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C. W. STEWART

2,074,348

METHOD OF TREATING FIBER CAN PARTS

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Fig. 1

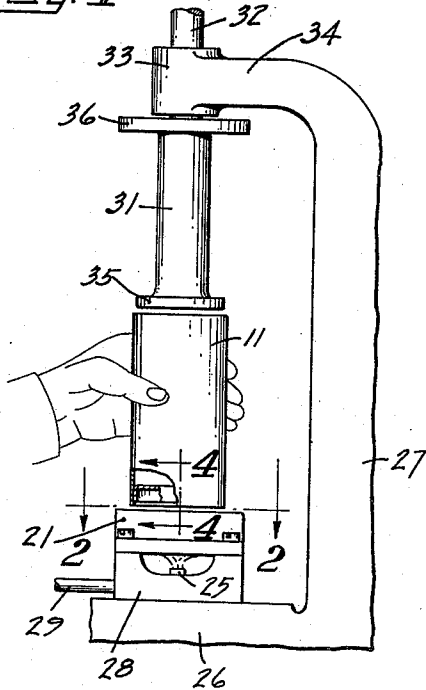


Fig. 2

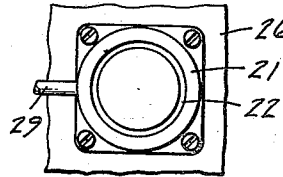


Fig. 3

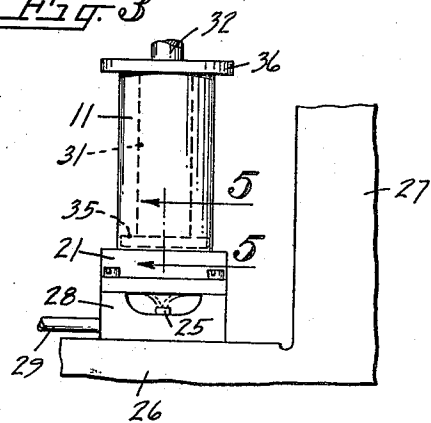


Fig. 4

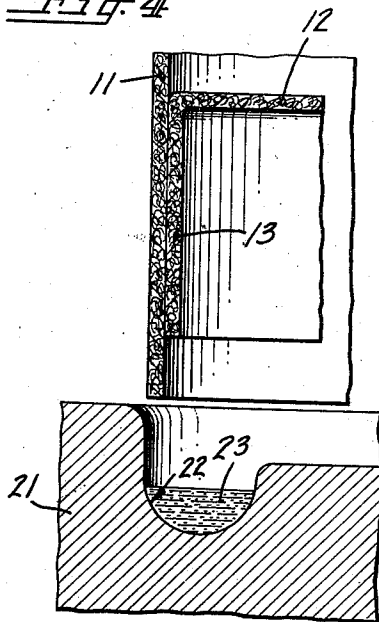
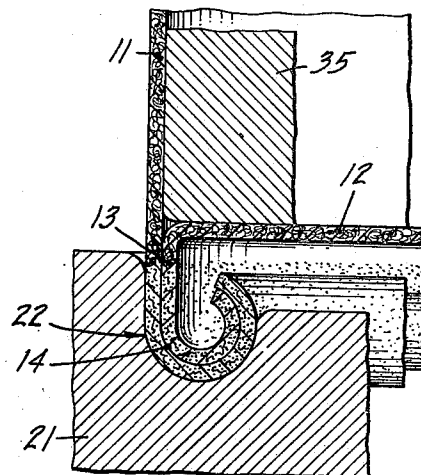


Fig. 5



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METHOD OF TREATING FIBER CAN PARTS

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10 Claims. (Cl. 93—36.5)

The present invention relates to a method of treating fiber can or container parts and is particularly directed to producing rigidity in the can part and resistance of its fiber to absorption of moisture by coating or at least partially impregnating the fiber with a liquid proofing solution while forming the part into permanent shape.

