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CONTAINER AND PACKING CONSTRUCTION

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FIG. 1

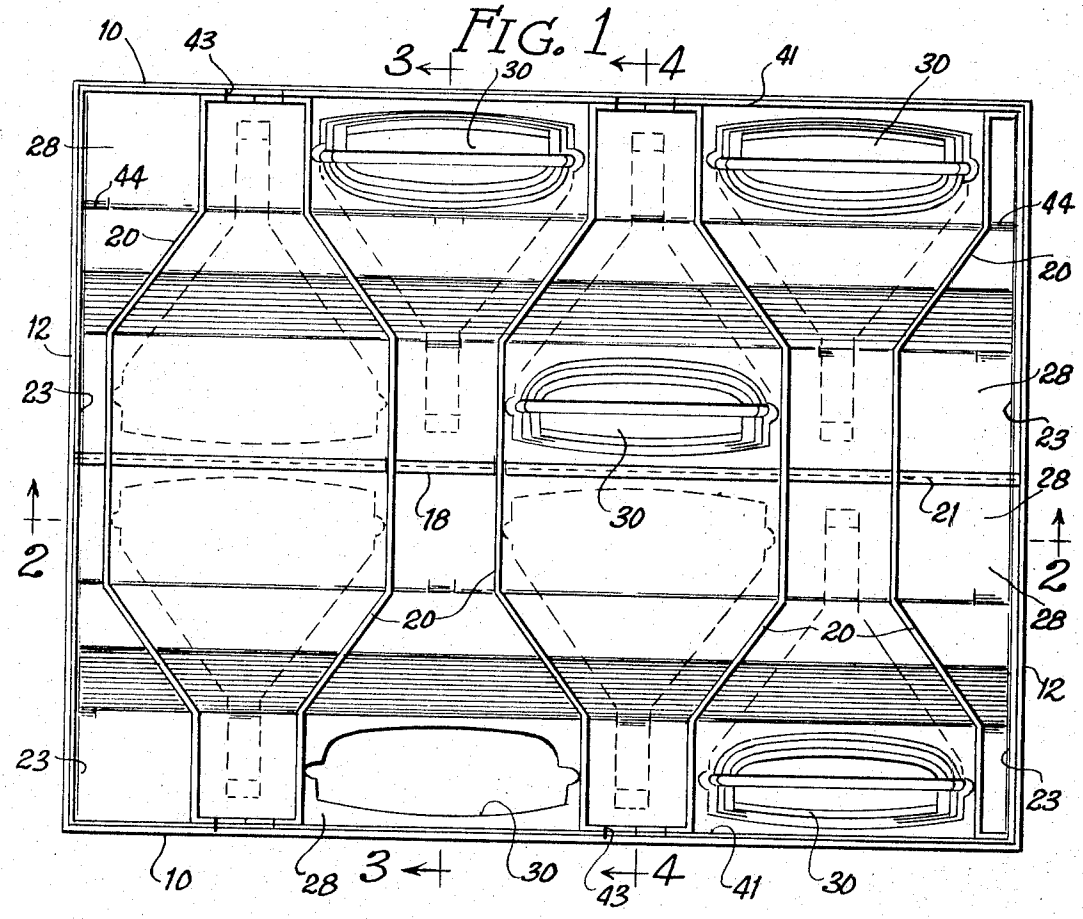
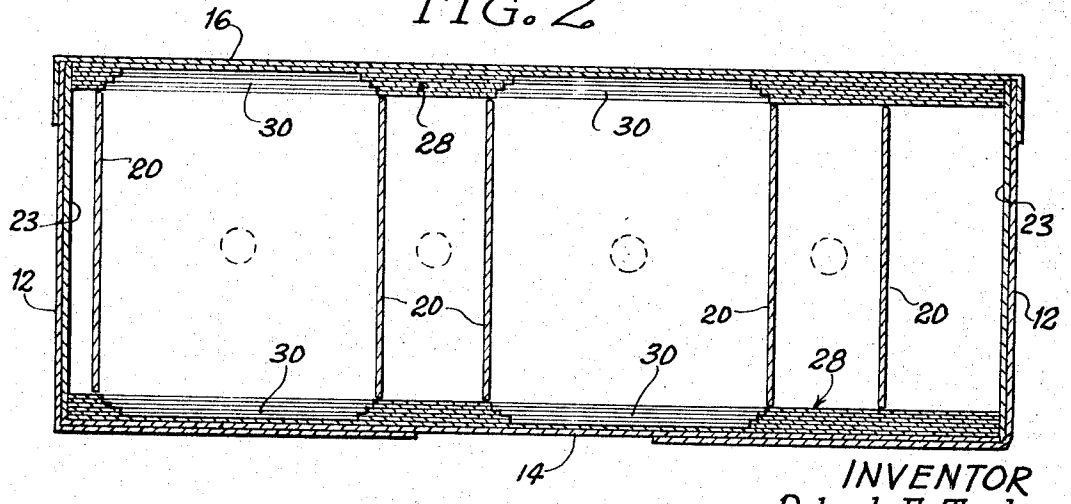


