April 18, 1939. C. G. JOHNSON 2,155,091

CARTON

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Fig. 1.

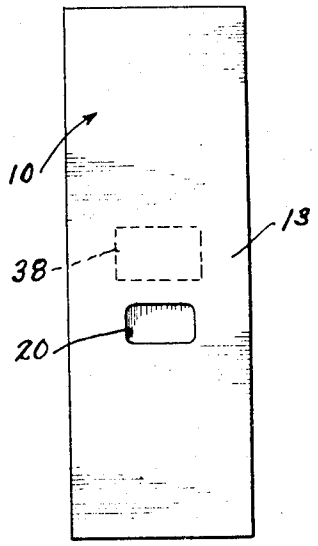


Fig. 2.

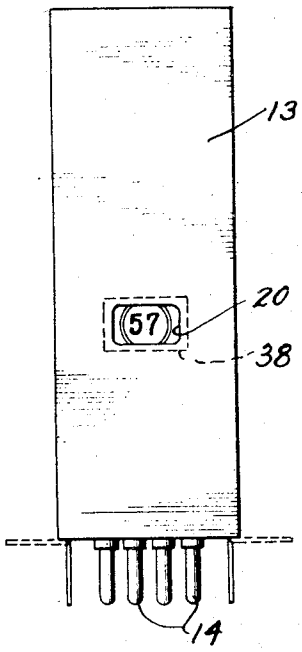


Fig. 4.

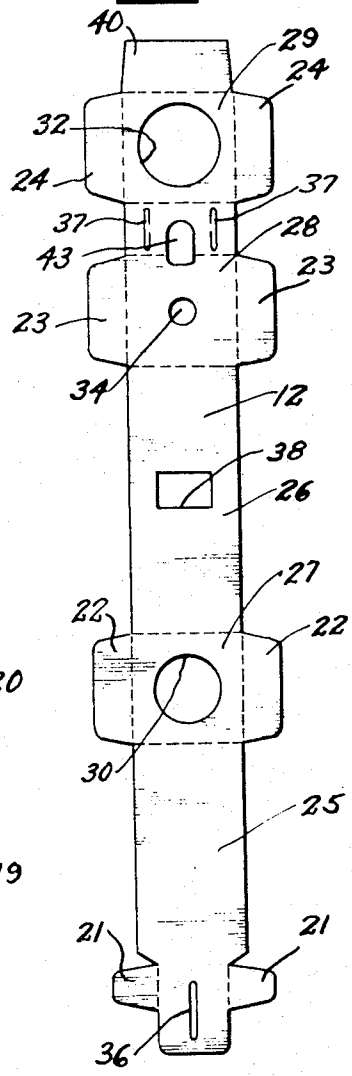


Fig. 3.

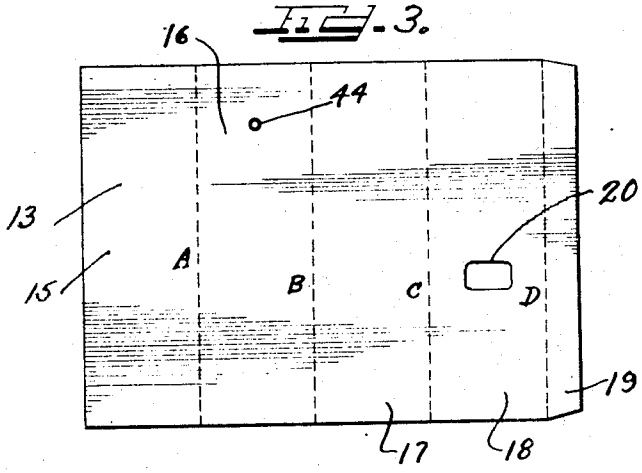
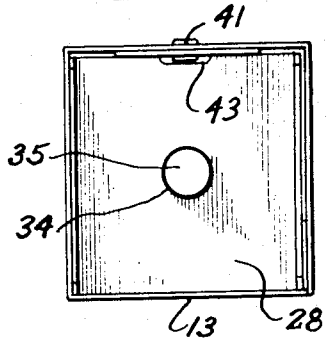


Fig. 8.



