May 21, 1963 L. J. BUDD 3,090,177

APPARATUS HANDLING METHODS

Original Filed May 17, 1954 2 Sheets-Sheet 1

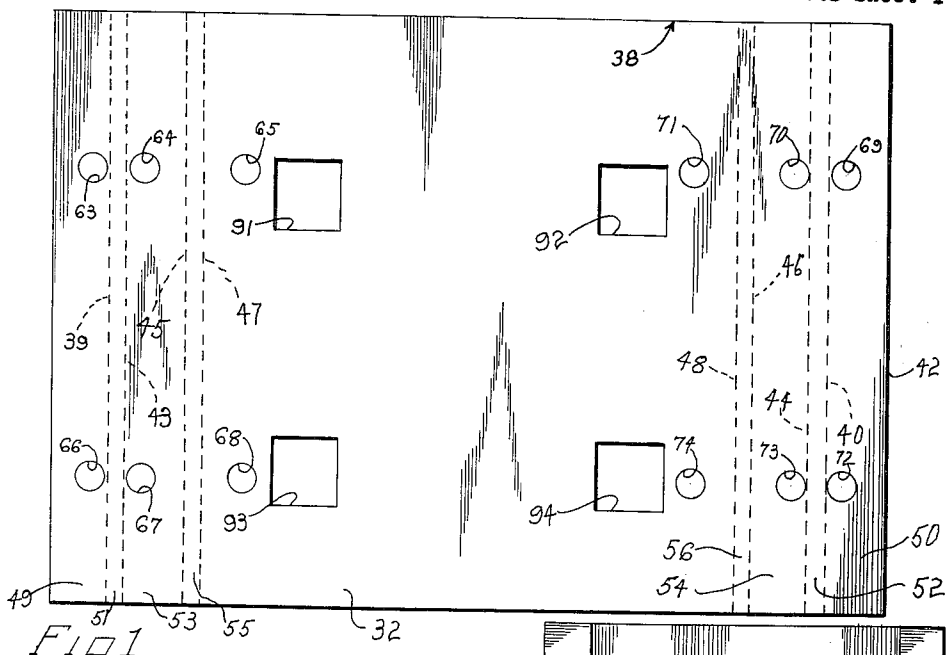


Fig 1

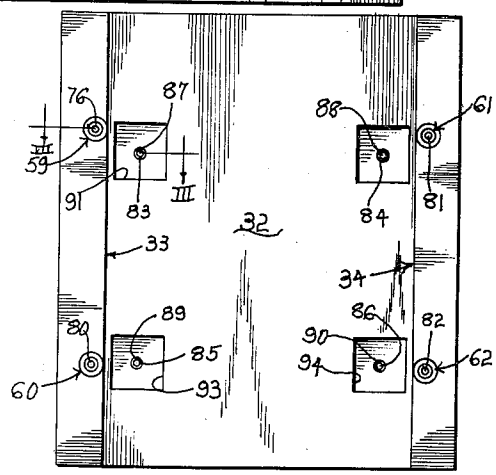
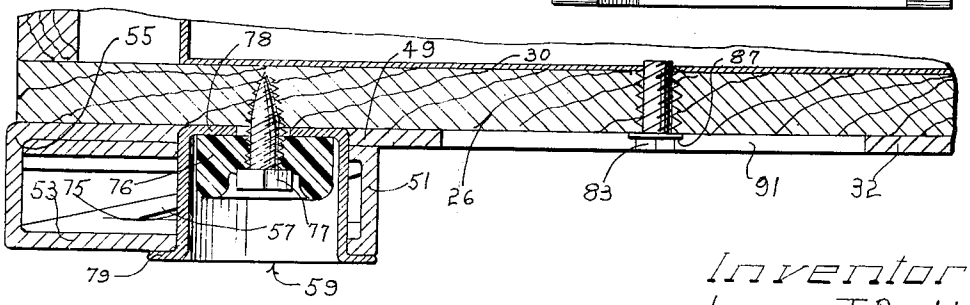


