June 5, 1951 K. STUART ET AL 2,555,380

CONTAINER

Original Filed Oct. 26, 1940 2 Sheets-Sheet 1

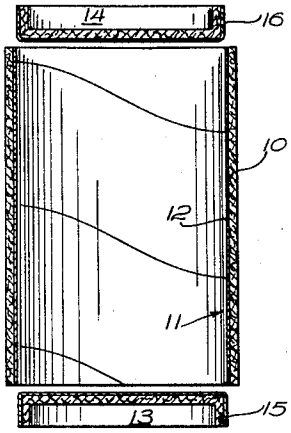


Fig. 1

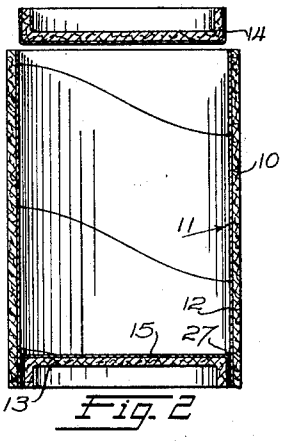


Fig. 2

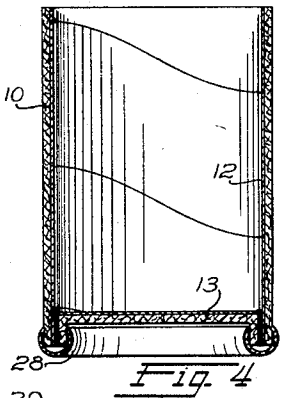


Fig. 4

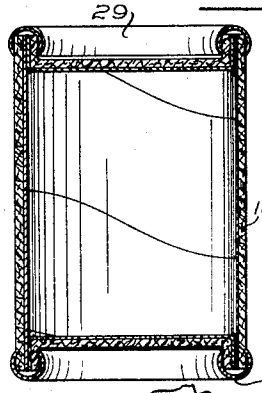


Fig. 5

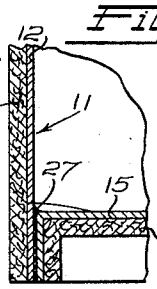


Fig. 3

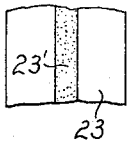


Fig. 6A



Fig. 7

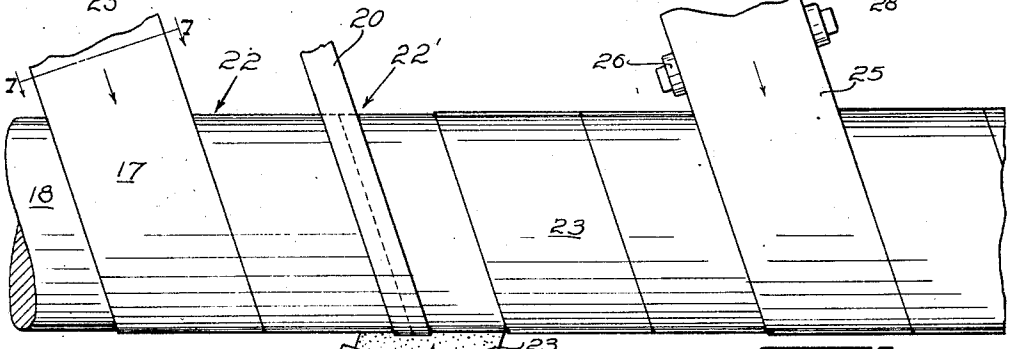


Fig. 6

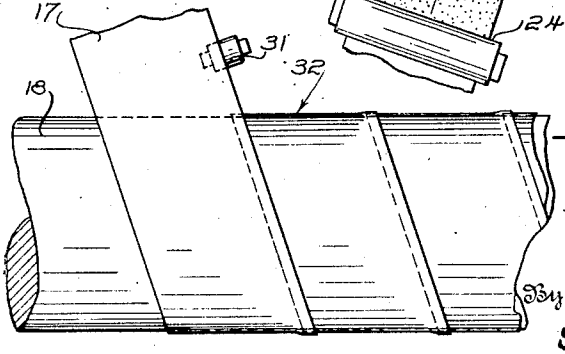


Fig. 8

Inventor

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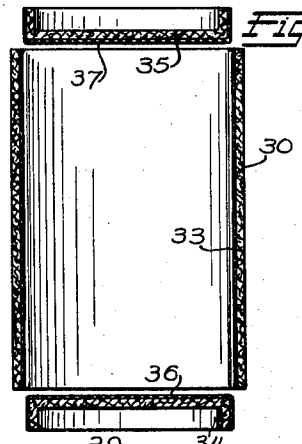
Strauch & Hoffman Attorney

