



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 405 591 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
07.04.2004 Bulletin 2004/15

(51) Int Cl.7: **A47L 13/20**

(21) Application number: **02396150.1**

(22) Date of filing: **04.10.2002**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**
Designated Extension States:
AL LT LV MK RO SI

• **Kaartinen, Pia**
24100 Salo (FI)

(71) Applicant: **Carl Freudenberg KG**
69469 Weinheim (DE)

(74) Representative: **Helino, Timo Kalervo et al**
Papula Oy,
P.O. Box 981
(Fredrikinkatu 61 A)
00101 Helsinki (FI)

(72) Inventors:
• **Lindholm, Keijo**
24100 Salo (FI)

(54) **Yarn mop**

(57) A yarn mop for the cleaning of surfaces, such as floors, said yarn mop (1) comprising a planar mount (2) provided with fastening elements (3) for attachment of the yarn mop to a cleaning implement (4) and with a

large number of yarns fixed to its other planar surface, said yarns forming the scrubbing part (5) of the yarn mop. According to the invention, the yarns of the scrubbing part (5) mainly consist of microfiber and additionally of thicker synthetic fiber or converted fiber.

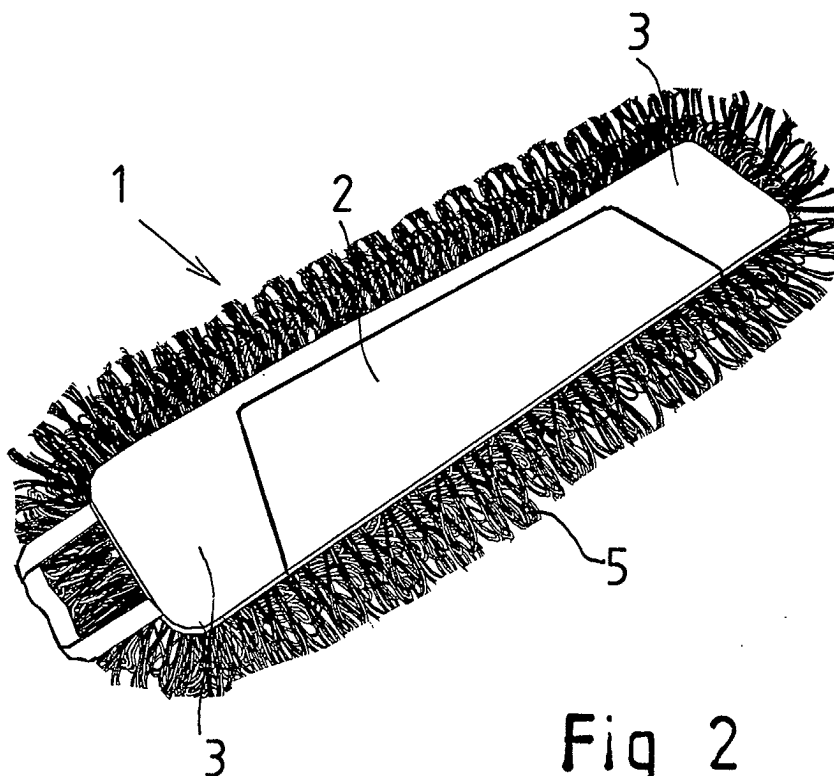


Fig 2

EP 1 405 591 A1

Description

[0001] The present invention relates to a yarn mop intended in the first place for the cleaning of floors and comprising a planar mount provided with fastening elements for connecting the yarn mop to a cleaning implement and with a large number of yarns attached to its other planar surface to form a scrubbing part of the yarn mop.

[0002] Traditionally, the scrubbing parts of yarn mops have been made from natural fiber, such as cotton or viscose or mixtures of these with chemical fibers. However, especially in heavy professional use, these materials have several drawbacks that would call for improvement. Such drawbacks include considerable shrinking of the mop during use, relatively low wear resistance, unhygienic nature of natural fiber in continuous wet use and relatively poor basic properties.

