Aug. 7, 1945. W. A. MEYER 2,381,460

METHOD OF PRODUCING CAN BODIES

Filed May 10, 1941 2 Sheets-Sheet 1

Fig 1

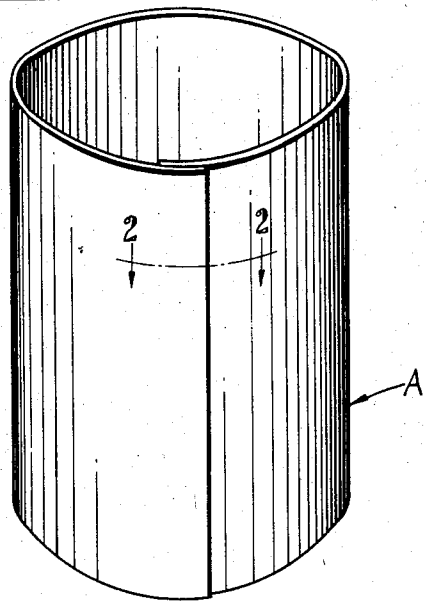


Fig 2

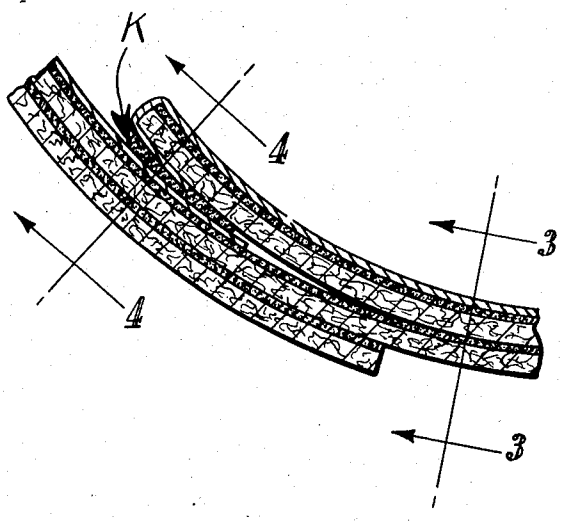


Fig 4

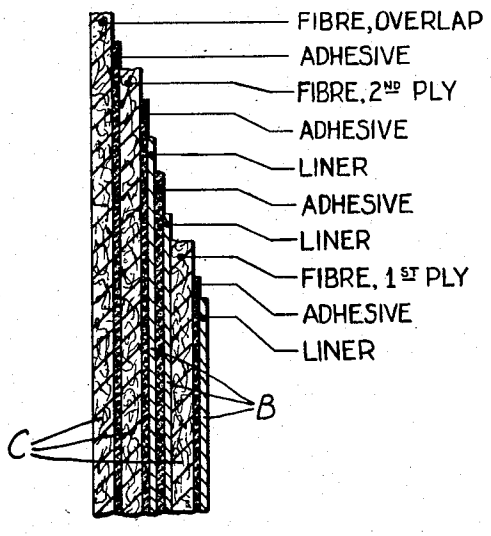
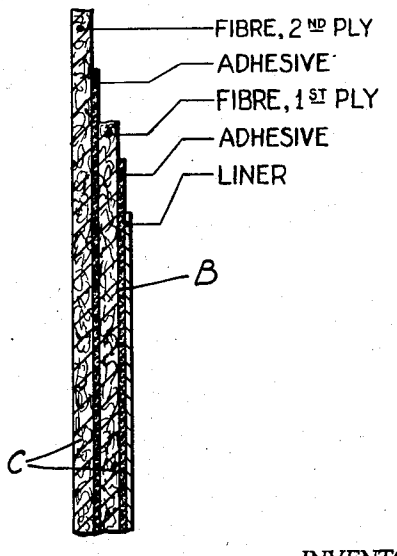


