

May 21, 1940.

M. WAGNER

2,201,416

CONTAINER

Filed Dec. 7, 1936

2 Sheets-Sheet 1

FIG. 1

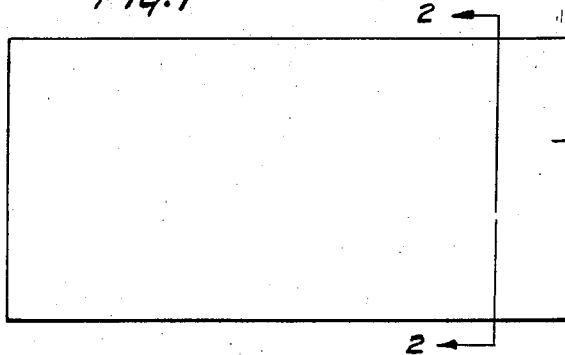


FIG. 2

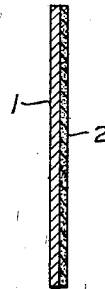


FIG. 3

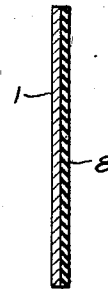


FIG. 4

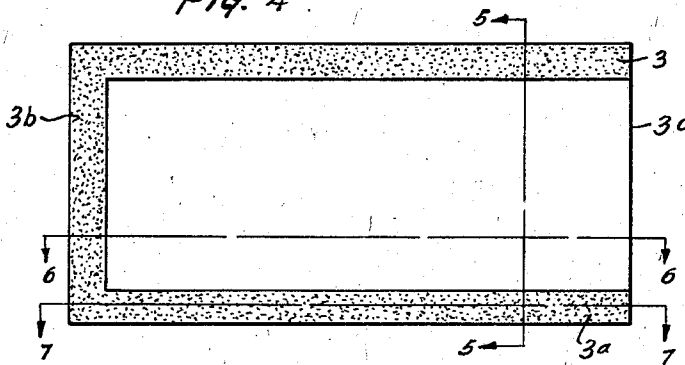


FIG. 5

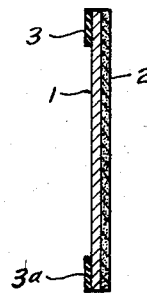


FIG. 6

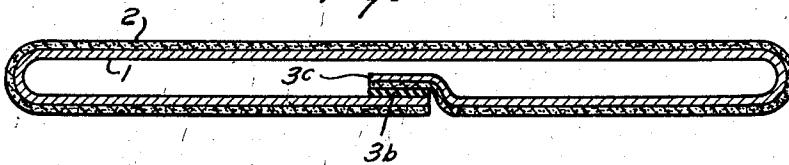


FIG. 7

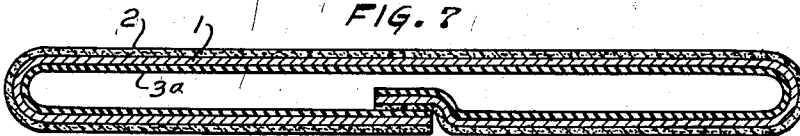
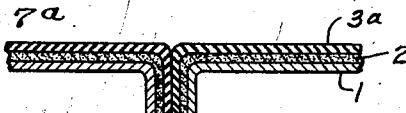