[0003] In prior art, various mops made of microfiber fabrics are also used in dry or half-dry conditions. They have the advantage of having good scrubbing and cleaning properties and an excellent durability. However, they are only suited for use in dry or half-dry conditions because in moist or wet conditions their friction against the surface to be cleaned is so great that dragging or pushing them along the surface is too fatiguing, at least for this work to be continued for a full work day.

[0004] The object of the invention is to eliminate some of the above-mentioned drawbacks. A specific object of the invention is to disclose a new type of yarn mop that has as many good properties typical of yarn mops as possible, including: good cleaning result, good ergonomic properties, usability in both dry, moist and wet conditions, good absorption capacity, good wear resistance, hygienic nature and versatile possibilities regarding mop color.

[0005] As for the features of the invention, reference is made to the claims.

[0006] The yarn mop of the invention intended for the cleaning of e.g. floors comprises a generally planar and flexible mount made of fabric-like material and provided with fastening elements to allow the yarn mop to be attached to a cleaning implement. The fastening elements may consist of various pockets, loops, buckles, sticker surfaces or equivalent. The mount is provided with a large number of yarns fixed to its other planar surface and forming the scrubbing part of the yarn mop. The number of yarns may vary considerably, but in general substantially the entire planar surface has yarns attached to it while part of the yarns extend outside the area of the planar surface.

[0007] According to the invention, the yarns of the scrubbing part mainly consist of microfiber and additionally of thicker synthetic fiber or converted fiber.

[0008] Thus, according to the invention, the microfiber yarns make the scrubbing part durable and give it good washing properties, i.e. surface rubbing properties, as well as a good liquid absorption capacity, while the thick-

er synthetic fibers or converted fibers endow the scrubbing part with ergonomic properties necessary, in other words, they reduce the friction of the scrubbing part and give it a suitable lubricity against the surface to be cleaned even in wet conditions. In addition, the thicker fibers make it possible to dye the scrubbing part with desired color and so that it retains its color. As is known, microfibers are generally colorless or white and are very difficult to dye and have a poor ability to retain color, so that microfibers loose or change color even after slight use.

[0009] In the scrubbing part of the invention, the microfiber content is 50-90% of the total amount of fibers. According to experiments carried out, already with a 50-% microfiber content a clearly better cleaning result is achieved relatively easily than using traditional scrubbing parts, even on a wet surface. With a 90-% microfiber content, a very good cleaning result is achieved, but in this case there appears the problem that moving a wet cleaning implement on the surface to be washed requires a relatively great effort.

[0010] To improve the cleaning result and enhance the ergonomics and ease of cleaning work, the range between the limit percentages referred to above can be narrowed down to 60-80%, preferably 65-75% and e.g. to 70%, which is a value that has yielded excellent washing test results with a wet or moist scrubbing part sliding readily and easily on the surface to be cleaned. An actual cleaning result as much as 30% better than with traditional cotton-viscose mops has been achieved. The test results are fully objective as the assessments are based on optical measurements and reflection properties of the surfaces washed.

[0011] The yarns used in the scrubbing part may have a thickness varying in the range of 0.1-1.0 dtex. The range of thickness variation is preferably 0.3-0.9 dtex. Very good test results have been achieved with a microfiber thickness of about 0.6 dtex.

[0012] The microfiber used in the yarns of the scrubbing part of the invention may consist of polyester microfiber, polyamide microfiber, polypropylene microfiber, viscose microfiber or a suitable mixture of these microfibers.

[0013] The thicker fiber in the yarns of the scrubbing part may consist of polyester fiber, polyamide fiber, polypropylene fiber, viscose fiber or a suitable mixture of these microfibers. The range of thickness variation of the thicker fiber is preferably 1-6 dtex, preferably 2-5 dtex. In testing conditions, good results have been achieved with a fiber thickness of about 3 dtex.

[0014] The yarns of the scrubbing part, both microfibers and thicker fibers consist of yarn spun from staple fiber, which improves the cohesion of the yarns. The structure of yarns made of filament microfiber easily breaks up during hot washing and in heavy use. During cleaning work, a scrubbing part yarn thus damaged easily gets caught on various sharp corners, skirtings and the like. The absorption capacity as well as the dirt-hold-

ing capacity of a yarn made of staple fiber is particularly good as compared with traditional filament fibers and filament microfibers. The length of the staple fibers use is in the range of 5-60 mm, preferably 10-20 mm.

