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UNITED STATES PATENT OFFICE

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COMPOSITION FOR PRESERVATIVE TREATMENT OF FRESH FRUIT

No Drawing.

Application filed March 2, 1925. Serial No. 12,776.

This invention relates to compositions for preservative treatment of fresh fruit; and in particular it relates to wax-containing compositions useful when spread in a thin film-like continuous coating over the surface of fresh fruit to preserve the same in sound, plump, unwithered condition, and in substantial degree also to protect the fruit against infection from external sources.

Generally described, the novel composition of the invention comprises waxy material, such as a good commercial grade of paraffin wax associated with a phenolic mold-retarder and also, most desirably, with a solvent of suitable character, such as a relatively light mineral oil. A mold-retarder of the phenol type is well adapted for use in a composition of this character, although it is not well adapted ordinarily for direct application to fruit in the absence of associated wax or the like, because, when used without accompanying wax or oil, it is apt to burn or scald the fruit. Of the various phenols available for use in practicing this phase of the invention, the higher monohydric phenols are found to afford advantages rendering them distinctly superior to ordinary phenol, cresol, and the like. Phenols of the xylenol type, and mixtures of these with aromatic hydrocarbons such as the xylols, we have found after long investigation to exercise remarkable specific inhibiting action upon the development of blue mold and blue mold spores, while at the same time they are non-toxic to humans; and when blue mold spores are added to compositions containing a relatively small amount of such a phenolic agent, the spores do not develop but become permanently inactive. In practice it has been found desirable to employ for this purpose a commercial product obtained in the distillation of coal tar and known as "high efficiency acid". This contains phenols consisting largely of xylenols, together with aromatic hydrocarbons such as xylol and the like. The potency of this product as a disinfectant and fungicide varies somewhat, but its phenol coefficient as determined by the U. S. Hygienic Laboratory method is invariably greater than 5 and usually as high as 10 or 12.

The novel protective composition may or may not include constituents other than those above mentioned. It is sometimes advantageous for the composition to take the form of an emulsion-like coating mixture, and in such case the composition may include a substantial percentage of water and an appropriate emulsifying agent.

As typical of the novel composition when prepared in the form of an emulsion as just referred to, the following formula-range may be given as an illustrative example:

Paraffin wax-----	5 to 20 per cent	
Refined light mineral oil		
of the kerosene type--	30 to 50 per cent	
An emulsifying agent,		
such as a mixture of		
eight parts of coconut		
oil and one part of		
borax-----	up to 10 per cent	
A phenolic mold retarder		
of the xylenol type---	up to 10 per cent	
Water-----	the remainder.	

The refined light mineral oil of the kerosene type, referred to in the foregoing table, may in a typical instance be a petroleum distillate having a specific gravity of about 0.810, a flash point of about 149° F., and an approximate boiling range of 360° to 486° F. It is to be understood that the composition of the invention may comprise such a mineral oil in admixture with paraffin-wax and the phenolic mold-retarder, without other ingredients, the paraffin-wax constituting from 5 to 20 per cent of the mixture, the phenolic mold-retarder up to 10 per cent and the light mineral oil the remainder. Ordinarily much less than 10 per cent of the phenolic mold-retarder is required, as little as 1/2 to 1 per cent sufficing in many cases.

Another satisfactory coating mixture of suitably fluent character may consist of one part of paraffin-wax and two parts of a highly refined low-viscosity white mineral oil, which is odorless, tasteless and colorless, together with a small percentage of a phenolic mold-retarder of the character described. Such a white mineral oil may have, for example, a specific gravity of about 0.840, a vis-

cosity of 70-73 seconds at 100° F., a flash point of 340°-350° F., and a boiling range approximately 600°-745° F.

In employing the novel protective compositions of the invention in the preservative treatment of fruit, a very small quantity of the composition should be applied to the fruit and then spread over the entire surface of the fruit in a continuous and extremely thin film as by thoroughly rubbing the fruit. In practice this treatment can be effectively carried out by warming the composition if necessary to give it sufficient fluidity to enable spraying or atomizing it, and then directing a fine jet of the liquid composition upon the fruit, after which the small amount of coating composition thus applied can be spread over the fruit to give a protective film coating of the desired extreme thinness by subjecting the fruit to the rubbing and brushing action of rapidly revolving horsehair rolls. This general method of procedure is fully described in our prior copending application Serial No. 657,215, filed August 13, 1923, of which the present application is a continuation, and requires no further description here.

In preparing the novel composition the paraffin wax may be melted, and the light mineral oil is also desirably heated to somewhat above the melting point of the wax. Streams of the two warm liquids are simultaneously run into a container and the mixture stirred well. The phenolic retarder may be added at this stage, and the agitation continued, desirably in an emulsifier or homogenizer, until the mixture has cooled to room temperature. If the composition is to include water and an emulsifying agent, these may be added before the final agitation.

What we claim is:

1. As a new composition of matter, a mixture non-toxic to humans and comprising paraffin, a refined mineral oil and a phenolic constituent of the xylenol type, said mixture being of spreadable consistency at ordinary temperature.

2. As a new composition of matter, a mixture non-toxic to humans and comprising paraffin, a refined mineral oil and a phenolic constituent having a phenol coefficient of at least 5, said mixture being of spreadable consistency at ordinary temperatures.

3. As a new composition of matter, a mixture non-toxic to humans and comprising paraffin, a refined mineral oil and a phenolic constituent having a phenol coefficient of at least 10, said mixture being of spreadable consistency at ordinary temperatures.

4. As a new composition of matter, a mixture non-toxic to humans and comprising paraffin, a refined mineral oil and a fungicidal agent that includes xylenol and xylol.

5. As a new composition of matter, a mixture non-toxic to humans and comprising paraffin, a refined mineral oil and high coefficient

ciency acid derived from coal tar distillation.

6. As a new composition of matter, an emulsion-like mixture non-toxic to humans and comprising paraffin 5 to 20 per cent, a refined light mineral oil of the kerosene type 30 to 50 per cent, an emulsifying agent comprising borax and coconut oil up to 10 per cent, a phenolic mold-retarder up to 10 per cent, and water the remainder.

In testimony whereof we hereunto affix our signatures.

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