Fig 2

Fig 3



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Fig 4

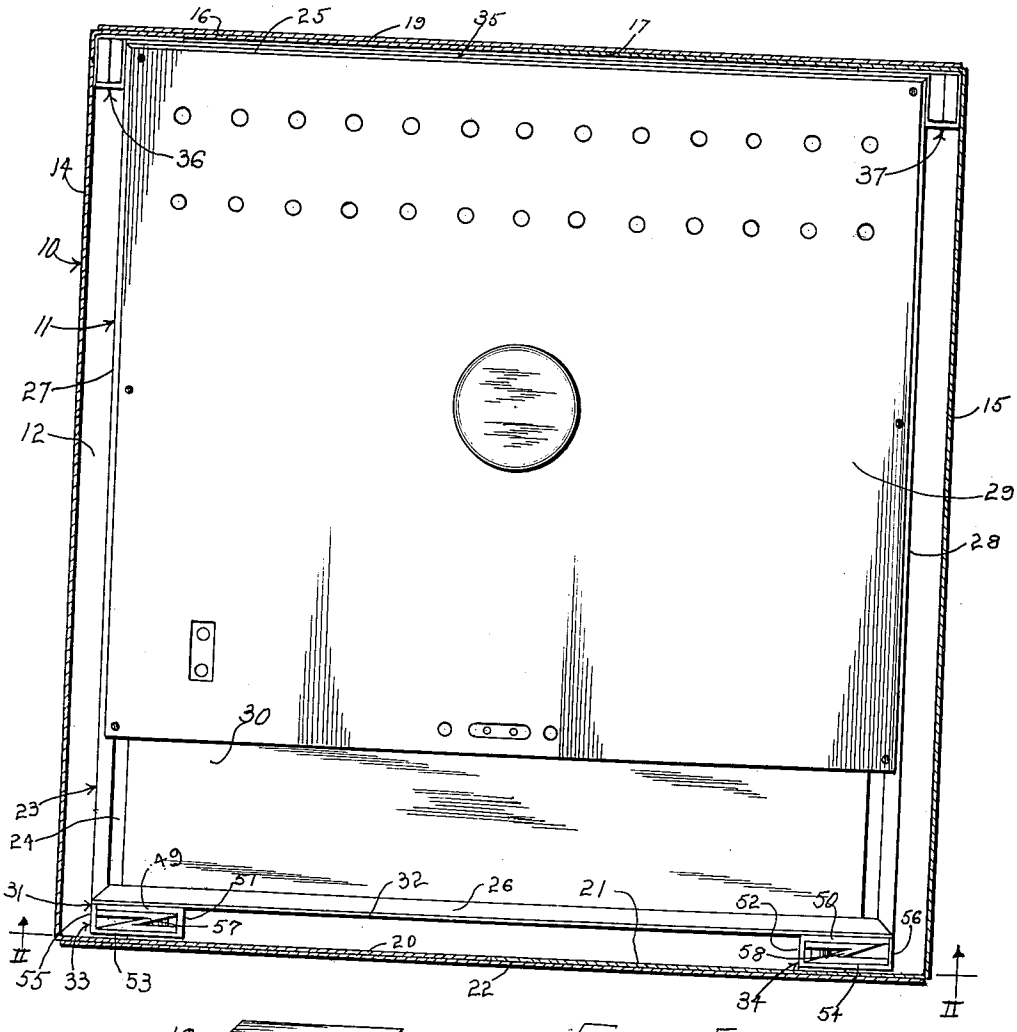
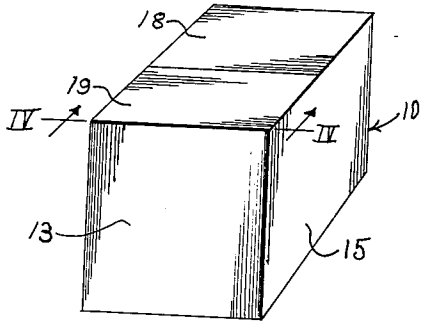


Fig 5



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APPARATUS HANDLING METHODS

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Original application May 17, 1954, Ser. No. 430,382, now Patent No. 2,888,222, dated May 26, 1959. Divided and this application Mar. 9, 1959, Ser. No. 797,936
3 Claims. (Cl. 53—196)

This invention relates to apparatus handling methods and more particularly to methods by which apparatus may be readily and safely handled, assembled and protected for transport.