[0015] A yarn made of microfiber only is generally relatively bleak and colorless, so when used in the scrubbing part of yarn mop it quickly becomes unpleasantly dirty in appearance. Therefore, a proportion of the thicker fiber, such as polyester fiber, of the yarns of the scrubbing part consists of colored fiber that gives the yarn mop a desired color. For example, when the proportion of colored black fiber in yarns used is 10-20%, e. g. about 13% of the total amount of fibers, the whole scrubbing part will have a smooth and nice gray color.

[0016] Traditionally, various three-ply mop yarns have been used. However, in the scrubbing part of the invention 3-15-ply, e.g. 6-ply yarn is used, which considerably increases the wear resistance of the yarns. Another preferable essential feature of the scrubbing part of the yarn mop of the invention is that the yarns used in it have a length exceeding 20 mm, preferably between 30-80 mm, e.g. of the order of about 50 mm.

[0017] As compared with prior art, the yarn construction of the scrubbing part of the yarn mop of the invention has significant advantages:

- the scrubbing part is completely unshrinkable and retains its properties and shape,
- the scrubbing part works well even with mere water, and washing agents need not necessarily be used,
- the scrubbing part has an excellent wear resistance; for instance, in comparison with a traditional viscose scrubbing part, the loss of weight in certain use has fallen from 40% to 2%.
- as compared with traditional mops, over 30% better cleaning result, i.e. cleaner floor,
- works excellently in both dry, moist and wet conditions,
- good ergonomic properties regarding ease of work even when used in moist and wet conditions, and
- unlimited coloring possibilities and good color retention properties.

[0018] In the following, two figures will be described, of which

Fig. 1 presents a cleaning implement provided with a yarn mop, and

Fig. 2 presents a yarn mop.

[0019] Figures 1 and 2 visualize the uses of the invention. Thus, the invention concerns a yarn mop 1, which comprises a planar mount 2 generally made of a fabric or a fabric-like, elastic and flexible material. One of the planar surfaces of the mount is provided with fastening elements 3, i.e. suitable pockets for attachment of the yarn mop to a cleaning implement 4. The cleaning implement 4 again consists of a suitable rigid support plate

and a handle pivotally connected to it. The rigid support plate may comprise various elastic, flexible, turnable or otherwise yielding structures that allow support plate to be inserted or fitted into the fastening elements of the yarn mop. It is also possible to use various sticker surfaces.

[0020] Attached to the other planar surface, i.e. the lower surface of the planar mount 2 is a large number of yarns of substantially equal length, which together form the scrubbing part 5 of the yarn mop. The yarns may be fixed to the mount 2 in various ways, by sewing, tying, knitting, gluing or by similar methods. The form of the yarns may also vary, in other words, they may consist of closed loops or straight cut pieces of yarn or suitable combinations of these. More exactly speaking, the present invention concerns the material and construction of the yarns of this scrubbing part.

Claims

1. Yarn mop for the cleaning of surfaces, such as floors, said yarn mop (1) comprising a planar mount (2) provided with fastening elements (3) for attachment of the yarn mop to a cleaning implement (4) and with a large number of yarns fixed to its other planar surface, said yarns forming the scrubbing part (5) of the yarn mop,
characterized in that the yarns of the scrubbing part (5) mainly consist of microfiber and additionally of thicker synthetic fiber or converted fiber.
2. Yarn mop according to claim 1, **characterized in that** the proportion of microfiber is 50-90 %.
3. Yarn mop according to claim 2, **characterized in that** the proportion of microfiber is 60-80 %, preferably 65-75 %, e.g. about 70 %.
4. Yarn mop according to claim 1, **characterized in that** the thickness of the microfiber is 0.1-1.0 dtex, preferably 0.3-0.9 dtex, e.g. about 0.6 dtex.
5. Yarn mop according to any one of claims 1-4, **characterized in that** the microfiber consists of polyester microfiber, polyamide microfiber, polypropylene microfiber and/or viscose microfiber.
6. Yarn mop according to claim 1, **characterized in that** the thicker fiber is polyester fiber, polyamide fiber, polypropylene fiber and/or viscose fiber.
7. Yarn mop according to claim 1, **characterized in that** thickness of the thicker fiber is 1-6 dtex, preferably 2-5 dtex, e.g. about 3 dtex.
8. Yarn mop according to any one of claims 1-7, **characterized in that** the yarn consists of yarn spun

from staple fiber.

