Oct. 22, 1968 G. T. BRANDER 3,406,819

CONTAINER CONSTRUCTION

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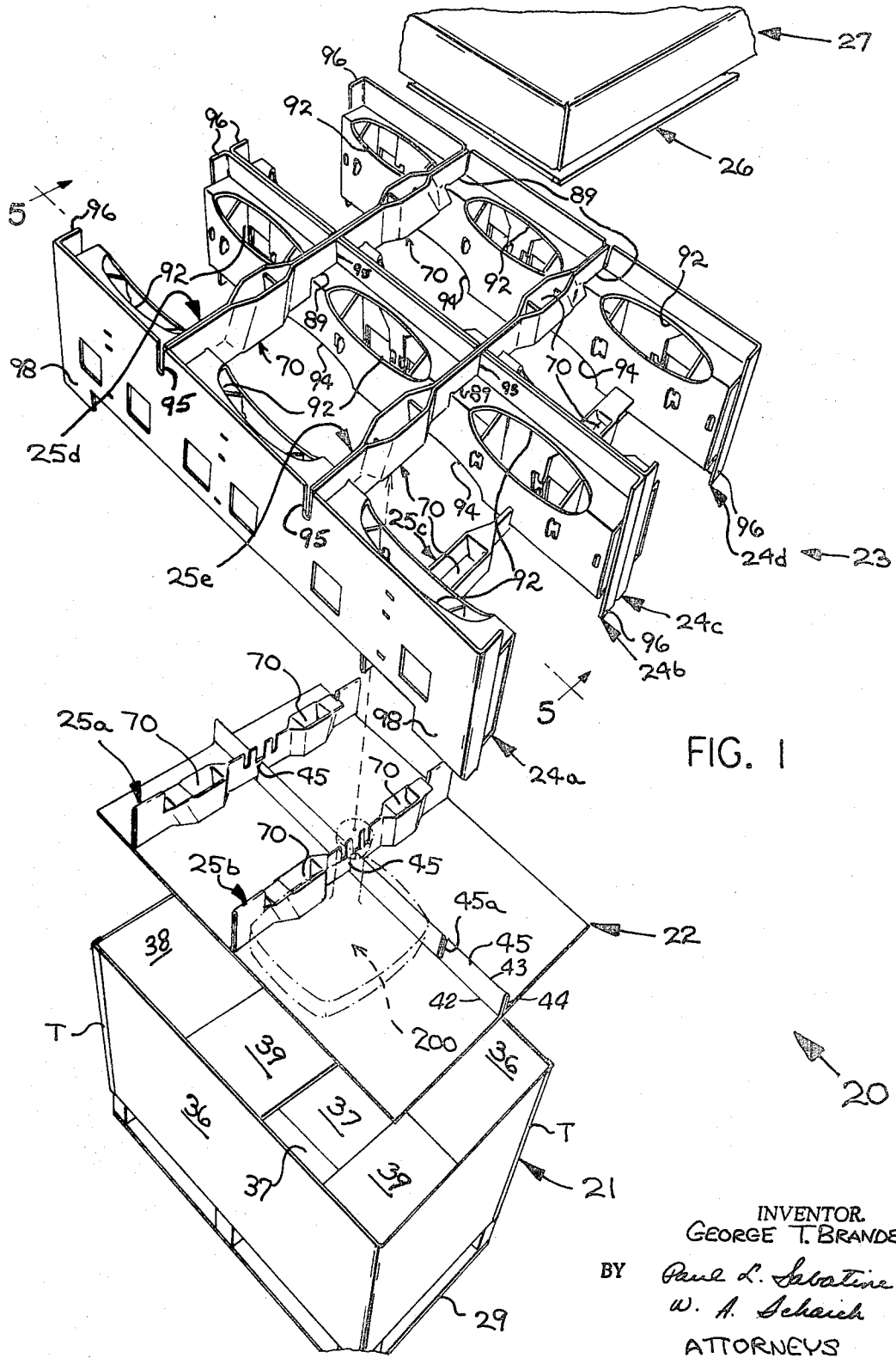


FIG. 1

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Oct. 22, 1968 G. T. BRANDER 3,406,819

CONTAINER CONSTRUCTION

Filed Feb. 3, 1966 9 Sheets-Sheet 2

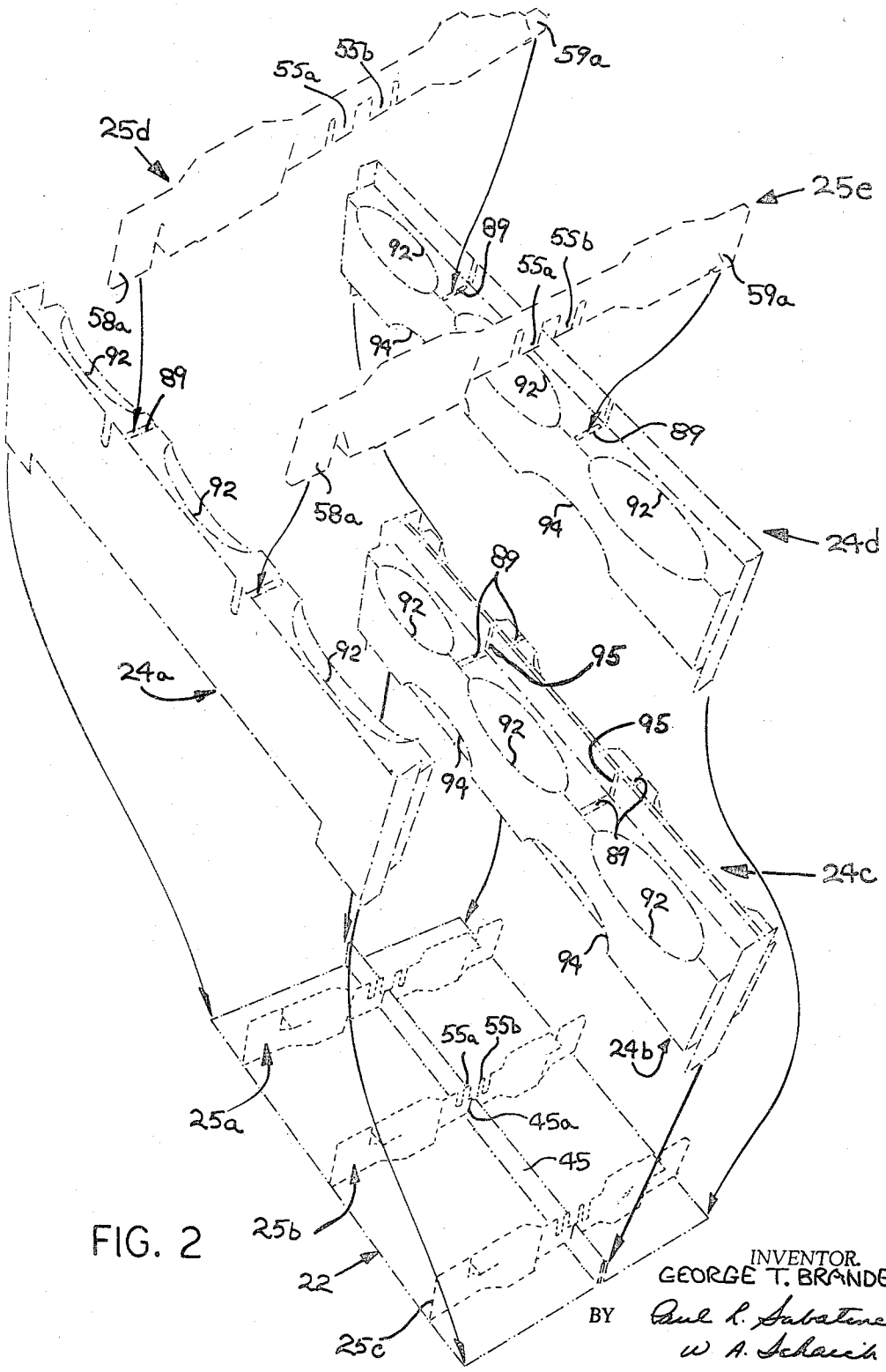


FIG. 2

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Oct. 22, 1968 G. T. BRANDER 3,406,819

