The present invention relates to an improved self-propelling liquid textile sizing composition. More particularly, it relates to a self-propelling liquid textile sizing product having non-sticking properties.

Liquid textile sizes have become increasingly popular, and more recently it has been recognized that it is desirable to package a liquid textile size or liquid laundry starch together with a propellant gas in aerosol-dispensing containers so that the size can be readily expelled in spray form onto a fabric which has already been washed and dried and is ready for ironing. In order to satisfactorily expel the starch solution, it was necessary to use such a dilute solution that the consumer had to make several applications of the spray to the fabric, each followed by ironing, in order to obtain the desired stiffness. As the starch content was increased to meet the demands of the consumer, other problems arose. These problems included clogging of the nozzle, corrosion of the interior of the dispenser, spoilage of the starch solution, foaming, and undesirable odors. These problems have been minimized by the incorporation of various additives and changes in the construction of the dispenser. Various type nozzles have been developed which minimize clogging and provide a relatively even spray. Corrosion inhibitors such as polyphosphates have almost eliminated the corrosion of the interior of the dispenser. Spoilage of the starch solution has been greatly reduced by the addition of a preservative such as sodium-orthophenyl phenate. Foaming has been essentially eliminated by the addition of a silicone-containing anti-foam agent and to counteract any undesirable odors imparted to the fabric, a small amount of perfume is added.

However, with an increase in the amount of starch present in the solution, as per the desire of the consumer, there is an increase in the tendency of the sizing agent to deposit on the iron. All of the presently available spray starches possess this one objectionable characteristic.

It is an object of the present invention to substantially completely eliminate the sticking tendencies of a self-propelling liquid textile sizing composition. Another object is to provide a spray starch product, which when applied to textiles, aids the case with which the textile is ironed.

Other objects of the invention will be apparent from the following description and claims.

According to the present invention, a substantial improvement in the ironing properties of a spray starch is obtained by incorporating a naturally occurring phosphatide into the spray starch formulation. The presence of one or more phosphatides, such as lecithin, cephalin, or the like, in spray starch increases the ease with which the iron slides over the textile being ironed, thereby preventing the sticking of the sizing material to the iron, and substantially eliminating objectionable scratching and spotting resulting from a sticking iron.

Some additives have been tried heretofore, but until the discovery of the present invention, no satisfactory agent or combination of agents was found. For example, the use of silicones has been practiced, but though sticking was reduced, undesirable spots, having the appearance of grease spots, remained on the fabric. Although moderate amounts of silicone may be incorporated in spray starches without adverse effects, amounts sufficient to reduce sticking to any degree, result in undesirable spotting of the fabric.

In accordance with one embodiment of the present invention, pregelatinized starch is dispersed in water in the amount of between about 1 and about 10 percent by weight. To this aqueous starch dispersion are added various components, such as a preservative, an antifoaming agent, a corrosion inhibitor, a perfume, and an ironing aid comprising one or more phosphatides. These additives may be incorporated by simply admixing them in any desirable order with the starch dispersion after which the resulting aqueous dispersion is packaged in an aerosol-dispensing container with a propellant.

Any type of gelatinized starch dispensible, e.g., corn, wheat, rice, grain sorghum, waxy grain sorghum, waxy maize, or tapioca, or mixtures thereof, or water-dispersible modifications or derivatives thereof, or water-soluble cellulose materials such as carboxymethyl cellulose or water-soluble synthetic resins may be employed in the process of the present invention.

As heretofore mentioned, precooked and gelatinized starch may be slurried in water to form the base for the spray starch formulation of the present invention. However, in another embodiment of this invention, untreated, ungelatinized starch is slurried in an aqueous medium containing the other additives, including lecithin, of the spray starch formulation except the propellant, and the resulting mixture is then heated or cooked in order to effect gelatinization of the starch. After cooling, the mixture is packaged with a propellant in an aerosol-dispensing container.

