Jan. 30, 1940. J. B. CALVA 2,188,497

CONTAINER AND METHOD OF MAKING THE SAME

Filed Sept. 24, 1936 2 Sheets-Sheet 1

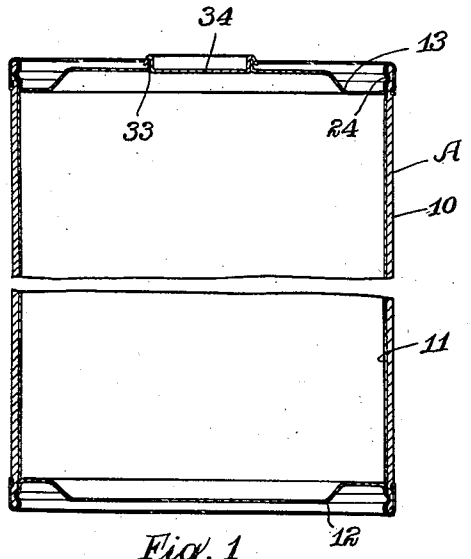

Fig. 1

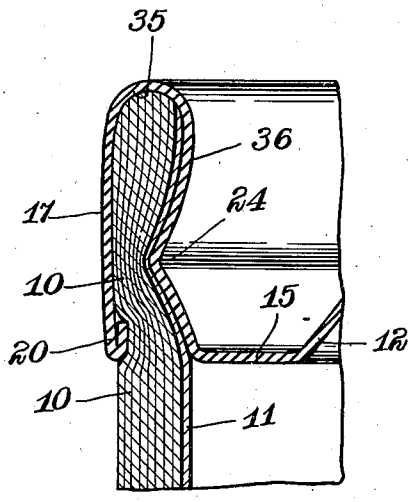

Fig. 2

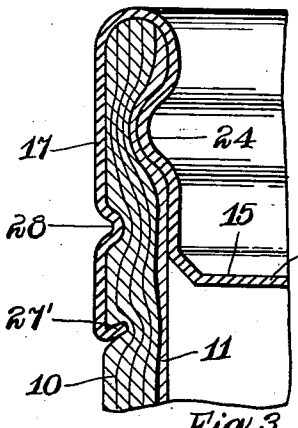

Fig. 3

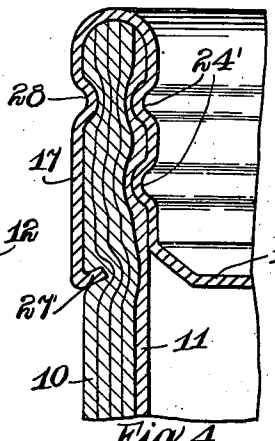

Fig. 4

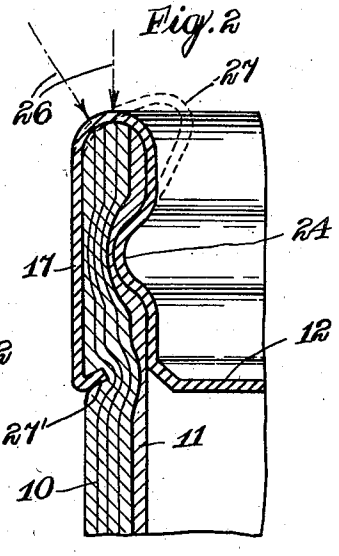

Fig. 5

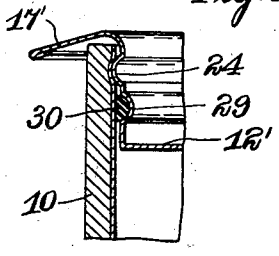

Fig. 6

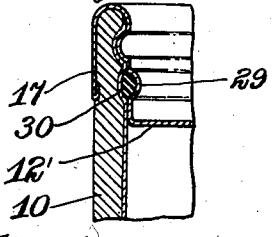

Fig. 7

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CONTAINER AND METHOD OF MAKING THE SAME

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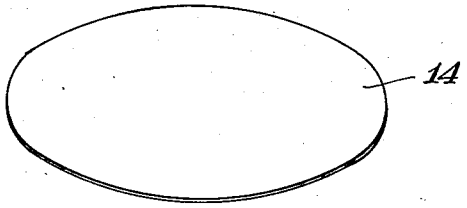