Inventor

CHARLES G. JOHNSON.

by Charles Hill Attys.

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Fig. 5.

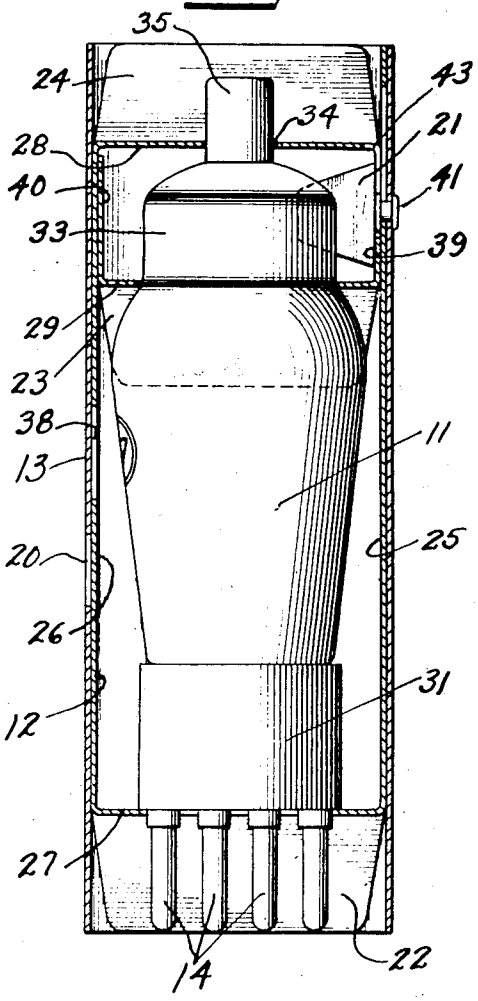


Fig. 6.

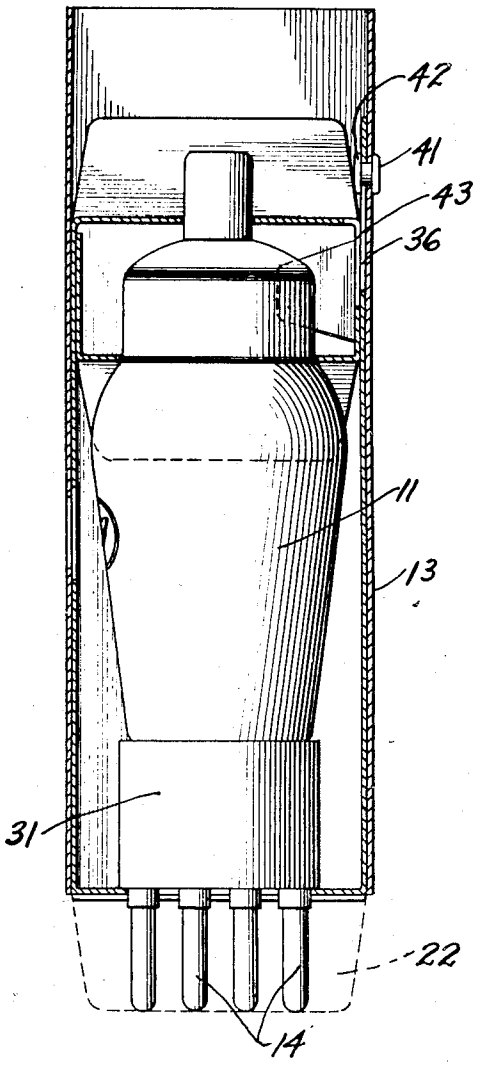
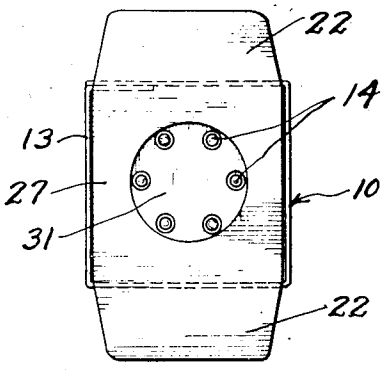


Fig. 7.



Inventor

CHARLES G. JOHNSON.

by Charles G. Fill Atty.