The invention is particularly adapted for the treatment of fiber container parts such as end seams, curled edges or the like. In some instances a fiber container having untreated fiber ends such as containers sometimes used for scouring powder and other products has been found to be unsatisfactory. When inadvertently or otherwise placed in damp or wet places the moisture is quickly absorbed by the fiber end seam which softens and oftentimes breaks down rendering the container unserviceable as such.

It is an object, therefore, of the present invention to provide in a series of method steps a container having a part or parts coated or partially impregnated with a suitable stiffening and liquid proofing material which is applied in a liquid or molten state and the container part shaped into form in a heated forming device such as a die while the material is still in a liquid or molten condition.

Another object is the provision of such a method whereby two operations, namely a forming and coating or proofing operation may be performed simultaneously or in rapid succession thereby saving considerable time, labor and material.

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 side elevation of one form of apparatus including a die for carrying out the method steps of the instant invention, the view showing a container in position over the die prior to liquid proofing and shaping;

Fig. 2 is a top plan of the die as viewed substantially along a plane indicated by the line 2—2 in Fig. 1;

Fig. 3 is a view similar to Fig. 1 showing the parts of the apparatus in a different position and the container inserted into the die;

Fig. 4 is an enlarged sectional view of one corner of the lower end of the container and bottom end closure and a corner of the die prior to bringing them together, the view being taken substantially along the line 4—4 in Fig. 1; and

Fig. 5 is an enlarged sectional view similar to Fig. 4 showing the container inserted into the die, the view being taken substantially along the line 5—5 in Fig. 3.

To illustrate a preferred adaptation to a con-

tainer of the treatment effected by the method steps of the invention there is illustrated in the drawing a conventional type of container having a cylindrical or other form of tubular body 11. The body is suitably assembled with a properly positioned unsecured closed bottom 12 having a depending flange wall 13 which fits closely against the interior surface of the body wall. During the treatment or proofing the bottom 12 is preferably secured in place by interfolding or curling the lower marginal portion of the body wall with the adjacent flange wall 13 of the bottom so as to form a seam or holding curl 14 as illustrated in Fig. 5 which serves as a base on which to rest the container. It is this bottom curl or joint which is preferably reinforced and liquid proofed by the method steps of the invention.

Such a container as described above is subjected to a series of forming and proofing operations which may be carried out by a die mechanism the principal parts of a preferred form of which are shown in the drawing. This die mechanism comprises in part a lower curling die 21 having a curling recess 22 formed in its top for forming the container curl 14 when the container and its bottom end are inserted into it as will be hereinafter explained and for holding a given quantity of stiffening and liquid proofing material 23 such as sulphur, wax or resin, or a combination of some or all of these.

The die 21 is heated and maintained at a temperature high enough to hold the liquid proofing material in a molten state. This temperature obviously depends upon the material used and for the materials mentioned above will range between 230 degrees Fahrenheit and 460 degrees Fahrenheit or in other words above the melting point of the material. This temperature is maintained by a heating element 25 which is secured to the bottom of the die and which in turn is carried on a bed 26 of a suitable frame 27.

The heating element may be any suitable commercial gas or electric or other device for imparting sufficient heat to the die. An exemplary form shown in Figs. 1 and 3 of the drawing comprises a burner 28 which is secured to one end of a pipe 29 which leads to any suitable source of combustible gas.

A container to be treated is vertically positioned, by any suitable means, over the top of the die with the lower marginal edge of the body 11 directly over the top of the recess 22 containing the molten liquid proofing material 23. A vertical plunger 31 (Fig. 1) is now moved down into the open container to support and back up the bottom 12. This plunger is formed on the lower end of a vertical rod 32 which is carried in a bearing 33 formed in an arm 34 of the frame 27.

The lower end of the plunger is provided with

an enlarged head 35 adapted to enter the container body 11 and engage against the inner surface of the bottom 12 and form a solid backing therefor when the plunger is fully seated in the body (Fig. 5). Above the head 35 the plunger is formed with a disc 36 larger than the horizontal cross section of the body and which seats against its upper edge (Fig. 3) when the head engages the bottom. This disc pushes the body down into the die recess as the plunger continues to descend.