FIG. 7a



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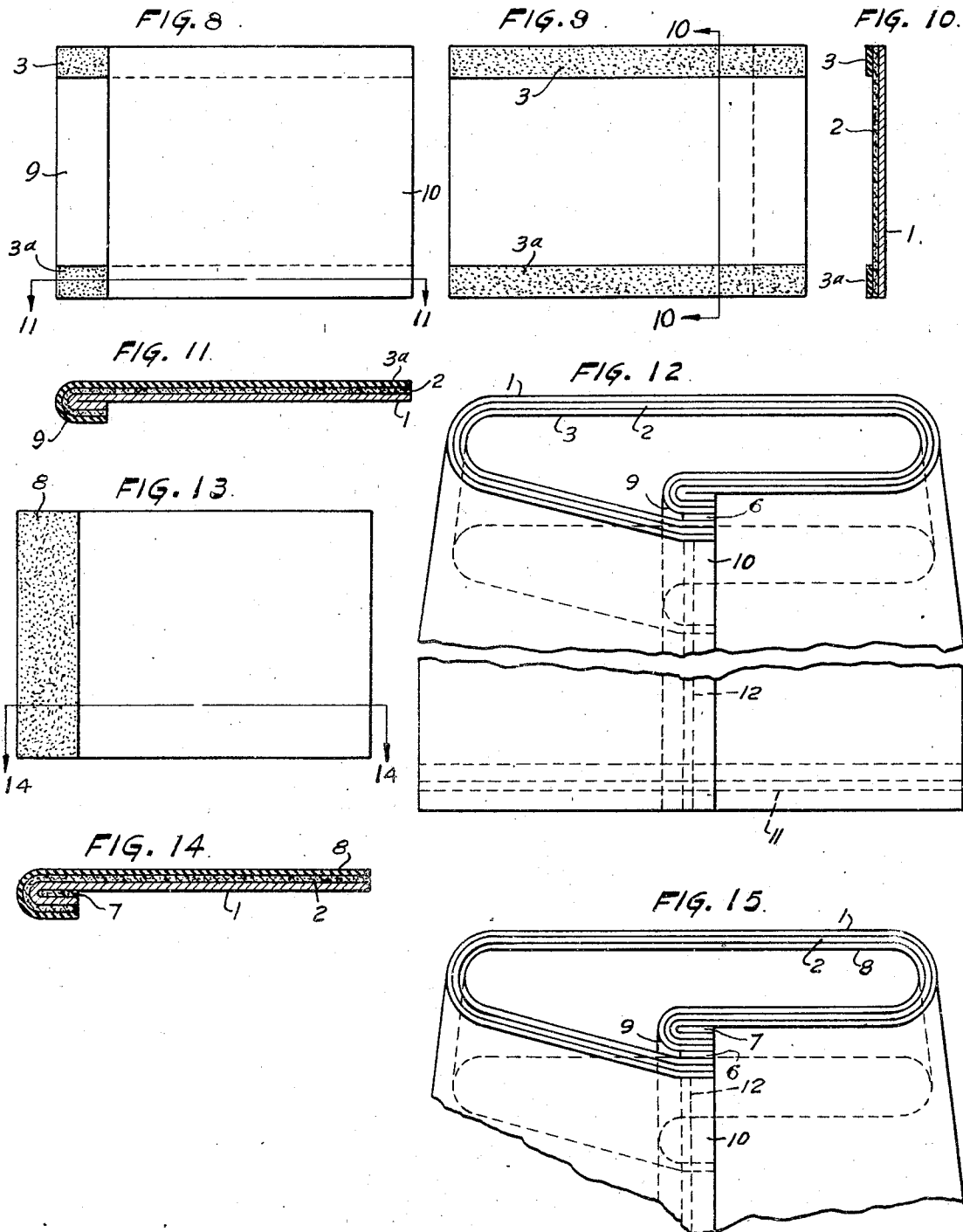
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CONTAINER

Filed Dec. 7, 1936

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,201,416

CONTAINER

Melvin Wagner, Chicago, Ill., assignor to The
Liquid Carbonic Corporation, Chicago, Ill., a
corporation of Delaware

Application December 7, 1936, Serial No. 114,651

5 Claims. (Cl. 229—3.5)

My invention relates to containers and particularly to gas and liquid-tight containers.

It is the object of my invention to provide a gas or liquid-tight container of paper which can be sealed to contain gas or liquid.

It is a further object to provide such a container with a flexible body wall so that it will accommodate itself both to the contents which it may contain and any other carton or container in which it may be inserted.

It is my object to provide a material for the making of such containers which is substantially impervious to the passage of liquid and is substantially impervious to the passage of gas within a reasonable period of time; and to provide in combination with such material means of sealing the container formed therefrom without the production of any solvent odors which will contaminate the contents of the container.

