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Description

Technical field

5 The invention relates to a hand-guided floor treatment device for the treatment of floors by scrubbing, polishing or sanding.

Prior art

10 EP 0 978 249 discloses an apparatus for treating surfaces, in particular for cleaning and polishing, said apparatus providing an articulation, which is movable in at least two directions, between a holding device and the bottom part. Said articulation makes it possible for the user to tilt the holding apparatus so as to adjust the handle height to the personal height of the user and to move the apparatus forward and back in the treatment direction, and also to carry out lateral movements with the apparatus.

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Since the articulation is arranged laterally on the bottom part and the bottom part has protruding parts, the lateral movability is, however, restricted.

20 DE 203 02 630 U1 discloses a steam scrubbing machine with a handle part which is movable in relation to the bottom part in the treatment direction and has a water tank, a water pump, a heater and a steam distributor on the bottom part. Disclosed as an advantageous development is a vacuum cleaner unit which is likewise attached to the bottom part and comprises a suck-up chamber, a suck-up pump, a suction channel and a suck-up opening, for dry cleaning.

25

Also disclosed are back-mounted vacuum cleaners with a back-mounted unit and a carrying frame, in which the back-mounted unit comprises at least one suck-up pump and a suck-up chamber. To increase the movability, an energy storage device for supplying energy to the pump in the back-mounted unit can also be provided.

DE 196 22 856 A1 discloses a surface scrubbing device which is guided by hand and has at least one, preferably two, circular brushes, and at least one roller brush, and which is moved in a manner supported on wheels. Furthermore, a suck-off strip is provided which is preferably attached to the rear end of the cleaning device, and which is connected to a receiving container for dirty water via a hose. A container for cleaning liquid is likewise attached to the surface scrubbing device.

However, this surface scrubbing device has the disadvantage that its weight is increased by the liquid container attached to the device itself, and that, although the wheels permit a slight movement in the linear direction, they do not permit any actual movability in the lateral direction.

EP 0 560 523 A2 discloses a lip for a wiping device, the side surface of said lip having projections along its length with non-protruding chambers between the projections which extend upwards from the lower edge, with the other side surface being smooth. If said lip is moved with its smooth side over a floor, it forms a seal with the floor, said seal not allowing any water to penetrate. If the lip is moved over the floor with the side surface having projections, water can flow through the intermediate chambers mentioned. A suction unit consisting of two corresponding lips can thereby take up water in two directions, forward and back.

The invention is based on the object of providing a floor treatment device which, in addition to polishing or sanding, also permits wet cleaning and is easily movable and operable by hand.

Summary of the invention

The hand-guided floor treatment device according to the invention has a bottom part with at least one tool for treatment of a floor and a motor for driving the at least one tool, and a guide part with a handle part, wherein the guide part is connected to the bottom part via a

first articulation adjustable in a treatment direction with an articulation axis transversely to the treatment direction. The bottom part has a liquid feed and a liquid receptacle. According to the invention, the guide part comprises at the lower end below the centre, but above the bottom part, a further articulation with a further articulation axis extending transversely to the first articulation axis, around which axis the guide part is adjustable transversely to the treatment direction such that the bottom part can be turned by a user in parallel to the treatment surface about a vertical axis of the bottom part in at least $\pm 270^\circ$.

The further articulation together with the first articulation forms a universal articulation (cardan joint) and allows a user to turn the bottom part within the treatment plane, even if the guide part is inclined about the first articulation axis relative to the vertical axis of the bottom part, which allows a great movability of the bottom part. Thus, the treatment direction of the bottom part is pivotable parallel to the floor even with inclined guide part and allows easy treating of corners or recesses or below ledges.

In principle, by means of such a universal articulation, turning the bottom part at will about its vertical axis is possible even with the guide part in an inclined position.

Thus, the user may turn the treatment direction of the floor treatment device from a standing position about 270° , even if the guide part is inclined about the first articulation axis relative to the vertical axis of the bottom part. This allows for the user to operate the floor treatment device initially in a direction oriented away from the user, then to turn the bottom part about 180° and to move the floor treatment device back in a direction oriented towards the user. Furthermore, the user can turn the bottom part even further, while moving it back towards the user, that is, the user still has complete movability in a lateral direction even during movement of the bottom part directed towards the user. Said movability allows cleaning of corners, recesses or ledges, for example below stairs or tables. This allows for the user to operate the floor treatment device initially in a direction oriented away from the user, then to turn the bottom part about 180° and to move the floor treatment device back in a direction oriented towards the user. Furthermore, the user can turn the bottom part even further, while moving it back towards the user, that is, the user still has complete movability in a lateral direction even during movement of the bottom part directed towards the user. Said movability allows easy cleaning of corners, recesses or ledges, for example below stairs or tables. Furthermore, the movability allows cleaning both in the forward and backward directions, as well as in a lateral direction, even if the guide part is inclined about the first articulation axis relative to the vertical axis of the bottom part, wherein the floor

treatment device can always be moved in the treatment direction, what is a prerequisite for regular uptake of liquid.

