Dec. 30, 1952 C. E. MAIER ET AL 2,623,444

METHOD OF MAKING LINED LAPPED SEAM FIBER CONTAINERS

Filed April 8, 1946 3 Sheets-Sheet 1

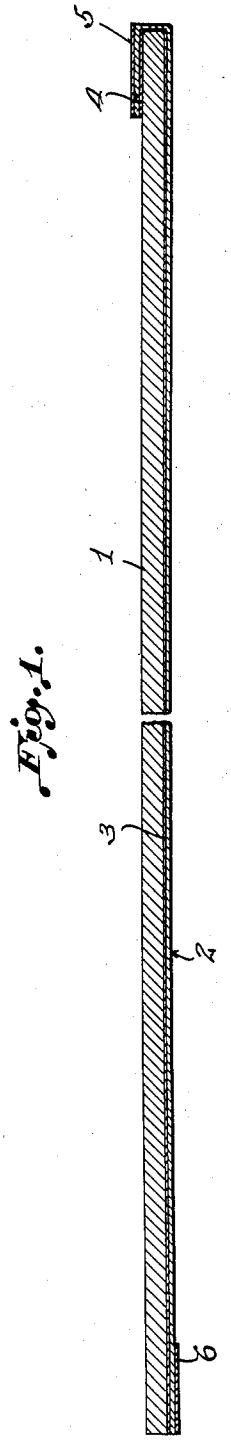

Fig. 1.

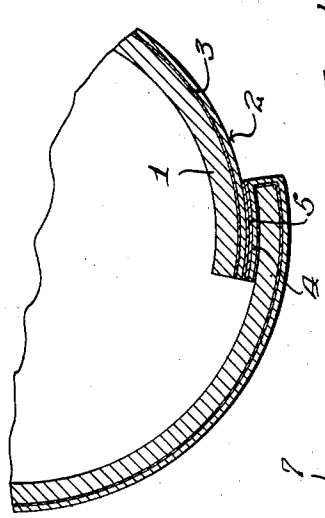

Fig. 2a.

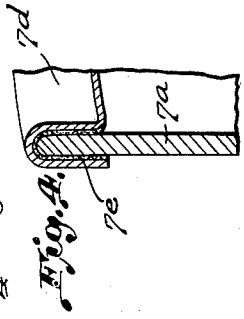

Fig. 4.

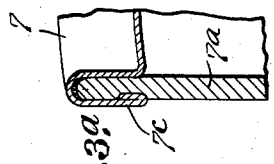

Fig. 3a.

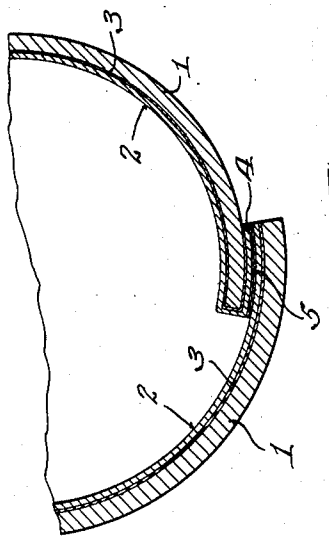

Fig. 2.

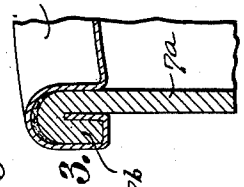

Fig. 3.

