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[54] BOX CONSTRUCTION AND METHOD OF
MANUFACTURE
5 Claims, 4 Drawing Figs.

[52] U.S. Cl.....	229/5.5
[51] Int. Cl.....	B65d 3/10
[50] Field of Search.....	229/5.5, 5.7, 93; 220/67

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ABSTRACT: A box construction and method of manufacture are presented wherein the sidewall and top disc are intimately secured by an adhesive which is caused to flow between the abutting surfaces of the disc and sidewall in the final step of construction. In an intermediate step of construction the sidewall and top disc are temporarily held together by an adhesive tape wrapped around the sidewall and overlapping the top disc. The top disc is preferably provided with a beveled edge in the area of the overlap of the adhesive tape, and an adhesive material may be placed in the area of this beveled edge to further secure the tape to the top disc.

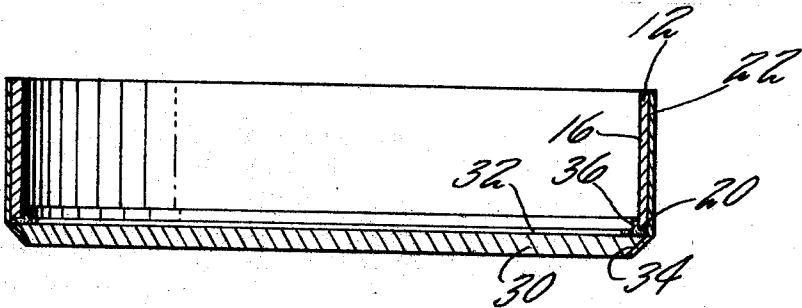


FIG. 1

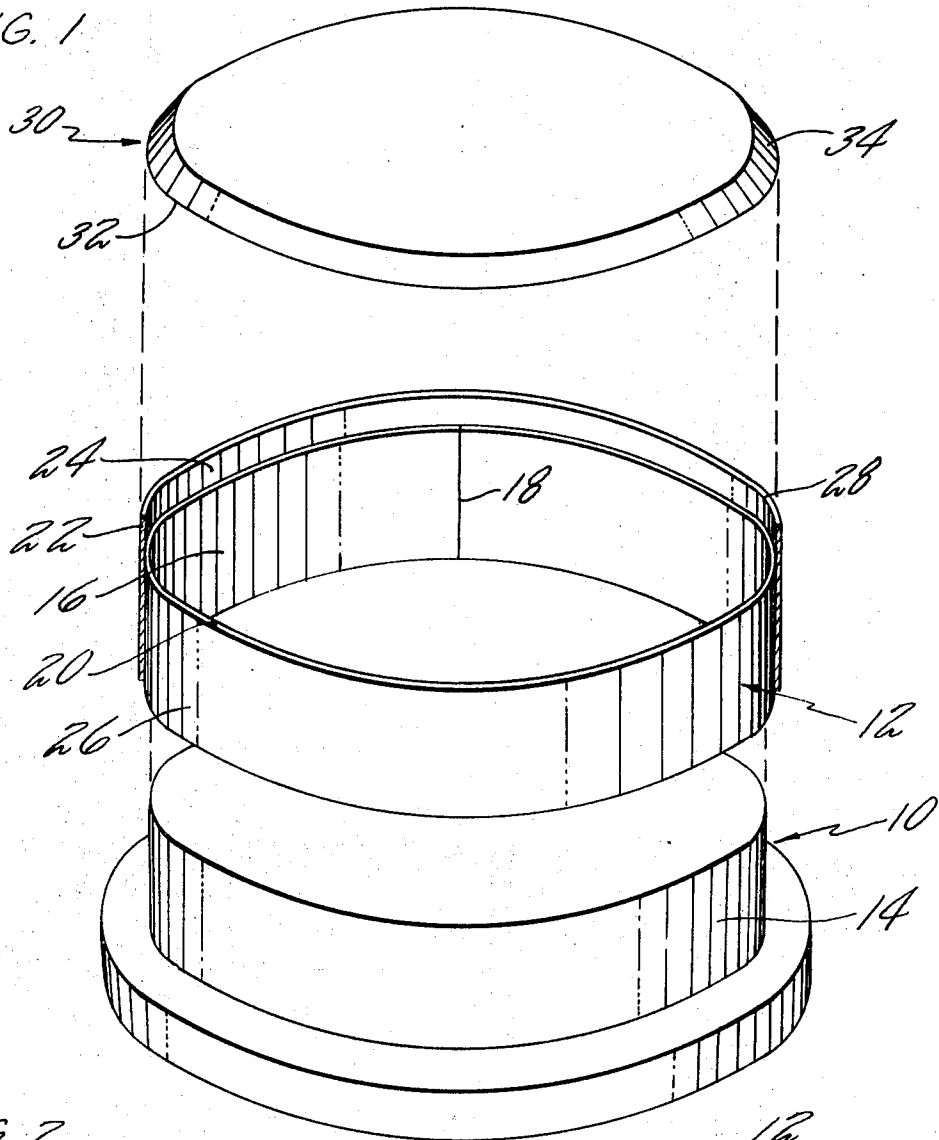


FIG. 2

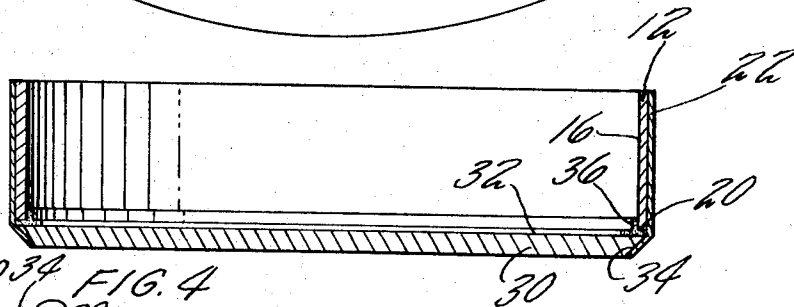


FIG. 3

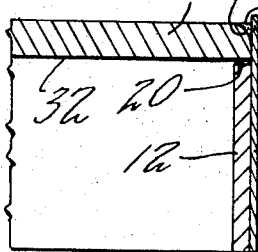
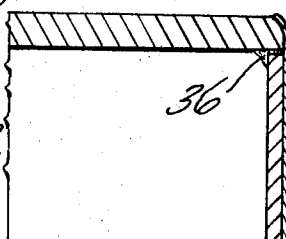


FIG. 4



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BOX CONSTRUCTION AND METHOD OF MANUFACTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to telescoping boxes and the fabrication thereof. More particularly, this invention relates to a box construction and method of manufacture especially suitable for boxes of nonrectangular shape such as circular, oval and other arcuate shapes.

2. Description of the Prior Art

Box construction of the circular or oval shape has been plagued by a continual problem of a lack of adequate support for the top disc. The overall construction has been generally weak, the sidewall and top disc have been easily separable whereupon the integrity of the box has been destroyed, and the top disc has tended to warp whereby the box has become misshapened or broken by stresses resulting from the warp. These problems have been particularly acute and magnified in the larger boxes such as those having a diameter or other major dimension of on the order of 8 inches or more, and the problem increases as the size of the box increases.

