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## FLOOR SWEEPING COMPOSITION COMPRISING FINELY DIVIDED SOLIDS, PETROLEUM OIL, AND ATACTIC PROPYLENE POLYMER

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4 Claims

### ABSTRACT OF THE DISCLOSURE

A floor sweeping composition comprising finely divided solid material and a wetting agent consisting essentially of petroleum lubricating oil and atactic propylene polymer.

### BACKGROUND OF THE INVENTION

The present invention relates to improved floor sweeping compositions comprised of finely divided solid material and a novel wetting agent. Specifically, the present invention relates to floor sweeping compositions comprising finely divided solid material and a novel wetting agent consisting of petroleum oil and atactic propylene polymer.

Floor sweeping compositions generally are used to prohibit settled dust and dirt and fines from refloating in the air during the sweeping process, thereby providing for more efficient dirt and dust collection. Heretofore, floor sweeping compositions have generally consisted of finely divided inert materials such as sawdust, sand and salt which are combined with a wetting agent which is usually high viscosity, oily material such as petroleum lubricating oils. The function of wetting agent is to cause the dust and dirt and other fine particles to adhere to the finely divided solid materials of the sweeping composition.

The oil wetting agent is normally of a high viscosity so that it will substantially adhere to the surface of the solid particles of the composition for long periods of time and thereby provide a floor sweeping composition which will aid in dirt and dust removal even after long periods of storage. Usually low viscosity oils are not used in floor sweeping composition because of their tendency to drain from the solid particles and thereby result in ineffective dirt and dust collection. Also, low viscosity oils have been known on occasion to stain some of the materials with which they remain in prolonged contact for even short periods of contact. Thus, for the most part, presently used floor sweeping compositions have been limited to very high viscosity oils as wetting agents in order that oil stain damage can be avoided.

Unfortunately, however, very high viscosity oils are inherently substantially less efficient as wetting agents than lower viscosity oils. Thus, although drainage and staining problems of floor sweeping compounds can for the most part be avoided by using high viscosity oils as wetting agents, these oils are somewhat less efficient in dirt and dust removal. The loss in efficiency of cleaning ability from compositions containing high viscosity oils results in the requirement of larger quantities of the sweeping compound to provide effective dirt and dust removal, all of which results in a generally unsatisfactory floor sweeping composition.

### DESCRIPTION OF THE INVENTION

We have now discovered a novel floor sweeping composition which is stable and non-staining and is effective for use for sweeping dirt and dust from floors, or similar surfaces. We have discovered that a floor sweeping composition comprising finely divided solid materials such as sand, sawdust, and salt combined with a wetting agent

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comprising petroleum oil and atactic propylene polymer is an effective floor sweeping composition which is stable for substantially long periods of time and is resistant to staining surfaces with which it is contacted.

The compositions of the present invention generally comprise a mixture of 70 to 95 weight percent finely divided solid material such as sand, sawdust or salt and 5 to 30 weight percent of a wetting agent which is preferably comprised of 2 to 25 weight percent (based on the weight of the wetting agent) of atactic propylene polymer dissolved petroleum oil. Specifically, the floor sweeping compositions of the present invention comprise 70 to 95 weight percent finely divided solid material, 4.9 to 29.4 weight percent petroleum oil and 0.1 to 7.5 weight percent atactic propylene polymer based on the weight of the total composition.

Petroleum oils usable in the compositions of the present invention include a wide variety of oils generally of naphthenic, paraffinic, or mixed base mineral oils or synthetic oils made from monomers derived from petroleum crude oil. The oils are normally referred to as lubricating oils and can be generally characterized as having a Saybolt Universal viscosity at 100° F. in the range of 55 to 25,000; at 210° F. in the range of 30 to 250; and a pour point in the range of -50 to 75° F.

Atactic propylene polymers of the present invention include the homopolymer polypropylene as well as copolymers of propylene and ethylene. Amorphous polymer fractions are recovered as a by-product of the stereospecific polymerization process normally used to produce isotactic propylene polymers. Atactic propylene polymers are generally characterized as solid, tacky substantially amorphous polymers soluble in boiling hexane, having an average molecular weight in the range of 20,000 to 300,000 as measured in Decalin at 275° F., and a density in the range of 0.82 to 0.91, with the preferred average molecular weight in the range of 25,000 to 60,000.

Procedures for the stereospecific polymerization of propylene are well known to those skilled in the art. Examples of this type of process are disclosed in Belgian Pat. 538,782 and British Pat. 994,416, as well as many others. The finely divided solid material of the compositions of the present invention can include sand, sawdust, salt or any hard inert finely divided solid material generally having a particle size distribution in the range of 10 to 200 mesh sieve.