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2,155,091

UNITED STATES PATENT OFFICE

2,155,091

CARTON

Charles G. Johnson, Owensboro, Ky., assignor to Ken-Rad Tube & Lamp Corporation, Owensboro, Ky., a corporation of Kentucky

Application October 29, 1937, Serial No. 171,634

5 Claims. (Cl. 229—6)

This invention relates to a carton, and more particularly to two piece double shell radio tube cartons of the type which permit sufficient exposure of the radio tube to permit testing of the same but which prevent complete removal of the radio tube except when the carton is partially or completely destroyed.

In the sale and distribution of radio tubes and the like, it has been found highly desirable to provide a carton which permits a testing of the tube without the tube being removed from the carton and in which the tube can only be completely removed for use in a radio circuit by tearing or otherwise partially or completely destroying the carton. To provide a carton in which the radio tube is normally completely retained therein and yet provide an arrangement in which the base prongs of the radio tube may be inserted in a socket in the test equipment, it has been found desirable to provide a two-piece double shell carton in which the inner shell is arranged for limited longitudinal movement with respect to the outer shell. That is to say, it is desirable to arrange the inner shell of a double shell carton so that it can be moved sufficiently in a longitudinal direction to completely expose the base prongs of the radio tube. Since a complete removal of the inner shell from the outer shell of a carton would permit the removal of the radio tube without destroying the outer carton, it is very clear that the longitudinal movement of the inner shell should be definitely restricted to a mere exposure of the base prongs of the radio tube. From a manufacturing standpoint it is also considered highly desirable to construct the carton with minimum number of pieces of material.

It is an object of the present invention to provide a novel carton for radio tubes and the like which permits a partial exposure of the article housed therein, but which prevents complete removal thereof, except upon partial or complete destruction of the carton.

Another object of the present invention is to provide a novel carton for radio tubes and the like which is economical to manufacture, and which is rugged and reliable in use.

A further object of this invention is to provide a novel method and means for housing radio tubes and the like.

A still further object of this invention is to provide a novel double shell radio tube carton constructed of only two pieces.

Another and further object of this invention is to provide a novel carton for radio tubes and the like having a window therein for exposing a portion of the radio tube at will.

Another and still further object of this invention is to provide a novel double shell carton having novel means for limiting the longitudinal movement of one shell with respect to the other.

Also, another object of this invention is to provide a novel inner shell for double shell cartons which is formed from a single strip of material.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claims. My invention itself, however, both as to its organization, manner of construction, and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings, in which:

Figure 1 is a front elevational view of a double shell radio tube carton with the inner shell in its normal position;

Figure 2 is a front elevational view of the double shell radio tube carton of Figure 1, the inner shell being in its lowermost position with the base prongs of the radio tube exposed;

Figure 3 is a developed view of the outer shell of the double shell radio tube carton;

Figure 4 is a developed view of the inner shell of the carton of Figure 1;

Figure 5 is a side elevational view partly in cross section of the double shell radio tube carton of Figure 1 and of a radio tube housed therein;

Figure 6 is a view similar to Figure 5 but shows the inner shell of the carton in its lowermost position corresponding to Figure 2;

Figure 7 is a bottom view of the double shell radio tube carton, the inner shell being in the position shown in Figure 6; and

Figure 8 is a top view of the double shell radio tube carton.

Referring now to the various figures of the drawings which illustrate one embodiment of my invention, a double shell carton 10 is provided for housing a radio tube 11 and includes in general an inner shell 12 and outer shell 13. While a wide variety of materials may be employed for forming the carton, a suitable grade of cardboard has been found to be extremely satisfactory. As will presently be more fully understood, the inner shell 12 is arranged for limited longitudinal movement within the outer shell 13. This limited longitudinal movement of the inner shell 12 with respect to the outer shell 13 permits the exposure of the base prongs 14 of the radio tube

11. In Figure 1 of the drawings, the carton is shown with the inner shell 12 completely enveloped within the outer shell 13. In Figure 2 of the drawings, the inner shell 12 has been moved longitudinally with respect to the outer shell 13 until the base prongs 14 of the radio tube 11 are fully exposed.