FIG. 2



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FIG. 3

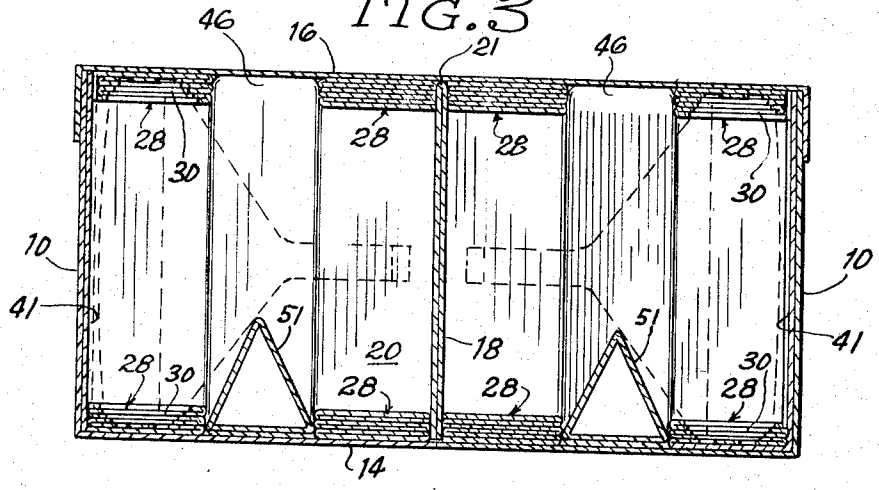


FIG. 4

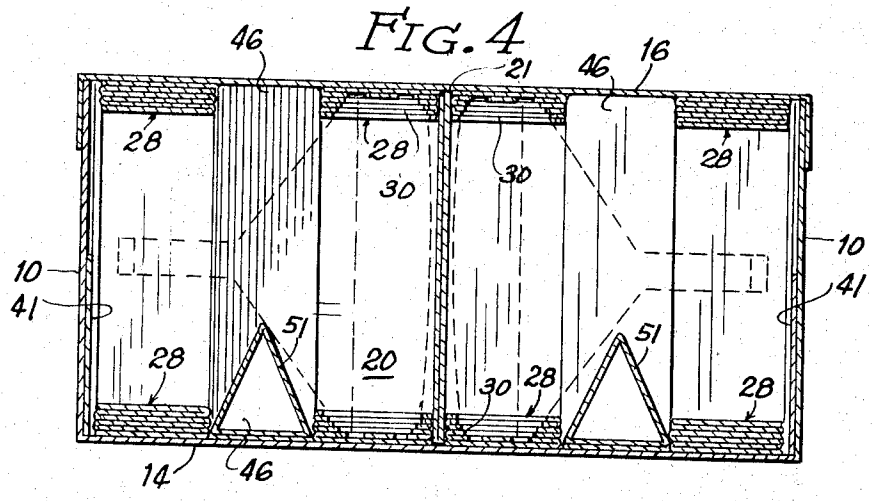
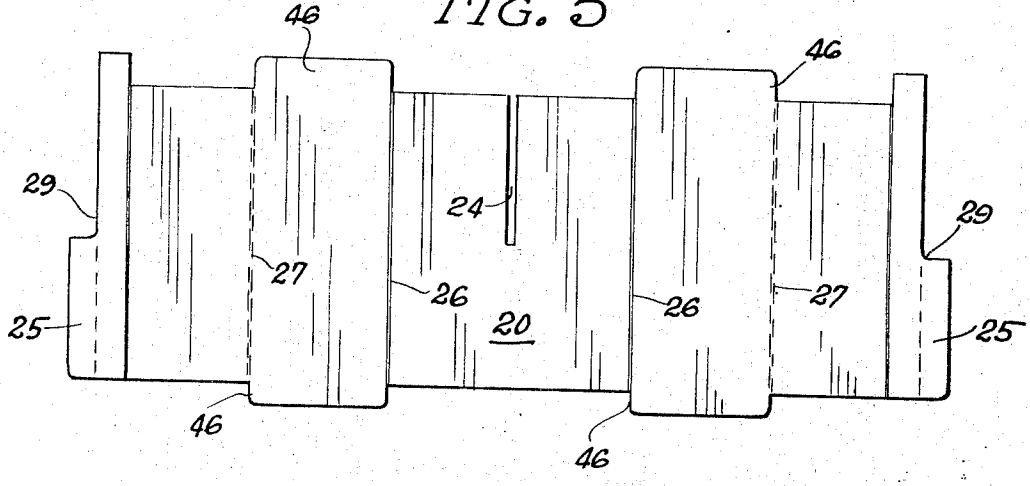