Compositions of the present invention can be prepared by means of two or three separate steps which include:

- (a) petroleum oil and atactic propylene polymer are blended to form the wetting agent,
- (b) when more than one type of finely divided solids are used, the separate solid materials are blended together in the desired proportions prior to being blended with the wetting agent, and
- (c) blending the wetting agent composition and the finely divided solids to provide a substantially homogeneous floor sweeping composition comprising finely divided solid material wholly or partially coated with an oil-atactic propylene polymer wetting agent composition.

The floor sweeping composition can be blended at a temperature in the range of room temperature up to the boiling point of the particular oil being used.

To further illustrate the compositions of the present invention, the following examples are presented.

### EXAMPLE I

80 grams of a naphthenic base petroleum oil characterized as having an API gravity of 24.3, Saybolt viscosity at 100° F. of 56.0 and at 210° F. of 33.7 and a pour point of -50° F. were blended at 150° F. with 20 grams of

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atactic polypropylene having an average molecular weight of 45,000. The resulting blend was subsequently mixed with 900 grams of a composition comprising sand and sawdust in the ratio of 4 parts sand to 10 parts sawdust. The wetting agent and solid were blended in a rotating drum mixer for 30 minutes at 150° F. until the wetting agent was dispersed uniformly over the solid particles.

The composition recovered was found to be a stable effective floor cleaning composition which did not stain the areas on which it was used. This example provides a demonstration of a means of using low viscosity petroleum oil in floor sweeping compositions by adding a stabilizing amount of atactic propylene polymer to the oil.

#### EXAMPLE II

A floor sweeping composition was prepared by a method identical to that of Example I with the exception that the wetting agent was comprised of 85 grams of a solvent refined paraffinic petroleum oil characterized as having an API gravity of 27.4, a Saybolt viscosity at 100° F. of 2501 and at 210° F. of 150 and a pour point of 0° F. and 12 grams of atactic polypropylene having a molecular weight of 45,000.

The resulting floor sweeping composition was effective in removing dirt and dust without staining the surfaces with which it was brought in contact. In this example an intermediate viscosity paraffinic oil is shown to be used effectively in a floor sweeping composition.

#### EXAMPLE III

A floor sweeping composition was prepared according to the procedures disclosed in Example I with the exception that the wetting agent consisted of 96 grams of a mixed base petroleum lubricating oil characterized as having an API gravity of 11.6, a Saybolt viscosity at 100° F. of 17,438 and at 210° F. of 175 and a pour point of 65° F.; and 4 grams atactic polypropylene having a molecular weight of 45,000. The composition of this example on testing was found to be equal in performance to the compositions of Examples I and II.

Atactic propylene polymers and petroleum oils when blended together form a thick, viscous gel-like composition which is tacky. The addition of the propylene polymer to the wetting agent substantially improves the effectiveness of the floor sweeping compound. The polymer itself is tacky and sticky so that it effectively holds both large and small dirt and dust particles to the surfaces of the solid in the floor sweeping compositions. This inherent characteristic when combined with the wetting ability of the oil in the compositions provides a superior floor sweeping composition which provides a substantial improvement in removal of dust and dirt. The polymer also maintains

the oil on the solid particles of the floor sweeping composition, thereby providing a more stable and stain resistant type material. The consistency of the polymer-oil gel depends upon the viscosity of the oil used and the amount of polymer added to the oil. Normally the lower the viscosity of the oil, the larger the quantity of polymer that is necessary to provide the stable wetting agent suitable for use in floor sweeping compositions. This point can be realized when the above given examples are examined.

Normally lower molecular weight atactic propylene polymers are more tacky than higher molecular weight propylene polymers. However, higher molecular weight polymers provide a thicker consistency to the oil-polymer solution so that the properties of the wetting agent can be adjusted accordingly. Thus, the physical characteristics of the present floor sweeping composition can be adjusted to the desired physical requirements by selecting the proper ratio and type of polymer and oil to form the improved wetting agents of this invention.

What is claimed is:

1. A floor sweeping composition comprising finely divided solid material and 5 to 30 weight percent of a wetting agent consisting essentially of petroleum oil and atactic propylene polymer having an average molecular weight in the range of 25,000 to 60,000.

2. A composition according to claim 1 comprising 70 to 95 weight percent finely divided solid material, 4.9 to 29.4 weight percent petroleum oil and 0.1 to 7.5 weight percent atactic propylene polymer.

3. A composition according to claim 2 wherein the finely divided solid material is comprised of a mixture of sand and sawdust.

4. A composition according to claim 2 wherein the atactic polymer is polypropylene.

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