

March 3, 1942.

H. W. MORGAN

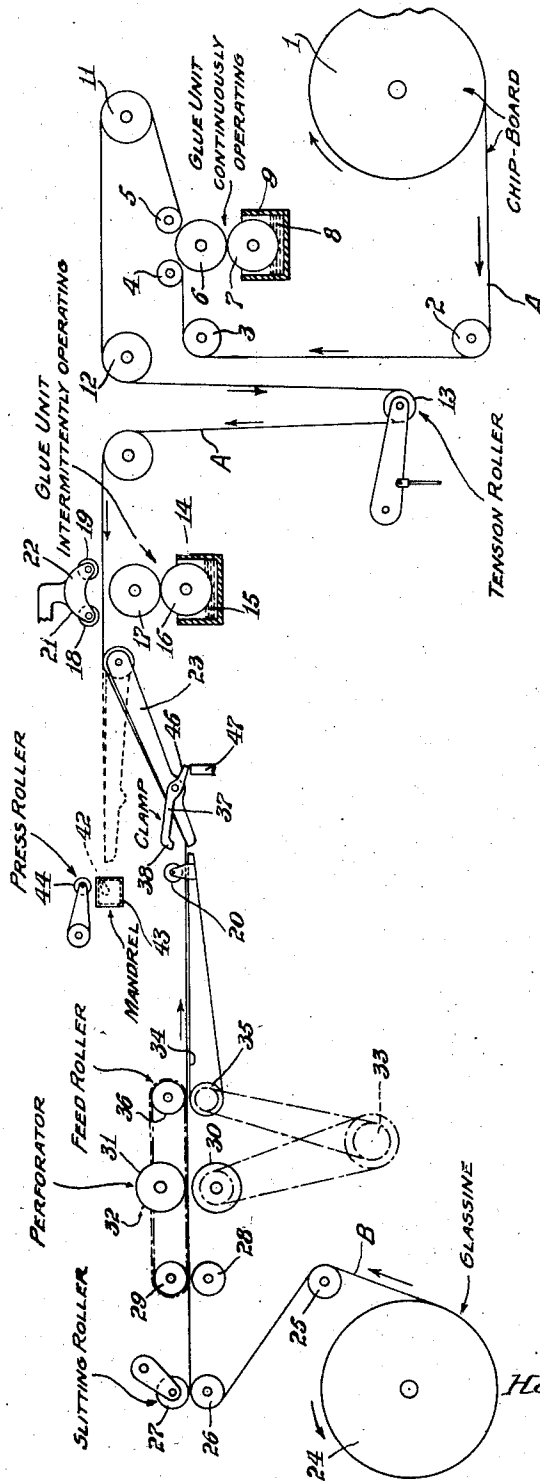
2,275,157

METHOD OF MANUFACTURING FIBER CONTAINERS

Original Filed Dec. 29, 1938

3 Sheets-Sheet 1

Fig. 1.



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3 Sheets-Sheet 2

Fig. 2.



Fig. 3.

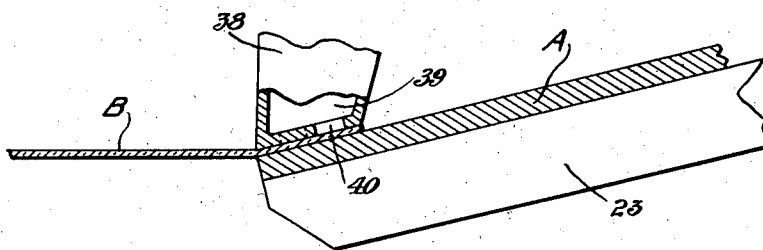


Fig. 4.

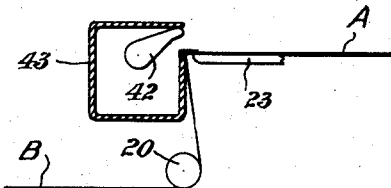


Fig. 5.

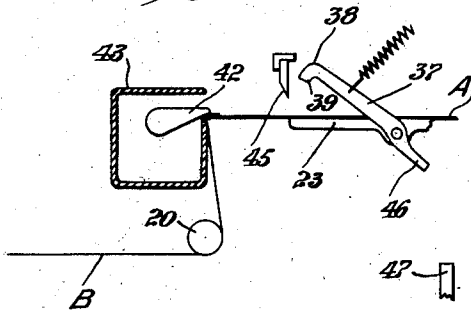
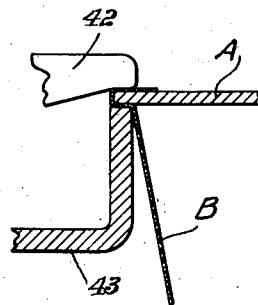


Fig. 6.



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3 Sheets-Sheet 3

Fig. 7.