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CONTAINER

Original Filed Oct. 26, 1940 2 Sheets-Sheet 2

Fig. 9



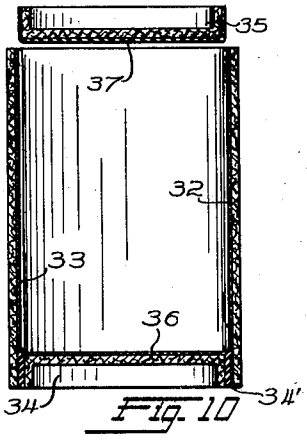
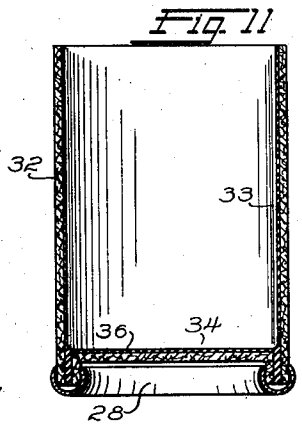


Fig. 10

Fig. 11



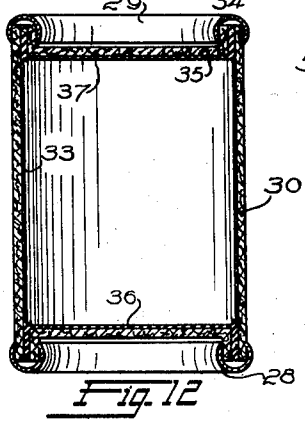


Fig. 12

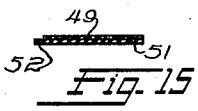


Fig. 15

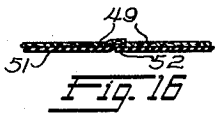


Fig. 16

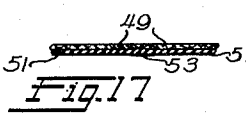


Fig. 17

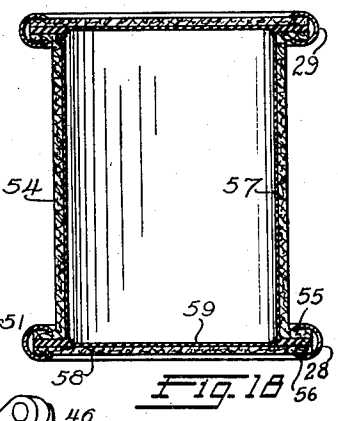


Fig. 18

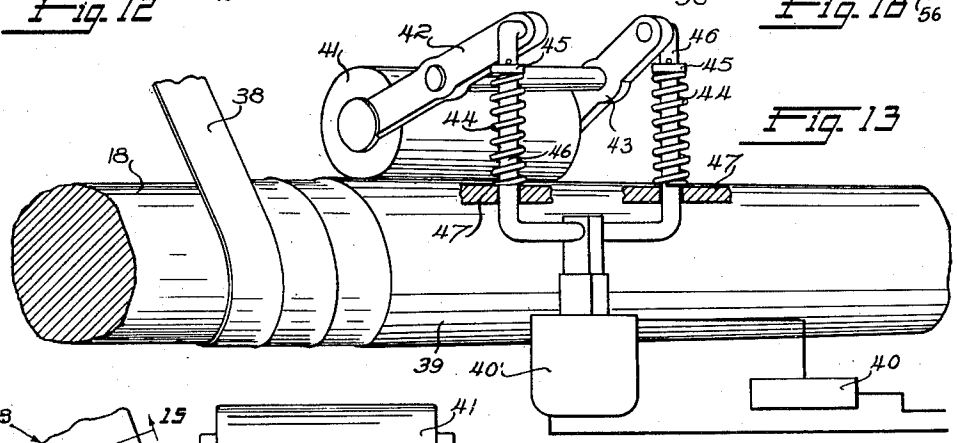


Fig. 13

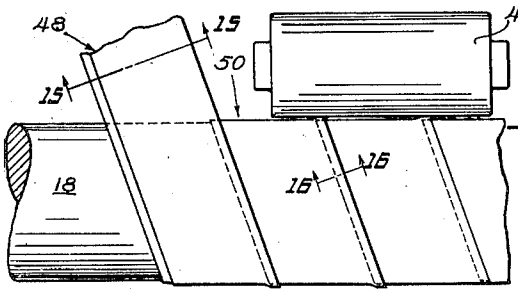


Fig. 14

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Patented June 5, 1951

2,555,380

UNITED STATES PATENT OFFICE

2,555,380

CONTAINER

Kimberly Stuart, Menasha, Wis., and Allen B. Wilson, Evanston, Ill.; said Wilson assignor, by mesne assignments, to Elizabeth R. B. Stuart, Menasha, Wis.

Original application October 26, 1940, Serial No. 363,060. Divided and this application January 21, 1946, Serial No. 642,544

5 Claims. (Cl. 229—3.5)

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The present invention relates to containers for packaging foods, liquids and any other substances and to methods of making such containers. More particularly, our invention is concerned with spirally wound tubular containers which are lined to be leak-proof and impervious to mechanical or chemical action of the contents.

This is a division of our application Serial No. 363,060 filed October 26, 1940 which issued as United States Letters Patent No. 2,393,347 on January 22, 1946.

This is also a continuation-in-part of our application Serial No. 272,516 filed May 8, 1939 which was copending with said application Serial No. 363,060 and has since matured into United States Letters Patent No. 2,281,889 dated May 5, 1942.

The invention is especially designed for packaging food mixtures and liquids in containers of suitable size for retail sale, and the preferred embodiment of the invention to be hereinafter described has been found to be very satisfactory for paper beer cans of two quart capacity or more. It will be understood, however, that the scope of the invention is not thus limited but embraces containers for any substances.

It has heretofore been suggested to line liquid carrying paper containers with foil or cellophane but such linings have generally been inserted into otherwise complete containers, and this presents difficulties of assembly. In practicing our invention, the lining is incorporated during manufacture of the container walls and to our knowledge we are the first to make a spirally wound container of paper or like fibrous material having such a smooth, substantially continuous, built-in liner which is moisture and leak-proof and is impervious to the chemical action of the contents.

