April 28, 1959 H. L. CARPENTER ET AL 2,884,176

CLOSURE ASSEMBLY FOR FIBRE CONTAINERS AND METHOD OF MAKING THE SAME

Filed Nov. 2, 1953 3 Sheets-Sheet 1

Fig. 1

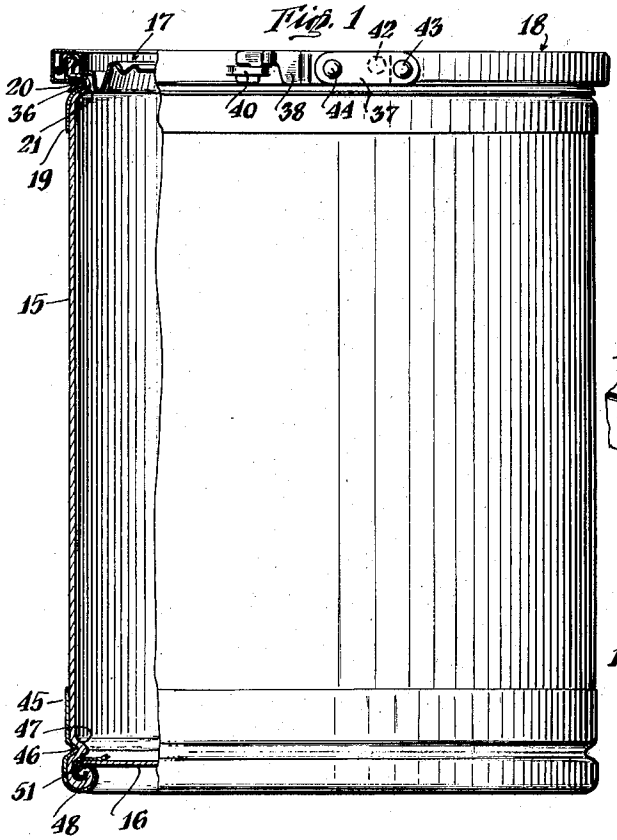


Fig. 5

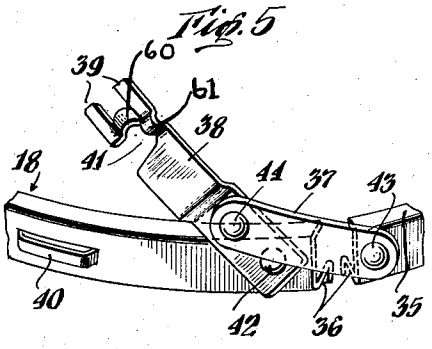


Fig. 6

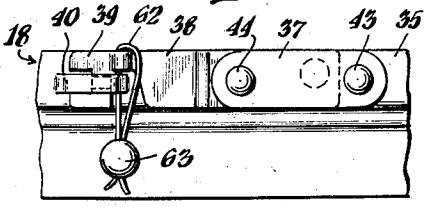


Fig. 2

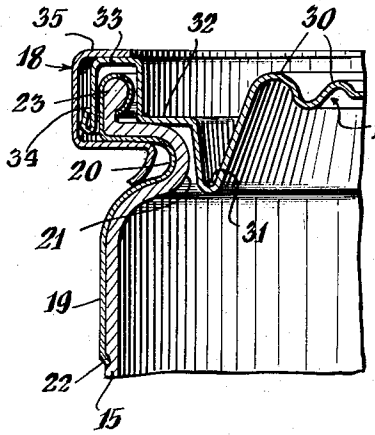


Fig. 4

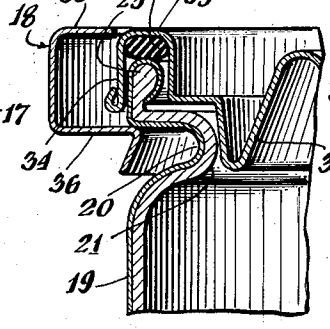
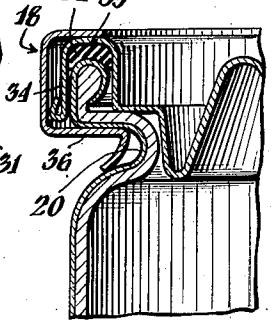


Fig. 3



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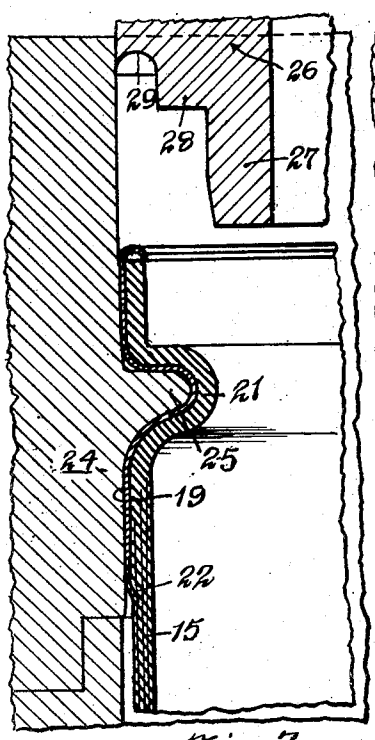


Fig. 7.