Fig. 9

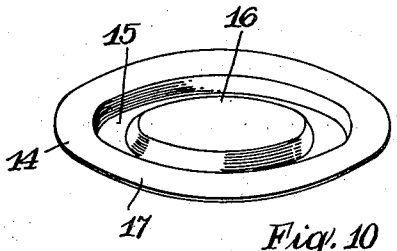

Fig. 10

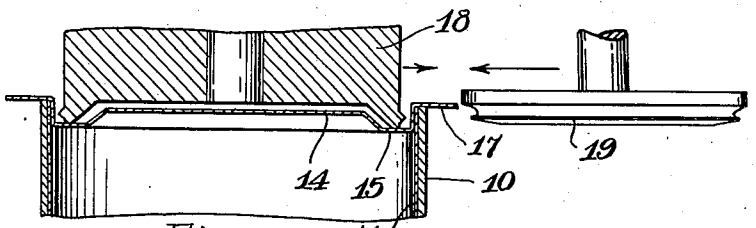

Fig. 11

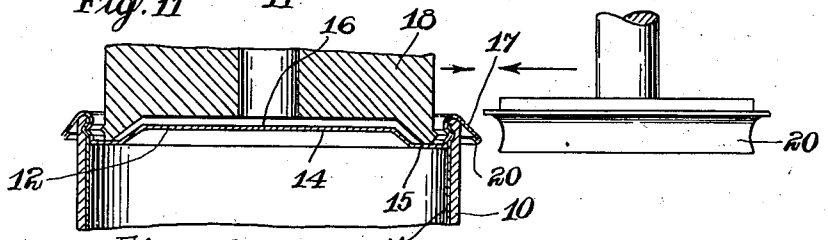

Fig. 12

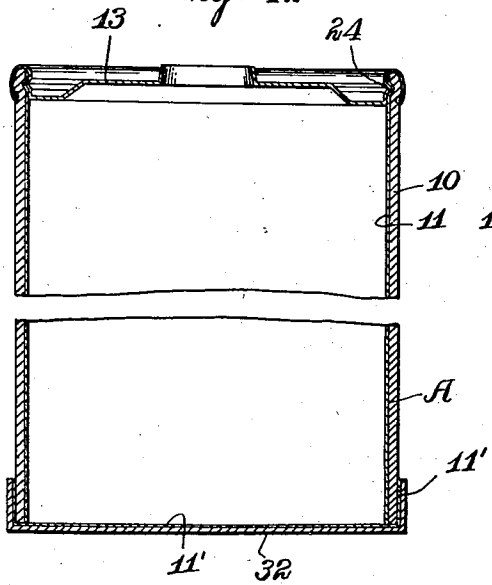

Fig. 8

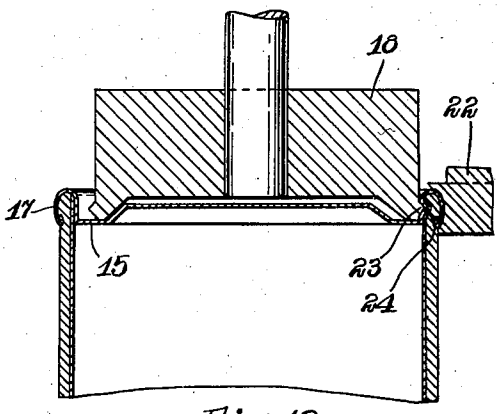

Fig. 13

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UNITED STATES PATENT OFFICE

2,188,497

CONTAINER AND METHOD OF MAKING THE SAME

Jose B. Calva, St. Paul, Minn., assignor, by mesne assignments, to Waldorf Paper Products Company, a corporation of Minnesota

Application September 24, 1936, Serial No. 102,262

3 Claims. (Cl. 229—5.5)

This invention relates to containers and the method of making the same, wherein the body of the container is made of paper or other suitable non-metallic material. The method includes the forming of the body out of paper or other suitable material, and in providing a liquid and grease-proof liner which may be spirally wound with the spiral formation of the body, and having a sealed overlap in the liner.

The liquid and grease-proof liner for these containers is made by a certain process which makes the same impervious to liquid, moisture, or oily substances. The liner has no capillary attraction for moisture or oily substances, and thus provides a non-metallic liner which seals the inner surface of the non-metallic body of the container so that the container may be used for liquids, oils, or other similar material, owing to the fact that the thin, film-like, protective liner protects the body which can be made of paper or other similar light-weight material, of an economical nature.