In particular it is my object to provide material for a container and a container of the character described consisting of a flexible material such as paper, an impervious coating such as a varnish from which the solvents are driven off after the application of the varnish to the paper, and a preformed thermoplastic sealing medium such as rubber hydrochloride in sheet-like form.

It is my object to provide a container in which the sealing medium is restricted to the sealing areas and which can be applied and will adhere either to the paper directly or to the varnished surface of the paper after the solvent has been driven out of the varnish.

In particular it is my object to provide a sheet of paper having a high surface gloss, that is relatively transparent and dense, a varnish which firmly anchors itself on the surface of the paper and enters any interstices in the paper to render it substantially impervious, and a preformed sheet-like thermoplastic sealing medium such as rubber hydrochloride either along the sealing edges or over the surface of the material which can be caused to adhere by the application of heat.

It is my object to provide a container of the laminated construction described which can be sealed along one edge by the use of the varnish having a solvent, leaving the top and bottom of the container open so that the solvent can be driven off and all odors removed before sealing the bag, and thereafter sealing the bag by the application of heat to the top and bottom thereof adjacent the preformed thermoplastic material in order to complete the closure of the container.

It is my object to provide means of retaining

the first-mentioned seam in such a position as not to interfere with the sealing of the top and bottom of the bag.

It is my object to provide a blank of container material in which one edge is turned over to form a sealing seam.

Referring to the drawings:

Figure 1 is a blank shown in plan from the paper side of the blank.

Figure 2 is a section on the line 2—2 of Figure 1 which shows a single sheet of paper having a varnished surface.

Figure 3 is a similar view showing a single sheet of paper having a preformed sheet of thermoplastic material over the entire surface.

Figure 4 is a plan view of the inside of the blank of Figure 1 showing a horizontal and a vertical preformed thermoplastic sealing strip applied on the margins of three of the sides of the blank.

Figure 5 is a section on the line 5—5 of Figure 4 looking in the direction of the arrows.

Figure 6 is a section on the line 6—6 of Figure 4 with the blank folded and sealed along its seam as the first step in forming the container.

Figure 7 is a section on the line 7—7 of Figure 4 with the blank having its vertical seam arranged in the same manner as in Figure 6.

Figure 7a is a view showing in detail a preferred form of seal at the vertical seam.

Figure 8 is an outside elevation of a modified blank consisting of a sheet of paper, a varnished surface, and preformed strips of thermoplastic sealing medium at the top and bottom of the sheet with the edge of the sheet turned over for use in forming the vertical seam when the container is assembled.

Figure 9 is an inside view of the same blank shown in Figure 8.

Figure 10 is a section on the line 10—10 of Figure 9.

Figure 11 is a section on the line 11—11 of Figure 8.

Figure 12 is a perspective of the container as assembled and sealed along the vertical seam and across the bottom prior to being sealed at the top.

Figure 13 is a plan view of the outside of a modified blank which has a sheet of paper, a coating of varnish, and a preformed cover sheet of thermoplastic material, the whole blank being turned over along one vertical edge to form a sealing seam.

Figure 14 is a section on the line 14—14 of Figure 13.

Figure 15 is a perspective of the top portion of the container prior to sealing with the vertical seam turned over and sealed against the outside of the container.

5 It will be understood that when I refer to paper I refer to a variety of different types of paper, preferably those that are dense and which have a high gloss and are translucent or trans-

10 When I refer to a varnish I refer to a resinous liquid coating composition which can be applied by spraying, brushing or roller coating or any equivalent means, and, if it contains a solvent, of such character that the solvent can be driven off or will dry off within a reasonable period of time. Amongst the materials that I have found satisfactory is a varnish of a synthetic resin such as one of the vinyl resins. It will be understood, however, that there are a wide variety of synthetic resins or natural gum resins which can be employed as long as they dry with a hard impervious surface, adhere to the paper, and are dense while retaining their flexibility.