The outer shell 13 of the carton 10 is formed from a single sheet of cardboard and folded along four longitudinal lines A, B, C, and D. The folding of the sheet of cardboard along the four longitudinal lines A, B, C, and D as shown in Figure 3 of the drawings provides four sections 15, 16, 17, and 18 of substantially the same shape and area, and a fifth section 19 which acts as a tab for engaging the first section 15. After the sheet of cardboard has been folded along the lines A, B, C, and D, the tab 19 may be glued or otherwise suitably secured to the longitudinal marginal edge of the section 15. As will be readily understood by those skilled in the art, this forms a cardboard shell of substantially square cross sectional configuration.

For a reason which will presently appear, a rectangular opening 20 is cut out of the section 18.

The inner shell 12 of the double shell carton 10 is cut from a single strip of cardboard in the manner shown in Figure 4 of the drawings. More specifically, ears 21 are cut at one end of the strip and three pairs of tabs 22, 23, and 24 are cut along the length thereof in the manner indicated in Figure 4. The lines of fold of the cardboard strip which forms the inner shell 12 are indicated by the various dotted lines. As will at once be clear to those skilled in the art, the folds are such that two longitudinal side walls 25 and 26 are provided. A lower end or base wall 27 is provided between side wall portions 25 and 26. A double end wall is provided for the upper part of the carton 10 by the sections 28 and 29. As will presently be explained, the section 28 is arranged to form the uppermost end wall partition of the carton, while the end wall or section 29 is arranged to extend in parallel but spaced relationship below the section 28.

The base wall 27 is provided with a relatively large opening 30 therein which permits the base prongs 14 of the radio tube 11 to extend therethrough but which is not sufficiently large to permit the base 31 itself to pass therethrough. The lower partition 29 of the double end wall is provided with an opening 32 through which the upper portion 33 of the radio tube 11 may extend (see Figures 5 and 6). The partition 28 of the double end wall is provided with a smaller opening 34 through which the top cap 35 of the radio tube 11 may extend. For a reason which will presently appear, a longitudinal guide slot 36 is provided in proximity to the laterally extending ears 21, and two slots 37 are provided between partitions 28 and 29 of the double end wall for the reception of the laterally extending ears 21. A rectangular opening 38 is provided in the side wall 26 which is of slightly greater size than the rectangular opening 20 which is provided in the section 18 of the outer shell 13. As will presently be understood, opening 38 of the inner shell 12 and opening 20 of the outer shell 13 are arranged to coincide when the inner shell 12 is in its lowermost position. This provides a window through which a portion of the radio tube may be seen.

Referring now to Figure 5 of the drawings, the manner in which the inner shell 12 is folded and disposed within the outer shell 13 is clearly shown. The end of the strip of cardboard having the slot 36 therein is disposed in the upper right hand side of the outer shell 13. From there it extends downwardly forming the side wall portions 25, and then it extends laterally across to form the end or base portion 27. From there it extends upwardly forming the side wall 26 until it reaches approximately the top of the outer shell 13 again. From there it is folded across the upper part of the carton forming the upper partition 28 of the double end wall until it reaches the opposite side of the carton. From there it is bent downwardly again forming a section 39 which is provided with the longitudinal slot 37 therein. It then extends again across the carton in the form of partition 29 which forms an intermediate partition or lower partition for the double end wall. It finally terminates in an upwardly extending tab 40 which lies against the side wall 26. The ears 21 are extended through the slots 37 and thereby definitely hold the opposite end walls of the inner shell 12 in predetermined spaced relationship with respect to each other. The tabs 22, 23, and 24 greatly reinforce the inner shell in a manner which will readily be appreciated by those skilled in the art.

The novel manner in which the longitudinal movement of the inner shell 12 within the outer shell 13 is restricted will now be described. An eyelet or similar guide stud 41 is secured to the outer shell 13 opposite the longitudinal slot 36 of the inner shell 12 and extends therethrough. The eyelet 41 is crimped or spun over at its inner end as at 42, which prevents separation of the inner shell from the eyelet 41. From a close inspection of Figures 5 and 6 of the drawings, it will readily be appreciated that by spinning or crimping the end of the eyelet in such a manner that the eyelet 41 is free to move within the slot 36, a convenient and simple arrangement is provided for limiting the longitudinal movement of the inner shell 12 within the outer shell 13 of the carton 10. It will also be appreciated that by virtue of the fact that the end 42 of the eyelet 41 is spun over or otherwise expanded, the inner shell 12 cannot thereafter be removed from the outer shell 13 without partially or completely destroying one or the other or both.