9. Yarn mop according to claim 8, **characterized in that** the staple fibers have a length in the range of 5-60 mm, preferably 10-20 mm. 5
10. Yarn mop according to claim 1, **characterized in that** part of the thicker fiber, such as polyester fiber, consists of colored fiber, e.g. black fiber, in order to give the scrubbing part of the yarn mop a desired color. 10
11. Yarn mop according to claim 10, **characterized in that** the proportion of colored fiber in the yarn is 5-25 %, preferably 10-20 %, e.g. 12-16 %. 15
12. Yarn mop according to any one of claims 1-11, **characterized in that** the yarn in the scrubbing part is 3-15-ply, preferably 4-8-ply, e.g. 6-ply yarn. 20
13. Yarn mop according to any one of claims 1-12, **characterized in that** the length of a yarn in the scrubbing part is over 20 mm, preferably 30-80 mm, e.g. about 50 mm. 25

25

30

35

40

45

50

55

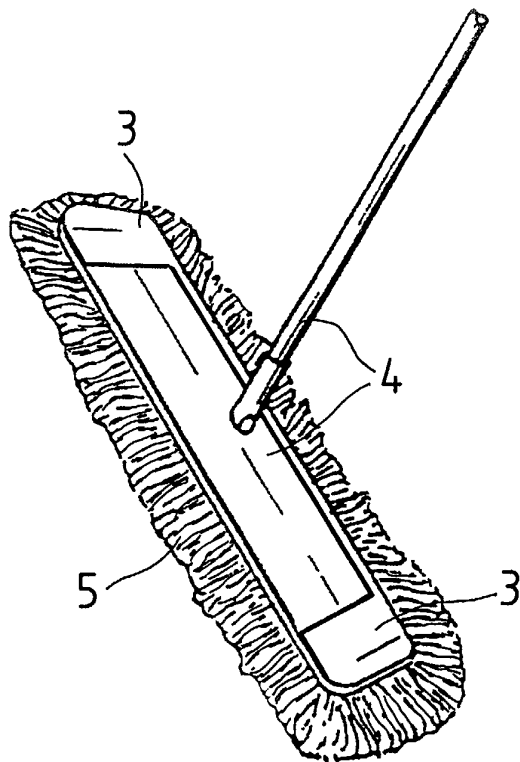


Fig 1

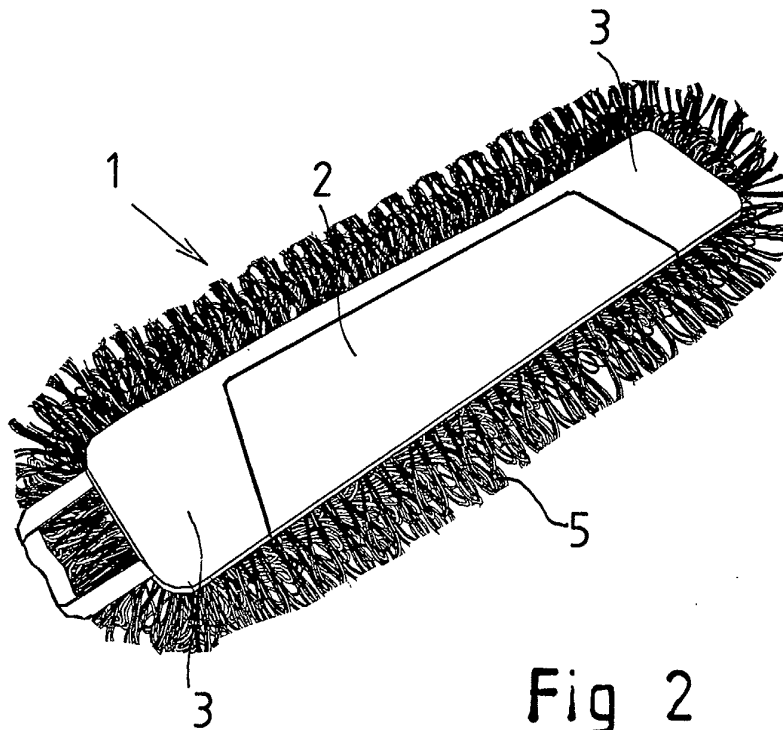


Fig 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 39 6150

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 804 274 A (NORDIN RUDOLF) 8 September 1998 (1998-09-08) * column 1, line 47 - column 4, line 38; figures 1-3 *	1-8	A47L13/20
X	US 5 887 311 A (OSBERGHAUS RAINER ET AL) 30 March 1999 (1999-03-30) * column 3, line 14 - column 6, line 5; figures 1,2 *	1,4-6,10	
X	PATENT ABSTRACTS OF JAPAN vol. 2002, no. 08, 5 August 2002 (2002-08-05) -& JP 2002 102132 A (SEIWA KK), 9 April 2002 (2002-04-09) * abstract; figures 1-5 *	1,4-6	
A	DE 196 36 988 A (FREUDENBERG CARL FA) 19 March 1998 (1998-03-19) * column 3, line 54 - column 4, line 17; figures 3,4 *	1-13	
A	EP 0 953 314 A (SANAMUNDI AKTIENGESELLSCHAFT) 3 November 1999 (1999-11-03) * column 2, line 18 - column 3, line 56 * * column 5, line 40 - column 6, line 42; claim 1; figures *	1-13	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A47L