One known attempt to solve these problems has involved the use of crepe paper adhesively secured to the outer surfaces of the side wall and top disc. However, this approach has not proven to be satisfactory for many reasons. The resulting box construction is very weak because the parts can only be assembled with the interior of the sidewall abutting the outer peripheral edge of the top disc, and thus the completed construction does not provide a support for the top disc. Also, the crepe paper is relatively awkward and difficult to handle in the construction process with the result that the box becomes expensive to produce and very high inspection standards must be established in order to ensure proper construction. Furthermore, the crepe paper overlaps the top disc and thus presents a ragged edge which must be covered by a label or decorative cover which can only be added after the box is assembled. A neat appearance of the box cannot be attained because the overlap of the crepe edge by the cover causes a bump in the surface. Another significant problem of this prior art crepe construction is that a cover sheet must be provided over the crepe on the sidewall if printed matter or decoration cannot be provided directly on the crepe. This additional cover sheet is a serious cost problem.

SUMMARY OF THE INVENTION

The present invention will be discussed with respect to circular and oval telescoping boxes. However, it will be understood that the problems to which the present invention are directed are present in many nonrectangular box shapes, and it will be understood that the invention is easily applicable to those other box shapes. In addition, while the present invention will be described with respect to construction elements referred to as a sidewall and a top disc, it will be understood that the reference to a top disc is meant to include any closure disc and is thus equally applicable to the bottom half or portion of a telescoping box construction as well as the top half or portion of a telescoping box construction.