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METHOD OF MAKING LINED LAPPED SEAM FIBER CONTAINERS

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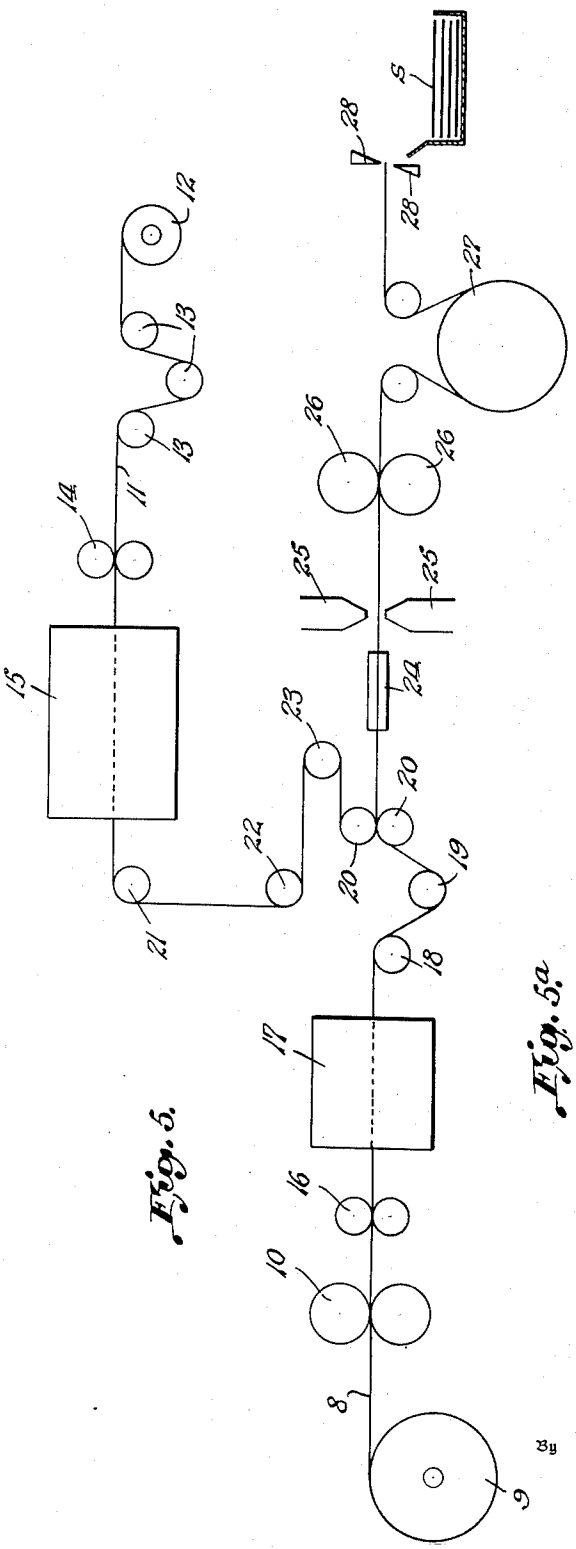

Fig. 5.

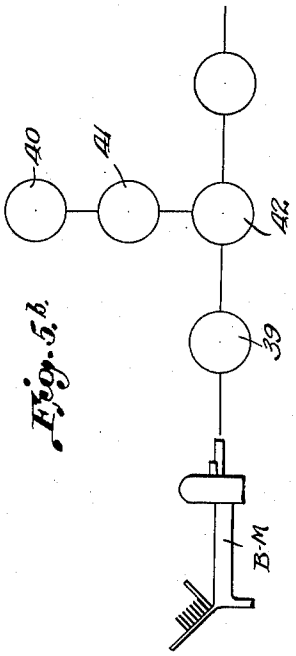

Fig. 5b.

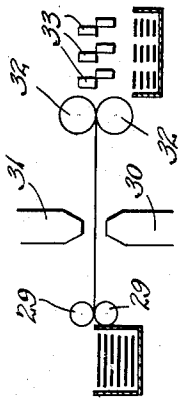

Fig. 5a.

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Fig. 8.

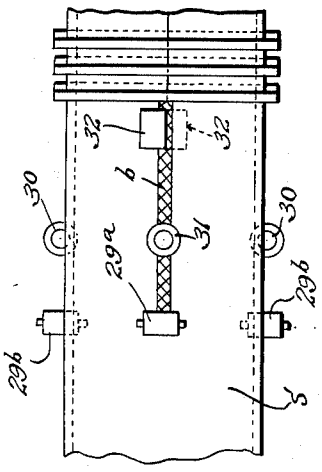


Fig. 9.

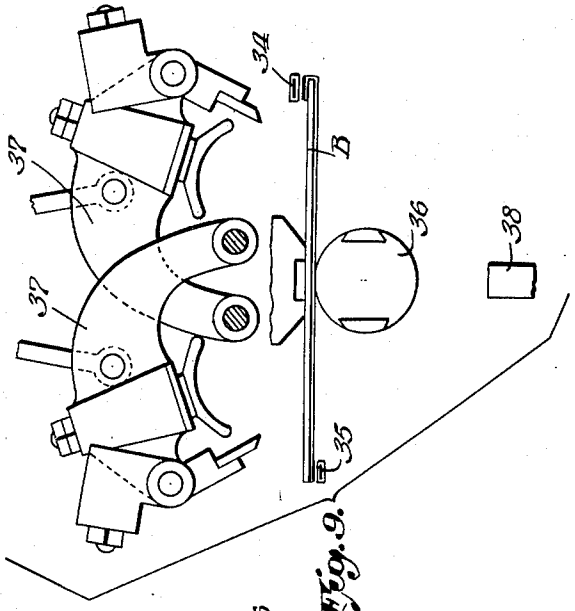


Fig. 6.