FIG. 5



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FIG. 6

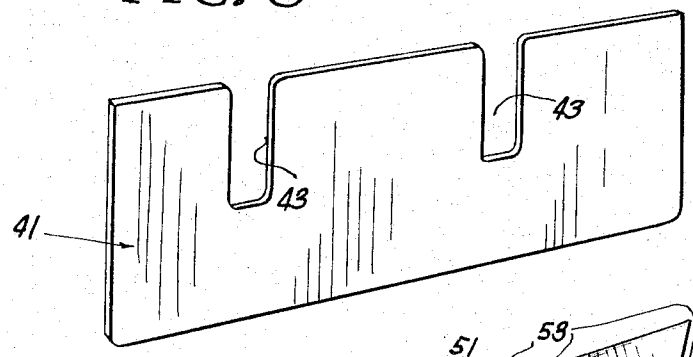


FIG. 7

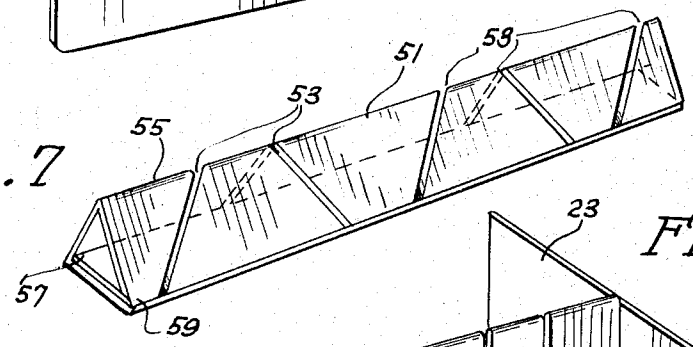


FIG. 8

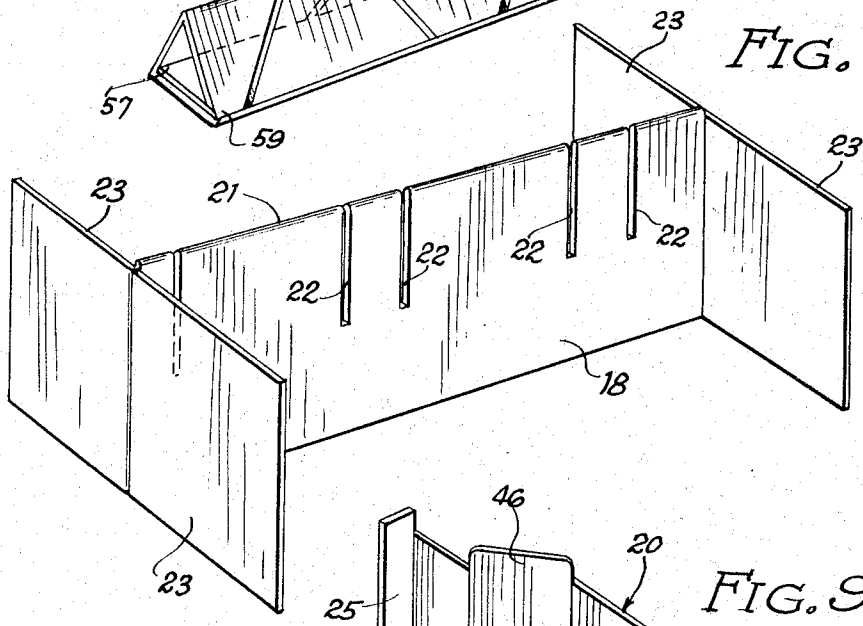


FIG. 9

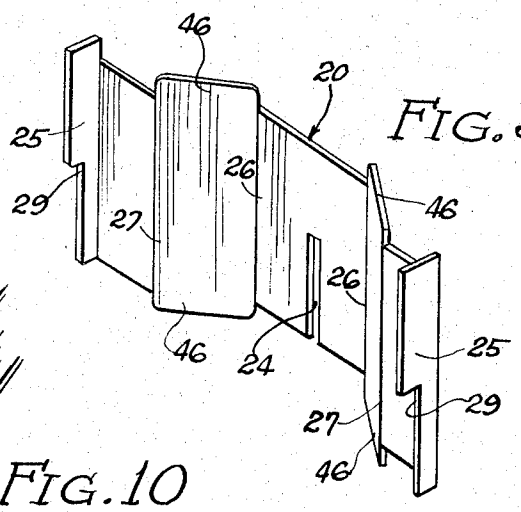
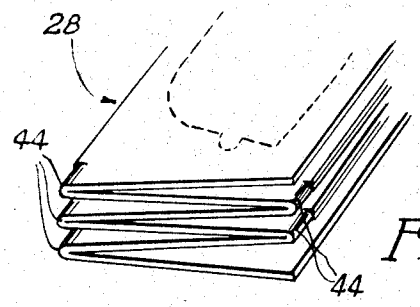


