April 11, 1944. G. KRESS 2,346,135

METHOD OF MAKING TUBULAR CASINGS FOR SHIPPING CONTAINERS

Filed April 9, 1941

Fig. 1.

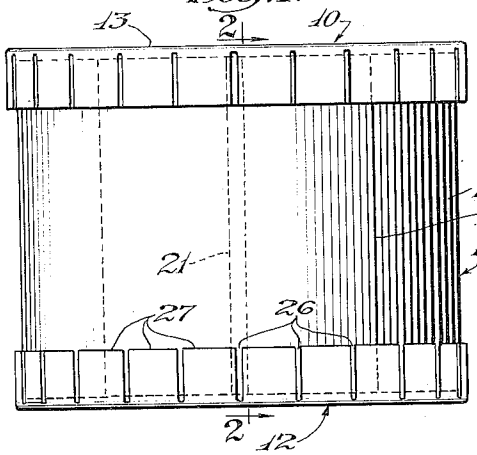


Fig. 2.

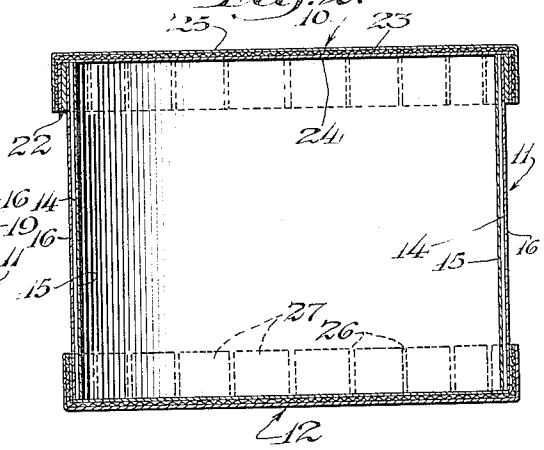


Fig. 3.

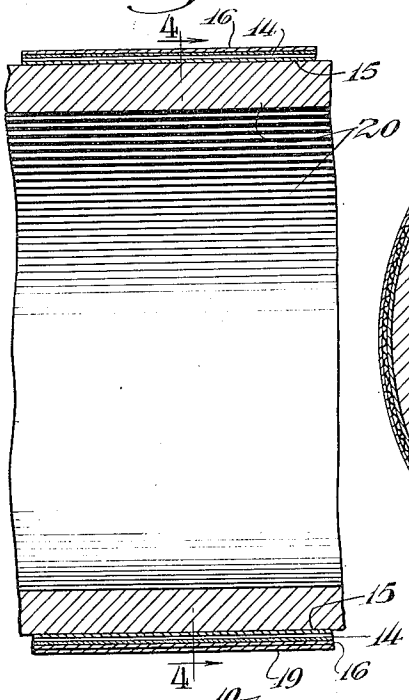


Fig. 4.

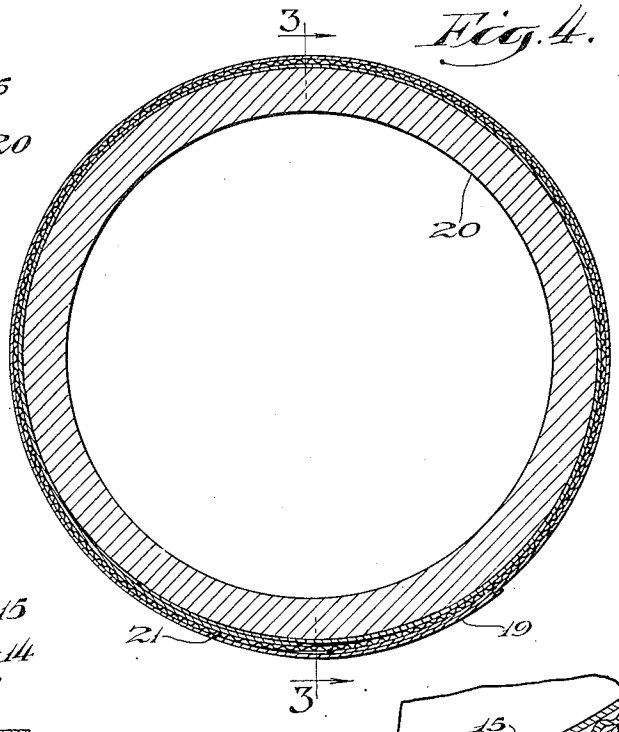


Fig. 6.

