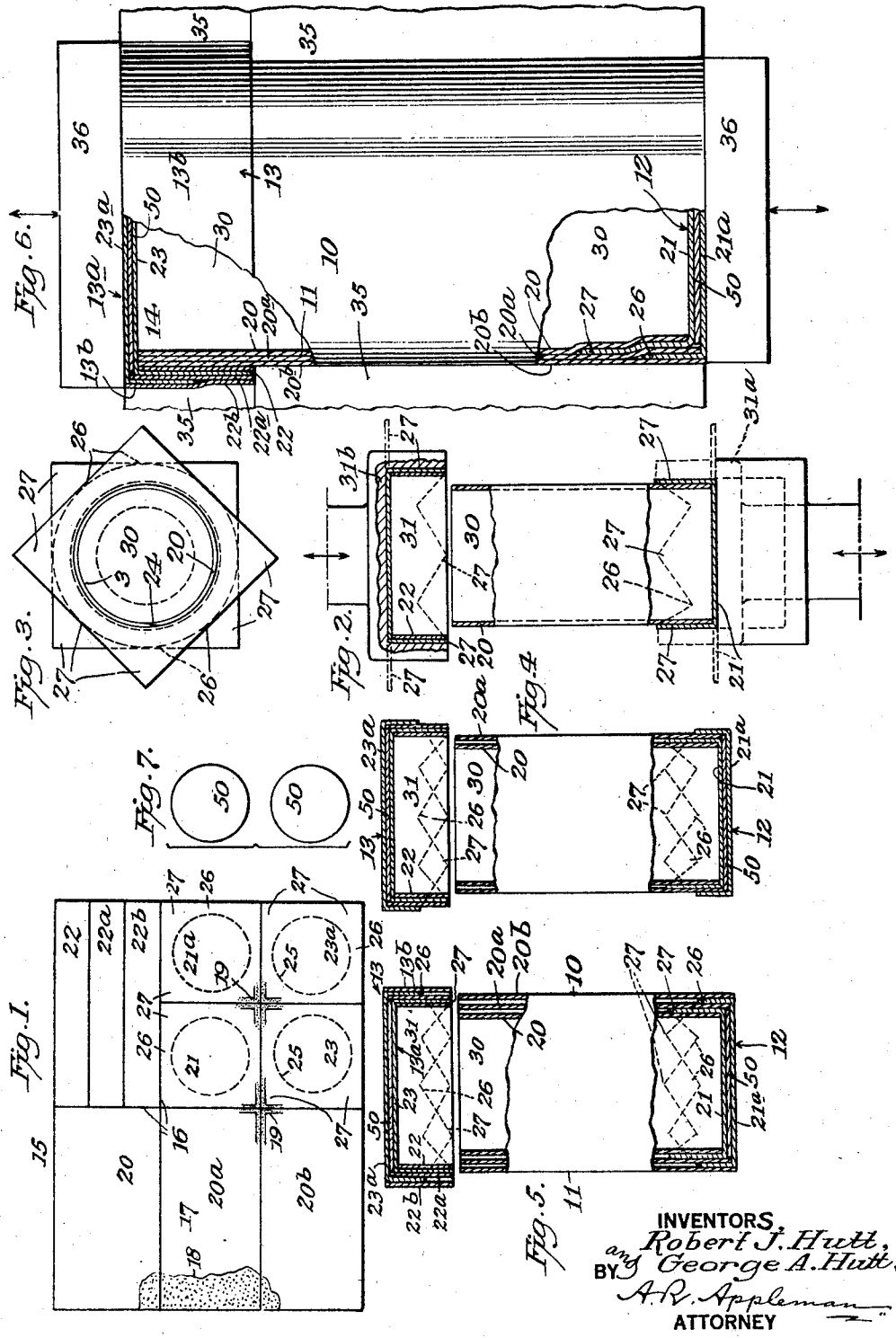
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METHOD OF MAKING LAMINARY CONTAINERS

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METHOD OF MAKING LAMINARY CONTAINERS

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This invention relates to an improved method for making containers of the laminary type from any appropriate sheet material, such as paper, for drinking cups, milk holders and the like.

A principal feature of the method, being to build up a container structure from pieces of a preformed and scored sheet blank, appropriately divided into relative component parts for conjunctive assembly to form containers able to withstand a maximum service and of such low cost as to encourage their use for heavy duty in articles such as nail and bolt kegs, tar barrels and other like products.

A principal object of the present method is to provide a complete substantially fluid-proof container, including a body, a bottom portion and a cover; the bottom and cover top each having pyramidal portions extending between the side walls of body and cover for effectively reinforcing the structure to withstand the destructive action of fluids, acids or other contents for an unusual length of time.