FIG. 10



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FIG. 11

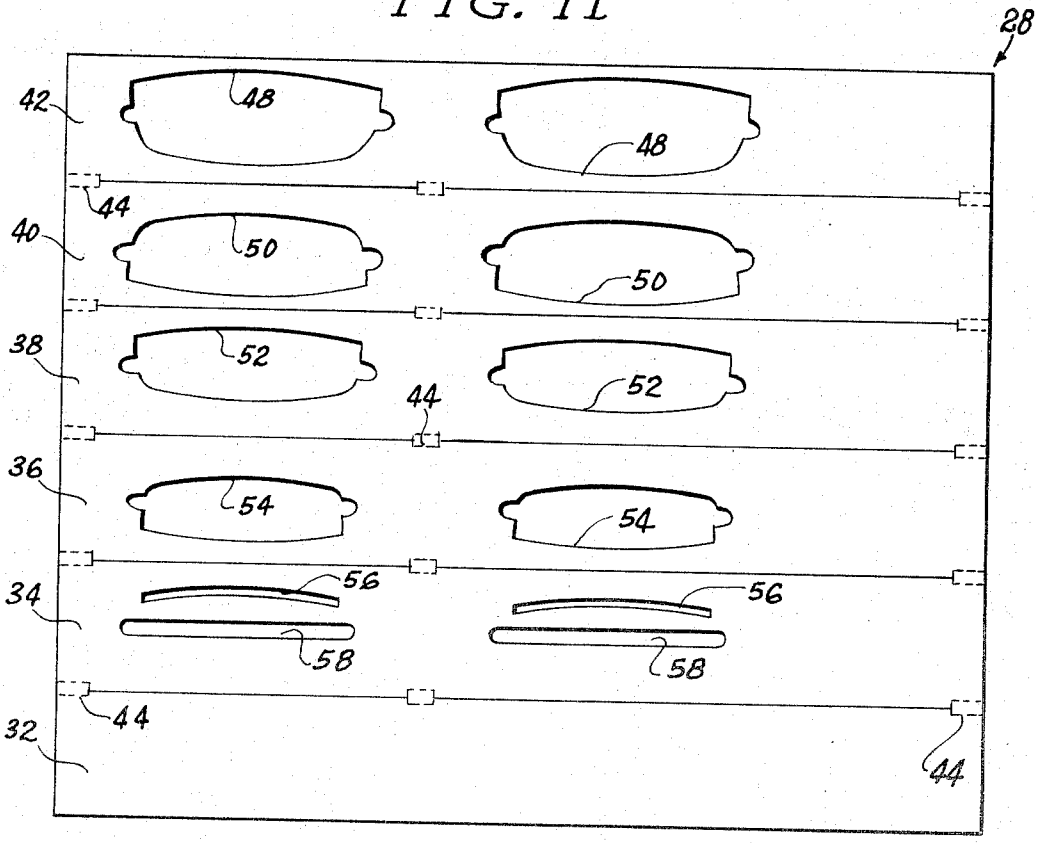


FIG. 12

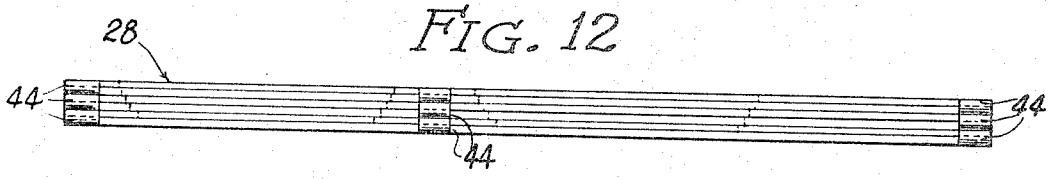
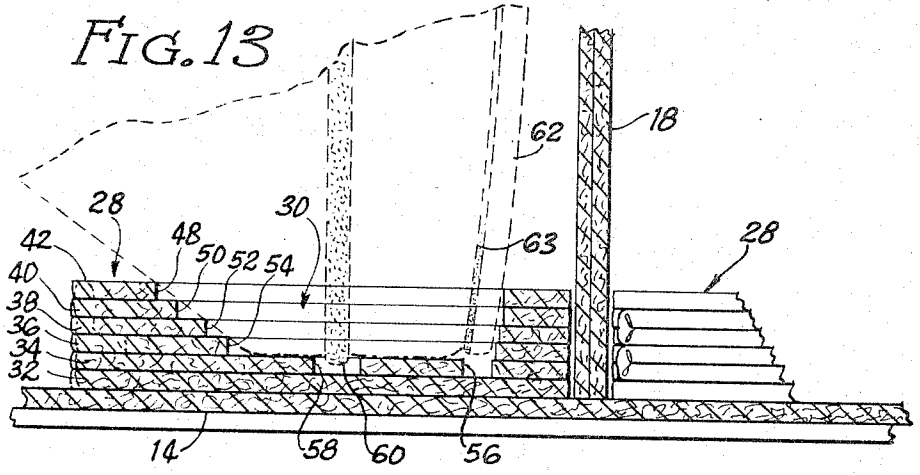


