Feb. 13, 1934. J. ROSIN 1,946,502

ETHER PACKAGE AND METHOD OF PACKAGING ETHER

Filed Jan. 27, 1931

Fig. 1.

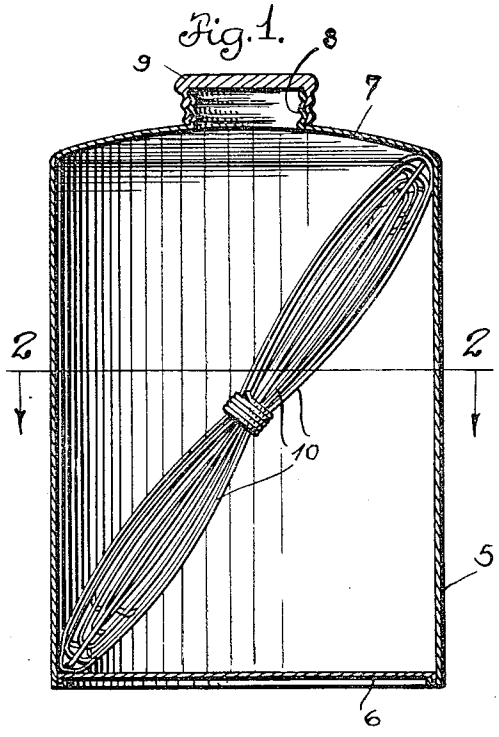


Fig. 3.

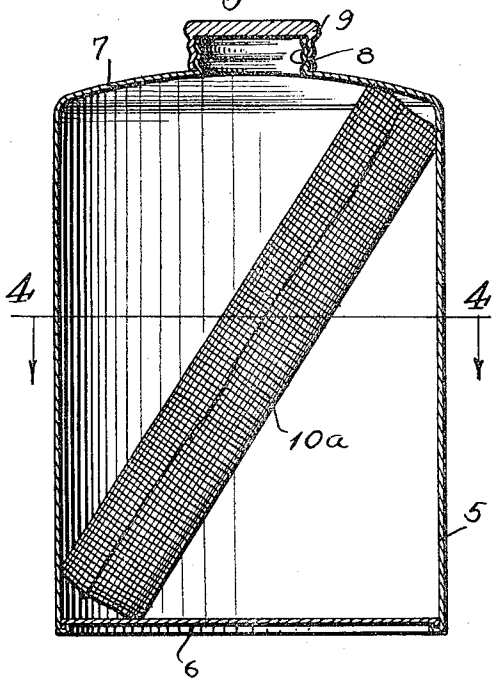


Fig. 2.

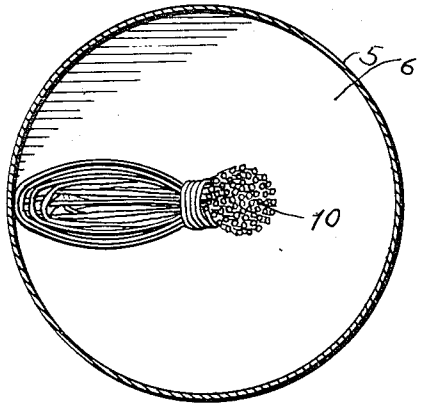
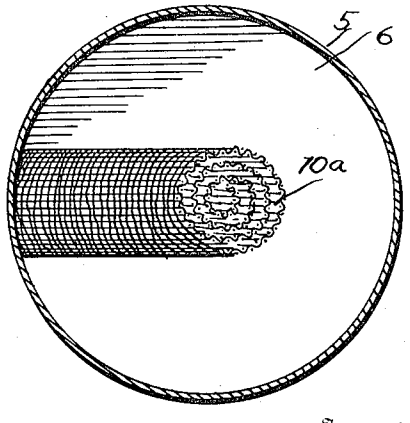


Fig. 4.



Inventor
Joseph Rosin

By Charles A. Darius

Attorney

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ETHER PACKAGE AND METHOD OF PACKAGING ETHER

Joseph Rosin, Plainfield, N. J., assignor to Merck & Co., Inc., Rahway, N. J., a corporation of New Jersey

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6 Claims. (Cl. 23—239)

This invention relates to certain new and useful improvements in ether packages and method of packaging ether.

The primary object of the invention is to provide means for the preservation of ether in packaged form especially intended for use as an anesthetic, it having been found that with the use of commercial containers in the form of tin or other metal cans, or of glass, now employed, deterioration after packaging results, rendering the ether unfit for anesthetic purposes.

It is a well known fact that ethyl ether is subject to spontaneous deterioration by oxidation. After packaging, whether in metal cans or glass, this oxidation process frequently appears to be accelerated by the walls of the container through some form of catalytic action, not well understood, with the resultant formation of ethyl peroxide and aldehyde. It has long been the aim of manufacturers to overcome this difficulty. Numerous attempts have been made to retard or prevent such changes or catalytic action, but in the majority of such instances, it is understood that the ether has been rendered unfit for anesthetic purposes, or it has been noted that any claimed favorable results were of a more or less indifferent character.

The present invention aims to provide a satisfactory method of packaging ether by the employment of the commercial packages now used in the trade, so that deterioration or catalytic action is either prevented or reduced to a minimum for practical periods of time and in a reasonably economical manner.

Anesthetic ether has been usually packaged in glass bottles or in tin cans, and while it is not definitely understood, it is believed that there is some form of catalytic action by the surface of the package or container resulting in the formation of ethyl peroxide or aldehyde in the ether. The object of this invention is to employ any of the ordinary containers for ethyl ether and to place a preservative element in them and immersed in the ether to prevent deterioration of the latter.