5 Furthermore, the movability allows cleaning both in the forward and backward directions, and also in a lateral direction, wherein the floor treatment device can always be moved in the treatment direction, what is a prerequisite for regular uptake of liquid.

According to the invention, the floor treatment device has at least one energy storage device to supply the at least one tool for the floor treatment.

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An energy storage device makes it possible to operate the floor treatment device without a connection to an external energy supply and thereby increases the radius of movement of the floor treatment device. This permits, for example, the cleaning of staircases by means of the floor treatment device according to the invention.

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It is possible to supply both the at least one tool attached to the bottom part and the suction turbine of a suction unit by means of the same energy supply. For this purpose, an energy storage device can be provided on the floor treatment device.

20 In an advantageous manner, at least one energy storage device is removably attached.

As a result, the weight of the floor treatment device can be reduced if the floor treatment device is connected, for example, to an external energy supply. Furthermore, this permits the changing of the energy storage device, and therefore the operating period of the floor treatment device driven by the energy storage device attached removably to the device can be extended. As a result, the energy storage device can be exchanged and a longer operating time be achieved. Furthermore, this allows to remove the energy storage device and thus to reduce the weight of the bottom part and/or of the guide part, when the floor treatment device is connected to an external energy supply, for example, so that moving and guiding the bottom part by means of the guide part is facilitated. Advantageously, at least one energy storage device is mounted on the bottom part and/or on the guide part.

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Depending on the shaping of the bottom part and of the guide part, it may be advantageous to attach the energy storage device to the bottom part and/or to the guide part, in order to ensure as easy movability of the bottom part as possible by means of the guide part.

5

Advantageously, a liquid tank for the liquid feed is provided.

The advantage is that an external water supply does not have to be connected, wherein a corresponding hose would restrict the radius of movement of the floor treatment device.

10

Advantageously, the liquid tank is mounted on the guide part.

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This permits an advantageous compact shape of the floor treatment device. If, in addition to the liquid tank, the container for the taken-up liquid is also disposed on the guide part and/or on the bottom part, the overall weight of bottom part and guide part remains very substantially constant, as a result of which a constant pressure on the tools carrying the bottom part can be ensured. This permits a constant quality of cleaning by the tools for floor treatment.

20

Advantageously, the liquid tank mounted on the guide part is formed elongated along the guide part.

25

This has the advantage that the liquid located in the liquid tank is always located as close as possible to the guide part, and therefore the weight of the liquid loads the guide part as little as possible, even when the guide part is tilted, which facilitates the handleability.

If, in addition to the liquid tank, the container for the taken-up liquid is also attached in an elongate shape along the guide part, it can be possible to form said two liquid containers identically, thus enabling production to be more cost-effective.

In an advantageous manner, the tool for floor treatment is composed of at least two counter-rotating and essentially horizontally rotating pad holders with treatment pieces, or of at least two counter-rotating rollers provided with bristles.

5

The counter rotation of in each case two pad holders attached symmetrically around the centre of the floor treatment device leads, in the case of an even number of pad holders, to a force-neutral state of the bottom part and permits easy, resistance-free guideability of the bottom part by means of the guide part over the floor. The same applies for rollers.

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In an advantageous manner, the treatment pieces can be brushes, plates for pads or abrasive discs.

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This has the advantage that the user needs only one floor treatment device in order to carry out a wide variety of operations, namely scrubbing, polishing and sanding, wherein the fastening of the treatment pieces is intended to be possible by hand without an additional tool.

20

Advantageously, the liquid receptacle has a suction strip with two sealing lips, which is disposed at least across half the width, preferably across the entire width, of the bottom part and curved around the brushes transversely to the treatment direction, and is disposed, when viewed in the movement direction, behind the tool for floor treatment, wherein preferably the sealing lip located in front in the treatment direction is grooved or includes openings.

25

The suction strip with the two sealing lips permits direct taking up of liquid. The further the suction strip with the sealing lips extends around the tool for floor treatment, the more liquid is taken up even in the first course of the treatment procedure. The grooving or the openings of the front sealing lip allow that the liquid enters in the region between the sealing lips and is sucked up into the container for the taken-up liquid by means of the negative pressure generated by the suction unit.

