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D. G. MAGILL

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METHOD OF SEALING FIBER CANS

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Fig. 1

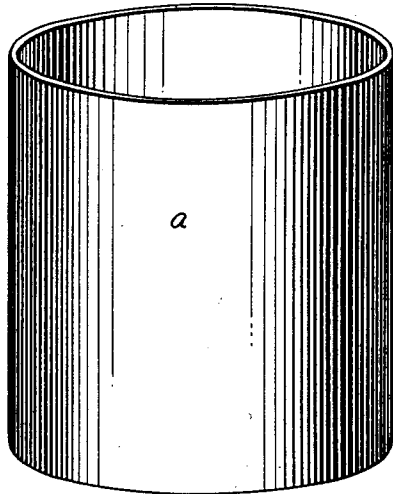


Fig. 3

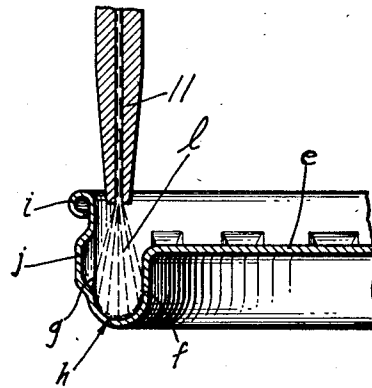


Fig. 2

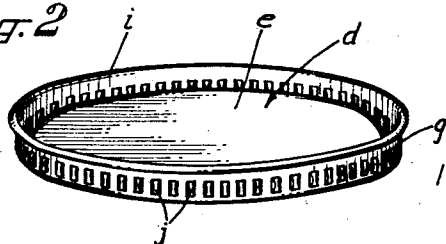


Fig. 4

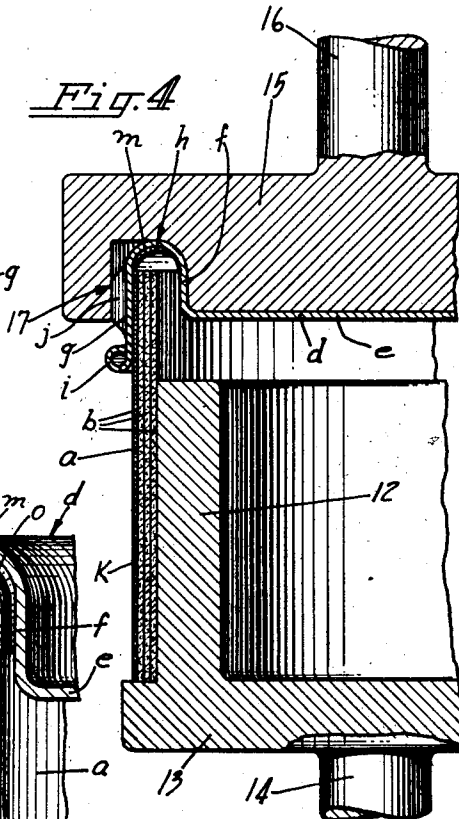
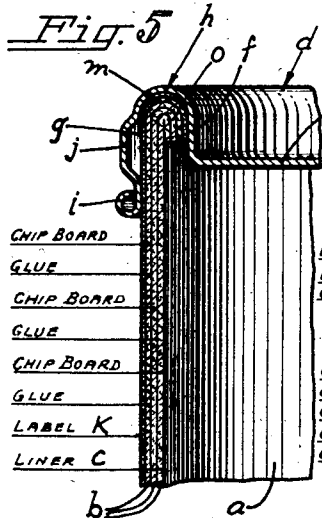
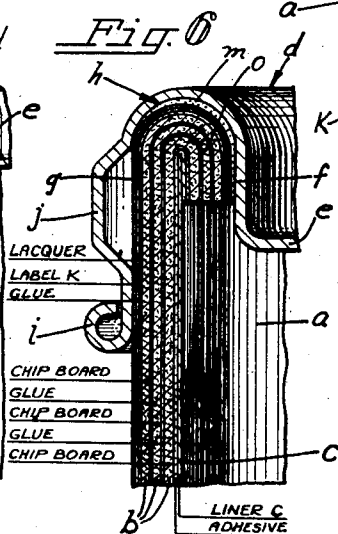


Fig. 5



CHIP BOARD
GLUE
CHIP BOARD
GLUE
CHIP BOARD
GLUE
LABEL K
LINER C

Fig. 6



LACQUER
LABEL K
GLUE
CHIP BOARD
GLUE
CHIP BOARD
GLUE
CHIP BOARD

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METHOD OF SEALING FIBER CANS

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3 Claims. (Cl. 93—55.1)

The present invention relates to containers or cans formed of fiber bodies and metal ends and has particular reference to a method of sealing such a can by a particular application of its cover.

