Patented Feb. 2, 1937 2,069,247

UNITED STATES PATENT OFFICE

2,069,247

CAN COATING ENAMEL

Lehman E. Hoag, Bellwood, Ill., assignor to American Can Company, New York, N. Y., a corporation of New Jersey

No Drawing. Application October 24, 1933, Serial No. 695,047

4 Claims. (Cl. 99—181)

The present invention relates to coating materials and has particular reference to a process for preventing spangling and discoloration of the interior of metallic containers for food products and also for preventing discoloration of the container coating as well as discoloration of the contents of the can through the use of a more universal coating of the baking enamel class applied to the can wall. The term "spangling" as understood in the can making industry is to an extent somewhat synonymous with the term "discoloration". Specifically the term "spangling" has reference to the discoloration of the tin plate which follows in shape the etch figure of the tin crystals. Whereas the term "discoloration" has specific reference to the dark areas more or less generally distributed over areas of the surface of the plate, the term "spangling" refers to the discoloration that follows the etch figure of the tin crystals.

Prior to the instant invention tin cans have been generally provided with protective coatings for the packaging of food products to prevent undesirable reaction between the metal or metals of the can and the packaged materials, and these coatings have included resin, and synthetic resin varnishes and enamels.

Some of these enamels have served as a protection against the action of certain food products. Other special coatings have been used to prevent spangling and, or, discoloration of the can walls by certain less acid food products, corn for example, where the enamel has been pigmented with zinc or other oxides. The value, however, of these enamels as protective coatings has been restricted and special coatings have been found necessary for special products.

The present invention contemplates improvement in coatings of this character to the end that a more universal use is possible so that a single coating will serve more purposes and its value will be extended to a larger range of products. Furthermore, the metal of the can is more perfectly and fully protected against chemical reaction with the food products and the coating itself is better able to withstand attack from the can contents before, during, and after processing of the product.

The improved coating is also easily made and applied and ordinary varnish manufacture and ordinary coating and baking procedure of the enamels are in large part used. Viscosity is also easily controlled particularly at the coating stage where the surfaces of the can or those surfaces which eventually form the inner can walls, are covered with the enamel coat. This is important for much trouble has been experienced in the past in the livering and thickening of some coatings such as the zinc oxide group of special enamels, a thickening action being at times so great as to result in great losses of materials which must be discarded as unfit for use. In other cases, particularly with the zinc oxide enamels, leaching of the zinc into the product is likely to occur and undesirable color effects are produced either on the product or the enamel.

The accomplishment of these desirable ends and the avoidance of the undesirable features in accordance with the instant invention are effected by incorporating into the varnish or enamel a metallic soap which, unlike the zinc oxide previously used in the coatings mentioned, goes into solution in the enamels and provides substantially a permanently embodied material which does not react detrimentally with the product to impair the coating, nor to spangle the can walls nor to affect the product itself. Spotting or streaking and discoloration of the can wall or discoloration of coating or discoloration or impairment of the product does not take place.

The metallic soap referred to may be incorporated with most of the resin varnishes generally employed for the lining or coating of cans. A typical varnish or vehicle for the soap, as one example, may consist of I rosin, copal gums, heat treated China wood oil, manganese resinate, and mineral spirits properly compounded.

The metallic soaps may take many forms of organo metallic compounds, organic compounds of zinc being preferred as far as present practices are concerned. Magnesium, calcium, and other soaps may also be used. The organo zinc compounds in turn may be zinc linoleate, zinc tungate, zinc resinate, zinc oleate, etc. The exact manner of making the soap is immaterial to the present invention. As one example, a zinc linoleate may be produced by the kettle method by heating the fatty acids of linseed oil at a temperative of 450° F. and reacting with an equivalent weight of zinc oxide. The fatty acids of many drying and semi-drying oils may be successfully used in such soap production.

The addition of the metallic soap to the enamel may be made in several ways during or after thinning of the enamel, a certain regard for the temperatures being the only limitation. A more favorable way of proceeding, however, is to first thin the zinc soap by an appropriate varnish thinner which may comprise any one of a number of mineral spirits, and toluene has also

been found to be very satisfactory. A soap solution is thus obtained. This solution will keep for a reasonable time and may be added directly to the enamel without heating whenever most convenient, this usually being when the enamel is to be run in the factory. The standard practice in this regard is coating of the sheet in the flat and before fabrication into a can, so that baking of the applied coating is thus most conveniently made. This is standard can manufacture and further description for the instant purpose is unnecessary.

The metallic soap being neutral provides a stable and permanent coating when applied to the interior walls of the can. It will not liver or thicken when applied by the usual coating rollers. It may be stored and used only as needed, this obviating any losses by deterioration.

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. The process of preventing spangling of the interior of metallic containers and discoloration of the can wall coatings and discoloration of the contained product sealed in the cans by the action of the said product which consists in providing a liquid enamel coating containing zinc linoleate soap which is soluble in the enamel.

2. The process of preventing spangling and discoloration of the interior of metallic containers by the action of food products sealed in the cans which comprises, providing a lacquer enamel coating for the cans which contains a zinc tungate soap soluble in the enamel.

3. The process of preventing spangling and discoloration of the interior of metallic containers by the action of food products sealed in the cans which comprises, providing a lacquer enamel coating for the cans which contains a zinc oleate soap soluble in the enamel.

4. The process of preventing spangling and discoloration of the interior of metallic containers by the action of food products sealed in the cans which consists in providing a lacquer enamel coating for the cans, said lacquer including an organic metallic compound produced by chemical reaction between zinc oxides and the fatty acids of the semi-drying oils, said metallic compound being soluble within the said lacquer enamel constituting the vehicle.

LEHMAN E. HOAG.