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Advantageously, the liquid tank for the liquid feed and/or the container for the taken-up liquid are arranged about the guide part above the further articulation.

As a result, the easy movability of the bottom part by means of the guide part is ensured.

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Advantageously, the liquid feed, the at least one tool for the floor treatment and the suction unit of the floor treatment device are to be switched separately from each other and may be combined in an arbitrary manner.

10 This allows to employ the described floor treatment device for most different tasks, for example wet scrubbing, polishing or even sanding.

Advantageously, the container for the taken-up liquid is attached on the guide part above the further articulation and is formed in an elongated shape along the guide part.

15

As a result, the movability of the bottom part provided by the two articulations is not restricted and the movability of the guide part is afflicted as little as possible by the weight of the taken-up liquid.

20 Brief description of the drawing

An exemplary embodiment of the invention is illustrated in the drawing, in which

Fig. 1 shows a hand-guided floor treatment device with a suction unit designed as a unit which is to be fastened to the body,

25 Fig. 2 shows a detailed view of a bottom part and of a unit of the floor treatment device from Fig. 1, which unit is to be fastened to the body,

Fig. 3 shows a cross section of the bottom part with a guide part and handle part of the floor treatment device from Fig. 1,

Fig. 4 shows various variant embodiments of a tool for floor treatment of the floor treatment device from Fig. 1,

5 Figs. 5A, B show an illustration of the movability of the bottom part of the floor treatment device from Fig. 4,

Fig. 6 shows a hand-guided floor treatment device with a suction unit designed as a further floor unit.

10 Exemplary embodiment

Fig. 1 illustrates a floor treatment device according to the invention. A bottom part 1 can be guided by a user P via a guide part 2 and a handle part 3, wherein the guide part 2 is connected to the bottom part 1 via two articulations which together form a universal
15 articulation. A first articulation 4 consists of a bracket 5 and an axle 30 which is illustrated in Fig. 3 and is attached to the bottom part 1, wherein an articulation axis G1, which is illustrated in Fig. 3, runs along the axle 30 parallel to a treatment surface B and transversely to the treatment direction 6, and the bracket 5 can be moved about the axis G1 according to the direction indicated by the arrow 7. A second articulation 8 connects the guide part 2
20 to the bracket 5, wherein an articulation axis G2 runs transversely to the articulation axis G1, and the guide part can be moved about the axis G2 according to the direction indicated by the arrow 9. This makes it possible for the user P, even when the guide part 2 is tilted, to turn the bottom part 1 parallel to the treatment surface B about its vertical axis A1. The user P can therefore turn the treatment direction 6 parallel to the treatment surface B. The
25 user P can move the bottom part, for example, first of all away from himself and then, after turning the bottom part through 180°, toward himself, wherein the treatment direction 6 correspondingly first runs away from the user and then towards the user.

The floor treatment device according to the invention has a liquid tank 10 for the liquid feed, said liquid tank being able to be attached, for example, to the guide part 2 above the second
30 articulation 8 and being connected to the bottom part 1 via a liquid feed 11.

In the embodiment illustrated, it is advantageous to configure the liquid tank 10 in such a manner that it at least partially reaches around the guide part 2 and its dimensions in the direction transversely to the guide part 2 are as small as possible while the dimensions along the guide part 2 can be larger. As a result, the movement of the guide part 2 is
5 impeded as little as possible by the liquid likewise moving in the liquid tank 10.

The floor treatment device has a splash guard 12 which is arranged on the outer side of the bottom part 1 and reaches as far as possible around the bottom part 1. The splash guard 12 has bristles or lips toward the treatment surface B and is arranged in such a manner that
10 it is movable vertically in relation to the bottom part 1 over the treatment surface B, and therefore said splash guard always sits with its bristles or lips on the treatment surface B.

Furthermore, the bottom part 1 has, on its lower side, a liquid receptacle 13 which reaches as far as possible across the width of the bottom part 1 transversely to the treatment
15 direction 6 and is arranged behind the bottom part 1 in the movement direction 6 and is fastened to the splash guard 12 without restricting the free movability of the splash guard 12 vertically in relation to the bottom part 1.

Owing to the fact that both the liquid tank for the liquid feed and the container 16 for the
20 taken-up liquid are arranged on the guide part 2 and/or on the bottom part 1, the overall weight of the floor unit consisting of bottom part 1 and guide part 2 remains substantially constant during the floor treatment. This makes it possible to keep the pressure on the at least one tool 31 for floor treatment constant and thus to guarantee a constant and reliable manner of operation.