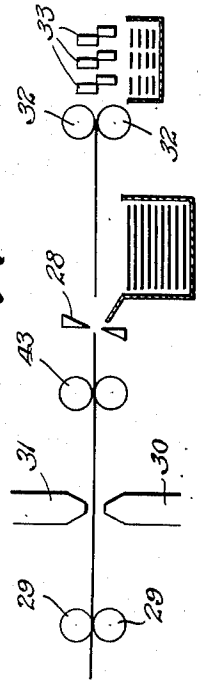
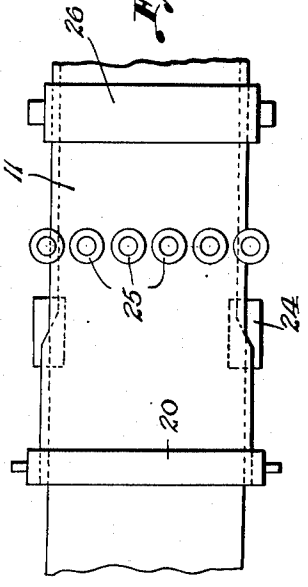


Fig. 7.



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UNITED STATES PATENT OFFICE

2,623,444

METHOD OF MAKING LINED LAPPED SEAM FIBER CONTAINERS

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Application April 8, 1946, Serial No. 660,366

4 Claims. (Cl. 93—94)

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The invention relates to new and useful improvements in containers and the method of making the same, and more particularly to a container having a fiber body.

Lined fiber body containers are known in the art but have heretofore been made by methods in which comparatively thin sheets of fiber board are wound either spirally or convolutely to form a body including a number of plies of fiber board. Liners have been incorporated in such containers by securing the liner adjacent the inner end of the strip from which the container body is to be wound. Lined and unlined fiber containers have been made in this manner even though it has long been recognized that methods involving either convolute or spiral winding do not lend themselves to production at speeds which have been achieved in the manufacture of metal container bodies. In contrast, container bodies secured by a simple lapped seam can be made much more rapidly than the convolutely or spirally wound bodies, but heretofore no one has been able to satisfactorily secure a liner, particularly a liner such as aluminum foil on a fiber board of adequate strength to form a satisfactory lap seam body.

An object of the present invention is to provide a lined lapped seam fiber container body in which the liner is secured to the fiber body so as to become a unitary structure therewith.

A further object of the invention is to provide a method of making a fiber container body of the above type wherein the liner is secured to the fiber body blank while in the flat so as to become a unitary structure therewith.

A further object of the invention is to provide a method of making a container of the above type wherein the fiber bodies and the liners are formed from webs which are secured together in a unitary structure, after which the unitary structure is cut into body blanks which are shaped into body form, and the edges lapped and bonded together in a side seam.

A still further object of the invention is to provide a method of the above type wherein the liner web is folded about the edge of the body web onto the opposite face thereof and the body blanks so cut from the integral structure that the liner covers one of the ends of the body blank which is formed into the side seam.

These and other objects will in part be obvious and will in part be hereinafter more fully described.

In the drawings which show one form of container embodying the improvements and the preferred method of making the same,

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Figure 1 is a longitudinal sectional view through a body blank from which the container body is formed;

Figure 2 shows the body blank formed into a cylindrical body with the liner arranged on the interior of the body and the ends of the body blank lapped and secured in a side seam;

Figure 2*a* is a view similar to Figure 2 but showing the liner on the outside of the container body;

Figure 3 is a view of one end of a container body embodying the improvements with a metal end secured thereto by double seaming;

Figure 3*a* is a view similar to Figure 3 but wherein the metal end is secured to the fiber by a false seam;

Figure 4 is a view similar to Figure 3 but showing a fiber end secured to the fiber body by an adhesive;

Figure 5 is a view showing diagrammatically a portion of an apparatus which may be employed in carrying out the improved method;

Figure 5*a* is a view showing more or less diagrammatically another section of the apparatus which may be used in carrying out the method;

Figure 5*b* is a view showing more or less diagrammatically still another section of an apparatus which may be used in carrying out the method;

Figure 6 is a view showing more or less diagrammatically a modified form of the apparatus as illustrated in Figure 5*a*;

Figure 7 is a view showing more or less diagrammatically and in plan a portion of the apparatus for folding the edge of one web around the edge of the other;

Figure 8 is a view showing more or less diagrammatically and in plan the section of the apparatus illustrated in Figure 5*a* for applying strips of adhesive to the laminated web and slitting and cutting the same into body blanks;

Figure 9 is a view showing more or less diagrammatically an apparatus for heating the thermoplastic adhesive at the ends of the body blanks, the folding of the body blank around a horn into body shape, the lapping of the edges to form a side seam, and the application of pressure to the lapped edges for bonding the same.