CONTAINER CONSTRUCTION

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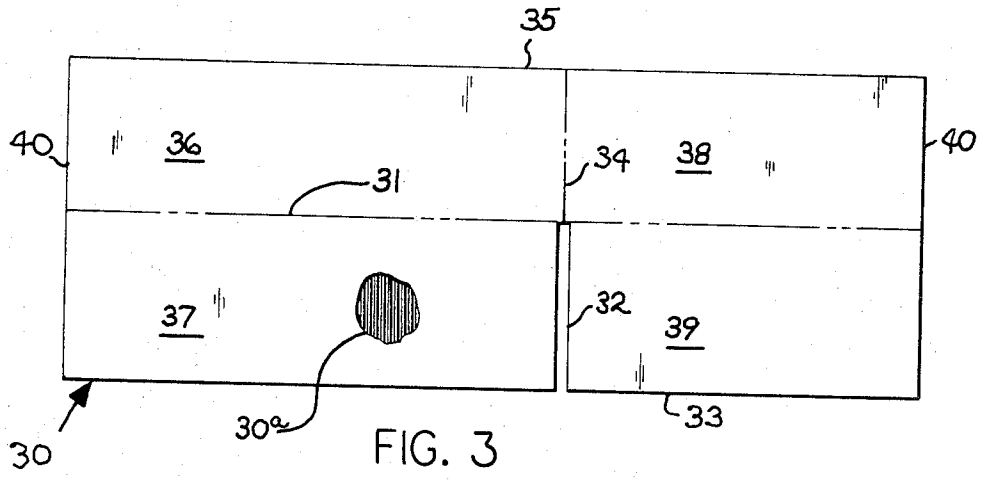


FIG. 3

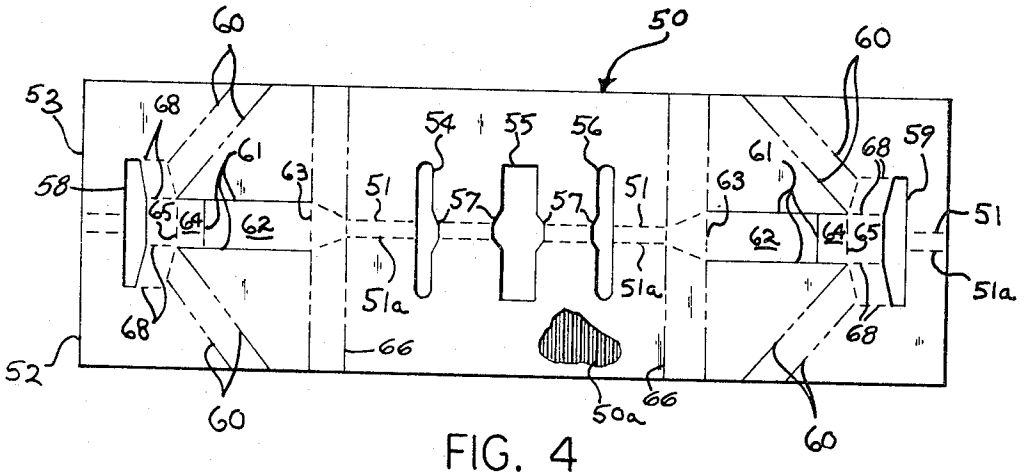


FIG. 4

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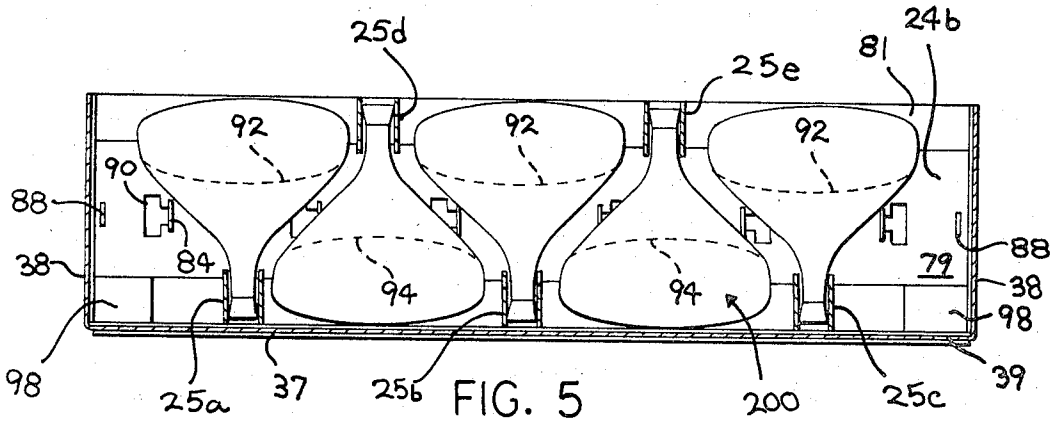


FIG. 5

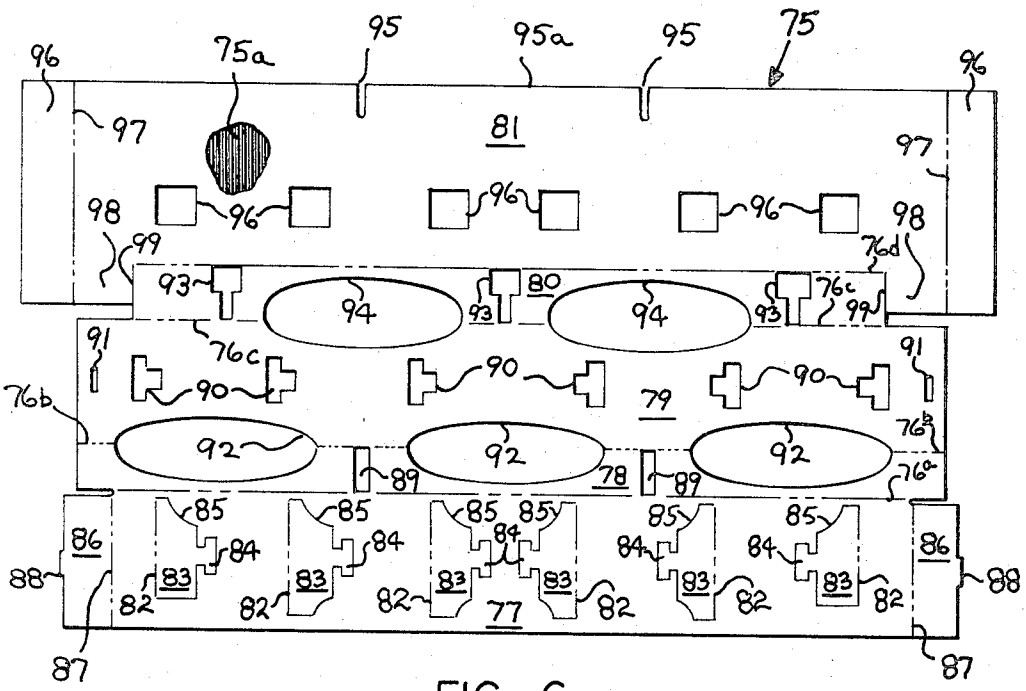


FIG. 6

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Oct. 22, 1968 G. T. BRANDER 3,406,819

CONTAINER CONSTRUCTION

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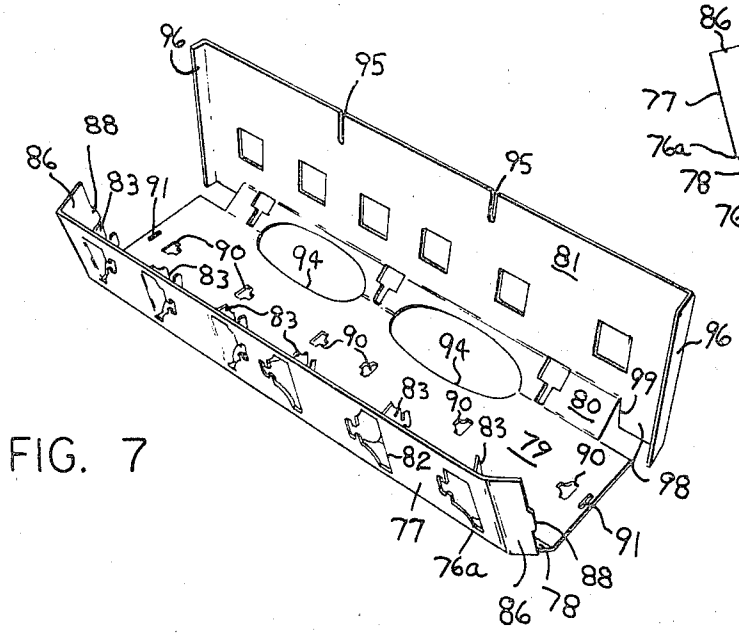


