

June 14, 1938.

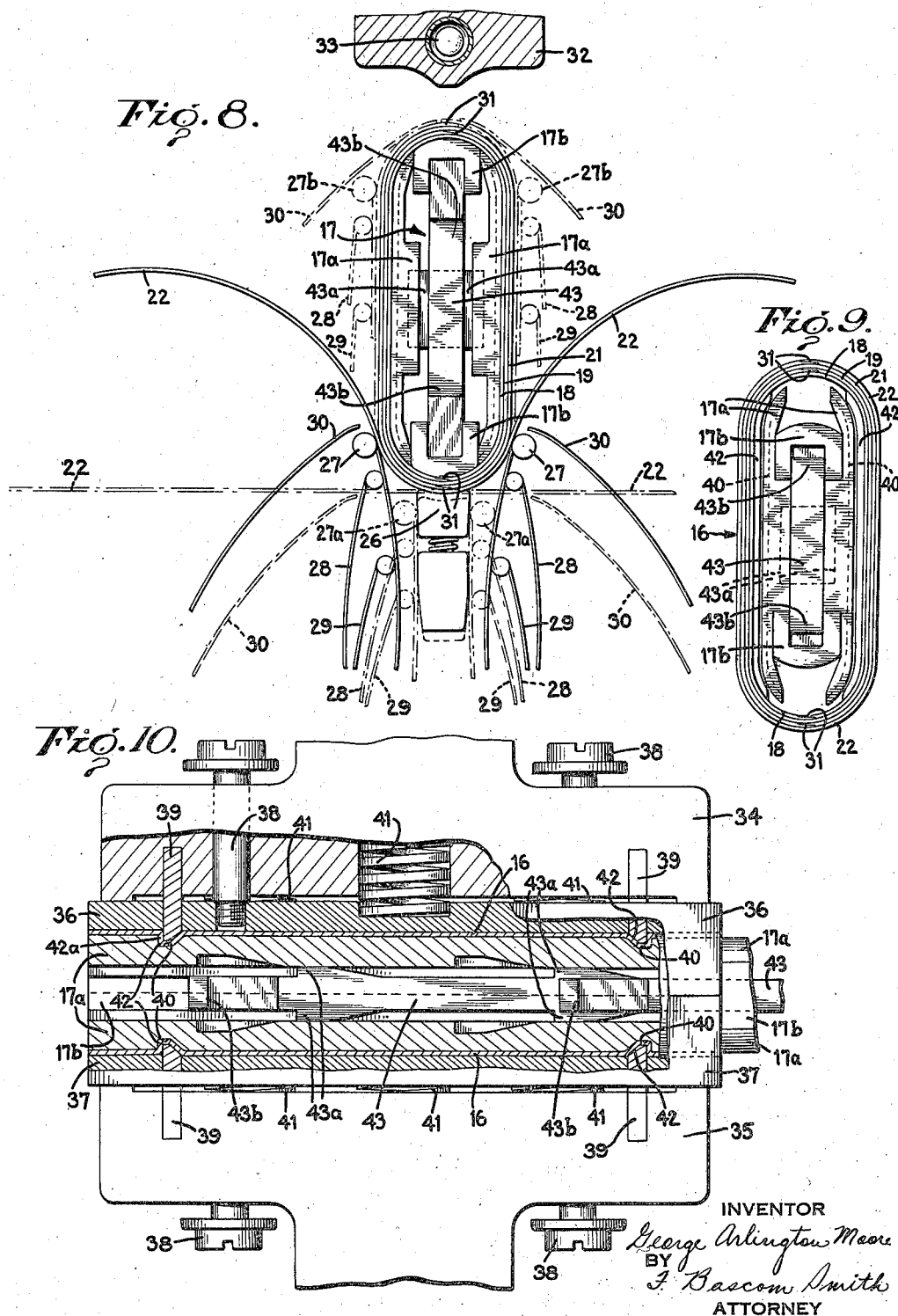
G. A. MOORE

2,120,904

CONTAINER AND METHOD OF MAKING THE SAME

Filed Dec. 10, 1935

4 Sheets-Sheet 2



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