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MORTIMER T. HARVEY, OF NEWARK, NEW JERSEY

CONTAINER AND MATERIAL THEREFOR

No Drawing. Application filed October 1, 1927. Serial No. 223,481.

The present invention relates to containers and to material for containers with which are associated a coating or an impregnation of a material made from the oil or liquid which occurs in the cellular outer shell or husk of the cashew nut and to method of producing these products. Containers having such a coating thereon or impregnated thereinto are particularly useful for holding and transporting food stuffs because this material is insoluble in water, alcohol, oils, dilute acids and alkalis, and other solvents; and for this reason such containers are useful for holding dilute acids or alkalis, ether, alcohol, oils, and so on, and the materials and the containers made according to the invention are useful in the arts generally.

Various objects and advantages of the invention will be obvious from the following description of new and useful containers and container material embodying the invention; and the invention consists of the containers and container material set forth in the claims.

The material for coating the containers of the invention and for impregnating the same or others thereof is made by treating the oil or liquid from the husk of the cashew nut to make it insoluble when dried and also to make it presentable either by itself or by means of a carrier vehicle or by a solvent vehicle to apply it to a material to be coated or impregnating or both as by flowing or dipping or brushing or other suitable methods or means.

The methods of making the oil insoluble are set forth in various copending applications but two suitable examples will be cited here to make the present invention practicable. One method is to heat the husk oil of the cashew nut in contact with copper metal at a temperature of 200° C. for about forty-five minutes at a normal pressure. The resultant material is a liquid which itself can be applied to a surface by some of the methods above cited. This resultant liquid can also be taken up with a solvent such as kerosene, naphtha, benzine or the like. In either case, whether applied by itself or by a solvent or other vehicle the reaction product, after removing the vehicle in cases where used, will dry to a tough, resilient or flexible body, or film. A suitable temperature for drying the reaction product is 104° C. for an hour and in some cases for very much less time.

For some purposes gelled linseed oil is mixed with the above reaction product and applied as by means of a solvent vehicle. This is desirable for example when the cashew shell oil is limited in quantity and linseed oil not so limited. The product involving linseed oil has many of the desirable characteristics of the products of the cashew shell oil alone although in some cases not to the same degree. These coating materials, as well as the others herein noted, are, among other uses, notably suited for lining bottle caps and caps for other containers, for example, for mustard and pickle bottles, for cardboard ice cream containers, and for lining the caps on metal bottles for containing ether. The characteristics which make these products suitable for the particular purposes above noted are insolubility, freedom from taste and smell and proof against dampness and absorption of water.

Another method of producing coating and impregnating material for containers is substantially as follows. The cashew nut shell oil is heated with about 10% of its weight of nitric acid sp. gr. 1.40 for about thirty minutes at a temperature of about 240° C. The reaction product is washed to free it of acid and is taken up with a vehicle such as kerosene. The application of this form is by dipping, brushing, or spraying as with the others.

The materials for making containers for which the above described reaction products of cashew nut husk oil are suitable are any of the materials theretofore used such as paper, cardboard, wood, gelatines, cellulose acetate and the like, metal and other materials some not heretofore used because of unsuitability on account of porousness, absorption of moisture, and other reasons. The materials named can be rendered gas tight by a coating of one of the reaction products named. These products can be used also for water proofing or moisture proofing wood, paper, glacine paper, cellulose products and so on.

Food containers in particular can be made of material which has been impregnated or coated with the reaction products named.

A further use for the material is the replacement of tin for coating iron in the making of sheet metal containers, the material being peculiarly adapted for this use because of its insolubility in food juices, certain acids and alkalis, acetic acid-brine pickling solutions and hydrocarbons which are generally known as solvents such as kerosene, gasolene and the like. The material can be used for coating copper and the copper which is coated can be utilized for bringing the cashew shell oil into a condition in which it will dry as for example according to the copper reaction above described. In making of containers either or both the inside and outside surface of the container is or are provided with the coating described. Also the material for the container is coated either before or after the container is made thereof.

A still further method of making containers or container material is to produce a thin coating of copper on sheet iron as by immersing the sheet iron in a copper sulphate bath until the iron becomes coated with the copper, or by electrolytic deposition with electrodes. The copper coating on the iron is then utilized to catalyze a reaction of cashew nut shell liquid brought in contact thereover. In making metal containers or in making the material therefor a coating of cashew nut shell liquid varnish can be obtained by immersing the material or the container itself in the shell liquid which is at a temperature of about 200° C. for about forty-five minutes after which the immersed and treated material is withdrawn from the bath and properly drained to secure an even coating of the treated liquid thereover. Further heating at from 100° to 150° C. or more is then used to set the resultant coating on the surface.

A still further method of preparing the cashew nut shell liquid for making the coating or impregnating material is to heat it up to about 600° F. and then allow it to cool. Dryers such as litharge, or manganese dioxide, or copper oleate, or mixtures of these, or other driers, can be added at suitable temperatures; 450° F. is a practical temperature for adding the driers. The treated liquid, with or without the drier, can be applied without or with a solvent as a coating or impregnations and dried at say about 100° to 125° C., for examples. Also linseed oil, China wood oil, gums, or resins or mixtures of these can be added to the cashew nut shell liquid before or after or part before and part after the treatment of the cashew liquid and in these cases the drier can be used or not to secure different results.

Although I have set forth and described various methods and processes for producing my new products, it is obvious that various changes may be made in the methods or processes or in the various steps thereof without changing or modifying these essential features and characteristics of the products produced and that such products remain substantially with the same desirable characteristics although modifications may be made in the appearance, texture and in the physical and chemical characteristics.

Certain features of the invention disclosed but not claimed herein are claimed in my copending application Serial No. 227,862, filed October 21, 1927.

What I do claim as new and desire to secure by Letters Patent is:

1. The method of preparing a coated material which comprises producing a coating of copper on sheet iron, coating the copper layer with cashew nut shell liquid, heating said liquid in contact with said copper to produce a reaction in said liquid, and form a product in a layer in situ.

2. The method of preparing a coated material which comprises producing a coating of copper on sheet iron, coating the copper layer with cashew nut shell liquid, heating said liquid in contact with said copper at about 150° to 250° C. to produce a reaction in said liquid, and form a product in a layer in situ.

3. The method of preparing a coated material which comprises producing a coating of copper on sheet iron, coating the copper layer with a cashew nut shell liquid varnish, and heating said varnish in contact with said copper to set said varnish in place.

4. The method of forming a film which comprises providing a copper surface with a coating of cashew nut shell liquid varnish, and heating said varnish in contact with said copper to set said varnish in place.

5. The method of forming a film which comprises providing a copper surface with a coating comprising cashew nut shell liquid, and heating said coating in contact with said copper to set said liquid in place.

6. The method which comprises heating material selected from the group consisting of cashew nut shell liquid and modified cashew nut shell liquid in contact with copper to set said material in place against said copper.

In testimony that I claim the invention set forth above I have hereunto set my hand this 28th day of September, 1927.

MORTIMER T. HARVEY.