

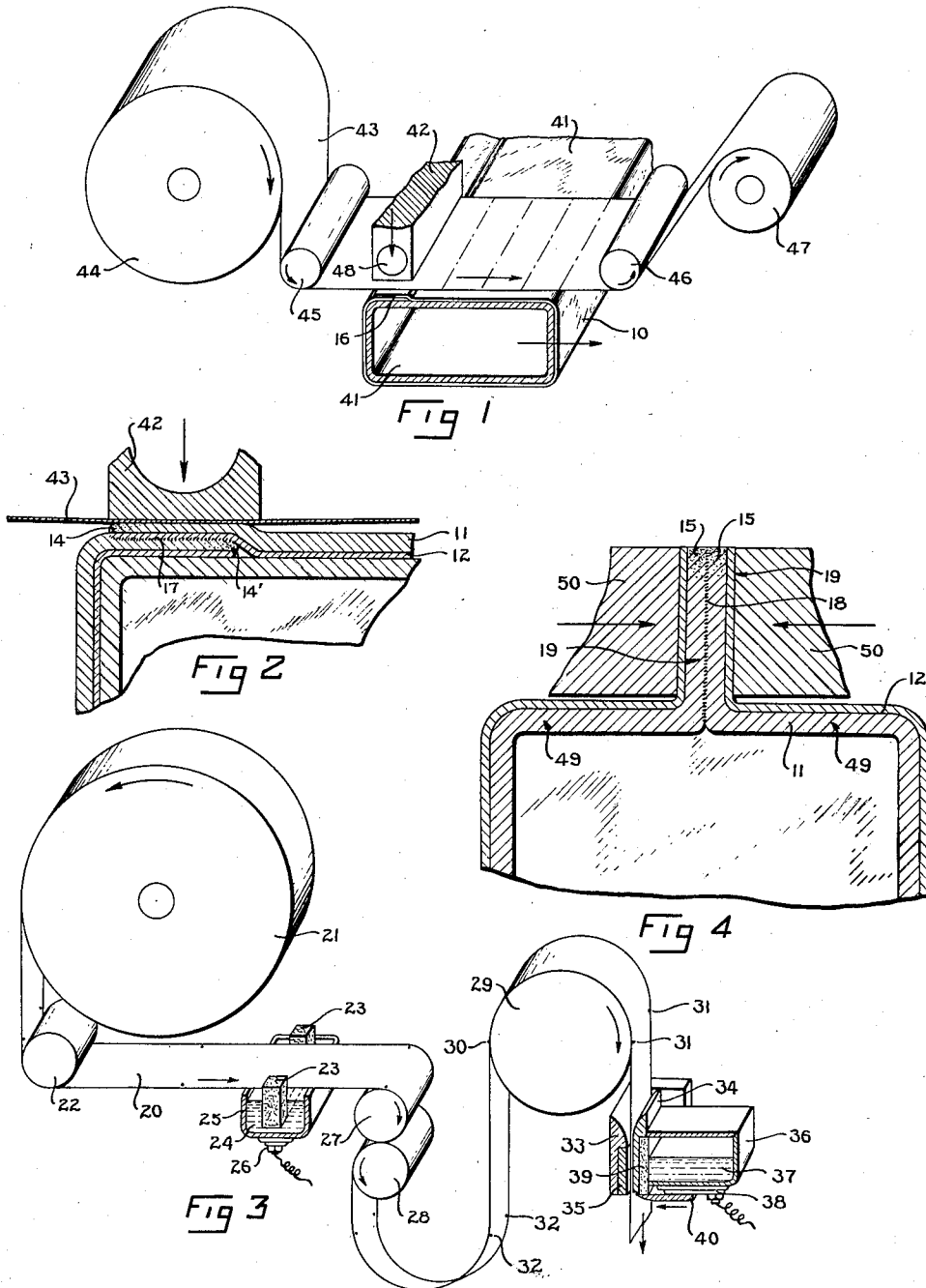
May 14, 1940.