A container embodying the novel improvements is shown in Figures 1 to 4 of the drawings. In Figure 1 there is shown in longitudinal section the body blank prior to the shaping of the same into body form. This body blank includes a fiber board portion 1 and a liner 2. The fiber board and liner are secured together by an adhesive 3. In the preferred form of the invention the liner

is folded around the end of the fiber board blank as indicated at 4. A thermoplastic adhesive 5 is applied to the portion 4 of the liner and a thermoplastic adhesive 6 is applied to the other end of the liner. As shown in Figure 2, the body blank is formed about a horn so that the liner 2 for the body blank is disposed on the inside of the formed container body. This brings the thermoplastic adhesive strips 5 and 6 into contact and the portion of the body blank around which the liner is folded is on the inside of the container body. Prior to the forming of the body and the lapping of the ends of the blank, the thermoplastic adhesive strips 5 and 6 are heated so as to render the adhesive tacky and the seam is completed by pressure applied thereto, preferably by a bumping iron which engages the seam from one end to the other.

As shown in Figure 2*a* the body blank is bent around the horn so that the liner is on the outside of the container body and in this case the ends are lapped so that the body blank around which the liner is folded will be on the outside of the fiber body. It will be understood, of course, that while the body blank is shown as formed into a container body which is cylindrical, nevertheless it may be oval in cross section or have parallel sides with rounded corners.

The fiber body thus formed may be closed in any suitable way with end members. As shown in Figure 3, a metal end 7 is attached to the fiber body 7*a*. The fiber body is first flared or flanged outwardly and the metal end is rolled with the flared portion of the fiber body into a double seam, indicated at 7*b*. In Figure 3*a* a metal end is attached to the fiber body 7*a* by a well known false seam 7*c*. In Figure 4 a fiber end 7*d* is shown attached to the fiber body 7*a* by a suitable adhesive 7*e*.

To produce a useful lined lap seam fiber container such as described above, it is very essential to choose the right materials. The fiber body 1 must have good bending properties so that it may be formed into the desired body shape without breaking or distortion. The strength and surface properties of the selected fiber board should be of a good quality consistent with low cost. Various types of fiber board are suitable for forming the fiber body of the improved container. Some of the fiber boards that can be used are kraft, sulphite, chip or news. For many types of containers, machine lined or coated fiber boards are of advantage because good surface strengths and appearance can be obtained. For example, chipboard lined with kraft on one side and patent coating (sulphite fiber-clay lining) on the other side would be desirable because of the advantage of laminating a foil liner to the kraft lined side and of being able to print or lithograph the patent coated side.

The fiber board thickness can be varied within rather wide limits depending upon the type of board, size of container, strength and rigidity required. For ordinary container sizes, board thickness of 0.015 to 0.050 would be suitable.

The liner 2 should be moisture-proof or grease resistant to the degree required by the product to be packed. The liner must not be adversely affected by the product packed, nor should the product be adversely affected by the material used in forming the liner when the liner contacts with the product. Aluminum foil provides a good moisture-proof liner for a fiber container body. Parchment paper or cellophane or glassine provides a good grease resistant liner for the container body. The liner selected should be the one which is most efficient for a particular product to be packed and the protection required by the product.

Proper adhesive materials for joining the lapped edges of the body bank can be selected from substances which have bonding properties relative to the body materials. It must be capable of heat-sealing at a temperature within the range of 200 degrees F. to 350 degrees F. and under bumping pressure, and at a speed of approximately $\frac{1}{10}$ of a second or faster. The adhesive applied to board must be non-blocking at temperatures up to 100 degrees F., free from cold flow and thus resistant to the strains occurring during the life of the container free from deterioration upon aging, free from brittleness and any sufficient change of strength and behavior at temperatures of minus 20 degrees F. to plus 225 degrees F., free of causing degeneration of the body materials which may come in contact therewith either as an incident of the sealing or during the course of the container life; and free of attack under normal storage and shipping conditions from or upon the product to be packed.

The properties for heat-sealing adhesives for the lap seam are exhibited satisfactorily by compositions based upon thermoplastic masses prepared from natural and synthetic rubber and vinyl resins. The selection of the base and additives is dependent upon the probable later contact with water or moisture, oils, etc., the selection being made to avoid substances which can be extracted or attacked by the contacting material. Thus, butadiene polymer rubbers such as Buna S, Buna N, and neoprene can be employed, for example in organic solvent solution with the inclusion of modifying resins such as non-heat-hardening compatible phenolic resins in quantity to provide a tackiness point within the heat-sealing range stated above. Buna S, modified by such a resin, may be employed in water dispersion.