25 Furthermore, it is possible to form the container for the taken-up liquid and the liquid tank for the liquid feed identically, i.e. to select just one shape for the two containers, as a result of which the production costs of the floor treatment device can be reduced.

Furthermore, Fig. 2 illustrates the bottom part 1 of the floor treatment device according to
30 the invention from below without a treatment piece. Two pad holders 27 are driven in a counter-rotating and essentially horizontal manner by a motor 26. The liquid receptacle 13 is attached to the splash guard 12, which, in this variant embodiment, reaches annularly around the entire bottom part 1, in such a manner that the free movement of the splash

guard 12 in its height above the treatment surface in relation to the bottom part 1 is not adversely affected. The liquid receptacle 13 has a suction strip 49 with two sealing lips 28, 29 which are spaced apart from each other in the treatment direction 6, wherein the lip 28 which is in front in the treatment direction 6 is as far as possible grooved or includes openings through which the liquid which is to be taken up can pass into the region x between the two sealing lips 28, 29 when the bottom part 1 moves in the treatment direction 6. Said region x of the suction strip 49 between the sealing lips 28, 29 is connected via the hose 14 to the suction unit, which is designed as a back-mounted unit 15, and therefore liquid can be sucked up.

10

Fig. 3 shows a cross section of the bottom part 1 with guide part 2 and handle part 3 of the floor treatment device from Fig. 1. The articulation 4 which consists of the bracket 5 and the axle 30, which is fastened to the bottom part 1, is again illustrated, wherein the articulation 4 can be moved about the articulation axis G1 according to the direction indicated by the arrow 7.

15

Furthermore, the bottom part 1 has a tool 31 for floor treatment, said tool comprising the pad holders 27 and treatment pieces 32, such as, for example, brushes which are illustrated, wherein the bottom part 1 is supported exclusively on the tool 31. The treatment pieces 32 arranged on the pad holders 27 are driven by the motor 26 which is powered by an energy storage device 33. Said energy storage device 33 is fastened removably as far as possible to the bottom part 1 and can be charged up, for example, via a power cable. The liquid feed 11 of the liquid from the liquid tank 10 takes place centrally through the pad holders 27.

20

The splash guard 12 can be loosely connected to the bottom part 1 by at least one bracket 36, which reaches over the bottom part 1, and therefore said splash guard is freely movable vertically, i.e. in the direction of the arrow 37, during treatment, but remains connected to the bottom part 1 via the at least one bracket 36 when the bottom part 1 is raised. As a result, the user P can simultaneously raise and displace the bottom part 1 and the splash guard 12 and does not have to move the splash guard 12 in addition.

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The energy storage device for powering the motor driving the suction turbine can also be arranged on the guide part, wherein the energy storage device is advantageously attached below the tank 19, but above the articulation 8.

Fig. 4 illustrates further variant embodiments of the tool 31 for floor treatment. Fig. 4A shows a pad holder 27 with a treatment piece 32 in the form of a plate 48 for pads 38, and Fig. 4B illustrates a pad holder 27 with an abrasive disc 39 as treatment piece. Fig. 4C shows a
5 bottom part 1 of a floor treatment device according to the invention which, on its lower side, has rollers 40 with bristles 41 as the floor treatment tool 32.

Figs. 5A, B illustrate how the bottom part 1 of the floor treatment device according to the invention can be turned by means of the articulations 4 and 8 about the vertical axis A1 of
10 the bottom part 1, which vertical axis is substantially perpendicular to the treatment surface B, when the guide part 2 is tilted. By turning the handle part 3 by 90° about a longitudinal axis A2 of the guide part 2, the bottom part is likewise turned by 90° about the vertical axis A1, wherein the bracket 5 is brought here from a starting position, which is tilted counter to
15 the first treatment direction 6, about the axis G1 into a position parallel to the axis A1 and the guide part 2 is moved about the further articulation axis G2 from an initial orientation parallel to a longitudinal axis A3 of the bracket 5 into an orientation obliquely with respect to the longitudinal axis A3 of the bracket 5. From said position illustrated in Fig. 5B, by turning the handle part 3 by a further 90°, the bottom part 1 can likewise be turned by a
20 further 90°, and therefore the treatment direction 6 which originally points in a direction away from the user P, is now directed towards the user P, corresponding to the direction indicated by the arrow 6'.

Fig. 6 shows a floor treatment device according to the invention, as illustrated in Fig. 1, with the difference that the structurally separate suction unit is designed as a further floor unit
25 42. The floor unit 42 has a container 43 for the liquid taken up from the floor surface B, and a suction turbine 44 which can be driven by a motor 45 which is likewise arranged in the floor unit 42.