FIG. 13



United States Patent Office 3,363,753 Patented Jan. 16, 1968

3,363,753

CONTAINER AND PACKING CONSTRUCTION

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Continuation-in-part of application Ser. No. 528,009, Dec. 2, 1965. This application Sept. 26, 1966, Ser. No. 581,926

19 Claims. (Cl. 206—65)

ABSTRACT OF THE DISCLOSURE

A container construction for television tubes which includes supporting means disposed within the walls of a carton. The supporting means include divider members which stand upright within the carton and which define tube receiving spaces disposed in side-by-side relationship. The television tubes are positioned in the carton with the faces of the tubes vertically disposed. Nesting members are provided for supporting the tubes, and the divider members are alternately bent in opposite directions so that the tube receiving spaces provide for positioning of the tubes in alternating attitudes along the length of the carton.

This application is a continuation-in-part of application Ser. No. 528,009.

This invention relates to an improved container construction. The invention is particularly directed to a construction which is uniquely suitable for the transporting of television tubes and the like.

In the television industry, it is common practice to manufacture television tubes at sites remote from the sites of manufacture of television sets. In many cases, therefore, the television tube manufacturer must transport the tubes to the television set manufacturer. The usual facilities are employed for the transporting of the tubes including truck and railroad transportation.

Television tubes are relatively expensive items, and it is, therefore, extremely important to provide for a minimum of damage to the tubes during handling while in a plant and during transportation. Containers for the tubes must be capable of withstanding normal handling procedures during their transportation, and they should also be capable of withstanding conditions which frequently arise through accident or incompetence of the personnel conducting the handling operations.

The nature of container constructions for television tubes is also important when the provision of an inventory of the tubes is considered. Thus, the tube manufacturer as well as the set manufacturer will often require a large inventory of tubes in order to meet the varying demands which characterize various industries. Where such is the case, the container constructions for the tubes should be capable of being stacked. This presents a considerable problem since television tubes are quite heavy, and conventional container constructions will not stand the weight when a plurality of containers holding tubes are stacked.

It is a general object of this invention to provide an improved container construction particularly suitable for the holding of television tubes.

It is a more particular object of this invention to provide a container construction of the type described which will withstand all normal handling operations during transportation and which is uniquely capable of withstanding damage to its contents under conditions resulting from accidents or from incompetence of the personnel handling the constructions.

It is a still further object of this invention to provide a container construction of the type described which is characterized by a structural arrangement permitting stacking of a large number of the constructions whereby a large

inventory of television tubes can be conveniently maintained and whereby storage facilities for the tubes can be used with maximum efficiency.

It is a still further object of this invention to provide a container construction which achieves the foregoing objects, which can be manufactured in a relatively efficient manner and which is characterized by structural components adapted to be assembled with relative ease, particularly during packing of television tubes in the construction.

These and other objects of this invention will appear hereinafter and for purposes of illustration, but not of limitation, specific embodiments of the invention are shown in the accompanying drawings in which:

FIGURE 1 is a plan view of the container construction of this invention;

FIGURE 2 is a vertical sectional view taken about the line 2—2 of FIGURE 1;

FIGURE 3 is a vertical sectional view taken about the line 3—3 of FIGURE 1;

FIGURE 4 is a vertical sectional view taken about the line 4—4 of FIGURE 1;

FIGURE 5 is a plan view illustrating the blank employed for forming one divider member utilized in the construction;

FIGURE 6 is a perspective view illustrating a blank employed as a reinforcing member in the construction;

FIGURE 7 is a perspective view of a support member utilized in the construction;

FIGURE 8 is a perspective view of an additional support member;

FIGURE 9 is a perspective view of the structure of FIGURE 5 as it appears when folded for use;

FIGURE 10 is a fragmentary view of a nesting member employed in the construction;

FIGURE 11 is a plan view of a blank used in forming the nesting member;

FIGURE 12 is a side view of the nesting member when folded; and

FIGURE 13 is an enlarged fragmentary view illustratin the association of a television tube with the nesting member.

The container construction of this invention generally comprises top, bottom and side walls in the manner of a typical corrugated box. It will be appreciated when considering the following description that the elements of the construction can be suitably formed from conventional corrugated material, and that the construction itself can take the form of a typical rectangular box. It will also be obvious that other suitable materials and other configurations may be utilized along with the novel concepts of this invention for achieving the objects thereof.

The improvements of this invention generally relate to internal supporting means which are uniquely suitable for the packing of electronic tubes, particularly television tubes. The supporting means comprise a divider arrangement which forms article receiving spaces within the construction. The divider arrangement provides the spaces in side-by-side relationship in a manner such that maximum use of the available space can be achieved. The divider arrangement also provides for support within the construction whereby the stacking features which characterize the constructions can be obtained.