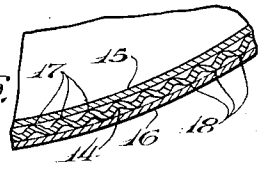
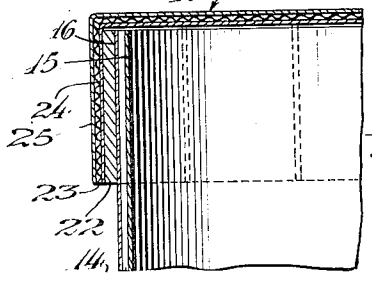


Fig. 5.



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Patented Apr. 11, 1944 2,346,135

UNITED STATES PATENT OFFICE

2,346,135

METHOD OF MAKING TUBULAR CASINGS FOR SHIPPING CONTAINERS

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Application April 9, 1941, Serial No. 387,600

6 Claims. (Cl. 93—94)

This invention relates to a casing and container and a method of making the same.

An object of the invention is to provide a strong tubular container and a simple inexpensive method of making the same from corrugated material and liner sheets.

Another object is to provide a container of corrugated material equipped with inner and outer liner sheets, the sheets being of a different material than the corrugated material. Another object is to provide a tubular casing of corrugated material with liner sheets secured to the inside and outside surfaces of the casing, the liner sheets being tightly secured to the extending surface of each of the ribs of the corrugated material. Still another object is to provide in a casing of corrugated material equipped with liner sheets on the inside and outside thereof, an overlapping of the liner sheets with the opposite sides of each of the sheets secured together in overlapping relation and with the overlapping portions of the inner liner being disposed in a different portion of the casing than the overlapping portions of the outside liner. Yet another object of the invention is to provide a method for making a tubular casing wherein a substantially straight sheet of corrugated material has a liner secured to one side thereof and the corrugated sheet with the liner attached is thereafter formed into a tubular casing and a secondary liner applied to the other side of the corrugated sheet.

A further object of the invention is to make a container of corrugated material with the ribs of the corrugations extending longitudinally with respect to the body of the container and with inner and outer liners wrapped transversely around the body of the container and secured thereto. Another object is to provide a closure member for the container, the member including a corrugated sheet equipped with a depending annular peripheral flange and to provide a band and peripheral flaps on the sheet to form the flange. Still another object is to provide a tubular casing of corrugated cardboard which is open at both ends and is equipped with closure members adapted to be removably attached to the open ends of the casing to cover the same.

Other objects and advantages will appear from the following specification and drawing in which—

Figure 1 is a side elevational view of the container; Fig. 2 is a vertical sectional view of the container taken along the line 2—2 of Fig. 1; Fig. 3 is a vertical sectional view partly broken away of the tubular casing or body of the container mounted on a mandrel, the view being taken along the line 3—3 of Fig. 2; Fig. 4 is a transverse sectional view of the tubular casing mounted on a mandrel, the view being taken along the line 4—4 of Fig. 3; Fig. 5 is a fragmentary detail sectional view of the upper portion of the container and Fig. 6 is a fragmentary detail transverse sectional view showing the wall of the container.

In the construction of containers and the like from corrugated materials such as corrugated cardboard considerable difficulty has always been encountered in attempting to provide a curved or rounded wall of the corrugated material. Corrugated cardboard, in order to be effective and satisfactory for most purposes, should be provided with a liner of cardboard or similar material on both sides of the corrugated sheet. In preparing corrugated sheets of cardboard, the liners are usually secured to the sheet immediately after it is subjected to the corrugating rolls. The resulting product is a straight sheet of corrugated material with a cardboard liner on either side thereof. Such a product cannot be successfully used in making containers which are provided with rounded and curved surfaces since in order to bend the sheet to an arcuate form it is necessary to either crush the corrugations or release one or both of the liner sheets from the material.

Efforts to make tubular containers from corrugated cardboard by forming the corrugated sheet into a tubular casing before the liners are applied have been similarly unsuccessful. When the liners are attempted to be applied it is found that the ribs of the corrugations are not in alignment and it is difficult, even impossible, to attach the liners to each of the ribs. Thus, if it were attempted to attach liners to such a tubular casing of corrugated material, the liners could not be brought into contact and engagement with the extending surfaces of each of the ribs without great difficulty and the use of expensive equipment and operations.

In the present invention, a container of tubular or curved or arcuate form may be made of corrugated board and by following the simple steps set forth the corrugated material may be provided with liners which are tightly secured to each of the ribs on both sides of the corrugated material.

The general steps of the present invention include the providing of a substantially straight sheet of corrugated cardboard or the like, adhesively securing a liner sheet to one side of the corrugated sheet, forming the corrugated sheet with the liner attached into a tubular casing and

applying a second liner to the other side of the corrugated sheet.