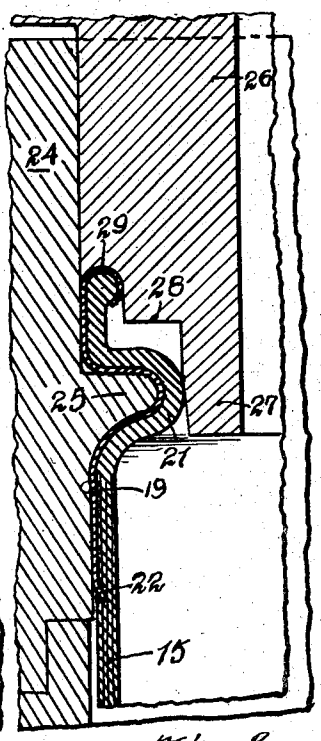


Fig. 8.

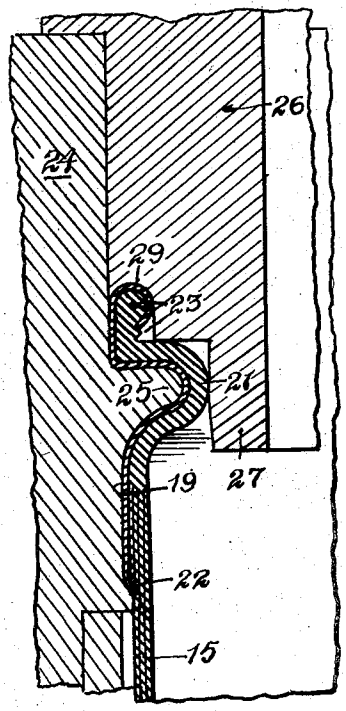


Fig. 9.

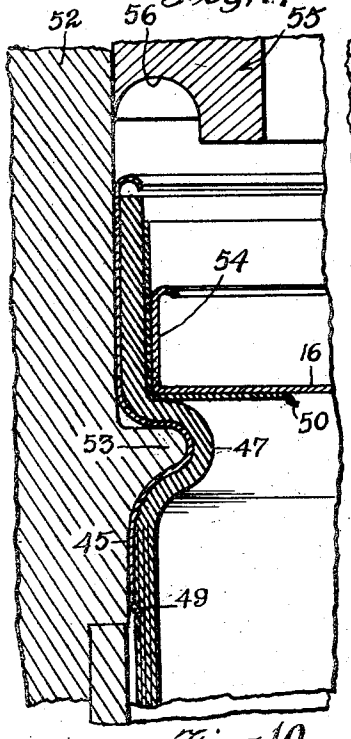


Fig. 10.

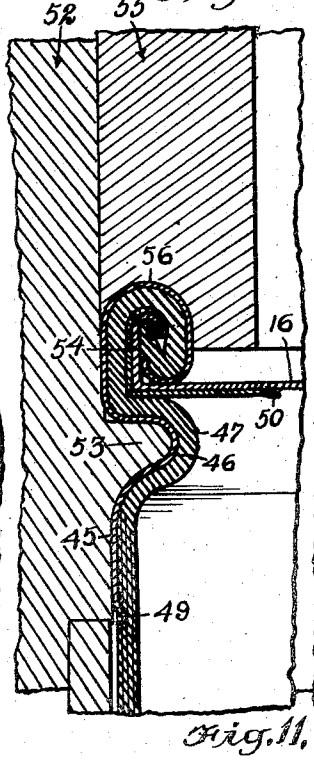


Fig. 11.

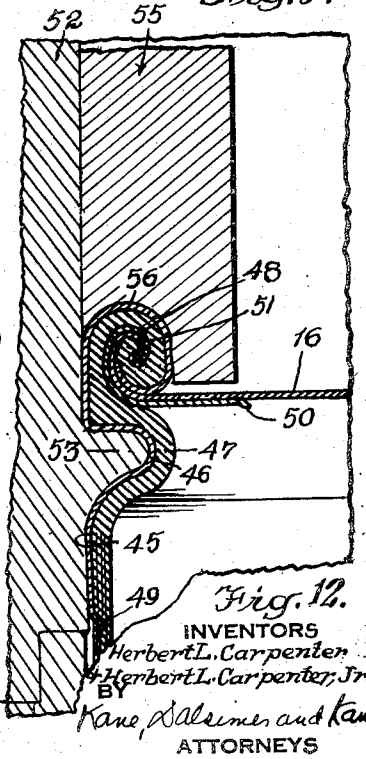


Fig. 12.

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Fig. 13.