FIG. 7

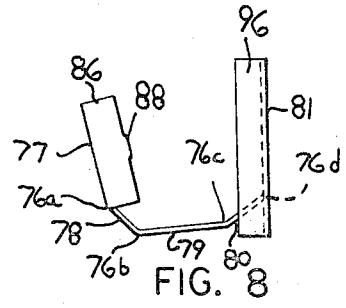


FIG. 8

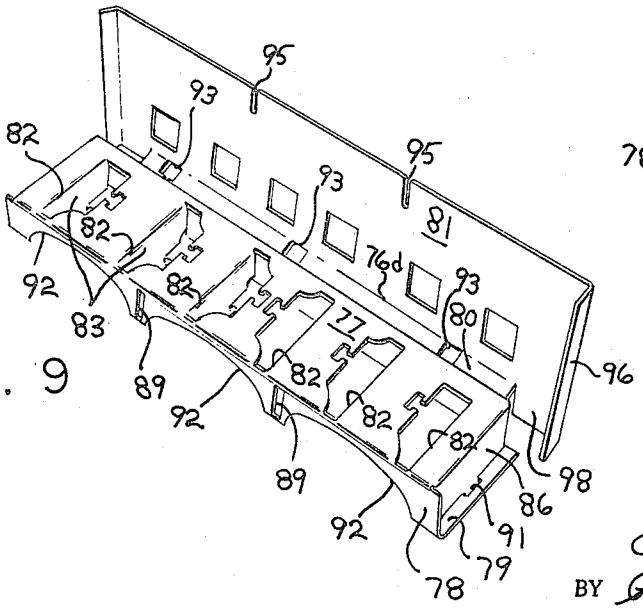


FIG. 9

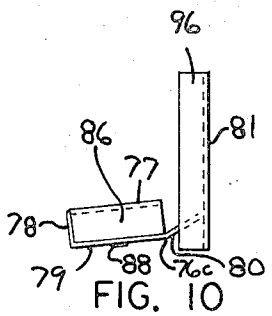


FIG. 10

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Oct. 22, 1968 G. T. BRANDER 3,406,819

CONTAINER CONSTRUCTION

Filed Feb. 3, 1966 9 Sheets-Sheet 6

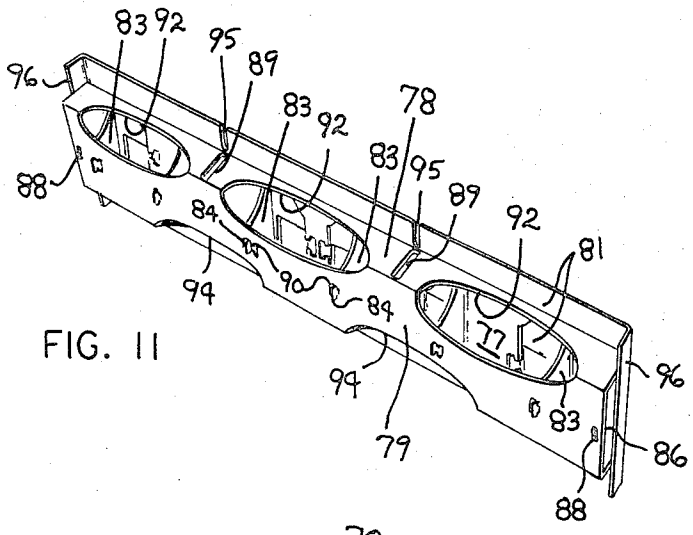


FIG. 11

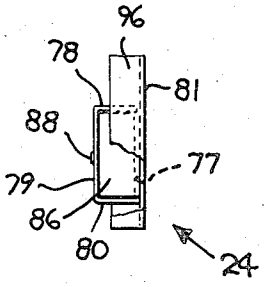


FIG. 12

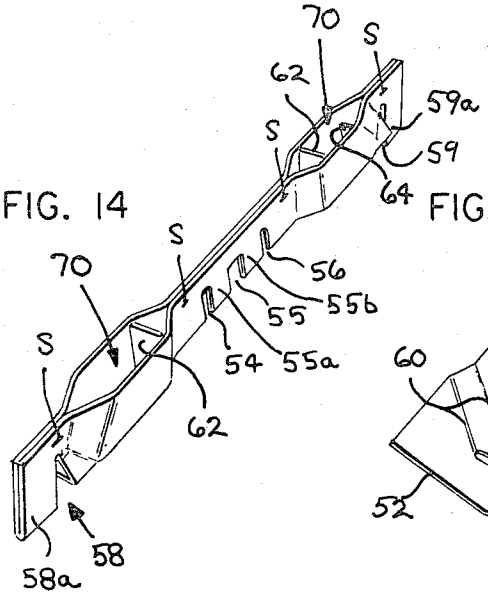


FIG. 14

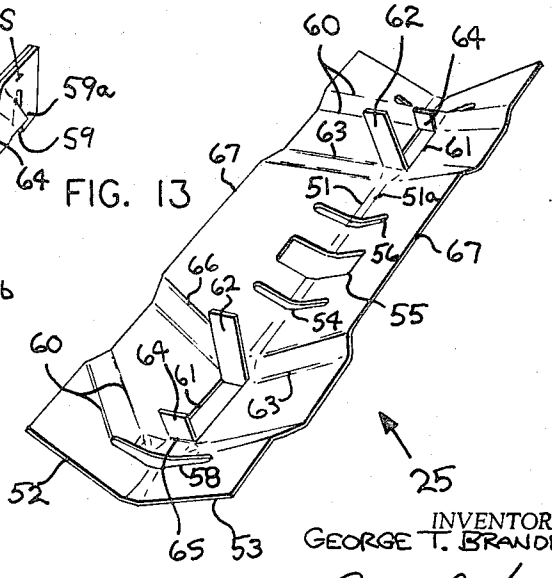
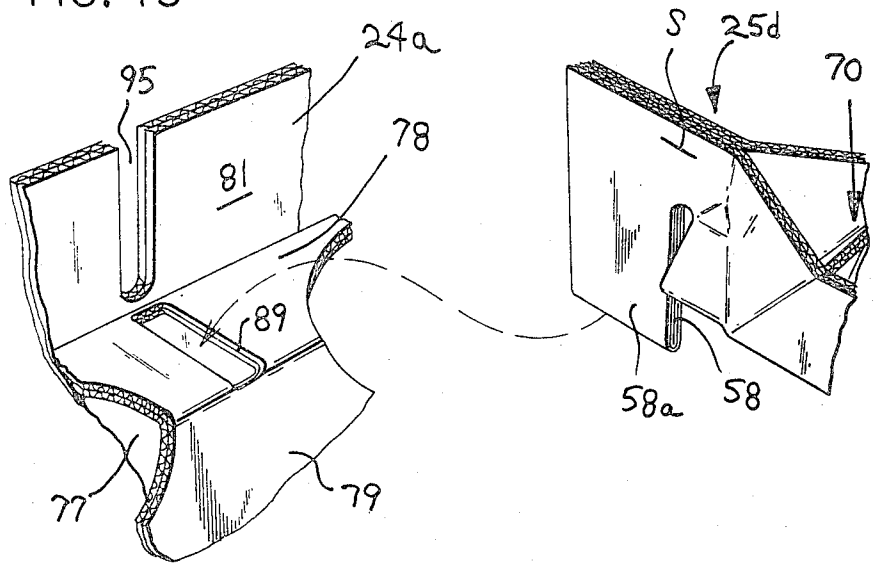


FIG. 13

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FIG. 15



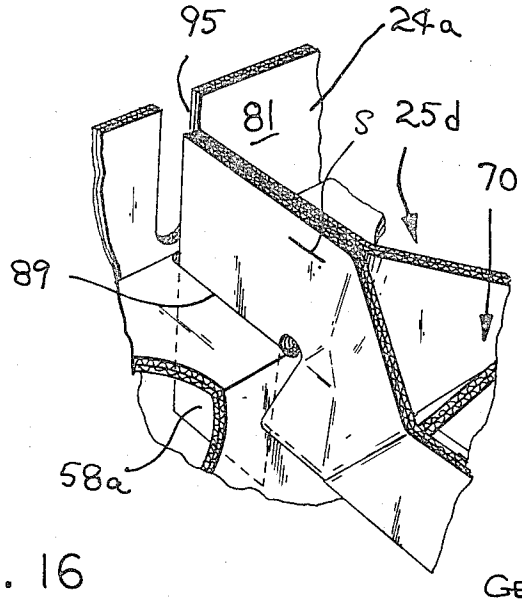


FIG. 16

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Oct. 22, 1968 G. T. BRANDER 3,406,819