The length of the longitudinal slot 36 is governed by the length of the base prong 14 of the radio tube 11. Particularly, the slot 36 should be of sufficient length to permit full extension of the base prongs 14 below the base edge of the outer shell 13 as is shown in Figure 6 of the drawings.

In order that the side wall 25 of the inner shell 12 will not interfere with the end of the eyelet 41, a hole 43 is cut in the inner shell in the upper part of the strip of cardboard lying between partitions 28 and 29 and extending around into a part of partition 28. (See Figures 4, 5, and 6.) As is clearly shown in Figure 5, the spun or crimped end 42 of the eyelet extends into this opening 43 when the inner shell 12 is in its upper position with respect to the outer shell 13. When the inner shell 12 is moved downwardly to expose the base prongs 14 of the radio tube 11, the end 42 of the eyelet 41 lies above the cut out portion 43, note being taken that by virtue of the fact that the cut out portion 43 extends around the corner and into part of the partition 28, this partition 28 does not interfere with the eyelet 41 as it moves downwardly past the end 42 thereof.

As may be seen best in Figure 7 of the draw-

ings, the tabs 22 are arranged to fold outwardly when the inner partition is moved down into its position as shown in Figure 6. This presents a flat base to the carton 10 which is substantially adjacent the lower surface of the base 31 of the radio tube 11. In this position it will readily be understood that the prongs 14 may be pushed into the usual radio tube socket.

The general appearance of the top of the carton 10 with a radio tube mounted therein is shown in Figure 8. As is clearly shown in this figure, as well as Figures 5 and 6, the top cap 35 of the radio tube extends upwardly through the opening 34. Note should be taken that this top cap 35 of the radio tube 11 is free at all times both when the inner shell 12 is in its upper position, as well as when the inner shell 12 is in its lower position, to be connected to the usual conductor and conductor connecting clip which is employed to connect this part of the radio tube to the circuit in which the radio tube is to be employed.

Although the type of tube which is housed in a carton of the above type and other marks of identification are commonly printed on one or more of the exterior surfaces of the carton, it has been found desirable to check the form of the tube by an identifying mark on the tube itself. As is well known to those skilled in the art, radio tubes are manufactured in a wide variety of forms, such for example as diodes, duo-diodes, triodes, tetrodes, pentodes, and other multi-electrode and multi-unit tubes. Each tube generally carries an identifying mark on the outer surface of its envelope in the form of a letter, a number, or a combination of letters and numbers which indicates the exact nature and characteristics of that particular radio tube. For example, the radio tube may contain a number such as is shown in Figure 2 of the drawings. For example, the number 57 is generally understood by the radio tube manufacturing industry as designating a triple grid detector-amplifier. The cut out portion 38 in the side wall 26 of the inner shell 12 is arranged so that it lies opposite the tube identification mark when the tube is positioned in the carton. As previously pointed out, this cut out portion 38 is arranged to coincide with the cut out portion 20 of the outer shell 13 when the inner shell 12 has been moved to its lowermost position with the base prong 14 of the radio tube 11 projecting therefrom. In this position the cut out portions 20 and 38 act as windows through which the identification mark of the radio tube 11 may be readily seen. Other identification marks, such for example as price and the like, may be placed on the outer surface of the envelope of the radio tube at approximately the same height as the principal identification mark of the tube so that by grasping the cap 35 and rotating the radio tube 11 these other identification marks may be progressively passed in front of the windows 20 and 38. When the inner shell 12 is in its uppermost position, the windows 20 and 38 do not coincide so that no opening is left through the carton through which dust, debris, and other foreign matter may pass while the tube is being stored.

It will also be readily understood by those skilled in the art that any desired marking can be made on the radio tube after it has once been confined in the carton through the windows 20 and 38. The placing of such additional markings on the radio tube does not affect or harm the carton itself and for that reason the carton may be delivered intact to the customer thereafter. This is a highly desirable and advantageous feature of the present invention.