15 I have found that the combination of the paper and this varnish provides a medium that is substantially impervious to the passage of liquid and gases, even gases under pressure, such as those pressures customarily used in packaging materials with an inert gas. I have found that a single sheet of paper with such a varnish is satisfactory for most purposes, but under some conditions it is desirable to apply two sheets of paper to a single varnish coat between them.

20 When I refer to a thermoplastic medium I refer to rubber hydrochlorides such as "Pliofilm" or to one of the vinyl resins. Indeed, the vinyl resins when used as a varnish may also be employed as a thermoplastic sealing medium by the application of heat and sometimes of heat and pressure. The rubber hydrochlorides, however, have no solvent odors and are caused to seal and adhere by the application of heat alone, or in some cases, a very slight deformation or pressure.

25 It will be understood that one of the problems that has confronted the art is to provide a container which will have no residual solvent odors to contaminate the contents of the container, such as food products. By first coating paper with a solvent-containing varnish or coating and then driving off the solvents by evaporation, and subsequently applying under the action of heat to the solvent-free, varnish coating a preformed thermoplastic medium such as rubber hydrochloride known as "Pliofilm" to given areas or over the entire surface, the resulting sheet is impervious and is thermoplastic over the entire surface and on given areas as desired. The procedure of removing the solvents from the varnish before application of the "Pliofilm" is important because "Pliofilm" is comparatively impervious to solvents and will not allow entrapped solvents to penetrate through it. The sealing can take place to form the container and to close it after the solvents have been thus removed so that there is no danger of the contamination of the contents of the container. I prefer to evaporate this solvent before having the two materials adhere so that there will be no entrapped solvent. The flexibility of the coating of the paper can be regulated by the addition of the usual plasticizers.

30 In Figures 1 to 7 inclusive, a single sheet of paper 1 is coated with either the varnish 2 or a preformed layer of the thermoplastic material

such as rubber hydrochloride. I prefer to use the varnish and to mount on the opposite side the horizontal preformed strips of thermoplastic material 3 and 3a, with a vertical side strip at the seam designated 3b. The advantage of this arrangement is that the adjacent vertical seam edges can be caused to adhere by bringing the strip 3b against the solvent-free varnish film on the outside of the adjacent seam edge at 3c. This provides a seam that is flat with the overlapping portion on the inside of the container. Thereafter the container is sealed at the top and bottom as heretofore described.

35 Figure 7A represents a method of accomplishing a vertical seal for a container made in accordance with the present invention. In this figure the paper sheet is designated 1, the varnish coating on the paper which is applied to the paper and dried solvent-free before application of the thermoplastic face or strip 3a as 2 and the thermoplastic sheet or strip which is adhered to the varnished surface 2 as 3a. The vertical edges of a blank so prepared are brought into abutting relationship so as to form a seam portion at right-angles to the main portion of the container blank, and the thermoplastic faces 3a caused to adhere at their points of contact by the application of heat or heat and pressure along the vertical seam. The vertical seam so formed may or may not as desired be folded back against the sidewall and caused to adhere thereto by adhesive or a strip of thermoplastic material.

40 Referring to the modification shown in Figures 8 to 12 inclusive, the sheet of paper 1 is coated with the varnish 2 and then there is mounted upon the varnished surface at the top and bottom the horizontal preformed strips 3 and 3a of thermoplastic sealing material. The edge of this blank at 9 is turned over. When the bag is folded to form a container, the edge 9 is in position to be overlapped by the opposite seam edge 10 so that the thermoplastic strips 3 and 3a will by themselves upon the application of heat or heat and pressure form a band 6. If desired, a vertical strip of rubber hydrochloride can extend vertically on the face 9 throughout its length. The lines of heat sealing are indicated by the dotted lines 11 and 12.

45 Figures 13 to 15 show formation of a container similar to that of Figures 8 to 12 except that preformed sheet 8 of thermoplastic material covers the entire varnished surface of the paper sheet 1 and the turned over edge of the paper is sealed to the outside of the paper by a layer 7 of adhesive or varnish.