The present application is a division of my U.S. patent entitled "Apparatus Handling Means," filed May 17, 1954, No. 2,888,222.

In an exemplary application of this invention, a television receiver cabinet, after manufacture thereof is completed and preferably before transportation thereof, has installed on the underside of the bottom wall thereof an expendable palletized support structure. The cabinet is then transported to an assembly point which is, of course, readily accomplished by virtue of the palletized support of the cabinet. At the assembly point, the television receiver chassis and associated apparatus are installed in the cabinet. The cabinet may then be readily transported to final checking points, if desired, and thence to a second assembly point. At this point, the cabinet together with the receiver therewithin and the palletized support structure secured thereto is installed in a suitable container for shipment. When the container arrives at the place of business of the dealer or distributor, the cabinet together with the receiver and palletized support structure may be removed from the container and the palletized support structure again improves handling of the assembly and need not be removed until the receiver reaches its ultimate destination.

It will be readily appreciated by those skilled in the art that installation of the palletized support structure on the cabinet prior to transportation of the cabinet to the point where the receiver apparatus is installed therewithin will greatly facilitate handling of the cabinet. It will also be appreciated that the palletized support structure will also greatly facilitate handling of the receiver from the point where the receiver apparatus is installed therewithin to the point where the cabinet together with the receiver is installed in a container. It will be further appreciated that the palletized structure provides added protection for the receiver and cabinet while being transported within the container and, of course, it also faciiltates handling of the receiver and cabinet by the dealer or distributor.

A specific feature of the invention relates to the manner of securing the palletized support structure to the underside of the cabinet bottom. According to this feature, the cabinet may be of a type having bumpers secured by headed fastening means, such as screws, to the underside of the bottom thereof, such bumpers being ordinarily formed of a rubber or similar resilient or elastomeric material. Holes may be cut in the palletized support structure in the same spacing and relation as the bumpers and, after the support structure is disposed against the underside of the cabinet bottom, the bumpers may be disposed against the underside of the palletized support structure in alignment with the holes therein after which the headed fastening means may be extended through the bumpers and through the holes to secure both the bumpers and the palletized support structure against the bottom of the cabinet. The fastening means thus performs a dual function and separate means for securing the palletized support to the cabinet bottom are not required.

In accordance with another specific feature of the invention, the receiver may be secured on the bottom of the cabinet by fastening means such as screws extending upwardly through holes in the cabinet bottom and before installation of the palletized support base on the cabinet bottom, holes may be cut in the base in the same spacing and relation as such fastening means so that after the palletized support structure or base is installed on the cabinet bottom and after the cabinet is transported to the assembly point, the receiver may be readily installed in the cabinet without necessitating removal of the palletized support structure.

An important feature of the invention resides in the construction of the palletized support structure. According to this feature, the palletized support structure may be formed by folding under opposite edge portions of a sheet of relatively rigid form-sustaining material to form tube-like supports along such edges. After the structure is installed on the cabinet bottom, the cabinet may then be readily and safely handled by engaging under the portion of the structure intermediate the tube-like supports. The tube-like supports also perform an important function when the cabinet is installed in a container for shipment since the tube-like supports may then transmit the weight of the cabinet and receiver to portions of the bottom of the container adjacent the sides thereof, such portions of the bottom being most securely supported from the container side walls.

The tube-like supports may preferably be formed by scoring the sheet of relatively rigid form-sustaining material along score lines including a first score line spaced a first predetermined distance from one end of the sheet to define a first section, a second score line spaced a second predetermined distance from the first score line to define a second section, a third score line spaced from the second score line a distance slightly greater than said first predetermined distance to define a third section and a fourth score line spaced from the third score line a distance slightly greater than said second predetermined distance to define a fourth section. The sheet may then be bent at the score lines to dispose the first section against the portion of the sheet adjacent the fourth score line with the third section parallel to the first section and with the second and fourth sections normal to the first and third sections. Preferably, the first section may be adhesively secured to the portion of the sheet against which it is engaged.