For additional strength and rigidity at the ends, we may employ disk pieces located between the laminæ of the top and those of the bottom of the container.

Suitable means, such as a powerful fluid-proof adhesive, may be employed to unite the conjoined parts in forming the container, drinking cup or the like; the adhesive being applied to advantageous or desirable areas on the several portions of a sheet blank at the time, or before the cutting or scoring is done to prepare the parts for use, if desired, or said adhesive may be applied to an entire face of each of said parts or to an entire face of the said sheet blank.

For the sake of simplicity, there is shown and described a container of rounded or cylindrical conformation, in cross section, but, of course, various cross-sectional or general shapes may be adopted and no limitation is intended by the phraseology of the above statements of invention or in the following description in detail, with reference to the drawing, illustrating one form of the method, which show the container as having vertical parallel side walls, but said container may be formed with flaring walls (not shown) to provide a drinking cup or other useful article of that general shape.

In the drawing:

Fig. 1 is a plan view of a blank sheet preferably of suitable tough paper or the like, showing scored lines and no waste, for a complete container.

Fig. 2 is a diagrammatic side view showing forming elements which may be employed when practicing our improved method.

Fig. 3 is a top view of the elements shown in Fig. 2.

Fig. 4 is a partial sectional side elevation showing a further step in the method.

Fig. 5 is a partial sectional elevation showing a still further step in the method.

Fig. 6 is an enlarged partial sectional side elevation showing the last step in the method, and showing in exaggerated form a finished container.

Fig. 7 is a detail view of disks which may be employed in further reinforcing the top and bottom walls of the container.

Referring now to the drawing in detail, the improved container body 10, as in Fig. 6, comprises a cross-sectionally cylindrical side wall 11, a bottom 12, and a separate removable cover 13, having a top wall 13*a*; the cover being of a size to fit snugly around and over the mouth or open end 14 of the container.

Our method of building the improved container 10 consists in first supplying a sheet blank (Fig. 1) of proper size and contour so that no stock waste remains. This sheet blank 15, being divided or cut as at 16 into pieces or portions 17 to be assembled and united as hereinafter set forth:

In carrying out the method, one face of the sheet blank may be entirely coated with a suitable adhesive as at 18, or the edges only of the pieces or portions 17, may have applied thereto lines of adhesive, as at 19.

In the present form, the identical portions 20, 20*a* and 20*b* may comprise, collectively, the laminated 3 ply side wall 11 of the container shown in Fig. 6, and the identical parts 21 and 21*a* collectively may comprise the laminated 2 ply bottom 12 of the said container, between which plies a supplemental reinforcing disk 50 may be placed.

The identical blank pieces 22, 22*a* and 22*b* collectively when properly rolled and sealed may form the side wall 13*b* of the cover 13 of the container, and the identical square parts or portions 23 and 23*a* of the sheet blank 15, and an interposed disk 50 may collectively comprise the top 13*a* of the cover 13 but the said disks 50 between the laminæ forming the bottom 12 and top 13*a* of the container may not be employed in some cases.

The side wall layers or laminations are preferably provided with overlapping sealed joints as at 24 in Fig. 3 of the drawing, and in the hereinafter description no further joints will be referred to as it will be understood that the laminated walls of the container and its cover, when

properly assembled, are subjected to high sealing pressure throughout to provide a hard, rigid reinforced structure, when dry.

The circular bending lines of the bottom portions 21 and 21*a* and the top-of-the-cover portions 23 and 23*a* are indicated by dotted lines, at 25 on the sheet blank 15, and outward of these circular bending lines are a short and longer reinforcing portions 26 and 27 the latter of general triangular shape which, in the method assembling operation, are turned inwardly between the respective side walls of the container body and its cover to reinforce the corners, and for some distance from said corners, as clearly shown in Fig. 6 of the drawing.

By referring to the drawing, it will be seen that the short and longer reinforcing extensions 26, 27 of the square top and bottom laminæ or layers, are placed in diametrically staggered relation, to lie at diametrically opposite points in the side walls, so that the reinforcing media in said walls are extended at equally spaced areas, and of course, the shape and size of these longer reinforcing extensions may be varied if desired, or required, but are preferably triangular to secure greater strength of structure at or near the corners or ends, at the bottom and top of the container.

Suitable mandrels or forms 30 and 31 may be supplied, on which the wall portions of the paper blank may be rolled alternately with respect to the application and bending of the reinforcing portions of the top layers 23 and 23*a* and the bottom layers 21 and 21*a* inwardly and against the side of each progressive wall portion or layer, and are permanently interposed in the wall structures, as best shown in Fig. 6 of the drawings.