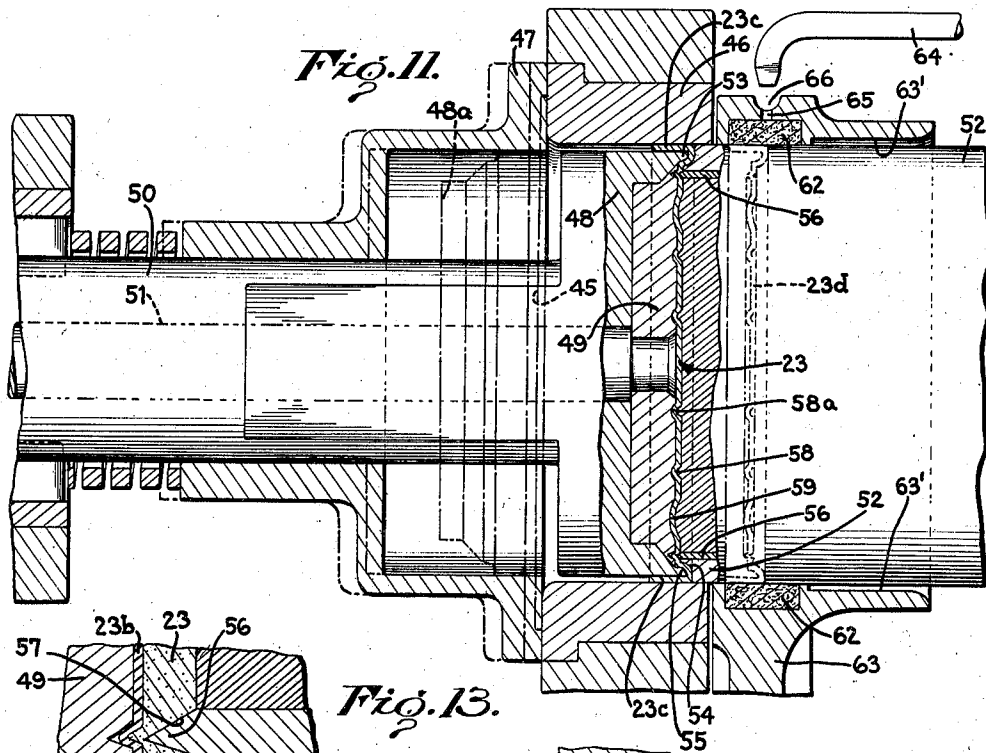
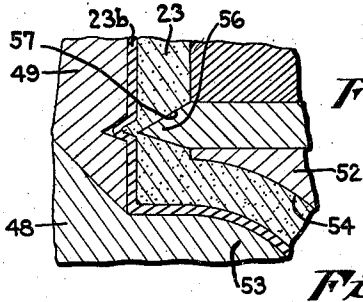
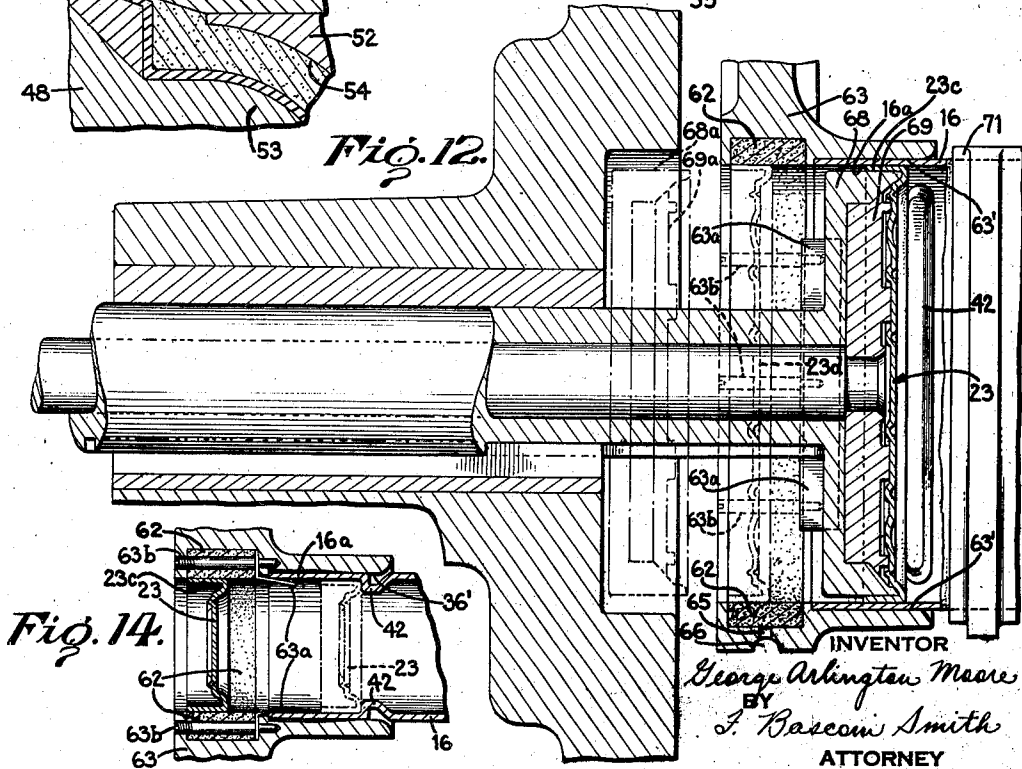
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4 Sheets-Sheet 3