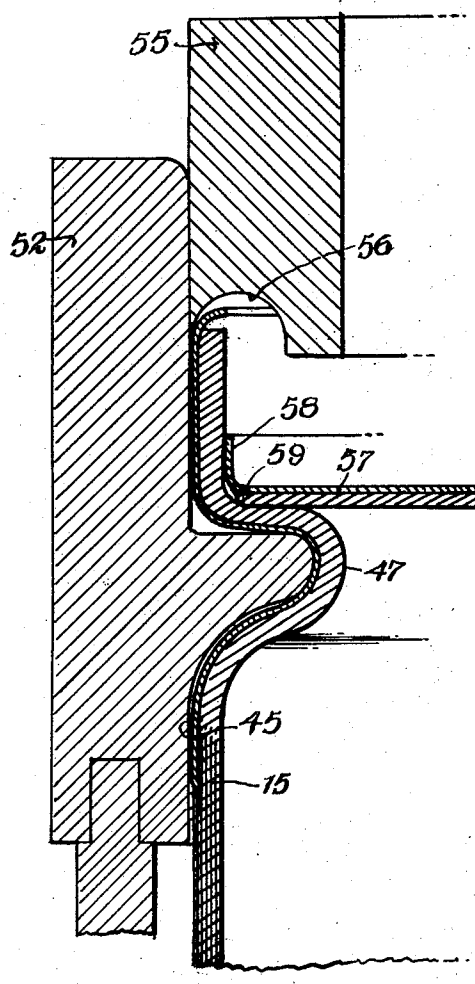
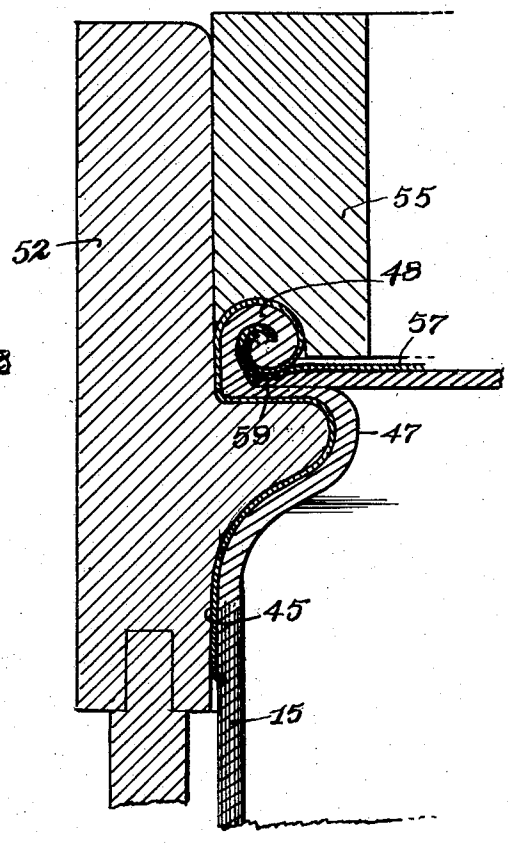


Fig. 14.



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CLOSURE ASSEMBLY FOR FIBRE CONTAINERS AND METHOD OF MAKING THE SAME

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Application November 2, 1953, Serial No. 389,731

4 Claims. (Cl. 229—5.6)

This invention relates to improved fibre drums and containers and more specifically to improved top and bottom closure assemblies of fibre containers and to the method of making the same.

Fibre drums are made from convolutely wound laminated layers of kraft board, fibre board or the like. They are generally provided with top and bottom closures in which the top closure is removable and the bottom closure is permanently secured in place. Fibre drums and containers are commonly used for the shipment and storage of bulk materials, raw materials, chemicals and the like. In practice, they are frequently subjected to rough treatment and mishandling and are often dropped from relatively great heights, such as from the tailboards of trucks, while fully loaded. Under those circumstances, of course, the containers are subject to unusual impacts, stresses and strains, particularly in the area of the chimes and closure assemblies.

It is an object of the present invention to provide a fibre container of the above type having improved top and bottom closure assemblies which can withstand the impacts, loads, stresses and strains to which fibre containers are subjected, which is relatively simple and economical to manufacture and in which the top closure can be readily applied to and removed from the container but will nevertheless be firmly held in place when locked.

In carrying out our invention we mold the fibre at the two ends of the drum, while it is still fresh, moist and workable, into interlocked relationship with a metal reinforcing chime member and simultaneously complete the formation of an external groove and inturned bead in the reinforced drum body. Also, while the fibre is still fresh, moist and workable we mold the lower end of the drum into an inturned, rolled bead having interlocking relationship with the bottom closure thereby permanently and securely holding it in place so that it can withstand substantial impacts, loads, stresses and strains. The fibre in the bead is in the form of a tightly compressed, cohesive, unitary mass and is encased in and protected by the metal reinforcing chime, which, along with the closure, is interlocked with the bead.

Other objects of the invention include the provision of an improved fibre container of increased strength—particularly increased resistance to puncturing—and also one in which attachment of the fibre parts in the container to metal parts is improved so as to increase the strength thereof and to minimize the formation of condensate on the metal.