Patentkrav

1. Håndholdt gulvbehandlingsapparat der omfatter en bunddel (1) med mindst et værktøj (31) til gulvbehandling og en motor (26) til at drive det mindst ene værktøj (31), og som omfatter en føringsdel (2) med en håndtagsdel (3), hvilken
- 5 føringsdel (2) er forbundet med bunddelen (1) via et første hængsel (4), der kan justeres i en behandlingsretning (6) med en hængselakse (G1) på tværs af behandlingsretningen (6), hvilken nederste del (1) omfatter en væsketilførsel (11) og en væskebeholder (13), og hvor der er tilvejebragt en strukturelt separat sugeenhed med en sugeturbine til optagelse af væske,
- 10 **kendetegnet ved, at**
- føringsdelen (2) i den nedre ende under midten, men over den nederste del (1), omfatter et yderligere hængsel (8) med en yderligere hængselakse (G2), der strækker sig på tværs af den første hængselakse (G1), omkring hvilken akse føringsdelen (2) er justerbar på tværs af behandlingsretningen (6), således at den
- 15 nederste del (1) kan drejes af en bruger (P) parallelt med behandlingsfladen (B) omkring en lodret akse (A1) af den nederste del (1) i mindst $\pm 270^\circ$, og at gulvbehandlingsindretningen har mindst en energilagringsindretning (24, 33) til forsyning af det mindst ene værktøj (31) til gulvbehandlingen.
- 20 **2.** Gulvbehandlingsapparatet ifølge krav 1, **kendetegnet ved, at** mindst én energilagringsindretning (24, 33) er aftageligt fastgjort.
- 3.** Gulvbehandlingsapparat ifølge krav 1 eller 2, **kendetegnet ved, at** mindst en energilagringsindretning (33) er monteret på den nederste del (1) og/eller på føringsdelen (2).
- 25 **4.** Gulvbehandlingsapparat ifølge et hvilket som helst af kravene 1 til 3, **kendetegnet ved, at** der er tilvejebragt en væsketank (10) til væsketilførslen (11).
- 30 **5.** Gulvbehandlingsapparatet ifølge krav 4, **kendetegnet ved, at** væsketanken (10) er monteret på føringsdelen (2).

6. Gulvbehandlingsapparatet ifølge krav 5, **kendetegnet ved, at** væsketanken (10) der er fastgjort til føringsdelen (2), er formet aflang langs føringsdelen (2).
7. Gulvbehandlingsapparat ifølge et hvilket som helst af kravene 1 til 6, **kendetegnet ved, at** værktøjet (31) til gulvbehandling består af mindst to drivskiver (27), der er drevet kontraroterende og i det væsentlige vandret med behandlingsstykker (32), eller består af mindst to kontraroterende ruller (40) med børster (41).
8. Gulvbehandlingsapparatet ifølge krav 7, **kendetegnet ved, at** behandlingsstykkerne (32) kan være i form af børster, plader til puder (38) eller slibeskiver (39).
9. Gulvbehandlingsapparat ifølge et hvilket som helst af kravene 1 til 8, **kendetegnet ved, at** væskebeholderen (13) har et sugerør (49) med to tætningslæber (28, 29), der mindst strækker sig over halvdelen af bredden, fortrinsvis over hele bredden, af den nederste del (1) og er buet rundt om værktøjet (31) til gulvbehandling på tværs af behandlingsretningen (6), og som er anbragt, set i bevægelsesretningen (6), bag værktøjet (31) til gulvbehandling, hvor tætningslæbe der fortrinsvis (28) er placeret foran i behandlingsretning (6), er rillet eller inkluderer åbninger.
10. Gulvbehandlingsapparatet ifølge krav 1, **kendetegnet ved, at** væsketanken (10) til væsketilførslen (11) og/eller beholderen (16) til den opsamlede væske er fastgjort omkring føringsdelen (2) over det yderligere hængsel (8).

