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A METHOD OF LAUNDERING ARTICLES

The present invention relates to a method of laundering articles, in particular heavily soiled and specialized fabric materials such as whitework, workwear and high visibility garments and articles at temperatures of no more than 40°C.

In commercial laundries, industrial-size washing machines containing up to 100 kg of articles for washing are used which depend on a constant flow of pre-heated water and into which metered quantities of washing powder and adjuncts are pumped by dosing apparatus. Conventionally, in order to wash heavily soiled articles such as table cloths, hospital bedding, workwear and the like, it is necessary to use high-temperature water, mechanical action within the washing machine, and high alkalinity and enzyme detergents. The cost of pre-heating the water to temperatures of 60°C and greater for use in the washing process makes up a significant proportion of the cost of such a process. Typically the water is heated by injecting steam into it and significant time and energy is taken up producing the steam for this purpose. Also, as the washing cycle itself is likely to be for time in excess of 20 minutes, steam continues to have to be generated throughout the washing cycle to ensure that the washing liquor is maintained at the correct temperature. Such heavy washing also typically requires at least two and sometimes more rinse cycles to remove the washing preparations from the articles and reduce their alkalinity to acceptable levels.

In addition, articles such as whitework, such as table and bed linen, and white workwear are usually bleached. However, the maximum temperature at which conventional bleaches can be used within a washing process is 60°C if damage to the washed articles is to be prevented. As the washing cycle of such articles usually takes place at around 80°C, a separate bleaching cycle must be carried out wherein

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a cooler water temperature is used. This prolongs the washing process and involves the use of a considerable quantity of water that still requires heating to the appropriate temperature.

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There are, however, some forms of specialized fabric materials which cannot be cleaned by such means, in particular high visibility garments and articles typically comprising fabric to which is adhered tiny reflective glass
10 beads. These fabrics cannot be laundered at high temperatures without significant damage occurring to their reflective capacity. As a result, they tend to be pre-washed or soaked in solvents to remove oil and grease stains before being washed at a low temperature no higher than 40°C. This special
15 treatment adds greatly to the cost of their cleaning.

Also, some fabrics, such as polycottons, which comprise a mixture of synthetic and natural fibres are liable to suffer "thermal shock" if they undergo a water extraction
20 process such as spinning or pressing immediately after a high temperature washing cycle. This means that they become creased in such a way that the creases are set into the fabric until they are washed again. To prevent thermal shock, this type of fabric must be cooled in stages from say an 80°C
25 wash down to a 60°C wash and then down to a 40°C wash before they can be rinsed and then spun or pressed. All of this takes considerable time and energy to carry out the required number of wash cycles at different temperatures.

30 The object of the present invention is to provide a method of laundering articles, such as those detailed above, that can be used in commercial laundries with conventional washing machines provided with powder dosing apparatus and liquid additive injectors and that overcomes or substantially
35 mitigates the aforementioned problems.

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According to the present invention there is provided a method of laundering articles using water heated to no more than 40°C wherein in a single washing process there are no more than two wash cycles followed by at least one rinse
5 cycle and wherein in one of the wash cycles a combination of at least two laundry preparations is used, a first of the laundry preparations being in powder form and containing up to 15% by weight a powdered detergent, and a second of the laundry preparations being in liquid form and comprising at
10 least one of a degreasing emulsifier and a bleach, the laundry preparations in total comprising up to 10% by weight a terpene.

Although terpenes, preferably, for example d-limonene or
15 dipentene or a mixture of d-limonene and dipentene, are known ingredients in washing preparations, they have not before been incorporated in such quantity in a laundry preparation for use in combination with a degreasing emulsifier or a bleach. It was surprisingly found that such a combination
20 gives outstanding cleaning results on all forms of heavily soiled and specialized fabric materials using water temperatures of no more than 40°C. This means that significant savings can be made in the energy that would otherwise be used on heating the washing water. Also, as the
25 water used in the present method is never greater than 40°C, unlike conventional laundering methods, a separate bleaching cycle is not required and the bleach can be used in the main wash cycle. This results in significant savings in water consumption, energy consumption and time over conventional
30 methods.

