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METHOD OF TREATING FIBROUS MATERIAL

Filed June 23, 1933

Fig. 1

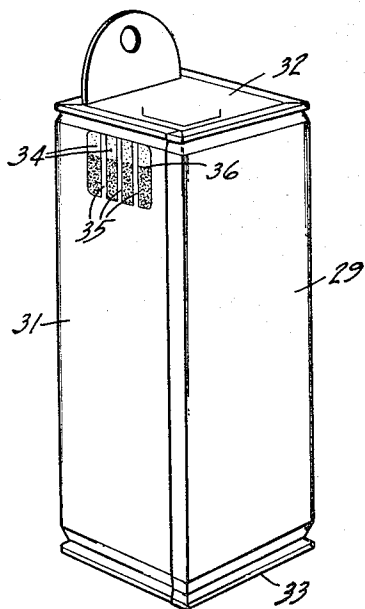


Fig. 2

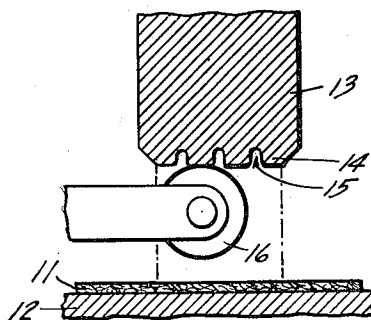


Fig. 3

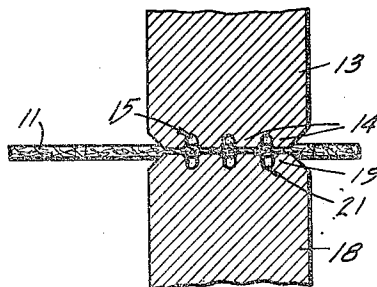
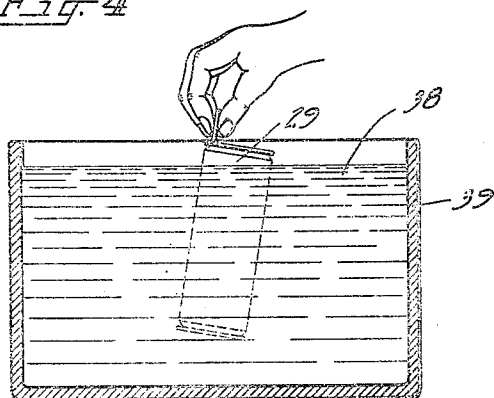


Fig. 4



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METHOD OF TREATING FIBROUS MATERIAL

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2 Claims. (Cl. 91-68)

The present invention relates in the main to treating fibrous sheet material to render sections more or less transparent, and while it has more particular reference to the creation of windows for containers such as are used for the packaging of milk and similar liquids, it will be apparent that its several features have other valuable applications and uses.

The invention has for its object broadly the transforming of portions of a fibrous sheet, which is more or less opaque, into transparent or translucent sections, this transformation being the result of a thinning of the fibrous wall by pressure together with the simultaneous forcing of a penetrating liquid such as oil, glycerin or the like into the thinned areas.

The invention also contemplates the forming of windows for the walls of milk or other liquid containers so that the cream line may be discernible through the window.

One object of the invention, therefore, is the making of such transparent sections in the blank sheet which is subsequently formed into and treated for such liquid containers.

To heighten the effect of observation through such windows the invention also contemplates the formation of a composite window in a fibrous sheet wherein transparent thinned areas in each window are separated and set off by intermediate opaque and unthinned sections, the application of the thinning pressures and the application of the penetrating liquid for forming the window sections being a matter of location within the sheet wall, these intermediate opaque sections contrasting with the thinned surfaces and aiding in observance of substances through the window by reason of this contrast. This is particularly noticeable in viewing, through such a composite window, such substances as milk on which the cream appears.

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 container which has been provided with transparent windows produced according to the method steps of the present invention;

Fig. 2 is a schematic cross section through a pressure member shown in position above the sheet of fibrous material, the view also illustrating application of a penetrating liquid to the pressure surfaces of the pressure member;

Fig. 3 is a view similar to Fig. 2 but illustrating the use of a pair of cooperating pressure members in the closed or pressure position in the sheet thinning and liquid impregnating operations; and

Fig. 4 is a schematic view illustrating the step of moisture proofing a windowed container made from a sheet of fibrous material.

