**Title:** IRONING AID COMPOSITION

**Abstract:** An ironing aid composition for use in a washing process in a ware washing machine comprises (a) 3 to 10 wt.% of an anti-wrinkle silicone; and (b) 20 to 30 wt. % of a polycarboxylate polymer.
IRONING AID COMPOSITION

This invention relates to an ironing aid composition which is suitable for adding directly into the wash liquor of a ware-washing machine.

Garments, when washed using harsh detergents or bleaches and subsequently dried, in many instances, evolve subtle undesirable aromas.

The use of ironing aids on such washed and dried garments, including spray compositions and liquid compositions (for inclusion in the steam chambers of the irons), which include fragrances, has been found to have inherent problems concerning the application of measurable, controllable, effective and consistent quantities of freshening agent (e.g., fragrance and/or malodour maskant) to the garment.

Most of the ironing aids heretofore available are in the form of spray starches or sizing products offered in conventional aerosol or trigger spray delivery systems. Thus, for example, U.S. Letters Patent No. 4,238,057 discloses a spray-type sizing composition comprising a modified low viscosity starch and, to make the iron move smoothly during the ironing operation, a minor amount of dipropylene glycol is added. PCT Published Patent No. 91/19037 discloses the use of a silicone gel for ease of ironing and improvement in the appearance of ironed garments.

It is an object of the present invention to obviate / mitigate the disadvantages described above.
According to one aspect of the present invention, there is provided an ironing aid composition for use in a washing process in a ware washing machine comprising:

(a) 3 to 10 wt.% of an anti-wrinkle silicone; and
(b) 20 to 30 wt.% of a polycarboxylate polymer.

Generally the ironing aid is in the form of a liquid, such as a solution, suspension or emulsion.

The ironing aid according to the present invention has been found to provide excellent properties. Indeed the ironing aid provides outstanding gliding properties (for the iron as it passes over the surface being ironed) and stiffness to the item being ironed.

Without wishing to be bound by theory it is postulated that these two affects arise from the combination of the silicone and polycarboxylate polymer used. Indeed, as such the realisation of these two advantages is surprising: usually polycarboxylate polymers are recognised to detrimentally affect the gliding properties of an ironing aid and as such their presence in ironing aids is avoided. In the present invention this detrimental effect is not observed.

Preferably the silicone comprises a non-ionic silicone. In this regard it has been noted that non-ionic silicones have a more favourable interaction (than their ionic counterparts) with polycarboxylate polymers. In this regard non-ionic silicones do not cause detrimental precipitation of polycarboxylate polymers.
Preferably the silicone comprises a liquid organohydro-genpolysiloxane of the formula below

\[
\begin{align*}
(CH_3)_2HSiO_3 \quad \text{SiO} \quad \text{SiH}(CH_3)_2 \\
\left[ \begin{array}{c}
\text{Si} \\
\text{CH}_3
\end{array} \right]_n
\end{align*}
\]

where \( n \) is an integer greater than 1.

Preferably \( n \) is equal to 20.

Preferably the silicone comprises a divinyldimethicone / dimethicone copolymer

Surfactants may need to be used to emulsify the silicone oils. Although surfactant (typically cationic or non-ionic) is important for stabilising the silicone emulsion, it is preferred to use the lowest level of surfactant possible. Preferred methods of emulsifying suitable silicone oils are disclosed in WO 01/07710 or US2003143176.

Most preferably the polycarboxylate polymer comprises a polyvinyl acetate.

It is recognised that the polymer provides a stiffening function to the ironing aid composition.
Additional Components

The composition may also optionally contain up to 5% by weight of additional components of at least one of the following; antioxidants and reductive agents, bacteriocides, natural or synthetic extracts, antifoam agents, desiccants, enzymes, bleaches, bleach activators, hydrotropes, opacifiers, foam controllers, preservatives, disinfectants, pearlising agents), optical brighteners, dye transfer inhibitors, colour fading inhibitors, and aesthetic ingredients, for example fragrances and colorants.

Antifoam Agent

The addition of an antifoam agent may be necessary to avoid excess generation of foam during the rinse cycle. Preferably up to 5%wt, ideally less than 3%wt or 2%wt. Typically such agents are silicones.

The term "silicone" has become a generic term which encompasses a variety of relatively high-molecular weight polymers containing siloxane units and hydrocarbyl groups of various types. Generally, the silicone antifoam agents can be described as siloxanes having the general structure: wherein n is from 20 to 2,000, and where each R independently can be an alkyl or an aryl radical. Examples of such substituents are methyl, ethyl, propyl, isobutyl, and phenyl. Preferred polydiorganosiloxanes are polydimethylsiloxanes having trimethylsilyl endblocking units.