Fig 3



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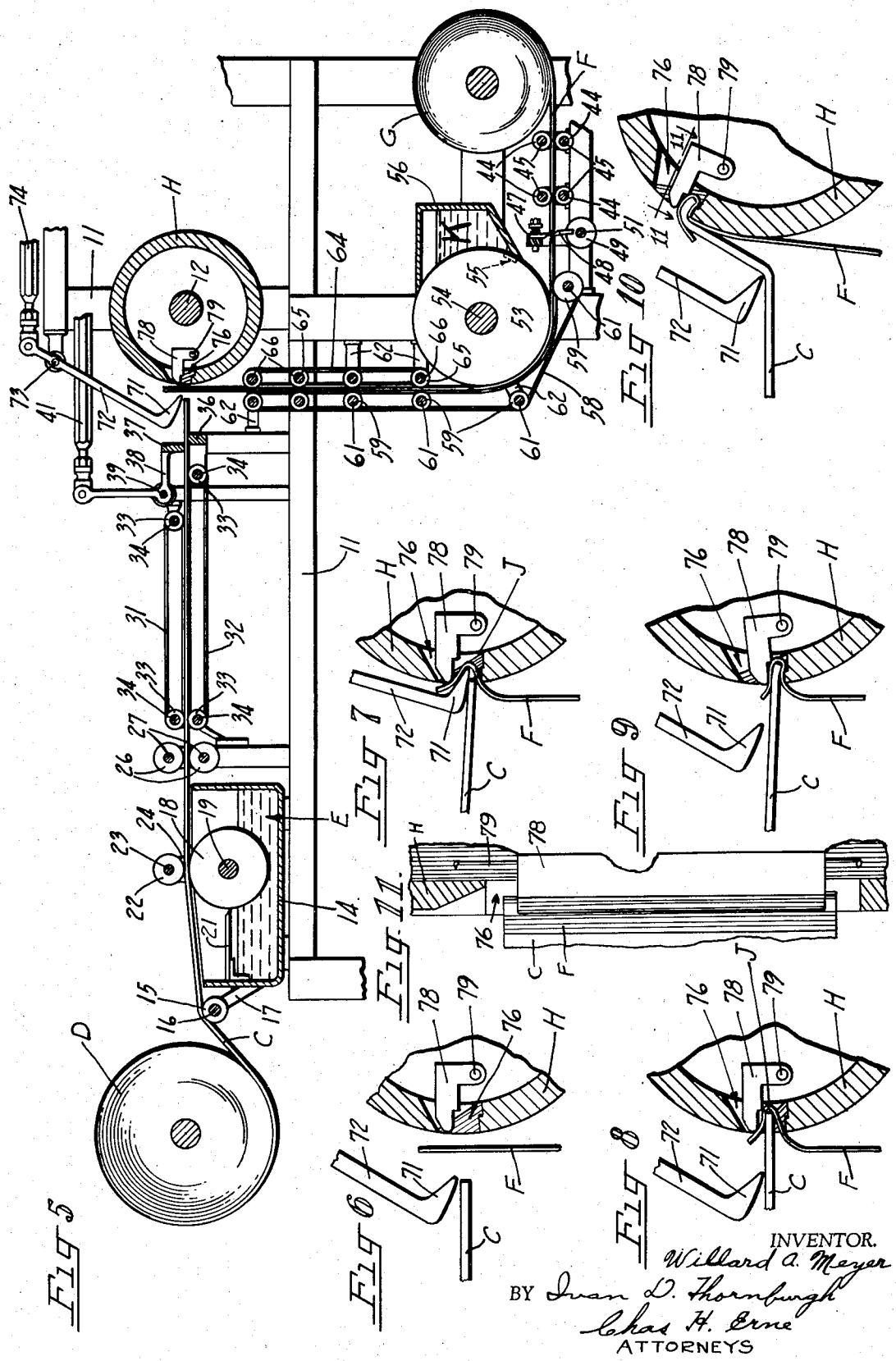


Fig 5

Fig 6

Fig 7

Fig 8

Fig 9

Fig 10

Fig 11.

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METHOD OF PRODUCING CAN BODIES

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Application May 10, 1941, Serial No. 392,978

4 Claims. (Cl. 93—94)

The present invention relates to a method of producing lined fibre container or can bodies and has particular reference to applying the liner sheet to the body material and folding the liner sheet over the inner edge of the body material while the can body is being formed.

An object of the invention is the provision of a method of producing lined fibre can bodies wherein the liner sheet is applied to the body material simultaneously with the winding of the body material into can body shape to insure greater efficiency and more economical production of such can bodies.

