

UNITED STATES PATENT OFFICE.

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PROCESS OF MANUFACTURING PAINTS.

SPECIFICATION forming part of Letters Patent No. 702,175, dated June 10, 1902.

Application filed January 2, 1900. Serial No. 59. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM N. BLAKEMAN, Jr., of the borough of Manhattan, in the city, county, and State of New York, have invented a new and useful Process of Effecting the Drying of Non-Drying Fatty Oils, which invention is fully set forth in the following specification.

The object of this invention is to adapt the "non-drying" fatty oils for use in the manufacture of paints by so combining them with pigments and driers that the combinations formed when applied as paints will exhibit drying and indurating qualities and produce more economical and satisfactory results than the mixtures now in use.

The invention will first be described in detail and then set forth in the claims.

The drying of oil combined with a pigment when spread as a paint is owing to three actions—namely, an increase of surface area exposed, the formation of a metallic soap or saponaceous compound, and the absorption of oxygen—and my investigations in the matter have demonstrated the fact that the formation of metallic soap is the first chemical reaction and that the character of the soap formed, whether a hard soap or a soft soap, is also of the highest importance. These facts have been entirely overlooked in all previous attempts to dry the non-drying fatty oils in combination with a pigment, and the result has been continuous failure, it being necessary to the drying of a paint that the pigment shall assist in forming a hard insoluble soap with its oil vehicle. Lead oxids and salts, iron oxids and salts, and some others in the proportions in which they can be used in paints form soft soaps with the non-drying fatty oils, and a non-observance of this fact has led to the persistent use of white lead as a pigment, with the result that all attempts to dry and harden the non-drying fatty oils have failed. Successive investigators have been led into this error because white lead possesses the characteristic of "body in oil" in such a preëminent degree that heretofore it has been found necessary to use sufficient white lead in all pigment mixtures to give "body" or spreading power to the paint; but in the case of a non-drying fatty oil being

used as a vehicle the white lead when employed in the usual manner to give body or spreading power has defeated the drying of the paint.

I have discovered that by first treating a pigment in the manner hereinafter described and then incorporating this treated pigment in a non-drying fatty oil drying properties will be imparted to the oil, so that the paint produced will dry satisfactorily. Any pigment that has a tendency to form a soft soap when used in a non-drying oil will have this tendency very considerably reduced if treated by my process; but in carrying out my invention I prefer to reject such pigments and to use and treat a pigment that will form or assist in forming a hard soap with the non-drying oil. If the pigment selected be deficient in body or spreading power, I may impart to it this characteristic, as well as drying properties, before incorporating it with the oil.

The non-drying fatty oils at present falling within the economical scope of my process are cotton-oil, sunflower-oil, corn-oil, and the like, and the pigments which may be used are preferably such metallic and earthy oxids and salts as will form a hard soap with the oil vehicle, the pigment which I have found the most suitable being oxid of zinc or zinc-white.

In carrying out my process, having selected a pigment and a non-drying fatty oil vehicle, I first incorporate a drier with the pigment before it is ground in said vehicle. Many substances are available for use as driers; but having in view simplicity and economy of manipulation and the most satisfactory commercial results I prefer to employ some of the metallic or earthy oxids or salts—for example, manganese salts and aluminium salts. I have discovered that some driers, notably the various salts of manganese, will perform the triple function of assisting or accelerating the formation of a hard metallic soap, of giving body or spreading power to the pigment, and of imparting oxygen to the paint, and hence I prefer to employ such agents in carrying out my invention.

Selecting cotton-oil as the oil vehicle and zinc-white as a pigment, adapted to form a

hard metallic soap therewith, I first impart drying properties as well as body or spreading power to the pigment by incorporating therewith a small proportion (say one and one-half per cent.) of a manganese salt, such as sulfate of manganese. The manganese sulfate is preferably attenuated or dissolved in a volatile vehicle—water, for example—and the pigment then saturated with the solution and the water then evaporated. I then, as the second step in my process, grind the pigment so treated in the cotton-oil vehicle, and if one hundred parts of pigment treated as above described be ground in one hundred parts of cotton-oil a paint will be produced which possesses great body or spreading power and will dry in a satisfactory manner, the time of drying being reduced if the usual quantity of commercial drier be added to the paint.

In order to produce a still more satisfactory and quicker-drying paint, the pigment may be first treated with a reduced proportion of manganese sulfate (say three-fourths of one per cent.) and then ground in a mixture of seventy parts of cotton-oil and thirty parts of linseed-oil. The paint so produced will dry satisfactorily, and if the usual quantity of commercial drier be added it will dry in five hours.