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CONTAINER AND METHOD OF MAKING THE SAME

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9 Claims. (Cl. 93—39.1)

This invention relates to fabricated containers and to methods of making the same.

Among the objects of the invention are the provision of (a) a novel container which is strong and durable, substantially impervious to air and moisture, and one which may be fabricated by means of automatic machinery capable of securing rapid production in large quantities at low cost; (b) a container which may be opened by digital pressure; (c) a container having a frangible but impervious head which may be readily opened without the use of a tool, the escape of the contents of the container being prevented by a cover adapted to close the opening in the head; (d) a container formed of fibrous material, such as paper, and/or plastic materials, such as bakelite, and/or cellulose acetate or nitrate films, and which lends itself to the use of metal foil in certain portions thereof; (e) a container wherein thermoplastic lacquers, adapted to be activated by heat, or a solvent, or both, are employed in the preferred method of fabrication; (f) a container which in one preferred form has substantially straight wall portions and rounded or arcuate connecting wall portions; (g) a container which is reinforced at the marginal portions thereof with plies of the reinforcements welded together, one end of the container having a cover coacting with the reinforced portion; (h) a novel method of forming a plurality of parts and assembling and sealing these parts to form the completed container; and (i) a container which is pleasing in appearance and which particularly lends itself to conservation of space in packing and shipping.

The above and further objects and novel features of the invention will appear more fully in the detailed description, which is to be read in connection with the accompanying drawings. It is to be expressly understood, however, that the drawings are for purposes of illustration only and are not designed as a definition of the limits of the invention, reference for this latter purpose being had primarily to the appended claims.

In the drawings, wherein like reference characters refer to like parts throughout the several views,

Fig. 1 is a perspective view of a preferred form of cover for the container;

Fig. 2 is a perspective of the upper head of the container before it is inserted into the container body or shell;

Fig. 3 is a perspective of the container shell or body showing its laminated formation and the coated surfaces of the laminations, a por-

tion of the laminations being cut and separated for clearness of illustration;

Fig. 4 is a perspective of the lower or bottom head of the container prior to its insertion into the shell;

Fig. 5 is a side elevation, partly in section, of the cover shown in Fig. 1;

Fig. 6 is a side elevation, partly in section and with parts broken away, illustrating the complete container;

Fig. 7 is an enlarged detail view, with parts broken away, illustrating the seam between the upper head and shell and one manner in which the cover is attached to the shell;

Fig. 8 is an end view illustrating one manner of forming the laminated shell;

Fig. 9 is an end view illustrating one form of collapsible mandrel, in collapsed position, about which the laminations of the shell may be wound;

Fig. 10 is a sectional side elevation, with parts broken away, illustrating one manner in which the strengthening grooves may be formed in the side walls of the shell;

Fig. 11 is a sectional view illustrating one manner in which the hatch may be formed in the upper head of the body, the flange drawn therein, and a solvent applied to the outer surface of the flange to activate the lacquer on the inner surface of the shell for sealing purposes;

Fig. 12 illustrates one manner in which the upper head carrying the hatch may be inserted into the container shell;

Fig. 13 is a highly enlarged detail sectional view of one form of cutting means for forming the hatch in the upper head of the container, and showing the effect of the cutting operation on the outer lamination of the head;

Fig. 14 is a detail side view, partly in section and with parts broken away, of the female die of Fig. 12 on a reduced scale;

Fig. 15 is a somewhat diagrammatic view illustrating one manner in which the seam between the head and the container shell is formed; and,

Fig. 16 is a somewhat diagrammatic sectional view illustrating a second step in the method of forming the seam between the upper head of the container and the container shell.