It has been found that by this method, the tubular support means may be readily provided. Further, the support means so formed are superior to any other known manner of construction of the same, for the purposes of the instant invention.

According to a still further specific feature of the invention, plugs may be so disposed in the tube-like supports in positions transverse to the direction thereof so as to greatly strengthen and rigidify the same. The plugs may also serve as a means for transmitting the weight of the cabinet directly to a support surface.

Further, in accordance with another specific feature of the invention, the plugs may have an inverted cup-like configuration and may have a tube-like portion to receive one of the bumpers previously referred to and an upper wall apertured for passage of fastening means therethrough, the fastening means as previously indicated being arranged to secure both the bumpers and the palletized support structure to the underside of the cabinet.

Most preferably, the inverted cup-shaped plugs may have lower outwardly projecting annular rims for limiting upward movement thereof and for obtaining a broader area for engagement with the supporting surface.

An object of this invention, accordingly, is to provide improved apparatus handling methods.

Another object of this invention is to provide an improved method of handling assemblies wherein apparatus is installed within the housing in which a palletized support structure is secured to the housing prior to transportation of the housing to a point where the apparatus is installed therein.

Still another object of this invention is to provide an improved method of construction of palletized support structure.

This invention contemplates other objects, features and advantages which will become more fully apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate a preferred embodiment and in which:

FIGURE 1 is a view illustrating a blank from which a support structure or pallet may be formed, in accordance with the principles of this invention;

FIGURE 2 is a sectional view taken substantially along lines II—II of FIGURE 4 and illustrating a bottom plan view of the support structure for the television receiver;

FIGURE 3 is a sectional view taken substantially along lines III—III of FIGURE 2;

FIGURE 4 is a sectional view taken substantially along lines IV—IV of FIGURE 5 and showing the television receiver and support structure therefor in rear elevation; and

FIGURE 5 is a perspective view of a container having a television receiver packed therewithin for shipment, in accordance with the principles of this invention.

Reference numeral **10** generally designates a shipping container which may house a television receiver **11**. The container **10** may comprise a front wall **12**, a rear wall **13**, side walls **14** and **15**, a top defined by a first pair of flaps **16** and **17** extending inwardly from the top edges of the side walls **14** and **15**, respectively and a second pair of flaps **18** and **19** extending inwardly over the flaps **16** and **17** from the top edges of the front wall **12** and the rear wall **13**, respectively, and a bottom defined by flaps **20** and **21** extending inwardly from the lower edges of the side walls **14** and **15**, respectively and flaps **22** extending inwardly from the lower edges of the front and rear walls **12** and **13** under the flaps **20** and **21**.

The television receiver **11** may comprise a cabinet generally designated by reference numeral **23** which may comprise a front wall **24**, a top wall **25**, a bottom wall **26**, side walls **27** and **28** and a removable rear wall **29**. Receiver apparatus is installed within the cabinet **23** which may include a chassis **30** disposed on the upper surface of the cabinet bottom wall **26**.

The receiver **11** may be supported within the container **10** by means including a palletized structure generally designated by reference numeral **31** which may comprise a section **32** underlying the cabinet bottom wall **26** and generally tubular support structures or pads **33** and **34** underlying and supporting opposite edge portions of the section **32**. As will be apparent from the foregoing preliminary discussion, the palletized support structure **31** and the manner of utilizing the same is the gist of the present invention.

Before proceeding with a detailed description of the palletized support structure **31** and the manner of constructing and utilizing the same, it may be noted that a top support structure **35** may be disposed over the top wall of the cabinet **23** and may have generally tubular spacer means **36** and **37** depending from the opposite side edges thereof to engage between the side walls **27** and **28** of the cabinet **23** and the side walls **14** and **15** of the container **10**. The structure **35** and the manner of constructing the same forms an important feature of my U.S. patent entitled "Means for Supporting Apparatus for Shipment," filed May 17, 1954, U.S. Patent No. 2,895,661.

It is believed that the manner of construction and utilization of the palletized support structure **31** will be best understood from a step-by-step description of the construction and utilization thereof. Reference is therefore made to FIGURE 1 which illustrates a blank **38** from which the support structure **31** is formed.