With the above in mind, it is a major object of the present invention to provide a novel inexpensive spirally wound paper or like fibrous container having a built-in lining of moisture-impervious material which is chemically inert to the contents of the container.

A further object of the invention is to provide a novel spirally wound container having a substantially continuous tubular lining of metal foil. Preferably the foil lining is adhesively sealed by a special latex adhesive chemically inert to the contents of the container.

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A further object of the invention is to provide a novel spirally wound container having an integral built-in thermoplastic lining. Preferably, the lining material is sheet rubber hydrochloride.

A further object of the invention is to provide a novel spirally wound container having a substantially continuous lining of material which is moisture-impervious and chemically inert with respect to the contents of the container and wherein a closure member is sealed to the container and further secured thereto by a clenched metal reinforcing rim.

Further objects of the invention will presently appear as the description proceeds in connection with the appended claims and the annexed drawings, in which:

Figure 1 is an exploded view in section of a container comprising a preferred embodiment of the invention, prior to assembly of the container body with the end closure members;

Figure 2 is a sectional view illustrating the first step in assembly of the container parts of Figure 1 wherein the bottom closure member is attached to the container body;

Figure 3 is an enlarged fragmentary section illustrating the adhesive bond between the foil linings of the bottom closure member and the container body member;

Figure 4 is a sectional view illustrating the next step in assembly of the container wherein a reinforcing metal rim is clenched along the joint between the container body and the bottom closure member;

Figure 5 is a section illustrating the complete container wherein the top closure member or cover is attached to the container body in the same manner as the bottom closure member;

Figure 6 is a diagrammatic view illustrating a method of making the tubular container body wherein the liner strip is wound with a butt seam between convolutions;

Figure 6A illustrates application of the adhesive to the butt seam by the inner body wall strip, wherein the strip is provided with a narrow strip of adhesive on its inner surface;