Vinyl polymer resins with a compatible plasticizer, such as a mixture of 87:13 vinyl chloride-acetate copolymer (Vinylite VYHH) with at least 40 per cent of tripolymer resin (Vinylite VMCH) which has an 87:13 vinyl chloride-acetate ratio with inclusion of 1 or 2 per cent of maleic anhydride, are satisfactory upon inclusion of 3 to 15 per cent (of total resin and plasticizer solids) of a softening plasticizer such as diamyl phthalate, dibutoxy ethyl phthalate, or like compatible high boiling organic ester of phthalic or sebacic acid: these being employed in a ketone solvent or a solvent mixture of ketone and coal-tar solvent. With these vinyl resins, modifying phenolic resins such as phenol-aldehyde or ortho-cresol-aldehyde resin of non-heat-hardening type can be included up to say 10 per cent. Such modifying vinyl resins form excellent lap-seaming adhesives for containers which may be exposed to water or oils. Polyvinyl acetate with a plasticizer of the above type may be employed in organic solution or in water dispersion for containers where water or prolonged moisture contact is not probable. In general, organic solutions are used for coating upon metal foil liners by reason of the greater ease of assuring a continuous coating.

Specific examples of adhesive coating compositions for the lap seams are: (*a*) 60 parts by weight of 87:13 vinyl chloride-acetate copolymer (Vinylite VYHH), 40 parts tripolymer of 87:13 vinyl chloride-acetate with 1–2 per cent maleic anhydride, 17.6 parts of dibutoxy ethyl phthalate

(Kronisol plasticizer), and 235.2 parts each of methyl isobutyl ketone and toluol; (b) neoprene rubber with non-heat-hardening resin modifier, 40 per cent solids in toluol with a tackiness point of 200 degrees F.

Such compositions, being organic solutions or water dispersion are applied to the areas to be lapped and are then heated to eliminate the solvent or dispersant and effect adhesion, for example, by baking for three minutes at 300 degrees F. (air temperature): on cooling, the container blank is non-tacky and non-blocking at room temperature and up to about 100 degrees F.

The laminating adhesive used for joining the liner in a unitary structure with a fiber body board must be adherent to both liner and body board and provide a body blank which can be folded about the horn into body shape without rupture of the laminating adhesive or cleavage of the parts. In general, the same thermoplastic adhesive employed for the lap seam is satisfactory. For foil liners, the vinyl resin and rubber type adhesives are preferred. For cellulosic liners such as parchment, glassine, plain cellophane and the like, used with paper board bodies, the laminating adhesive may be of a flexible starch-dextrine or animal glue; such as a starch-dextrine tube winding glue or an animal glue, to either of which a flexibilizing agent such as 20 to 25 per cent of glycerine has been added. The laminating adhesive is under strain at the lap seam area during the life of the container and therefore it should be free from cold flow. It should be free from brittleness; stable against deterioration or aging; and capable of withstanding temperatures from minus 20 degrees F. to plus 225 degrees F., because a container may be stored at very low temperature and products are often filled into containers at temperatures ranging from 180 degrees F. to 200 degrees F. It must be resistant to the temperature and conditions for effecting the junction at the lap seam.

The materials used in the forming of the fiber body of the container have been referred to in detail as the selection of materials is very essential to the successful carrying out of the method.

In the drawings an apparatus has been illustrated more or less diagrammatically for carrying out the improved method of forming a lapped seam lined container body of the character described above. A web of fiber board is indicated at 8 in the drawings. This web is drawn from a coil 9 and if a soft or lightly calendered board is used, it may be passed between precalendering rolls 10.

A web of lining material 11 is drawn from a coil 12. The liner web 11 is drawn from a coil 12 through a slack loop series of rollers 13, and then between adhesive applying rolls 14. These adhesive applying rolls are of a character such that adhesive will be applied to the upper face of the web. The adhesive used is applied in solution in a solvent and after passing through the adhesive applying rollers, the web will be passed through a baking oven 15 so that the solvent in which the adhesive is dissolved will be driven off leaving the adhesive in non-tacky form.

In some instances it is found desirable to apply an adhesive also to the fiber board web 9, in which case the web will pass through adhesive applying rolls 16 of suitable character for coating the upper face of the web and thence through an oven 17 where the solvent vehicle for the adhesive is driven off, thus providing the upper face of the web with an adhesive which is non-tacky. The web 9 passes over guide rolls 18 and 19 and thence between combining rolls 20, 20. The liner web 11 passes over guide rolls 21, 22 and 23 and thence between the combining rolls 20, 20. At this point the two webs are brought into assembled relation with the liner web superimposed on the body web.

