

The invention concerns a powdered cleaning agent and a method for the preparation thereof according to the introductory part of claims 1 and 2.

A cleaning agent of this kind or method of preparation is disclosed by British patent application 2 194 972. A powdered cleaning agent for textile surfaces is known from this. A gel-like polymer mixed with water, with cellulose and other active ingredients is used as the carrier material there. In this cleaning agent the gel is formed by a mixture of water, active ingredient solution and cellulose. The cellulose (organic particles) in this case form constituents of the hydrogel former. No mechanical cleaning agent is provided there. A disadvantage with this development is furthermore that the active ingredients which are in the gel become active only in a very small proportion with textile fibres to be cleaned, as the active ingredients are dissolved within the particles.

The patent US-A-4 440 661 describes a cleaning agent in which the organic fibres are embedded in a resin.

Further, cleaning agents are known from German patent 2 732 011.

With the known cleaning agents, various organic and inorganic substances have already been proposed as carrier materials, for example sawdust, ground cork, diatomaceous earth etc. But only urea formaldehyde foams and cellulose powders have hitherto acquired considerable significance as carrier materials, at all events for the use of such cleaning agents in the domestic sphere. The use of the last-mentioned materials is subject to criticism for various reasons. With respect to the formaldehyde foams, reference is made to a possible health-damaging effect of the formaldehyde. In case of cleaning agent with a carrier material based on cellulose powder, a high proportion of bleached native cellulose of perennial plants is needed at any given time. Preparation of the cellulose powder is furthermore very effluent-intensive and, in spite of the introduction of new methods of digestion for obtaining

cellulose, seriously pollutes the environment. But a reduction of the cellulose content in known powdered cleaning agents leads to products which when worked into for example a carpet "smooth," clean much worse, are difficult to suck up and require long drying times. Also the products are then no longer "free-flowing."

Starting from the state of the art described above, it is the object of the invention to provide a powdered cleaning agent for textile surfaces which saves raw materials with the maximum possible cleaning capacity and at the same time manages without or with only small proportions of materials classed as a danger to health or environmentally incompatible.

This object is achieved with the invention provided in claim 1.

The subsidiary claims are advantageous developments.

According to the invention it is provided that polymer particles which are highly absorbent in the dry state and water-blown subsequently - so-called superabsorbers - are used as the carrier materials, together with organic fibre particles, which fibre particles are deposited on the surface of the polymer particles. The highly absorbent, water-blown polymer particles provide the necessary volume and the necessary surface area by a high proportion of water bound to the polymer particles. As a result the consumption of valuable raw materials, namely in particular bleached cellulose, can be greatly limited. The carrier material or the absorbent material is fully available to the carpet surface. It tends to form agglomerates, so that it does not get "bogged down" in the carpet. The organic fibre particles are deposited on the surface of the water-blown polymer particles. They are therefore very well distributed and only a small quantity of organic fibre particles is required. Another essential advantage lies in that very variable formulations of the cleaning agent are possible. For example, the cleaning agent can easily be made "wet" or "dry," as explained in detail below. In a

further embodiment it is provided that the polymer particles consist of a polyacrylate. Such a polyacrylate has become known in particular under the trade name "Favor," marketed by the firm Stockhausen, Krefeld. Particularly preferred is a crosslinked polyacrylic acid which is partially present as sodium salt. Such highly absorbent polymers, as also described in the text "General Report on Nonwovens 4, 1984, pages 178-182," can absorb many times their own weight in aqueous liquids. In this case a gel forms, of which however the properties may be varied. Such highly absorbent polymers do not surrender the aqueous liquid, i.e. as a rule ordinary water, which they have absorbed, even under pressure, or surrender it only in a relatively small proportion. Within the scope of the invention it is preferred that the gel displays the properties of a granular mass (caviar structure). Very small polymer particles of spherical structure are formed as a result, with a diameter from about 10 to 1,000 μm in the water-blown state. Accordingly the result is a very large surface area. The organic fibres can have a diameter from 5 to 30 μm and a length from 50 to 400 μm . These are preferably cellulose fibres.