The container of the present invention, in the form illustrated, comprises a shell or body (Fig. 3) having straight side wall portions connected by arcuate end portions. This shell may be formed by wrapping one or preferably a plurality of rectangular blanks of paper about an expansible and collapsible mandrel (Figs. 8

and 9). The inner layer or liner 18 of the shell is constituted by a blank of long-fibered, super-calendered kraft paper having a thickness of approximately .0035 inches. The inner surface of blank 18 is coated with a dry film of a thermoplastic, nitro-cellulose lacquer 18a about .0004 to .0006 inch thick, or for certain purposes a cellulose acetate may be advantageously used. Said lacquer constitutes an impervious coating and preferably has potential adhesive qualities, the same being adapted to be activated, or rendered tacky, by a solvent, by heat, or both, and rendered effective to bind the overlapped ends of the blank together when the latter is properly shaped to form the inner lamination of the container shell, and for securing the end closures or heads therein, as will be pointed out more fully hereafter. If heat alone is used as an activating agent, the lacquer should be rendered tacky only at temperatures considerably in excess of usual room temperatures, for example, 125° to 140° F.

One suitable lacquer for the inner surface of liner 18 is composed of about 65% of such ester solvents as ethyl acetate, butyl acetate, or the like, and such hydro-carbons as toluol, and about 35% of solids which can be readily activated by solvents as well as heat. The solids content is composed of about 25% of low viscosity nitro-cotton, 60% of resins and about 15% of a plasticizer such as dibutyl phthalate which may have small quantities of vegetable oils added thereto, if desired. The resins employed may contain some gums, such as ester gum, but usually synthetic resins, which have more definite physical properties than any natural resin, are used. This lacquer is free from tack at room temperatures and under normal conditions of humidity. Contact temperatures for forming seals at the overlapped edges of the shell laminations and between the shell and end closures therefor must be in excess of 140° F., the excess being dependent upon the speed of operation and conductivity of the materials used. Under normal conditions, the lacquer is firm, but sufficiently flexible and elastic so that the same will not crack or flake, or become susceptible to penetration by air and moisture when the walls of the shell are deformed in a manner to appear hereafter.

Around liner 18 is wound a filler constituted by a second blank of long-fiber, normal-calendered kraft paper having a thickness of approximately .005 inch and having a thin dry film of glue 20 on the surface thereof. To avoid the presence of excessive moisture between the layers of the shell and shrinkage and drying with consequent wrinkling of blank 19, a film of animal glue approximately .0007 inch thick, which carries about 10% to 12% of moisture and which is rendered tacky when the moisture content is raised to not more than 22% to 27%, is used.

To give additional body and strength to the shell, a third layer or filler 21 about .006 to .0065 inch thick is wound around filler 19, the inner face thereof being coated with a film of glue similar in composition and thickness to that used on filler 19. Other suitable adhesives, such as thermoplastics, may be substituted for the animal glue on fillers 19 and 21, if found desirable.

The outer layer or label of shell 16 is constituted by a blank 22 of sulphite paper to which sufficient bleached sulphate fiber is added to give it ample strength for withstanding the stresses incident to the forming operations to be described hereafter, the thickness of said label being .003

to .0033 inch. Although a film of animal glue 20 is shown on the inner surface of label 22, the same may in lieu thereof be coated with a film of lacquer about .0003 inch thick having adhesive qualities and adapted to be activated by a small amount of solvent. The solvents of one suitable lacquer for this purpose are composed of about 25% of ester solvents, such as ethyl acetate, and the remainder toluol. The solid content is composed of 85% high viscosity nitro-cellulose and 15% of a plasticizer such as dibutyl phthalate. A mixture of ethyl acetate and methyl cellosolve constitutes a suitable activating agent for this lacquer.

The outer face of label 22 may carry designs or other printed matter thereon and is coated with a high gloss lacquer to act as a protective surface and to give a pleasing appearance. A lacquer film about .0006 inch thick consisting of about equal percentages of solvents and solids is suitable and economical. The solvents may comprise ethyl acetate diluted with alcohol and toluol while the solids are made up of 30% low viscosity nitrocellulose, 10% of a plasticizer such as a modified coconut oil, and 60% of synthetic resins having as chief characteristics transparency and gloss.

The upper end of the shell 16 is adapted to be closed by a head 23 (Fig. 2) and the lower end by closure 24 (Fig. 4), and a cover 25 (Fig. 1) is secured to the upper end of the shell, all in the manner to be described hereafter.