In the specific embodiment of the invention described herein, a container 10 is equipped with a tubular casing or body portion 11 and with upper and lower closure members or covers 12 and 13. The wall of the tubular casing as seen particularly in Fig. 6, includes a sheet of corrugated material 14 and an inner liner 15 and an outer liner 16. The liner 15 is adhesively secured to the corrugated sheet 14 at the extending surfaces 17 of the ribs of the corrugated sheet. Similarly the liner 16 is adhesively secured to the outwardly extending surfaces 18 of the ribs of the corrugated sheet.

The corrugated sheet 14 may be made of cardboard or any other suitable material such, for example, as synthetic products such as those sold under the trade name "Masonite" but referred herein to corrugated board. I intend to include cardboard and other suitable materials which may be made into corrugated sheets.

The liners 15 and 16 are preferably made of sheets of hard surfaced cardboard and are normally lighter than the corrugated sheet. If desired, paper or other suitable material can be used for the liner sheets.

In making the tubular casing or body portion 11 of the container, a sheet of corrugated material 14 is secured to the liner 16. The corrugated sheet 14 is preferably substantially straight and may be attached to the liner sheet by adhesive, the adhesive being applied to each of the extending surfaces 18 of the ribs of the corrugations or to the surface of the liner 16. The adhesive is permitted to dry to form a tight bond. The inner liner 15 is placed around a suitable mandrel 20, the mandrel being of a diameter equal to the desired inside diameter of the container. The liner 15 is somewhat wider than the corrugated sheet 14 and extends entirely around the mandrel 16 with the opposing sides of the liner 15 overlapping at 21. The overlapping portion of the liner 15 is adhesively secured to the other side of the liner sheet. Adhesive may then be applied to the outside surface of the inner liner 15 and the corrugated sheet applied to the liner or to the inwardly extending surfaces 17 of the ribs of the corrugated sheet.

The corrugated sheet is wound around the mandrel in tubular form with the extending surfaces 17 of the sheet 14 being brought into engagement with the outside of the inner liner 15. The outer liner 16 is of a greater width than the corrugated sheet 14 so that when the sheet 14 is formed around the mandrel 20 the portion 19 of the outer liner 16 is adhesively secured to the opposing side of the liner. If desired, the overlapping portions of the inner and outer liners may be disposed on opposite sides of the tubular casing. When the adhesive has dried the tubular casing is complete and may be removed from the mandrel 20.

The closure members 12 and 13 are identical in construction and may be easily and readily made. In the making of the colsure member a cardboard strip 22 is formed into an endless band. A sheet of corrugated material 23 equipped with inner and outer liners 24 and 25 respectively is placed across one of the open ends of the band. The sheet 23 is of such a size that the periphery thereof extends beyond the band by a distance substantially equal to the depth of the band. The sheet 23 with the liners attached thereto may then be cut away at the portions 26, these portions preferably being of V-shape. The space notches in the sheet 23 thus provide spaced peripheral flaps 27 in the sheet. The flaps 27 are turned downwardly along the outside of the band 22 and adhesively secured thereto. If it is desired to permanently attach one or both of the closure members to the tubular casing, the inside of the band 22 may be coated with a layer of adhesive and thereby attached to the outside of the casing.

In the tubular casting 11, the ribs of the corrugations are disposed longitudinally with respect to the casing and the liners are wrapped transversely about the corrugated body portion with the ends of the liners disposed in overlapping relation. Preferably, the liner sheets as shown are wound around the corrugated body portion in a direction substantially normal to the axis thereof. With this construction, a maximum strength is provided by the ribs while the liners are tightly secured against removal from the corrugated sheet. By applying the outer liner to the corrugated sheet before it is formed into a tubular casing, a tight adhesive bond is formed by the liner and the extending surface of each of the ribs of the corrugation. When the corrugated sheet is thereafter bent the attachment of the ribs to the outer liner maintains the ribs in alignment with each other during the bending operation. Accordingly when the inner liner is to be adhesively secured to the corrugated sheet it may readily be brought into engagement with the inwardly extending surfaces of each of the ribs. This feature is extremely important since, if the ribs are out of alignment by even a few thousands of an inch, a good adhesive bond will not be obtained with all of the ribs. Moreover, with this construction, the outer liner is very tightly secured to the corrugated sheet and any weakness in the adhesive bond which should appear is more likely to be present in the inner liner where it is least important.

