Nov. 29, 1938. A. L. KRONQUEST 2,138,741

METHOD OF COATING SHEET METAL CAN WITH WAX

Filed April 7, 1936

FIG. 1.

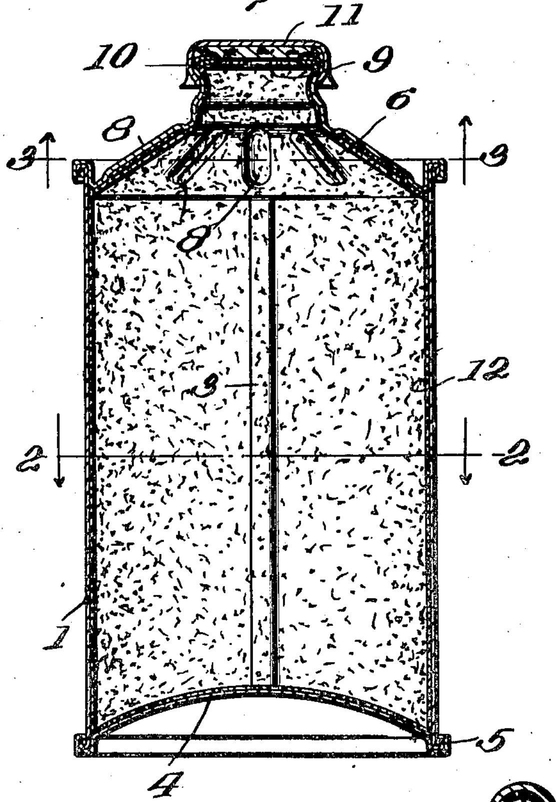
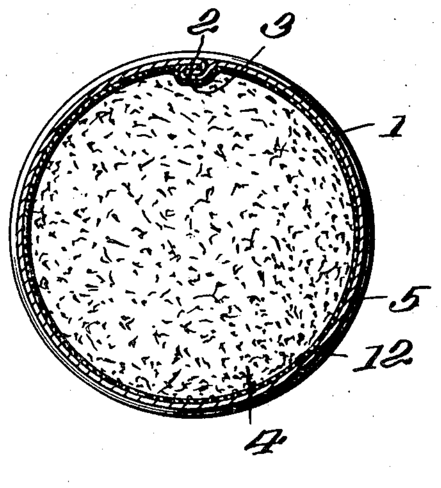


FIG. 2.



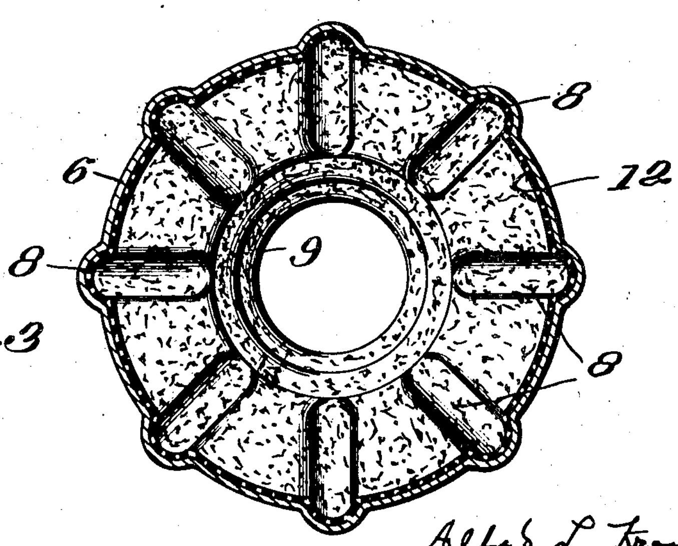


FIG. 3

Inventor

Alfred L. Kronquest

By Mason & P

Attorneys

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METHOD OF COATING SHEET METAL CAN WITH WAX

Alfred L. Kronquest, Syracuse, N. Y., assignor to Continental Can Company, Inc., New York, N. Y., a corporation of New York

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2 Claims. (Cl. 91—70)

The invention relates to new and useful improvements in a method of coating sheet metal cans with petroleum wax.

An object of the invention is to provide a method of coating a can whereby the can may be flooded with a molten wax, the surplus wax drained therefrom and a film caused to adhere to the inner surface of the walls of the can which will produce, when cooled and set, a substantial coating covering every particle of the inner surface of the can.

In the drawing which shows by way of illustration a can coated by the improved method—

Figure 1 is a view partly in section and partly in side elevation;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1, and

Fig. 3 is a sectional view on the line 3—3 of Fig. 1.