Another object is the provision of such a method of producing lined fibre can bodies wherein the liner sheet is folded over the inner edge of the body material at the beginning of the winding operation so that the inner edge of the body material will be covered and protected when the body is completed.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a perspective view of a can body made in accordance with the steps of the instant method invention;

Fig. 2 is an enlarged sectional view of the can body shown in Fig. 1, the view being taken substantially along the curved line 2—2 in that figure, with parts broken away;

Figs. 3 and 4 are fragmentary sectional views taken along the lines 3—3 and 4—4 in Fig. 2, with the constituent parts of the body wall named;

Fig. 5 is a sectional view through apparatus for carrying out the various steps of the instant method invention, parts being broken away; and

Figs. 6 to 10, inclusive, are enlarged schematic sectional details showing the various steps of bringing the can body parts together prior to winding them into a can body.

Fig. 11 is a fragmentary longitudinal sectional view taken substantially along the line 11—11 in in Fig. 10 and drawn to an enlarged scale.

As a preferred embodiment of the instant invention the drawings illustrate a method of producing a fibre multiple ply can body A (Fig. 1) having an inner moisture-proof and grease-proof liner B (Figs. 2, 3 and 4) which extends over the inner edge of the body material and thus protects the body against seepage of the contents which may be subsequently filled into a container made from such a body.

In such a method of forming can bodies, a substantially continuous strip or web C (Fig. 5) of fibre body material is taken off a supply roll D of such material and is fed along a straight line path of travel while a coating of adhesive E is applied to one side thereof. This coated side of the web is what will be the inner surface when it is subsequently formed into can body shape.

Simultaneously with this advancement of the fibre web C, a web F of moisture-proof and grease-proof liner material, such as "Cellophane," glassine or the like, is taken off a supply roll G and is advanced toward the moving web of fibreboard at right angles thereto. The leading edge of the liner web F moves into a position adjacent a rotatable mandrel H and in front of and across the path of travel of the leading edge of the fibre web C.

While the liner web F is in this position adjacent the mandrel H, a tuck J (Fig. 7) is formed in the web adjacent its leading edge. The front edge of the advancing body web C moves into this tuck in the liner web F and the latter is folded down over the body web and is gripped in the mandrel. A length of liner web sufficient to encircle the mandrel once is then cut off of the web and a stripe or band of adhesive is applied to the inner surface of this cut off liner sheet adjacent its rear edge.

The cut off liner sheet and the body web C are then simultaneously wound around the mandrel to produce a lined can body, the liner sheet being applied to the adhesive covered side of the body web C. When there is the proper length of body material, sufficient to wrap around the liner preferably twice and a lap at the seam, the web is severed to separate this partially finished can body from the web.

After the total length of the cut off body blank is laid down on the body the latter is removed from the mandrel. During this removal step, the leading edge portion of the liner which covers the inner edge of the body blank is pressed outwardly against the adhesive stripe on the inner surface of the tail end of the liner sheet and is thereby secured to the inside of the can body. This results in a can body having a moisture-proof and grease-proof liner which covers and protects the inner edge of the body material so that seepage of the contents through this inner edge is prevented.

The drawings illustrate one form of apparatus for carrying out the method steps of the instant invention. Such a machine includes a main frame 11 (Fig. 5) in which the mandrel H is

suitably supported on a cross shaft 12. The cross shaft may be rotated in any suitable manner in time with the other moving parts of the machine.

In front of the mandrel H, the main frame 11 carries an adhesive tank 14 in which the adhesive E, which is applied to the body web C, is contained. The body web C as it comes from the supply roll D operates over a guide roller 15 mounted on a pin 16 carried in a bracket lug 17 formed on an end of the adhesive tank 14. The web continues over an adhesive applying roller 18 which is mounted on a shaft 19 carried in bearings in the tank. This roller is rotated in the adhesive in the tank and thus carries some of the adhesive up onto the web.

A doctor blade 21 is provided in the tank 14 and engages against the applying roller 18 to regulate the thickness of the film of adhesive applied to the web C. A pressure roller 22 mounted above the applying roller presses the web down against the applying roller to insure contact therewith. The pressure roller is mounted on a cross shaft 23 carried in bearing brackets 24 formed on the adhesive tank.

From the adhesive tank 14, the web C passes between a pair of feed rollers 26 which are mounted on spaced and parallel shafts 27 carried in bearings formed in the main frame 11. These feed rollers are rotated in unison in any suitable manner in time with the other moving parts of the machine. Feed rollers 26 draw the web across the adhesive tank and advance it toward the mandrel.

