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**Global Patents**

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(54) **Washing method**

(57) Supply of fragrance to laundry by adding a water-soluble, fragrance-containing film of polysaccharide or cellulosic polymer to the laundry in a washing cycle. Fragrance applied to laundry by this method is very

long-lasting, much more so than that achieved by adding perfume to the laundry detergent.

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## Description

**[0001]** This invention relates to fragrances and more particularly to the delivery of fragrances in laundry.

**[0002]** Fragrances added to laundry can give it a fresh, clean smell. However, fragrances are relatively expensive materials and it is desired to utilise them as efficiently as possible, to achieve the maximum possible benefit. One such benefit would be to impart a long-lasting fragrance to the laundry, one that persisted even after drying and ironing.

**[0003]** The traditional way of imparting fragrance has been to add it to the laundry detergent itself. The problem with this approach is that the addition of sufficient fragrance to give a desirable long-lasting effect results in a powder whose fragrance is unacceptably strong. On the other hand, a powder with an acceptable level of fragrance loses too much in the wash water. A more recent development has been to add fragrance in a liquid laundry detergent contained in a water-soluble sachet. This approach has the problem that only a limited amount of fragrance can be included in a liquid detergent. If it is attempted to include more fragrance, not only will this not disperse easily in the detergent, but it may also delay the dissolution of the sachet in the wash water, leading to poorer dispersion of the perfumed detergent in the wash and the formation of residues.

**[0004]** Another method has been to add fragrance as a component of an auxiliary material, particularly a fabric softener. This is now established as the main method for adding fragrance to laundry, but it is inconvenient because (a) fabric softeners are generally liquids and dosing accurately can be messy, and (b) the surfactants present in fabric softeners impart their own (undesirable) odour to the laundry, thus partially negating any positive effect.

**[0005]** A recent format of fabric softener is a tablet that is incorporated in a net to be placed in the washing machine. Introduced in the main wash during the laundering process, the single dose delivers perfume on fabric. However, the use of this fabric softener tablets must be inserted in the net, otherwise residues can appear on fabric.

**[0006]** It has now been found that it is possible to add fragrance to laundry in such a way as to achieve a long-lasting fragrance with a relatively small quantity of fragrance. The invention therefore provides a method of providing a fragrance to laundry by adding to laundry in a washing cycle, a water-soluble polymeric film, the film being composed of a polymer selected from water-soluble cellulosic derivatives and polysaccharides, the film incorporating the fragrance within it.

**[0007]** By "water-soluble" is meant complete water solubility under normal washing conditions.

**[0008]** By "washing cycle" is meant all operations involved in the washing of laundry from the initial dry dirty laundry to the wet washed laundry (and prior to drying of the washed laundry). A washing cycle may be conducted by hand washing or by a washing machine. "Washing cycle" also includes soaking.

**[0009]** Water-soluble cellulosic derivatives are well known to the art, and many types are commercially available. Typical examples include alkyl celluloses such as methyl cellulose, ethyl cellulose, propyl cellulose and derivatives thereof, such as the ethers (such as hydroxyethyl, hydroxypropyl and hydroxypropylmethyl celluloses) and esters (such as cellulose acetate) and cationic and anionic celluloses derivatives.

**[0010]** Water-soluble polysaccharides are also well-known to the art. The materials for use in this invention are starches, dextrin and gums, for example guar and gum Arabic.

**[0011]** Modified versions of polysaccharides are also useful in this invention and are within the scope of this invention. One example is cationic guar gum.

**[0012]** It is possible and permissible to use more than one such cellulosic derivative and/or polysaccharide in the preparation of films for use in this invention. Indeed, some of the best performers are blends. One particularly preferred film-former contains cellulose-propylene glycol ether, ethyl cellulose and starch.

**[0013]** The fragrance may be any suitable fragrance that is desirable for addition to laundry to convey a desired smell. Many are known to the art and all are suitable for use with this invention.

The fragrance is incorporated within the film. By "incorporated within the film" is meant that the fragrance is uniformly distributed throughout the film, in such a manner that the fragrance will pass from the film into the laundry during the wash cycle. This can be achieved by any convenient means. However, the films for use in this invention are preferably made by blending an aqueous solution of the sheet-forming material with the fragrance and drying to form a film.

**[0014]** Other ingredients may also be added in art-recognised quantities to perform known functions. One such ingredient is a viscosifier, which increase perfume viscosity and to increase long-lasting effect on fabric. Another such ingredient is a softening agent. Examples include at least one of vegetable oil, silicone oil and silicone derivatives, non-ionic, cationic or anionic surfactant, non-ionic or cationic proteins.

**[0015]** The sheets thus prepared may be added to the laundry load prior to commencing washing and then washing is carried out in the normal manner. The films dissolve completely and leave no residue. They may be added directly to laundry in a washing machine in the detergent drawer to replace the fabric softener. When added directly to laundry, the film is used alone or can be associated with detergent, tablets or powder, as a two-in-one product. The water-soluble film can also be added directly in water for soaking or hand washing.

**[0016]** The sheets for use in this invention have been found to be surprisingly efficacious in providing fragrance to laundry, much more so than any other method. This, coupled with an ability to hold more perfume that is usually present in a normal laundry detergent charge, gives enhanced olfactory performance over a considerable period. It has been

found that fragrance persists at a high level for more than 5 days. Moreover, it has also been found that increasing the perfume loading in the film has no effect on its water solubility properties. It is therefore possible to use thin and thick films, small and large films without any restriction.

[0017] The invention therefore also provides use in providing fragrance to laundry in the course of a laundry cycle of a film consisting of a water-soluble polymer selected from water-soluble cellulosic derivatives and polysaccharides and incorporating fragrance within it.