The ends of my container are formed of metal discs which are formed in a peculiar manner to provide a strong, durable end which is so connected to the tubular non-metallic body as to provide an absolute seal to prevent the leakage of liquid from the container. Further, the method which I employ in attaching the metallic ends to the non-metallic tubular body of my container, provides a new container construction wherein a joint between the non-metallic body and the metal ends is adapted to resist shock and to have a tendency to tighten the joint or connection between the metallic ends and the non-metallic body if a glancing blow is struck against the metal rim of the end of the container. Heretofore, in old types of containers where the body was made of non-metallic material, they were not provided with liners which were truly liquid and grease-proof. If these old types of containers were dented at the metal ends, they would leak, owing to the fact that the seal between the metal ends and the non-metallic wall of the container would be invariably broken. I have provided a method of making the container wherein the construction is designed to cause the joint to tighten rather than to give way if the edge of the metal end is struck a glancing blow, or dented.

Further, the metal ends of my container are formed with certain defined crimped creases which are positioned so as to take the strain transmitted to the edge of the container and absorb the same by permitting the edge to dent or bend if the blow is sufficiently hard, and causing a tightening of the joint by any bending action directed to the edge of the metal ends. The metal ends of my container are embossed with a central outwardly projecting portion, around which an annular inwardly extending recess is formed from around the outer edge of which a collar portion projects outwardly along the inner wall of the non-metallic body to the end of the same, and then the metal end is rounded over the end and brought down in a collar-like portion on the outside of the non-metallic body and is provided with a reinforcing bead at the edge which is pressed into the outer wall of the non-metallic body virtually in line and directly across from the edge of the annular recess on the inside of the end. After these operations have taken place in the forming of the metal ends and the securing of the same to the non-metallic body, one or more annular grooves may be crimped into the inner collar wall of the metal end, crimping the non-metallic body more tightly between the inner and outer collar portion of the end. The outer collar portion of the metal end may also be formed with crimped grooves properly positioned. The crimped grooves act to securely join the metal end to the non-metallic tubular body and also provide the means of causing the edge of the metal end to bend or buckle in a manner to tighten the grip between the metal end and the non-metallic wall of the body. This is an important function in the construction of this container which is accomplished by the method herein set forth.

In the drawings forming part of this specification:

Figure 1 is a vertical section through my complete container, showing the construction thereof, and a portion of which is broken away.

Figure 2 is an enlarged sectional view through a portion of a side wall and an attached end wall secured thereto.

Figure 3 is an enlarged sectional view of a slightly different form of construction from that illustrated in Figure 2 of the drawings.

Figure 4 is an enlarged sectional view similar to Figure 3, showing a different form of crimping.

Figure 5 is an enlarged sectional detail, showing still another form of crimping used in the making of my container.

Figure 6 is a cross-sectional view of still another form, showing the end in the process of being attached to the container.

Figure 7 illustrates a sectional detail of the container side wall and end, when finished, of the construction illustrated in Figure 6.

Figure 8 illustrates a different end form of the container.

Figure 9 illustrates a metal disc, showing the first operation in making the metal end of the container.

Figure 10 illustrates a perspective of the disc after the next operation.

Figure 11 diagrammatically illustrates the first forming of the end to the non-metallic side wall.

Figure 12 diagrammatically illustrates the second forming of the end to the paper side wall.

Figure 13 diagrammatically illustrates the final forming of the metal end to form an annular crimp in the inner collar portion of the end.

This application is a continuation in part of my application Serial No. 18,550, filed April 27, 1935, for "Container and method of making the same."

My container A may be provided with a cylindrical non-metallic wall 10 which may be formed of laminations of paper or other suitable material, and may be spirally or convolutely wrapped to form the wall 10 of the desired thickness. The wall may also be formed or cast of molded pulp or similar material as may be desired.

In carrying out the method of making this container, in making the wall 10, a suitable sheet-like liner 11 of liquid, moisture, or grease-proof material is applied in a manner to provide the liner for the cylindrical body so as to cover the wall 10 on the inside with this liner 11. The liner 11 forms a film-like member over the inside surface of the wall 10, preventing liquid or semi-solid contents of the package from impregnating or passing into or through the wall 10 of the container A.

The ends 12 and 13 of the container A are adapted to be formed of metal or similar material, and in carrying out my method in forming the container, these ends are adapted to be attached to the non-metallic or paper body which forms the wall 10 in a manner so that a positive connection is insured which is designed in a peculiar manner to reinforce the connection between the metallic ends and the non-metallic wall 10.

The first step of the process in making the ends of the container A, is to provide a disc 14 of metal. The next step resides in forming the disc 14 with a depressed recess 15 and providing a central disc-like portion 16. This provides the disc 14 with an outer flange portion 17, which in the second step of the process, extends virtually in a plane with the top of the disc portion 16.

