure 9, to thereby lock such partitions in position. The end flap 11 folds

in against the base of the tube, the prongs or leads 49 of the tube being projected through the opening 48, the opening being of a diameter to snugly receive the prongs. The end flap 11 thus serves, in conjunction with the adjacent partition, to stay or hold the tube rigidly in the carton, even though the bulb end of the tube should work out of contact with the opposite partition wall.

The carton is completed by folding down the cover section 18 and folding in the end wall sections 20. During this operation, the insert flap 23 of the cover is engaged between the front wall 7 and the forward hinge sections 31 of the partitions. The insert flaps 25 of the end wall sections are inserted within the carton and bear against the upper faces of the bottom hinge sections 36, and the insert flaps 26 of the end walls are inserted in the carton, and engage against the forward hinge sections 31. Thus the insert flaps 25 and 26 also aid in locking the partitions and end flaps in tube-supporting position, and further aid the end flaps and partitions in strengthening and rigidifying the carton. In this completely formed condition of the box, the three walls and the cover form the sides of the box and the end walls 20 form the ends of the box, the partitions are spaced inwardly from the ends of the carton and support the electron tube, and the end flaps are locked into position, and in turn lock the partitions in position, and one of such end flaps supports the prongs or leads of the tube, and the other bears against the head portion of the tube.

The carton is now sealed by the utilization of a sealing strip 39 across the junction of the front 7 and cover 18 of the carton, as illustrated in Figure 6, or as illustrated in Figures 7 and 10, a sealing cord 40 may be used. Such cord at its ends is provided with anchors 41, one of which may be passed through a perforation 42 near the forward edge of the cover section, and the other anchor, after the cord has been passed down across the front of the carton, to bridge the junction between the front wall and the cover, and after having been passed across the bottom 5 and up and across the rear wall 6, may be inserted through a perforation 43 near the rear edge of the cover section.

Whatever method is used for sealing the carton, it will be observed that while the end walls 20 and one or both of the end flaps may be pulled out for the purpose of inspecting and testing the contents of the carton, such contents cannot be removed without tearing out one or both of the partitions, or otherwise mutilating the carton. Thus when the manufacturer, for instance, of electron tubes, has packed a tube in a carton and sealed the latter, he will know that the tube cannot be removed, and another tube inserted in its place and returned to him, without the muti-

lation of the seal or of the carton informing him that there has been a substitution. The importance of this will become apparent when it is understood that unfortunately many concerns which now retail electron tubes, have been practicing the substitution of imperfect or used tubes for perfect tubes, and returning such substituted tubes to the manufacturers with a demand of financial adjustment thereon.

When a tube thus packed and sealed in a carton is to be inspected, the end walls 20 are opened out, and the end flap 11 is pulled out, thus exposing the portion of the base of the tube beyond its supporting partition. The base of the tube may then be grasped and the tube pulled outwardly through its supporting partition a sufficient distance to allow the insertion of the tube in a testing apparatus. Such position is indicated in Figures 10 and 11. The end flap 10 may be pulled out to allow the bulb of the tube to be observed through the opening in the uppermost partition wall while the tube is in the testing machine. When the base of the tube is drawn outwardly, the increased diameter of the glass body of the tube will prevent the tube being withdrawn beyond a certain position, but nevertheless the tube may be withdrawn sufficiently for testing purposes, without mutilation of the carton, by virtue of the movement of hinge portions 31 along their bounding creases, and by further virtue of the bending of the partition along its central crease 34, as illustrated in Figure 11. In this figure it will be understood the cover section has been thrown back for purposes of clearness of illustration.

Thus it will be observed that the partition wall and its hinges, while supporting and cushioning the tube against the effects of shock and jar, at the same time are sufficiently flexible to allow withdrawal of the tube to a position where it can be readily placed in an apparatus for testing purposes, but that complete withdrawal of the tube is impossible without mutilation of the carton.

The foregoing description has been given for purposes of clearness of understanding, and no undue limitations should be deduced therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

Having thus described the invention what I claim as new, and desire to secure by Letters Patent is:—

1. A paper carton comprising a bottom, side walls, and a cover hinged to one of the side walls, partitions inset from the ends of the carton, partition hinge sections connecting the partitions to the side walls and hinged to said partitions and to said side walls, end flaps likewise inset from the ends of the carton and disposed against and out-

side of said partitions, end flap hinge sections connecting the flaps to the bottom and hinged to said end flaps and said bottom and abutting against the partitions to lock the same in place, said partitions being provided with openings for receiving an electron tube, such openings being of smaller diameter than the largest diameter of said tube, and end walls hinged to the cover and provided with insert flaps, respectively, bearing against one of the partition hinge sections and against the end flap hinge sections.

2. A paper carton comprising partition walls inset from the ends of the carton and connected to walls of the carton by hinge sections which are hinged to such walls and to the partition walls, end walls spaced from the partition walls, end flaps interposed between the partition walls and the end walls, and hinge sections to which the end flaps are connected and which lock the partition walls in place.

3. A paper carton comprising a bottom wall longitudinally creased along its center, end flaps hinged to the bottom wall and likewise longitudinally creased on continuations of the bottom wall crease, and partitions hinged to the sides of the carton and inset from the ends thereof and transversely creased in a plane coincident with the plane of the bottom crease and parallel with the side walls.

4. A paper carton blank including a bottom wall section, side wall sections flanking the bottom wall sections and separated therefrom by creases, hinge sections forming continuations of the bottom wall section and separated therefrom by creases, end flap sections forming continuations of the hinge sections and separated therefrom by creases, said bottom wall section, hinge sections and end flap sections being creased along a continuous line, partition wall hinge sections forming continuations of the side wall sections and separated therefrom by creases, partition wall sections forming continuations of the partition wall hinge sections and separated therefrom by creases, said partition wall sections being creased parallel with the creases separating them from the partition wall hinge sections, and a cover section separated from one of the side wall sections by a crease.

5. A paper carton blank including a bottom wall section, a hinge section, and an end flap section forming a continuation of the bottom wall section, said hinge section being separated from the bottom wall section and end flap section by creases, said bottom wall section, hinge flap hinge section, and end flap section being creased along a continuous line, side wall sections separated from the bottom wall section by creases, and partition wall sections and partition wall hinge sections flanking the end flap section and forming continuations of the side wall sections, such

partition wall hinge sections being of greater width than the end flap hinge section, and being separated from the side walls and from the partition wall sections by scores, said partition wall sections being scored parallel with the partition wall hinge sections.

In testimony whereof I hereunto affix my signature.

HENRY E. KONDOLF.

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