Generally, laundry preparations in powder form are preferred to those in liquid form in industrial laundries because a smaller volume of preparation needs to be used to
35 provide a desired concentration of washing liquor. Usually, a large volume of liquid detergent is required to produce the

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same concentration. This is inconvenient as regards storage and use of the preparations. Given this, the reason for the combination of a laundry preparation in powder form with one in liquid form in the present invention is that it is not possible to incorporate significant quantities of the degreasing emulsifiers, which comprise liquids, into the powder preparation without it dissolving to form a slurry. Hence, the requirement for the combination.

10 The terpenes, which comprise volatile oily liquids, can either be incorporated into the powder preparation, added to the liquid preparation or be injected separately directly into the washing water. Preferably, however, it has been found it that the best cleaning results occur if the terpenes are mixed into the powder preparation. This is also surprising as it is generally thought that the incorporation of such a quantity in a washing preparation would require the preparation to be in a gel or liquid form with the terpene suspended therein in a micro-emulsion otherwise the terpene would quickly evaporate away. Such liquids or gels preclude the dispensing of such a preparation by a conventional powder dosing apparatus associated with an industrial tunnel washing machine. They are also difficult to dispense using liquid injectors in view of their sticky, viscous nature. However, it was surprisingly found that simply by blending up to 10% by weight of a liquid terpene into a dry laundry washing preparation in powder form that the liquid became dispersed within the powder and was thereby retained so that does not evaporate away significantly quickly.

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Preferably therefore, the first laundry preparation in powder form contains up to 15% by weight a powdered detergent in which up to 10% by weight a terpene has been dispersed.

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Such a preparation is manufactured by dry blending the powdered ingredients and then by mixing the liquid terpene

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component into the blend to disperse the liquid into the dry powder ingredients. Preferably, the liquid terpene is sprayed into the blended powdered ingredients, which are then further blended to disperse the liquid.

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Preferably, the terpene comprises an equal mixture of d-limonene and dipentene and forms up to 5% by weight of the first laundry preparation.

10 The other ingredients of the powder preparation preferably comprise up to 70% by weight inorganic salts. For example, the preparation may comprise up to 33% by weight sodium carbonate and up to 40% sodium chloride. The sodium carbonate acts in known manner as a water softener and
15 provides alkalinity when dissolved in the washing water. The sodium chloride is believed to act as a synergistic ionic accelerator which improves the action of the other ingredients. A builder, such as sodium tripolyphosphate, may also be added at up to 25% by weight.

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An anti-redeposition agent, such as sodium carboxymethylcellulose may also be added to the preparation.

Other optional ingredients may be added to the
25 preparation to produce particular effects. Such ingredients comprise optical brightening agents, enzymes, bleaches, biocides, flame-retardant compounds, dirt repellents, and perfumes.

30 It will be appreciated, therefore, that the powder preparation operates differently from conventional laundry powders that usually act on greases and oils by saponification, that is by using a high pH washing liquor in combination with an elevated washing temperature and
35 mechanical action oil and grease soiling is removed by turning it into a soap that is then dissolved in the water.

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However, in the method of the present invention the terpenes in the laundry preparations act as solvents to dissolve oil and grease soiling directly, the resulting solution then being dispersed and saponified within the washing liquor with the need for a greatly reduced alkalinity to achieve this result. This is a much more efficient process as it does not require a washing liquor temperature of more than 40°C and significantly less mechanical action, which saves washing time.

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The low temperature used in the method also has the significant advantage that thermal shock of the articles being washed is avoided.

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Various basic examples of a powder preparation for use in a method according to the invention will now be listed. In all cases, the preparation was manufactured by dry blending of the powdered ingredients into which dry mix the liquid terpene component was sprayed and mixed in to disperse the liquid into the dry powder ingredients. The proportions of the ingredients set forth in the examples are percentages by weight.