In the accompanying drawings:

Fig. 1 is an elevational view partially in section and with the central portion omitted of a fibre drum having top and bottom closure assemblies embodying our present invention and illustrating one specific type of bottom closure;

Fig. 2 is a detailed, sectional view of the top closure assembly showing the relationship between the closure, the locking rim and the chime portion of the container body;

Fig. 3 is a similar view of a modified structure embodying a gasket between the cover and the top of the container;

Fig. 4 is a similar cross-sectional view of the modified structure with the rim in open position and with the gasket expanded so as to elevate the cover;

Fig. 5 is a detailed view in perspective of the two end portions of the locking rim with the interconnecting locking link and lever showing the lever in open position;

Fig. 6 is a perspective view partially fragmentary with the locking lever in closed position and with a seal applied thereto;

Fig. 7 is a detailed view in section of a pair of dies and the upper chime portion of a container body showing one step in the production of the upper closure assembly with the dies illustrated in open position;

Fig. 8 is a similar view showing the dies in the process of being closed;

Fig. 9 is a similar view with the dies completely closed showing the upper chime portion of the container body when completed;

Fig. 10 is a detailed sectional view showing a pair of dies, the lower chime portion of the container body in inverted position and also one form of bottom closure which is to be assembled with the container illustrating the dies in open position;

Fig. 11 is a similar view to Fig. 10 with the dies in partially closed position;

Fig. 12 is a similar view with the dies in completely closed position showing the bottom closure assembly in completed condition;

Fig. 13 is a detailed sectional view similar to Fig. 10 but showing a modified type of bottom closure; and

Fig. 14 is a view similar to Fig. 12 showing the modified type of bottom closure assembly in completed condition.

In the accompanying drawings we have shown a fibre drum having a tubular body portion **15** which may be of any cross-sectional shape and which is made in the usual manner from convolutely wound, laminated layers of kraft board, fibre board or the like. The body portion of fibre drums are usually made by winding a sheet of kraft board around a mandrel with suitable adhesives coating the surfaces of the board and permeating the pores and fibres thereof. To increase the strength of the body portion, and also its resistance to leakage and puncturing, one or more of the convolutely wound layers may be made of a sheet metal, plastic, reinforced plastic instead of fibre. For this purpose we may use a glass fibre fabric layer impregnated and coated with a plastic material or a synthetic resin such as phenolic resin. This layer may be incorporated on either the inner or outer surface of the body wall, or at an intermediate position between the two surfaces. Materials of this type are much stronger than fibre and increase the strength of the container.

The lower end of the fibre container is provided with a permanently attached closure **16** and the upper end with a removable cover or closure **17** which is releasably locked in place by means of a locking rim **18**.

So as to strengthen the end portions of the drum, we provide a metal reinforcing chime or band around both the upper and lower ends of the drum body. Thus, around the upper end we provide the metal reinforcing chime **19** in the form of a strip of sheet metal such as steel, which is fitted tightly around the container body and extends from a spaced distance below the upper end upwardly and overlapping the top and projecting downwardly for a short distance into the interior of the drum as shown most clearly in Figs. 1–4 and 9. A short distance from the

upper end of the drum, the fiber body and the metal reinforcing chime are deformed inwardly so as to provide an external groove **20** and an internal rib or bead **21**. It should be noted that the upper surface of the groove and of the rib in the completed drum are preferably disposed at a sharp angle to the plane of the body of the drum forming a right angle shoulder, whereas, the lower surface of the groove and rib taper or curve gradually and merge with the drum body. The lower end of the metal reinforcing chime is preferably bent inwardly as shown at **22** so as to be firmly anchored in the drum body, thereby strengthening the connection between the parts and eliminating any sharp edges. Also, the metal reinforcing band may be secured to the fibre body by an adhesive or preferably by one of the new synthetic sealing or bonding agents. Where the sealing or bonding agents are employed the metal and fibre are securely sealed or bonded together in integral fashion with the sealing or bonding agent permeating the fibres. This greatly increases the strength of the structure and prevents condensation on the attached surface of the metal.

As shown most clearly in Figs. 1–4 and 9 the upper end of the fibre drum body is formed into a rounded bead **23** and the fibrous material in this bead is in compressed, molded, cohesive, unitary form and is relatively more compact than in the main portion of the drum body. The metal reinforcing chime extends upwardly around the bead encasing and protecting it and it extends downwardly over the inner surface of the drum to a point near the internal rib **21**.

In making the upper chime portion of the drum the metal reinforcing chime strip is tightly extended around the drum shortly after the drum body has been wound and before the adhesive has set so that the fibrous material of the body is still moist and workable. In this connection, the lower end of the metal chime strip is preferably deformed inwardly as shown in the drawings at the time of application so that it is embedded in the fibre body and an adhesive or bonding agent may be applied between the attached surfaces. The upper end of the chime strip overlaps the top of the body as shown in Fig. 7 but does not extend downwardly into contact with the inner surface. Thereafter, the external groove and internal bead may be preformed in the reinforced upper end of the drum as by suitable means such as rollers (not shown) providing a rounded, partially formed groove and rib as shown in Fig. 7. This operation is performed while the fibrous material is still in moist and workable condition and prior to the setting of the adhesive.

