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COMPOSITION FOR MAINTAINING CLEAR VISION IN WINDSHIELDS

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5 Claims. (Cl. 106—13)

This invention relates to the maintenance of clear vision in windshields and the like and to compositions therefor.

In particular the invention relates to an improvement in the method and composition disclosed in United States Patent No. 2,612,458, issued September 30, 1952, in which the method of rendering window surfaces water and rain repellent is defined as follows.

There is applied to the window surface a substituted polysilicane, consisting only of carbon, hydrogen and silicon and having not less than one Si-Si linkage and at least one of a group consisting of alkyl and aryl radicals attached to at least one silicon atom in the linkage, in admixture with a volatile hydrocarbon solvent and a finely divided inorganic, non-siliceous adhesion-promoting agent which with rubbing changes the polysilicane from a form which is soluble in hydrocarbon solvent to one which is insoluble therein and rubbing the mixture on the surface with a fabric to cause the polysilicane to adhere to it in the form of a film which is inert to oil, gasoline, alcohol and glycol. The adhesion-promoting agent is described as selected from the group consisting of carbon black, rouge, barium sulphate, lithopone and the precipitated fluorides of calcium, barium, strontium and lithium.

It has now been found that much better results are obtained when the silicane is applied to the window surface with an adhesion-promoting or friction agent consisting of carbon black and a cleaning agent, the latter having a particle size greater than the carbon. This combination substantially reduces the time and effort necessary to effectively apply the silicane to the window surface and produces a water repellent film. This film alone is particularly suited for use on automobiles, trucks, boats and other vehicles, which normally move relatively slowly, and for application to more rapidly moving windows a wax coating, as described in the above identified patent, may be added over it as may be necessary.

It appears that the relative coarse particles, associated with the carbon particles, insures efficient cleaning of the window surface with a minimum of rubbing and that the silicane bonds more readily to the freshly cleaned surface since the consecutive use of the cleaning agent and adhesion promoting friction agent does not produce the repellent film as easily as does the simultaneous use of the two together. This despite the fact that the cleaning agent may be of a type which does not produce the repellent film if used alone with the silicane, e. g. the cleaning agent may be a siliceous material, which is absolutely inert to the silicane. Cerium oxide used alone is extremely effective in removing the film but mixed with carbon black assists in producing the film. Frequently large window surfaces require treatment and it will be recognized that a reduction of as much as 80% in the time and effort required in applying the silicant film is of importance, particularly when many vehicles have to be serviced. The reduction of effort is particularly marked with a window surface which has not been previously treated with the silicane. When carbon alone was used as the adhesion-promoting or friction agent 40 to 50 strokes

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along one line were required to produce optimum results whereas a mixture of carbon and rouge required only 8 to 10 strokes. The cleaning agent may be any of the fine abrasive materials commonly used to clean or polish glass without scratching it; e. g., very fine silica, diatomaceous earth, rouge, cerium oxide. It is desirable to use as cleaning agent a powder which itself has some value in directly promoting the production of the repellent film, and all of the coarser powders listed in the prior patent have value in this respect. Of these, rouge, cerium oxide and the fluorides, in order have the greatest effect, and rouge therefore is selected as preferred as the most active cleaning agent for this purpose. The particle size of the cleaning agent is greater than that of the carbon black which is about 25 A.

The relative proportions of the active friction agent and the cleaning agent may be varied over a long range with much less effect than might perhaps be expected. The added cleaning agent may for instance be reduced to as little as $\frac{1}{20}$ part by weight of the carbon black and still be of some value, while conversely if even 10 parts by weight to one part of carbon black are used the repellent film can still be produced fairly easily. For general use median proportions of these material are however preferred, and the range from 15% rouge, 85% carbon black by weight; to 50% rouge, 50% carbon black is most useful.

The following specific compositions are illustrative:

- (1) 4 grams acetylene carbon black, 4 grams rouge and 11 grams of the silicane.
- (2) 17 grams of carbon black, 3 grams of rouge and 45 grams of silicane.
- (3) 9 grams of acetylene carbon black, 1 gram of rouge and 22.5 grams of silicane.

Of the many polysilicanes tetraethyldiamyldisilicane is particularly suitable for use on relatively slow moving vehicles. It is easily applied, has adequate water repellency and withstands abrasion of windshield wipers for substantial periods. On the other hand, for use on faster moving vehicles diethyltetraamyldisilicane provides higher repellence but requires more rubbing. For use at still higher speeds octaamyiltrisilicane produces a still higher degree of repellence.

As disclosed above these, and like compositions are applied to the window surface with rubbing and may also be used in admixture with a volatile hydrocarbon solvent as in my prior patent.

I claim:

1. A composition for rendering window surfaces water and rain repellent comprising essentially substituted polysilicane, consisting only of carbon, hydrogen and silicon and having not less than one Si-Si linkage and at least one of a group consisting of alkyl and aryl radicals attached to at least one Si atom in said linkage, in admixture with carbon black and 15 to 50% of its weight of rouge having a particle size larger than that of the carbon black.
2. The composition defined in claim 1 in admixture with a hydrocarbon solvent.
3. The composition defined in claim 1 wherein the silicane is diethyltetraamyldisilicane.
4. The composition defined in claim 1 wherein the silicane is tetraethyldiamyldisilicane.
5. The composition defined in claim 1 wherein the silicane is octaamyiltrisilicane.

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