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METHOD OF PRESERVING ETHER

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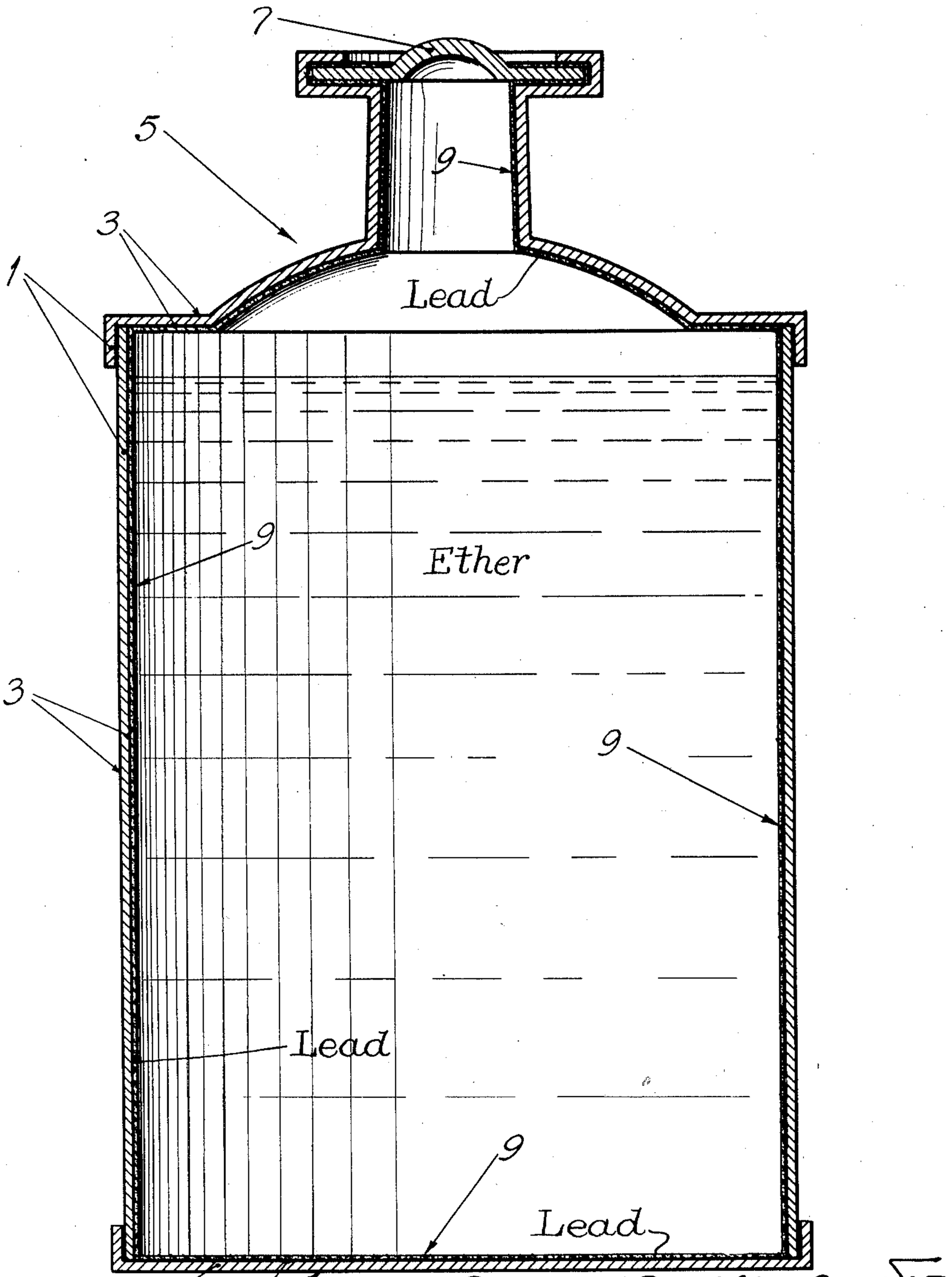

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METHOD OF PRESERVING ETHER

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1 Claim. (Cl. 23—240)

This invention relates to a method of, and apparatus for preserving ether, and with regard to certain more specific features, to a new and improved package for ethyl ether. This is a division of our pending application, Serial No. 233,980 filed Nov. 17, 1927, which matured into United States Patent 1,697,320, dated January 1, 1929.