The supporting means of the construction also include unique nesting members adapted to be located in association with the divider members. In the packing of television tubes, the nesting members are located adjacent the top and bottom walls of the construction with the divider members deposited therebetween. Each of the nesting members defines cavities which are located in opposed relationship for positioning of the tubes therebetween. The edges of the tube fit into the nesting mem-

bers, and these nesting members define specific recesses which prevent damage to areas of a tube which are particularly susceptible to damage.

The box construction shown in the drawings comprises side walls **10**, end walls **12**, bottom wall **14** and a top **16**. In the embodiment illustrated, the construction takes the form of a shoe box in that the top **16** is a member separate from the remaining outside components. It will be appreciated that this only represents one suitable form of the exterior box construction, and that other designs can readily be employed.

The supporting means employed in the construction of this invention comprise divider members consisting of a first divider **18** which extends along the length of the construction, and second dividers **20** extending generally transversely of the divider **18**. The configuration of the divider **18** is shown in FIGURE 8, and a blank employed for forming the dividers **20** is shown in FIGURE 5, with the configuration of this divider shown in FIGURE 9.

The divider **18** can be formed from a flat one-piece blank comprising a rectangular member having interior openings **22** formed at specific positions intermediate its ends. When the rectangular blank is folded, the openings **22** form slots along the folded edge **21**. End flaps **23** are positioned against end walls **12** to provide reinforcement when the box is assembled.

The dividers **20** define a slot **24** at a central portion thereof. Score lines **26** and **27** are provided for achieving the configuration of FIGURE 9

The divider **18** stands vertically in the construction, and the dividers **20** are associated therewith by joining the dividers through the use of the slots **22** and **24**. Thus, the slot **24** of a divider **20** will fit down around the portion of the divider **18** extending immediately below a slot **22**. The slot **22**, in turn, fits around the central portion of the blank **20** along a line above the slot **24**.

As best shown in FIGURE 1, each of the dividers **20** is bent about the score lines **26** and **27**, and the bending direction alternates along the length of the divider **18**. Accordingly, a plurality of loading spaces are defined by the construction, and the shape of the spaces is such that a television tube is adapted to be included within each of the spaces.

The dividers **20** carry end flaps **25** having cut out portions **29**. The end flaps of adjacent dividers meet in an assembled container thereby providing precise alignment as well as additional vertical support. The cut outs provide additional free space for the ends of the tubes thereby minimizing the possibility of damage through contact with the side walls.

Nesting members **28** are provided in the construction for purposes of positioning the television tubes. The nesting members are first located along the bottom of the construction. In the embodiment illustrated, each nesting member defines a pair of cavities **30**. The nesting members are located whereby a cavity **30** is centrally positioned at the wide end of each space defined by the dividers **20**.

The nesting members **28** are formed from blanks of the type illustrated in FIGURE 11. The blanks comprise a plurality of sections **32–42** which are foldable with respect to each other. Hinges **44** connect the respective sections whereby the sections can be bent in either direction. This arrangement is provided so that a single blank can be employed for all of the nesting members **28**. Thus, adjacent nesting members in the arrangement shown comprise mirror images of each other. Either of the two types of nesting members will be formed depending upon which way the blank sections are folded.

It will be noted that each of the blanks forming the dividers **20** includes extensions **46** along the top and bottom edges thereof. These extensions are dimensioned whereby a nesting member **28** can be fitted on opposite sides thereof. As best shown in FIGURES 3 and 4, the

extensions **46** engage the respective top and bottom walls of the construction.

FIGURES 6 and 7 illustrate additional elements which can be advantageously employed in the container construction. The reinforcing member **41** illustrated in FIGURE 6 is located over the inside surface of a side wall **10**. This reinforcing member defines openings **43** which are in line with the ends of the necks of the television tubes. With this arrangement, the support members **41** will add vertical strength to the construction; however, adequate freedom is still provided for the tubes. Thus, inward pressure on the side walls may cause the walls to move toward the ends of the tubes; however, sufficient space is provided so that the walls will not engage delicate points of the tubes.

The support member **51** illustrated in FIGURE 7 can be formed from a flat blank having interior openings **53** formed intermediate its ends. When the blank is folded about fold lines **55**, **57** and **59**, a triangular configuration results. As shown in FIGURES 1, 3 and 4, this configuration serves as an additional support for the tubes thereby preventing tipping within the container.

In the use of the construction of this invention, the reinforcing members **41** are situated adjacent the side walls **10**, and four of the nesting members **28** are positioned over the bottom wall **14** of the container. In FIGURE 1, the uppermost nesting member is a mirror image of the bottom member while the intermediate nesting members are mirror images of each other.