In fabricating shell 16, blanks 18, 19, 21 and 22 are successively fitted between a reciprocating, resiliently mounted anvil 26 and expanding mandrel 17 (Fig. 8), the last three blanks being first passed over rollers (not shown) dampened with water or other suitable solvent for activating the glue or lacquer coatings 20. Each blank is first moved by anvil 26 against the lower edge of mandrel 17 or the previous blank and thereafter against the sides of said mandrel or previous blank by reciprocating flexible wrapping plates 27 which extend longitudinally along the full length of the shell and normally assume the dotted line position 27a. During the upward movement of plates 27, each blank is progressively moved into place, the pressure of said plates, augmented by spring plates 28 and 29, being effective to press the adjacent blanks into intimate contact with one another, distribute the activated adhesive in the interstices of the blanks, and to expel all air, there being no excessive adhesives to exude therefrom. When members 27 reach the uppermost or dotted line position 27b, a pair of tucking members 30 are pivoted inwardly, in succession, to move the ends of the blank into overlapping relation, as indicated at 31. A heated iron 32 is then lowered into engagement with lap 31 to activate and properly set the adhesives, whereby the adjacent surfaces of the lap are welded together. Iron 32 may be heated by any suitable means, such as electricity, steam or gas, an electric heating element 33 being illustrated. Preferably, mandrel 17 is rotatably mounted on a rotatable turret, and each blank is applied to shell 16 at a different station in such a manner that laps 31 of alternate laminations will be spaced 180° apart, thereby avoiding excessive wall thickness at the laps and insuring the imperviousness of the shell.

The shell thus fabricated is moved by mandrel 17 to a position between a pair of forming dies 34 and 35 (Fig. 10) having a pair of clamping plates 36 and 37 mounted thereon by means

of studs 38 for movement relative thereto and carrying die members 39 which slidably extend through slots in said clamping plates and coact with grooves 40 formed in side members 17a of mandrel 17. When dies 34 and 35 are moved toward body 16, plates 36 and 37, which are normally held away from said dies by a plurality of springs 41, yieldingly engage and encompass the outer surface of said body. Upon continued movement of members 34 and 35 with dies 39, the latter engage the walls of body 16 and draw the material thereof into grooves 40 of members 17a to form inwardly extending ribs 42 in said walls. In order to prevent any wrinkling or pleating of the material by reason of the shortening of the peripheral length thereof during the formation of ribs 42 and the grooves complementary thereto, the latter are interrupted at desired intervals. In the form shown, said ribs are interrupted at the arcuate wall portions of the shell. Preferably, grooves 40 and dies 39 are so shaped that the inner surface of ribs 42 comprises a ledge portion 42a (Fig. 7) extending inwardly substantially at right angles to the side walls, an intermediate portion 42b which is substantially parallel to the side walls, and an inclined portion 42c connecting the side wall and portion 42b and disposed at an angle of substantially 45° thereto.

Ribs 42 are preferably formed adjacent and parallel to the ends of shell 16 and serve as means for positioning closures 23 and 24 and as braces or struts for receiving the thrust incident to inserting said closures and forming the sealing joints to be hereinafter described. Said ribs also give additional strength and rigidity to the container and serve to prevent any bowing or arching of the straight side walls thereof. The grooves which are complementary to ribs 42 constitute general registering means for receiving the various guiding and supporting means employed in transferring and holding shell 16 during the fabrication, packing and sealing of the container.

After the formation of ribs 42, mandrel 17 is moved to another station and collapsed (Fig. 9) by moving the central element 43 thereof to the left, as seen in Fig. 10, until the enlarged portions 43a and 43b register with recesses in members 17a and 17b respectively. Shell 16 is then removed from the mandrel. The use of adhesives of the type specified above and the respective activations of these adhesives results in a shell or body of great strength that will retain its shape and which is particularly adapted to receive the die deformations without fracture.

Preferably, heads 23 and 24 are formed by subjecting flat laminated blanks to an embossing and drawing operation, the inner laminae 23a and 24a of each blank being composed of fibrous material such as fiberboard, or the like, and the outer laminae 23b and 24b being constituted by metal foil, such as an aluminum or lead foil. In forming head 23, a laminated blank 45 is inserted between a female die member 46 and a yielding pressure member 47 to be acted upon by male die 48 which carries a relatively movable stripper member 49 mounted concentrically therewith and cooperates with a reciprocable buffer die 52, the face of which is initially in alignment with the left-hand face of die 46 (Fig. 11). As dies 48 and 49 are moved to the right by shafts 50 and 51 from the dotted line position 48a, a peripheral arcuate bead 53 on the face of die 48 engages the blank and draws the material of the marginal portion thereof into a peripheral

arcuate groove 54 on the face of die 52, said marginal portion being held against wrinkling or buckling by member 47. A groove 55 and a complementary rib are thus formed in the blank, said rib adding rigidity and strength to head 23 and to the container as a whole.