With the foregoing and other objects in view, that will become apparent as the nature of the invention is better understood, the invention consists of a preservative element, contained within the ether container and such ether package and method of packaging ether will be hereinafter described in detail with particular reference to the containers of the can type.

One embodiment of the invention is shown in the accompanying drawing, to which reference is had by like characters, designating corresponding parts throughout the several views and in which drawing:—

Figure 1 is a vertical longitudinal sectional view of a commercial ether container with a preservative element placed in the container;

Figure 2 is a cross-sectional view taken on line 2—2 of Figure 1;

Figure 3 is a vertical longitudinal sectional view of the commercial container with another form of preservative element in the container, and

Figure 4 is a horizontal sectional view taken on line 4—4 of Figure 3.

In the art of ether preservatives and in the packaging of ether for commercial uses, such as for anesthetic purposes, it is known that metallic iron in powdered form effectively retards or prevents catalytic or other reactions which are responsible for deterioration of the ether, but where the ether is to be used for anesthetic purposes, it is impractical to use metallic iron powder or any substance which would present finely divided foreign matter to the ether.

Therefore, one specific adaptation of the present invention is to place metallic iron in different forms within the container, to be immersed in the ether and to present a multiplicity of exposed faces to the ether for intimate association, and in effect accomplishing the action of iron powder without the detrimental use of such powder. The introduction of the metal in any other loose form is also obviously objectionable.

In the form of the invention shown in Figures 1 and 2, the reference numeral 5 designates a can that may be of any configuration in cross-sectional area, herein illustrated as round in Figure 2 and having a bottom wall 6, a shoulder 7, a neck 8 and a removable screw cap 9. A sheaf 10 of bent wire or iron rod of a length slightly greater than the height of the can is inserted through the can neck 8 and inherent resiliency thereof permits flexing so that sheaf 10 can assume an angular position within the can and be rigidly supported therein by having one end engaged with the bottom 6 adjacent the side wall 5 and the other end engaged with the shoulder 7 adjacent the upper end of the side wall, thus to eliminate vibration or movement of the sheaf within the can.

In the form of the invention shown in Figures 3 and 4, the ether preservative is in the form of an iron mesh screen roll 10*a* of a diameter to pass through the can neck 8 and being of a character to present practically an unlimited number of

faces to the ether contained in the can, the screen roll 10*a* being retained in the can against movement in a manner similar to the sheaf 10.

It is, of course, understood that similar adaptation of the principle of the invention can also be made to glass bottle containers for ether.

It will be understood that a maximum surface exposure of metal to the ethyl ether is obtained by a preservative of the types herein illustrated, it being understood that such iron preservative may be in the form of strips or the like and may be separately placed in the can. It will also be found preferable to first insert the iron preservative in the container and thereafter charge it with ether so that immediate sealing thereof may be accomplished for the purpose of preventing unnecessary evaporation, access of air or possible contamination.

While there are herein shown and described the preferred embodiments of the invention, it is understood that specific changes may be made, such as will fall within the scope of the invention as claimed.

I claim:—

1. The method of preserving ether from deterioration in commercial containers, comprising the storing of ether in the presence of a preservative element, consisting of an integral member of metallic iron in a form presenting a multiplicity of exposed faces immersed in the ether, said member being arranged in a flexible, resilient bundle or sheaf of a length slightly greater than the transverse longitudinal diameter of the container, adapted to assume an angular position within the container and to be rigidly retained in such position by engagement of its opposite ends within the corners formed by the walls of the container.

2. The method of preserving ether from deterioration in commercial containers, comprising the storing of ether in the presence of a preservative element consisting of a flexible resilient sheaf of fine iron wire immersed in the ether, said sheaf being of a length slightly greater than the transverse longitudinal diameter of the container, adapted to assume an angular position within the container and to be rigidly retained in such position by engagement of its opposite ends within the corners formed by the walls of the container.

3. The method of preserving ether from deterioration in commercial containers, comprising the storing of ether in the presence of a preservative element consisting of a flexible resilient bundle of iron wire netting immersed in the ether, said bundle being of a length slightly greater than the transverse longitudinal diameter of the container, adapted to assume an angular position within the container and to be rigidly retained in such position by engagement of its opposite ends within the corners formed by the walls of the container.

4. A package of ether comprising a container of the kind described, and a resilient integral member consisting of iron metal in a form having a multiplicity of exposed faces, and immersed in the ether, said member being arranged in a flexible, resilient bundle or sheaf of a length slightly greater than the transverse longitudinal diameter of the container, adapted to assume an angular position within the container and to be rigidly retained in such position by engagement of its opposite ends within the corners formed by the walls of the container.

5. A package of ether comprising a container of the kind described, and a resilient sheaf of fine iron wire, said sheaf being immersed in the ether and being of a length slightly greater than the transverse longitudinal diameter of the container, adapted to assume an angular position within the container and to be rigidly retained in such position by engagement of its opposite ends within the corners formed by the walls of the container.

6. A package of ether comprising a container of the kind described, and a resilient bundle of fine iron wire netting, said bundle being immersed in the ether and being of a length slightly greater than the transverse longitudinal diameter of the container, adapted to assume an angular position within the container and to be rigidly retained in such position by engagement of its opposite ends within the corners formed by the walls of the container.

JOSEPH ROSIN.