The blank **38** may, as shown, be of generally rectangular shape and may be of any relatively rigid form-sustaining sheet material and preferably of an inexpensive expendable material such as paperboard, fiberboard or the like.

To form tthe tube-like supports or legs or cushioning pads **33** and **34**, opposite edge portions of the blank **38** may be folded under by making bends at score lines which may be scored by marking the blank or preferably by actual indentation of the blank, especially when the blank is of paperboard or a like material, but it will be appreciated that marking or indentation is not necessarily required and the terms "scoring" and "score line" are therefore used in a figurative sense to indicate the position of the bends.

In particular, score lines **39** and **40** may be located parallel to and at first predetermined distances from opposite edges **41** and **42** of the blank **38**, score lines **43** and **44** may be located parallel to and at second predetermined distances inwardly from the score lines **39** and **40**, score lines **45** and **46** may be located parallel to and spaced inwardly from the score lines **43** and **44** at distances slightly greater (by about the thickness of the sheet material) than the aforesaid first predetermined distances, and score lines **47** and **48** may be located parallel to and spaced inwardly from the score lines **45** and **46** by distances slightly greater (by about the thickness of the sheet material) than the aforesaid second predetermined distances.

The score lines **39** and **40** together with the edges **41** and **42** of the blank **38** may be considered as forming first sections **49** and **50**, the score lines **39** and **40** together with the score lines **43** and **44** may be considered as forming second sections **51** and **52**, the score lines **43** and **44** together with the score lines **45** and **46** may be considered as defining third sections **53** and **54**, the score lines **45** and **46** together with the score lines **47** and **48** may be considered as defining fourth sections **55** and **56**, and the score lines **47** and **48** may be considered as defining the section **32** which, as pointed out above, engages the underside of the cabinet bottom wall **26**.

The blank may be bent at the score lines **39**, **40** and **43–48** so that the fourth sections **55** and **56** extend downwardly at right angles to the section **32** with the third sections **53** and **54** extending inwardly in parallel relation to the section **32** and with the second sections **51** and **52** extending upwardly to the underside of the section **32** in parallel relation to the fourth sections **55** and **56**, as shown in FIGURE 4.

The first sections **49** and **50** may extend inwardly from the upper edges of the sections **51** and **52** (at score lines **39** and **40**) but much greater rigidity is obtained by extending the sections **49** and **50** outwardly toward the sections **55** and **56**. Most preferably, the terminal edges of the first sections **49** and **50**, that is, edges **41** and **42** of the blank **38**, are in firm engagement with the sections **55** and **56** adjacent the bends between such sections **55** and **56** and the section **32**. With this arrangement, maximum strength and rigidity is obtained and yet the supports **33** and **34** are readily formed.

The sections **49–56** may be secured in the positions as illustrated in FIGURE 4 by securing the first sections **49** and **50** to the section **32**, preferably by adhesive engagement between the upper surfaces of the sections **49** and **50** and the lower surface portions of the section **32** in facing relation thereto. This may be accomplished by applying glue to the surfaces of the sections **49** and **50** and/or such facing surface portions of the section **32** before the sections are in the positions as illustrated in FIGURE 4.

After the sections **49–56** are in the positions as illustrated in FIGURE 4, brace members **57** and **58** may be inserted in the tube-like supports defined thereby. Such brace members may be of sheet material such as paper-

board bent into a Z-like configuration with the intermediate diagonal portion of brace member 57 extending between the junction between sections 53 and 55 (at score line 45) and the junction between sections 49 and 51 (at score line 39) and with the intermediate diagonal portion of member 58 extending between the junction between sections 54 and 56 (at score line 46) and the junction between sections 50 and 52 (at score line 40). It has been found that with this specific arrangement, maximum strength and rigidity of the supports 33 and 34 is achieved.