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Example 1

25	Nonyl phenol ethoxylate (9 ETO)	4%
	D-limonene	5%
	Sodium carboxymethyl cellulose	2%
	Sodium carbonate	30%
	Sodium tripolyphosphate	25%
30	Sodium chloride	34%

Example 2

	Nonyl phenol ethoxylate (9 ETO)	4%
	Dipentene	5%
35	Sodium carboxymethyl cellulose	2%
	Sodium carbonate	30%

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	Sodium tripolyphosphate	25%
	Sodium chloride	34%
5	<u>Example 3</u>	
	Nonyl phenol ethoxylate (9 ETO)	4%
	D-limonene	2.5%
	Dipentene	2.5%
	Sodium carbonate	30%
10	Sodium tripolyphosphate	25%
	Sodium chloride	34%
	Sodium carboxymethyl cellulose	2%
	<u>Example 4</u>	
15	Nonyl phenol ethoxylate (9 ETO)	4%
	D-limonene	2.5%
	Dipentene	2.5%
	Sodium carbonate	29%
	Sodium tripolyphosphate	24%
20	Sodium chloride	34%
	Sodium carboxymethyl cellulose	2%
	Nitrilotriacetic acid 3NA	2%

25 The above formulations can all be adjusted slightly to take into account the addition, in small quantities, of the additional ingredients such as optical brighteners, blue speckles, perfumes and other common additives to washing powders, for example by adjusting the proportion of sodium chloride in the composition.

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The second laundry preparation in liquid form comprises either a bleach or a degreasing emulsifier. If the preparation comprises bleach, then this can comprise any
35 conventional chlorine based bleaching agent, such as sodium

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hypochlorite, or hydrogen peroxide, both of which are already used in industrial laundries.

If the second laundry preparation comprises a degreasing emulsifier, then this preferably comprises a nonionic surfactant such as, for example nonyl phenol ethoxylate. Alternatively, the degreasing emulsifier may comprise an alcohol ethoxylate.

In order that the efficiencies of the method proposed herein can be appreciated, reference should be made to the following tables wherein four different laundry processes using a method in accordance with the present invention are described in the tables labelled Table 1A - 4A for comparison with a conventional laundry method as described in the tables labelled Table 1B - 4B. In both cases, the washing processes used the same type of articles and the same type of conventional industrial washing machine comprising a washing drum, powder dosing apparatus and liquid additive injectors to achieve similar cleaning results. In these tables, the time taken for the washing machine to perform various functions within one washing or rinse cycle of a washing processes is indicated, these functions being defined as follows.

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<u>Function</u>	<u>Definition</u>
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Fill	Filling a drum of the machine with water to desired level
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Heat	Heating the water to a desired temperature, as indicated in the table
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Wash	Tumbling the drum of the machine to cause a mechanical washing action after the indicated
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chemical additions have been added to the water
to create an aqueous washing liquor

Drain Draining the aqueous washing liquor from the
5 drum

Rinse Tumbling the drum of the machine to cause a
 mechanical rinsing action after any indicated
 chemical additions have been added to the water
10 to create an aqueous rinsing liquor

Low Extract Spinning the drum at a relatively low rpm to
extract washing liquor from the articles
themselves

High Extract Spinning the drum at a higher rpm than that used
in the Low Extract to extract all free washing
liquor from the articles

20 The meanings of other terms used with the tables are as follows.

Low Dip This refers to the level to which drum of the machine is filled with water. If a 'Low Dip' is used, the water level is relatively low so that the actual volume of water used is lower resulting in a higher concentration of any chemical additions thereto than with a 'High Dip' function and also a greater mechanical action on the articles when the drum is rotated during washing and rinsing functions.