CONTAINER CONSTRUCTION

Filed Feb. 3, 1966 9 Sheets-Sheet 8

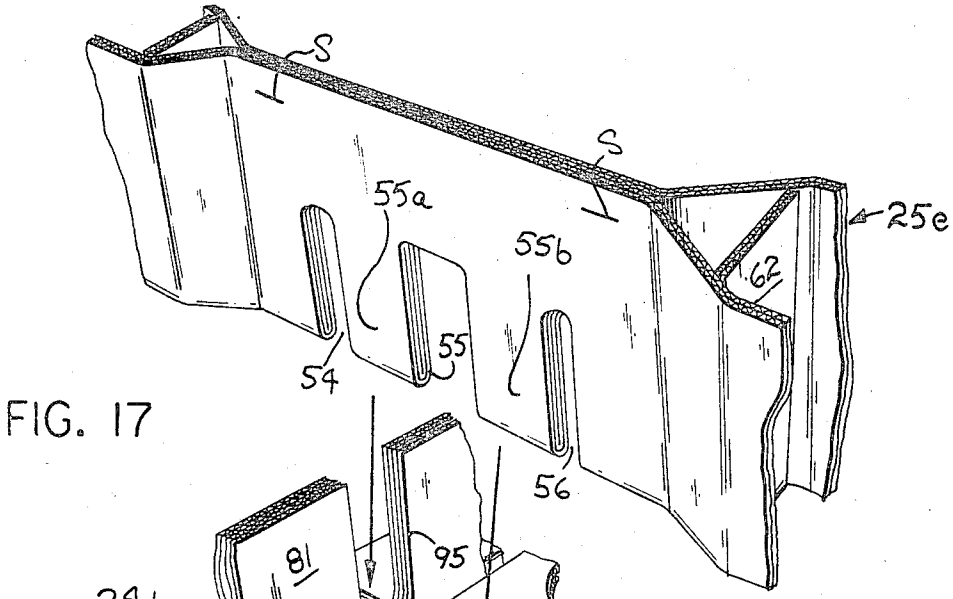
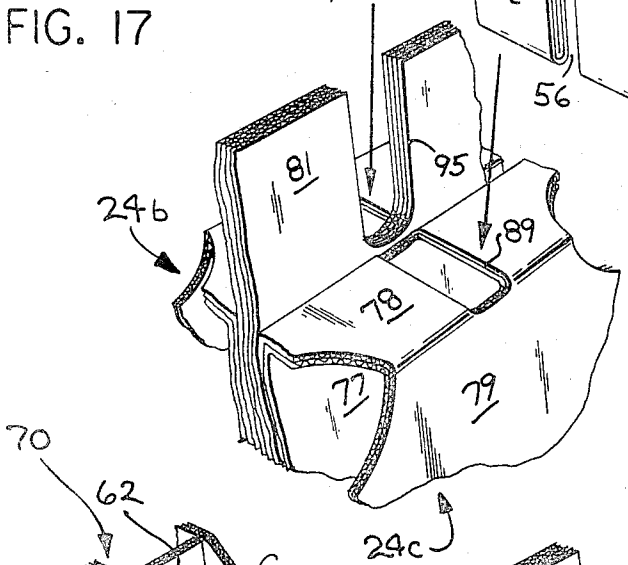


FIG. 17



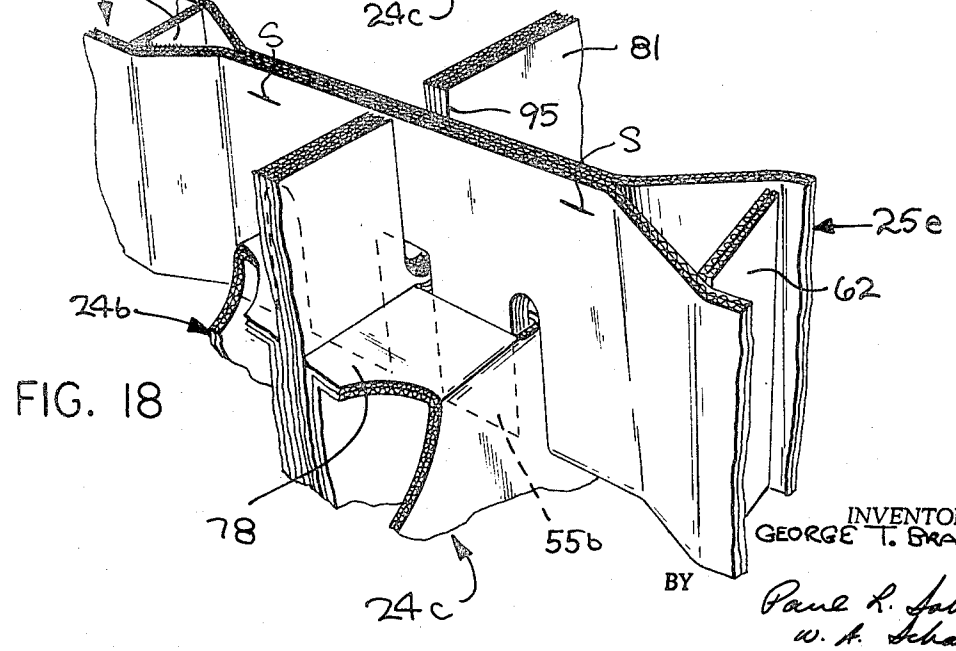


FIG. 18

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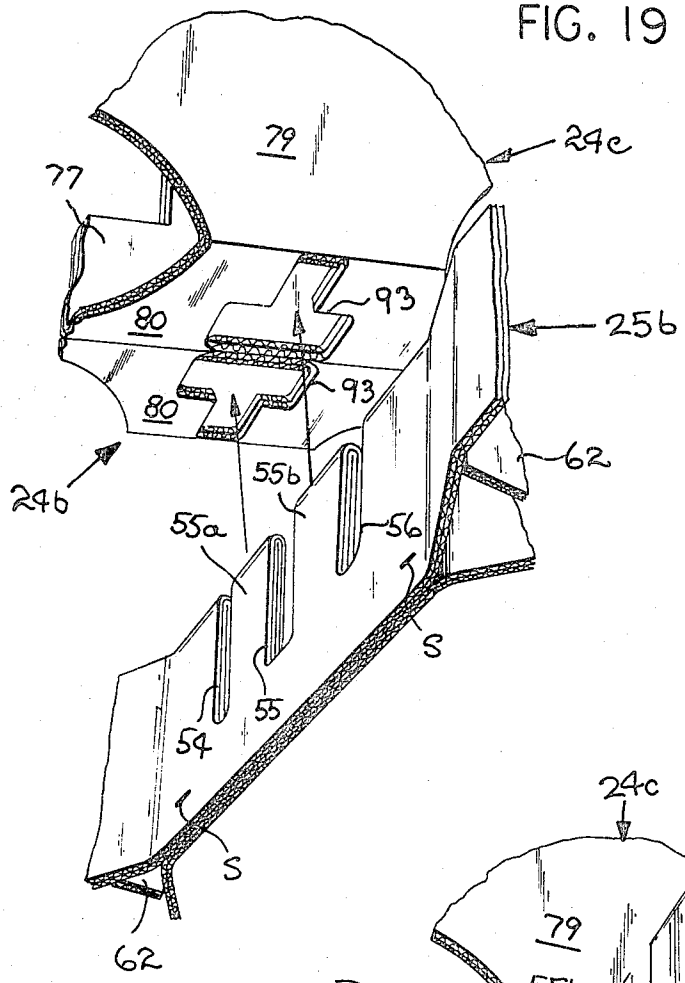
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Oct. 22, 1968 G. T. BRANDER 3,406,819

CONTAINER CONSTRUCTION

Filed Feb. 3, 1966 9 Sheets-Sheet 9

FIG. 19



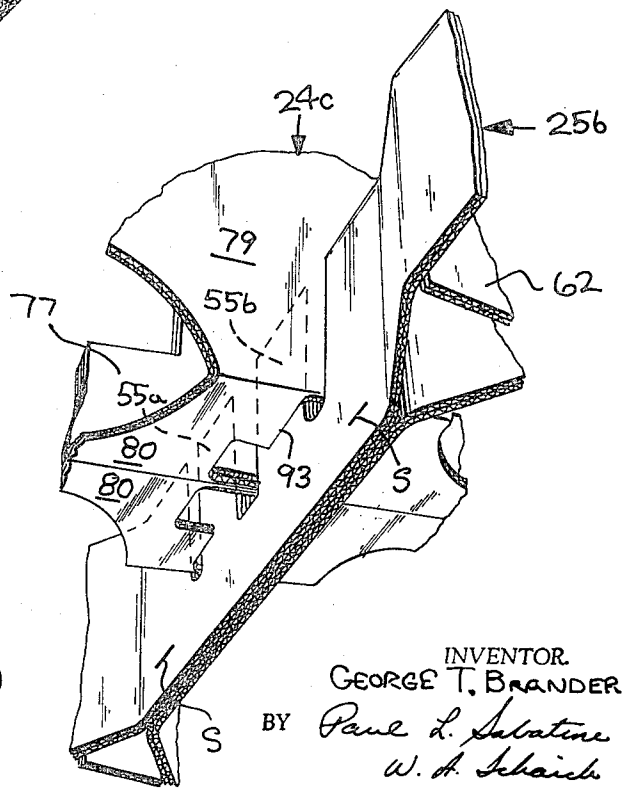


FIG. 20

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United States Patent Office 3,406,819 Patented Oct. 22, 1968

3,406,819

CONTAINER CONSTRUCTION

George T. Brander, Columbus, Ohio, assignor to Owens-Illinois, Inc., a corporation of Ohio

Filed Feb. 3, 1966, Ser. No. 524,878
14 Claims. (Cl. 206—65)

ABSTRACT OF THE DISCLOSURE

This application discloses a corrugated fibreboard container construction which has utility in the packaging and shipment of television bulbs. The container features a parallelepiped-shaped shell and, located within the shell, an array of normally horizontally disposed elongated tubular channel members, some of which extend laterally of the shell and others longitudinally, and define, with one another, a plurality of adjacent spaces for receiving and maintaining television bulbs in inverted relationship with respect to adjacent bulbs. Certain of said channel members serve to support the funnel portions of the television bulbs while others of said channels have portions which are effectively but loosely, out of contact with the face-plates of the bulbs.