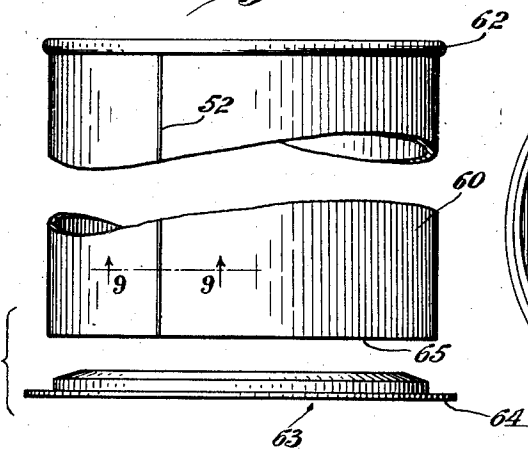


Fig. 8.

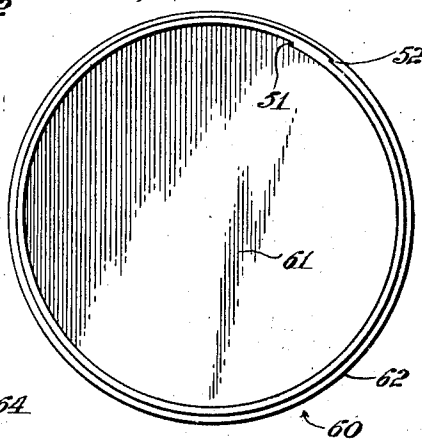
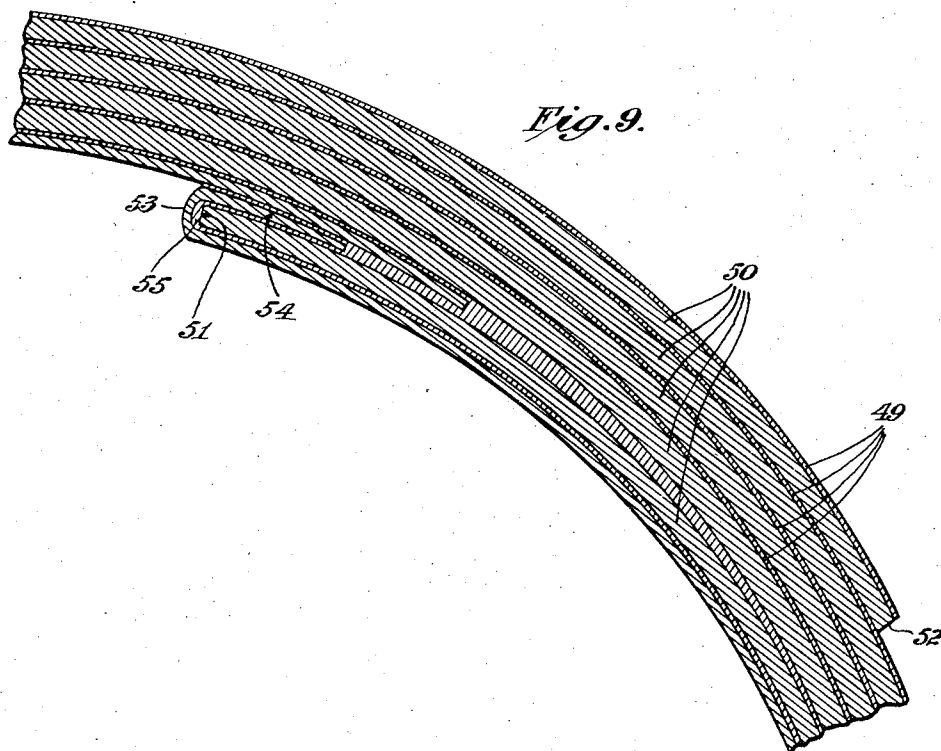


Fig. 9.



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UNITED STATES PATENT OFFICE

2,275,157

METHOD OF MANUFACTURING FIBER CONTAINERS

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Continuation of application Serial No. 248,151,
December 29, 1938. This application December
23, 1939, Serial No. 310,808

15 Claims. (Cl. 93—94)

This application is a continuation of my prior application, Serial No. 248,151, filed December 29, 1938 relating to Paper containers and assigned to The Canister Company.

The present invention relates broadly to a method of manufacturing fibre tubing non-permeable to moisture, grease or oil, from which tubing may be fabricated containers or cans having metallic end closures. More particularly, the invention contemplates the formation of fibre tubing of the straight wound laminated type, provided with an inner-liner having the properties of being impervious to hygroscopic or deliquescent materials, also non-permeable to oils and greases; the inner-liner being hermetically joined to the body wall stock.