When the groove and rib have thus been preformed and while the fibre is still moist and workable it is placed in a split die **24** having an inwardly projecting rib or flange **25** which fits into the partially formed groove in the drum. Projecting flange **25** has an upper surface providing a sharp shoulder with respect to the body of the die and a curved lower surface. In other words, it is formed in the desired shape of the completed groove and rib. A movable die **26** is also provided and it is adapted to move downwardly inside of the split die **24**. Movable die **26** has a tapered cylindrical portion **27** cooperable to move downwardly into engagement with the inner surface of the rib **21** when the drum is assembled in die **24** thereby assuring that the rib will present a sealing surface of uniform diameter. It also is provided with a sharp shoulder **28** which is adapted to engage the upper surface of rib **21** and a rounded or concave peripheral portion **29** which is adapted to engage the upper end of the drum body.

After the partially formed drum is disposed in the split die **24**, movable die **26** is moved downwardly in the manner shown in Fig. 7, 8 and 9. The first result is that the concave peripheral portion of the die engages the upper end of the container body as shown in Fig. 8 forming it into a rounded bead and curving the metal reinforcing chime downwardly inside the drum. As the die **26** moves further downwardly to the position shown in Fig. 9 the rounded bead **23** is completed with the fibrous material compressed into more compact form and when the adhesive sets the fibrous material in the bead is a compact, molded, cohesive unitary mass. In addition, the metal reinforcing chime is curved downwardly and inwardly so as to encase and protect the chime.

Simultaneously, with this action, the shoulder **28** of die **26** engages the upper surface of the rib and through the combined action of the shoulder and of the concave peripheral portion of the die, the groove and rib of the reinforced drum body are formed into the final shape with a right angle shoulder at the upper portion thereof and a gradually curved taper at the lower portion thereof.

The removable head or closure **17** may be made of any desired material. The illustrated head is made of sheet metal such as steel and is in the form of a central disc-like portion having concentric reinforcing ribs **30** extending therearound. Immediately surrounding the ribs **30** is a U-shaped channel **31** which is of a size and shape to project into the drum and to be spaced inwardly from rib **21**, as shown in Figs. 2, 3 and 4. Due to the shape of channel **31** it provides for a degree of resilience and for better shock resistance for the closure. Around the outside of the channel **31** is an outwardly projecting shoulder **32** which rests upon the upper surface of rib **21** forming a tight seal therewith. The peripheral portion of the closure is provided with a concave, inverted, U-shaped portion which overlaps and is spaced from the upper end of the container. The concave portion is provided with a depending apron extending downwardly around the outer surface of the drum as shown at **34** in Fig. 2.

When the upper head or closure is assembled with the drum, the horizontal sealing portion **32** engages and seals against the upper surface of rib **21** while the concave portion **33** overlaps and is spaced from the upper end of the container and U-shaped channel **31** is spaced nwardly from rib **21**.

The inner surface of the head may be coated with a protecting material or a seal made of paper, plastic, rubber or the like may be extended over the inner surface thereof in the usual manner. Where a seal made of paper, plastic, rubber or the like is employed it may be free from connection with the inner surface of the head, or it may be secured thereto by a suitable adhesive or preferably one of the new synthetic sealing or bonding agents in the manner and with the results heretofore described.

The locking rim **18** serves to releasably lock the removable head **17** in place. The rim is in the form of a split ring extending almost completely around the upper end of the container and having an inturned lip or flange **35** along its upper edge overlapping the top of the head and an inturned channel portion **36** around its lower edge for engaging with groove **20** so as to hold the assembly locked and sealed in place. The channel portion **36** is slightly larger in dimension than the flange **35** so that when the rim is assembled around the drum and tightened and locked the channel **36** will first engage in the groove **20** and thereafter the flange **35** will engage against the curved surface **33** of the head performing a camming function and forcing the head downwardly.

Pivotally connected to one end of the rim is a link **37** which is pivoted at its opposite end to locking lever **38**. The locking lever **38** is in turn pivoted to the opposite end of rim **18**. The free end of the locking lever is provided with a pair of spaced, projecting fingers **39** and with a locking detent **60** having a convex outer surface for frictionally engaging with the concave inner surface of the strap or loop **40** pressed outwardly from the surface of the locking rim **18**. The lever is provided with a recess **41** so as to permit engagement with the loop without obstruction from the end of the loop. When the lever is shifted to horizontal position so that detent **60**

engages with loop 40 there is a definite audible click indicating to the operator that the lever has been locked. The frictional engagement is such, however, that the operator can manually release the lever when desired.