The present invention relates to a container construction. More particularly, this invention relates to those containers which are more commonly known as shipping cartons. These latter are usually fabricated of paper in the form of chipboard, solid fiber and, more particularly, corrugated board. Corrugated board, as well-known in the art, is composed of spaced facing sheets having, adhesively secured therebetween, a convoluted corrugating medium lending stiffness and considerable strength to the board, particularly in the direction of the corrugations.

The corrugated carton construction of the present invention has been designed to meet a particular packaging use. Thus, the corrugated carton construction of the present invention is adapted, by reason of novel design and features of internal construction, to contain, and to maintain in isolated relationship, a plurality of television tube envelopes, hereinafter referred to as television bulbs.

Television bulbs are manufactured by the glass manufacturer and then desirably shipped to a purchaser who incorporates therein the electronic gun and related equipment as will enable the assembly to be combined with a chassis for ultimate use as a television receiver. Television bulbs include a faceplate (which is the component seen by the television viewer), a marginally connected funnel portion which projects rearwardly, terminating in an elongate cylindrical neck portion. Television bulbs are frequently quite large, extremely unwieldy (by reason of the structure as described) and, consequently, difficult to package.

A common practice in packaging television bulbs is to place them in individual cartons. This, however, is wasteful of space, wasteful of corrugated board and is generally inefficient.

In is an object of the present invention to provide a corrugated carton container which is adapted to contain a plurality of television bulbs in such fashion that the individual bulbs are effectively isolated one from the other whereby the possibility of contact and resultant breakage is avoided.

It is another object of the present invention to provide a container construction which, by reason of novel interior design, provides for location of adjacent television bulbs in inverted relationship whereby economy in space is achieved and, as well, economy of the material forming the container.

It is also an object of the present invention to provide a corrugated carton construction which includes internal

supporting channel members which are so configurated as to essentially immobilize the faceplate region of the television bulb while allow some freedom of motion for the neck portion.

It is still another object of the present invention to provide a corrugated carton construction which embodies structural strength and, at the same time, is economical in terms of the amount of corrugated board used in the construction.

It is likewise an object of the present invention to provide a carton construction which features therewithin an array of interlocking support members which, in addition to lending structural rigidity to the novel container, serves to support and essentially immobilize the television bulbs.

It is another object of the present invention to provide novel supporting channel members of particular utility in that only two different types are necessary. Furthermore, the channels in each group may be interchanged with the same ones in that grouping.

The arrangement, provided by the internal structural members of the carton in the present invention wherein adjacent bulbs may be located in inverted relationship, results in an approximately 50% economy in space.

The above, as well as other objects of the present invention, will become apparent to those skilled in the art from the following detailed description taken in conjunction with the annexed sheets of drawings on which are presented, for purposes of illustration only and not limitation, several embodiments of the present invention.

In the drawings:

FIG. 1 is a three-quarter perspective view of the carton construction of the present invention shown in vertically exploded form for the purpose of more clearly illustrating the interior arrangement of the support members, e.g., channels;

FIG. 2 is a similar exploded view, in dotted outline, with the outer carton elements eliminated to provide a basis for describing assembly of the interior carton components;

FIG. 3 is a plan view of a scored and slotted "blank," two of which are used in forming the principal outer shell of the carton embodying the present invention;

FIG. 4 is a plan view of a "blank," slotted and scored, for use in forming one type of interior carton component, principally elongated support channels; five of which are employed in the carton of this invention;

FIG. 5 is a vertical, partially sectional, view taken generally along the line 5—5 of FIG. 1;

FIG. 6 is a plan view of a planar "blank" slitted, cut and scored as to form, when folded together and stapled the second type of supporting channel member of which four are employed in erecting the carton of this invention

FIG. 7 is a perspective view of the "blank" of FIG 6 shown partially folded in erected condition;

FIG. 8 is an edge view of the "blank" as shown in FIG. 7;

FIG. 9 is a perspective view of the structure of FIG 7 folded over in a later stage of erection and with certain parts interlocked;

FIG. 10 is an edge view of the construction as shown in FIG. 9;

FIG. 11 is a perspective view of the supporting channel member shown in FIGS. 6–10 fully erected, stapled and adapted for incorporation into the carton construction of the present invention;

FIG. 12 is an end view of the channel of FIG. 11;

FIG. 13 is a perspective view of the "blank" shown in FIG. 4 partially folded into erected configuration;

FIG. 14 is a perspective view of the same "blank" of FIGS. 4 and 12 fully erected, stapled and adapted for incorporation into the carton of this invention;

FIG. 15 is a partially perspective view showing an end of the one type of elongate support channel and the interengaging portion of the other type of support channel, said channels being slightly spaced apart;

FIG. 16 is also a perspective view showing the two components shown in FIG. 15 in assembled mating engagement;

FIG. 17 is a broken-away perspective view of portions of one type of channel members in back-to-back relationship and, situated thereabove, the mating segment of one of the second type of support channel;

FIG. 18 is a perspective view of the same parts as shown in FIG. 16 in engaged relationship;

FIG. 19 is a perspective view, with parts broken away, of the underside of the two back-to-back support members of FIG. 17 about to engage the central portion of one of the second type of support channel; and

FIG. 20 is a view similar to FIG. 19 showing the two channels in engaged relationship.

In its simplest embodiment, the present invention envisions a corrugated carton construction featuring an outer shell which includes spaced side walls, end walls, a bottom wall spanning said side and end walls, a removable upper closure and, located within said shell, an array of elongated tubular channel members in perpendicular relationship and defining a plurality of adjacent spaces for receiving and maintaining television bulbs in inverted relationship with respect to adjacent envelopes; certain of said channels serving to support the funnel portion of the television bulbs while certain of said channels hold portions effectively but loosely out of contact with other bulbs. It is an additional feature of the carton construction of this invention that provision is made for the channel members to engage with one another to thereby reinforce the overall carton.

Referring now more particularly to the drawings, there is disclosed in FIG. 1 a complete carton **20** of the present invention shown vertically exploded to reveal the interior construction. The carton **20** is composed of a rectangular shell **21**, a bottom pad **22**, a releasably engaging array of support channels **23**, a top pad **26** and, lastly, a cap **27** which serves as a top closure. The carton shell **21** is shown in its usual shipping position mounted on a "pallet" or "skid" **29**. The support channels **23** are of two types. Reference numerals **24***a*, **24***b* and **24***c* and **24***d* identify the four bulb support channels which extend from end wall to end wall and also from top to bottom. They feature cutaway portions (to be described) which support and confine the funnel portion of a television bulb. Reference numerals **25***a*, **25***b*, **25***c*, **25***d* and **25***e* identify the five neck support channels which are perpendicular to the bulb channels **24**; neck channels **25***a*, **25***b* and **25***c* being generally below the bulb channels **24** while neck channels **25***d* and **25***e* are situated above the bulb channels.

FIGS. 1, 2 and 5 may be considered together for a better understanding of the relationship of the channel members and the television bulbs supported thereby in inverted relationship.

The shell **21** is formed by folding and taping together two of the "blanks" **30** shown in FIG. 3. This blank **30** is generally rectangular and is formed of double wall corrugated board having corrugations running as indicated at cutaway **30***a*. It is provided with a longitudinal score foldline **31**, a slit **32** proceeding from the bottom edge **33** to the foldline **31** and, from that point, another score foldline **34** in alignment therewith and proceeding to the upper free edge **35**. The foldline **31** separates panel **36**, which forms one of the side walls of the shell, from panel **37**, which forms a bottom wall of the ultimate carton when folded normal to panel **36**. Panel **38**, separated from panel **36** by a score foldline **34**, forms one end wall of the shell, while panel **39**, separated therefrom via foldline **31** when folded normally to panel **38**, becomes a portion of the bottom wall. Panels **38** and **36** when folded normally to each other thus form one-half of the carton and when joined with another like half and taped, for example, at edges **40** to a like subassembly, form the complete rectangular shell **21**. The tape joint is identified by the reference letter T in FIG. 1.