In still another embodiment of the present invention, carboxymethyl cellulose is simultaneously admixed with cephalin and the other components comprising a spray starch. The mixture is then packaged with a propellant in an aerosol-dispensing container.

The resulting operating examples will more clearly illustrate the invention:

**Example 1**

Two hundred parts of a 3.3 percent lecithin-in-water emulsion were blended with 823 parts of a dimethyl silicone emulsion having 35 percent solids. In a separate container an aqueous solution was prepared containing borax, polyethylene glycol, sodium hydroxide, a preservative, and a mixture of sodium tripolyphosphate and silic-
cate in amounts corresponding to those set forth in the formulation chart below. An enzyme-modified water dispersible starch was dispersed in an aqueous solution in an amount so that the final formulation contained 4.1 percent by weight of starch. The starch-containing dispersion was then admixed with the lecithin-silicone emulsion, and the perfume and antifoam were added. This mixture was packaged in an aerosol-dispensing container with a propellant. The over-all formulation for Example 1 is as follows:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>88.151</td>
</tr>
<tr>
<td>Pregelatinized starch</td>
<td>4.0</td>
</tr>
<tr>
<td>Dimethyl silicone emulsion</td>
<td>0.8</td>
</tr>
<tr>
<td>Lecithin</td>
<td>0.01</td>
</tr>
<tr>
<td>Borax (sodium tetraborate decahydrate)</td>
<td>0.4</td>
</tr>
<tr>
<td>Nalco 26W (sodium tripolyphosphate and silicate)</td>
<td>0.002</td>
</tr>
<tr>
<td>Polyethylene glycol</td>
<td>0.1</td>
</tr>
<tr>
<td>Dowicide A (sodium-ortho-phenyl phenate)</td>
<td>0.015</td>
</tr>
<tr>
<td>Silicone antifoam</td>
<td>0.01</td>
</tr>
<tr>
<td>Perfume</td>
<td>0.032</td>
</tr>
<tr>
<td>NaOH (97%)</td>
<td>0.08</td>
</tr>
<tr>
<td>Freon (difluorodichloromethane)</td>
<td>6.3</td>
</tr>
</tbody>
</table>

**Example 2**

The process of Example 1 is repeated except that a 2 percent hypochlorite-oxidized white milo starch is substituted for the enzyme-modified water dispersible starch of Example 1.

**Example 3**

The process of Example 1 is duplicated except that a 80-fluidity thin boiling acid-modified corn starch is substituted for the enzyme-modified water dispersible starch of Example 1.

**Example 4**

The process of Example 1 is followed except that carboxymethyl cellulose is substituted in the amount of 1 percent by weight of the total mixture for the enzyme-modified water dispersible starch of Example 1.

**Example 5**

The process of Example 1 is repeated except that cephalin is substituted for lecithin.

Although the invention has been described by reference to certain specific embodiments thereof, it is to be understood that such matters are purely illustrative for the purpose of clarifying the invention, and the invention is in no sense to be considered limited thereto. Numerous modifications and equivalents of the present invention will be apparent from the foregoing description to those skilled in the art.

In accordance with the foregoing description, the following claims distinctly claim the subject matter of the invention.

We claim:

1. A self-propelling liquid laundry starch consisting essentially of 4.1 percent starch, 0.8 percent dimethyl silicone emulsion, 0.4 percent borax, 0.1 percent polyethylene glycol, 0.01 percent lecithin, 0.01 percent silicone antifoam agent, 0.002 percent mixture of sodium tripolyphosphate and sodium silicate, 0.015 percent sodium-ortho-phenyl phenate, 0.002 percent mixture of sodium tripolyphosphate and sodium silicate, 0.015 percent sodium-ortho-phenyl phenate, 0.002 percent mixture of sodium tripolyphosphate and sodium silicate, and 88.151 percent water.

2. An ironing aid for a self-propelling liquid textile sizing composition consisting essentially of 200 parts of a 3.5 percent lecithin in water emulsion and 823 parts of dimethyl silicone emulsion having 35 percent solids.

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