During the formation of groove 55, the lower face of the blank contacts a cutting knife 56 which is preferably removably mounted in die 52 and projects upwardly from the face thereof. Said knife extends completely around the face of die 52 adjacent the inner edge of groove 54, and a vertical section of the cutting edge thereof has the outline of a scalene triangle. In order to prevent cutting edge 56 from destroying the moisture-proof qualities and impermeability of foil lamination 23b or of a veneer coating which may be placed on the outer surface of head 23, the pressure on the upper face of the blank opposite said scalene cutting edge is relieved by the provision of a similarly shaped groove in die member 49, thus preventing any ruptures of the materials by reason of compression thereon and permitting the central portion of dies 49 and 52 to contact the blank before said knife cuts entirely through the same. Thus, when blank 45 is moved into contact with die 52, 56 by die 48, 49, a furrow 57 is cut around the central portion of head 23, thereby providing said head with a hatch whereby an opening for dispensing the contents of the container may be readily made by digital pressure, said hatch being formed without destroying the impermeability of the head.

To further facilitate the opening of the container, a plurality of outwardly extending ribs 58, 58a, which constitute bending lines or hinge means for the hatch, and buttons 59, which constitute means for readily locating the proper point for application of pressure, are embossed in head 23 by means of suitable contours on the face of die 52 adapted to cooperate with similarly shaped recesses in the face of stripping die 49. In the form illustrated, four ribs 58, 58a are provided which divide head 23 into two pairs of sections 60 and 61, one pair of which is illustrated in open position by dotted lines in Fig. 6.

Further movement of die 48, 49 into die 46 is effective to draw the entire margin of blank 45 into the latter die, thus forming the smooth continuous flange 23c of head 23. The margin of the blank is yieldingly held against buckling, during the drawing operation, by member 47.

For a purpose to appear hereafter, novel means are provided for applying a suitable quantity of solvent to the outer surface of flange 23c which means, as shown, comprise a solvent dispensing strip or pad 62. The latter is positioned in a groove in, and constitutes a part of the inner wall of, an opening or pocket in a rotatable turret 63. Pad 62 is saturated with a suitable solvent such as a mixture of methyl Cellosolve and ethyl acetate which may be supplied thereto from a conduit 64 and through radial passages 65 extending inwardly from a groove 66 around the periphery of the turret which comprises a plurality of pockets 63'. Head 23 is moved into pockets 63' to the dotted line position 23d by continued movement of dies 48 and 49 to the right, as seen in Fig. 11, said dies being then successively withdrawn, the latter serving to strip head 23 from die 48.

Turret 63 is then indexed to the position illustrated in Fig. 12, bringing pocket 63' into alignment with a reciprocating ram 68 and a stripper member 69, having lugs on the face

thereof to prevent interference with the hatch above described. Ram 68 and member 69 normally assume the dotted line positions 68a and 69a. With pocket 63' and ram 68 in alignment, the upper end of a container body 16 which may be held by a revoluble and longitudinally movable chuck comprising a pair of cooperating jaws 70 and 71 (Fig. 15) is moved thereby into an enlarged portion of said pocket.

Movement of ram 68 and stripper 69 to the right is effective to move head 23 into said body until the lower edge of the head engages ledges 42a of ribs 42. In order to prevent any interference by the upper edges of the side walls of shell 16 with head 23 during the insertion of the latter, novel guiding means may be interposed between said edges and head. As shown, said means comprise a pair of thin metallic plates 63a (Fig. 14) which extend to the right and spring inwardly in pocket 63' from the right-hand edge of pad 62 to a point beyond the edge of body 16, thus preventing any possibility of interfering contact between said head and the edge of said body. Plates 63a may be secured in place by screws 63b that engage flanged portions thereof extending into the groove which houses pad 62. When members 63a are used, buffer die 52 is equipped with suitable yielding members for expanding members 63a when said die is moved through turret pocket 63'.

The outer surface of flange 23c having been dampened with solvent by pad 62 engages that portion of the inner surface of the margin 16a of body 16 which is not covered by plates 63a and deposits some of the solvent thereon. The solvent thus deposited and that remaining on flange 23c is effective to aid in the activation of adhesive coating 18a on liner 18, the quantity of solvent being sufficiently small, however, to avoid the presence of excessive moisture in the joint or seam to be formed between body 16 and flange 23c. It will be noted that by the novel means thus employed, an adhesive activating solvent may be applied to the inner surface of container 16 without any possibility of contaminating the dies or product with solvent.