The bottom pad **22** is formed of a planar sheet of double wall corrugated board provided with three centrally located parallel score foldlines **42**, **43** and **44** which, when reversely folded, form the central triangular (in section) ridge **45** shown in FIG. 1. The pad also contains three spaced parallel slits **45***a* extending between score foldline **42** and **44**, which serve as guide slits for the three lowermost of the neck channels **25**. Channels **25***a* and **25***b* are shown engaged by the slits **45**, while the third neck channel **25***c* is shown in assembly with the bulb channels **24** in a manner to be described.

The neck channels **25***a*–**25***e* (five) are identically formed, as indicated hereinbefore, from identically cut and scored "blanks."

The bulb channels **24**, of which there are four, are located in spaced relationship as shown; the two outer of which fall along the side walls of the shell, while the centermost two are located in back-to-back relationship as shown. The neck channels **25***a*–**25***e* are formed from the "blank" **50** shown in knocked-down plan view in FIG. 4 and are foldably erected into channel configuration in the manner illustrated in FIGS. 13 and 14.

The "blank" **50** is rectangular and, like the other components of the carton construction of the present invention, formed of double wall corrugated board in which the corrugations run in the direction indicated in the cutaway section **50***a*. Spaced parallel perforated scores **51** and **51***a* on either side of the longitudinal axis of the "blank" **50** provide relative foldability of the two halves **52** and **53**. The "blank" contains, proximate the central region, three spaced transverse cutouts **54**, **55** and **56**. The centermost cutout contains a slight bulge slot **55** on both side edges near the center, as at **57**. Similarly, the closest edges of the adjacent slot cutouts **54** and **56** are bulged, as also identified by the reference numeral **57**. Cutouts **58** and **59**, similar to cutouts **54** and **56**, are located near the end extremities of the "blank" **50**. In a manner to be described, these cutouts define tongue or prong means which cooperatively mate with slots formed in the tube channel members **24**. Reference numeral **60** defines pairs of perforated score lines which proceed angularly from the upper and lower free edges toward the cutouts **58** and **59** at each end. Reference numeral **61** defines full thickness cuts which define two major tabs **62** foldably connected to the "blank" via foldlines **63** and minor tabs **64** foldably connected to the "blank" via foldlines **65**. The foldlines **63** extend laterally beyond cuts **61**, that is, the full width of the "blank" **50**. Another pair of full width foldlines **66** are spaced toward the center from the foldlines **63**. Very short parallel foldlines **68** connect the slots **58** and **59** with the perforated scores **60** and the intersection thereof with full thickness cuts **61** and provided ready foldability in the region containing these four foldlines **65**.

To convert slotted and scored "blank" **50** into a channel **25**, the two major tabs **62** are folded upwardly normal to the "blank" **50** about the foldlines **63** in a manner shown in FIG. 13. Similarly, the minor tabs **64** are folded upwardly via foldlines **65**. The lateral free edges **67** are thence bent upwardly and brought together and stapled, as at S, to fasten the two halves together at the places indicated in FIG. 12. The referred-to scores, perforated scores and the arrangement thereof cooperate with the upstanding major tabs **62** and the minor tabs **64** at each end in holding portions of the side walls of the channel spaced apart to define enclosure openings **70** as the free edges **67** are brought together to form the channel. As can be seen, the upstanding sets of tabs **62** and **64** as indicated, in cooperation with the surrounding score and cut score lines, prevent the side walls from assuming face-to-face relationship, as is the case with the remainder

of the blank halves 52 and 53. A neck channel member 25, shown fully erected in FIG. 12, will be described more fully hereinafter as to its interconnecting engagement with the tube channel member 24.

The tube channel members 24*a*, 24*b*, 24*c* and 24*d* are each erected from a die-cut, scored and slotted "blank" 75 shown in knocked-down plan view in FIG. 6 and in various stages of folding and erection in FIGS. 7–12. The "blank" 75 is formed of double wall corrugated board and the corrugations are shown in the cutaway portion 75*a*. Referring to FIG. 6, four parallel longitudinal score foldlines 76*a*, 76*b*, 76*c* and 76*d* separate side-by-side panels 77, 78, 79, 80 and 81. Panel 77 contains six spaced, parallel score foldlines 82. In each case, the extremities of these score foldlines 82 are connected by an irregular full thickness cut outlining, together with the foldlines, six foldable flaps 83. The flaps are generally rectangular, but have a T-shaped tab 84 formed on one side. Also, the corners of the flaps 83 are truncated in varying degrees, as at 85, for a purpose to be described. Flaps 86 are foldably connected via foldline 87 to each end of the panel 77; each flap containing an axially extending tab portion 88. Panel 78 contains two spaced slots 89 which extend from foldlines 76*a* to foldlines 76*b*. Panel 79 is provided with six generally equal spaced T-shaped cutouts 90 which are generally in alignment with foldlines 82 in panel 77. Panel 79 also contains, proximate its end extremities, lateral slits 91 corresponding generally in size with tabs 88 formed on flaps 86. Panels 78 and 79 have formed, at their foldline intersection 76*a*, three spaced, generally elliptical, cutouts 92. Panel 80 contains three spaced T-shaped slots 93 located in generally horizontal alignment with the center of the cutouts 92. Panels 79 and 80 are also provided near their line of separation, foldline 76*c*, with two generally elliptically shaped cutouts 94, similar to cutouts 92 in panels 78 and 79. These are generally in alignment with the slots 89 in panel 78. Panel 81 is provided with two spaced notches 95 in the free edges 95*a* in general alignment with the elliptical cutouts 94 in panels 80 and 79 and with the slots 89 in panel 78. Panel 81 also contains six spaced rectangular cutouts 96 which provide access to the interior of the tube-like channels, when erected, for purposes of stapling the various wall parts together. Panel 81 has foldably connected to end extremities thereof flaps 96 which are foldable about foldlines 97. Panel 81 also includes flange portions 98 at each end and separated from panel 80 by cuts 99.

To convert the "blank" 75 into erected channel configuration (e.g., bulb channels 24), the panels 77, 78, 79, 80 and 81 are folded successively on the score lines 76*a*–76*d* in the manner illustrated in FIG. 7 through FIG. 12. Also, the flaps 83 and the flaps 86 are folded inwardly normal to the panel 77. As folding continues and the panel 78 is normal to panel 79 and panel 77 spaced from and about parallel with panel 79, the T-shaped tabs 84 are urged through the cutouts 90 in panel 79 which lock the panels 77, 78 and 79 together in tubular configuration (FIGS. 9 and 10). At the same time, the tabs 88 on flaps 86 at each end of panel 77 are brought normally downwardly, as viewed in FIG. 9, to engage and pass through the slits 91 at each end of panel 79. The construction, as viewed in FIG. 9, is then further folded on the foldlines 76*c* and 76*d* to bring panel 78 into normal relationship with panel 81 and panel 77 into face-to-face relationship with panel 81, as may be seen viewed through the cutout 92 (FIG. 11) or in the end view shown in FIG. 12. The panels 77 and 81 are stapled together, making use of the rectangular openings 96 which are in registry with the cut openings left by the movement of the flaps 83 downwardly out of the plane of the panel 77 to connect with panel 79 via T-shaped cutouts 84. The bulb channel 24, as shown in FIGS. 11 and 12, is in its upright position and adapted to be combined appropriately with the like bulb channels and neck channels 25 and located into the carton 21 in the manner illustrated in FIGS. 1 and 2. It may be noted that the channel 24 in its upright position, as in FIG. 11, has three arcuate cutouts 92 in the side wall 79 and top wall 78, while the same side wall 79 and bottom wall 80 have the two downwardly facing arcuate cutouts 94. Further, as viewed, the abutting panels 81 and 77 form one side wall of the bulb channel, while panel 79 forms the opposite spaced parallel side wall. Panel 78 is the top wall panel and panel 80 is the bottom wall of the channel. The T-shaped cutouts 93 in the bottom wall ultimately serve the same function as the slits 89 in the top wall panel 78. They are T-shaped simply to provide access to the interior of the tubular channel as an aid in affixing staples to secure panel 77 to the panel 81.