In the present invention an improved box construction overcoming the problems of the prior art is realized by a box configuration wherein the top disc is supported on the sidewall, and the sidewall and top disc are directly and intimately adhesively bonded. An adhesive tape holds the sidewall element and the top disc element together temporarily during construction so that the parts are properly positioned relative to each other in preparation for the application of a suitable adhesive to bond the sidewall and top disc at the internal surfaces. The outer periphery of the top disc may be provided with a beveled edge to which the adhesive tape is secured both to provide additional strength for the completed structure and to hold the parts in proper relative position during construction and also to contribute to the structural integrity of the completed construction. A label or decorative cover can be

applied to the disc before assembly (actually it can be applied before the disc is cut to shape) and the adhesive tape can be preprinted thus substantially reducing the cost and improving the appearance of the box.

Accordingly, one object of the present invention is to provide a novel and improved box construction.

Another object of the present invention is to provide a novel and improved box construction especially suitable for circular and oval shapes and also especially suitable for many non-rectangular shapes.

Still another object of the present invention is to provide a novel box construction especially suitable for circular and oval shape having improved strength and structural integrity and being especially suitable for circular and oval boxes.

Still another object of the present invention is to provide a novel and improved box construction having an improved appearance and being economical to produce.

Other objects and advantages of the present invention will be apparent and will be understood from the following detailed description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, wherein like elements are numbered alike in the several figures:

FIG. 1 is an exploded view showing the box construction of the present invention prior to assembly and in relation to a construction arbor.

FIG. 2 is a sectional view showing a box member constructed in accordance with the present invention.

FIG. 3 is a partial view, in section, showing a modified version of a box construction of the present invention in an intermediate stage of construction.

FIG. 4 is a partial view, in section, showing a modified box of FIG. 3 in completed form.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, the initial assembly steps in the construction of a cardboard box member in accordance with the present invention are shown. The initial assembly takes place on an arbor 10. Arbor 10 may be of any general construction known in the art, but it preferably has a release capability such as by being provided with air holes therethrough so that a box member can be rigidly constructed thereon and then pressure loaded internally to accomplish or assist in removal by blowing the box off the arbor. The arbor could also be partly contractible so that a box member can be rigidly constructed thereon and then released for removal.

A cardboard wall 12 is placed on arbor 10 and wrapped around a cylindrical section 14 of the arbor. The outer periphery of section 14 will, of course, be circular, oval or of other shape depending on the desired final configuration of the box member. Sidewall 12 is formed from a strip which may either be precut to desired size or may be dispensed in desired lengths from a roll or other storage medium. Strip 12 is worked to stress relieve or break the fibers thereof so that it will readily conform to the contour of cylindrical section 14 without the ends of the strip tending to peak up. Sidewall 12 is placed on arbor 10 so that the inner surface 16 of sidewall 12 is in contact with and bears against the outer surface of cylindrical section 14. The ends of the strip from which sidewall 12 is formed meet and abut together at 18 without any overlap of the ends and without any peaking at the juncture of the ends. The upper edge 20 of sidewall 12 is at least flush with or extends slightly above the upper surface of cylindrical section 14 when sidewall 12 is placed on the arbor so that edge 20 is free to receive and cooperate with other elements of the box construction.

In the next step of construction a closure disc 30 (which may be a top disc or a bottom disc depending on whether the top or bottom box member is being constructed) is placed on sidewall 12 so that the inner surface 32 of disc 30 (see also FIG. 2) butts against or rests on edge 20 of sidewall 12. At this stage of construction there is no direct bond between sidewall

12 and disc 30 but rather the two parts merely meet or are butted together along a full line of contact between edge 20 and inner surface 32. At this stage, disc 30 is held against wall 12 by mechanical means such as rollers or by drawing a slight vacuum through arbor 10 such as by through the air holes discussed above with respect to pressure loading for removal. The outer periphery of disc 30 may be provided with a full or partial bevel edge 34 to contribute to and improve the construction by providing an enlarge contact surface.