An object of the invention is the provision of a method of manufacturing a fibre tubing of the above character from a composite body stock produced continuously by a series of inter-related steps that are carried out successively in such a manner that nothing but the end product is contemplated, i. e. completely formed tubing, whereby the formation of any intermediate product, that may be further processed separately, or may require partial reprocessing to obtain the end product, is avoided.

Another object is the provision of a method of making laminated inner-liner fibrous tubes consisting of continuously feeding a fibrous body sheet and a lining material such as an oil proof parchment in opposite directions, folding the parchment over the leading edge of the body sheet, and feeding the folded edge in the direction of feed of the body sheet.

Another object is the provision of a method by which the leading edge of the body material functions as a tucker element for the lining material in presenting the two materials to a tube rolling mechanism.

Another object of the invention is the provision of a method of manufacturing container bodies comprising continuously feeding a roll of body stock in one direction, continuously feeding a roll of parchment in the opposite direction, providing lines of weakness in the parchment which permits severance thereof along the lines of weakness without interrupting the feeding of the parchment, and compensating for the difference in the feed of the two materials so that they are brought to a point of joinder in such a manner as to permit their overlapping and making a fold of the parchment about the leading edge of the body stock.

Another object is the provision of a method

comprising utilizing a body stock of indefinite length and sectionally applying thereto a lining material, in dry condition, i. e. unmoistened or free from adhesive, of the same width as the body stock and of predetermined length.

Another object of the invention is the provision of a method of fabricating multi-ply tubular container bodies having a moisture and oil proof inner-liner, which method contemplates continuously coating one side of a body stock of indefinite length with a suitable adhesive and intermittently coating the other side of the body stock with an adhesive, the intermittently coated sections being coextensive with the area of oil proof inner-liners severally applied to said sections.

A further object is the provision of a method of manufacturing fibre tubing which comprises uniting a body stock with a sheet of parchment in such a manner that the parchment is cut into sections in lengths appreciably longer than the inside circumference of the tubing, folding one end of the parchment over the leading edge of the body stock, rolling the two together and severing the body stock into lengths sufficient to form one or more plies about the inner-liner during the rolling operation.

A special object of the invention is the provision of a method whereby the number of plies of body stock and/or the cross-section of the formed container body may be varied within wide limits with a minimum of machine adjustments or duplication of machine parts.

Other objects of the invention will manifest themselves as the description proceeds, as for example the overcoming of many inherent difficulties now encountered in the fabrication of multi-ply container bodies having an inner-liner adhesively joined thereto, and the production of complete containers from said bodies.

Heretofore various methods have been proposed for continuously manufacturing fibre containers, and apparatus for carrying out the methods, but all such methods of which I am aware have been impractical or met with indifferent success because of some inherent defective step or steps forming part of a given method. One such method I have in mind contemplated feeding a sheet of body material and a sheet of inner-liner in the same direction, applying an adhesive to one surface of the inner-liner and then joining the body material with the inner-liner. A serious difficulty with any method involving such an operating step is that it is impossible to prevent a moistened inner-liner of thin material such as glassine from wrinkling

or blistering, and in attempting to overcome or lessen this tendency, means must be provided for drying the composite body stock at that stage, which constitutes an interruption in the continuity of the process. Furthermore, any method which requires a drying step, necessitates a partial reprocessing of the body stock to recondition it for further fabrication. In practicing my method no drying and/or reconditioning steps are required.

A further objection to one such method of the prior art, which included the above described step, is that the sheet of inner-liner is secured to one of the marginal edges of the sheet of body material, and after the drying operation the composite strip is passed to a cutting station, which by severing the strip cross-wise produces a can body blank, as an intermediate product, having the width of the sheet of body material, which restricts the number of laminations of which the body container may be composed when formed upon a rolling mechanism. Obviously, this necessitates a large assortment of rolls in order to adapt the machine to any substantial change in container size or variation in the number of plies employed. Also, fundamentally the formation of an intermediate product has the tendency of prolonging or complicating the main process, and is therefore objectionable.

My method is free of all such objectionable steps as will be apparent as the description proceeds.

The method of manufacturing fibre containers in accordance with the present invention, comprises continuously feeding a body sheet of fibrous material such as chip board, or the like, in one direction, and continuously feeding a sheet of inner-liner, which may be any parchmentized oil-proof or oil resistant material, such as glassine, in the opposite direction, the inner-liner preferably being fed over the body material. The chip may have its upper surface covered throughout its entire length with an adhesive, preferably a vegetable adhesive, and the opposite or under surface intermittently covered with a suitable oil insoluble adhesive for a distance slightly greater than the length of the inner-liner. The body sheet and the inner-liner sheet are provided with cross-wise straight cut edges and the opposing edges are moved toward each other so that the leading edge of the inner-liner sheet is positioned above and slightly overlaps the leading edge of the body sheet, in which position they are pressed together by moving one edge against the other. By this operation an overlap of substantial width is provided and a fold is formed by turning the inner-liner downwardly and backwardly. From this stage the leading edge of the chip functions as a tucker element for the inner-liner in presenting the fold to a gripping member, forming part of the tube rolling mechanism.