After leaving the feed rollers 26 the web C is guided between a pair of parallel endless belts, an upper belt 31 and a lower belt 32. These belts operate over pulleys 33 which are mounted on cross shafts 34 carried in bearing brackets bolted to the machine frame 11. The belts are driven in any suitable manner in time with the passage of the web C through the machine. The belts carry the web to a position adjacent the mandrel H and guide the web into a cut off device which serves the web into can body lengths or blanks.

The cut-off device includes a stationary shear blade 36 and a movable shear blade 37 between which the web passes. The stationary blade 36 is disposed below the path of travel of the web and is secured to the machine frame 11. The movable blade is located above the path of travel of the web and is formed on a bell crank 38 mounted on a pivot pin 39 carried in the machine frame.

The bell crank 38 is pivotally connected to an actuating link 41 which is reciprocated in any suitable manner in time with the other moving parts of the machine. Actuation of the bell crank brings the movable blade 37 down on the web at the proper time and thereby cuts it off against the cooperating stationary blade 36.

The web F of liner material is fed from its supply roll G by a plurality of upper and lower feed rollers 44 between which the web passes. These rollers are mounted on shafts 45 carried in bearing blocks located below the mandrel H and secured to the machine frame 11. These rollers are rotated in any suitable manner in time with the other moving parts of the machine.

The feed rollers 44 advance the liner web F into position in a cut-off device which includes a stationary yieldable shear blade 47 and a movable blade 48 which is carried in a rotating disc 49. The stationary blade is disposed above the path of travel of the web and is secured to the machine frame. The disc is located below the web and is mounted on a shaft 51 which is carried in the machine frame and which is rotated in any suitable manner in time with the other moving parts of the machine. At the proper time the disc brings its blade 48 into cutting engagement with the stationary blade 47 to sever a liner blank from the web as hereinbefore explained.

The liner blank before being cut from the web F passes around an adhesive applying roller 53 which is mounted on a shaft 54 journaled in bearings formed in the machine frame. The roller is rotated in any suitable manner in time with the other moving parts of the machine. This roller preferably is of an intaglio character and is formed in its outer surface with an adhesive receiving recess 55 which picks up a stripe of adhesive K from a reservoir 56 mounted adjacent the roller. The bottom edge of the reservoir serves as a doctor blade which wipes off all adhesive from the outer surface of the roller excepting that which is picked up by the recess 55. It is this adhesive that is applied in a stripe K to the tail end of the cut-off liner blank as hereinbefore explained.

The liner blank is held by an endless belt 58 against the intaglio roller 53 as it passes thereabout. This belt operates over a plurality of spaced rollers 59 which are mounted on cross shafts 61 carried in brackets 62 secured to the machine frame. This belt 58 also cooperates with a similar auxiliary belt 64 in guiding the liner sheet into position adjacent the mandrel H.

The auxiliary belt 64 is located parallel to the belt 58 and is disposed on the opposite side of the liner sheet. This auxiliary belt operates over a plurality of rollers 65 which are mounted on cross shafts 66 carried in the brackets 62. The roller shafts of both belts may be rotated in any suitable manner in time with the other moving parts of the machine. It is these belts that bring the leading edge of the liner sheet into position adjacent the mandrel H for the tucking operation.

The tuck J which is formed in the liner sheet preferably is effected by a tucking tool 71 which is disposed adjacent the mandrel H. This tucking tool is formed on the lower end of a lever 72 which is mounted on a pivot pin 73 carried in the machine frame 11. The upper end of the lever is pivotally connected to an actuating link 74 which may be reciprocated in any suitable manner in time with the other moving parts of the machine.

When the leading edge of the liner comes adjacent the mandrel H, as best shown in Fig. 6, the tucking tool 72 moves in against the sheet and forces it into a recess or slot 76 formed in the mandrel, as best shown in Fig. 7. It is this action that forms the tuck J. During this forming of the tuck, the leading edge of the body blank C advances toward the mandrel in time with the tucking tool and is guided by the tool into the newly formed tuck. This step is shown best in Fig. 7.