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2,200,289

CONTAINER AND METHOD OF MAKING THE SAME

Original Filed Aug. 17, 1937



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UNITED STATES PATENT OFFICE

2,200,289

CONTAINER AND METHOD OF MAKING THE SAME

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Original application August 17, 1937, Serial No 159,505. Divided and this application September 10, 1938, Serial No. 229,235

9 Claims. (Cl. 93—36)

This invention relates to containers and more particularly to containers including fibrous materials and methods of making said containers.

This application is a division of my co-pending application Serial No. 159,505, filed August 17, 1937, for Container and method of making the same.

It has been heretofore proposed to impregnate the surfaces of the materials from which containers are constructed with paraffin or like material to render the same moisture repellent, but in prior containers of this character the paraffin may prevent the provision of dependable adhesively joined seams or joints and moisture is absorbed either from the contents of the container or from the atmosphere outside of the container by the raw edges of the fibrous material and is absorbed or wicked in or out of said material. It has also been proposed to coat the surface of the material with moisture-proof lacquers and the like which may also serve as adhesives, but even this has not obviated the absorption and wicking of moisture through the raw edges of the fibrous component of the container. Moisture is thus carried to or away from the contents of the container, thereby varying the desired percentage of moisture therein.

Accordingly, one of the objects of the present invention is to provide a novel container or package comprising fibrous materials which is so constructed as to be impervious to the entrance or escape of air and moisture.

Another object of the invention is to provide a novel method of making containers including fibrous materials and having moisture-proof qualities.

Still another object of the invention is to provide a novel method for making containers having heat-sealed seams or joints which may be carried out without defacing the surface of the container by the application of heat.

A further object is to provide a novel method and means for treating the raw edges of fibrous or like materials to render the same moisture repellent.

A still further object is to provide a novel container and method of making the same which may be made and carried out, respectively, with ease and rapidity at low cost.

The above and further objects and novel features of the invention will more fully appear from the following detailed description when read in connection with the accompanying drawing. It is to be expressly understood, however, that the drawing is for the purpose of illustrating

tion only and is not intended as a definition of the limits of the invention, reference being had primarily for this latter purpose to the appended claims.

In the drawing, wherein like reference characters refer to like parts throughout the several views,

Fig. 1 is an isometric view, partly in section and with parts broken away, illustrating means for carrying out one of the novel steps of the method for making one form of container comprehended by the present invention;

Fig. 2 is a detail sectional view showing a portion of the apparatus of Fig. 1 on an enlarged scale;

Fig. 3 is a diagrammatic, isometric view, partly in section and with parts broken away, illustrating additional means for carrying out novel steps in the method of the invention; and,

Fig. 4 is an enlarged detail view, partly in section and with parts broken away, showing the end closure seam of a second form of container embodying the present invention.

In the embodiments of the invention illustrated in the drawing, a container suitable for packaging cigarettes is shown, by way of example, but it will be understood that various other embodiments thereof may be provided for packaging tobacco in other forms and many other varieties of products, particularly those products which are hygroscopic in nature. The form of container shown is impervious to air and moisture, the same being constituted by a novelly treated, laminated blank 10 comprising a layer of fibrous material 11 and a layer of metallic foil 12 or other non-hygroscopic material, said fibrous and foil layers being preferably secured together throughout their entire areas by means of a suitable adhesive. The foil lamina may constitute either the inner surface of the container, as seen in Fig. 2, or the outer surface thereof, as seen in Fig. 4. Preferably, the marginal portion of the inner surface of blank 10 adjacent at least three edges thereof is coated with a thin dry film of thermoplastic, moisture-proof lacquer having potential adhesive properties, such as Du Pont Lacquer No. 606 or 543, for example, said lacquer serving to seal the seams or joints of the container, as will hereinafter appear. If desired, the entire inner and outer surfaces of the container, or either of said surfaces, may be coated with said lacquer to improve the moisture-proof qualities of the container. A coating of high gloss lacquer capable of taking printing ink or overcast may be provided on the outer

surface of the container in lieu of said thermoplastic lacquer, if desired, to improve the appearance thereof, and any suitable designs or advertising matter may be printed thereon.