The inner-liner, prior to effecting the above fold, is scored transversely at predetermined lengths, corresponding substantially to the internal diameter of a given size container body, and which is approximately the distance the under surface of the chip is sectionally coated by the intermittent application of adhesive to said under surface, as mentioned above. The inner-liner is the same width as the chip stock and the marginal edges of the two materials are kept in alignment. When a measured length of the inner-liner has been joined to the chip stock, it is severed along the line of weakness or scor-

ing, and the combined sheets of chip and inner-liner are rolled together to enclose the inner-liner and to form a tube. When the desired number of plies of chip have been wound upon the mandrel of the rolling mechanism the chip is severed independently of the inner-liner, and a label, preferably made from waterproof stock, is applied to the exterior of the tube thus formed.

At the time the overlapping edges of the inner-liner and the chip stock are joined, the outer edge of the inner-liner has a side seam of an adhesive applied thereto. The length of the inner-liner being slightly greater than the inside circumference of the tubing provides an overlap for the edges of the liner so that the adhesive for the side seam joins the inner edge of the liner with the outer or adjacent edge thereof, and the adhesive on the outer wall of the inner or adjacent ply of chip, as well as the adhesive on the inner wall of the succeeding or second ply, produces a non-permeable seal at the fold of the inner-liner.

Referring to the accompanying drawings:

Fig. 1 is a schematic side elevation of the essential machine elements employed in carrying out the various process steps in fabricating a fibrous container body in accordance with the present invention;

Fig. 2 is an enlarged transverse sectional view taken through the fibrous body material and the inner-liner material which are united into a composite body, the inner-liner being positioned above and overlapping the body materials;

Fig. 3 is an enlarged view, partly in section and partly in elevation, of the over-lapped edges of the body material and the inner-liner gripped between a glue pot of a clamping device and the movable edge of a table;

Fig. 4 is a schematic sectional view of the folded over edge of the inner-liner being presented to the jaws of a gripper element forming part of the tube winding mechanism;

Fig. 5 is a similar view showing the fold engaged by the gripper, the table retracted, and the glue finger of the clamping device released, preparatory to the severance of the body stock;

Fig. 6 is an enlarged, fragmentary sectional view, of gripping mechanism positioned as shown in Fig. 5.

Fig. 7 is an elevation with a part of the body of the container broken away and with the bottom closure separated from the body of the container as delivered by the manufacturer;

Fig. 8 is a bottom view of the container; and

Fig. 9 is an enlarged fragmentary sectional view taken on the line 9-9 in Fig. 7 looking up.

Referring to Fig. 1, it will be seen that the invention in its broad aspects contemplates the continuous feeding of a fibrous body material in sheet form in one direction, and the continuous feeding of an oil and grease-proof material, also in sheet form, in the opposite direction, the leading edges of the two materials being brought together and overlapped at a convenient station which may be centrally located with respect to the various apparatus elements employed in carrying out the successive operations in processing the container body. More particularly, the fibrous material may be chip board, designated generally by the reference character A, and the inner-liner may consist of any suitable parchmentized oil and grease-proof paper, such as glassine, designated generally by the reference character B. A parent roll 1 of chip stock may

be mounted on a suitable reel at the right of the machine and the sheet A is fed over the rolls 2 and 3 and under rolls 4 and 5, which engage the sheet A with a glue roll 6 which turns on a glue roll 7 partly submerged and rotatable in an adhesive 8 contained in a main glue pot 9 at which station the upper or outer surface of the chip A is coated throughout its entire length with the adhesive 8. This system of rolls cooperatively functions as feed rolls in carrying the sheet A of chip to rolls 11 and 12 and around a dance roll 13 pivotally mounted in any suitable manner. A secondary glue pot 14 contains an adhesive 15 into which dips a roll 16 which engages a roll 17 mounted thereover and positioned slightly below the normal path of travel of the chip A. Rolls 18 and 19 are symmetrically positioned over the roll 17 on arms 21 and 22 which may be raised and lowered intermittently by any suitable cam arrangement to engage the top surface of the chip A thereby effecting the application of adhesive intermittently to the lower or inner side of the chip A. The chip A is next led to a feed table 23, pivotally mounted upon each side along one edge, and which, in accordance with the usual practice, may be provided with a gravity bar or lever (not shown) which holds the chip against back slipping. The table 23 should be designed to move to and fro in a horizontal plane, and swing upwardly about its pivotal points. Means for accomplishing this will readily suggest themselves to those skilled in the art, and the purpose of such a construction will be apparent hereinafter. The normal position of the table 23 is inclined downwardly and forwardly. The free end of the table 23 may be raised through an arcuate path motion to a horizontal plane as shown in dotted line, Fig. 1. In that position the table 23 moves slightly forward so as to advance the leading edge of the chip A to an operative position (see Fig. 4) with respect to the tube rolling mechanism, as will be hereinafter more fully explained.

