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<p>(21) International Application Number: PCT/EP94/00466 (22) International Filing Date: 17 February 1994 (17.02.94) (30) Priority Data: 93200628.1 4 March 1993 (04.03.93) EP (34) Countries for which the regional or international application was filed: NL et al. (71) Applicant (for all designated States except AU BB CA GB IE LK MN MW NZ SD): UNILEVER N.V. [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL). (71) Applicant (for AU BB CA GB IE LK MN MW NZ SD only): UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London EC4 4BQ (GB). (72) Inventor: HÄBERLI, Peter; Im Leisibüel 51, CH-8484 Weisslingen (CH).</p>	<p>(81) Designated States: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, 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 With international search report.</p>	
<p>(54) Title: SUCTION HEAD FOR A FLOOR CLEANING MACHINE</p>		
<p>(57) Abstract</p> <p>There is provided a suction head for a floor cleaning machine, comprising a housing (7) and a package (1) consisting of a squeegee (2) and at least one clip element (3), whereby the size and shape of said clip element and the housing are such that this package can be removably fixed into the housing and that the squeegee (2) can be removably fixed into the clip element (3). When applying this suction head, optimal use can be made of said squeegee.</p>		

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SUCTION HEAD FOR A FLOOR CLEANING MACHINEField of the invention

5 The present invention relates to an apparatus for cleaning floor surfaces. The invention is particularly concerned with a suction head arrangement suitable for use with a wet floor cleaning machine.

10 Background of the invention

It has been known in the past to employ a mobile suction head as part of a machine for cleaning of floor surfaces, especially a machine for wet cleaning of such surfaces.

15 US-A-2,531,370 discloses a suction mop suitable for use in scrubbing floors and the like. This suction mop comprises a mop head including a U-shaped channel in which an inverted squeegee blade can be removably supported.

20 US-A-3,434,178 relates to a vacuum cleaner comprising a vacuum suction nozzle having an inlet near the floor, and an elongate floor brush located near this inlet. This brush is resiliently attached to the vacuum nozzle by way of a U-shaped clip coupled to the nozzle by way of a leaf spring.

25

US-A-3,371,371 discloses vacuuming equipment for treating floors, in particular a pick-up tool assembly comprising a vacuum head, means for positioning said vacuum head in a fixed functional relationship to the surface to be cleaned, while in use. These positioning means include a non-removable elongate squeegee which is attached to the assembly by a pair of clip elements.

35 It is an object of the present invention to provide a suction head for a floor cleaning machine, comprising a squeegee which can be easily removed but is, on the other hand, tightly fixed to the rest of the suction head when in

use.

It is also an object of the invention that optimal use is made of said squeegee when applied in said suction head.

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It has been found that these objects can be achieved by a suction head according to the present invention.

Definition of the invention

10 The present invention provides a suction head for a floor cleaning machine, comprising a housing and a package consisting of a squeegee and at least one clip element, whereby the size and shape of said clip element and the housing are such that this package can be removably fixed
15 into the housing and that the squeegee can be removably fixed into the clip element.

The invention also provides a package consisting of a squeegee and at least one clip element which is suitable for use in a suction head according to the invention,
20 whereby the size and shape of the clip element are such that the package can be removably fixed into the housing of the suction head and that the squeegee can be removably fixed into the clip element.

25 Detailed description of the invention

The first aspect of the invention is concerned with a suction head for a floor cleaning machine, preferably a wet floor cleaning or floor polishing machine. This suction head comprises a removable package consisting of a
30 removable squeegee and at least one clip element.

In order to be sure of a tight fixation of the package in the suction head, a U-shaped clip element is preferably applied which can be tightly fixed in a similarly shaped
35 channel in the housing of the suction head.

For the same reason of tight fixation, this clip element preferably comprises relatively small projections located

on the outer surface thereof. After positioning the clip element in the U-shaped channel, these projections will exert an outwardly directed force so as to keep the package tightly fixed.

5

For obtaining an effective and practical suction head, it is desirable that the housing and the package have an oblong shape and that only one clip element is present in
10 said suction head, whereby this clip element has substantially the same length as the squeegee.