5 In order to prevent the absorption and consequent wicking of moisture into and out of the container through the fibrous lamina 11 via the raw edges thereof, which cannot be satisfactorily coated with lacquer, blank 10 from which the
10 container is made has all of its edges impregnated with paraffin or similar moisture-repellent materials, as shown at 14, 14', in the embodiment of Fig. 2, and at 15, 15 in the embodiment of Fig. 4. Two opposed ends of the blank are
15 overlapped and heat-sealed to provide a longitudinal seam 16 and thus form a tubular body, the engaging surfaces of said overlapping ends being substantially welded together at 17 (Fig. 2)
20 by the thermoplastic lacquer coating referred to above. When the tubular body has been thus formed, the open ends thereof are preferably closed and sealed by pressing opposed halves of the inner surface of the marginal portions of said
25 body into engagement and heat-sealing said surfaces together, as at 18 (Fig. 4), by the application of heat and pressure, the thermoplastic lacquer coating on the inner surface of the blank serving as a binding or sealing medium. Tab 19
30 formed in this manner at each end of the container may be folded down against the body portion of the latter in any desired manner.

A novel method is provided whereby the edges of blank 10 may be wax-impregnated and the
35 above-described container formed rapidly and at low cost. In practicing said method, the fibrous and foil laminations are adhesively secured to each other throughout their areas by a suitable adhesive, an elastic or latex adhesive, and supplied in the form of a long strip 20 on a reel or
40 roll 21 with the desired lacquer coatings and printed matter thereon. The strip of laminated stock passes from said roll over a guide roller 22 and, thence, between a pair of vertically extending
45 pads 23 of felt or other suitable absorbent material, the raw edges of said strip engaging the adjacent faces of said pads. The lower ends of the latter are immersed in a bath 24 of melted paraffin, wax, or similar moisture-repellent substance, in a container 25. In effect, pads 23, 23
50 constitute wicks which continuously absorb the melted paraffin 24 and deposit the same on the raw edges of strip 20. The paraffin bath 24 is maintained in a molten or melted state by any suitable means, such as an electrical heater 26 of
55 any suitable construction. Strip 20 is moved longitudinally between pads 23, 23 either continuously or intermittently, by a pair of drive or feed rollers 27 and 28 which are rotated in opposite directions by suitable power means (not shown)
60 and are frictionally engaged by said strip in the manner clearly shown in Fig. 3. Suitable braking or retarding means may be provided for yieldingly resisting rotation of reel 21 in order that strip 20 may be maintained taut between
65 rollers 22 and 27.

After passing over roller 28, some slack is permitted in strip 20 to provide a slack loop, and the strip is then led over a drive or measuring roller 29, the periphery of which is preferably twice as
70 long as each of the blanks 10 and has diametrically disposed pairs of pins or lugs 30 and 31 projecting radially therefrom at the edges thereof. Lugs 30, 31 engage openings or holes 32 provided in strip 20 adjacent the edges thereof at intervals equal to the desired length of blank 10.
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Roller 29 thus constitutes a positive driving means whereby any slippage of strip 20 on friction rollers 27 and 28 is compensated for and the strip delivered to a suitable cutting means, to be next
5 described, so as to be severed along predetermined lines extending laterally of said strip. Any desired printing matter, such as designs or advertising matter, may accordingly be impressed on strip 20 with perfect assurance that, when the
10 strip is cut into blanks, each of the latter will be of the proper length and contain the desired printed matter properly positioned thereon.

Strip 20 is next cut into blanks of suitable lengths and one or both of the severed edges of each blank is impregnated with paraffin in a
15 novel manner either simultaneously with the cutting operation or during the subsequent steps in making the container, as will hereinafter appear. Preferably, as strip 20 leaves roller 29, it passes downwardly through a pair of guide members 33 and 34, the former of which is provided
20 with a hard metal insert 35. The other guide member, in the form shown, constitutes one wall of a container 36, in which a quantity of paraffin 37 is maintained in a melted or liquid state by
25 an electric heating element 38. Extending into container 36 in contact with the melted paraffin and projecting through a slot in the bottom of said container is a pad 39 of felt or other suitable
30 absorbent material, the length of said pad being equal to or greater than the width of strip 20. The lower somewhat enlarged surface of pad 39 is slidably engaged by the upper surface of a reciprocating knife 40, the cutting edge of which
35 cooperates with plate 35 to cut strip 20 into blanks 10 of the proper length.