With respect to preparation, the procedure is such that the powder consisting of sodium polyacrylate (or the above-mentioned polyacrylic acid) is mixed with water until it is saturated. In this case the polyacrylate swells up and develops the above-mentioned caviar structure. One gramme of polyacrylate can absorb many times its weight in water, for example up to 100 g. Even under pressure the polyacrylate no longer surrenders absorbed water. By adding more water which is no longer absorbed by the polyacrylate, it can be adjusted to "wet." The water-blown polyacrylate is then mixed with the cellulose fibres which are deposited on the surface of the polyacrylate particles. Then the powder obtained in this way is further mixed with the necessary active washing substance, as a rule an aqueous solution of surface-active agent. Furthermore if

occasion arises a solvent is added and if occasion arises further additives such as perhaps aromatic principles.

A powdered cleaning agent of this kind may contain 5 to 75 weight per cent water-blown acrylate, preferably 25 to 35 weight per cent, and also 10 to 50 weight per cent organic fibres, wherein linters and chemically or mechanically modified cellulose as well as similar materials are considered here in addition to cellulose. Preferably the proportion is between 25 and 35 weight per cent, wherein a cellulose powder with a grain size spectrum from 50 to 350 μm is used. It can furthermore contain about 5 to 35 weight per cent of water, preferably 20 to 25 weight per cent. 0 to 20 weight per cent, preferably also again 5 to 15 weight per cent, can be organic solvents, e.g. methoxypropanol or benzene free from aromatic compounds. 0 to 7 weight per cent can be a surface-active agent or a surface-active agent mixture. Especially it may be an anionic, non-ionic, cationic or amphoteric surface-active agent. Preferably this proportion is around 0.5 to 2 weight per cent. Finally there are 0 to 5 weight per cent, preferably 0 to 2 weight per cent further ordinary adjuvants and aromatic principles such as perhaps preservatives, antistatic, etc.

Below, two formulations by way of examples are given (the terms Arbocel, Technocel, Rewopol etc. indicated there are partly trade names):

Sample formulation I:

<u>Carrier materials</u>	<u>Quantity (weight %)</u>
<u>Cellulose:</u>	45.00
e.g. Arbocel B 820 C	
Arbocel fd 00	
Arbocel TP 40	
Technocel 90 DU with 10%	
Technocel 300 BL	
Arbocel B 00 with 15%	
LIC 200	

Favor CT (acrylate water-blown) 5.00
 (corresponds to 0.025% Favor with
 4.975% water)

Active ingredient solution:

Water	33.50
Surface-active agent (e.g. Rewopol V 2800)	5.00 (corresponds to 1% WAS)
Anti-foaming agent (e.g. Baysilon AC 3099)	0.05
Anti-static (e.g. Statexan)	0.15
Perfume oil (Kobofleur)	0.10
Isopropanol	1.00
Preservative (e.g. Actacid SPX)	0.20

Solvent:

e.g. Isopar J	10.00
	<u>100.00</u>

Sample formulation II:

<u>Carrier materials</u>	<u>Quantity (weight %)</u>
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<u>Cellulose:</u>	30.00
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e.g. Arbocel B 00 with 50% Arbocel Lic 200	
Arbocel fd 00 with 30% Arbocel Fic 200	
Arbocel B 820 C with 10% Fic 200	

Favor CT (acrylate water-blown)	30.00
(corresponds to 0.15% Favor with 29.85% water)	

Active ingredient solution:

Water	23.60
Surface-active agent (e.g. Rewopol V 2800)	5.00 (corresponds to 1% WAS)
Anti-foaming agent (e.g. Baysilon AC 3099)	0.05

Anti-static	0.05
(e.g. Statexan)	
Perfume oil	0.10
(Kobofleur)	
Isopropanol	1.00
Preservative	0.20
(e.g. Actacid SPX)	
<u>Solvent:</u>	
e.g. Isopar J	<u>10.00</u>

100.00

The above formulations are prepared, with respect to a quantity of 150 kg, more or less as follows (values for formulation I in brackets):

First the acrylate dispersion consisting of 0.23 kg (0.04 kg) Favor CT and 44.78 kg (7.46 kg) water is stirred. Depending on the desired viscosity of the dispersion, it can further be diluted with water from the active ingredient solution.