50 Thus it will be seen that my invention consists primarily of a sheet of paper, an impregnating varnish to render the paper impervious, and a preformed thermoplastic sealing medium arranged either in a sheet or in strips which is not subject to solvent odors. It is therefore possible to secure the plasticity and ready application of a varnish, to drive off the solvent odors, and then to seal the container immediately before and after filling without danger of contamination of the contents of the container.

55 It will be understood that my method of forming a container and the material for so forming a container consists of coating a sheet with a varnish-containing solvent, driving off the solvent while still maintaining the varnish in a plastic, adhesive condition, and of applying the preformed sheet or strip thermoplastic medium in its non-plastic state on the adhesive varnished surface. The solvent may be evaporated either by heating, 75

by a blast of air, or by suction. The thermoplastic medium may be pressed against the adhesive varnish. In any event, after the union has been effected, the composite sheet is cooled. The same procedure is followed in causing the thermoplastic material to adhere to a paper surface or in causing two sheets of paper to adhere to one another.

My method of forming this composite sheet of container material is covered by a separate application, Ser. No. 115,178, filed December 10, 1936, while this application covers the product.

It will be understood that I desire to comprehend within my invention such modifications as may be necessary to adapt it to varying conditions and uses.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent, is:

1. A new article of manufacture for use as a material for forming a container comprising the combination of a sheet of paper, a layer of solvent-free thermoplastic resinous varnish superimposed thereupon and bonded thereto by a bond formed therebetween in the presence of solvent and an exposed superimposed preformed sheet-like thermoplastic medium mounted on the solvent-free surface of said varnish and adhesively adhering thereto, said thermoplastic medium being bonded to the solvent-free varnish layer by a bond formed therebetween under the action of heat but in the absence of solvent.

2. A new article of manufacture for use as a material for forming a container comprising the combination of a sheet of paper, a layer of solvent-free thermoplastic resinous varnish thereon and bonded thereto by a bond formed therebetween in the presence of solvent, and an exposed superimposed preformed sheet-like thermoplastic medium mounted on the solvent-free surface of said varnish and adhesively bonded thereto by a bond formed therebetween under the action of heat and in the absence of solvent, said thermoplastic medium being rubber hydro-

chloride and characterized by the fact that it is capable of softening under heat and pressure and is resilient and adherent when cold.

3. In combination in a container, a container formed of a composite wall of paper, a layer of solvent-free thermoplastic resinous varnish thereon bonded thereto by a bond formed therebetween in the presence of solvent, and a preformed sheet-like thermoplastic medium superimposed on the surface of said varnish and so arranged that when areas adjacent the edges of the container formed from said material are brought into engagement under heat and pressure, said thermoplastic medium will cause said edges to adhere.

4. In combination, container material formed into a bag, a thermoplastic coating for rendering said bag impervious to gases and liquids, said coating being bonded thereto in the presence of a solvent and allowed to dry solvent-free, and means superimposed on said solvent-free coating for sealing the adjacent edges of said bag under heat and pressure comprising a preformed sheet-like thermoplastic resilient medium which is adherent and resilient when cold and thermoplastic when heated, said medium being bonded to said coating by a bond formed under heat and in the absence of a solvent.

5. In combination in a container free from solvent odors and impervious when sealed to gases and liquids, a bag comprising overlapping edges and adjacent sealing margins, said bag wall comprising paper, a varnish thereon free from solvents and solvent odors, said varnish being adhered to said paper by a bond formed in the presence of solvent and a superimposed layer or rubber hydrochloride mounted upon the surface of said varnish and adapted to seal said container under heat and pressure and to resiliently retain the sealed portions thereof in engagement when cold, said layer of rubber hydrochloride being bonded to said varnish by a bond formed in the absence of solvent.

MELVIN WAGNER.

DISCLAIMER

2,201,416.—*Melvin Wagner*, Chicago, Ill. CONTAINER. Patent dated May 21, 1940.
Disclaimer filed August 27, 1941, by the assignee, *The Liquid Carbonic Corporation*.

Hereby enters this disclaimer to claims 1 and 2 in said Letters Patent.
[*Official Gazette September 16, 1941.*]