Figure 7 is a section along line 7—7 of Figure 6 illustrating the laminated paper and foil construction of the liner strip;

Figure 8 illustrates a variation of the method of Figure 6 wherein the paper and foil liner strip

is wound with an overlapped adhesively secured seam;

Figure 9 is an exploded view in section similar to Figure 1 except that the container body and closure members are lined with a thermoplastic sheet material;

Figure 10 is a sectional view illustrating the first step in assembly of the container parts of Figure 9 wherein the bottom closure member is heat sealed to the container body;

Figure 11 is a sectional view illustrating the next step in assembly of the container of Figure 9 wherein a clenched metal rim is secured along the joint between the container body and the bottom closure member;

Figure 12 is a section illustrating the complete container having the top closure member heat sealed to the container body and provided with a clenched metal rim;

Figure 13 illustrates a method of forming the liner employed in the tubular body member of the container of Figure 9, wherein a sheet of thermoplastic material is lap wound on a mandrel and its seams are heat sealed by a hot roller;

Figure 14 illustrates a variation of the method illustrated in Figure 13 wherein the thermoplastic strip is laminated to a strip of paper before winding on the mandrel;

Figure 15 is a section on line 15—15 of Figure 14 illustrating the laminated construction of the liner strip of Figure 14;

Figure 16 is a section on line 16—16 of Figure 14 illustrating the butt seam between the wound strip convolutions before heat sealing;

Figure 17 is a section illustrating the liner seam of Figure 16 after it has been heat sealed; and

Figure 18 is a section through a flared end can provided with flat closure members and lined according to the invention.

Our invention briefly comprises making a spirally wound tubular container body having a substantially continuous inner lining which is moisture and gas proof and chemically inert with respect to the contents of the container, and providing the container with end closure members lined with the same material as the container body. The linings of the container body and the closure members are sealed to each other and comprise a substantially continuous envelope surrounding the contents of the container.

Preferably the container is lined with aluminum foil or a thermoplastic sheet material such as rubber hydrochloride or Pliofilm.

An especially important feature of the invention is our novel manner of making the tubular container body wherein we first spirally wind suitable strip material on a mandrel to form a tubular liner and then, after sealing the seams of the liner, we build up further spiral layers of relatively heavy paper or like fibrous material until the desired wall thickness has been obtained. Where the liner material is sufficiently tough to withstand relatively rough handling and the tension required for winding it on the mandrel, as with sheet rubber hydrochloride or Pliofilm, the initial step of making the liner comprises winding an individual strip of this material. Where, however, the material is relatively fragile and easy to tear, as in the case of thin, light aluminum foil, we prefer to laminate it to a strip of thin backing paper before winding.

Foil-lined container

Referring to Figures 1–8, the container comprises a tubular cylindrical body 10 of heavy paper, cardboard, fiber-board or like inexpensive fibrous material, having a tubular liner 11 faced with a substantially continuous, smooth lining 12 of metal foil, such as aluminum foil. In the illustrated embodiment of the invention, the container is provided with internally fitting shallow, cylindrical, cup-shaped bottom and top closure members 13 and 14 having foil linings 15 and 16, respectively.

Closure members 13 and 14 are suitably formed from paper, cardboard, fiberboard or like fibrous material; and linings 15 and 16 are cemented thereto by a suitable adhesive such as the latex adhesive described in Stuart Patent No. 2,068,893.

Tubular container body 10 is preferably constructed by the method illustrated in Figure 6.

Tubular liner 11 is shaped by spirally winding a laminated strip 17 upon a suitable rotatable mandrel 18. As illustrated in Figure 7, strip 17 comprises a thin, tough, flexible sheet of paper 19 bonded in full surface engagement with a thin sheet of aluminum foil 21. Preferably sheets 19 and 21 are adhesively bonded by the latex adhesive above described.

Laminated strip 17 is spirally wound with its foil surface 21 contacting the periphery of the mandrel so as to comprise the inner surface of the liner tube and adjacent edges of the wound strip are disposed in abutting relation. The width of strip 17 and the pitch of the spiral in which it is wound on the mandrel are matters of choice depending on the type of the container to be manufactured.

