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LAUNDERABLE WAX-IMPREGNATED
DUSTING CLOTH AND THE LIKE

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The present invention relates to a launderable, wax-impregnated dusting cloth or other materials and it particularly relates to a dusting cloth which may be used repeatedly after laundering without substantial decrease in effectiveness.

It is among the objects of the present invention to provide a novel duster of fabric or other material which will most effectively retain dust and prevent dust from being thrown into the air and which at the same time may be readily laundered and after laundering will retain substantially all of its original effectiveness.

Another object is to provide a durable, impregnated dusting cloth or other material of the character described which may be used repeatedly after laundering and which will retain substantially its original effectiveness even though repeatedly laundered.

Another object is to provide a novel procedure for making dusting cloths or other dust collecting material which will assure the production of dusting cloths capable of being repeatedly laundered without loss of substantial effectiveness.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

It has been found most satisfactory to use as a wax collecting impregnant of a dusting cloth a mixture of waxes and ones which will be solid or non-liquid at room temperature.

Such a solid mixture, contrary to expectations, collects dirt and dust about as well as a liquid mixture, or as well as oil itself.

It has been found desirable, according to one embodiment of the present invention to provide a dusting cloth impregnated with a solid non-liquid wax and oil combination serving as a dust collecting mixture of low or zero saponification value and particularly with a high molecular weight, high melting point solid wax of the structure and character of microcrystalline wax derived from petroleum materials.

This solid wax when impregnated upon fabric or cloth materials not only greatly enhances the dusting qualities of a dusting cloth but also is very durable and resists laundering in lukewarm water or at temperature below 125° F. over long periods of time.

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When such a solid or mixture on cloth is laundered below its melting point, the losses of dust-collecting material are negligible as compared to when this dust-collecting material is a liquid.

It has been found in general that in order to provide a cloth which will retain and catch the maximum amount of dirt and dust, it is desirable to have a wax of low saponification number less than 15 to 20, having a high penetration value and a melting point above 100° F.

The waxes generally should all be of the hydrocarbon type and they may be mixed with other hydrocarbon materials, such as refined lubricating oil or liquid or jelly petrolatum, but low melting point or liquid hydrocarbon materials may be maintained at less than 20% and desirably less than 10% but with a high melting point wax (185° F. to 195° F.), the oil may run as high as 70 to 80%.

It is also possible to use similar hydrocarbon waxes, such as ceresin and ozokerite, and in general other high melting point hydrocarbon waxes which have low saponification values or saponification values which are fairly close to zero. This wax apparently appears to act as a sizing upon the fabric, yarn, paper or other dusting material while at the same time it permits penetration and action to detergent materials, such as soap, to remove such dust and dirt without the wax itself being removed. This sizing effect upon the exterior of the yarn or other material gives particularly satisfactory results in dusting and polishing and in connection with dust mops and dust cloths.

It is desirable to avoid mixtures containing vegetable or insect waxes with the customary saponification values of 40 to 200 since these show losses on laundering many times those with saponification values close to zero.

With such a material only 5% or less of the wax material is lost on each hand laundering at 125° F. compared with 50% or 90% with other waxes, such as Japan wax, carnauba wax or beeswax.

Interestingly enough, the microcrystalline or similar wax will retain low melting point hydrocarbon material, such as mineral oil or petrolatum jelly, upon the cloth in spite of repeated laundering.

In preparing the cloth or yarn for the purposes of the present invention, the microcrystalline wax is desirably included in a spindle oil solution having a viscosity of about 70 and containing minor proportions of ceresin or ozokerite, or both. Desirably small quantities of petrola-

tum either in liquid or solid form or paraffin may be included, as may also synthetic resins and latex, but these percentages should be below 25%.

Waxes such as carnauba wax, ouricury wax, palm wax and beeswax should preferably be omitted or not included in amounts greater than 5%. Paraffin may also be included, but here again should not be included in amounts over 10% or 15%.

To give several formulations:

Example

	Parts by Weight	Range
Microcrystalline.....	50	20 to 70
Ozokerite.....	5	0 to 20
Ceresin.....	5	0 to 20
Petrolatum.....	10	0 to 80
Stearamide of pentaethylene tetramine.....	1	1 to 5
Paracoumarin-indene resins.....	2½	2 to 25
Oil soluble phenol formaldehyde resin.....	1	0 to 5
Paraffin oil.....	1½	0 to 80
Napthenic oil.....	2	0 to 80
White mineral oil.....	1	0 to 80

The solids in the above impregnating composition should range at least from 50 to 75% or more. The oils and petrolatum should be less than 50% and desirably between 30 and 50%. The saponification number in all instances should be zero. The melting point of the wax composition should be over 125° F. to 150° F.