A divider **18** is located in position between the two intermediate nesting members and two supports **51** are situated in the spaces defined between the nesting members. The five dividers **20** are then located in place. It will be noted that the slots **53** defined by the supports **51** receive the extensions **46** to thereby assist in providing the proper angular relationship of the dividers **20**.

Television tubes or the like are then adapted to be inserted into each of the spaces provided with the described arrangement. Eight such spaces are formed with the illustrated structural elements; however, it will be obvious that a larger or smaller number of spaces could be utilized.

After positioning of the tubes, additional nesting members **28** are positioned over the top edges of the tubes whereby each tube is seated in an upper and lower cavity **30**. The top **16** of the container can then be put into place, and the construction sealed in any desired manner.

It will be noted when considering FIGURES 3, 4 and 13 that the cavity **30** is designed for proper seating of a tube. Thus, the cut out portions **48–58** (FIGURE 11) become progressively smaller so that tapered walls are defined by the cavity. Naturally, the specific dimensions of the cut outs will depend upon the dimensions of the tubes to be packaged. It is desirable to provide a relatively snug fit for the tubes to avoid any significant shifting movement.

The section **34** of the blank defines cut outs **56** and **58** which are provided for a specific purpose. Thus, a conventional television tube defines a frit line shown at **60**. This frit line is extremely fragile, and it is important to eliminate contact of the frit line with other objects. This can be readily accomplished with the instant invention by providing the cut out **58** which is located and dimensioned for maintaining the frit line in spaced apart relationship with respect to the box construction.

The cut out **56** is located in position beneath the juncture **63** of the safety glass **62** with the tube. This particular arrangement greatly reduces the possibility of shifting movement of the safety glass relative to the underlying tube surface. It has been found that such shifting movement can result in distortion in the tube face due to movement of the underlying adhesive material during the drying process.

The container construction of this invention is also

particularly advantageous since each of the tubes is positioned horizontally during transporting of the tubes. Thus, it is known that positioning color television tubes in a manner such that the neck of each tube is located in a horizontal plane provides the best position for minimizing damage.

The desired positioning of the tubes results from the fact that a mask is located within the tube in the position of the frit line **60**. This mask contains a multitude of very fine openings which must be in precisely aligned positions with the tube screen for proper functioning of the color television tube. Any misalignment of this mask due to jarring of the tube will prevent proper operation of the tube and, accordingly, it is desirable to package the tubes in a manner which will avoid such damage.

The container construction of this invention has been found to be extremely effective for achieving this result. Thus, the mask referred to is secured within the tube by means which will minimize the danger of damage as long as the tube is located in a horizontal position. Prior containers which required placing of the tubes in a face down or face up position are unsatisfactory since jarring of the tubes in any way can frequently result in movement of the mask whereby proper registration with color dots on the tube screen will be lost. This damage can result even where the mask is properly secured within the tube.

The inside surface of the funnel portion of television tubes is usually coated with a graphite dag. Under certain conditions, some graphite particles may be dislodged, and if the particles fell onto the mask, apertures in the mask could be blocked. When a tube is positioned horizontally in the manner of this invention, any dislodged particles will fall downwardly and will be collected in a reservoir, usually provided for this purpose. Again, prior containers are considered undesirable where the tubes must be vertically positioned, and this invention eliminates this disadvantage.

As previously noted, color televison tubes for which the container construction is particularly designed are relatively heavy. When corrugated material is used for the box construction, the heavy tubes press against the corrugated to the extent that the material will become flattened at the bottom of the cavity **30**. The construction of this invention allows for this possibility due to the fact that the depth of the cavity **30** is greater than the amount which the corrugated can be flattened. Accordingly, the top portion of a tube will not be moved out of a cavity **30** when the bottom cavity is flattened out. This prevents any significant shifting of the tube from its desired position even when such flattening occurs. It will be apparent that the tubes could be severely damaged if the top portion thereof were released from a top cavity since the tube neck would then be pressed against the side wall or bottom of the construction and could be snapped off. Accordingly, the arrangement which prevents such shifting comprises an extremely important feature of the invention.

It will also be noted that each tube is supported against tipping by the supports **51**. These supports are easily manufactured and easily inserted, and they add significantly to the protective characteristics of the construction.

As previously indicated, the carton construction described has been found particularly desirable due to the fact that several cartons can be stacked upon each other even when loaded with tubes. The structural strength of the cartons has been demonstrated by stacking full cartons weighing over 3000 pounds on top of an empty carton. The design of this invention provides substantial support since each of the divider members and reinforcing members such as the members **23** and **41** cooperates to resist collapsing of the cartons. Thus, all of these members are vertically deposited and the edges thereof engage the top and bottom walls of the construction for supporting purposes. In this connection, it is quite important to note that stacking of several cartons will not result in the application of pressure on the tubes themselves. Thus, the divider and support members are dimensioned whereby they will provide the support with the tubes being free of any significant load.