At the section indicated at 22 in Figure 6, the liner tube consists of spirally wound abutting coils which are maintained in this position on the mandrel by winding tension. Beyond section 22, a narrow thin strip 20 of paper or like material having its inner face coated with a fresh layer of adhesive is spirally wound upon and along the butt seam between adjacent coils of the liner tube. This adhesive is selected according to the use for which the container is intended, and a large number of adhesives are available including the latex adhesive above described. In general any adhesive may be used which will retain its strength during the life of the container and will not be softened by or mix with the contents of the container. This seals the butt seam at the section indicated at 22′ in Figure 6. Just sufficient adhesive is supplied at the butt joint to fill the seam and insure proper attachment of the adjoining coils, and no excess adhesive is transmitted to the mandrel surface. Beyond section 22′, a strip of paper, cardboard, or like fibrous material 23, the inner surface of which passes over a suitable adhesive coating roll 24, is spirally wound upon the liner tube. Strip 23 is preferably appreciably thicker and stronger than the liner strip and is coated with the latex adhesive described above.

As strip 23 is spirally wound about the liner tube, it is adhesively secured thereto and thereby assists strip 20 in retaining the convolutions of the liner tube in contiguous abutting relation. Strip 20 prevents excess adhesive from the inner surface of strip 23 from entering the butt seams between the convolutions of strip 17. This prevents oozing of excess adhesive to the mandrel surface. The pitch of strip 23 may be opposite to that of strip 17 if desired.

As shown in Figure 6A, strip 20 may be omitted and the inner surface of strip 23 coated with a thin strip of adhesive 23′ located to fall directly

upon and along the butt seam. By carefully controlling the viscosity and amount of adhesive at 23', there is no oozing of the adhesive between the abutting edges of strip 17 onto the mandrel surface.

Beyond the winding station of strip 23, a further strip 25 similar to strip 23 is spirally wound about the mandrel exteriorly of wound strip 23 to build up a second layer of relatively thick paper. A suitable roll 26 coats the inner face of strip 25 with our above described latex adhesive in the same manner as strip 23. Beyond strip 25, additional strips are spirally wound and adhesively bonded in succession until the container body tubing is built up to required wall thickness. The number of layers wound about the liner tube is a matter of choice. Since these latter winding operations are conventional in the spiral can winding art, further description of the same is deemed unnecessary to understand the invention.

After the container body tubing has been built up to required wall thickness, it is cut into individual container body lengths in the usual manner and is ready for incorporation in the complete container.

Tubular container body 10, made as above described, comprises a relatively stiff cylinder of spirally wound paper or like fibrous material having a substantially continuous inner surface of metal foil. This inner surface of metal foil is smooth and uninterrupted except at the spiral liner seams. The space between these seams is filled and sealed by the latex adhesive supplied by strip 20 as above described. Strip 20 and the several succeeding adhesively secured paper layers retain the coils of strip 17 against separation.

While the use of the above-identified latex adhesive is especially satisfactory in practicing the invention because it is impervious to moisture and chemically inert with respect to beer, foods, and most mixtures and liquids which are usually packaged in this manner, it is within the scope of this invention to employ any quick adhesive which is non-toxic for the particular contents of the container. The particular adhesive is usually selected for its inertness with respect to the contents of the container. Constructed as above, tubular container body 10 has a moisture impervious, chemically inert lining which is smooth and pleasing in appearance.

In assembling the container parts, tubular body member 10 is first provided with bottom closure member 13. Closure member 13 fits snugly within body 10 with the arcuate surfaces of foil lining 15 substantially uniformly contacting inner foil lining 12.

As illustrated in Figures 2 and 3, we seal bottom closure member 13 to the container body by providing a film or layer 27 of our latex adhesive between the adjacent foil surfaces of the closure member and body. Film 27 is elastic and adheres very strongly to the foil surfaces.

Many substances packaged in sealed containers contain or produce gases which develop substantial internal pressures within the container which may increase to such proportions as to burst the closure member seals. The canning of beer is a very good example of a problem of this kind. In order to reinforce the seal and bond between our container body and the bottom closure member, we provide the joint between them with a continuous C-shaped clenched metal rim strip having its opposite lateral edges biting into the paper at opposite sides of the joint. The clenched rim and the method and apparatus for applying it to the container may be that disclosed in United States Letters Patent No. 2,283,962 issued May 26, 1942, but preferably we employ the serrated end rim disclosed in United States Letters Patent No. 2,342,715 issued February 29, 1944, which is especially suitable for securing closure members on containers.