The components of the active ingredient solution [33.43 kg (47.30 kg) water; 7.50 kg (7.50 kg) surface-active agent solution; 0.08 kg (0.08 kg) anti-foaming agent; 0.15 kg (0.23 kg) anti-static; 0.15 kg (0.15 kg) perfume oil; 1.50 kg (1.50 kg) isopropanol and 0.30 kg (0.30 kg) preservative] are mixed in a separate tank.

In a mixer called a ploughshare mixer are placed 46.97 kg (70.46 kg) cellulose powder (4.2% moisture). While the mixer is running, first the acrylate dispersion, then the active ingredient solution and lastly 15.0 kg (15.0 kg) benzene are sprayed on with a diaphragm pump.

In both cases a white, free-flowing powder having a dry feel is produced.

The specification "WAS" listed above has the meaning that 5% aqueous surface-active agent mixture corresponds to 1% pure "WAS" surface-active agent fraction. The aforementioned isopropanol has the function of serving as a solvent for the perfume which is added to the agent. It is normally contained in the surface-active agent mixture

mentioned in the application.

The characteristics of the invention disclosed in the above description and claims can be of significance for putting the invention into practice both individually and in any combination.



Claims

1. Powdered cleaning agent for textile surfaces, in particular textile floor coverings, containing a carrier material mixed with water and an active ingredient solution consisting of an active cleaning substance, if occasion arises solvents and if occasion arises further additives, wherein the carrier material is formed by highly absorbent, water-blown polymer particles and organic fibre particles, characterised by a mixture of the organic fibre particles, which are deposited on the surface of the water-saturated polymer particles, with an active ingredient solution.
2. Method for the preparation of a powdered cleaning agent for textile surfaces, in particular textile floor coverings, containing a carrier material mixed with water and consisting of highly-absorbent, water-blown polymer particles and organic fibre particles, characterised in that the water-saturated gel formed by the polymer particles is mixed with the organic fibre particles for deposition of the organic fibre particles on the surface of the polymer particles and then the powder is mixed with the active ingredient solution.
3. Cleaning agent or method for the preparation of a cleaning agent according to claim 1 or 2, characterised in that the polymer particles consist of a polyacrylate.
4. Cleaning agent or method for the preparation of a cleaning agent according to claim 3, characterised in that the polymer particles consist of crosslinked polyacrylic acid which is partially present as sodium salt.
5. Cleaning agent or method for the preparation of a cleaning agent according to one or more of the preceding claims, characterised in that the polymer particles are ground, with a diameter from 10 to 1,000 μm in the water-



blown state.

6. Cleaning agent or method for the preparation of a cleaning agent according to one or more of the preceding claims, characterised in that the cleaning agent contains

- 5 to 75 weight per cent water-blown polymer particles,
- 10 to 50 weight per cent organic fibres,
- 5 to 40 weight per cent water,
- 0 to 20 weight per cent organic solvent,
- 0 to 3 weight per cent anionic, non-ionic, cationic or amphoteric surface-active agent or surface-active agent mixture,
- 0 to 5 weight per cent other ordinary adjuvants and aromatic principles.

7. Cleaning agent or method for the preparation of a cleaning agent according to one or more of the preceding claims, characterised in that it contains

- 25 to 15 weight per cent water-blown polymer particles,
- 25 to 35 weight per cent cellulose powder,
- 20 to 25 weight per cent water,
- 5 to 15 weight per cent benzene free from aromatic compounds,
- 3 to 7 weight per cent surface-active agent mixture,
- 0 to 2 weight per cent adjuvants.

8. Cleaning agent or method for the preparation of a cleaning agent according to one or more of the preceding claims, characterised in that the organic fibres have a diameter from 5 to 30 μm and a length from 50 to 400 μm .