With five neck channels 25 and four bulb channels 24 erected as described above, it is in order to describe the manner in which the carton 20, including its channel components, shell-like enclosure and ten television bulbs, are assembled together. Reference should be had to FIGS. 1, 2 and 5 in the following description. First, the carton enclosure (without channels) 21 is erected in the manner described, usually in combination with the pallet or skid 29. Next, the pad 22 is inserted down into the shell defined by the spaced side walls 36 and spaced end walls 38 to rest on the bottom wall defined by the flaps 37 and 39, with the central upstanding ridge 45 in line with the longitudinal axis of the carton. Next, the three neck channel members 25*a*, 25*b* and 25*c* are pushed down into the slots 45*a* spaced along the length of the ridge 45 with the slits 54, 55 and 56 facing upwardly in the manner shown. These three slits define therebetween two prongs or tongues 55*a* and 55*b*. Similar tongues 58*a* and 59*a* are formed on the ends of the channels 25 by the slits 58 and 59. Next, two tube channel members 24*b* and 24*c* are placed in back-to-back relationship with the side walls defined by the panels 77 and 81 abutting. The two notches 95 in each side wall will thus be in registry as will the two slots 89 in each adjoining top wall. Similarly, the three slots 93 in each bottom wall will be located proximate the three corresponding slots 93 in the abutting channel. This side-by-side, hand-held assembly of the two channels 24*a* and 24*c* is lowered down into the carton in bisecting relationship with the three neck channels 25*a*, 25*b* and 25*c*. Engagement occurs as the upstanding tongues 55*a* and 55*b* on the neck channels 25*a*, 25*b* and 25*c* are received by the slots 93 in the side-by-side bottom walls of the tube channels 24*b* and 24*c*. FIG. 19 is an enlarged perspective view (looking upwardly) just prior to engagement of the upstanding tongues 55*a* and 55*b* on neck channel 25*b* with side-by-side center cutouts 93 in the bottom walls of bulb channels 24*a* and 24*b*. FIG. 20 is similar to FIG. 19, but showing the relationship after engagement; the upstanding prongs 55*a* and 55*b* being shown in dotted outline.

The slots 93, 54, 55 and 56 and tongues 55*a* and 55*b* are sized for frictional engagement lending rigidity and overall reinforcement to the carton construction. With the two abutting bulb channels located in engaging bisecting relationship with the three lowermost neck channels 25*a*, 25*b* and 25*c*, the carton enclosure is divided into two rows, each adapted to receive two television bulbs face down; that is, with the necks upstanding. One bulb 200 is shown in dotted outline in FIG. 1.

In inserting the bulbs face down, the neck is bent slightly toward the center bulb channels so that the funnel portion of the television bulb will slip underneath the arcute edge 94 formed in the side wall 79 and bottom wall 80 and then returned to a vertical position, as shown. When four bulbs have been located in face-down position, like the bulb 200, the two remaining bulb channels 24*a* and 24*d* are inserted down into the carton along the opposed side walls 36. The bulb channels 24*a* and 24*d* engage with the neck channels 25*a*, 25*b* and 25*c* as the end prongs 58*a* and 59*a* at each end of each of the neck channels project into the slots 93 in the bottom wall 80

of the bulb channels. As the bulb channels engage the neck channels, two downwardly facing arcuate cutout portions **94**, in each, contact the funnel portion of the bulbs, providing balanced contact therewith since the same contact occurs between the funnel and the center bulb channels **24***b* and **24***c*.

The next step is to introduce the two remaining neck channels **25***d* and **25***e*, one at a time. These neck channels are first inverted with respect to the other neck channels; that is, with the prongs **55***a*, **55***b*, **58***a* and **59***a* projecting downwardly and with the well-like opening or enclosures **70** (four) situated over the upstanding necks of the four bulbs already in the carton. Engagement of neck channel **25***d* occurs as tongues **58***a*, **55***a*, **55***b* and **59***a* project into slots **89** in each of the bulb channels **24***a*–**24***d* (see FIGS. 1 and 2). Similarly, neck channel **25***e* engages the bulb channels as the tongues **58***a*, **55***a*, **55***b* and **59***a* project downwardly through slots **89** in each. The engagement of the endmost neck channel tongue **58***a* or **59***a* with bulb channel slot **89** is shown in enlarged perspective in FIGS. 15 and 16, while the engagement of the central neck channel tongues **55***a* and **55***b* with bulb channel slots **89** is shown in FIGS. 17 and 18. As the tongues pass through the slots, the well-like chambers **70** (two in each neck channel) telescopically receive the ends of the neck portions of the four television bulbs already in the carton.

With these neck channels **25***d* and **25***e* in place, the necks of the television bulbs already in the carton are protected and the remaining television bulbs (six) can be introduced. Thus, three bulbs are located on one side of the center bulb channels **24***b* and **24***c* and three bulbs on the other. In so doing, the neck portions of the television tubes are guided downwardly into the well openings or enclosures **70** (six) formed in the three lower neck channels **25***a*, **25***b* and **25***c*. At the same time, the funnel portion of the bulbs comes to rest in the opposing arcuate cutouts **92** in the spaced bulb channel sets **24***a*–**24***b* and **24***c*–**24***d*. There are three sets of these facing arcuate cutouts **92** on the left-hand side of the carton as viewed in FIG. 1 and three sets of the facing arcuate portions on the right-hand side. Lastly, the corrugated pad **26** is laid down over the array of bulbs and the cap closure **27** is telescoped down about the side walls of the container proper **21** and secured thereto. It should be here mentioned that the corner cuts **85** on the flaps **83** are provided so the edges will not interfere with the fitting of the tubes down into the arcuate recesses **92** or **94**.

Looking at FIG. 5, it can be seen that the adjacent tubes in each row (between bulb channels) are in inverted relationship with the neck portions protected protected against accidental contact with the faceplate or funnel portion of an adjacent television bulb. The television bulbs, which are rectangular, are also held relatively mobile against accidental shifting on their own axis by reason of the engagement of the funnel portion with the arcuate cutouts in the side walls of the bulb channels and, as well, by the arcuate cutouts in the top walls of the bulb channels.

It is also a particular feature of the present invention that the side walls of the bulb channels, which are flush with the side walls of the carton, are of double thickness; that is, formed of the panels **81** and **77**. Furthermore, they extend the full depth of the carton defined by the side wall **36** as to lend structural rigidity from top to bottom. Also contributing to this top-to-bottom strength are the end flaps **96** extending from the bulb channels **24***a*–**24***d* which are bent into the plane of the adjacent wall and add particularly to corner strength, since these flaps extend from top to bottom of the carton **21**. Also contributing in top-to-bottom strength is the feature of construction wherein the center of the carton is structurally supported by two bulb channels which have their double wall side walls (panels **77** and **81**) in flush engagement and extending from top to bottom of the carton. The flange flaps **96**, which are oppositely bent in channels **24***b* and **24***c*, also provide reinforcement in the center of the carton. These latter features are of importance since it is desirable to stack these cartons one on top of the other in shipping and in plant inventory.

The carton construction of this invention is very desirable since only two channel designs are necessary; thus simplifying production of the "blanks" and also facilitating assembly since the two channels are readily distinguishable, one from the other, and only the two types are needed. In the past, it has not been uncommon to find three and four different types of carton components which hinder efficient assembly, since a workman's selection of a wrong channel at a critical time can delay assembly and loading of the carton with television bulbs.

It will further be appreciated that the longitudinal dimension of the carton is reinforced against compression by reason of the four bulb channels therein which are of tubular configuration and structurally rigid, particularly by reason of the flaps **83** engaging and structurally reinforcing the spaced side walls of each of the bulb channels.

The width dimension of the carton is also reinforced by the five neck channels **25***a*–**25***e* which, in turn, are reinforced by frictional tongue-slot engagement with the bulb channels.

It is an important feature of the present invention that the bulb channels are formed to define upwardly and downwardly facing arcuate cutouts in the wall portions; which cutouts are of a configuration to support both the underside of the funnel portion and, as well, the marginal side of the funnel portion whereby rotation of the television bulbs on their own axis is precluded. At the same time, the well-like chambers **70** formed in the neck channels are such as to permit some movement of the neck. Thus, it is and would be undesirable to hold the neck portion and the funnel portion absolutely relatively rigid since any slight movement could cause breakage somewhere in the funnel portion or at the juncture of the neck portion with the funnel portion. The well-like enclosures in the neck channel are selected of a size as to permit some slight movement of the neck; yet it is restricted in the sense that it is prohibited from contacting the adjacent funnel portion of the next adjacent, inverted television bulb.

The carton of the present invention, by reason of the constructional features contained therein as described above, is also extremely useful since the tongue and slit arrangement provided by this design permits the channel members and the television bulbs therein to be quickly and safely disassembled for speedy unpacking.

In summary, the channel members, by reason of their inner engagement and interlocking, provide for essential isolation of adjacent, inverted television bulbs, one from the other, and at the same time provide inner reinforcing strength to the overall carton. All of the slots and cutouts are sized as to snugly and frictionally receive the wall portion of the engaging channel member.

