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PROCESS OF REMOVING WAX FROM FLOORS

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The present invention relates to improved floor cleaners and, more particularly, to a cleaner adapted to remove maintenance wax from floors.

Surfaces such as floors, which are maintained with wax polishes, require repeated applications of wax from time to time. The wax so applied accumulates in layers in the corners and crevices of the floor and on such other parts which are not exposed to the ordinary traffic. Dirt is gradually worked into these layers of accumulated wax thereby causing an unsanitary condition and an unsightly appearance.

It has therefore been the practice in the art of floor maintenance to remove periodically all of the wax from the floor prior to the application of a fresh coating thereof. The insolubility in water of waxes and most floor wax compositions has presented a problem in its removal from floors. The recent commercial introduction of difficultly removable aqueous water-proof emulsions has further stimulated the search for an inexpensive wax remover which is rapid in its cleaning action without being harmful to the various floor finishes and flooring compositions. The compositions heretofore employed as floor cleaners, such as alkali solutions, organic wax solvents, and alkali metal soap solutions with or without the addition of free alkali, have not been entirely satisfactory for the reason that they are either very slow in their cleaning action or injurious to some or all of the composition floors and floor finishes.

The cleaning action of an alkali metal soap solution, whether pure or fortified with free alkali, depends upon the removal by abrasion of minute particles of wax from the wax film on the floor which wax particles are then emulsified with the soap. The complete removal of the wax in such small emulsifiable particles requires a tedious scrubbing action during the cleaning operation until the scrubbing has removed the entire film of wax. The use of the wax solvent cleaner also requires that the wax be removed by means of a severe scrubbing operation which serves the further purpose of replacing the saturated solvent adjacent to the film with more of the unsaturated solvent.

One of the principal objects of this invention is to provide a floor wax remover which is rapid in its cleaning action and harmless to the flooring or floor finish. Another object is to provide a non-inflammable and inexpensive floor wax remover which requires only a minimum of very light scrubbing during the cleaning operation to remove the entire wax film. Another object is to provide a floor cleaner which is substantially neutral. Further objects will readily become apparent from the description of the invention hereinafter set forth.

I have found that many alkaline reacting low molecular weight alkyl and cyclic amines exert an unusual penetrating action on waxes generally and particularly on the ester type of waxes such as carnauba wax. The application of a very thin coating of these amines or their aqueous solutions upon a wax polished surface causes the entire wax film to swell which swelling softens and loosens it from the floor. Since the cleansing action of these amines is neither by way of emulsification nor solution of the wax, it is difficult to explain in terms other than that the amine attacks the ester linkage of the wax thereby causing the swelling of the entire wax film. The above-mentioned amines, however, have the same corrosive action on composition floors and floor finishing materials as do strong alkalis, and their use as wax removers is likewise prohibited. I have discovered that unlike the strong alkalis, which, when sufficiently diluted to become harmless to the floors, are also ineffective as wax removers, certain amines will form a dissociated product in a dilute aqueous solution with higher fatty acids which will react upon a wax film in like manner as the amines, but without causing any injury whatever to the floor. The amines suitable for this purpose of forming a dilute aqueous solution with higher fatty acids are diethylamine, monoethylamine, dimethylamine and morpholine. The preferred fatty acids are those which have from 8 to 18 carbon atoms, such as linseed fatty acids, soya fatty acids, cotton seed fatty acids, oleic acid, linoleic acid, linolenic acid, stearic acid, palmitic acid, etc.

In preparing the cleaner I prefer to first prepare a cleaner stock which at ordinary temperatures has a consistency of a heavy viscous liquid or paste. This stock, when added to from four to six parts of hot water, provides a cleaning solution which possesses the unusual property of penetrating wax films. A preferred formula for the cleaner stock employing diethylamine is given as an illustration, parts being by weight:

Formula I

Diethylamine	5.7
Linseed fatty acids	20.0
Water	230.0

The fatty acid is heated to about 160° F. and the diethylamine is then added thereto with stirring. About 40% of the water, at or near its

boiling point, is slowly added to the mixture of fatty acids and amine with agitation. The remainder of the cold water is then slowly added with stirring until a uniform gelatinous paste is formed.

Other formulas which employ different amines, but which are prepared in the same manner, are as follows, parts being given by weight:

Formula II

Linseed fatty acid	20
Monoethylamine (33.3% aqueous solution)	10
Water	200

Formula III

Oleic acid	20
Dimethylamine (33.3% aqueous solution)	10
Water	200

Formula IV

Linseed fatty acids	20
Morpholine	9
Water	260

The stock paste for the wax remover is prepared so that the total weight of fatty acid and amine is equal to about 10% of the total mass, and the ratio of fatty acid to the amine is such that the amine substantially neutralizes the acid. Substantial neutralization of the fatty acid can be determined when the stock paste, upon being diluted with about 5 parts of water, produces a solution having a pH from about 8.9 to 9.3. This pH is the lowest which can be obtained for a dilute aqueous solution of a fatty acid having from 8 to 18 carbon atoms and an amine selected from the group consisting of diethylamine, dimethylamine, monoethylamine and morpholine. The pH of the wax remover prepared according to this disclosure is lower than that of the commercial so-called neutral soaps which have a pH of ten or more.

In using the stock paste, about one part of the cleaner stock is added to about four to six parts of hot water. This provides an effective amine soap concentration of about 2%. An increase in the concentration of the reaction product of the fatty acid and the alkaline amine decreases the effectiveness of the solution as a wax remover. At concentrations exceeding about 10% of the combined solutes the solution becomes ineffective as a practical floor cleaner. Although this novel wax remover also reacts like a soap in that it will emulsify any small particles of wax which are loosened from the floor, the necessity of a very dilute solution seems to indicate that the unusual wax film penetrating property of the cleaner is dependent upon the dissociated amine.

In removing the wax from floors, the hot solution of the cleaner stock and water is merely spread on the floor in a thin film and allowed to penetrate for about three minutes after which a very light scrubbing action removes the entire film of wax. This solution is then removed from the floor which is preferably rinsed with water before being allowed to dry.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In the art of floor maintenance the process of removing wax from floors which consists in applying to the floor a thin film of a hot solution comprising water and the reaction product of a fatty acid having from 8 to 18 carbon atoms and an amine selected from the group consisting of diethylamine, monoethylamine, dimethylamine and morpholine wherein the said reaction product equals by weight from about 1 to 10% of the water, allowing said solution to penetrate the dried wax film for about three minutes, scrubbing lightly to remove the loosened soft wax film, and then removing the wax and solution from the floor.

2. The process of removing wax from floors which consists in applying to the floor a thin film of a solution comprising water and the reaction product of a fatty acid having from 8 to 18 carbon atoms and an amine selected from the group consisting of diethylamine, monoethylamine, diethylamine, and morpholine, wherein the said reaction product equals by weight from about 1 to about 10% of the water, allowing said solution to penetrate the wax film, scrubbing to remove the loosened wax, and removing the wax and solution from the floor.

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