In carrying out the method as illustrated in the drawings, the body fiber board web is previously slit so as to provide a width of web which is equal to twice the length of the body blank desired for the forming of a container body. The liner web is also previously slit so as to provide a width which is equal to the width of the body fiber board web plus twice the width of the lapped seam. The assembled webs are guided so that the liner web will project an equal distance at each side of the body fiber board web and these projecting portions are passed through a folder 24 such as used in a sewing machine for forming a hem, or between rollers arranged so as to fold the edge portions of the liner web around the edge and onto the opposite face of the body blank. The assembled webs with the edges folded as described are then passed between heating devices 25, 25 and preferably infra-red heaters are used for this purpose. The heating devices will heat the thermoplastic adhesive so as to render it tacky and then the assembled webs are passed through high pressure laminating rolls 26, 26, which may or may not be heated. The distance between the laminating rolls is less than the thickness of the assembled webs so that the body web and liner web will be pressed into intimate contact and a unitary structure produced. This bonding of the body web and liner web together must be of a character such as will prevent the breaking of the bond when the laminated body blank is folded around a horn into body shape, i. e., the bond must be such as to provide a unitary structure embodying the board and liner.

The web after it leaves the calendering rolls, passes around a cooling drum 27 where the adhesive is set and the two webs united into the unitary structure. This unitary web may be passed between flying the shears 28, 28 of a well known construction and the web cut transversely to form sheets S.

The sheets thus formed are next passed through devices for applying strips of adhesive to the sheets. The sheets may be stacked and then fed from the stack through adhesive applying rolls 29. There is a central adhesive applying roll 29*a* arranged for forming the strip of adhesive centrally of the sheet as shown in Figure 8. This strip is twice the width of the strip 6 applied to one end of the body blank. On the under side of the sheet are rolls 29*b*, 29*b* which apply strips 5 of adhesive to the under face of the liner which is folded around the edges of the body board. The adhesive selected for application to the sheets is of a thermoplastic nature, as described above, and after leaving the coating rolls the sheet is passed over heaters 30, 30 and beneath a heater 31 so that the solvent vehicle for the adhesive is removed therefrom and the adhesive strips are rendered non-tacky. The sheets are then passed through slitting rolls 32 which cut the sheet into two strips, splitting the same in the center of the adhesive strip applied by the roll 29*a*. These strips formed from the sheet are passed through transverse cutters 33 which cut the strips into body blanks such as shown in Figure 1.

It is to be noted that the body blanks are cut from the web so that the machine direction of the board extends transversely of the body blank, and when the body blank is formed into a container body the machine direction of the board will extend parallel to the axis of the container body.

The body blanks are then transferred to a body maker where the body blanks are shaped into body form, the edges lapped and bonded together into a side seam. In Figure 9 there is shown very diagrammatically the essentials of a body maker for forming the body about a cylindrical body shaping horn. The body maker includes a supporting bed along which the blanks indicated at B are fed, while in their flat condition.

Extending along the path of movement of the body blank is a heating unit **34** which applies heat to the adhesive strip **5**. Extending along the other side of the bed is a heating element **35** which applies heat to the adhesive strip **6**. Sufficient heat is applied to the adhesive by these heating elements in order to render it tacky, after which the body blank moves over the forming horn **36** and folding wings **37, 37** move down into contact with the body blank and fold it around the horn, lapping the edge portions of the body blank so that the end around which the liner is folded will form the inside of the lapped seam when the liner is on the inside of the body. If the liner is on the outside of the body, the portion around which the end of the liner is folded will be at the outside of the side seam. After the adhesives have been brought into contact, a bumping iron **38** is raised into contact with the lapped edge portions and this bumping iron will contact with the side seam throughout the entire length and apply sufficient pressure in order to bring about a bonding of the lapped edge portions of the body.

A specific example of the practice of the method of making a foil lined lap seam body will be given for a round container body $3\frac{3}{16}$ inches in diameter and $4\frac{3}{8}$ inches high. Kraft lined chipboard having a thickness of 0.030 inch may be used to advantage for the fiber body board and soft aluminum foil having a thickness of 0.001 inch used for the liner. Either a Vinylite adhesive or neoprene rubber-resin adhesive such as described above in detail may be used for laminating the liner to the fiber body and also for adhesively joining the lap portions of the body blank to form the side seam. The adhesive should be applied to the aluminum foil liner and baked for three minutes at 300° F. air temperature. This baking of the adhesive is for the purpose of driving off the solvent. The amount of adhesive applied should be sufficient to give a film weight of 10 mg. per square inch. When a Vinylite adhesive is used, the heat sealing temperature both for laminating and for the lap seam should be from 300° to 350° F. and if the neoprene-resin adhesive is selected, then the heat sealing temperatures should be from 200° to 300° F. The combining rolls should be set so that the space therebetween is 0.020 inch. With materials as selected above and treated in the manner stated, a very strong fiber board aluminum foil lined container body will be produced.