A feature of the invention resides in the provision of one or more plugs in each of the depending support means for rigidifying the same. According to this feature, a pair of plugs 59 and 60 are disposed in the tube-like support structure 33 and a pair of plugs 61 and 62 are disposed in the tube-like support structure 34. To receive the plugs 59–62, openings may be cut in the supports 33 and 34 and the section 32 after the supports 33 and 34 are formed. Preferably, however, suitable holes are cut in the blank 38 prior to formation of the supports 33 and 34.

In particular, a hole 63 is cut in the section 49, a hole 64 is cut in the section 53 and a hole 65 is cut in the section 32, the holes 63, 64 and 65 being aligned when the sections 49, 51, 53 and 55 are bent to form the support 33. The plug 59 may then be inserted therethrough to rigidify the support 33. The aligned holes 63, 64 and 65 comprise a socket through which a fastener is adapted to be disposed as will hereafter further be described. The plug 59 is inserted into the socket to reinforce the socket as well as the cushioning pad in which the socket is disposed.

Similarly, holes 66, 67 and 68 are cut in the sections 49, 53 and 32, respectively, to receive the plug 60, holes 69, 70 and 71 are cut in the sections 50, 54 and 32, respectively, to receive the plug 61, and holes 72, 73 and 74 are cut in the sections 50, 54 and 32 to receive the plug 62.

As discussed heretofore, a further feature of the invention is in the use of bumpers together with fastening means used to secure such bumpers through the underside of the cabinet to secure the palletized support structure 31 to the bottom wall 26 of the cabinet.

In accordance with this feature, the plugs 59–62 may be so formed as to receive such bumpers. In particularly, as illustrated in FIGURE 3, the plug 59 may have an inverted cup-like configuration with a tube-like portion 75 arranged to receive a bumper 76 which, as is conventional, may be of a resilient or elastomeric material such as rubber or plastic. Such bumpers are, of course, provided to prevent marring of the floor or table on which the cabinet is placed. To secure the bumper 76 to the bottom wall 26 of the cabinet 23, a headed fastening member such as a wood screw 77 may extend through a central opening in the bumper 76.

The screw 77 may also serve to fasten the palletized support base 31 to the cabinet 23 and for this purpose, the plug 59 may have an upper wall 78 having an opening therein of sufficient diameter for passage of the shank of screw 77 therethrough, but small enough to prevent passage of the bumper 76 therethrough. The upper surface of the top wall 78 of the plug 59 may preferably be on the level with the upper surface of the section 32.

In accordance with a further specific feature of the invention, the plug 59 may have an integral outwardly projecting annular flange or rim portion 79 at its lower end arranged to engage the lower surface of the support 33 about the openings therein, that is, the surface of section 53 about the opening 64.

The plugs 60, 61 and 62 may preferably be of a form similar to the plug 59 to receive bumpers 80, 81 and 82, respectively.

According to a further feature of the invention, provision is made for securing the receiver chassis 30 on the bottom wall 26 of the cabinet 23 after the palletized support structure 31 is secured to the underside of the bottom wall 26. In particular, the receiver chassis 30 may be

rigidly secured to the cabinet bottom wall 26 by headed fastening means such as screws 83, 84, 85 and 86, which screws extend upwardly through the bottom wall 26 and are threaded into the chassis 30, as is illustrated in connection with the screw 83 in FIGURE 3. If desired, and preferably, washers 87, 88, 89 and 90 may be disposed between the heads of the screws 83–86 and the bottom surface of the bottom wall 26 about the screw holes therein.

To permit ready attachment of the chassis 30 to the bottom wall 26 after the palletized support structure 31 is attached to the bottom wall 26, section 32 may be preformed with holes 91, 92, 93 and 94 having the same spacing and relation as the holes in the cabinet bottom wall 26 receiving the fastening means 83, 84, 85 and 86, respectively. The holes 91, 92, 93 and 94 may preferably be considerably larger than the heads of the fastening means 83–86 and washers 87–90, if used, and may be generally square as illustrated for most ready formation thereof. The holes 91–94 may, of course, be cut at the same time that the holes 63–74 are cut.