During the advance of the sheet A of chipboard as set forth above, the sheet B of the inner-liner has been feeding from the opposite end of the machine to meet and be consolidated with the sheet B. A parent roll 24 of inner-liner material is rotatably mounted upon a supporting stand. The sheet B is threaded under a roll 25 and over a roll 26 where slitter knives 27 may be mounted to slit the sheet B longitudinally so as to form strips of any desired width which would be determined by the height of a given container body undergoing fabrication. The sheet B is next threaded between feed rolls 28 and 29 and over roll 30 above which is mounted a rotary perforator comprising a roller 31 having a cutter bar 32 arranged transversely and having a serrated edge which projects sufficiently so as to perforate or make a series of transverse cuts and thus form a line of weakness, but leaving enough of the sheet B uncut to maintain lengthwise continuity. The length of the individual inner-liners is varied by changing the ratio between sprocket wheels located at 30 and 33.

A vacuum belt 34 is operated by feed rolls 35 and 36 in vertical tandem, with the roll 36 contacting the upper surface of the belt 34 in such a manner as to insure constant or uniform tension on the sheet B as it passes under the cutter bar 32. As vacuum belts are of more or less standard construction and commonly employed in the feeding of fibrous or woven materials, the construction and operation of the belt 34 will

be appreciated by those skilled in the art. The belt 34 carries the edge of the web B to its extreme right end where the latter passes under a tear roll 20. At this stage the table 23 carrying the advancing chip board has swung downwardly at its left end, so that the leading edges of the sheets A and B are extending towards each other in opposite directions, with the edge of the inner-liner above and slightly overlapping the edge of the chipboard, the latter at this step in the process having glue on both sides thereof. That is to say as the sheets A and B are about to be united to each other to form a composite body, the sequence of operations are so timed that a section of the sheet A having its lower surface coated with adhesive has arrived opposite the leading edge of the sheet B, and it will be recalled the upper surface of the sheet A is continuously coated with adhesive, so that both surfaces of sheet A are now covered with glue.

As the left end of the table 23 reaches its lowermost position, it effects the operation of a clamp device, designated generally by the numeral 37 and pivotally mounted at the sides of the table 23 and normally held open by a suitable tension spring. The clamp 37 may comprise a crank having a short lever arm 46 and a glue finger 38 terminating in a glue pot 39 having perforations 40 transversely arranged in the bottom thereof (see Fig. 3) which allow the glue to escape slowly therethrough forming a film. The closure of the clamp 37 may be effected by any suitable means operated by the table 23 in swinging down to its lowermost position, as for example by the arm 46 engaging a pin 47 adjustable vertically and operatively positioned with respect to the arm 46, whereby the glue pot 39 is forced down on the overlapping edges of the sheets A and B. By this operation the joinder of the leading edges of the chip and the inner-liner is accomplished, and simultaneously therewith a side seam of adhesive, deposited from the film on the under surface of the glue pot 39, is applied to the upper surface of the leading edge of the inner-liner.

At this step in the process the table 23 moves forward and upward simultaneously, and the sheet B, being thus brought into engagement with the tear roll 20, is thereby severed along the adjacent transverse line of perforation or scoring previously formed by the cutter bar 32 of the rotary perforator. It will be appreciated that the upward movement of the table 23, in an arcuate path so as to position the edge thereof opposite the mandrel 42, is faster than the rate of feeding the inner-liner B over the vacuum belt 34. It is because of this difference in the relative rate of movement of the table with respect to the rate of feeding the inner-liner, that effects the severing of the inner-liner along the line of perforation, and it will thus be seen that practically the instant the table 23 starts its upward movement, a section of inner-liner is torn from the continuous web thereof. The vacuum created by the belt 34 retains the leading edge portion of the inner-liner in position on said belt, and the leading edge of the inner-liner sheet B advances, by operation of feed roll 36, to the end of the vacuum belt so that when the edge of the table 23 is again in a receptive position for the overlapping of the edges of the sheets A and B, the edge of the sheet B will have advanced to a position extending slightly beyond the belt 34 and juxtaposed to the leading edge of the web A. At the time the edge of the table is moving upwardly the finger 38 of the clamp 37 is retracted

under spring tension, thus releasing the united edges of the sheets A and B and permitting the forward feeding thereof. The leading edge of the chip is now free to function as a tucker element for the overlapped and/or folded edge of the inner-liner B, in presenting the latter to a gripper member 42 (see Figs. 4 to 6) which may be any well-known structure constituting part of a winding mandrel 43. The mandrel 43 may be any shape in cross-section but as shown is square. The gripper closes and a press roller 44 is moved down tightly but yieldingly upon the mandrel 43 to insure the better adherence and consolidation of the several laminations or plies of material forming the container body.

