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PROCESS OF MAKING METALLIC SOAPS

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This invention relates to the process of making metallic soaps and more particularly to the heavy metal soaps of the drying oil acids, especially tung oil, and has for its object the covering of the particles of the soap with a protective film to prevent oxidation.

The water insoluble heavy metal soaps are used both as driers and as transparent pigments for the manufacture of flat varnishes and lacquers and for such purpose must be finely divided pale colored powders, which permit of easy grinding in lacquer or varnish vehicles. The zinc, calcium, aluminum and magnesium soaps of the fatty acids are commonly utilized; these are manufactured by precipitation of sodium soap solutions by soluble heavy metal salt solutions, followed by filtration, washing, and drying.

The soaps commonly employed in the past have been those of fatty acids which are completely saturated, or nearly so—stearic, palmitic, etc. The soaps of these salts may be dried without difficulty and yield fine white powders. Recently, however, the use of soaps of the drying acids has been suggested and adopted because of their waterproof qualities. These soaps have lower melting points, however, than the soaps of the saturated acids and cannot be dried at elevated temperatures without danger of fusion. Furthermore, the unsaturated acids absorb oxygen from the air during the drying period, causing darkening. Where masses of these soaps are stored, oxidation causes heating, which may result in fusion in the container.

Of the drying oil soaps, the tungates are the most outstanding because of their waterproofness. But because wood oil is the most rapid drying of all the oils, the technique of handling the wood oil soaps is most difficult. This is especially noticeable in the zinc soap, as zinc has a drying action on oils, while the other heavy metals used for pigment soaps do not. As a result of this combination of drier radical with rapid oxidizing radical, zinc tungate cannot be handled in the dry state. When the fresh press cake is spread out to dry, a heat of over 100° F. is fatal, as the material fuses long before the water is gone. If a thin layer is spread out at room temperature and dried by air circulation, reasonably good results can be obtained, although the tungate darkens; but the resultant dry zinc tungate, stored in containers, fuses spontaneously, and we have often noted that it will catch fire while so doing. Immediate wetting with organic liquids and grinding does not always help because small agglomerates have been fused, and the re-

sultant pigment paste contains these agglomerates, which must then be centrifuged out of the flat varnish or lacquer. Because of these difficulties, zinc tungate pigment cannot be purchased in the open market.

Because of the extremely valuable properties of zinc tungate as a flattening pigment and its absence from the open market for the reasons stated, we endeavored to find some way of preparing this product in available form for storage and shipment from plant to plant.

We found that dry zinc tungate may be prepared and stored by adding to the wet slurry approximately 1% of a sugar, based on the weight of dry zinc tungate. The sugar apparently forms a protective film over the particles, and prevents oxidation of the interior pigment particle. Any sugar will work, but we prefer to use glucose because of its low cost.

In a preferred form of our invention, we sapon-

China wood oil	40 lbs.
Flake caustic soda	6 lbs.
Water	9 gals.

by heating just short of boiling for 2-8 hours until saponification is complete. The soap is added to a solution of 17 pounds of commercial zinc sulphate in 10 gallons of water, slowly, and with constant agitation. To the resultant slurry, a solution of ½ pound of glucose in water is then added, and stirred thoroughly. The slurry is then filtered through a press or centrifuge. The press cake is spread on racks to dry at approximately 110° F. and is then stored.

We have varied the methods of saponification and precipitation and have even dried up to 140° F. without fusion. Above this temperature, however, fusion is apt to take place.

Sucrose and other common sugars give results comparable with glucose, but are more expensive. We prefer to hold the sugar to a minimum. While 1% of sugar does not affect the waterproofness and general desirability of the zinc tungate as a flattening pigment, higher amounts have a tendency to do so. We use a minimum of sugar that will prevent fusion.

Other tungates and drying oil soaps in general may be kept from oxidizing by this method; but our experience indicates that those that remain solids at normal temperatures can be prepared without the use of sugar by careful manipulation. However, the addition of sugar gives a wider latitude in plant operating conditions.

We claim:

1. The process of producing a stable dry zinc

tungate consisting of precipitating the soap by any of the known methods, adding one percent of sugar, separating the soap and drying.

2. The process of producing a stable dry zinc
5 tungate consisting of precipitating the soap by any of the known methods, adding one percent of glucose, separating and drying.

3. The process of producing a stable dry zinc
10 tungate consisting of precipitating the soap by any of the known methods, adding sugar in sufficient quantity to prevent fusion and oxidation of the soap upon drying but insufficient to affect the waterproofness of the soap.

4. The process of producing a stable dry zinc
15 tungate consisting of precipitating the soap by any of the known methods, adding glucose in sufficient quantity to prevent fusion and oxidation of the soap upon drying but insufficient to affect the waterproofness of the soap.

20 5. The process of producing a stable dry zinc tungate consisting of coating the particles of the tungate with a protective film of sugar sufficient to prevent fusion and oxidation of the soap upon drying but insufficient to affect the waterproof-
25 ness of the soap.

6. The process of producing a stable dry zinc tungate consisting of coating the particles of the tungate with a protective film of glucose sufficient to prevent fusion and oxidation of the soap
30 upon drying but insufficient to affect the waterproofness of the soap.

7. A powdered zinc tungate the particles of which are coated with a sugar in sufficient quantity to prevent fusion and oxidation of the soap
35 upon drying but insufficient to affect the waterproofness of the soap.

8. A powdered zinc tungate the particles of which are coated with glucose sufficient to prevent fusion and oxidation of the soap upon drying
40 but insufficient to affect the waterproofness of the soap.

9. A powdered tungate the particles of which are coated with a sugar sufficient to prevent fusion and oxidation of the soap upon drying but
45 insufficient to affect the waterproofness of the soap.

10. A powdered tungate the particles of which are coated with glucose sufficient to prevent fusion and oxidation of the soap upon drying but insufficient to affect the waterproofness of the soap.

11. A powdered drying oil soap the particles of which are coated with a sugar which will prevent fusion and oxidation of the soap upon drying but insufficient to affect the waterproofness
5 of the soap.

12. A powdered drying oil soap the particles of which are coated with glucose which will prevent fusion and oxidation of the soap upon drying but insufficient to affect the waterproofness
10 of the soap.

13. The process of making a stable zinc tungate which consists of adding to the soap a water solution of sufficient sugar to coat the particles
15 of soap, and separating the soap from the liquid.

14. The process of making a stable zinc
20 tungate which consists of adding to the soap a water solution of sufficient glucose to coat the particles of soap, and separating the soap from the liquid.

15. The process of making a stable tungate 25 which consists of adding to the soap a water solution of sufficient sugar to coat the particles of soap, and separating the soap from the liquid.

16. The process of making a stable tungate
30 which consists of adding to the soap a water solution of sufficient glucose to coat the particles of soap, and separating the soap from the liquid.

17. The process of making a stable drying oil soap which consists of adding to the soap a water solution of sufficient sugar to coat the particles
35 of soap, and separating the soap from the liquid.

18. The process of making a stable drying oil soap which consists of adding to the soap a water
40 solution of sufficient glucose to coat the particles of soap, and separating the soap from the liquid.

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