Among the several objects of the invention may be noted the provision of means for protecting packaged ether from certain deteriorating influences exerted by the material comprising the original inner surface of the enclosing package and the provision of means of the class described which are economical in application. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, arrangements of parts, materials and the combinations of materials and the steps and sequence of steps, which will be exemplified in the following description and the application of which will be indicated in the annexed claim.

In the accompanying drawing, the figure illustrates a cross section of a package of ether to which the present invention has been applied.

Similar reference characters indicate corresponding parts throughout the specification and drawing.

Heretofore the conventional package for ether has comprised a metal can having the general shape of the package shown in the drawing. However, the shape of the can or package is of substantially no consequence in this invention. This previously used can was composed of conventional tin plate formed by the conventional process. During this process but after the tinning operation thereof, the plate passes through a bath of hot zinc chloride which removes dross and oxides from the tin surface. Thereafter the sheet is flushed with hot palm oil, whereby most of the zinc chloride is removed and the formation of an oxide film on the tin surface is substantially prevented.

We have found that a clean tin surface, prepared for example by the above process and whether or not in the presence of iron, exerts what is thought to be a catalytic or accelerating effect upon the reaction between ethyl ether and air, whereby ethyl peroxide and/or acetaldehyde is produced.

The tin cans (of which those made by the above process are merely representative) when filled with ethyl ether, have been found to exert the above effect upon the formation of ethyl peroxide and/or acetaldehyde in the ether. The ether, filled in contact with air, carries with it sufficient oxygen for the formation of these impurities, if thus catalyzed. It is conceivable that the effect may be other than catalytic, but in any case the invention described herein is effective independently of the theory of chemical action exerted by the inner tin or similar surface of the can.

The presence of ethyl peroxide and/or acetaldehyde is undesirable both in anæsthetic ether and certain grades of commercial ether.

It has been found that the rate of spoilage depends upon the character and extent of the tin or other surface exposed to the ether, the rate of decomposition being a function of the area of active tin. Hence, by cleaning the tin before the cans are used, the active catalytic surface is exposed, to the detriment of the subsequently packaged ether. Even though the palm oil were not undesirable per se, and were left on the tin, the ether cuts through it and thereby permits the detrimental catalytic action of the tin to proceed.

It is to be understood that the above remarks, as well as those following, apply to cans made by the above process, or pure-tin cans or others having inner surfaces which are detrimental to the ether.

It has been proposed to overcome the detrimental catalytic action of the inner can surfaces by merely introducing into the container an alleged catalyst poison or anti-catalyst.

On the other hand, the present invention comprises treating tin containers or similar packages so that a non-catalytic or passive surface is produced on the inner face of the metal composing the can, said surface being devoid of objectionable influence on the ether, whether the ether be in the presence or out of the presence of air.

Referring to the drawing, numeral 1 refers to the sheet iron which is surfaced on both sides with a coat of tin 3 and formed as a can or package 5.

Numeral 9 indicates the harmless inner passive surface. For the production of this surface several different methods of treatment have been found to be effective, of which one of the preferred forms is a protective metal coating.

The metal coating, which is harmless to the catalytic deterioration of ether, may comprise some passive metal such as lead, and may be applied either by a tinning or blowing operation, a dipping process, or any other similar process. The point to be made is that a coating non-detrimental to the deterioration of the ether is applied to the interior surface. This coating pro-

vides a non-detrimental surface, protecting the ether from the detrimental surface.

It will be seen from the above that one of the objects of the invention is to treat what is or becomes the inner surface of the can, so that there is substantially no catalytic or other action between the inner surface and the ether and/or air within the can, thus obviating the necessity for using preservatives or other foreign substances.

Furthermore, the invention eliminates the expense of a can composed completely of the non-detrimental substance but, at slight expense, makes the ordinary economical tin can available for packaging ether.

It is to be understood that the tin or other plate may be treated in the manner described before or after the can is formed.

It is also to be understood that the inner surface of the cap 7 may be treated as above described if it is desired to manufacture the cap from material similar to the material composing the can.

By entirely or completely surfacing of the inside of the can is meant herein, at least the surfacing of the container portion or portions without the cap, since the cap may be composed of non-detrimental material or its area may be so small that its detrimental effect is negligible.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in carrying out the above, without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

We claim:

The process of packaging ether comprising introducing ether into a container composed of material which may be deleterious to the ether, but which has the interior surface covered with lead.

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