



(86) Date de dépôt PCT/PCT Filing Date: 1998/06/12
 (87) Date publication PCT/PCT Publication Date: 1998/12/30
 (45) Date de délivrance/Issue Date: 2007/08/07
 (85) Entrée phase nationale/National Entry: 1999/12/13
 (86) N° demande PCT/PCT Application No.: GB 1998/001727
 (87) N° publication PCT/PCT Publication No.: 1998/059026
 (30) Priorité/Priority: 1997/06/20 (GB9713023.1)

(51) Cl.Int./Int.Cl. *C11D 3/00* (2006.01),
A01N 25/16 (2006.01), *A01N 59/16* (2006.01),
C11D 17/04 (2006.01), *C11D 3/02* (2006.01),
C11D 3/12 (2006.01), *C11D 3/37* (2006.01),
C11D 3/48 (2006.01), *C11D 7/10* (2006.01),
C11D 7/20 (2006.01)
 (72) Inventeur/Inventor:
 CORNELIUS, GAY, GB
 (73) Propriétaire/Owner:
 RECKITT BENCKISER (UK) LIMITED, GB
 (74) Agent: FETHERSTONHAUGH & CO.

(54) Titre : AMELIORATIONS APPORTEES AU NETTOYAGE DE SURFACES
 (54) Title: IMPROVEMENTS IN OR RELATING TO THE CLEANSING OF SURFACES

(57) **Abrégé/Abstract:**

A cleaning material for cleansing surfaces comprises a closed cell foam matrix including an antimicrobial composition. The foam matrix may be a polyurethane foam and the antimicrobial composition may comprise a source of silver ions in the form of a composite in combination with a porous support material such as titanium dioxide.

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : C11D 3/00, 17/04, 3/37, 3/12, 3/02</p>	<p>A1</p>	<p>(11) International Publication Number: WO 98/59026 (43) International Publication Date: 30 December 1998 (30.12.98)</p>
<p>(21) International Application Number: PCT/GB98/01727 (22) International Filing Date: 12 June 1998 (12.06.98) (30) Priority Data: 9713023.1 20 June 1997 (20.06.97) GB (71) Applicant (for all designated States except US): RECKITT & COLMAN PRODUCTS LIMITED [GB/GB]; 67 Alma Road, Windsor, Berkshire, SL4 3HD (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): CORNELIUS, Gay [GB/GB]; 57 The Wolds, Cottingham, East Yorkshire HU16 5LQ (GB). (74) Agents: DALE, Martin, Nicholas et al.; Reckitt & Colman plc, Group Patents Dept., Dansom Lane, Hull HU8 7DS (GB).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p>	
<p>(54) Title: IMPROVEMENTS IN OR RELATING TO THE CLEANSING OF SURFACES</p>		
<p>(57) Abstract</p> <p>A cleaning material for cleansing surfaces comprises a closed cell foam matrix including an antimicrobial composition. The foam matrix may be a polyurethane foam and the antimicrobial composition may comprise a source of silver ions in the form of a composite in combination with a porous support material such as titanium dioxide.</p>		

25448-133

- 1 -

Improvements in or relating to the cleansing of surfaces

This invention relates to the cleansing of surfaces and more particularly, but not exclusively, is concerned with the cleansing of non-absorbent hard surfaces
5 found in the domestic environment.

It is an object of the present invention to provide a new and improved cleaning material for cleansing a surface without scratching the surface.

According to one aspect of the present invention
10 there is provided a cleaning material for cleansing surfaces which material comprises a coherent self-supporting body formed of a closed cell foam matrix which comprises a source of silver ions as antimicrobial agent, which silver ions are released from the composition when the body is in contact
15 with water.

In use, the surface is rubbed with the cleaning material and it is particularly preferred for the foam matrix to be of such a friability that it tends to wear away to a limited extent when being rubbed on the surface with
20 the ingrained dirt in the cracks and fissures in the surface being rolled out by the fine nature of the mildly abrasive particles formed as the matrix crumbles in use. A rating of the friability of the foam matrix can be found using Stable Micro Systems Ltd Texture Analyser TA-XT2 in particular in
25 conjunction with the Craft Knife Adapter & Blades Test Unit (code A/CKB). The preferred friability corresponds to a force in the range of 700-900gms with a pre speed of 2.00mm per second using this technique.

Accordingly, another aspect of the present
30 invention provides a method of cleansing a surface which comprises rubbing the surface with a cleaning material as

25448-133

- 2 -

above defined in the presence of water and thereafter wiping the surface with a cloth.

Cellular products resulting from the foaming of certain polymers are subject to microbial attack either
5 because the polymer is a food source of organisms or because the reticular form of the polymer allows the collection of debris which serves as a food source for the organisms. The present invention utilises a closed cell foam which is
unable to absorb water and become moist. This together with
10 the anti-bacterial composition means that the system is sanitary.

It is particularly preferred for the foam matrix to have a density of from 30 to 70 (preferably from 42 to 56 kg/m³) and a substantially uniform and fine cell size.
15 Preferably the foam is a rigid polyurethane foam.

Preferably the source of the silver ions is a silver salt such as a silver halide, for example silver chloride.

In a preferred embodiment, the antimicrobial
20 composition includes a support material for the source of silver ions. Preferably, the support material is porous so that it can absorb the source and protect it from ambient light. Suitable support materials are

25448-133

- 3 -

oxidic materials such as particulate titanium oxide. On contact with aqueous medium, the support material releases silver ions in a controlled way. Such supported silver compounds are described in EP-A-0251783.