The proportion of microcrystalline wax should be between 10 and 90% of the total composition. The melting point of the entire composition, including the oil, should not be less than 100° F. If macro crystalline waxes are also employed, they should not be used in larger amounts than 10 to 20%.

The preferred microcrystalline wax should have a melting point in excess of 150° F. and desirably from 155 to 195° F.

The additives should be from 2 to 10% and these additives may include aluminum stearate, calcium stearate, polybutadiene, dioctylamine, and high molecular weight imidazolines. It is also possible to include pour-point depressants used as crystal inhibitors in mineral waxes and oil additives used as tackifiers to impart adhesiveness to an oil or grease and to increase its viscosity.

It is also possible to use hydrocarbon wax naphthalene condensates resulting from aluminum chloride reaction.

Generally, acids, esters, anionic surface active agents and nonionic surface active agents should be altogether omitted.

In the impregnation, the various mixtures of wax, oil and materials are desirably put in molten condition and then the cloth, cotton waste, fibers or other materials are dipped therein and otherwise impregnated by spraying or padding with the molten waxy material. This spraying or coating is desirably done with a temperature of about 180 to 200° F. and it has been found most effective to apply the material to cotton flannel or other felted or napped fabrics, following which the fabric is wrung out and dried.

It is also possible to impregnate the cloth or other material with the wax-oil mixture dispersed in an emulsion using a cationic emulsifier. The cationics in small concentrations do not increase the laundering losses.

It has been found particularly desirable to include high molecular weight cationic materials

such as amides of stearic or palmitic acid in amounts of not over 2 or 3% in the molten mixture.

It has been found that the resultant wax-impregnated dust cloth, cotton waste, mop, paper or other material will withstand repeated laundering below 125° F. without any great loss of wax, and after long usage in repeated laundering will only lose about 2% of its wax content and its effectiveness in picking up and retaining dust.

For example, to give comparable prior art and present invention results with a laundering at 125° F.:

- Oil treated cloth. 90% loss per laundering
- Wax-oil mixture of prior art. 50% loss per laundering
- Wax-oil mixture of present invention. 2% to 10% loss per laundering

To obtain uniform distribution after the initial impregnation or to restore uniform distribution after laundering, the cloth, mop or flannel material which has been impregnated may be baked for a period of five to ten minutes up to 225° F., which will result in a re-distribution of the waxy material upon the fibers.

The dusting materials of the present invention have a safe laundering temperature at "lukewarm," which is about 125° F., with an additional 25° to 30° F. as a margin of safety.

Desirably the waxes used must have high penetration values and so must be plasticized with oil. Mineral oil has a saponification value of zero. The only waxes which have sufficiently low or zero saponification values are microcrystalline wax, ozokerite, and ceresin. Although paraffin has a low saponification value, it is not too suitable, being crystalline and usually of low melting point, and moreover because it dissolves in the oil. On the other hand, in the present invention, the oil dissolves in microcrystalline wax.

The invention is not only applicable to dust cloths but also in floor mops, dusting mits, and as sizing for paper, shredded fibrous material, and other material.

The embodiment of the invention described herein is to be considered merely illustrative, as the invention is susceptible to variation, modification and change within the spirit and scope of the appended claims.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed, what is claimed is:

1. A dusting woven textile material surface coated with a microcrystalline wax-mineral oil mixture solid at room temperatures.
2. A dusting woven textile material surface coated with a microcrystalline wax-mineral oil mixture resistant to laundering at or about 125° F.
3. A dusting woven textile material surface coated with a microcrystalline wax-mineral oil mixture having a saponification value of not over about 15 to 20.
4. A dusting woven textile material surface coated with a microcrystalline wax-mineral oil mixture, said wax and oil being substantially non-saponifiable.
5. A dusting cloth material comprising fibers impregnated with a high melting point non-

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saponifiable hydrocarbon wax having a melting point above 100° F.

6. A dusting cloth material comprising fibers impregnated with microcrystalline wax.

7. A dusting cloth comprising fibrous materials impregnated with microcrystalline wax, mineral oil and a para coumarin-indene resin composition.

8. A dusting cloth material comprising fibers impregnated with a mixture of 50% microcrystalline wax and 50% mineral oil.

9. A dusting cloth impregnated with a composition of microcrystalline wax, mineral oil, a para coumarin-indene resin and an additive.

10. A dusting cloth impregnated with a composition of microcrystalline wax, mineral oil, a para coumarin-indene resin and a high melting point fatty acid amide.

11. A washable launderable dusting textile material impregnated with a high melting point non-saponifiable hydrocarbon wax selected from the group consisting of microcrystalline wax,

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ceresin and ozokerite plasticized with a non-volatile mineral oil.

12. The material of claim 11 in which the mineral oil is petroleum jelly.

13. The material of claim 11 in which the mineral oil and the hydrocarbon wax are used in equal proportions.

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