The mandrel 43 may be rotated in any suitable manner, and after having made the required number of turns to wind the desired number of plies it stops rotating. Meanwhile the table 23, having retracted in a horizontal plane, comes to rest in an operative position with respect to a transverse cutting knife 45, which is adapted to move downwardly and shear the sheet A transversely, and thereupon a stripper (not shown) may be caused to move forward along the mandrel 43.

The next station may be the labeling position, at which the unwound flap, formed by severing the sheet A at the time the mandrel 43 was stopped and the knife 45 moved to cutting position, is rolled onto the container body and may constitute a part of the labeling operation. Upon the completion of the container body it may be ejected from the mandrel 43 by any suitable ejecting means.

Referring to Fig. 9, which is a greatly enlarged sectional view, it will be seen that the container body comprises five plies, indicated by the reference character 50, of the continuous sheet B of the chipboard. The chip terminates in an inner edge 51 and an outer edge 52, which edges are cut along straight lines transversely and which would ordinarily expose, unless otherwise protected as herein contemplated, the interior edge of the chipboard so that liquids, oils and greases might by absorption or capillary action, slowly permeate the chip stock from edge to edge.

The coating of glue applied to the entire outer surface of the sheet B of chip forms layers 49 causing the plies 50 to adhere firmly to each other throughout the entire container body. The folded over edge 53 of the inner-liner forms a seal over the cut edge 51, and the overlap 54 of the fold is completely encased in the adhesive applied to the outer wall of the inner ply 50 and the inner wall of the succeeding or second ply. That is to say, at the time the fold was made, a seam of glue was applied to the upper edge of the inner-liner, and this source of glue, together with the glue which is applied intermittently to the under surface of the sheet B, and for a distance slightly greater than the length of an individual inner-liner, constitute the sources of adhesives for encasing the overlap 54. It should also be appreciated that the squeezing of the overlap on opposite sides of the fold by the clamping device 37 forced adhesive 55 between the cut end 51 and the fold 53. The layer of adhesive 55 formed over the cut edge 51 provides a secondary seal under the fold, and this, together with the complete glue encasement of the folded or overlapped edge of the inner-liner, render the edge 51 non-permeable to liquids, oils, greases and the like.

It will be noted that Fig. 9 does not show a label applied to the container body, which may

constitute the final step in the processing thereof. However, as will be understood by those skilled in the art, the adjacent edges of a label, preferably of waterproof stock, would overlap and form a seam in the proximity of the outer edge 52 of the chipboard, thus giving a finish to the container body as well as a protection against whatever absorption may occur if the edge 52 were exposed to the atmosphere.

The completely fabricated container body which, for convenience, may be designated by the numeral 60, is sealed at the top by a metal closure 61 having at its periphery a flange which is bent over and impressed in the outer wall of the container body 60 to form a sidewardly projecting bead 62. At the time the metal closure 61 is sealed to the container body 60, a suitable "dope" is applied to the raw edge of the body 60 which forms a perfect hermetical seal between the end of the container body 60 and the closure 61. Another metal closure 63 has a flange 64 projecting out sidewise at the periphery. The closure 63, in this form, is shipped separately by the manufacturer and after the container has been filled by the packer, the flange 64 is placed on the edge 65 of the container body 60 and the flange is rolled down and impressed in the outer wall of the body 60 to form a bead similar to the bead 62. At the time the packer seals the closure 63 to the container body 60, the above mentioned precaution or step of applying "dope" is followed in order to hermetically seal the container at both of its ends.

From the foregoing it will be seen that fibrous container bodies produced by practicing my method are characterized by having an inner-liner non-permeable to oil and grease, with the ends thereof overlapping and completely glue encased. An important feature or step in the method, is applying the liner in a dry or unmoistened condition, thus avoiding the likelihood of forming wrinkles or blisters, and at the same time insuring good glue contact throughout the entire engaging surfaces of the liner material and body stock. The method of fabricating the container bodies inherently avoids the production of any intermediate product which requires separate or partial reprocessing. This is conducive to making the process more truly a continuous one in the sense that the end product, i. e. a finished container body, is the ultimate and only article produced.

By the very nature of the process, the number of plies forming the surrounding support for the inner-liner may be increased or decreased at will because the body stock is fed as a continuous sheet and it is merely a matter of making the necessary mechanical adjustments on the machine to vary the number of plies. It is also possible to vary the width of the container body within a considerable range because the tube winding mandrel may be made of substantial width and by suitable adjustment of the slitter knives practically any length can body may be wound coming within the maximum width of the winding mandrel. It will also be appreciated that the cross-section of the fibrous tube may be round, oval, elliptical, square, rectangular, etc. the same merely depending upon the shape of the mandrel. These features make the method practically universal in its adaption to the fabrication of different sizes and shapes of multi-ply container bodies.