The second aspect of the invention is concerned with a package comprising at least one clip element and a
15 squeegee, whereby the squeegee can be removably fixed into the clip element. For obtaining an effective removable fixation of the squeegee in this respect, it is desirable that the clip element comprises sharp projections on the inner surface thereof.

20

In view of the construction of the package of the present invention which warrants easy removability of the squeegee, we found that the operating lifetime of the squeegee could be considerably increased when applying an oblong squeegee
25 blade of which all four edges can be used for cleaning purposes. When one of the edges has been worn out, this squeegee does not need to be replaced; it can, instead, be turned along its longitudinal axis after having removed it from the package, such that another edge is applied for
30 cleaning purposes.

The squeegee blade suitable for use in the suction head of the present invention, is preferably somewhat flexible; it is, therefore, desirably made of a plastic material such as
35 poly urethane or rubber. As indicated above, good cleaning results were obtained with a squeegee having an oblong shape; its length and breadth are preferably in the range

of respectively 0.6-1.0 m and 0.03-0.05 m. The thickness of the squeegee is effectively in the range of from 3-4 mm.

The invention is illustrated by figures 1-3, of which:

5 Figure 1 shows schematic drawings of cross-sections of a squeegee, a clip element and a package according to the invention;

Figure 2 shows schematic drawings of cross-sections of said package, the part of a suction head of the invention
10 substantially consisting of a U-shaped channel, and said channel into which said package has been positioned.

Figure 3 shows a schematic view of a complete suction head of the invention.

15 Referring now in detail to these drawings, in Figure 1 (1) indicates a package of the invention consisting of a squeegee blade (2) and a clip element (3) . It is also shown in this Figure how the squeegee can be removably fixed into the clip element by way of several sharp projections (4)
20 located on the inner surface of the clip element.

In Figure 2, it is shown how the package of the invention (1) can be tightly fixed into the housing (7) of a suction head by way of a U-shaped channel (6). Adequate fixation is
25 accomplished by the outward directed force exerted by the projections (5) located on the outer surface of the package, when this package has been positioned in the U-shaped channel. The fixation of the package into the housing of the suction head can further be improved by applying a clip
30 element having a part (8) which can be attached to the housing as indicated.

In Figure 3, a suction head (9) is shown which can be coupled to any suction system suitable for use in a wet
35 floor cleaning machine.

It is emphasized that the suction head and package shown in

the Figures illustrate only one preferred embodiment of the invention and that various constructional alternatives will be immediately evident to the man skilled in the art, without departing from the scope of the present invention.

CLAIMS

1. A suction head for a floor cleaning machine, comprising
5 a housing (7) and a package (1) consisting of a squeegee
(2) and at least one clip element (3) , whereby the size
and shape of said clip element and the housing are such
that this package can be removably fixed into the housing
and that the squeegee (2) can be removably fixed into the
10 clip element (3).

2. Suction head according to claim 1, wherein the clip
element has a U-shape and wherein the housing comprises an
inverted U-shaped channel (6) into which the clip element
15 can be fixed.

3. Suction head according to claim 2, wherein the clip
element comprises relatively small projections (5) on the
outer surface thereof, which projections exert an outward
20 directed force so as to keep the package tightly fixed when
it is present in the U-shaped channel (6).

4. Suction head according to any of claims 1-3, wherein
the housing and the package have an oblong shape, and the
25 package contains only one clip element having substantially
the same length as the squeegee.

5. Package consisting of a squeegee and at least one clip
element, said package being suitable for use in a suction
30 head according to the invention, whereby the size and shape
of the clip element are such that the package can be
removably fixed into the housing of the suction head and
that the squeegee can be removably fixed into the clip
element.

35

6. Package according to claim 5, whereing the clip element
comprises sharp projections (4) located on its inner sur-

face, by which a squeegee can be tightly fixed in the clip element.

- 5 7. Package according to claim 5 or 6, wherein the package has an oblong shape , whereby all four edges of the squeegee blade present in the package can be applied for cleaning purposes.

10

Fig.1.