The manner in which a radio tube is packed in a carton of the above type will now be described. Assume that the outer shell has already been formed as previously described and the inner shell is in its extended or developed position as shown in Figure 4. The inner shell blank is first folded on the four score lines beginning at the top of the blank as viewed in Figure 4 and progressing downwardly, and the dome 33 and the top cap 35 of the radio tube are inserted in the holes 32 and 34 respectively. The shell blank is then folded on the remaining score lines, placing the base pins 14 of the radio tube 11 through the hole 30 in the base end 27 of the shell 12. The locking ears 21 are then placed through the slot 37 to complete the inner shell or slide assembly. The inner shell 12 containing the tube is then placed in the outer shell 13 with the longitudinal eyelet slot 36 opposite the eyelet hole 44 in the wall 16 of the outer shell 13. An eyelet 41 is then placed through the hole 44 and the slot 36, and the end 42 is then spread, crimped, or otherwise altered in shape to prevent its removal without damage to the shell of the carton 10, and yet permitting it to move freely in the slot 36. While the eyelet 41 has been described with its head on the outer side of the carton 10 and its inner end spread out, it is to be understood that the head of the eyelet 41 may be placed on the inside of the carton 10 so that the eyelet will extend through the slot 36 and the hole 44 and have its end spread or crimped on the exterior side of the carton 10. When the tube and inner shell is so assembled within the outer shell 13 to form the carton 10, the windows 20 and 38 are positioned on the same side of the carton and arranged to be in and out of coincidence with each other depending upon whether the inner shell 12 is in its lowermost or uppermost position within the outer shell 13.

From the above description, it will be seen that I have provided an extraordinarily effective double shell radio tube carton of a tamper proof type and yet which permits testing of the radio tube when desired without removal of the same from the carton. It will also be understood that the above carton can readily and economically be manufactured and that it is rugged and reliable in use.

I claim as my invention:

1. A carton for housing radio tubes comprising an outer shell, an inner shell slidably mounted within said outer shell and having end portions for extension across the upper and lower ends of a radio tube, one of said shells having a longitudinal slot therein, a stop member carried by the other of said members and extending through said slot to form a pin and slot connection, and means on said stop member for preventing removal thereof from said slot, said pin and slot connection being such that said inner shell may be longitudinally moved to expose the base prongs of the radio tube but not sufficiently to remove the radio tube from said carton.

2. In a double shell radio tube carton, an inner shell comprising a single strip of material folded to provide successively a side wall, an end wall, a second side wall, a second end wall, a spacing member and an intermediate wall, said spacing member lying against said side wall and having slots therein, and tabs on said side wall

extending through said slots to position said spacing member relative to said side wall, said slots extending longitudinally of said strip so as to leave a strong connection between said second end wall and said intermediate wall.

3. An inner shell for double shell radio tube cartons and the like comprising a single strip of material folded at a plurality of points thereabout to provide sidewalls, an end wall for the base of a radio tube, and a double end wall for the top of the radio tube, said strip being longitudinally slotted between the walls of said double end wall, said strip having at least one ear thereon for extension through said slotted portion of said strip, whereby a radio tube can only be removed from said inner shell upon destruction or removal of said inner shell from the outer shell of said carton.

4. A double shell carton for housing radio tubes and the like comprising an outer shell, an inner shell slidably mounted within said outer shell and having a longitudinal guide slot in one wall thereof, and an eyelet extending through said outer shell and said guide slot for limiting the relative longitudinal movement of said inner shell with respect to said outer shell.

5. A double shell carton for housing radio tubes and the like comprising an outer shell, and an inner shell slidably mounted within said outer shell and having a longitudinal guide slot in one wall thereof, said inner shell having a side wall and an end wall which extends across said shell and abuts said side wall at an intermediate position along the length of said slot, and a stop member carried by said outer shell extending through said slot of said inner shell and having a head on its inner end to prevent removal thereof from said slot, said end wall being cut out to permit the free passage of the head of said stop member.

CHARLES G. JOHNSON.