Patented Sept. 1, 1936

2,053,007

UNITED STATES PATENT OFFICE

2,053,007

CLEANING FLUID

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No Drawing. Application June 30, 1932, Serial No. 620,303

5 Claims. (Cl. 87—5)

My invention relates to improvements in dry cleaning fluids and particularly in dry cleaning fluids of the flame-resistant type comprising substantial quantities of chlorinated solvents.

One object of my invention is to provide a dry cleaning fluid of superior detergent properties, particularly with respect to dirt and water soluble stains which are not readily removed by an ordinary cleaning fluid. Another object is to provide a cleaning fluid which will leave a superior luster on garments which have been cleaned with it. A still further object is to provide a dry cleaning fluid of the chlorinated solvent type containing a new and improved detergent whose use prevents the occurrence of certain decomposition reactions which have been encountered in the use of previously known materials. Additional objects will become apparent as the description of my invention proceeds.

It has long been customary to dry clean textile fabrics, and particularly garments, with cleaning fluids such as naphtha, gasoline, benzol, etc. It has more recently been found desirable to use cleaning fluids containing substantial quantities of such chlorinated solvents as carbon tetrachloride, tetrachlorethylene, tetrachlorethane, trichlorethylene, etc. The use of these materials alone or together with flammable solvents, such as petroleum naphtha, gives a cleaning fluid of flame-resistant qualities which is highly desirable from the standpoint of safety. This type of fluid may be referred to as the "chlorinated solvent type."

It is known to incorporate certain types of soaps in naphthas and similar dry cleaning fluids. Usually for this purpose, soaps of the alkali metal fatty acid type have been employed. One objection to these previously known soaps is that they are rarely completely soluble and tend to settle out, which is particularly undesirable in a cleaning fluid to be used in the home. A very serious objection to these materials when used in fluids of the chlorinated solvent type is that they have a relatively high alkalinity or pH value which tends to promote hydrolytic decomposition of the chlorinated solvent with production of hydrochloric acid, metal chlorides, free fatty acids and other undesirable materials. I have found that it is possible to substantially overcome these disadvantages by the use of the sulfonic soaps, preferably the alkali sulfonates. Although it is possible to use sulfonic soaps made by the sulfonation of aromatic hydrocarbons and other materials, for instance, naphthalene sulfonates, I prefer to use sulfonic soaps made by the sulfonation of petroleum or petroleum distillates with concentrated or fuming sulfuric acid or other known sulfonating agents. Still more particularly, I prefer to use the preferentially oil soluble petroleum alkali sulfonates. These are commercially known as "mahogany soaps."

As a specific example of the manufacture of a soap of the type which I prefer to use in the manufacture of my new and improved cleaning fluids, a Mid-Continent lubricating distillate having a viscosity of about 130 seconds Saybolt at 100° F. is treated with six successive portions of 104% fuming sulfuric acid, each of these "dumps" of acid being in the ratio of one-half pound of acid to one gallon of distillate. Between each successive dump the acid sludge produced is withdrawn. The oil remaining after the acid treating is then neutralized with a 28° Bé. solution of sodium hydroxide. This neutralization should be very carefully performed in order to avoid the presence of free alkali or free mahogany acid in the final product. The "mahogany soap" produced by this neutralization, is extracted with a 60% aqueous solution of alcohol and the alcohol is then distilled off. It will be found that this soap will contain considerable amounts of sodium sulfate and other impurities and it is preferred to remove these. This is done by dissolving the crude soap in a 70% aqueous solution of alcohol and allowing the salts to settle out. The alcohol is then distilled off and a purified mahogany soap is the result. This soap contains small quantities of oil and I have found that this is not undesirable. In fact, it is sometimes desirable to add a small quantity of oil, for instance, a refined distillate having a viscosity of about 70 seconds Saybolt at 100° F., to the soap solution prior to the last distillation. In this way a purified mahogany soap can be produced which will contain from 20 to 80% oil. I prefer to use a soap having an oil content of about 30 to 50%.

In making my new and improved cleaning fluids, mahogany soap or other sulfonic soap is dissolved in the cleaning fluid in proportions ranging from about 0.01% to about 1%. As aforementioned, I find this particularly desirable in the case of cleaning fluids of the chlorinated solvent type.

As an example of one preferred embodiment of my invention, I may add 0.1% by weight of mahogany soap prepared as above indicated to a cleaning fluid having the following composition by volume: 60% carbon tetrachloride, 20% tetrachlorethylene, 20% petroleum naphtha boiling approximately between the boiling points of the

two chlorinated solvents. This produces a cleaning fluid of highly superior detergent properties and which is completely non-flammable and non-combustible. The mahogany soap dissolves to forms a homogeneous solution and has no adverse effect on the chemical stability of the chlorinated solvents. I also find that the use of this material gives a highly unusual and desirable luster to the fabrics or garments after dry cleaning. Thus, for instance, I find that badly soiled white cotton fabrics which retain a dull and greyish appearance when cleaned in the aforementioned cleaning fluid to which no mahogany soap has been added are rendered white and lustrous by cleaning fluid of the same composition to which 0.1% of mahogany soap has been added.

Although I have described my invention in connection with a specific embodiment thereof, I do not wish to be limited thereby, but only to the scope of the appended claims.

I claim:

1. A composition of matter for use in dry cleaning, consisting of a dry cleaning fluid of the chlorinated solvent type and between approximately 0.01% and approximately 1% by weight of a substantially neutral oil soluble petroleum sulfonic soap, said petroleum sulfonic soap being dissolved in said dry cleaning fluid of the chlorinated solvent type.

2. A composition of matter for use in dry cleaning, consisting of a dry cleaning fluid of the chlorinated solvent type and between approximately 0.01% and approximately 1% of substantially neutral mahogany soap dissolved therein, said mahogany soap containing between approximately 20% and approximately 80% of mineral oil.

3. A composition of matter for use in dry cleaning, consisting of a dry cleaning fluid of the chlorinated solvent type and between approximately 0.01% and approximately 1% of substantially neutral mahogany soap dissolved therein, said mahogany soap containing between approximately 30% and approximately 50% of mineral oil.

4. A composition of matter for use in dry cleaning, consisting of a fluid mixture of approximately 60% by volume of carbon tetrachloride, approximately 20% by volume of tetrachlorethylene and approximately 20% by volume of petroleum naphtha, and between approximately 0.01% and approximately 1% by weight of a subsantially neutral oil soluble petroleum sulfonic soap dissolved in said fluid mixture.

5. A new composition of matter for use in dry cleaning comprising approximately 0.1% by weight of petroleum sulfonic soap and approximately 99.9% by weight of a fluid mixture comprising approximately 60% by volume of carbon tetrachloride, approximately 20% by volume of tetrachlorethylene and approximately 20% by volume of a petroleum naphtha.

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