When locking lever 38 is pivoted upwardly to the position shown in Fig. 5, link 37 is shifted to the right thereby expanding the diameter of the locking rim so that it can be assembled around or removed from the end of the drum. In applying the rim it is first assembled around the drum with the channel 36 projecting into groove 20. The lever 38 is then pivoted downwardly causing flange 35 to engage and overlap the head and force it downwardly to sealing position. The lower finger 39 of lever 38 is projected through loop 40 and detent 60 is engaged with the loop so as to hold the lever in horizontal position. In addition, the pivotal connections between lever 38, link 37 and the ends of the locking rim are such as to resist accidental opening. When the lever is disposed in horizontal locked position the pivotal connection 42 between the lever and the end of the rim is offset upwardly with respect to the pivotal connections 43 and 44 between the link and the rim, and the link and the lever respectively. Thus, with the end of the lever engaged with loop 40 any force tending to expand the rim only serves to lock the lever more tightly. However, by a simple manipulation, the free end of the lever may be pivoted upwardly in the manner shown in Fig. 5 to release the rim. When the rim has thus been released it can be removed from the top of the drum so as to permit the removal of the head 17. Lever 38 is preferably provided with a small loop 61 for receiving a sealing wire when the lever is in locked position. Thus, as shown in Fig. 6 the sealing wire 62 may be extended through strap 40 and loop 61 and then engaged with a metal seal 63. It will thus be seen that the drum cannot be opened without breaking the seal which will clearly indicate that someone has tampered with the rim and closure.

In Figs. 3 and 4 I have shown a modified structure in which a sealing gasket 64 is provided between the upper end of the container body and the closure. The sealing gasket is made of a resilient, compressible sealing material such as natural or synthetic rubber, neoprene, polyethylene or some other suitable plastic material. It is in the form of a cross-sectionally oval or round ring positioned in the concave portion 33 of the closure and it is secured in place in the closure by means of a suitable adhesive preferably a synthetic sealing or bonding agent. When the head is placed on the top of the container and before the rim is constricted and closed the gasket 64 serves to hold the head in elevated position as shown in Fig. 4. However, when the rim is constricted by pivoting lever 38 downwardly to horizontal position channel 36 first engages in the groove 20 and flange 35 will then engage the peripheral portion 33 of the head performing a camming function pulling the head downwardly to sealing position and compressing and sealing the gasket as shown in Fig. 3. In this connection the depending apron 34 around the outside of the closure is of lesser width than the rim 18 so that when the head is pulled downwardly to closed position the lower end of the apron does not engage with the channel portion 36 of the rim.

Referring now to the lower end of the container, it is provided with a metal reinforcing chime 45 made of sheet metal such as steel. The reinforcing chime tightly embraces the drum and extends from a point spaced a short distance from the lower end downwardly overlapping the lower end and thence inwardly around the inner surface of the drum as shown most clearly in Figs. 1 and 12. A short distance from the lower end the reinforced chime portion is provided with an external groove 46 and an internal rib 47 corresponding to groove and rib 20 and 21. Fig. 12 shows the lower end of the drum in inverted form and Fig. 1 shows the entire drum in upright position. The lower surface of the groove and rib is in the form of a sharp right angle shoulder, whereas the upper surface curves in a gradual taper or radius merging with the drum body.

The extreme lower end of the reinforced container wall is formed into an inturned rolled bead 48. The fibre material in the bead 48 is in tightly compressed, molded, cohesive, unitary form and is relatively more compact than the fibre in the main body of the container. The metal reinforcing chime extends completely around the outer surface of the bead so as to protect and encase *the* fibre and as shown most clearly in Fig. 12, the inner end of the reinforcing chime extends inwardly into the bead and is anchored therein. As in the case of the metal reinforcing chime at the upper end of the container the upper edge of the metal reinforcing chime 45 may be deformed inwardly and anchored in the fibre wall body as shown at 49. Also, the metal reinforcing chime may be secured in place by a suitable adhesive preferably a synthetic sealing or bonding agent so as to increase the strength of the assembly.

The fixed head or closure at the lower end of the container may be made of any desired material. In the form shown in Figs. 1 and 10 to 12 inclusive, the closure 16 is made of sheet metal such as steel and has a seal 50 made of paper, plastic material, rubber or the like extending across the inner surface thereof. Seal 50 may likewise be secured in place by a suitable adhesive, preferably a sealing or bonding agent which will weld the parts together in a unitary structure.

The head is in the form of a disc disposed inside the lower end of the container in engagement with the internal rib 47. It is provided with a peripheral portion 51 which extends downwardly and is rolled into the bead as shown and is frictionally and adhesively anchored therein.