The drawing in addition to showing method steps for producing transparent or translucent window sections in a sheet of fibrous material according to the present invention also discloses a fully formed liquid container with such transparent sections.

In producing such a windowed container a sheet of fibrous material 11 is provided as the blank from which such a container is subsequently formed.

The sheet blank 11 may first be placed upon a flat table 12 and beneath a pressure die member 13. This die is shown as adapted to produce a composite window and is preferably formed on its lower face with projecting parts 14 which are set off by transverse grooves 15, the lower face of the parts 14 being the required size and shape desired in the window panels to be produced. A flat, ungrooved die member would be used for a single or simple window.

A suitable penetrating liquid such as oil or glycerin is preferably next applied to the lower surface of the projecting parts 14 in any suitable manner as by means of a roller 16 as illustrated in Fig. 2.

The sheet blank 11 is then engaged by the die member 13 which is moved downwardly as the blank rests upon the table 12. In this movement the projecting surfaces 14 are pressed into the upper surface of the sheet and the latter is compressed and thinned in those sections of the sheet which are engaged between the parts 14 and the table, the intermediate grooves 15 giving freedom from pressure as to those parts of the blank at that place.

Instead of placing the blank 11 on a flat surface after the penetrating liquid is applied to the lower face of the pressure member 13 such as sheet may be positioned between a pair of cooperating pressure members which clamp on it from top and bottom as illustrated in Fig. 3. In this case the lower pressure member 18 is provided with projections 19 formed on its upper face and in vertical alignment with the projections 14 of the member 13. The upper face of the member 18 will match the face of member 13 and for the composite construction shown will also be formed

with grooves 21 which set off the projecting surfaces.

The penetrating liquid may be suitably applied to either one or both of the pressure faces of the members and these members are then brought closer together with the blank 11 clamped between as shown. The thinned sections of the sheet or blank in this case are located along the horizontal center, both surfaces of the blank being pressed inwardly to provide the thinned sections.

The thinned blank 11 may then be suitably shaped or formed and glued in the usual manner to produce a container or box 29 having side walls 31 (Fig. 1) the thinned section being located adjacent a top end 32 the other end having a suitable bottom 33. The composite window in a side wall 31 of the container and produced by the thinning and liquid penetrating step described is composed of transparent panels 34 between which unthinned opaque mullions 35 set off and separate the window panels.

These mullions 35 being of the same thickness as the rest of the wall 31 and also being untreated present the same opaque surface as the rest of the container wall and give a better visual effect to substances viewed through the windows. Where the container is a liquid container holding, for example, milk, the cream line (designated by the numeral 36) appears more distinct by reason of this contrast of surfaces.

Where the container 29 is used for liquids it may be suitably treated with a moisture-proofing material such as paraffine and this may be applied both inside and outside if desired. The paraffine may be sprayed on the container before closing of its top end 32, or it may be dipped in paraffine if desired as illustrated in Fig. 4. In this figure there is schematically shown a bath 38 of liquid

paraffine or similar material contained in some suitable holding vessel or tank 39. A container 29 dipped in such a bath so that it is first filled with the paraffine which is then emptied and drained back, will be suitably moisture-proofed both inside and outside.

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. A closed liquid proof container for milk and the like, said container including side and end walls formed of substantially opaque fibrous sheet material, a side wall of said container having a thinned compressed portion near its top impregnated with a penetrating liquid to form a translucent window in said wall, whereby the cream line of the milk confined within said opaque container is visible through said windows, the inner and outer surfaces of the container including the thinned portions being coated with paraffin.

2. In the method of making a container having translucent liquid proof windows, the steps which comprise thinning a container having side and end walls to form said windows, impregnating the thinned portion with a penetrating liquid to decrease the opacity of such windows, and then coating the inner and outer surfaces of the container including the thinned portions with paraffin.

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