After the strip from which sidewall 12 is formed is placed on arbor 10 and shaped to conform to cylindrical section 14 and disc 30 is placed on sidewall 12, an adhesive tape 22 having an adhesive coating 24 on the inner surface (which can be precoated or deposited during the construction process) is wrapped entirely around the outer surface 26 of sidewall 12 to hold sidewall 12 in conforming shape to cylindrical section 14. The upper edge 28 of tape 22 extends freely above edge 20 of sidewall 12 at this stage of construction to a height approximately level with the top of disc 30.

In the next construction step, the upper edge 28 of adhesive tape 22 is formed over to be brought into contact with the outer periphery 34 of disc 30 so that tape 22 becomes bonded to disc 30 as well as to sidewall 12. Thus, at this stage of construction disc 30 and sidewall 12 are connected together through the medium of adhesive tape 22. It will be observed that tape 22 contacts essentially all of outer surface 26 of wall 12 so that the tape is strongly bonded to wall 12, and the tape is also firmly secured to outer periphery 34 of disc 30, especially if the periphery is provided with a beveled edge as illustrated to serve as an enlarged gripping surface. Tape 22 also acts as a retaining element since the upper diameter of disc 30 is slightly smaller than the lower diameter when the tape is formed over bevel edge 34. The beveled edge is shown in exaggerated form for purposes of illustration.

At this stage of construction, the box member is removed from arbor 10. Removal may be manually, but it is preferably automatic or semiautomatic such as by pressure loading through air holes in the arbor to blow off the box member or by reducing the arbor in size to facilitate release and removal of the box member. The box member is then inverted as shown in FIG. 2 in preparation for the final construction step.

Referring now to FIG. 2, the box member is shown in section after removal from the arbor and inversion. The bonding of tape 22 to sidewall 12 and to the peripheral surface 34 of disc 30 can be seen. As the final stage of construction, an adhesive bead 36 is deposited internally of the box member along the entire line of contact or abutment between sidewall 12 and inner surface 32 of disc 30. This adhesive bead 36 spreads or flows so that it extends along inner surface 16 of wall 12, along inner surface 32 of disc 30 and seeps between the upper edge 20 of sidewall 12 and inner surface 32 along the entire line or area of contact between edge 20 and surface 32. The adhesive bead thus deposited forms, in cross section, a stubby "T" shaped configuration which simultaneously joins together or connects inner surface 16 of wall 12 to inner surface 32 of disc 30 while at the same time bonding together edge 20 of wall 12 and inner surface 32 of disc 30. Actually, the adhesive will seep into any opening between the box parts to bond the parts together in a strong unit. For example, if there is any separation between tape 22 and sidewall 12, the adhesive will seep into that opening from between edge 20 and surface 32. The adhesive may then be cured such as by heat exposure to speed drying.

Of course, it will be understood that adhesive bead 36 extends around the entire inner junction between wall 12 and disc 30. The adhesive constituting bead 36 can be any adhesive material that will flow such as a resin, a hot melt, a dextrin or an animal glue by way of example, and it will be obvious to those skilled in the art that the selection of the adhesive may be determined by the requirements of the material of which the sidewall 12 and the disc 30 are constructed. These parts could be cardboard or any other suitable paper product, or they could also be, for example, plastics, in which event a sol-

vent could be employed in place of bead 36. Regardless of the adhesive employed, the adhesive can be deposited either in globules and be allowed to flow along the juncture between the inner surfaces of wall 12 and disc 30 (with the box member perhaps being tilted and manipulated to assist the flowing) or the adhesive can be deposited uniformly and merely allowed to seep between edge 20 and surface 32. In any event, after deposition of adhesive bead 36 and setting thereof the construction of the box member is complete. Of course, printed or other decorative or advertising material or labels may be placed on the outer surface of disc 30 or tape 22 either before or after construction of the box member. However, it will be observed that with the present invention such material or labels can be put on before assembly of the box.