The antifoam agent of the typically further comprises as a water-soluble or water-dispersable organic carrier a surfactant-containing solution.
The surfactant containing solution comprises a surfactant which can be selected from nonionic and/or anionic and/or cationic and/or ampholytic and/or zwitterionic and/or semi-polar surfactants.

Hydrotrope

Hydrotropes aid in the solubility or dispersibility of different surfactants in aqueous solution. This usually has the side effect of lowering the viscosity of the resulting mixture.

Examples of suitable and preferred hydrotropes are the alkali metal salts of a benzene, cumene, toluene and xylenesulfonate, ideally the sodium salt.

Hydrotropes may be added from 0.1 to 10% by weight, ideally no more that 5% by weight.

According to a second aspect of the invention there is provided the use of an ironing aid composition comprising:

(a) 3 to 10 wt.% of an anti-wrinkle silicone; and

(b) 20 to 30 wt.% of a polycarboxylate polymer.

in a ware washing machine.

Preferably the ware washing machine is an automatic clothes washing machine.

The invention is illustrated in the following non-limiting examples, in which all percentages are on an active weight % basis unless otherwise stated.
**Example 1**

The formula below was prepared.

<table>
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<tr>
<th>Raw Material</th>
<th>% MIN</th>
<th>% MAX</th>
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<tbody>
<tr>
<td>Deionised water</td>
<td>76.415</td>
<td>59.015</td>
</tr>
<tr>
<td>Sodium hydroxide L</td>
<td>0.035</td>
<td>0.035</td>
</tr>
<tr>
<td>Hydroxyethylcellulose</td>
<td>0.100</td>
<td>0.100</td>
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<tr>
<td>EMH</td>
<td></td>
<td></td>
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<tr>
<td>XANTHAN GUM</td>
<td>0.200</td>
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</tr>
<tr>
<td>Proxel GXL (BIT)</td>
<td>0.100</td>
<td>0.100</td>
</tr>
<tr>
<td>Silicone PDMS</td>
<td>3.000</td>
<td>10.000</td>
</tr>
<tr>
<td>Polyvinyl Acetate</td>
<td>20.000</td>
<td>30.000</td>
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<tr>
<td>EML 56%</td>
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<tr>
<td>FRAGRANCE</td>
<td>0.100</td>
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<tr>
<td>Dimethicone emulsion SRE</td>
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**Claims**

1. An ironing aid composition for use in a washing process in a ware washing machine comprising:
   
   (a) 3 to 10 wt.% of an anti-wrinkle silicone; and
   
   (b) 20 to 30 wt.% of a polycarboxylate polymer.

2. An ironing aid according to claim 1, wherein the ironing aid is in the form of a liquid, such as a solution, suspension or emulsion.

3. An ironing aid according to claim 1 or 2, wherein the silicone is a non-ionic silicone.

4. An ironing aid according to claim 3, wherein the silicone comprises a liquid organohydrogenpolysiloxane of the formula below

   ![Chemical Structure](attachment:image.png)

   where \( n \) is an integer greater than 1, preferably \( n \) is equal to 20.

5. An ironing aid according to claim 3, wherein the silicone comprises silicone is a divinyldimethicone / dimethicone copolymer.
6. An ironing aid according to any one of claims 1 to 5, wherein the polycarboxylate polymer comprises a polyvinyl acetate.

7. The use of an ironing aid composition comprising:

(a) 3 to 10 wt.% of an anti-wrinkle silicone; and

(b) 20 to 30 wt.% of a polycarboxylate polymer,

in a ware washing machine.
## INTERNATIONAL SEARCH REPORT

**International application No**

PCT/GB2008/001304

### A. CLASSIFICATION OF SUBJECT MATTER

INV. C11D3/37 C11D3/00

According to International Patent Classification (IPC) or to both national classification and IPC

### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<tr>
<td>A</td>
<td>US 2003/162689 A1 (SCHYMITEK TATIANA [DE]) ET AL) 28 August 2003 (2003-08-28) paragraph [0001], [0012], [0013], [0021] - [0034], [0054]; claims; examples</td>
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<td>A</td>
<td>WO 99/41346 A (RHONE POULENC CHIMIE [FR]) 19 August 1999 (1999-08-19) claims 1,2; examples</td>
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- Special categories of cited documents:
  - A: document defining the general state of the art which is not considered to be of particular relevance
  - E: earlier document but published on or after the international filing date
  - L: document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - O: document referring to an oral disclosure, use, exhibition or other means
  - P: document published prior to the international filing date but later than the priority date claimed

- X: see patent family annex.

- Y: later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

- Y: document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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- S: document member of the same patent family

**Date of the actual completion of the international search**

17 July 2008

**Date of mailing of the International search report**

28/07/2008

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