The end 14 is then placed upon the end of the non-metallic wall 10 as illustrated in Figure 11, with the forming roller 18 projecting into the channel 15, and the next step in the method of making the container A, resides in moving the roller 19 against the outer edge of the flange 17 so as to form a reinforcing bead 20 on the edge of the flange and bending the flange down as illustrated in Figure 12.

The final step of the method of making the container A resides in rolling the flange 17 inward into the position illustrated in Figures 1 to 5, 7, 8, and 13; and at the same time the flange 17 is rolled or crimped against the outer surface of the wall 10 the completion of the crimping of the ends of the container A is accomplished when the roller 18 receives the maximum pressure from the outer finishing roller 22, thereby completing the annular locking groove means 24 in the inner wall of the collar portion of the end which overlaps and is adapted to be secured to the ends of the cylindrical wall 10. This locking groove 24 accomplishes the liquid-proof seal and shock absorbing means.

It will be apparent that the reinforcing bead 20 will be forced into the side wall 10 as illustrated in the enlarged section of Figure 2, and that this reinforcing bead 20 is virtually in line with the depth of the channel 15. It will also be apparent that the groove portion 24 projects toward the flange 17, pinching the side wall 10 between the flange 17 and the groove 24.

The groove 24 provides a means of reinforcing the ends of the container at the joint with the paper or non-metallic side wall 10 so that any force, such as a blow, struck against the edge of the container as indicated by the arrow 26 in Figure 5, will cause the edge to bend inwardly as illustrated in dotted outline at 27, causing the groove 24 to more tightly engage into the side wall 10 and thus prevent any loosening of either the end 12 or 13 from the non-metallic side wall 10 of the container A. Each of the ends 12 and 13 are adapted to be attached to the ends of the non-metallic side wall 10 in a similar manner by the method hereinbefore set forth, wherein the outer flange 17 is rolled down and crimped into the outside of the side wall, whereas, a groove 24 is formed on the inside of the collar-like end portion of the ends 12 and 13. It will therefore be understood when the crimping or grooving is described, that it may be applied to either the end 12 or 13.

The bead 20 grips into the side wall 10. A hook-like flange 27 may be formed on the outer edge of the flange 17 instead of the bead 20. The hook-like flange 27 is adapted to be pressed into the side wall 10 so as to grip firmly into the same. The beaded end 20 as well as the flange 27 are adapted to engage into the side wall 10 so that any strain such as described by the force in the direction of the arrows 26 in Figure 5, will not loosen the grip of the bead 20 or the flange 27. Thus a blow of this character if sufficiently severe will bend the edge of the end of the container as illustrated in dotted outline at 27. Therefore, it will be apparent that with this construction, it is virtually impossible to loosen the grip between the ends 12 or 13 and the non-metallic side wall 10 of the container A. A further development of the form of securing the ends 12 or 13 of my container is illustrated by the inner grooves 24' and the outer groove 28, as illustrated in Figure 4. Further, the position of the outer groove 28 may be varied as illustrated in Figure 3.

The positioning of the groove 24 on the side of the end 12 and the outer groove 28 on the outside below the point of grooving 24 on the inside, illustrates the manner in which the side wall 10 may be gripped. In this form, the larger groove 24 on the inside presses into the side wall from the inside, while the outside flange 17 is provided with an inwardly extending annular groove 28 which presses toward the inside of the collar end formed in the ends 12 and 13, and further, in this form, the hook-like flange 27 grips the non-metallic wall 10 below the depth of the channel 15. In this construction it will be apparent that whether the blow be from the inside of the collar end of the flange of the end 12, or from the outside, it will not loosen the grip of the metallic end with the non-metallic wall 10, but will tighten the same. In the construction of the grooving illustrated in Figure 4, the gripping of the non-metallic wall 10 between the grooves 24' and the outer annular groove 28 and the hook flange 27, an equally strong structure is provided wherein any denting, bending, or undue strain on the edges of the metallic ends 12 or 13, will be absorbed in the grooves, permitting the collar-like projecting flange of the ends which wraps about

the non-metallic wall to bend or flex sufficiently to prevent loosening of the ends 12 or 13 from the non-metallic wall 10. This is extremely important in sealing the containers A so as to hold the contents without leaking, whether it be liquid, of an oil nature, or other material which is adapted to be held within the container A. It is important that the grooves be so formed in the collar-like ends of the end portions of the container so as to properly grip the non-metallic wall 10 and resist any strain or shock directed against the same, without loosening the seal.