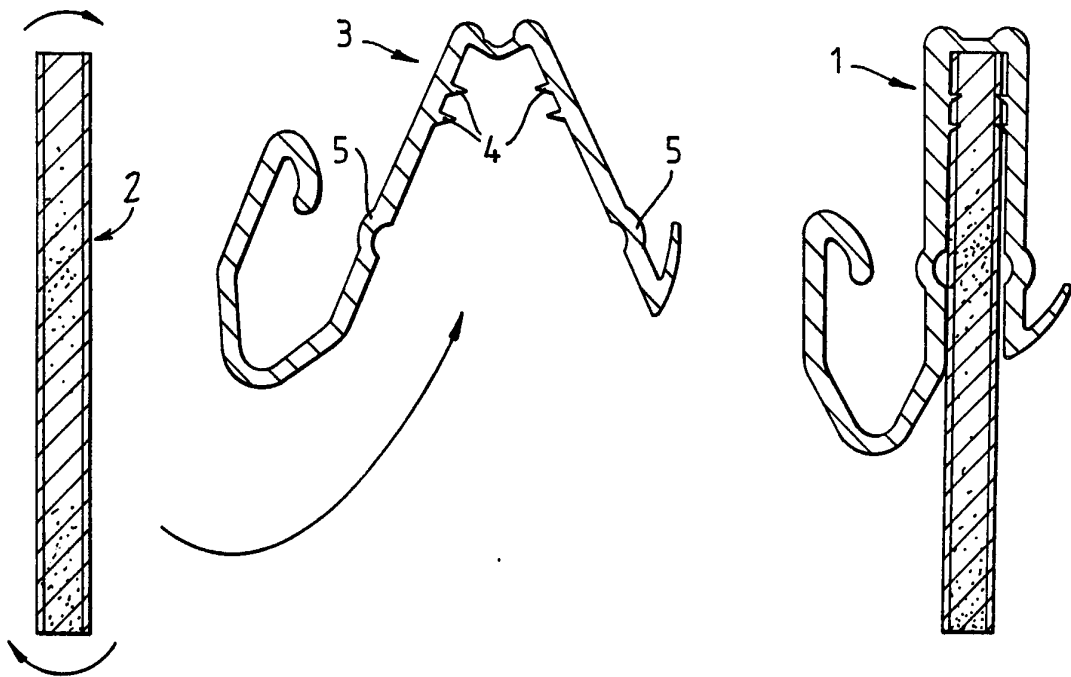


Fig.2.