A	EP 1 166 706 A (SANAMUNDI AG) 2 January 2002 (2002-01-02) * claims 12-16; figures *	1-13	
A	EP 1 224 900 A (MOPATEX S A) 24 July 2002 (2002-07-24) * the whole document *	1-13	
-/-			
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 12 March 2003	Examiner Lodato, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P04C01)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 39 6150

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 0 903 105 A (PETIT CHRISTIAN) 24 March 1999 (1999-03-24) * the whole document * -----	1-13	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 12 March 2003	Examiner Lodato, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 39 6150

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-03-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5804274	A	08-09-1998	SE 503414 C2	10-06-1996
			AT 179581 T	15-05-1999
			AU 3690295 A	02-05-1996
			CN 1166778 A ,B	03-12-1997
			DE 69509542 D1	10-06-1999
			EP 0784446 A1	23-07-1997
			FI 971416 A	04-04-1997
			JP 10506820 T	07-07-1998
			NO 971570 A	06-06-1997
			SE 9403398 A	08-04-1996
			WO 9610946 A1	18-04-1996

US 5887311	A	30-03-1999	DE 19510824 C1	23-05-1996
			AT 174489 T	15-01-1999
			CA 2203692 A1	09-05-1996
			DE 59504587 D1	28-01-1999
			DK 788328 T3	23-08-1999
			WO 9613192 A1	09-05-1996
			EP 0788328 A1	13-08-1997
			ES 2125055 T3	16-02-1999
			FI 971741 A	23-04-1997
			NO 970822 A	24-02-1997

JP 2002102132	A	09-04-2002	NONE	

DE 19636988	A	19-03-1998	DE 19636988 A1	19-03-1998
			AT 207145 T	15-11-2001
			WO 9811290 A1	19-03-1998
			EP 0925399 A1	30-06-1999
			ES 2165613 T3	16-03-2002
			PT 925399 T	29-04-2002

EP 0953314	A	03-11-1999	EP 0953314 A1	03-11-1999

EP 1166706	A	02-01-2002	EP 1166706 A1	02-01-2002

EP 1224900	A	24-07-2002	ES 1047980 U1	01-06-2001
			EP 1224900 A1	24-07-2002

EP 0903105	A	24-03-1999	FR 2768042 A1	12-03-1999
			EP 0903105 A1	24-03-1999

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82