The tubular casing 11 as shown, is cylindrical in shape but may if desired be of oval, elliptical or other shape. By referring herein to the corrugated board as being straight when the outer liner is attached thereto I mean that a line drawn through the extending surfaces on one side of each of the ribs of the corrugations is substantially straight.

While there are shown and described certain embodiments of the invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is intended to claim all novelty inherent in the invention as broadly as permissible, in view of the prior art.

I claim:

1. A method of making a tubular casing comprising providing a substantially straight sheet of corrugated material, adhesively securing a liner sheet to the extending surface of the ribs on one side of said material, said liner sheet being wider than the corrugated sheet and extending beyond the same on one side thereof, forming the corrugated sheet and the liner attached thereto into a tubular casing with the liner on the outside of the casing and with the extending side of the liner in overlapping relation, and securing a liner sheet to the corrugated material on the inside of the casing.

2. A method of making a tubular casing comprising providing a substantially straight sheet of corrugated material, adhesively securing a liner sheet to the extending surface of the ribs on one side of said material, said liner sheet being wider than the corrugated sheet and extending beyond the same on only one side thereof, forming the corrugated sheet and the liner attached thereto into a tubular casing with the liner on the outside of the casing, adhesively securing the extending side of the liner to the other side of the same in overlapping relation, adhesively securing a liner sheet of a width greater than the width of said corrugated sheet to the extending surface of the ribs of the corrugated material on the inside of the casing with the sides of the inner liner sheet secured together in overlapping relation.

3. A method of making a tubular casing comprising providing a sheet of corrugated board with a liner sheet secured to one side thereof, said liner sheet being wider than said corrugated sheet and extending beyond the same on only one side thereof, bending said corrugated sheet into a tubular casing with the liner on the outside of the casing, adhesively securing the extending side of the liner to the other side thereof in overlapping relation, placing a second liner sheet around a mandrel with the opposite sides thereof joined together in overlapping relation, applying adhesive to the surface of said second liner sheet, and placing the tubular casing about said second liner with the ribs of the corrugations longitudinally disposed with respect to the mandrel and with the inner extending surfaces of said ribs in engagement with the inner liner and the adhesive thereon.

4. A method of making a tubular casing for a shipping container, comprising providing a substantially flat sheet of corrugated material adhesively securing a liner sheet in fixed position to the extending surfaces of the ribs on one side of said material while the corrugated sheet is substantially flat to provide a flat corrugated sheet with a liner sheet attached to the projecting ribs on one side thereof, forming the corrugated sheet and the liner attached thereto into a convolute tubular casing with said ribs disposed in parallel relation to the longitudinal axis of the casing, applying to the other side of the corrugated material a second liner sheet, and adhesively securing the second liner sheet to the extending surface of the ribs on the other side of the corrugated material while the corrugated sheet and the liners are in the form of a tubular casing.

5. A method of making a tubular casing for a shipping container, comprising providing a substantially flat sheet of corrugated material, adhesively securing a liner sheet to the extending surfaces of the ribs on one side of said material while the corrugated sheet is substantially flat, drying the adhesive to provide a flat corrugated sheet with a liner sheet attached in fixed position to the projecting ribs on one side thereof, forming the corrugated sheet and the liner attached thereto into a convolute tubular casing with said ribs disposed in parallel relation to the longitudinal axis of the casing and with the end edge of the corrugated sheet right-angularly disposed with respect to said axis, applying to the other side of the corrugated material a second liner sheet, and adhesively securing the second liner sheet to the extending surface of the ribs on the other side of the corrugated material while the corrugated sheet and the liners are in the form of a tubular casing.

6. A method of making a tubular casing for a shipping container, comprising providing a substantially flat rectangular sheet of corrugated material, adhesively securing a liner sheet in fixed position to the extending surfaces of the ribs on one side of said material while the corrugated sheet is substantially flat, the liner sheet being of substantially the same length as the corrugated sheet and having its end edges registering with the end edges of the corrugated sheet, forming the corrugated sheet and the liner attached thereto into a convolute tubular casing with said ribs disposed in parallel relation to the longitudinal axis of the casing and with the registering end edges of the corrugated sheet and liner right-angularly disposed with respect to said axis, applying to the other side of said corrugated material a second liner sheet of substantially the same length as the corrugated material, and adhesively securing the second liner sheet to the extending surfaces of the ribs on the other side of the corrugated material with the end edges of the second liner sheet registering with the end edges of the corrugated sheet, the second liner being secured to the corrugated sheet while the corrugated sheet and liners are in the form of the tubular casing.

GEORGE KRESS.