High Dip This also refers to the level to which drum of
the machine is filled with water. If a 'High
35 Dip' is used, the water level is higher than
that in the 'Low Dip' level so that the actual

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5 volume of water used is greater resulting in a lower concentration of any chemical additions thereto than with a 'Low Dip' function and also a lower mechanical action on the articles when the drum is rotated during washing and rinsing functions.

Med Dip This is an abbreviation for 'Medium Dip' and again refers to the level to which drum of the machine is filled with water. If a 'Med Dip' is used, the water level is higher than that in the 'Low Dip' level but greater than that in the 'High Dip' level with concomitant effects on the mechanical action and concentration of the chemical additions.

Chemical Additions These comprise the laundry preparations that are used in the washing and rinsing functions. In the Tables 1A - 4A relating to the washing processes in accordance with the present invention, the preparations are as defined herein. In the Tables 1B - 4B relating to conventional washing process, the detergents used are conventional industrial washing powders, which generally do not contain any significant terpene content, conventional laundry bleaches, and conventional laundry degreasing emulsifiers. In all cases, the quantities stated are per kg of articles to be laundered.

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Laundry Process 1
Lightly Soiled Cotton Whites

TABLE 1A - Method in Accordance with Present Invention

Total Wash Process Time - 35 minutes

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 10 g/kg powder formulated in accordance with the present method 2. 5 ml/kg Liquid bleach
Heat	40°C	2	
Wash		8	
Drain		1	
Low Extract		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Low Extract		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Low Extract		1	
High Extract		8	

TABLE 1B - Conventional Method

Total Wash Process Time - 50 minutes

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 10 g/kg Conventional detergent
Heat	80°C	5	
Wash		8	
Drain		1	
Fill	Med dip	2	1. 5 ml/kg Liquid bleach
Heat	60°C	3	
Wash		6	
Drain		1	
Low Extract		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Low Extract		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Low Extract		1	
High Extract		8	

Laundry Process 2
Heavily Soiled Cotton Whites

TABLE 2A - Method in Accordance with Present Invention

Total Wash Process Time - 45 minutes

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 10 g/kg powder formulated in accordance with the present method 2. 5 ml/kg Liquid bleach
Heat	40°C	2	
Wash		4	
Drain		1	
Fill	Low dip	1	1. 5 g/kg powder formulated in accordance with the present method 2. 5 ml/kg Liquid bleach 3. 5 ml/kg Liquid degreasing emulsifier
Heat	40°C	2	
Wash		10	
Drain		1	
Low Extract	High dip	1	
Fill		3	
Rinse		2	
Drain		1	
Low Extract	High dip	1	
Fill		3	
Rinse		2	
Drain		1	
Low Extract	High Extract	1	
High Extract		8	

TABLE 2B - Conventional Method

Total Wash Process Time - 63 minutes

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 5 g/kg Conventional detergent 2. 5 ml/kg Bleach
Heat	40°C	2	
Wash		5	
Drain	Low dip	1	1. 10 g/kg Conventional detergent 2. 5 ml/kg Degreasing emulsifier
Fill		1	
Heat		5	
Wash	80°C	12	
Drain		1	
Fill		2	
Heat	60°C	3	1. 5 ml/kg Bleach
Wash		6	
Drain		1	
Low Extract	High dip	1	
Fill		3	
Rinse		2	
Drain		1	
Low Extract	High dip	1	
Fill		3	
Rinse		2	
Drain		1	
Low Extract	High Extract	1	
High Extract		8	

Laundry Process 3
Coloured Polycotton Overalls

TABLE 3A - Method in Accordance with Present Invention

Total Wash Process Time - 40

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 20 g/kg powder formulated in accordance with the present method 2. 8 ml/kg Degreasing emulsifier
Heat	40°C	2	
Wash		12	
Drain		1	
Fill	Low dip	1	
Heat	40°C	2	
Wash		4	
Drain		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Low Extract		4	