Knife 40 may be reciprocated in synchronism with the rotation of measuring roller 29 by some suitable power means (not shown), the stroke of said knife preferably being such that the cutting
40 edge thereof will be withdrawn from strip 20 to a line between the corners or edges of the lower surface of pad 39. Thus, during the movement of the knife from right to left, as viewed in the drawing, a small amount of liquid paraffin flows to the lower surface of the cutting
45 edge of the knife and a quantity is also deposited on the upper surface of said cutting edge from pad 39. As knife 40 continues its movement in the direction of the arrow and cuts strip 20, the
50 small quantities of liquid paraffin on opposite sides of the cutting edge are deposited on the severed edges of said strip and absorbed thereby to provide the impregnated edges 14, 14' (Fig. 2). It will be seen that the adjacent edges of successive blanks are simultaneously impregnated
55 by paraffin carried on knife 40. After each cutting operation, said knife is returned to the illustrated position to pick up additional paraffin from pad 39.

After each blank 10 is severed from strip 20, it is folded or wrapped around a rigid form or mandrel 41 (Fig. 1) with the wax impregnated ends
60 14, 14' overlapping, as best seen in Fig. 2. The overlapped portions of blank 10 are then sealed together by the application of heat and pressure which activates the dry lacquer film previously applied to the blank and presses the same into the interstices of the material, thereby substantially welding the engaging surfaces
65 together at 17 to form an impervious longitudinal seam 16. It will be seen that the edge 14' within the container will not absorb moisture from the contents of the latter and that the edge 14, which is exterior of the container, will
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not absorb moisture from the atmosphere. Since the surface of the fibrous component 11 is coated with a moisture-proof lacquer and foil layer 12 is inherently non-hygroscopic, the walls of the container will not be affected in any way by moisture and the moisture content of the product or substance within the container will be maintained substantially constant for an indefinite period of time irrespective of climatic conditions, such as pressure, temperature and humidity.

The heat sealing of seam 16 is accomplished in a novel manner whereby the heat is prevented from marring the glossy lacquer finish or the printed matter on the outer surface of the container, and whereby raw edge 14 may be impregnated or further impregnated with paraffin wax. In the illustrated embodiment, heat and pressure are applied by a sealing iron 42 to the overlapping portions of blank 10 through a sheet 43 of waxed paper. Sheet 43 is preferably supplied on a roll 44, is led beneath two spaced guide rollers 45 and 46, and onto a take-up and drive roller 47 (Fig. 1). Strip 43 is moved intermittently, by some suitable means (not shown), through distances equal to the width of the face of sealing iron 42. When waxed sheet 43 is heated and pressure is exerted thereon by iron 42, it will be seen that the wax on said sheet will be melted and squeezed from between the sheet and the lacquer coated marginal portion of the blank which is contacted by said sheet. A small quantity of wax is thus caused to flow to the raw edge 14 and is absorbed thereby. This latter method of impregnating edge 14 may either be employed alone or supplementary to the method above described for impregnating said edge. Any defacing or marring of the outer surface of the container by iron 42 is also obviated. The sealing iron may be heated to the proper degree by any suitable means, such as an electric heating element 48, the heat of said iron being effective to activate the lacquer film 17 between the overlapping ends of blank 10. The activated lacquer is pressed into the interstices of the engaging surfaces by the pressure of iron 42 and substantially welds said surfaces together.

After the formation of seam 16, the resulting tubular body is axially or longitudinally advanced on mandrel 41 until a sufficient marginal portion thereof extends beyond the end of the mandrel to permit the necessary folding thereof to form end walls 49, 49 and the closure seam 18, 19. The latter is preferably sealed by the application of heat and pressure, which are supplied by heated pressure members 50, 50 that converge and engage opposite sides of tab 19, as best seen in Fig. 4. The heat and pressure thus applied are effective to activate the lacquer film on the engaging surfaces and substantially weld the same together. After one end of the body is thus closed, the same is then removed from mandrel or form 41, filled with the desired contents, and the other end is sealed in a like manner. Tabs 19 at each end of the container may be folded down against end walls 49 to provide a package having a neat and pleasing appearance.