It may be noted that the character of adhesive used to join the several plies of chip together, as

well as the kind of adhesive employed in uniting the several sheets of inner-liner to the chip and encasing the ends thereof, will be determined by the type of container bodies undergoing fabrication. Ordinarily any suitable oil insoluble glue such as hide or fish glue may be used to bring the inner-liner and body stock into sealed relationship impervious to oil and grease. On the other hand for coating the outer surface of the chip board any suitable glue having moisture resistant characteristics may be used in order to make the container more moisture proof than it might otherwise be if the same type of adhesive was used throughout the container body. It is obvious that the character of the body sheet and inner-liner will have a bearing upon the selection of adhesive used, as well as the use to which the finished container is to be applied.

With respect to the kind of material used for the inner-liner, it may be observed that for an oil and grease-proof container, the liner may be a parchmentized paper, such as known and sold as "grease proof" paper, an example being glassine. Other satisfactory liner materials are vegetable parchment, Cellophane, cellulose acetate in sheet form, and many thermo-plastics. Therefore in using the term "parchmentized or oil-proof paper," or variations of this term, in certain of the appended claims, it is used in this broad sense and is intended to include all such inner-liner materials of the class or group just mentioned. The body stock may consist of any fibrous body sheet material such as chipboard, kraft, jute or any other inexpensive material of a similar nature.

While I have described a preferred embodiment of my invention, it is understood that the same is subject to modifications without departing from the spirit of the invention as covered by the appended claims.

What is claimed is:

1. The steps in the method of manufacturing laminated inner-liner fibrous tubes consisting of folding the leading edge of an oil proof parchment over the leading edge of a fibrous body sheet, and thereafter fabricating the parchment and the body sheet into a composite body stock and rolling the composite body stock to enclose the parchment within the fibrous body sheet to form a tube.

2. The steps in the method of manufacturing laminated inner-liner fibrous tubes consisting of feeding a fibrous body sheet and an oil proof parchment in opposite direction, folding the edge of the parchment over the leading edge of the body sheet and adhesively uniting the fold to the leading edge of the body sheet, and thereafter feeding the leading edge of the composite body sheet in a direction opposing the normal feeding of the parchment to advance directly the fold to a gripping member forming part of a rolling mechanism for rolling the body sheet and the parchment into a tube.

3. The steps in the method of manufacturing laminated inner-liner fibrous tubes consisting of perforating transversely an inner-liner sheet of oil proof parchment at predetermined lengths, uniting the perforated parchment with a fibrous body sheet for the length of a single perforated section, and automatically severing the united section of parchment along the perforation thereof before said section is completely applied to the fibrous sheet.

4. The steps in the method of manufacturing laminated inner-liner fibrous tubes consisting of

continuously coating one surface of a fibrous body sheet, sectionally coating the other surface of the body sheet, applying a sheet of an oil proof parchment of substantially the same area to each of the coated sections and keeping the marginal edges of the parchment and the body sheet in alignment, and rolling the sheets together to enclose the parchment and to form a tube.

5. The method of manufacturing laminated inner-liner fibrous tubes comprising continuously feeding a body sheet of fibrous material in one direction, continuously feeding an inner-liner sheet in the opposite direction, folding the leading edge of the inner-liner sheet over the leading edge of the body sheet, and feeding the leading edge of the composite body sheet to advance directly the composite body stock to a gripping member forming part of a rolling mechanism for rolling the body sheet and the parchment into a tube.

6. The method of manufacturing laminated inner-liner fibrous tubes comprising continuously feeding a body sheet of fibrous material in one direction, continuously feeding an inner-liner sheet of oil proof parchment in the opposite direction, slightly overlapping the leading edges of the body sheet and the parchment and joining them together, and utilizing the leading edge of the body sheet to advance the fold directly to a gripping member forming part of a rolling mechanism for rolling the body sheet and the parchment into a tube.

7. The method of manufacturing laminated inner-liner fibrous tubes comprising continuously feeding a body sheet of fibrous material in one direction, continuously feeding an inner-liner sheet of oil proof parchment in the opposite direction, folding the leading edge of the parchment over the leading edge of the body sheet, attaching a measured length of the parchment to the body sheet, severing the measured length of the parchment before completing the attachment thereof, rolling the severed sheet of parchment and a predetermined length of the body sheet to enclose the parchment and to form a tube, severing the body sheet prior to the completion of the rolling operation, and applying a label to the exterior of the tube thus formed.