TABLE 3B - Conventional Method

Total Wash Process Time - 56 minutes

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 20 g/kg Conventional Detergent 2. 8 ml/kg Degreasing emulsifier
Heat	80°C	5	
Wash		18	
Drain		1	
Fill	Low dip	1	
Heat	60°C	3	
Wash		2	
Drain		1	
Fill	Low dip	1	1. 5 g/kg Conventional Detergent
Heat	40°C	2	
Wash		4	
Drain		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Low Extract		4	

Laundry Process 4
White Polycotton Overalls

TABLE 4A - Method in Accordance with Present Invention

Total Wash Process Time - 40

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 12 g/kg powder formulated in accordance with the present method 2. 5 ml/kg Bleach
Heat	40°C	2	
Wash		4	
Drain		1	
Fill	Low dip	1	1. 6 g/kg powder formulated in accordance with the present method 2. 8 ml/kg Degreasing emulsifier 3. 5 ml/kg Bleach
Heat	40°C	2	
Wash		12	
Drain		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Low Extract		4	

TABLE 4B - Conventional Method

Total Wash Process Time - 60 minutes

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 6 g/kg Conventional Detergent 2. 5 ml/kg Bleach
Heat	40°C	2	
Wash		4	
Drain		1	
Fill	Low dip	1	1. 12 g/kg Conventional Detergent 2. 8 ml/kg Degreasing emulsifier
Heat	80°C	5	
Wash		12	
Drain		1	
Fill	Low dip	1	1. 5 ml/kg Bleach
Heat	60°C	3	
Wash		6	
Drain		1	
Fill	Low dip	1	
Heat	40°C	2	
Wash		2	
Drain		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Low Extract		4	

The method according to the invention is particularly effective in the washing of heavily soiled materials, in particular whitework and workwear at a temperature which is considerably lower than those conventionally used for such articles. In all of the examples, a maximum of two wash cycles is carried out so that at least one complete wash cycle is omitted as compared to conventional methods. In some cases, for example in Process 4, two whole wash cycles are omitted. It will be appreciated that this is a considerable advantage to commercial laundries in particular because it means that they can achieve the same cleaning efficiency in a much shorter time and without having to heat the large quantities of water required for at least one wash cycle. The cost is therefore considerably reduced. Also, although not featured in the examples above, specialized fabrics materials, such as the relatively delicate high visibility garments already mentioned can be efficiently cleaned without the need to use a high temperature and without having to carry out any pre-wash treatments such as soaking or dipping.

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In addition, using the formulations of laundry preparations indicated above also has the added advantage that at the final rinse stage of the washing process, the rinsing water is substantially ph neutral, i.e. ph 7, unlike many conventional laundry powders which tend to be still alkaline at this stage, typically between pH 8 and pH 9. This makes the method in accordance with the present invention ecologically friendly. A maximum of two rinse cycles is only every required and for these unheated water can be used. Also, if the articles being washed comprise whitework such as bed lines or tableware, then they are often starched and calendered after washing. If the final rinsing liquor is alkaline, then the calendering process can cause sodium matabisulphide sales to be formed in the fabric, leaving brown stains. This is called galling within the laundry industry. It will, be appreciated that in view of the

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comparative neutrality of the final rinsing liquor in the method according to the present invention that galling is much less likely to occur.

5 The above formulations are also suitable for use in hard water areas without the need to use water softening preparations and additional salt. They also have biocidal tendencies, which is advantageous generally.

10 The savings in time in the washing process of the present invention can cause unexpected problems in industrial laundries because the washed articles tend to overload the drying facilities. As an additional, optional feature of the method according to the invention, therefore, preferably in
15 the final rinse cycle of the washing process the articles are rinsed at a low dip in an aqueous solution of a cationic surfactant, typically at 0.6% w/w concentration. It has been found that such a solution tends to increase the run-off of water from the fabric of the articles during the final water
20 extraction by up to 40%. As a result the articles are drier when they leave the washing machine so that they require a shorter drying time.

 Preferably, the cationic surfactant comprises a
25 quaternary ammonium compound, for example a benzyl quaternary of ethoxylated monoalkyl amine.