Head 23 having been thus inserted into body 16, dies 68 and 69 are successively withdrawn, the latter serving as a stripping member during the initial retraction of the former, and chuck 70, 71 withdraws body 16 with said head from turret 63. The chuck is then indexed to carry body 16 to a plurality of other stations where the marginal portion of said body is curled or flowed into interlocking relation with and substantially welded to flange 23c to form an impervious seam.

A preferred means for flowing margin 16a in a suitable manner is illustrated in Fig. 15 as comprising a segmental expansible female die 72 into which said margin is adapted to be inserted by chuck 70, 71. A male die 73, having a peripheral groove 74 which is arcuate in radial cross-section, is adapted to be reciprocated in said female die and as the same is moved toward the right (Fig. 15) from the dotted line position 73a, the upper edge of body 16 is caused to follow the surface of groove 74, the radius of said surface being large enough so that margin 16a will flow freely in an inward and downward direction without buckling. The flowing of said margin is carried to such an extent that the raw edge thereof extends into groove 55. The thrust against body 16 during the flowing operation is absorbed by ribs 70a and 71a on jaws 70 and 71, respectively, which register with the grooves complementary to ribs 42 ad-

jacent the lower end of said body and by similar ribs on the inner surface of the parts of die 72 which register with the grooves adjacent the upper end of body 16.

After the flowing operation, body 16 is withdrawn from die 72 and again indexed by means of chuck 70, 71 to a position from which the upper end of the body may be moved into a second segmental expansible die 75 which, like die 72, is provided with ribs 75a adapted to register with the grooves on the side walls of said body. A pair of smaller but similarly shaped ribs 76 is also provided on the inner surface of die 75 to form grooves 78 and 79 in the front and back of the container adjacent the upper end thereof, said latter grooves constituting securing and latching means for cover 25. When the segments of die 75 have been moved into engagement with body 16, a collapsible male die 80 is expanded into contact with and exerts a pressure upon margin 16a thereby pressing the wall of body 16 and margin 16a into intimate contact with each side of flange 23c and forcing the material of said margin into groove 55, thus burying the raw edge of the margin and locking the same in said groove. The profile of the lower portion of the parts of die 80 is such as to permit the material of margin 16a to assume the configuration required in the proper formation of grooves by ribs 75a.

Surrounding segmental die 80 and in sliding engagement with die 75 is a bolster 81 which is provided with heating means such as electric heating coils 82. Heat is conducted by the metal dies from said coils to joint 16a, 23c for further activating the thermoplastic adhesive coating 18a, the activation of which was initiated by a solvent from pad 62. The adhesive is sufficiently activated by the heat and solvent so that the pressure exerted by die 80 is effective to cause the same to flow into the interstices of the paper laminations without saturating the same. The joint thus formed serves to reinforce the container and is impervious to air and moisture.

Although hatch 60, 61 is so constructed that it may be easily manipulated to close the opening made thereby for the purpose of avoiding any spilling of the contents of the container, a hinged cover 25 is also provided. Said cover is preferably constituted by a blank of fibrous material such as fiberboard having a thin sheet 25' (Fig. 7) of cellulose acetate secured to the outer surface thereof by a solvent adhesive which contains about 20% solids including some resins and a plasticizer. Sheet 25' is adapted to be rendered semi-plastic when heated by the dies employed in forming the blank into cover 25, but sets quickly when allowed to cool and becomes effective to hold the deformed fiberboard under stress and against any tendencies to spring back toward its original position. Additionally, said acetate coating, which may be colored in any desired manner by adding a proper pigment, gives a high gloss to the cover and renders the surface thereof impervious.

The fiber and acetate blank above described is subjected to the action of drawing and forming dies operating on the same principles as those employed in forming heads 23 to form cover 25 which, when completed, comprises a central portion having an inwardly projecting rib 25a therein to give strength and rigidity thereto, a tab 25b extending downwardly at the back thereof, and a downwardly extending flange 25c around the front and sides thereof, said flange being cut

away adjacent tab 25b to permit ready opening of the cover and to provide clearance for the pouring and discharge of products from the container. Tab 25b has a rib 42d impressed therein which is adapted to register with groove 42 on the back of body 16, and a smaller rib 79a adapted to fit into groove 79 of the container and serve as a bending line or hinge for the cover.