After insertion of the end of the body blank C into the tuck J and as the tucking tool recedes from the tuck, a clamping jaw 78 moves down against the tuck and thereby folds the liner blank around the end of the body blank C, as best shown in Fig. 8. This jaw is carried inside the mandrel H on a pivot pin 79 and may be actuated in any suitable manner in time with the other moving parts of the machine. The jaw extends into the recess 76 in the mandrel and as it continues to move in against the tuck it clamps the liner blank and the inserted end of the body blank C, down

tightly against the edge of the mandrel in the recess, as best shown in Fig. 9.

This clamping of the end of the liner blank of the web F and the inserted end of the body blank C is followed by the rotation of the mandrel H. As the mandrel rotates it winds or wraps the two blanks simultaneously around it and thus produces the lined can body hereinbefore mentioned. The beginning of the winding operation is shown best in Fig. 10. During this operation the tucking tool 71 remains in position adjacent the mandrel (Fig. 10) to guide the body blank C into place around and over the top of the liner blank.

When the body is fully wound on the mandrel, the jaw 78 releases its hold on the tuck J and the body thereupon is removed from the mandrel. Removal of the finished can body A may be effected in any suitable manner as by pushing the body endwise off the mandrel. The removal of the body also seals down the tuck J against the adhesive stripe on the tail end of the liner blank as best seen in Fig. 2, and this completes the operations incident to producing lined can bodies in accordance with the steps of the instant method invention.

More specifically, the sealing down of the tuck J is accomplished as follows: As best seen in Fig. 11, when the wound body is being slid off of one end of the mandrel H the tucked portion J engages an inclined surface formed in the mandrel, over which surface the tuck J is drawn as the wound body is removed. This inclined surface engages against the tuck J and progressively bends the liner F and the enclosed end of the web C forming the tucked section, so that the tuck is pushed out of the slot 76 and is sealed down against the adhesive stripe K on the tail end of the liner. The web C at such time is no longer hooked inwardly but due to said inclined surface, extends in a circular direction to provide the can body wall. It is this inclined surface in the mandrel H adjacent the slot 76 which performs this desirable function immediately above described.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the steps of the process described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the process hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A method of producing a multiple ply fibre container body having an inner moisture-proof and grease-proof liner, which comprises forming a tuck in a liner blank adjacent an edge thereof, inserting into said tuck an edge of a fibre body blank coated on one side with adhesive, and simultaneously wrapping said liner and body blanks into container body shape with the liner blank disposed against the adhesive coated side of the body blank so that the adhesive will form a bond between the blanks and between the multiple plies which results from wrapping them together to produce a can body having a moisture-proof and grease-proof liner covering and protecting the inner edge of the fibre body sheet.

2. A method of producing a multiple ply fibre container body having an inner moisture-proof and grease-proof liner, which comprises forming a tuck in a liner blank adjacent an edge thereof, applying adhesive to the inner surface of the liner blank adjacent the opposite edge thereof, inserting into said tuck an edge of a fibre body blank coated on one side with adhesive, simultaneously wrapping said liner and body blanks into container body shape with the liner blank disposed against the adhesive coated side of the body blank so that the adhesive will form a bond between the blanks and between the multiple plies of the container body so produced, and pressing the tuck edge of the liner against said adhesively coated opposite edge of the liner blank to produce a moisture and grease proof joint.

3. A method of producing a fibre container body having an inner moisture-proof and grease-proof liner, which comprises providing a liner member and a body member, forming a tuck into one of said members, inserting an edge of the other of said members into the tuck to enclose and protect said edge, and wrapping said members together into tubular form to produce a can body.

4. A method of producing a fibre container body having an inner moisture-proof and grease-proof liner, which comprises feeding a substantially continuous web of body material along a predetermined path of travel, applying adhesive to a side of the moving web, feeding a substantially continuous web of moisture-proof and grease-proof liner material toward and into a position in front of and across the path of travel of the web of body material, cutting off a length of the liner material to form a liner blank, forming a U-shaped tuck in the cut off liner blank adjacent an edge thereof, inserting the leading edge of the adhesive coated body web into place in the tuck of the liner sheet so that the edge is completely surrounded and protected, simultaneously wrapping the liner and the body web into container body shape with the liner blank disposed against the adhesive coated surface of the body web, and severing the partially wound container body blank from the web of body material while continuing the wrapping of the body to produce a container body having a moisture-proof and grease-proof liner.

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