 Such a surfactant also has the added advantage that it also forms a sacrificial, mono-molecular film over the
30 surface of the article that conditions the fabric and also tends to repel dirt to reduce resoiling of the article.

 Preferably also, the cationic surfactant is used in combination with an alcohol, for example isopropyl alcohol,
35 preferably in a proportion of 3:1 by weight.

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The alcohol in combination with the surfactant also provides an unexpected advantage in that it significantly reduces the drying time of the articles which have been rinsed in it. Hence, not only is the quantity of liquid left in the articles after extraction at the end of a washing process significantly reduced but the subsequent drying time of the articles is also lower than would otherwise be expected.

Taking into account all of the aforementioned advantages, it is possible to formulate a standard washing method, as detailed below, that can be used for the majority of articles to be laundered, including heavily blood-stained overalls and bedding, or oil/grease stained overalls.

TABLE 5A - 'Standard' Method in Accordance with Present Invention

Total Wash Process Time - 29.5 minutes

Function	Parameters	Time	Chemical Additions
Fill	Low dip	1	1. 15 g/kg powder formulated in accordance with the present method 2. 7 ml/kg Degreasing emulsifier 3. 5 ml/kg Liquid bleach (Optional)
Heat	40°C	1	
Wash		12	
Drain		0.5	
Low Extract		1	
Fill	High dip	3	
Rinse		2	
Drain		1	
Fill	Low dip	1	1. 0.6% w/w Cationic surfactant with alcohol
Rinse		2	
Drain		1	
Low Extract		1	
High Extract		3	

This method can be adjusted slightly dependent on the nature of the articles being washed, for example by adding bleach or not, but otherwise can stay the same. In some cases, it may be appropriate for the liquid bleach to be added part of the way through the single wash cycle. For example, after 7 minutes of the 12 minute wash, rather than initially.

The method can also be modified by combining both rinse cycles into a single cycle which starts out as a conventional cold rinse at a high dip but which after a predetermined period of time, say 2 minutes, instead of draining all of the rinsing liquor from the machine and starting a second rinse cycle, simply removes the liquor down to the low dip level, adds the cationic surfactant and then conducts a second rinse and the rest of a final rinsing cycle.

If a benefit comparison is carried out by comparing the above washing method for 90 kg dry weight of polycotton workwear with a conventional washing method, such as detailed in Table 3B above for the same quantity and type of workwear using the same industrial washing machine, then the savings in water consumption, hot water consumption, heat energy and time are as follows.

1. Water Savings

	Present Method	Conventional Method	Saving (%)
Water input	1278 litres	1638 litres	22%

As water is charged by cost to buy in and to dispose of as waste water, then the 22% saving is doubled with the present method.

2. Hot Water Savings

	Present Method	Conventional Method	Saving (%)
Hot Water	248 litres	608 litres	59%

This is calculated using two washes at 80°C and 60°C followed by a 40°C rinse in the conventional method and a single 40°C wash as indicated in Table 5A in the present method.

3. Heat Energy Savings

5		Present Method	Conventional Method	Saving (%)
	Kg of Steam required	9.3 Kg	45.5 Kg	80%

Using conventional laundry equipment, it costs approximately £10 to produce 1000 Kg of steam.

4. Time Savings

15		Present Method	Conventional Method	Saving (%)
	Wash Process Time taken	29.5 minutes	46.5 minutes	37%
20	Total number Of Machine Operations	13	19 (cf. Table 3B)	

This is again calculated using two washes at 80°C and 60°C followed by a 40°C rinse in the conventional method and a wash method as indicated in Table 5A in the present method.

It will be appreciated, therefore, that the method in accordance with the present invention provides substantial savings to the benefit both of the industrial laundry, the consumer and the environment. The benefits of the method can be summarized as follows.