Modifications may be resorted to without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A container construction formed of relatively stiff, sheet-like material, said container being adapted for receiving and maintaining a plurality of television bulbs in inverted, noncontacting relationship with adjacent bulbs, said bulbs including a faceplate and a connected rearwardly projecting funnel portion terminating in an elongated tubular neck portion,

said construction including a shell-like enclosure comprising side, end and bottom walls and a removable closure therefor,

said construction including, within said enclosure, a plurality of elongated channel members, in spaced, three-dimensional array defining a plurality of adjacent spaces for supportingly maintaining television

bulbs in inverted relationship with respect to adjacent bulbs.

said channel members including a first group which extends from end wall to end wall of said shell-like enclosure to reinforce same and which contains arcuate recesses supportingly receptive of the said funnel portion of the bulbs, and a second group defining enclosures for the said neck portions of said bulbs, said first and second group of channel members being perpendicular to each other,

said second group of channel members extending from side wall to side wall of said shell-like enclosure to reinforce same,

said first and second group of channel members having slots and tongues formed therein providing mating engagement therebetween and consequent reinforcement of each group by the other together with overall reinforcement of the shell-like enclosure.

2. A container construction formed of relatively stiff, sheet-like material, said container being adapted for receiving and maintaining a plurality of television bulbs in inverted, noncontacting relationship with adjacent bulbs, said bulbs including a faceplate and a connected rearwardly projecting funnel portion terminating in an elongated tubular neck portion,

said construction including a shell-like enclosure comprising side, end and bottom walls and a removable closure therefor,

said construction including, within said enclosure, a plurality of elongated channel members in spaced, three-dimensional array defining a plurality of adjacent spaces for supportingly maintaining television bulbs in inverted relationship with respect to adjacent bulbs,

said channel members including a first group which extends from end wall to end wall of said shell-like enclosure to reinforce same and which contains arcuate recesses supportingly receptive of the said funnel portion of the bulbs, and a second group defining enclosures for the said neck portions of said bulbs, said first and second group of channel members being perpendicular to each other, said second group of channel members extending from side wall to side wall of said shell-like enclosure to reinforce same, wherein said first group numbers four identical bulb channel members, two of which are arranged in flush engagement with said side walls of said shell-like enclosure and two of which are in flush back-to-back relationship along the longitudinal axis of said shell-like enclosure, said bulb channel members extending from the bottom wall to the upper edges of said end walls, said arrangement of bulb channels defining two parallel rows for location of television tubes.

3. A container as claimed in claim 1 wherein said second group includes five identical neck channel members, three of said neck channels being located in spaced, parallel relationship transverse to said bulb channels and extending generally along the said bottom wall of said shell-like enclosure, two of said neck channels being in spaced, parallel relationship transverse to said bulb channels and extending generally along the top of said shell-like enclosure, said upper two neck channels being located respectively midway between said first and second lower neck channels and midway between said second and third lower neck channel members.

4. A container as claimed in claim 3 wherein said neck channels each comprise a one-piece, elongated planar sheet folded on its longitudinal axis in generally face-to-face relationship but being slitted and scored to define two sets of adjacent foldable tabs bisected by said longitudinal axis, said tabs being foldable normal to the plane of said sheet prior to folding said sheet on its longitudinal axis so as to define spaced regions wherein said walls are held apart to define enclosures for neck portions of said tubes.

5. A container as claimed in claim 1 wherein said bulb channel members each have connected side and top walls cut to define three spaced arcuate recesses, said three recesses in each bulb channel being in opposed facing relationship with like recesses in a bulb channel on the other side of the said row.

6. A container as claimed in claim 5 wherein said bulb channel side walls include segments which are vertically coextensive with the said side and end walls of said shell-like enclosure, thereby lending improved top-to-bottom strength in said enclosure.

7. A container as claimed in claim 5 wherein said bulb channel members each have connected side and bottom walls cut to define two spaced arcuate recesses, said two recesses in each bulb channel being in opposed facing relationship with like lower recesses in an opposed tube channel, said two lower recesses being in offset relationship midway respectively between the three upper recesses.

8. A container as claimed in claim 7 wherein the second group of channel members include five identical neck channel members, three of said neck channels being in spaced parallel relationship transverse to said bulb channels and extending generally along the said bottom wall of said shell-like enclosure vertically beneath the three upper arcuate recesses in said bulb channels, two of said neck channels being in spaced, parallel relationship transverse to said bulb channels and extending generally along the top of said shell-like enclosure directly above the two lower arcuate recesses in said bulb channels.

9. A container as claimed in claim 8 wherein said neck channels each define a pair of enclosures for the necks of a pair of television bulbs in different rows defined by said bulb channels.

10. A container for shipping a plurality of television bulbs with adjacent bulbs in inverted relationship, said container including:

an outer shell including side, end and bottom walls and a removable top closure,

said container including within said shell:

a pair of elongate bulb channels in spaced, parallel relationship extending along said bottom wall, said channels each including an upper portion and a lower portion, and

a plurality of three elongate neck channels in spaced, parallel relationship and extending transversely of said bulb channels, the two outer of said neck channels being located generally along one of said bottom and top wall of said shell and the intermediate one of said channels being located generally along the other of said bottom and top wall of said shell,

said spaced bulb channels being cut away in the upper and lower portions to define three sets of opposed arcuate recesses in offset relationship and supportingly receptive of the arcuate funnel portion of three side-by-side bulbs located invertedly therebetween,

said neck channels defining an enclosure guidingly receiving the neck portion of side-by-side inverted bulbs.

11. A container construction formed of relatively stiff, sheet-like material, said container being adapted for receiving and maintaining a plurality of television bulbs in inverted, noncontacting relationship with adjacent bulbs, said bulbs including a faceplate and a connected, rearwardly projecting funnel portion terminating in an elongated, tubular neck portion,

said construction including a shell-like enclosure comprising connected side, end and bottom walls and a removable closure therefor,

said construction including, within said enclosure:

a plurality of first channel members in spaced, parallel relationship and having upper edges and lower edges and

a plurality of second channel members in spaced

relationship normal to said first channel members, said channel members being generally parallel, respectively, to said side and end walls,

two of said spaced first channel members including:

(a) a first set of opposed arcuate recesses in said upper edges supportingly receptive of the funnel portion of a bulb with its neck portion extending downwardly,

(b) a second set of opposed arcuate recesses in said lower edges supportingly receptive of the funnel portion of a second bulb in a position inverted with respect to said bulb in said first set and

(c) a third set of opposed arcuate recesses in said upper edges supportingly receptive of the funnel portion of a third bulb in the same relative position as the one maintained by said first set,

said second channel members being located proximate the neck portions of said bulbs and including spaced wall portions defining an integral enclosure for said neck portions.

12. A container construction as claimed in claim **11** wherein said first channel members include lateral foldable flaps which correspond to the height of said shell-like enclosures as defined between the bottom wall and the upper edge of said side and end walls thereof, and said lateral flaps are arranged in flush abutment with the end walls of said shell-like enclosure when erected.

13. A container for shipping a plurality of bulbs with adjacent bulbs in inverted relationship, said container including:

an outer shell,

a pair of elongate bulb channels in spaced, parallel relationship and extending from end-to-end of said shell, said channels each including an upper wall, a lower wall, facing side walls and outer side walls,

a plurality of three elongate neck channels in spaced, parallel relationship and extending transversely of said bulb channels, two of said neck channels being located generally in the plane of said bottom wall of said bulb channels and one of said channels being located generally in the plane of said top wall of said bulb channel, said latter upper neck channel being midway between the two lower neck channels as viewed in a top plan view of said pack,

said facing and top walls of said parallel bulb channels being cut way to define two spaced sets of arcuate recesses supportingly receptive of the arcuate funnel portion of two similarly disposed bulbs, said recesses being spaced to to provide room for an intermediate inverted bulb,

said two of said neck channels in the plane of the bottom wall each defining an upwardly opening enclosure guidingly receiving the neck portion of said two similarly disposed bulbs,

said facing and bottom walls of said parallel bulb channels being cut away, in a region midway between said two lower neck channels, to define opposed arcuate recesses supportingly receptive of the arcuate funnel portion of said intermediate inverted bulb, and

said upper neck channel defining a downwardly opening enclosure guidingly receiving the neck portion of said inverted bulb.

14. A container as claimed in claim **13** wherein one of the said side walls of each of said bulb channels are cut to define a spaced plurality of foldable flaps extending normally from said side walls, and said opposite side walls of the same channel contain a plurality of cutouts, said flaps each including a tab extremity engaging said cutouts to lend structural rigidity to said channel.

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