It will be understod that various changes and modifications may be made in the construction of this invention which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

That which is claimed is:

1. In a container construction for television tubes comprising top, bottom and side walls, the improvement comprising supporting means disposed within the construction, said supporting means including divider members standing upright within the construction for defining tube receiving spaces disposed in side-by-side relationship within the construction, nesting members located at least along the bottom wall of the constructions, said nesting members defining cavities for receiving lower edge portions of tubes whereby said tubes can be positioned in said construction with the faces of the tubes vertically disposed, said divider members comprising a first member extending along the length of said construction, a plurality of second members, each of said second members being joined with said first member and extending outwardly from said first member, said second members extending angularly with respect to said first member to provide a plurality of substantially triangular tube receiving spaces adjacent said first member.

2. A construction in accordance with claim **1** wherein said divider member is positioned intermediate the side walls of the construction, said second members extending outwardly on either side of said first member and said second members being alternately bent in opposite directions along the length of said first member to thereby provide the angular relationship with said first member and to provide triangular tube receiving spaces which receive said tubes in alternating attitudes.

3. A construction in accordance with claim **1** wherein said nesting members are positioned in opposed relationship adjacent the top and bottom walls of the construction with the cavities in opposed nesting members being located in facing relationship for the positioning of tubes therebetween.

4. A construction in accordance with claim **1** wherein said nesting members are formed from a blank divided into a plurality of sections, said sections being hinged together whereby nesting members can be formed by folding sections of a blank relative to each other, and wherein at least part of the sections define cut outs with the combined cut outs of folded sections forming said cavities.

5. A construction in accordance with claim **4** wherein said blank defines hinges which permit folding of the sections forming the nesting members in either direction whereby each blank can be employed for forming oppositely positioned nesting members.

6. A construction in accordance with claim **1** wherein each of said second members defines extensions which extend outwardly from the upper and lower edges of the second members, said extensions being located whereby said nesting members are adapted to be fitted between the extensions and the walls of the construction.

7. A construction in accordance with claim **1** wherein each of said divider members define vertical slots extending approximately halfway across the width of the divider members, the slots of the respective first and second members being adapted to be interfit with each other for assembly of said first and second members.

8. A construction in accordance with claim **7** wherein said extensions of said second members as well as the upper and lower edges of said first members bear against the respective top and bottom walls of said construction whereby said divider members cooperate with the side walls of the construction to provide vertical support.

9. A construction in accordance with claim 1 wherein said nesting members are located on either side of said first divider and adjacent each side wall of the construction, said tubes being positioned in alternating attitudes in adjacent receiving spaces.

10. A construction in accordance with claim 5 wherein the sections forming said nesting members include a bottom section without a cut out, said bottom section forming the base of said cavity, and wherein the section immediately above said bottom section defines a pair of elongated cut outs, one of said elongated cut outs being positioned whereby the frit line of a color television tube will be received in said one elongated cut out to hold the frit line out of contact with the construction, and wherein the second elongated cut out is positioned in line with the juncture which the safety glass of the tube makes with the tube body.

11. A construction in accordance with claim 3 wherein said blank is formed of a corrugated material and wherein the depth of said cavities is such that a tube will not be dislodged from an upper cavity when the corrugated material of the lower cavity is flattened by the weight of a tube.

12. A construction in accordance with claim 3 wherein said cavities are of sufficient depth whereby the top portions of the tubes will not be dislodged from upper cavities when the material forming the cavities of the lower nesting members is flattened by the weight of the tubes.

13. A construction in accordance with claim 1 including elongated support means extending along the length of the construction and including a portion extending upwardly above the plane of nesting members located on the bottom of the construction whereby said upwardly extending portion is adapted to engage tubes to assist in preventing tipping of the tubes when they are loaded in the construction.

14. A construction in accordance with claim 13 wherein said elongated support means is formed from an initially flat blank having interconnected sections folded into a triangular configuration, and including slots defined by the elongated support means for receiving bottom portions of said second members.

15. A construction in accordance with claim 1 including additional support means comprising a substantially flat piece removably positioned adjacent the side walls of the construction, said additional support means having substantially the same dimensions as said side walls to thereby provide additional support for the construction.

16. A construction in accordance with claim 15 including openings defined by said additional support means, said openings being located adjacent the ends of said spaces opposite the neck of a tube located in the spaces.

17. A construction in accordance with claim 1 wherein said second divider members include flat portions adapted to be bent over adjacent said side walls, said flat portions having substantially the same vertical dimensions as said side walls to thereby provide additional support in the construction.

18. A construction in accordance with claim 17 including cut out portions defined by said flap portions, said cut out portions being located directly opposite the neck portions of said tubes.

19. A construction in accordance with claim 1 wherein said first divider member comprises end flaps adapted to be folded into position adjacent the end walls of the construction, said end flaps having substantially the same dimensions as said end walls for providing additional support in the construction.

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WILLIAM T. DIXSON, JR., *Primary Examiner.*