In assembling the lower chime portion of the container, the metal reinforcing chime is applied as in the case of the upper end of the container by tightly extending the metal strip around the container body while it is still moist and workable and before the adhesive has set, with the lower end of the chime overlapping the lower end of the container in the manner shown in Fig. 10. Also, while the fibre is still moist and workable the external rib and groove 46 and 47 are preformed or partially formed therein in the approximate shape shown in Fig. 10 by any suitable means such as rollers. Then as shown in Figs. 10, 11 and 12 the drum is placed in inverted form into a split die 52 somewhat similar to the die 24 and having an inwardly projecting rib or flange 53 formed in the desired, finished shape of the groove and rib. Thereafter, the head 16 together with its seal or lining 50 are inserted into the open lower end of the container until they rest in engagement with the partially formed rib 47 as shown in Fig. 10. Both the head and its seal have a depending apron-like peripheral portion as shown at 54 which rests against the inner surface of the container between the rib and the open end. An adhesive, preferably a synthetic sealing or bonding agent, is applied to the contacting surfaces of the container and the apron-like peripheral portion 54 of the head.

Thereafter, a movable die 55 is inserted into the split die 52 and is moved downwardly in the manner shown in Figs. 11 and 12. The movable die 55 has a concave peripheral portion 56 which is shifted downwardly into engagement with the end of the reinforced container wall. The first effect of this movement is shown in Fig. 11. The movable die causes the reinforced container wall to fold downwardly and inwardly upon itself with the metal reinforcing chime completely surrounding the folded over wall and with the peripheral apron portion 54 of the closure disposed between the two folded over layers of the wall. Shifting of the die 55 downwardly to the position shown in Fig. 12 causes further rolling of the inturned lower end of the reinforced container wall and further compression thereof into the rolled bead 48 with the peripheral edge of the head extending into and em-

bedded in the bead, as shown, and with the inner end of the metal reinforcing chime extending inwardly into the bead—first in contact with the disc portion of the closure and then in contact with the peripheral portion thereof.

All of this molding, forming and rolling operation is performed while the fibre is still moist and workable and before the adhesive has set. The fibre is thus molded and compressed while the bead is thus rolled. After the adhesive has set, the fibre is in the form of a compressed, molded, cohesive, unitary mass which is more compact form than the fibre in the main body of the container. In addition the metal chime portion completely encases and protects the fibre in the bead and both the end of the metal reinforcing chime and the peripheral edge of the closure are rolled into the bead being embedded therein and being frictionally and adhesively secured in place. In this connection, I have found that the adhesive connection or bonding is improved by first coating the inner surface of the container between the rib and the lower end thereof with a suitable adhesive or preferably a synthetic sealing or bonding agent before inserting the closure to the position shown in Fig. 10. The inturned rolled bead **48** tightly presses against the closure and in turn presses the closure against rib **47** and that it is the metal reinforcing chime which presses against the outer surface of the closure. This provides a strong, reinforced structure with the closure tightly and permanently embedded therein. Where a sealing or bonding agent is employed the fibre seal and metal are bonded or welded into a unitary structure of greater strength with the bonding agent penetrating and impregnating the fibres. Also, as pointed out above the bonding agent prevents the formation of a condensate along the attached surface of the metal.

As previously stated, the lower closure may be made of any desired material. The closure **16** described above is made of metal. In Figs. 13 and 14 we have shown a closure made of non-metallic material and it should be understood that the closure may be made of any desired material such as fibreboard, wood, plywood, plastic, reinforced plastic, or the like. If preferred, the closure may be made of laminated layers of different material such as one or more layers of fibre laminated to one or more layers of reinforced plastic material.

Referring to Fig. 13, we have shown the inverted lower end of the drum positioned in split die **52** which is similar to the die shown in Fig. 10. A closure **57** made of a plurality of layers of non-metallic material is shown as positioned in the open lower end of the container body and resting against the rib **47**. The closure has a body portion in the form of a disc made of a plurality of layers of non-metallic material and also has a peripheral apron or flange portion **58** of reduced thickness which may be made of only one layer of non-metallic material. One or more of the layers may be made of fibre, such as kraft paper, and another of the layers may be made of a reinforced plastic, such as woven glass fibre impregnated and coated under pressure with a synthetic resin or plastic, for instance phenolic resin forming, in effect, a reinforced plastic tray. This greatly increases the strength of the closure, particularly its resistance to puncturing. The inner surface of the container between the rib and the lower end may be coated with an adhesive, preferably a synthetic sealing or bonding agent, before inserting the fibre head. Under any circumstances, the operation of securing the head in place is performed while the fibre in the container body is still moist and workable and before the adhesive has set.

When the die is brought downwardly the same sequence of events take place as shown in Figs. 11 and 12, until finally as shown in Fig. 14 the movable die **55** has been shifted all the way downwardly providing an inturned rolled bead **48**, with the peripheral edge portion **58** of the closure and the inner end of the metal reinforcing chime extending into the bead and frictionally anchored therein and bonded thereto by the synthetic sealing or bonding agent to form a unitary structure. The fibre in the bead is molded and compressed in the forming operation and after the adhesive or sealing or bonding compound has set it is in the form of a compressed, molded, cohesive, unitary mass which is relatively more compact than the fibre in the body portion of the drum. The sealing or bonding compound impregnates and permeates the fibres and bonds the closure to the body of the drum so as to provide, in effect, the welded or unitary structure. In addition, the bead is pressed downwardly against the periphery of the main portion of the closure **57** tightly engaging it and pressing it against the rib **47** and compressing it in tapered form as shown at **59**.