After bottom closure member 13 has been attached, the container is then provided with its contents and top closure member 14 attached to the container body in substantially the same manner as above described for bottom closure member 13 and as illustrated in Figure 5.

The complete container of Figure 5 comprises a sturdy cylindrical paper can wherein the top, bottom and inner side walls are lined with a chemically inert, moisture-proof envelope which has been incorporated into the can during the method of its making and assembly above described. The interior of the can is perfectly smooth and the exposed foil and adhesive portions of the lining prevent leakage of the contents through to the relatively porous outer walls 10, 13 and 14. The can is further reinforced against rough handling and the development of internal pressures by the elastic joints at 27 and by rims 28 and 29 which also give it a neat and pleasing appearance externally, an especially desirable factor in retail trade.

Figure 8 illustrates an alternative method of winding laminated strip 17 upon the mandrel. The successive convolutions of the spiral are slightly overlapped, with foil face 21 provided along a narrow area at one edge with a coating of our latex adhesive by a suitable roll 31 so that, during winding, successive convolutions of the strip are adhesively secured to each other with a lapped seam. The wound liner tubing section indicated at 32 is provided with such additional layers of paper as are required to build the container body tube to desired wall thickness in the manner described in Figure 6.

It is ordinarily a matter of choice as to whether a butt or lapped seam is provided for the container liner. This choice usually depends upon the nature of the material to be packaged. The lapped seam requires a greater amount of material than the butt seam, but it provides a more effective seal. The butt seam is easier to wind and is perfectly satisfactory for most purposes, however.

The internal surface of a container body provided with a lapped seam liner of Figure 8 is substantially as smooth as in a container having a butt seam liner since both the foil 21 and backing paper 19 are quite thin and their combined thickness at the seam lap is very small.

Thermoplastic sheet lined container

Figures 9–17 illustrate a tubular container lined with thermoplastic sheet material and methods of making the container.

Referring to Figure 9, the tubular container body 30 is provided with a tubular liner 33 of thermoplastic sheet material. For purposes of the invention, especially in the canning of syrup, beer, and other liquid foods and beverages, we have found that sheet rubber hydrochloride known under the trade name of Pliofilm is very satisfactory, but any other equivalent thermoplastic sheet material which is impervious to moisture and at the same time chemically resistant to the action of the contents of the can

may be employed. The container also comprises bottom and top end closure members 34 and 35, which are lined at 36 and 37, respectively, with the same thermoplastic sheet material. Closure members 34 and 35 are suitably formed from paper or like fibrous material similarly to closure members 13 and 14, and linings 36 and 37 are preferably uniformly bonded thereto in smooth intimate full surface engagement by our latex adhesive.

Figure 13 illustrates the initial step of a preferred manner of manufacturing container body 32. A thin sheet of rubber hydrochloride is spirally wound upon mandrel 18 to form the tubular liner section indicated at 39. Strip 38 is preferably wound in such manner that adjacent narrow edge areas of the convolutions are lapped as indicated in Figure 13 and these lapped areas are subjected to combined heat and pressure, as by heated roller 41.

Roller 41 is maintained at a sufficiently high temperature to soften the overlapped strip areas which thereby fuse and become integral, and the pressure of roller 41 is sufficient to flatten this lapped fused seam to distribute the material uniformly and prevent undesirable bulges at the liner seams. The effect of subjecting the liner tubing to the heat and pressure of roller 41 is to fuse and weld the wound liner strip into a continuous integral tube. Following this welding operation, successive layers of paper or the like are spirally wrapped and adhesively secured upon and about the liner tube in the manner above described.

Roller 41 may be of any suitable length for insuring proper fusing of the seam of the liner tubing. Roller 41 is idly rotatably supported at the ends of pivoted arms 42 and 43, which carry the electrical wires for supplying current to the internal roller heater element, and is rotated by reason of its frictional contact with the driven liner tubing.