The invention is particularly adapted for the coating of the interior of a sheet metal can which is to be used for the packaging of beer. One form of can which may be used for this purpose is shown in the drawing and consists of a body portion 1 which is formed from a flat metal sheet. The metal sheet is cut into blanks which are shaped so as to produce a cylindrical can body. The edges of the blank are notched and bent so as to provide interlocking hooks which are united, bumped and soldered, thus producing the usual lock and lap side seam. The side seam as shown in Fig. 2 consists of an inner hook 2, and an outer hook 3, which are interlocked and solder bonded as above noted. After the can body is formed into cylindrical shape, it is flanged at each end thereof, and a bottom end 4 is secured to the can body by a double seam 5. The bottom end of the can, as shown in the drawing, is curved inwardly so as to strengthen the same and also to provide a smooth continuous surface which is free from shoulders and to which the coating will adhere in a film forming a substantial coating covering the entire end. The upper end of the can body 1 is likewise flanged, and a can top 6 is secured thereto by a double seam. This can top, in the illustrated form of construction, is cone-shaped and is provided with raised ribs 8 which strengthen the end so as to prevent the collapsing of the same under the pressure incident to the sealing of the container. At the extreme upper end of the cone-shaped part is a nozzle 9 having a shoulder 10 adapted to receive the usual form of crown seal 11.

The entire inner surface of the can is covered with a coating 12 of petroleum wax. The petroleum wax used must have a melting point well above the pasteurizing temperature for beer, and it must also be free from cracking or flaking when the beer is reduced to a temperature slightly above zero, even when the wall of the can is bent or indented during handling. In my application filed October 14, 1935, Serial Number 44,970, there is shown and described a sheet metal container coated with a petroleum wax of the character described above, and no claim is made to the can with the wax coating per se in this application. In the usual practice of coating the can with wax, the wax is reduced to a molten condition and is flowed over the entire inner surface of the can. The surplus wax is drained from the can, thus leaving a film which, when cool, sets so as to provide a coating for the interior of the can. The wax used preferably has a melting point of at least 160° F. According to the old practice, the coating material is heated to approximately 250° F., and then injected into the can which is at room temperature. The application is continued for several seconds, with a resulting temperature in the metal of the can of approximately 230° F. The film on the wall of the can must cool, therefore, 70° before the wax reaches a congealing point or semi-solid state. It is essential that the wax when applied to a can at room temperature be heated to a temperature of 250° F., to insure that the wax will flow over the entire metal surface. At this temperature, the wax is very fluid, and while the can is draining, the wax tends to thin out on the side wall near the bottom end of the can. It will also thin out on the shoulders formed in the metal at the side seam and in the shoulders formed on the ribs in the cone-shaped end.

The present method of coating the can avoids this objectionable thinning out of the wax at the points indicated. In carrying out the method, the can is pre-heated to a temperature of 180° F. This may be accomplished in any suitable way. The wax to be applied to the interior of the can is heated to approximately 200° F. It is then flowed over the surface of the heated can and the surplus wax drained from the can. The resulting temperature of the metal of the can after the molten wax is applied will be approximately 190° F., and therefore, the metal must only cool 30° before a solidifying point of the wax is reached. The wax being at this much lower temperature when applied to the wall of the can is less fluid, but yet sufficiently fluid to flow freely over the entire surface of the heated can. This application of the wax at a temperature of approximately 200° F., in combination with the fact that the wax will set in a shorter length of time, causes a film to form throughout the entire region of the body wall which is substantially of uniform thickness. It also causes a film to form on the shoulders adjacent the side seam and on the shoulders adjacent the strengthening ribs in the cone-shaped part of the top end of the can. As a result, a substantial coating of wax is obtained throughout the entire inner surface of the can covering every particle of the surface, so that the beer cannot contact with the metal of the can.

While the method is described as applied to the coating of a can with a petroleum wax having a high melting point of 160° F., it will be understood that it may be utilized in connection with the application of other types of thermo-plastic materials and waxes having a different melting point. The essential features of the invention reside in the heating of the can to a temperature slightly above the congealing point of the material which is to be coated thereon, and in the heating of the coating material to a temperature above its melting point only sufficient to cause the material to flow freely over the entire metal surface.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is—

1. The method of coating the inner surface of a sheet metal can having a side seam and end seams with a petroleum wax which is rendered fluid by heating, flowed over the inner surface of the can, and the surplus wax then drained from the can, consisting in heating the can until the metal is raised to a temperature a few degrees above the congealing point of the wax, applying heat to the wax for melting and raising the same to a temperature only sufficient to cause the wax to flow freely over the entire inner surface of the can while at a temperature slightly above the congealing point of the wax, whereby said wax is caused to adhere to and form a continuous covering for the inner surface of the can and the shoulders formed in the metal incident to the bending of the metal for forming the seams.

2. The method of coating the inner surface of a sheet metal can having a side seam and end seams with a petroleum wax which is rendered fluid by heating, flowed over the inner surface of the can, and the surplus wax then drained from the can, consisting in heating the can until the metal is raised to a temperature of approximately 180° F., applying heat to the wax and raising the same to a temperature of approximately 200° F., so as to cause the material to flow freely over the entire inner surface of the can while at a temperature slightly above the congealing point of the wax whereby said wax is caused to adhere to and form a continuous covering for the inner surface of the can and the shoulders formed in the metal incident to the bending of the metal for forming the seams.

ALFRED L. KRONQUEST.