It will be understood, of course, that the method may be applied to the forming of can bodies of other shapes than round and when applied to a can body which is rectangular or oval in section it is preferable to score the portions of the body where they are to be bent on a small radius.

This completes the fiber body ready for the attachment of an end thereto. If the end is to be attached by a double seam such as shown in Figure 3, the body will pass from the body making machine into a flanger **39** which flanger is of the usual type for rolling the end portion of the body outwardly. The metal end may be fed from a press **48** where it is shaped, to a coating machine **41** where a sealing coating is applied to the channel of the end and then the end is applied to the fiber body at the seaming station **42**.

This seaming station is of the usual type and is provided with a seaming head, including seaming rollers which will roll the flange of the end and the flared end of the can body into a double seam such as shown in Figure 3. When an end seam such as shown in Figure 3*a* is desired, then no flanger is necessary. The end is formed and coated, then placed on the fiber body and the flange of the end is rolled into contact with the outer wall of the body as shown in Figure 3*a*.

While we have described the end as having a sealing coating, it will be understood that a sealing coating is not necessary in some types of fiber cans.

When an end of fiber is desired as shown in Figure 4, the fiber blank is shaped so as to provide a channel to receive the end wall of the container body. This channel is coated with a suitable adhesive and after the end is placed on the container then the walls of the channel are pressed into sealing contact with the inner and outer surfaces of the body. If a thermoplastic sealing material is used, then heat will be applied to effect the bonding of the end to the body.

In the above described apparatus the unitary web after having been completed, is passed through flying shears and cut into sheets. These flying shears and the forming of the sheets from the web at this point in the method may be omitted. In the form of apparatus as shown in Figure 6, the web after it leaves the cooling drum passes directly to the coating rolls **29** and then to the heating devices **30** and **31**, after which it will be passed through cold pulling rollers **43**. From this point the web may be cut by flying shears into sheets or it may be passed directly to a slitter **32** and thence to transverse cutters **33** where the web will be cut into body blanks.

It is also obvious that the above described method may be slightly varied so that after the fiber body web and the lining web have been united into a unitary web structure, said unitary web structure may be cut into sheets of multiple body blanks, and the sheets slit into individual blanks. A heat sensitive adhesive in a volatile solvent would then be applied to the body blanks in the areas thereof which are to be joined in the side seam of the container body, and heat applied to the adhesive for removing the solvent therefrom. The adhesive would be rendered tacky in the body making machine and the body blank bent about a mandrel into body shape so as to lap the edge portions and then pressure would be applied to the lapped portions for joining the same in a side seam.

While the method described is particularly suited for the forming of a fiber container body having a foil liner, it is equally adaptable for the making of a lined container body from parchment paper, cellophane, or the like. When the liner is of cellulosic material, a flexible starch dextrine or animal glue adhesive may be used for

joining the same to the paper body. In an apparatus for carrying out such a method the baking oven would be omitted as heat is not necessary for driving off any solvent. The liner would pass directly from the guiding roll 22 to the combining rolls. Likewise the body fiber would pass directly over the coating rolls to the combining rolls without going through an oven. When a cellulosic liner is used the adhesive may be applied solely to the body web, in which case the adhesive applying rolls associated with the liner will be omitted. The combining rolls need not be heated. The body web and the liner web will be dimensioned as above described and will be passed through folders for folding the edge portions of the liner around the edges of the body web. The assembled webs with the edges folded will then be passed directly between the pressure rolls which complete the joining of the body web and the liner web into a unitary web. The cooling drum is not essential. The remainder of the apparatus for the applying of the adhesive strips will be the same as that described above and as shown in Figures 5, 5*a*, 5*b* and 6.

As noted above, the materials used in the forming of the body and the liner of the container are determined by the use to which the container is to be put. Whether the liner be placed inside of the body board or outside thereof, and whether the liner is of foil material or cellulosic material, it is essential that the body board and the liner shall be bonded together while in the flat into a unitary body blank which will withstand the shaping of the body by bending the same about a horn without rupturing the bond. While the adhesive selected for bonding the body blank and the liner into a unitary structure will be determined by the character of the lining, it is essential that the adhesive used for joining the lapped edges of the body blank in the side seam shall be of thermoplastic character and of a type wherein the bonding may be instantly obtained by a bumping action.

While it is preferred to form the improved container body and container above described by the method described in detail, it will be understood that the container body may be made from sheets of body board and sheets of liner which are superposed one on the other and are joined together by a suitable stable non-brittle adhesive so as to form therefrom a unitary structure. This unitary structure, if not shaped to the dimensions of a body blank, will be trimmed or cut into body blanks and the adhesive applied thereto for bonding the lapped edges, after which the body blank will be formed around a horn, the edges lapped and bumped in the manner described above.

