UNITED STATES PATENT OFFICE.

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METHOD OF MAKING SICCATIVES.

SPECIFICATION forming part of Letters Patent No. 510,050, dated December 5, 1893.

Application filed January 7, 1893. Serial No. 457,609. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE W. SCOLLAY, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Methods of Making Siccatives, of which the following is a specification.

My present invention relates to driers for vegetable oils, paints, varnishes, &c., and it consists of certain novel processes or methods pointed out in the claims concluding this specification.

It is well known that lead and manganese make the best siccatives and these are now generally employed. The ordinary manner of proceeding is, briefly stated, to add litharge or minium to oil at boiling temperature, or which is subsequently raised thereto, and to continue the heat at this temperature until the oil has taken up a sufficient quantity of the oxide to make of it a commercial drier. One of the objections to this method is the dark color of the drier made thereby. Several methods have been proposed to overcome this objection, such as the use of various salts, for example, but these have not been sufficiently satisfactory to bring them into general use owing to various reasons.

I have discovered that if the mono-oxide (PbO) or lower oxide of lead such as di-plumbic oxide (Pb_2O) for example or equivalent forms of other metals, for instance, green (mono-oxide) of manganese (MnO) be added to the oil at a temperature below 300° or 350° Fahrenheit it will take up a sufficient quantity of the oxide to form a commercial siccative and that no objectionable discoloration of the oil used will accompany the operation, so that the siccative may be made no darker in color than the oil employed. In the use of these metallic oxides discoloration will ensue if the temperature of the oil be raised much above 300° Fahrenheit but a high temperature is not necessary as it is with litharge or minium. The temperature at which discoloration attends the introduction of these metallic oxides I call the "temperature of discoloration." The oxide employed acts as a carrier of oxygen from the air to the oil causing rapid oxidation of the same, or as it is called drying. Furthermore, not only can I in this way make a drier which is no darker than the oil used in its manufacture but I have further discovered that by using a metal in the forms above described in quantities in excess of what the oil will take up the resulting siccative will be even lighter than the oil or varnish used in making it—in other words, that the excess of metal which is precipitated acts as a decolorizer. In this way a "water-white" drier may be made, whereas driers in common use to-day are the color of dark molasses.

I will now describe how I at present proceed to make water-white driers according to the plan of my invention, to enable others skilled in the art to practice it in the manner at present preferred by me; but it will be understood that my invention is not limited to the precise steps or manner of proceeding described and that it embraces the use, not only of the materials described but also of their chemical equivalent and their use in different proportions, and that various modifications may be made without departing from the spirit of my invention and without exceeding the scope of the claims, in which claims the omission of reference to elements or steps herein described is intented to be a formal declaration of the fact that the omitted elements or steps are not essential to the practice of the inventions therein severally covered. Assume lead to be chosen as the metallic element of the siccative. It is of course immaterial how the mono-oxide or di-plumbic oxide be produced. At present I prefer to make it by heating white-lead in a retort to a dull red heat and then permitting the contents to cool while the retort is closed, although it may be prepared in any other suitable way.

In making varnish I usually proceed as follows: Melt gum and add to it the required quantity of linseed oil. After the gum is dissolved and the varnish has acquired the desired viscosity let it cool to 250° or 300° Fahrenheit (the temperature for filtering). Then add from twenty-five to fifty per cent. of turpentine. Then add five per cent. of the di-plumbic oxide or other lead sub-oxide and agitate briskly, for, say, fifteen minutes. Then settle and filter. The color of the var-

nish thus made will be very light, will set in three or four hours and will dry in ten or twelve hours.

In making a quick drying oil I usually proceed as follows: Boil the oil to give it the required body. Allow it to cool to about 200° Fahrenheit (the temperature for filtering). Add, say, five per cent. di-plumbic oxide and agitate one-half hour. Settle and filter. The oil will be lighter in color than it was before the siccative was added and will dry in from ten to twelve hours. Instead of filtering, if preferred, it can be cleared after separation from the precipitate by adding a small quantity of oil (preferably boiled).

In making a siccative for use with raw oil I usually proceed as follows: Boil the oil to give it the required body—the boiling in this case being preferably continued for a longer time than in the other. Then I cool and add, say, twenty-five to fifty per cent. of turpentine or other dilutant. Then I add, say, five to ten per cent. mono-oxide of lead or di-plumbic oxide and agitate, say, one-half hour. The metallic element is described as being introduced at the temperatures at which the varnish and oil are commonly filtered. It would effect substantially the same results if introduced at ordinary temperature.

The green oxide of manganese (MnO) may be made by passing hydrogen gas over carbonate of manganese in the presence of heat. Its affinity for oxygen is so great that it is in the presence of air instantly raised to a higher oxide. To avoid this my practice is to introduce oil into the retort before air has had access to it thus excluding oxygen from the green oxide of manganese. In this condition it may be used substantially as described above.

Litharge which is an impure and fused mono-oxide of lead is not the equivalent of pure mono-oxide of lead in the above processes. Litharge will not combine with vegetable oil in sufficient quantities to make a commercial siccative below the temperature of discoloration while mono-oxide or lower oxide of lead will. Neither are the salts of manganese from which the mono-oxide of manganese may be obtained the equivalent of the green oxide of manganese since they operate in a substantially different way and produce substantially different results.

It will be observed that I have described the introduction of the metallic oxide into the oil after it has been made more or less viscid by heat. I have discovered that viscid oil will absorb a much larger quantity of metallic oxide suitable to form a siccative than will the same oil before it has been rendered viscid by artificial means. Of course the viscosity might be obtained by other means than by boiling, as, for instance, by the passage of oxygen gas therethrough or in the manner described by me in a pending application bearing Serial No. 449,244. The addition of an oxide to the oil for the purpose of making a drier, irrespective of the character of the oxide employed, after the oil has been rendered viscid is, therefore, one of the novel features of my present invention.

What I claim is—

1. The method of making siccatives consisting in adding to vegetable oil a suitable metallic oxide introduced as such not higher than the mono-oxide to form a siccative.

2. The method of making siccatives consisting in adding to vegetable oil a suitable metallic oxide introduced as such not higher than the mono-oxide at a temperature below the temperature of discoloration.

3. The method of making siccatives consisting in adding to vegetable oil a suitable metallic oxide introduced as such not higher than the mono-oxide in excess of the quantity that will combine therewith, thereby simultaneously decolorizing it.

4. The method of making siccatives consisting in making vegetable oil viscid and then adding thereto a suitable metallic oxide or equivalent material.

5. The method of making siccatives consisting in making vegetable oil viscid and then adding thereto a suitable metallic oxide or equivalent material which will combine in sufficient quantities to make a siccative at a temperature below the temperature of discoloration.

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Witnesses:
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