Heretofore baking powder, dry chemicals and other products usually affected by moisture have been packed in moisture proof fiber containers with friction type closures. Such a closure consists of a metal ring and metal plug. The present invention makes it possible to eliminate the complicated and expensive structure of such a friction closure and at the same time produces a wider opening with a much simpler form of closure element.

The invention contemplates partially reforming all of that part of the fiber can body which is enclosed in the can cover so that a tighter joint is obtained, such a reforming action being a part of the sealing operation and is brought about by the manner of applying a cover having certain characteristics.

An object of the present invention is the provision of a method of sealing fiber cans having one or more metal can ends in which the metal end is utilized to reform a portion of the fiber body wall in order to effect a tighter seal.

Another object of the invention is the provision of such a sealing method for making a tight joint between the can body and its cover by rotating one relative to the other during application of the cover to the body so that the body wall is partially spun inwardly to fill the grooved space of the cover by the combination of an endwise thrust pressure and rotary movement.

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

Referring to the drawing:

Figure 1 is a perspective view of a fiber can body, one end of the body being adapted to be sealed by the steps of the present invention;

Fig. 2 is a perspective view of a metal cover for closing the end of such a body;

Fig. 3 is an enlarged schematic sectional view of a part of the can cover showing the distribution of a sealing compound or gasket into the groove of such a cover;

Fig. 4 is an enlarged sectional view of a can body and a can cover in assembled position preparatory to forming the sealed joint, the view also showing the supporting and rotating parts of a mechanism for performing the sealing operation;

Fig. 5 is an enlarged sectional view of a part of a sealed container showing the reformed can body in sealed position in the can cover; and

Fig. 6 is a greatly enlarged detail of the sealed joint.

The fiber can body illustrated in Fig. 1 and designated by the letter *a* may be of the laminated or spirally wound type and as such may consist of a plurality of layers *b* (Figs. 5 and 6) of chipboard or other fibrous sheet material and held together in the usual manner by a suitable adhesive or glue. Such a body is cylindrical and its body wall is straight particularly at the ends. The body also preferably has an inner moisture-proof liner *c* which may be glassine or other suitable material which is secured to the inner body wall by a suitable moisture-proof adhesive.

It should be understood that for best results the fiber can body web material from which the can body is made will contain one or more moisture-proofing elements. Such moisture-proofing operations may be of a kind usually practiced in the manufacture of various types of moisture-proof containers and moisture-proofing of this nature will have been performed on the chipboard or other fibrous sheet material prior to its being wound into the can body form hereinafter more fully described.

A metal cover *d*, as illustrated in Fig. 2, comprises a central countersunk panel section *e* merging into one of a pair of spaced peripheral walls *f* and *g* which form a sealing groove *h*. The outer wall *g* may be curled at *i* and this wall may also be pressed out at intervals to provide a knurled surface *j*. A laminated fiber body wall is preferably surrounded on the outside by a moisture-proofed lacquered or varnished label *k* (Figures 4 and 5). This label may be applied to the can body in the usual manner and constitutes a part of the tubular body structure *a*.

The first step incident to the sealing of one end of the fiber body *a* has to do with placing a gasket material into the groove *h* of the cover *d*. This step is illustrated in Fig. 3 wherein is shown a nozzle *l* of a suitable lining machine which is disposed to project a stream of the gasket material designated by the letter *l* into the groove *h* of the cover *d* during relative rotation of cover and nozzle. This is the usual form of lining apparatus employed in can manufacture and after the gasket material has been projected into the entire annular cover groove *h* the same is dried to provide a lining material *m* (Fig. 4). This lining material may be one of a number of compounds and for the present purpose of providing a tight joint between the can body and the cover, molten wax has been found satisfactory.

After the gasket film *m* has been provided the cover is in condition to be applied to the can body. Figure 4 illustrates sufficient apparatus for performing this applying operation. As illustrated in the figure, the can body *a* is positioned over a supporting sleeve *12* of a holder

member 13 which is preferably mounted on the upper end of a shaft 14. Such a holder member may be stationary and act as a fixed support as the can cover is applied to the can body.