The bond created by bead 36 whereby inner surface 16 of sidewall 12 is connected to inner surface 32 of disc 30 at the same time that edge 20 of wall 12 is bonded to inner surface 32 is so effective and strong that the problem of inadvertent separation between sidewall 12 and disc 30 is effectively eliminated. Tests have shown that forces tending to break the box member by separating wall 12 from disc 30 will result in the shearing or pulling away of the inner surface 32 from the body of disc 30 before the elements 12 and 30 are separated. Thus, the problem heretofore encountered of structural integrity of the box member is overcome and a very strong and secure box member is created. Furthermore, appearance is greatly improved since peaking of the ends of the sidewall are eliminated and the top disc or cover label is flat. Also significant economics can be achieved by preprinting the tape 22 and by putting a cover sheet or label on disc 30 prior to assembly. Actually, the cover sheet or label can be put on disc 30 before the disc is cut to size thus eliminating a separate cutting step for the cover sheet or label.

Referring now to FIG. 3, a slightly modified construction and method is shown. FIG. 3 depicts the construction stage wherein sidewall 12 has been mounted on arbor 10 and disc 30 has been placed on sidewall 12. At this stage, the upper edge 28 has not yet been formed over periphery 34, and thus a wedge-shaped reservoir is formed between tape 22 and edge 34. In the modification depicted in FIGS. 3 and 4, an adhesive material 38 is deposited in this reservoir and edge 28 may be left upright as in FIG. 3 or formed over as in FIG. 4. In either event, the adhesive 38 is caused to flow and seep between tape 22 and the outer surface of wall 12 and also perhaps between edge 20 and inner surface 32 at the junction thereof to ensure and improve the bonding therebetween. The box member is then removed from the arbor, inverted, and adhesive bead 36 deposited in the manner previously disclosed. It will be observed that the adhesive bead 36 of the FIG. 3 and 4 configuration may assume more of a triangular shape than the stubby "T" shape in FIG. 2 because of the possible prior presence of adhesive 38 between edge 20 and inner surface 32.

As illustrated with respect to FIGS. 3 and 4, the contouring of periphery 34 can be in a radius shape rather than a straight bevel if the surface is to be contoured and the construction of FIGS. 1 and 2 can also be a radius at periphery 34. In addition, it will be understood that the forming over of the upper edge 28 of tape 22 can be accomplished manually or by a compression wheel or other similar mechanisms in either the FIG. 3 and 4 configuration or the FIG. 1 and 2 configuration.

It can thus be seen from the foregoing description that the present invention, both in the method of construction and the structural configuration resulting therefrom produce a novel and improved box member configuration which is both simple and economical to produce and which overcomes the many problems previously attendant with contoured box configurations. The box member is suitable for many applications in which large boxes are required, such as merely by way of example, large circular jig saw puzzles or candy. Of course, it will be understood that both the upper and lower box members of a telescoping box configuration can be constructed in accordance with the present invention.

While a preferred embodiment has been shown and described, various modifications and substitutions may be made without departing from the spirit and scope of this invention. Accordingly, it is to be understood that this invention has been described by way of illustration rather than limitation. 5

We claim:

1. A box member including:

a sidewall shaped to conform to a desired contour, said sidewall having an edge and inner and outer surfaces; a disc mounted on said sidewall, the periphery of said disc conforming to said desired contour of said sidewall and being coextensive with the contour of the outer surface of said sidewall, the inner surface of said disc abutting said edge of said sidewall; 10

a tape adhesively secured to the outer surface of said sidewall and to said periphery of said disc; and adhesive means disposed between said edge of said sidewall 15

and said inner surface of said disc to bond said disc to said sidewall, said adhesive means extending substantially along the entire extent of abutment between said edge of said sidewall and said inner surface of said disc and also extending across a portion of the inner surface of said disc and the inner surface of said sidewall.

2. A box member as in claim 1 wherein: said sidewall is formed by contoured cardboard in which the contoured fibers are broken for stress relief.

3. A box member as in claim 2 wherein: said periphery of said disc is contoured.

4. A box member as in claim 2 wherein: said periphery of said disc is beveled.

5. A box member as in claim 2 including: additional adhesive material between said tape and said contoured periphery of said disc. 20

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,556,383 Dated January 19, 1971

Inventor(s) Norman Glasband, Hyman Saul Glasband

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

IN THE SPECIFICATION:

Column 1, line 43, after "decoration" insert --is desired on the side wall because such printed matter or decoration--

Column 2, line 12, after "construction" delete --especially suitable for circular and oval shape--

Signed and sealed this 11th day of May 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER,
Commissioner of Patent