During ordinary operating conditions, roller 41 is held in contact with the surface of the liner tubing by its own weight and the force of springs 44 which react between washers 45 secured to control rods 46, pivotally connected to the outer ends of arms 42 and 43, and stationary abutments 47. Rods 46 are suitably interconnected and the mechanism operating mandrel 18 actuates suitable devices insuring that rods 46 are displaced downwardly automatically whenever rotation of the mandrel stops. This may be effected for example by a centrifugal switch 40 or the like at the mandrel drive controlling a solenoid assembly 40' adapted to pull down rods 46. Springs 44 re-establish the roller on the tubular lining when the solenoid is de-energized. However, the exact details of this mechanism are not essential to a complete understanding of the invention, it being only necessary that roller 41 be displaced from the surface of the liner tubing while mandrel 18 is stationary.

While the above-described manner of applying heat for sealing the liner tubing seams is preferable, equivalent methods may be used without departing from the spirit of the invention. For example, heated roller 41 may be applied after one or more outer paper layers have been wound about the liner tubing, care being taken to accomplish this before the paper layers are so thick as to insulate the lining.

Beyond section 39, paper or fiber board strips are spirally wound and adhesively secured about the liner tube in the manner above described until the container body tubing on mandrel 18 is built up to desired wall thickness. The body tubing is then cut into lengths 30 which are ready for assembly into the complete container.

Tubular container body 30 thus manufactured comprises a relatively stiff paper cylinder which is mechanically strong and lined internally with a smooth uninterrupted coating of thermoplastic material. The relatively slight bulges where the seams of strip 38 are welded together are so smoothed and distributed along the container that they are not appreciable to the eye and do not interfere with the appearance of the container.

In assembly of the container elements, bottom closure member 34 is first inserted into container body 30 so that the arcuate face of lining 36 is in uniform contact with end areas of lining 33. Heat and pressure are then applied at the joint between closure member 34 and the container body in sufficient degree to fuse the contacting areas of thermoplastic linings 36 and 33 until they are integrally united as shown in Figure 10. Pliofilm is such an excellent conductor of heat that the application of a heated iron along the edge indicated at 34' in Figure 10 is sufficient to fuse the lining along the entire peripheral depth of closure member 34.

C-shaped rim 28 is then applied to the joint between body 30 and closure member 34 is illustrated in Figure 11. After the container has been provided with its contents, upper closure member 35 is then heat sealed to the container body in the same manner as member 34 and C-shaped rim 29 applied to reinforce the joint between closure member 35 and the container body as illustrated in Figure 12.

The finished container thereby comprises a spirally wound paper can continuously and integrally lined with thermoplastic material which comprises a complete envelope about the contents of the container and which is gas proof and moisture impervious and chemically inert with respect to beer, food or other contents of the can. Furthermore, rubber hydrochloride or Pliofilm possesses sufficient elasticity to withstand contraction and expansion resulting from temperature variations without injury to its sealing action. We have found that practically the thermoplastically sealed container provides a somewhat better bond between the container body and closure members than the adhesively sealed foil lined container.

Figure 14 illustrates a further manner of forming the tubular liner for container body 30 in the initial step of manufacturing that body. While sheet rubber hydrochloride is ordinarily sufficiently tough to withstand winding tension, it may be desired to employ very thin sheets of this material or to employ sheets of other thermoplastic material which are susceptible to tearing. In such instances, we laminate the rubber hydrochloride to a thin flexible sheet of paper as illustrated in Figures 14 and 15 where liner strip 48 comprises a thin flexible strip of tough paper 49 secured to a wider strip of sheet rubber hydrochloride or other thermoplastic 51. Preferably the paper and rubber hydrochloride sheets are uniformly bonded by our latex adhesive above described, and the thermoplastic strip extends a substantial distance beyond the lateral edge of the paper strip as indicated at 52 in Figures 15 and 16.

As illustrated in Figures 14 and 16, strip 48 is wound upon mandrel 18 spirally and the adja-

cent convolutions are so lapped that the double thickness edge of each convolution is lapped over the extended thermoplastic portion 52 of the preceding convolution. This relation of the lapped convolutions is clearly illustrated in enlarged Figure 16.

Beyond the winding station of strip 48, heat and pressure applying roller 41 is applied to the periphery of the wound liner tubing section indicated at 50, and this heat and pressure is sufficient to soften and weld the lapped areas of thermoplastic strip 52 together to form the fused seam indicated at 53 in Figure 17. During this operation, pressure of the roller is sufficient to substantially align the paper backings 49 of the adjacent convolutions into substantially abutting relation as illustrated in Figure 17.