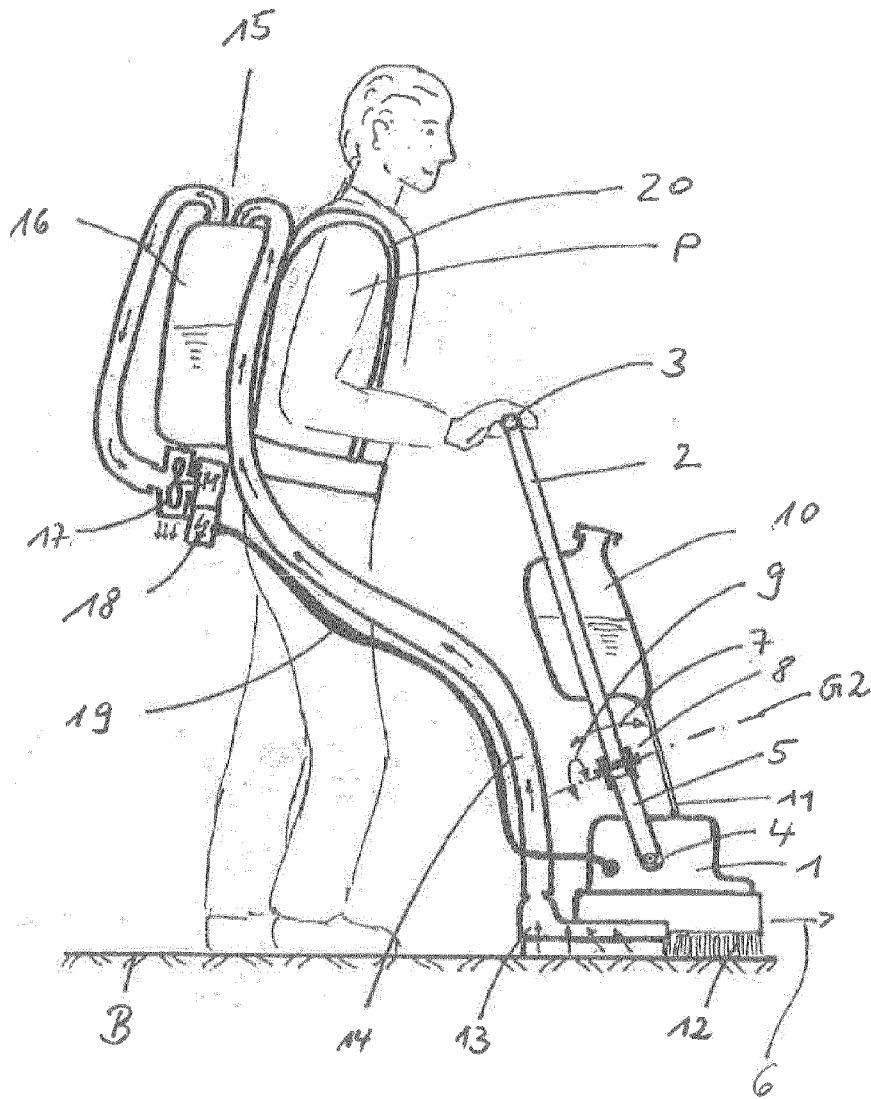


Fig.1

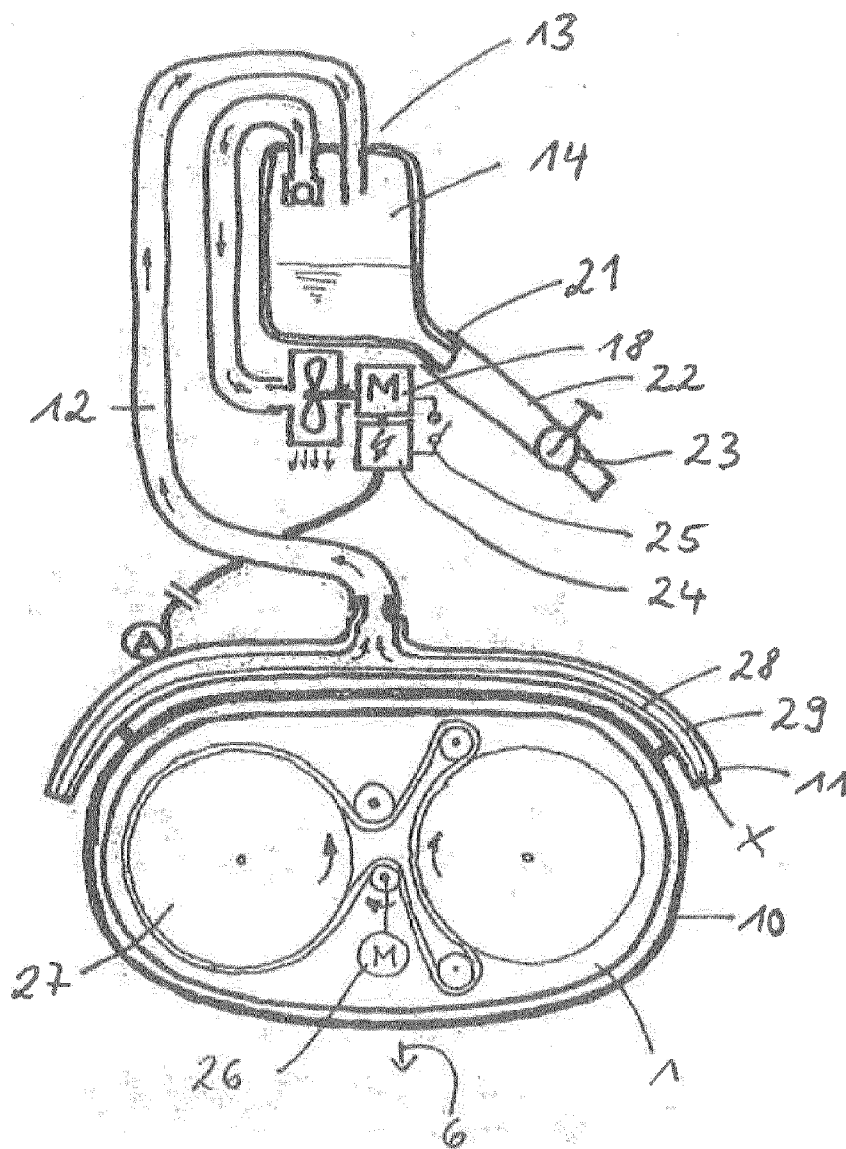


Fig.2

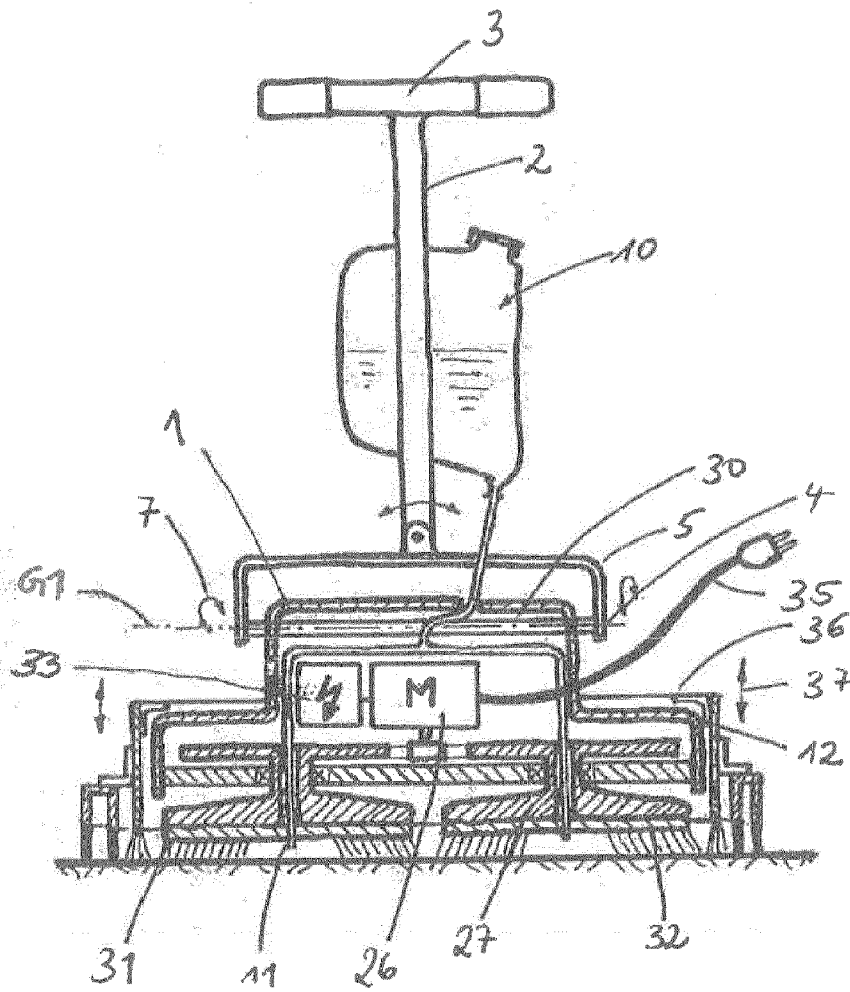


Fig.3