Our improved fibre container is used in the usual manner. It may be lined with any desired type of protective coating material. When it has been filled with the bulk material, chemicals, food products or the like, the removable closure **17** is applied thereto, the locking rim **18** assembled therearound and locking lever **38** pivoted downwardly until detent **60** is engaged with the loop **40** thereby releasably locking the assembled rim and closure in place. The cover will not now accidentally open. However, it may be readily opened by manually releasing detent **60** from engagement with loop **40** and shifting the lever upwardly so as to cause link **37** to expand the rim. In this connection, the link can shift upwardly without interference from the reinforced chime portion of the drum since it has no flanges projecting therefrom.

Our improved container is relatively simple to manufacture and is of great strength due to the metal reinforcing chimes and due to the manner in which the fibre is beaded, molded and compressed at the two ends forming a compact, molded, cohesive, unitary fibre mass encased and protected by the metal reinforcing chime and with the peripheral edge of the lower closure embedded therein. The strength is increased by the bonded connection between the parts, particularly between the metallic and non-metallic parts resulting from the use of the sealing or bonding agent. This also eliminates undesirable sweating or condensating along the bound surface of the metal.

Modifications may be made in the illustrated and described embodiments of our invention without departing from the invention as set forth in the accompanying claims.

We claim:

1. A fibre container assembly comprising: a tubular body made of convolutely wound, laminated layers of fibreboard; a metal reinforcing chime disposed around the tubular fibre body at one end thereof, said body and reinforcing metal chime being formed into an external groove and an internal shoulder extending completely around the container a short distance from the end thereof; a closure disposed in the reinforced end of the body and abutting against said internal shoulder; said tubular fibre body and said reinforcing metal chime, beyond said shoulder, being curved inwardly and formed into an inturned rolled bead rolled inwardly upon itself for more than one complete turn, the curve of said inturned bead starting substantially at said shoulder, and being continuous such that the metal reinforcing chime forms a terminal bead at the end of the container the end portion of which is substantially semi-circular in cross-section, said closure having its peripheral edge interlocked with said inturned bead, the interlocking of said edge with said inturned bead being further secured by an adhesive bonding agent within said inturned bead, the fibre material in said inturned rolled bead being in the form of a tightly-compressed, molded, cohesive, unitary mass with the metal reinforcing chime being disposed completely around the outer surface of the inturned rolled bead so as to protect and encase the fibre material therein, and said metal reinforcing chime being in engagement with the closure and extending inwardly into said inturned

rolled bead in contact with a portion of the peripheral edge of the closure.

2. The invention in accordance with claim 1 wherein said body and said closure include at least one layer of reinforced plastic material laminated between layers of the fibreboard.

3. The method of making a fibre drum assembly which comprises first, providing a tubular body made of convolutely wound adhesively laminated layers of fibreboard with the adhesive and fibre still moist and workable and with a metal reinforcing chime surrounding the body adjacent one end thereof and overlapping said end, said tubular body and said reinforcing chime being formed into an external groove and internal shoulder spaced inwardly from said end, that part of the metal reinforced tubular body outwardly of said shoulder being the bead forming portion of the body, further providing a closure having a peripheral apron adapted to be disposed in engaging relationship with the inner surface of the body immediately adjacent said end and spaced from the outer periphery of said end; applying an adhesive bonding agent to surfaces to be in engaging relationship of at least one of said inner surfaces of the tubular body and the peripheral apron of the closure, then inserting said closure into said end of the body with said closure resting upon said shoulder and with the peripheral apron disposed in engaging relationship with the inner surface of said bead forming portion of the body immediately adjacent said end, the length of said apron being not greater than one-half of the length of the bead forming portion, next while the fibre is still moist and workable folding the reinforced end of said body inwardly upon itself and over the inner surface of the apron and rolling the folded reinforced end of said body with the peripheral apron disposed therebetween inwardly under compressive force into engagement with said closure so as to provide an inturned rolled bead rolled inwardly upon itself for more than one complete turn to interlock the apron of said closure with the reinforced end of said tubular body

with the fibre material within said bead in compressed, molded, compact form and with the metal reinforcing chime encasing and protecting the fibre material in said rolled bead with closure secured within said bead by said bonding agent, with the peripheral end of the reinforcing chime anchored in the rolled bead, and with the roll of said bead starting substantailly at said shoulder and being continuous such that the metal reinforcing chime forms a terminal bead at the end of the container the end portion of which is substantially semicircular in cross-section, and finally drying the fibre and adhesive so that the fibre is formed into a compact, molded, cohesive, unitary mass.

4. The invention in accordance with claim 3 wherein said body and said closure include at least one layer of reinforced plastic material laminated between layers of the fibreboard.

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