It is obvious that minor changes in the construction of container and in the detailed steps of the method described above may be made without departing from the spirit of the invention as set forth in the appended claims.

We claim:

1. The method of forming a fiber lap seam container body consisting in superimposing a continuous web of lining material on a continuous web of fiber board in which the machine direction of the board extends parallel to the axis of the container body, one of which webs has applied thereto a stable non-brittle adhesive, said webs being dimensioned as to width so that the lining web will project beyond the side edges of the body web, progressively folding the projecting portions of the lining web about the edge portions of the fiber board web into contact with the opposite face thereof, passing the assembled webs and folded edge portions between pressure rolls for intimately joining the webs and folded portions into a unitary structure, said unitary structure being of a width equal to twice the length of the body blanks utilized in forming the container bodies, applying strips of heat-sensitive adhesive in a volatile solvent to the unitary structure in the areas thereof which are to be joined in the side seam of the container body, applying heat to the strips of adhesive for removing the solvent therefrom, slitting the unitary structure lengthwise centrally thereof and transversely to form individual body blanks, heating the adhesive applied to the end portions of the body blank for rendering the same tacky, bending said body blank about a horn, lapping the edge portions and applying pressure to the lapped portions for joining the same in a side seam.

2. A method of forming a fiber lap seam container body consisting in applying a thermoplastic adhesive to a continuous web of foil lining material, heating the adhesive to remove the solvent therefrom, superimposing said lining web upon a continuous web of fiber board in which the machine direction of the board extends parallel to the axis of the container body, said webs being dimensioned as to width and positioned so that the lining web will project an equal distance beyond each side edge of the fiber board, progressively folding the projecting portions of the lining web about the edge portions of the board into contact with the opposite face thereof, applying heat to the assembly for rendering the adhesive tacky and passing the heated assembled webs between pressure rolls for intimately joining the webs and folded portions into a unitary structure, said unitary structure being of a width equal to twice the length of the body blanks utilized in forming the container bodies, applying strips of heat-sensitive adhesive in a volatile solvent to the laminated web in the areas thereof which are to be joined in the side seam of the container body, applying heat to the strips of adhesive for removing the solvent therefrom, slitting the unitary structure lengthwise centrally thereof and transversely to form individual body blanks, heating the adhesive applied to the end portions of the body blank for rendering the same tacky, bending the body blank about a horn, lapping the edge portions and applying pressure to the lapped portions for joining the same in a side seam.

3. The method of forming a fiber lap seam container body consisting in superimposing a continuous web of lining material on a continuous web of fiber board in which the machine direction of the board extends parallel to the axis of the container body, one of which webs has applied thereto a stable non-brittle adhesive, said webs being dimensioned as to width so that the lining web will project beyond the side edges of the body web, progressively folding the projecting portions of the lining web about the edge portions of the fiber board web into contact with the opposite face thereof, passing the assembled webs and folded edge portions between pressure rolls for intimately joining the webs and folded portions into a unitary structure, said unitary structure being of a width equal to twice the length of the body blanks utilized in forming the container bodies, cutting the unitary structure into sheets of multiple body blanks, applying strips of a heat-sensitive adhesive in a volatile solvent

to the sheets in the areas thereof which are to be joined in the side seam of the container body, applying heat to the strips of adhesive for removing the solvent therefrom, subsequently heating the adhesive applied to the end portions of the body blank for rendering the same tacky, bending said body blank about a horn, lapping the edge portions and applying pressure to the lapped portions for joining the same in a side seam.

4. The method of forming a lined lap seam fiber body consisting in superimposing a continuous web of lining material on a continuous web of fiber board in which the machine direction of the board extends parallel to the axis of the container body, one of which webs has applied thereto a stable non-brittle adhesive, said webs being dimensioned as to width so that the lining web will completely cover the fiber board web and project beyond at least one of the side edges of the body web, progressively folding the projecting portion of the lining web about the edge portion of the fiber board web into contact with the opposite face thereof, passing the assembled webs and folded edge portion between pressure rolls for intermittently joining the web and folded portion into a unitary structure, applying strips of heat sensitive adhesive in a volatile solvent to the unitary structure in areas thereof which are to be joined in the side seam of the container body and applying heat to the strips of adhesive for removing the solvent therefrom, cutting the unitary structure into body blanks

of a size to form a lap seam fiber body, heating the adhesive applied to the end portions of the body blank for rendering the adhesive tacky, bending the body blank about a mandrel into body shape so as to lap the edge portions to form a side seam and applying pressure to the lapped portions for joining the same.

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