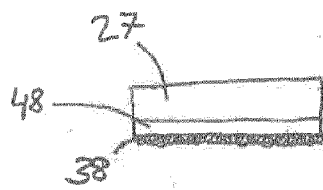


Fig. 4A

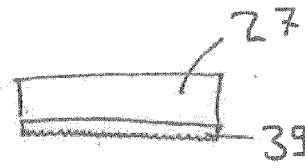


Fig. 4B

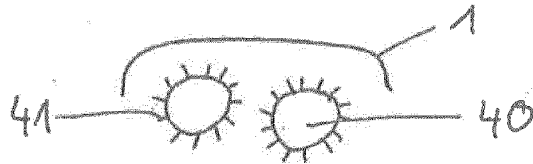


Fig. 4

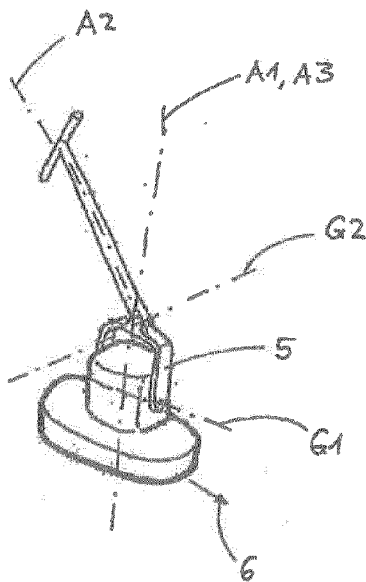


Fig 5A

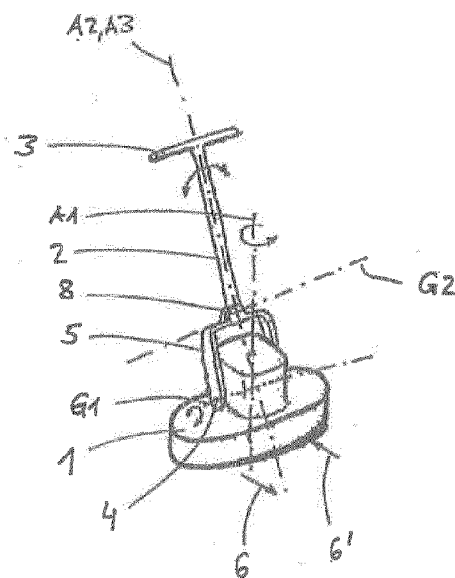


Fig. 5B

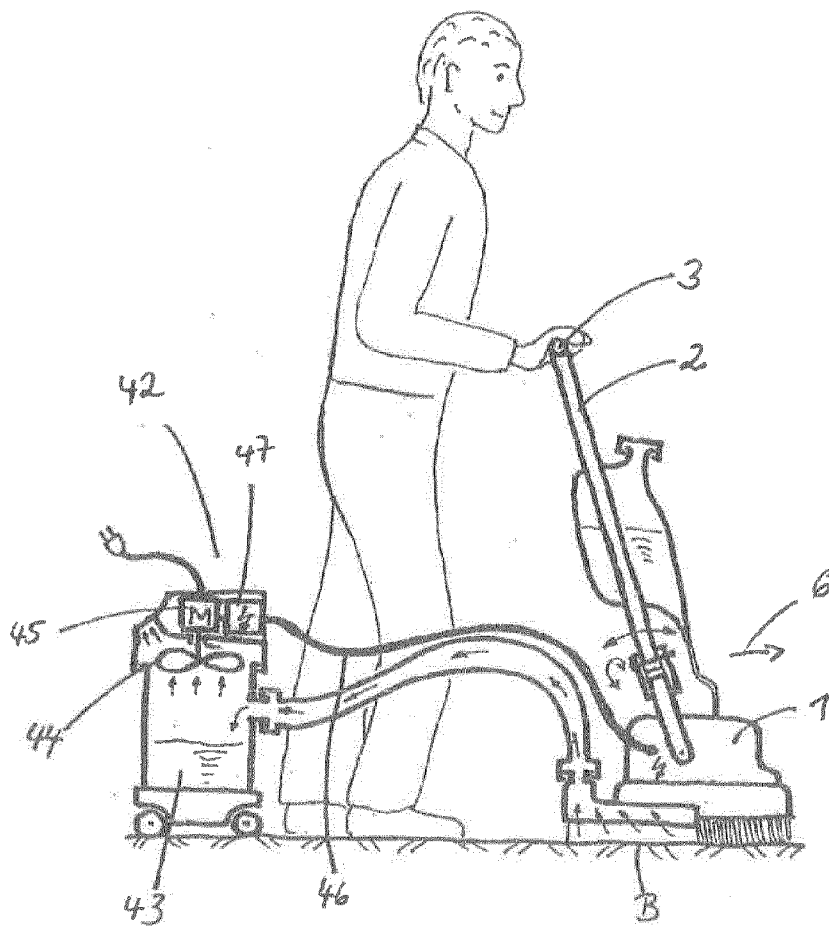


Fig.6