The drying and hardening of the non-drying fatty oils in combination with a pigment may be hastened still further by treating the non-drying oil itself, so as to cause it to assist in producing a quicker-drying result when the treated pigment is ground therein. This treatment of the oil I prefer to effect by boiling or heating the oil in the presence of an oxidizer or drier. Any suitable oxidizer or drier employed in the boiling of oils may be used; but I have found the oxids and salts of manganese and zinc well adapted for this purpose. If cotton-oil be selected, manganese black oxid will be found well suited as an oxidizer, twelve to fifteen parts of oxid in granular form to one hundred parts of oil being a good proportion. The heat may be from 250° to 300° Fahrenheit for a long exposure or from 350° to 380° Fahrenheit for a shorter exposure, care being taken not to carry the heat to incipient decomposition, for if the glycerids be greatly disturbed the oil will flock. When the oil has assumed a greenish color and grown perceptibly thicker, it will be found to be in a satisfactory condition, although the action may be carried still further by prolonged heating. In this operation the manganese oxid is partially dissolved in the oil and also yields a portion of its oxygen to the oil. In treating sunflower-oil ten or twelve parts of manganese oxid will be sufficient; but corn-oil will require fifteen parts or more. In all cases much better results are effected if the manganese oxid be added in small quantity at a time.

The proportions above given of driers, pigments, and oil vehicles and the method of

treatment may be varied as required by the character of the substances used and the nature of the result desired.

The driers used in my process may be any animal, vegetable, metallic, or mineral substance that will perform the function of imparting drying or hardening properties to the paint; but for treating the pigment I prefer to employ, as above stated, some of the metallic or earthy oxids and salts, such as the acetate, sulfate, borate, and benzoate of manganese and the hydrated oxid of aluminum. For treating the non-drying oil the peroxid or lower oxids of manganese will give good results, and when it is desired to add an additional drier to the paint the ordinary commercial drier will suffice.

I do not herein claim as a product the paint compound produced by the process herein described, such product being claimed by me in another application filed by me on the 16th day of December, 1899, bearing Serial No. 740,576.

Having thus fully described my invention, I claim—

1. The process herein described, which consists in first incorporating a drier with a pigment, and then grinding the pigment in a non-drying fatty oil.
2. The process herein described, which consists in first incorporating a drier with a pigment; then grinding said pigment in a non-drying fatty oil; and then adding an additional drier.
3. The process herein described, which consists in incorporating a drier with a pigment; heating a non-drying fatty oil in the presence of an oxidizer; and then combining the pigment and oil so treated.
4. The process herein described, which consists in first incorporating a drier with a pigment, and then grinding the pigment in a vehicle composed of a non-drying fatty oil and a drying oil.
5. The process herein described, which consists in incorporating a drier with a pigment; heating a non-drying fatty oil in the presence of an oxidizer; and then grinding said pigment in a vehicle composed of the non-drying fatty oil so treated and a drying oil.
6. The process herein described, which consists in attenuating a drier in a volatile vehicle; incorporating such attenuated drier with a pigment; evaporating the liquid portion of the vehicle; and then grinding said pigment in a non-drying fatty oil.
7. The process herein described, which consists in first incorporating a manganese salt with a pigment, and then grinding said pigment in a non-drying fatty oil.
8. The process herein described, which consists in incorporating a manganese salt with a pigment; heating a non-drying fatty oil in the presence of oxid of manganese; and then grinding said pigment in said oil.
9. The process herein described, which consists in first incorporating a drier with a zinc-

white pigment, and then grinding said pigment in a non-drying fatty oil.

10. The process herein described, which consists in first incorporating a drier with a zinc-
5 white pigment; then grinding said pigment in a non-drying fatty oil; and then adding an additional drier.

11. The process herein described, which consists in incorporating a drier with a zinc-
10 white pigment; heating a non-drying fatty oil in the presence of an oxidizer; and then grinding said pigment in said oil.

12. The process herein described, which consists in first incorporating a drier with a zinc-
15 white pigment, and then grinding said pigment in a vehicle composed of a non-drying fatty oil and a drying oil.

13. The process herein described, which consists in first incorporating a manganese salt
20 with a zinc-white pigment, and then grinding said pigment in a non-drying fatty oil.

14. The process herein described, which consists in incorporating a manganese salt with a zinc-white pigment; heating a non-drying
25 fatty oil in the presence of an oxidizer; and then grinding said pigment in said oil.

15. The process herein described, which con-

sists in incorporating a manganese salt with a zinc-white pigment; heating a non-drying fatty oil in the presence of an oxid of man-
30 ganese; and then grinding said pigment in said oil.

16. The process herein described which consists in incorporating a drier with a zinc-white pigment; heating a non-drying fatty oil
35 in the presence of an oxidizer; and then grinding said pigment in a vehicle composed of said non-drying fatty oil and a drying oil.

17. The process herein described which consists in first incorporating with a zinc-white
40 pigment a drier capable of giving spreading power to the pigment, and then grinding the pigment in a non-drying fatty oil.

18. The process herein described which consists in first attenuating in a volatile vehicle
45 a drier capable of giving spreading power to a pigment, then incorporating such drier with a pigment, then evaporating the vehicle and then grinding the pigment in a non-drying fatty oil.

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Witnesses:

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