5

In accordance with a particular preferred embodiment of the present invention, the support material is a composite comprising titanium dioxide having an average particle size of about 1 to 15mm, preferably about 2 to 5 mm, and having from about 10 to 80% preferably 20 to 60%, by weight (based on the composite) of silver chloride incorporated therein.

10

15

In addition to including the source of silver ions, the composition may comprise a colourant. Suitable colourants are commercially available colourants such as "Solvent Yellow 98" from Hoechst or "Solvent Blue 70" from BASF. It will be understood, however, that the choice of colour is arbitrary and that any suitable colourants known in the art can be used. It is particularly preferred for the cleaning material to be colour coded, a particular colour being used to designate the suitability of the material for a particular cleansing task.

20

25

The antimicrobial composition is preferably uniformly incorporated into the foamed matrix.

Preferably the cleaning material is in the form of a block about 120 x 50 x 45 mm in size and shaped to fit the hand. During use, it wears away to take the

30

25448-133

- 4 -

shape of the contours of the surface being cleaned and this enables awkward corners to be cleaned.

5 When, in use, the preferred cleaning material is rubbed over the surface to be cleaned together with a little water (e.g. cold tap water), the closed cell polyurethane foam wears away providing, as it does so, sufficient abrasive particles to clean dirt out of the fissures and cracks in the surface being cleaned. At the same time, silver ions are leached out of the composition to provide disinfection. As the foamed matrix is a closed cell structure, water will only come into contact with the silver ion source when a fresh surface is exposed due to the shearing action on the block as it is rubbed over the surface to be cleaned. After cleaning, the surface is wiped over with a cloth to finish. This removes residues created by the cleaning action but leaves sufficient silver composite within the surface fissures to provide the antimicrobial action. As more water is added to the surface, so residual antimicrobial action occurs.

20 The cleaning material of the present invention is particularly suitable for cleansing surfaces such as work surfaces (especially textured melamine* surfaces), sinks (especially textured plastics sinks), all types of cooker hobs (particularly vitreous ceramic hobs), oven interiors, extractor fan exterior surfaces, kitchen appliances (particularly those with textured plastic surfaces), windows and mirrors, baths and washbasins, tiles and marble, and non-absorbent floor tiles.

30 The following Example illustrates the invention.

*Trade-mark

- 5 -

Example

5 A free-flowing titanium dioxide/silver chloride composite powder was prepared by reacting silver nitrate with sodium chloride in the presence of titanium dioxide particles having an average size of from about 2 to 3mm so that, after drying, the composite contained 20% by weight silver chloride and 80% by weight titanium dioxide.

10 A polyurethane foam was made from a stoichiometric excess of commercial grade diphenylmethane 4,4'-diisocyanate (MDI) and a polyol and the above composite was incorporated therein. The foam was processed by dispensing it through a machine into a mould to obtain a block comprising a fine and regular
15 closed cell foam matrix containing not more than 4% by weight of the composite and having a density in the range of from 30 to 70kg/m³.

20 A surface of the block was rubbed over a hard non-absorbent surface to be cleaned in the presence of cold tap water. The block surface abraded away slightly to form abrasive particles which effectively removed dirt from the fissures and cracks in the surface to be cleaned. Also, the surface was disinfected by silver ions leached from the cells at
25 the block surface. During use of the block, a fresh cleaning and disinfecting surface was continually generated as the block abraded away. After being rubbed with the block, the cleaned surface may be wiped with a damp cloth whereby the antimicrobial
30 action continues.

25448-133

- 6 -

CLAIMS:

1. A cleaning material for cleaning a non-absorbent surface, which material comprises a coherent self-supporting body formed of a closed cell friable foam matrix and a source of silver ions as antimicrobial agent, which silver ions are released when the body is in contact with water.
2. The cleaning material as claimed in claim 1 wherein the foam matrix is a closed cell polyurethane foam.
3. The cleaning material as claimed in claim 1 or claim 2 wherein the foam has a density of from 30 to 70 kg/m³.
4. The cleaning material as claimed in claim 3 wherein the density is from 42 to 56 kg/m³.
5. The cleaning material as claimed in any one of claims 1 to 4, wherein the silver ion source is present in combination with a support material.
6. The cleaning material as claimed in claim 5, wherein the support material is a porous oxidic material.
7. The cleaning material as claimed in claim 6, wherein the support material is particulate titanium dioxide.
8. The cleaning material as claimed in claim 7, wherein the titanium dioxide has an average particle size of from 1 to 15 mm.
9. The cleaning material as claimed in claim 8, wherein the average particle size of from 2 to 5 mm.

25448-133

- 7 -

10. The cleaning material as claimed in any one of claims 1 to 9, wherein the source of silver ions is a silver salt.

11. The cleaning material as claimed in claim 10,
5 wherein the silver salt is silver chloride.

12. The cleaning material as claimed in any one of claims 7, 8 or 9 wherein the source of silver ions is silver chloride in an amount of from 10 to 80% by weight based on the weight of silver chloride and titanium dioxide.

10 13. The cleaning material as claimed in claim 12, wherein the amount of silver chloride is from 20 to 60% by weight based on the weight of silver chloride and titanium dioxide.

14. The cleaning material as claimed in any one of
15 claims 7 to 13 wherein the source of silver ions and titanium dioxide constitute, in the aggregate, not more than 4% by weight of the cleaning material.

15. The cleaning material of any one of claims 1 to 14 which further comprises a colourant.

20 16. A method of cleansing a surface which comprises rubbing the surface with the cleaning material, as defined in any one of claims 1 to 15, in the presence of water and thereafter wiping the surface with a cloth.

FETHERSTONHAUGH & CO.
OTTAWA, CANADA

PATENT AGENTS