There is thus provided a novel hermetically sealed container comprising fibrous materials and a method for making the same, said container being so constructed that moisture will not be absorbed from the contents of the container or from the atmosphere surrounding the container by the fibrous component of the material from

which the container is made. A novel method is also provided for impregnating the raw edge of a blank of fibrous material, said method being adapted to be carried out with facility and at a rapid rate at low cost. Additionally, a method for making containers which includes a novel step whereby any defacing or marring of the outer printed surface of the container by the heated irons employed in making heat-sealed seams or joints is obviated.

Although only a limited number of embodiments of the invention have been illustrated and described, it is to be expressly understood that the same is not limited thereto but that various changes may be made therein, particularly in the design and arrangement of parts and the size and shape of the container illustrated and in the materials specified without departing from the spirit and scope of the invention, as will now be understood by those skilled in the art. For a definition of the limits of the invention, reference is had primarily to the appended claims.

What is claimed is:

1. In the container making art, the method which includes impregnating the raw edges of a strip comprising fibrous material with a moisture-repellent substance, simultaneously cutting blanks of predetermined length from said strip and impregnating the severed edges with a moisture-repellent substance, and adhesively joining the ends of said blanks to form container bodies.

2. In the container making art, the method which includes impregnating the raw edges of the fibrous component of a strip of material with a moisture-proofing substance, simultaneously cutting a blank of predetermined length from said strip and impregnating an end thereof with a moisture-proofing substance, and adhesively joining said end to the opposite end of said blank to form a tubular container body.

3. In the container making art, the method which includes impregnating the raw edges of the fibrous component of a strip of material with a moisture-proofing substance, simultaneously cutting a blank of predetermined length from said strip and impregnating an end thereof with a moisture-proofing substance, adhesively joining said end to the opposite end of said blank to form a tubular container body, and forming end closure seams on said body by adhesively joining opposed halves of the inner surfaces of marginal portions at the ends of said body.

4. In the container making art, the method which comprises imparting relative movement to an elongated strip of foldable material having a paper component and absorbent means impregnated with a moisture-repellent substance in liquid form with the edges of said strip in contact with said absorbent means to thereby impregnate the raw edges of said paper component with said substance, and simultaneously cutting a blank of predetermined length from said strip and impregnating an edge of said paper component thereof at the line of severance with a moisture-repellent substance carried by the cutting tool.

5. In the container making art, the method which includes applying a thin dry coating of moisture-proof lacquer to the surface of a blank comprising fibrous material, folding said blank into tubular body form with two opposed ends thereof overlapping, and applying heat and pressure to said overlapping ends through a separate sheet of waxed material.

6. In the container making art, the method

which includes applying liquefied wax to the raw edges of a strip comprising fibrous material, cutting a blank of predetermined length from said strip and simultaneously impregnating one of the severed edges thereof with a moisture-repellent substance, folding said blank into tubular body form with the marginal portions at the ends thereof overlapping, and applying heat and pressure to said overlapping portions through a sheet of waxed material whereby the exposed raw end of said blank is impregnated with wax.

7. In the container making art, the method which includes applying a moisture-repellent substance to the raw edges of the sides of a blank comprising fibrous material, folding said blank into tubular body form with the ends thereof overlapping, and applying heat and pressure to said overlapping ends through a sheet of waxed material for simultaneously activating an adhesive between the engaging surfaces of said

overlapping ends and impregnating a raw edge of said blank with wax from said sheet of waxed material.

8. In the container making art, the method which includes applying liquified wax to the cutting edge of a cutting tool, and simultaneously cutting material having a paper component with said tool and depositing said wax on a raw edge of said paper component at the line of severance.

9. In the container making art, the method which includes impregnating the raw edges of a strip comprising a paper component with paraffin, simultaneously cutting blanks of predetermined length from said strip with a reciprocating cutting tool and impregnating the paper component of the severed edges with paraffin, and adhesively joining the ends of said blanks to form container bodies.

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