For securing cover 25 to body 16, a thin coating of thermoplastic adhesive adapted to be activated by either heat or a solvent, but preferably by both, is applied to the inner surface of tab 25b. One suitable method for joining said cover to the container body consists in applying a solvent to the area 16b on the container (Fig. 3) by sliding the latter past a wick saturated with a solvent and thereafter pressing tab 25b against the same by means of a heated iron shaped to conform to the contour of grooves 42d and 79a. An inwardly projecting rib 78a adapted to cooperate with groove 78 to constitute a latch for holding cover 25 in closed position is provided on flange 25c. When said cover is in closed position, the upper rim of the container extends into and is resiliently engaged by the walls of a channel 25d between rib 25a and flange 25c of the cover, and rib 78a is resiliently held in register with groove 78.

After the container has been filled with the desired product, bottom 24 may be inserted therein and secured in place in a manner and by mechanisms similar to those above described for inserting and sealing head 23.

There is thus provided a novel container and new methods for fabricating containers. It is to be expressly understood that the invention is not limited to a container having a specific shape or size, since those skilled in the art will observe that the invention may be embodied in containers of various shapes and sizes, for example, in round containers. Specific thicknesses of paper or fiber sheets and lacquer and glue coatings have been given, but these may be widely varied, depending on the uses to which the container is to be put and on the cost requirements. In certain types of containers, the heads or shells, or both, may be formed of a single sheet or a plurality of sheets of paper or other materials, fibrous or plastic. In the embodiment illustrated, the cover is preferably formed from a cellulose acetate sheet laminated with fiberboard, but success has been had with covers formed from laminated blanks having metal foil as one of the laminae. It will accordingly be understood that reference will be had primarily to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. In a container, a body and a cover therefor constituted by a laminated blank having a lamina of paper and a lamina of cellulose acetate intimately united by an adhesive, said blank being deformed while heated whereby said acetate lamina is rendered plastic but sets when cooled to hold said paper lamina in deformed position.

2. In the art of making containers comprising fibrous material, the method which comprises fabricating a shell, inserting a flanged head in said shell in contact with the marginal portion thereof and simultaneously activating an adhesive interposed between said marginal portion and the flange of said head, flowing said marginal portion into overlapping relation with said flange to form a joint, and subjecting the plies of the joint to heavy pressure for moving said plies into intimate contact with each other and pressing said activated adhesive into the interstices

thereof, thereby welding said marginal portion and flange together.

3. The method of fabricating a container which includes the steps of applying an adhesive solvent to the outer surface of the flange of a closure member by moving the latter in wiping engagement with a moistened absorbent pad, and inserting said closure into the container body by continued movement thereof.

4. In the art of making containers comprising fibrous material, the method which comprises fabricating a container body with a dry film of re-activatable adhesive upon the inner surface thereof, forming a flanged end closure for said body, applying a solvent to the flanged portion of said closure, inserting said closure into said body in contact with said adhesive, the latter being activated by said solvent, flowing the marginal portion of the walls of said body into interlocking relation with said flange portion, and subjecting the parts to the action of pressure for pressing the activated adhesive into the interstices of the interlocking portions and substantially welding the same together.

5. The method of making a container which includes forming a shell, and drawing an internal rib in the wall of said shell intermediate the ends thereof while supporting said wall by means closely engaging the same about the entire inner periphery of the shell on opposite sides of said rib and yieldingly pressing said wall against said supporting means.

6. The method of making a container which includes the steps of forming a shell on a mandrel, and thereafter forming an internal rib in said shell intermediate the ends of the mandrel while yieldingly pressing the walls of said shell against the mandrel on opposite sides of and adjacent said rib.

7. The method of making a container which includes the steps of forming a shell on a mandrel, forming an internal rib in said shell intermediate the ends of the mandrel while yieldingly pressing the walls of the shell against the mandrel, and contracting said mandrel sufficiently to allow said shell to be removed therefrom.

8. The method of making a container comprising fibrous materials which includes coating at least a portion of one surface of a blank with a composition having adhesive properties, allowing said coating to become dry, forming a tubular body including said blank with the composition coating on the latter inside the body and with the edges of the blank overlapping, securing said overlapping edges together by activating the composition coating therebetween, moistening the marginal portion of each end of the body with a solvent and inserting a flanged closure in each end of said body, and securing said closures in place with the moistened marginal coating by the application of heat and pressure.

9. The method of making a container comprising fibrous materials which includes coating at least a portion of one surface of a blank with a composition having adhesive properties, allowing said coating to become dry, forming a tubular body including said blank with the composition coating on the latter inside the body and with the edges of the blank overlapping, adhesively securing said overlapping edges together, moistening the marginal portion of one end of said tubular body with a solvent and inserting a flanged closure in said end, and securing said closure in place with the moistened marginal coating by the application of pressure.

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