After the winding and heat sealing operations above described, the resulting liner tubing comprises a spirally wound strip of thin paper having its inner surface securely bonded and integrally lined with a coating of thermoplastic material. The liner tubing is then provided with one or more spirally wound and adhesively secured paper or like layers until desired wall thickness is attained as described above in the other embodiments of the invention and the body tubing thus formed is cut to desired lengths. Where sheet rubber hydrochloride is employed at 51, strips 49 and 51 may be of the same width and wound on the mandrel with a butt seam between convolutions. Such a seam will seal upon application of heat and pressure similarly to the overlapped seam of strip 38 above described.

Figure 18 illustrates a further embodiment of the invention wherein the can body comprises a spirally wound cylindrical tube 54 having flared ends 55 which terminate in relatively flat lip portion 56. Tube 54 is manufactured by the usual methods of making such cans and is internally lined with a layer of moisture impervious, chemically resistant material 57 which may be the metal foil or the thermoplastic sheet material above described and which is incorporated during the initial steps of forming the tube according to the invention as above described.

As illustrated in Figure 18, lining 57 extends over lip portions 56 and thereby provides a seat for flat closure members 58. Each closure member 58 comprises a stiff circular cardboard member having an inner liner face 59 consisting of a sheet of metal foil or rubber hydrochloride adhesively bonded thereto and adapted to engage lining 57 and the container body in annular contact at lip 56.

Linings 59 and 57 are sealed together by our latex adhesive where the linings are metal foil, or by heat pressure where they are thermoplastic. Reinforcing rims 28 and 29 are applied along the joints in the manner above described.

The mandrel may be heated where the lining is non-thermoplastic as in Figures 1–7 to hasten adhesive setting at the butt joint.

Our invention provides an inexpensive safe manner of packaging oils, syrup, beer and other beverages and liquid foods, other foods and like substances. The built-in lining insures that such substances do not contact tinned or like surfaces which many people believe alter the taste. The can joints are reinforced to withstand high internal pressures, and to eliminate breakage due to rough handling.

The combined strength of the elastic joints between the can closure members and body and the clenched metal rims therealong is such that these joints withstand higher internal pressures than the paper can body itself.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A container comprising a spirally wound tube of paper or like fibrous material; a thin spirally wound moisture impervious wall lining said tube, means adhesively securing said wall to said tube; covers closing opposite ends of said tube, each of said covers being lined with moisture impervious material; means sealing the linings of said covers and tube in moisture tight relation so that the entire inner surface of said container comprises a substantially continuous moisture impervious envelope, and metal rims further securing said covers upon said tube, each of said rims comprising a narrow strip of metal disposed about and along the joint between the cover and tube and transversely arcuately bent so that its opposite lateral edges bite a substantial distance into the materials of said cover and tube at opposite sides of said joint with a tight grip.

2. A container comprising a spirally wound tube open at one end, a closure member at the other end of said tube having a peripheral portion overlapping with said tube, a heat sealed continuous thermoplastic lining on the inner side and bottom walls of said container and providing a flexible seal between the closure member and tube and a substantially C-shaped continuous metal rim clenched along and about the joint formed by the overlap between said closure member and tube, said rim having its opposite lateral edges imbedded in said closure member and tube respectively.

3. In a container, a spirally wound tube of paper or like fibrous material an integral lining of spirally wound, heat fused thermoplastic sheet material bonded to the tube an end closure member for said tube faced with thermoplastic material and heat sealed to said tube along coextensive peripheral portions, and a continuous rim substantially C-shaped in cross-section clenched about and along the joint provided by said coextensive peripheral portions of the tube and closure member.

4. A container comprising a spirally wound paper tube, covers at opposite ends of said tube, a continuous integral lining of thermoplastic sheet material bonded to said container, said tube and each cover being formed with coextensive annular portions providing joints sealed together by thermoplastic material integral with said lining, and continuous metal reenforcing rims clenched about and along the outer edges of each of said joints.

5. In a container, a liner comprising a spirally wound laminated strip made up of a strip of paper adhesively secured to a strip of thermoplastic sheet material, said thermoplastic strip being wider than the paper strip to provide over-

lapping thermoplastic edge sections on said laminated strip, and said edge sections being heat sealed.

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