- Can be used with any conventional industrial washing machine
- Provides substantial savings on water consumption, steam consumption, and wash dips
- The number of separate washing cycles are reduced increasing laundry throughput on a daily basis

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- The method is suitable for use in hard water areas without the need for salt and water softeners
- All types and classifications of laundry can be washed at a maximum of 40°C, including heavy, blood-stained whitework
- The savings include less wear and tear on boilers and machinery as the demand for steam is reduced by at least half
- The formulations detailed above for use in the method are very low in alkali and the low temperature wash avoids chemical damage occurring to fabrics caused by alkali crystallization within the weave of linen at high temperature (galling)
- The total number of washing cycles is reduced over conventional methods
- Thermal shock is avoided

CLAIMS

1. A method of laundering articles using water heated to no more than 40°C wherein in a single washing process there
5 are no more than two wash cycles followed by at least one rinse cycle and wherein in one of the wash cycles a combination of at least two laundry preparations is used, a first of the laundry preparations being in powder form and containing up to 15% by weight a
10 powdered detergent, and a second of the laundry preparations being in liquid form and comprising at least one of a degreasing emulsifier and a bleach, the laundry preparations in total comprising up to 10% by weight a terpene.
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2. A method as claimed in Claim 1, wherein there are no more than two rinse cycles.
3. A method as claimed in Claim 1 or Claim 2, wherein in
20 the final rinse cycle the articles are rinsed in an aqueous solution of a cationic surfactant.
4. A method as claimed in Claim 3, wherein in a single
25 rinse cycle the cycle commences with a cold water rinse at a high dip and after a predetermined period of time the rinsing liquor is drained down to a low dip level prior to the addition of the cationic surfactant thereto.
- 30 5. A method as claimed in Claim 3 or Claim 4, wherein the cationic surfactant comprises a quaternary ammonium compound.
- 35 6. A method as claimed in any one of Claims 3 to 5, wherein the cationic surfactant comprises a benzyl quaternary of ethoxylated monoalkyl amine.

7. A method as claimed in any one of Claims 1 to 6, wherein
in the final rinse cycle the articles are rinsed in an
aqueous solution of a cationic surfactant in combination
5 with an alcohol.
8. A method as claimed in Claim 7, wherein the relative
proportion of the cationic surfactant to the alcohol is
3:1.
- 10 9. A method as claimed in Claim 8, wherein the cationic
surfactant and alcohol combination are added to the
final rinse to produce a 0.6% w/w concentration.
- 15 10. A method as claimed in any of Claims 7 to 9, wherein
the alcohol comprises an isopropyl alcohol.
11. A method as claimed in any of Claims 1 to 10, wherein
the terpene comprises d-limonene or dipentene or a
20 mixture of d-limonene and dipentene.
12. A method as claimed in any of Claims 1 to 11, wherein
the terpene comprises an equal mixture of d-limonene and
dipentene.
- 25 13. A method as claimed in any of Claims 1 to 12, wherein
the first laundry preparation comprises the terpene at
5% by weight.
- 30 14. A method as claimed in any of Claims 1 to 13, wherein
the liquid degreasing emulsifier comprises a nonionic
surfactant.
- 35 15. A method as claimed in Claim 14, wherein the nonionic
surfactant comprises nonyl phenol ethoxylate or an
alcohol ethoxylate.

16. A method as claimed in any of Claims 1 to 15, wherein the first laundry preparation comprises up to 70% by weight inorganic salts.
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17. A method as claimed in any of Claims 1 to 16, wherein the first laundry preparation comprises up to 33% by weight sodium carbonate.
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18. A method as claimed in any of Claims 1 to 17, wherein the first laundry preparation comprises up to 40% by weight sodium chloride.
- 15
19. A method as claimed in any of Claims 1 to 18, wherein the first laundry preparation is as described herein in any one of the Examples 1 to 4.
- 20.
20. A method of laundering articles as claimed in Claim 1 and as described herein in any one of Tables 1A to 5A.
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21. A method as claimed in Claim 20, wherein in the final rinse cycle the articles are rinsed in an aqueous solution of a cationic surfactant.