In Figures 6 and 7, I have illustrated another form of the container, wherein the end portion 12' is adapted to be formed with an annular groove 29 in which an annular gasket 30 is laid, and then the end 12' is adapted to be secured by bending the flange 18' down over the outside wall 10 of the container, whereupon the gasket 30 which may be of any suitable material and preferably of a resilient material, will press into the wall 10 and provide a resilient seal between the wall 10 and the metal end 12'.

In Figure 8 I have illustrated another form of the container A' wherein the side wall 10 is made of paper or other non-metallic material, and a liquid, oil, or grease-proof liner 11 is provided. One end of this container is closed by a metallic end, such as 13, whereas the other end of the container is adapted to be closed by a cap-like portion 11' of the same material as the liner 11 is made, and this liquid and grease-proof liner 11' is protected by a metallic friction or screw cap 32 which engages over the portion of the liner 11' which projects over the end of the side wall 10 and down the outer side of the same. The friction or screw cap 32 may be forced onto the end of the body formed by the wall 10 when the liner portion 11' is stretched over the end so as to secure the friction or screw cap 32 rigidly in place and to provide a means of sealing the end of the container A in a simple manner. For some forms of containers, this end sealing is sufficient. It will be apparent that in this form of the container, the liquid and grease-proof liner portion 11' which closes the end of the container, projects in a film over the end and along the outside of the wall 10, thereby providing a sealing means having a non-capillary attraction for liquids, oils, or greases.

The method includes the making of a container of the character set forth, having primarily the feature of providing a liner having no affinity to capillary attraction of liquids, oils, greases, or semi-solid materials, and in providing a seal for the ends of the same to pinch the liner film tightly in place to positively seal the ends of the container.

While there have been containers made heretofore wherein it was the desire of the maker to provide a liner which was liquid and oil-proof, I have found by tests, that these containers were not provided with liners which would accomplish this result, but would break down in use long before the expected ordinary life of a container. These old forms were not liquid and oil-proof. Without such liners, containers made of non-metallic material are impractical. Further, none of these old forms of containers had ends sealed by a peculiar form of grooving which would absorb the shock and therefore they would leak upon the slightest bit of strain or force against the edges of the same.

The end 13 of the container A may be provided with a central hole 33 which may be closed by a cap 34 as illustrated in Figure 1. Each of the ends 12 and 13 are formed with the annular channels 15 which space the central raised disc-like portion 16 from the outer peripheral flange 17. The central disc-like portion provides a stiffening and reinforcing portion in the ends 12 and 13 and also provides a means of absorbing a portion of any shock directed to the outer edge of the channel formed by bending the flange 17 over the outer wall of the container. This channel 35 formed in this manner is adapted to receive the end of the non-metallic body to pinch or squeeze the same tightly between the outer side 17 and the inner side 36 of the channel 35, as illustrated in Figure 2.

I have overcome all of these former objectionable features and have been able to make and put into extensive use my containers for lubricating oil, greases, and other liquids and semi-solids, thereby providing an inexpensive yet durable and more practical oil can and liquid container for various uses without undue waste of metal and cutting down a large amount of weight in the shipment of any containers. Extensive tests have failed to develop a breaking down of my liquid, oil, and grease-proof lined containers, and it appears that my containers will stand up indefinitely under ordinary use.

In accordance with the patent statutes, I have described my container and the method of making the same. The illustrations show a form of carrying out the method, and it is apparent that variations may be made by those skilled in the art without departing from the spirit of the invention.

I claim:

1. A container including a fibrous side wall end portion, a metallic end wall for said container, said end wall including a peripheral channel enclosing the end of the side wall portion, a groove constituting a resisting abutment under shock in the inner wall of the channel extending into said side wall portion, and integral binding means on the edge of the outer wall of said channel engageable into said side wall portion, said means so located as to bind the side wall against the inner wall of the channel below the aforesaid groove.

2. A container including a fibrous side wall end portion, a metallic end wall for said container, said end wall including a peripheral channel enclosing the end of the side wall portion, a groove constituting a resisting abutment under shock in the inner wall of the channel extending into said side wall portion, and integral binding means reinforcing the channel edge and resisting deformation thereof anchoring said channel to said side wall portion, said means so located as to bind the side wall against the inner wall of the channel below the aforesaid groove.

3. A container including a fibrous side wall end portion, a metallic end wall for said container, said end wall including a peripheral channel enclosing the end of the side wall portion, a groove constituting a resisting abutment under shock in the inner wall of the channel extending into said side wall portion, and a flanged integral edge on the outer wall of said channel engageable against said side wall portion, said flanged edge so located as to bind the side wall against the inner wall of the channel below the aforesaid groove.

JOSE B. CALVA.