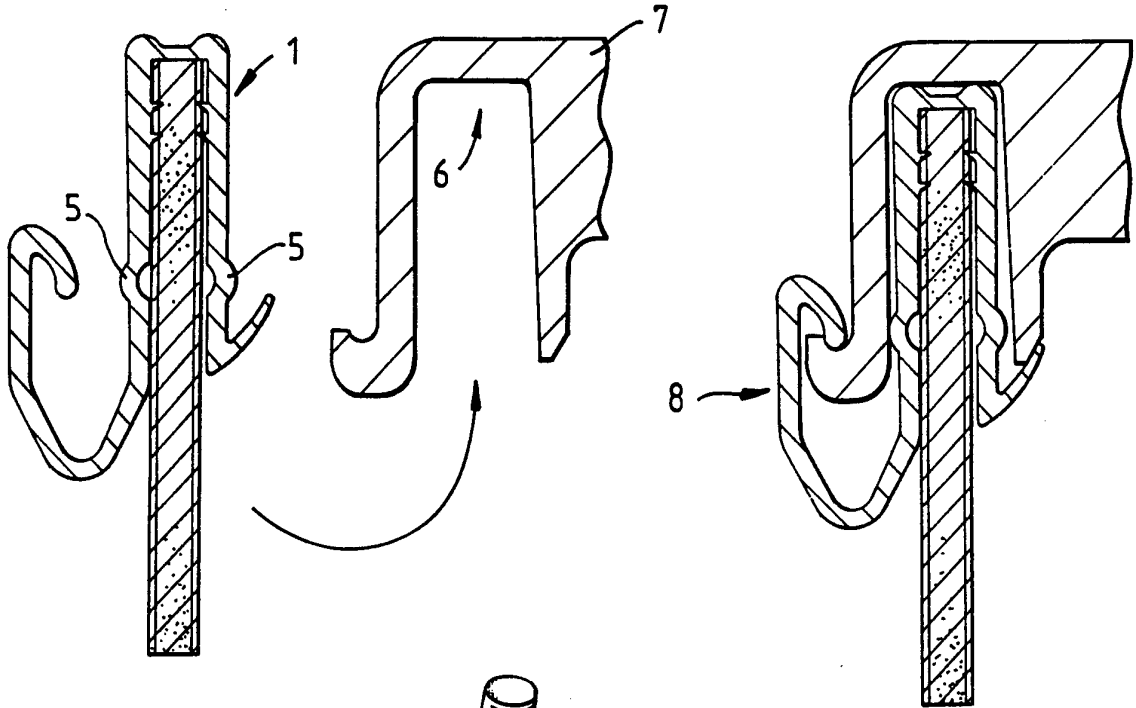
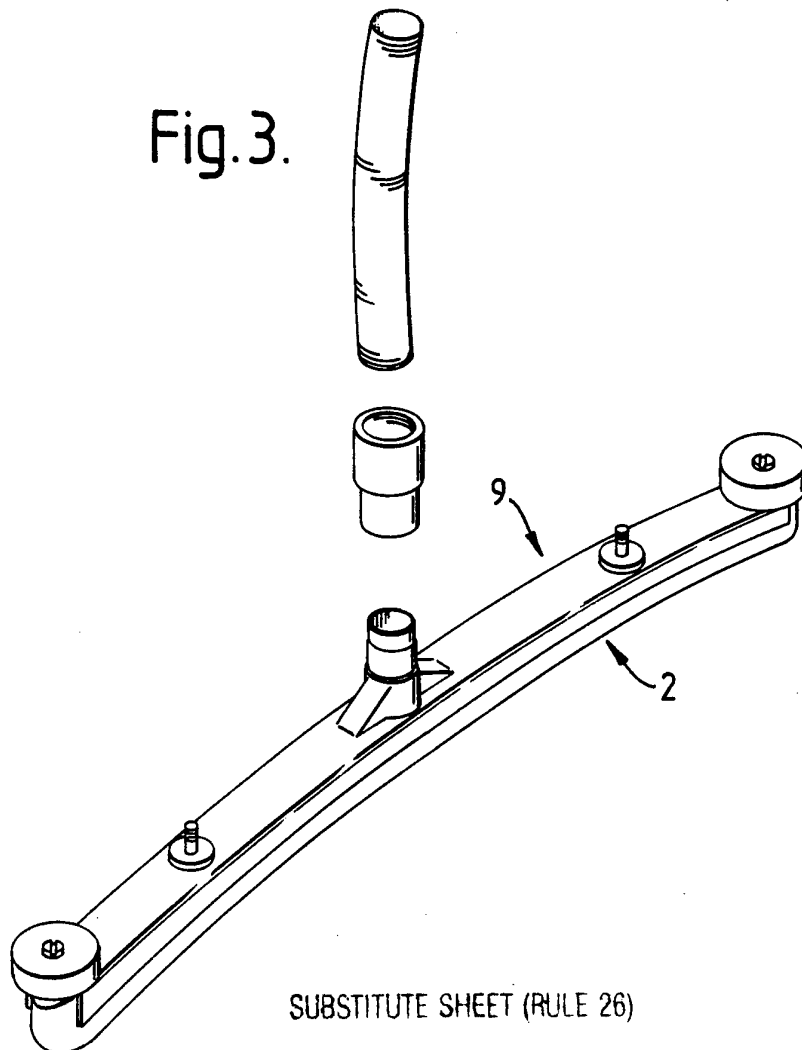


Fig.3.



INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 94/00466

A. CLASSIFICATION OF SUBJECT MATTER
IPC 5 A47L9/06 A47L13/11

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 5 A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US,A,4 611 363 (S. SAMUELSSON) 16 September 1986 see the whole document ---	1-5
Y	US,A,4 557 013 (L. BELMONT) 10 December 1985 see abstract ---	1-5
A	DE,A,26 42 579 (H. KARPP) 30 March 1978 see the whole document ---	1-5,7
A	US,A,4 941 228 (D.J. BELANGER) 17 July 1990 see column 2, line 12 - line 41; figures 2,3 ---	6
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4611363	16-09-86	NONE	
US-A-4557013	10-12-85	NONE	
DE-A-2642579	30-03-78	NONE	
US-A-4941228	17-07-90	NONE	
FR-A-2334332	08-07-77	NONE	