8. The method of manufacturing laminated inner-liner fibrous tubes comprising continuously feeding a body sheet of fibrous material in one direction, continuously feeding an inner-liner sheet of oil proof parchment in the opposite direction, folding the leading edge of the parchment over the leading edge of the body sheet, coating the body sheet with a sheet of the parchment for sufficient length to form an overlapping inner-liner of given size, severing the sheet of parchment before completing the coating operation, continuing the feeding of the body sheet and rolling a predetermined length thereof about the inner-liner before severing the body sheet.

9. A method of manufacturing inner-liner paper tubes comprising the following steps: applying adhesive on one side of a paper strip having a straight cut end, applying adhesive on the opposite side at the end of the strip for a distance more than the length of an inner-liner, composed of a sheet of paper or oil impervious material, forming a fold in the leading edge of the inner-liner and adhesively joining the fold on the end of the strip with the fold adjacent the end of the strip, and rolling the strip and the inner-liner into a tube having adhesive covering one side of the paper strip, and between the outer

wall of the inner-liner and all the contiguous walls of the strip.

10. A method of manufacturing inner-liner paper tubes comprising the following steps: applying adhesive on one side of a paper strip having a straight cut end, applying adhesive on the opposite side at the end of the strip for a distance more than the length of an inner-liner, composed of a sheet of paper or oil impervious material, forming a fold in the leading edge of the inner-liner and adhesively joining the fold on the end of the strip with the fold adjacent the end of the strip, squeezing the overlap on opposite sides of the fold to force adhesive between the cut end and the fold, and rolling the strip and the inner-liner into a tube having adhesive covering one side of the paper strip, and between the outer wall of the inner-liner and all the contiguous walls of the strip.

11. The process of making laminated inner-liner paper tubes comprising the following steps: applying adhesive to one entire side of a body sheet, applying adhesive to the opposite side of the body sheet for a distance slightly greater than the length of the inner-liner sheet, placing the leading edge of an inner-liner sheet upon the leading edge of the body sheet so that the leading edges are in opposite directions, pressing them together to adhere, applying adhesive to the outside of the edge of the inner-liner sheet, folding the inner-liner sheet across the leading edge of the body sheet, and rolling the sheets together to enclose the inner-liner sheet and to form a tube.

12. A process of making laminated inner-liner paper tubes comprising the following steps: Applying adhesive to one entire side of a body sheet, applying adhesive to the opposite side of a body sheet for a distance appreciably greater than the length of the inner-liner sheet, placing the leading edge of an inner-liner sheet in a different direction adjacent the leading edge of a body sheet, moving the leading edge of the body sheet against the inner-liner sheet, so that the leading edge of the inner-liner sheet folds over the leading edge of the body sheet and adheres thereto on both sides thereof, and rolling the combined sheets to form a tube.

13. The process of making laminated inner-liner paper tubes comprising the following steps: Applying a coating of adhesive to both sides of a fibrous body sheet, the coating on one side being of indefinite length and on the other side being of definite length, perforating an inner-liner sheet at measured lengths substantially

corresponding to the area of the coating of definite length, folding the leading edge of the inner-liner sheet over the leading edge of the body sheet and simultaneous therewith applying a side seam of adhesive to the outer edge of the inner-liner sheet, pressing the overlapping edges of the inner-liner sheet and the body sheet together to force the glue between the cut end of the body sheet and the fold formed by the overlapping operation, employing the leading edge of the body sheet to advance the fold to a gripping member, severing the inner-liner sheet along the adjacent perforation, partly winding the container body and then interrupting the winding to sever the body sheet, and completing the winding operation of the tube.

14. The steps in the method of manufacturing laminated inner-liner fibrous tubes consisting of applying a layer of adhesive to both sides of a fibrous body sheet, the layer of adhesive on one side being of indefinite length and on the other side being of definite length, bringing the leading edge of a sheet of oil proof parchment unmoistened into engagement with the layer of adhesive of indefinite length, severing the parchment into a length coming within the length of adhesive of definite length and uniting the severed length of parchment to the body sheet on the side thereof coated a definite length, with the lateral edges of both sheets of material in substantial register along their lateral edges, and rolling the body sheet and the severed length of parchment into a tube directly following their joinder into a composite sheet.

15. The method of manufacturing laminated inner-liner fibrous tubes comprising feeding a fibrous body sheet and a sheet of an oil proof parchment in different directions, coating both sides of the fibrous body sheet with adhesive, the coating on one side being continuous and on the other sectional, measuring the parchment into lengths sufficient to permit folding the leading edge thereof about the leading edge of the body sheet and successively cover the severally coated sections, adhesively joining the severed lengths of parchment with the adjacent coated sections of the body sheet and keeping the marginal edges of the parchment and the body sheets in alignment, severing the respective sections of parchment before the completion of their joinder with the body sheet, and independently severing the body sheet in completing the rolling of the body and the parchment into a tube.

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