Briefly, a body wall piece 20 is rolled around the mandrel 30; its ends overlapping and sealed as at 24 in Fig. 3, after which, a square bottom piece 21 is placed in proper position on the lower end of the cylinder wall thus produced and is engaged by a suitable cupped die 31*a* movable to turn the reinforcing portions 26—27 inwardly and upwardly into contact with the outer lower wall piece 20; wall piece 20*a* is then applied, rolled and sealed over the last described reinforcing portions 26—27 after which a second bottom piece 21*a* is applied by the cupped die 31*a* and finally another or third wall piece 20*b* is rolled and sealed over the second wall piece 20*a* and the reinforcing portions described, thus providing a three ply wall and a two ply bottom in a container and finally this structure may be hard pressed, with or without heat, making a hard rigid body portion which will stand up under long hard service.

The cover of the container may be built up by the same method and, if desired, simultaneously with the body of the container by employing a second mandrel or shaper 31 and a cupped shaper 31*b* as in Fig. 2 of the drawing. Pressure rollers 35 and movable blocks 36 may be employed to roll the side walls and press the cover into final closed position, as in Fig. 6.

The additional reinforcing disks 50 may be inserted into the top and bottom laminated structures when containers are made for heavier duty or against fluid escape or for other reasons.

What we claim is:

1. The method of making laminary containers; which consists in forming a body wall piece and a cover wall piece into respective cylinders; overlapping and sealing the fly ends of each; applying squared pieces to the outer ends of said cylinders and in projective relation with the diameters thereof; folding the projective portions of said squared pieces into contact with the walls of said cylinders; rolling respective body wall and cover wall pieces around and over the folded portions and the first named cylinders to form a second pair of body wall and cover wall cylinders; overlapping and sealing the fly ends thereof; applying to the outer ends of the second cylinders squared pieces having projective edges arranged in staggered relation with the edges of the first named squared pieces; folding the latter projective edges against the walls of the said second cylinders; rolling a third body wall piece and a third cover wall piece around the respective folded edges and the respective body cylinder and cover cylinder; overlapping and sealing the fly ends thereof; exerting endwise force for locating the cover in operative position for closing the top of the body; then subjecting the entire surface of the container to finishing pressure.

2. The method of forming a laminary container and its cover; which consists in rolling wall laminæ to form top and bottom cylinders and sealing the fly edges; applying to the outer ends of the top and bottom cylinders laminæ having irregular integral extensions; folding the said extensions into contact with the walls of said cylinders; rolling further wall laminæ around the turned extensions and the said cylinders and sealing the the fly ends thereof to form a second set of top and bottom cylinders; applying top and bottom laminæ having integral irregular extensions to the outer ends of the second cylinders; interposing a reinforcing disk between the respective pairs of top and bottom laminæ; folding the irregular extensions of the last applied top and bottom laminæ inwardly against the sides of the second cylinders; rolling a third set of wall laminæ over the second cylinder and the last named folded extensions to form a third cylinder with sealed fly ends; exerting end movement to seat the cover on the body of the container; then subjecting the entire surface of said container to a finishing pressure.

3. The method of forming a laminary container and its cover; which consists in rolling wall laminæ to form top and bottom cylinders and sealing the fly edges; applying to the outer ends of the top and bottom cylinders laminæ having irregular integral extensions; folding the said extensions into contact with the walls of said cylinders; rolling further wall laminæ around the turned extensions and the said cylinders and sealing the fly ends thereof to form a second set of top and bottom cylinders; applying top and bottom laminæ having integral irregular extensions to the outer ends of the second cylinders; folding the irregular extensions of the last applied top and bottom laminæ inwardly against the sides of the second cylinders; rolling a third set of wall laminæ over the second cylinder and the last named folded extensions to form a third cylinder with sealed fly ends; exerting end movement to seat the cover on the body of the container; then subjecting the entire surface of said container to a finishing pressure.

4. The method of forming a laminary container; which consists in first providing a mandrel; rolling a wall lamina around said mandrel and sealing the edges to provide a cylinder; applying a lamina having triangular extensions to an end of said cylinder; folding the triangular extensions into contact with said cylinder; rolling a

second wall lamina over the laminæ on said mandrel and sealing the edges to provide a second cylinder; applying a second lamina having pyramidal extensions over the end lamina first named with said extensions in alternate or staggered relation; folding the last named extensions into contact with the wall of the second cylinder; rolling a third wall lamina over the structure thus produced and sealing the edges to provide a third cylinder; then subjecting said structure to finishing pressure.

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