The lined cover *d* is inverted and positioned within a lining head 15 (Fig. 4) which is preferably formed on the lower end of a rotatable spindle 16. The head 15 is provided with an annular groove 17 in which the spaced annular walls *f* and *g* of the knurled cover *d* are adapted to be held. Preferably the head 15 is mounted in axial alignment with and above the support member 13 and is spaced from the latter a sufficient distance to permit placing of the can body over the support sleeve 12 and the positioning of the can cover within the head 15.

The two members 13 and 15 are then moved toward one another while maintaining their alignment so that the knurled edge *j* of the can end engages over the outer wall of the can body as the latter rests on its support. The head 15 is then preferably lowered during rotation thereof until the cover and body assume the position illustrated in Fig. 4.

Further downward movement of the head with its cover during rotation of the same thereon spins the upper end of the body inwardly and downwardly as the terminal edge scrapes along and follows the contour of the inner wall of the groove *h*. During this time a portion of the sealing or gasket material *m* is squeezed around in front of the moving body wall and at the same time reforming of the body takes place as the gasket material acts as a lubricating agent. This combined downward pressure and rotation of the cover relative to the held can body continues until the upper edge of the can body is bent inwardly into the hemmed shape *o* as illustrated in Fig. 5.

This hemmed shape of can body completely fills the groove and the gasket material remaining in the groove together with that which has been carried along with the edge of the can body acts to provide a tighter seal for the joint.

The head 15 thereupon is lifted from the assembled can body and cover and the body is then removed from its held position upon the support 13. It will be evident that the support member 13 may be rotated instead of the head 15, should this be desirable. It is not necessary to lower the head 15 to provide the required longitudinal pressure to effect the seal but the same results may be obtained by raising the support member 13. The necessary features to effect such a sealing are the combined pressure and rotation between the can body and its cover.

By reason of the outside lacquer or moisture-proofed label which tightly engages the outer annular wall *g* of the can cover when the parts are in sealed position, moisture cannot seep through the formed joint. This provides a moisture-proofed air-tight closure for one end of the can body.

After the can cover has been assembled to the body and the curling operation completed, as illustrated in Fig. 5, the wax solidifies and the can with its cover but without a bottom is ready for shipment to the company utilizing such a can for packing a product. The can body with its attached cover is then filled through the open bottom, after which the bottom may be crimped or sealed on in any suitable manner. By arranging such a joint for one end of the can body it will be evident that the seal which is

formed at this end of the can body and which will subsequently be used as the top of the filled and sealed container, has not been disturbed after sealing until the container is to be opened by the ultimate consumer of the contents of the can.

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

I claim:

1. The method of forming a tight seal between a cylindrical fiber can body and a metal can cover, which comprises providing a cylindrical fiber body having a straight wall at its open end, providing a metal can cover having an annular peripheral groove, depositing a gasket material having lubricating and sealing qualities on one of said members so that the edge of said straight body wall and the bottom wall of said cover groove confine the gasket material therebetween when body and cover are assembled, and forcing the body and cover together while effecting rotation between the parts to reshape and curl the said straight end of the body by spinning engagement with the wall of said cover groove while utilizing said gasket material for lubrication and sealing.

2. The method of forming a tight seal between a cylindrical fiber can body and a metal can cover, which comprises providing a cylindrical fiber body having a straight wall at its open end, providing a metal can cover having an annular peripheral groove, depositing a gasket material having lubricating and sealing qualities in the annular groove of said can cover, assembling said body and cover members by inserting the can body wall into the groove of said cover, and supporting the said body and the said cover while moving them together and while rotating one of them relative to the other to spin the said straight body wall inwardly along the wall of the said cover groove while doubling back and reshaping the end of such body wall the said gasket material acting as a lubricant during reshaping of the body and as a sealing medium after the reshaping operation is completed.

3. The method of forming a tight seal between a cylindrical fiber can body and a metal can cover, which comprises providing a cylindrical fiber body having a straight wall at its open end, providing a metal can cover having an annular peripheral groove, depositing a gasket material having lubricating and sealing qualities in the annular groove of said can cover, supporting said can body along its lower edge and in vertical position, supporting said cover in inverted position and applied to the straight unsupported edge of the body, forcing said can cover down over the body, and rotating said cover during its downward travel to cause the confined can body edge to move along the wall of said gasket lined groove and to be bent inwardly while wiping some of the gasket material ahead of the body edge as a lubricant so that the reshaped end of the body fills said cover groove in a tight seal.

DONALD G. MAGILL.