To summarize, the blank 38 may be scored with the score lines 39, 40 and 43–48 as illustrated in FIGURE 1 and at the same time, the circular holes 63–74 may be cut and also the square holes 91–94. The sections 49–56 may then be folded under the opposite sides of the section 32 to the positions illustrated in FIGURE 4 and the sections 49 and 50 may be adhesively secured to the facing underside portions of the section 32. The plugs 59–62 may then be inserted in the aligned openings in the supports 33 and 34 and section 32. Brace members 57 and 58 may thereafter be inserted in the tube-like supports 33 and 34.

The palletized support structure 31 may then be disposed against the underside of the cabinet bottom wall 26 after which the bumpers 76, 80, 81 and 82 may be inserted in the plugs 59, 60, 61 and 62, respectively, and the fastening means 77 may then be used to secure the bumpers together with the palletized support structure 31 to the underside of the cabinet bottom 26.

The cabinet 23 may then be transported to an assembly point. This transportation may most readily be accomplished by inserting lifting and carrying means between the support structure 33 and 34.

When the cabinet reaches the assembly point, the receiver apparatus including the chassis 30 may be installed in the cabinet 23 and securely fastened therein by means of the fastening means 83–86. Thereafter, the back 29 may be secured on the cabinet 23 and, if desired, final testing and checking operations may be performed on the receiver 11. The receiver 11, including the cabinet 23, the receiver apparatus and the palletized support structure 31 may then be transported to a second assembly point, again by inserting lifting and support means between the support structures 33 and 34, if desired.

When this second assembly point is reached, the cabinet 11 together with the receiver apparatus and palletized support structure 31 may be disposed within the container 10, the top structure 35 may be disposed over the top of the cabinet 23 and the flaps 16–19 of the container top may be closed.

It may be noted, at this point, that the tube-like supports 33 and 34 engage portions of the container bottom adjacent the side walls 14 and 15 to transmit the weight of the receiver 11 to such portions, which portions, of course, are most securely supported from the side walls 14 and 15.

After the container 10 with the received 11 therewithin reaches the dealer or distributor, the palletized support structure 31 may then be readily used in transporting the receiver 11 to its ultimate destination and need be removed only after such ultimate destination is reached. The palletized support structure 31 is, of course, very inexpensively constructed and can be thrown away.

It may be noted that the palletized support structure 31 may act in any position and terms such as "upper,"

"lower" and the like are therefore used herein only for the purpose of conciseness and clarity of description and reference and are not to be construed as limitations.

It will be further understood that modifications and variations may be effected without departing from the spirit and scope of the novel concepts of the present invention.

I claim as my invention:

1. The method of supporting an article, the steps of scoring the margins of a fiberboard sheet and cutting holes at spaced intervals in the margins, folding the margins at the score lines providing hollow tube-like legs at the margins on one side of the sheet forming an article support, reinforcing the hollow legs at the area of the holes by inserting reinforcing cups in said holes, engaging an article to be supported over the article support, and inserting fasteners vertically of the article support disposing ends of the fasteners in opens ends of the cups and securing opposite ends of the fasteners in the article thereby attaching the article support to the article.

2. The method of claim 1 further characterized by extending ends of the fasteners to be secured to the article initially through resilient bumpers in the cups while leaving opposite ends of the fasteners engaged with the bumpers to cushion the engagement between the tubes and the article to be supported.

3. The method of supporting an article having an article base comprising forming a paperboard blank, scoring opposite margins of said blank with a series of score lines and cutting spaced holes in said margins, folding under said blank along first score lines to provide a pair of sections integral with and projecting transversely generally at right angles from the first score lines which comprises opposite edges of said article-engaging blank surface, folding along second score lines to provide a second pair of sections extending inwardly toward third lines in the same plane as second score lines, folding along third score lines and forming a third pair of sections parallel to said first pair of sections extending to fourth lines adjacent said article-engaging surface, and forming a fourth pair of sections extending from said fourth lines along said article-engaging sections and having terminal edges confronting said first pair of sections, securing the facing surfaces of said fourth pair of sections and said article-engaging sections together thereby forming hollow tubes on one side of said blank, securing inverted reinforcing cups in the holes causing the cups to be lodged inside the hollow tubes, and disposing ends of fasteners in the cups while extending opposite ends of the fasteners through the cups securing the cups, tubes and the article base in assembly together.

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