The lower marginal edge of body wall 11 entering the die recess is first immersed into the molten liquid proofing material 23, the edge and side walls being thoroughly coated or partially impregnated with the material. Continued downward movement of the plunger forces the bottom edge of the body wall around the curved bottom wall of the recess, curling the body wall inwardly into an annular curl.

As the curling proceeds the flange wall 13 of the container bottom 12, prevented from moving upward by the plunger head 35, is carried down with the body wall into the molten material. Its edge and side walls are also coated or partially impregnated with the material, and caused to curl around with the body wall. It is this simultaneous coating, impregnating and curling action which forms the curl 14 shown in Fig. 5 and briefly mentioned above, the finished curl holding the bottom 12 securely in place within the body wall 11, and spacing it away from the extreme bottom edge so that moisture or water can not ordinarily reach the untreated horizontal bottom part 12.

The plunger 31 is now raised and the container is removed from the die. The coated-impregnated and curled end container is now placed in a suitable cool air blast (not shown) or simply permitted to remain in the atmosphere to cool and dry the molten liquid proofing material on the curl. This step of the treatment sets or hardens the liquid proofing material in the fiber walls causing them to become stiff and rigid. Thus the treatment of the container effects a rigid reinforcement at its bottom edge on which it can readily be rested. At the same time this treatment renders the curl hard and liquid proof so that the container may be set down in wet places without affecting it.

While the preferred form of apparatus carries out the container end immersing step and its curling or shaping step simultaneously, it should be understood that these steps can just as readily be separate independent steps following each other in quick succession, the container first being immersed into the molten material which may be contained in a separate reservoir and secondly while the material on the container is still molten or wet, placing it in a heated die and forming it into shape.

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 producing a fiberboard liquid

proof reinforced container, which comprises immersing the partially formed fiberboard container in a liquid proofing material, and simultaneously shaping the impregnated fiberboard while it is immersed in said material.

2. The method of producing a fiberboard liquid proof reinforced container, which comprises immersing the partially formed fiberboard container in a molten liquid proofing material, and simultaneously shaping the impregnated fiberboard while it is immersed in said molten material.

3. The method of producing a fiberboard liquid proof reinforced container, which comprises, immersing the partially formed fiberboard container into a die member containing a molten liquid proofing material, and simultaneously shaping the fiberboard in said liquid containing die member.

4. The method of producing a fiberboard liquid proof reinforced container, which comprises, immersing a portion of a preformed fiberboard container into a die member containing a molten liquid proofing material, and curling the immersed fiberboard by means of said die member while the fiberboard is immersed therein.

5. The method of producing a fiberboard liquid proof reinforced container, which comprises, shaping the impregnated fiberboard while it is immersed in a heated forming die containing a molten liquid proofing material, and then cooling the formed fiberboard to render it rigid and liquid proof.

6. The method of producing a fiberboard liquid proof reinforced container, which comprises immersing preformed assembled fiberboard container parts into a heated forming die member containing a molten liquid proofing material, and joining the immersed parts by relative movement between the same and said die member while the parts are immersed therein.

7. The method of producing a fiberboard liquid proof reinforced container, which comprises immersing an assembled preformed container body and a preformed bottom end into a forming die member containing a molten liquid proofing material, and joining said bottom end with said container body by means of said die member while they are immersed in said liquid proofing material.

8. The method of producing a fiberboard liquid proof reinforced container, which comprises substantially impregnating the fiberboard with sulphur, and shaping the impregnated fiberboard while it is immersed in a forming die member containing the sulphur.

9. The method of producing a fiberboard liquid proof reinforced container, which comprises immersing an assembled preformed container body and a preformed bottom end into a forming die member containing a liquid resin, and simultaneously joining said bottom end with said container body by relative movement between the latter and said forming die.

10. The method of producing a fiberboard liquid proof reinforced container, which comprises immersing an assembled preformed container body and a preformed bottom end into a forming die member containing a liquid wax coating material, and simultaneously joining said bottom end with said container body by relative movement between the latter and said forming die.

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