[0018] The invention is now further described with reference to the following non-limiting example.

(a) Formulation of film

[0019]

Phase A

glycerol	2.85 parts (wt)
cellulose-propylene glycol ether*	4.27
tapioca starch	13.10
water	66.50

Phase B

Perfume A	8.55
ethyl cellulose**	0.45
cellulose-propylene glycol ether*	4.28

\* Methocel™ F ex Dow Chemical Co.

\*\* Ethocel™ ex Dow Chemical Co.

[0020] The Phase A materials are blended and heated to 40°C. The Phase B materials are separately blended at 40°C and then added to the Phase A materials and blended, while allowing the blend to cool to room temperature.

[0021] 11.7 g of this blend is cast in a 12 cm diameter Petri dish and dried for 24 hours. The result is a circular film weighing 3.92 g., having a thickness of less than 0.1 mm thickness and containing 1 g of perfume A.

(b) Testing

[0022] A sheet prepared as previously described is used in one wash cycle for a fabric load of 2 kg of 250 g terry towelling with 50g of unperfumed powder detergent. The olfactive performance of this terry towelling is compared with that of an identical batch of terry towelling, washed using the same cycle, but with no sheet and 50g of perfumed powder detergent containing the same amount of fragrance as the sheet. (The dosage of fragrance in the detergent is 2% in order to have 1g of fragrance in the powder detergent dose - this is considerably higher than the normal 0.3% - 0.5%. A normal wash cycle at 40°C is used.

c) Olfactory assessment versus overdosed detergent

[0023] The terry towelling from both of the abovementioned washes are assessed olfactively by a panel of 10 experts. The towels are evaluated by pairs, one from each wash. Comparisons are made using an intensity scale from 0 to 5 (0 means barely detectable, 1: weak, 2: moderate, 3: strong, 4: very strong, 5: strongest imaginable) and a quality scale from 0 to 5 (0 means very poor, 1: poor, 2: fair, 3: good, 4: very good, 5: excellent)

[0024] Evaluations are done on wet fabrics and on dry fabrics after 24 hours and 5 days. The results are shown in the table.

Olfactory Evaluation With perfume A	on wet fabric - intensity	on wet fabric - quality	after 24h drying - intensity	after 24h drying - quality	after 5d drying - intensity	after 5d drying - quality
Sheet	3.5	3.5	3	4	3	4

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Table continued

Olfactory Evaluation With perfume A	on wet fabric - intensity	on wet fabric - quality	after 24h drying - intensity	after 24h drying - quality	after 5d drying - intensity	after 5d drying - quality
Detergent	3	3	1.5	1.5	1.5	1.5

**[0025]** It can readily be seen that the use of a sheet used according to the invention results in substantially (and surprisingly) improved olfactory performance.

d) Olfactory assessment versus fabric softener in liquid and tablet form

**[0026]** A sheet prepared as previously described with a fragrance is used in one wash cycle for a fabric load of 2 kg of 250 g terry towelling with 50g of unperfumed powder detergent. The olfactive performance of this terry towelling is compared with those of identical batches of terry towelling, washed using the same cycle, in one case with 1 fabric softener tablet containing the same amount of fragrance as the sheet, and in the other case, with 35g of liquid fabric softener containing 1% of the fragrance. A normal wash cycle at 40°C is used.

**[0027]** With the same scale, evaluations are done on wet fabrics and on dry fabrics after 24 hours and 5 days. The results are shown in the table.

Olfactory Evaluation With perfume B	on wet fabric - intensity -	on wet fabric quality	after 24h drying - intensity	after 24h drying - quality	after 5d drying - intensity	after 5d drying - quality
Liquid fabric Conditioner	5	4.5	4.5	4	3.5	3.5
Sheet	4.5	4.5	4	4	4	4
Tablet	4	4	3	3	2.5	2.5

**[0028]** It can readily be seen that the use of a sheet used according to the invention results in substantially (and surprisingly) improved olfactory performance on dry after 5 days.

e) Olfactory assessment between PVA film and Cellulosic film

**[0029]** A sheet prepared as previously described with a fragrance is used in one wash cycle for a fabric load of 2 kg of 250 g terry towelling with 50g of unperfumed powder detergent. The olfactive performance of this terry towelling is compared with that of an identical batch of terry towelling, washed using the same cycle, with 1 PVA water-soluble film, containing the same amount of fragrance as the previous cellulosic sheet. A normal wash cycle at 40°C was used.

**[0030]** With the same scale, evaluations are done on wet fabrics and on dry fabrics after 24 hours and 5 days. The results are shown in the table.

Olfactory Evaluation with Perfume C	on wet fabric - intensity	on wet fabric - quality	after 24h drying - intensity	after 24h drying - quality	after 3d drying - intensity	after 3d drying - quality
PVA film	4	3.5	3	3	3	3
Cellulosic film	4.5	4.5	4	4	4	4

**[0031]** It can readily be seen that the use of a cellulosic type sheet used according to the invention results in substantially (and surprisingly) improved olfactory performance versus PVA type film.

**Claims**

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1. A method of providing a fragrance to laundry by adding to laundry in a washing cycle, a water-soluble polymeric film, the film being composed of a polymer selected from water-soluble cellulosic derivatives and polysaccharides, the film incorporating the fragrance within it.
  2. A method according to claim 1 in which the water-soluble cellulosic derivative is selected from methyl cellulose, ethyl cellulose, propyl cellulose and derivatives thereof.
  - 10 3. A method according to claim 1, in which the water-soluble polysaccharide is selected from starches, dextrin and gums.
  4. Use in providing fragrance to laundry in the course of a washing cycle of a film consisting of a water-soluble polymer selected from water-soluble cellulosic derivatives and polysaccharides and incorporating fragrance within it.

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