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Description

Technical field

- 5 The invention relates to a hand-guided floor treatment device according to the preamble of Patent Claim 1.

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
15 the apparatus forward and back in the treatment direction, and also to carry out lateral movements with the apparatus.

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
25 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.

- Also disclosed are back-mounted vacuum cleaners with a back-mounted unit
30 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
5 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
10 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
15 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
20 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 of the
25 type mentioned at the beginning which, in addition to polishing or sanding, also permits wet cleaning and is easily movable and operable by hand.

In WO 2009/057934 A2 is disclosed another floor treatment device.

30 Summary of the invention

This object is achieved by the features of Patent Claim 1. 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
5 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. Furthermore, a structurally separate suction unit is provided which includes at least one suction turbine for taking up liquid.

10 The formation of the suction unit as a dedicated, structurally separate unit makes it possible to keep the weight of the bottom part low and therefore to ensure as light weight and resistance-free movement of the bottom part as possible by means of the guide part. According to the invention, the structurally separate suction unit comprises at least the suction turbine.

15

According to the invention, a container for the taken up liquid is disposed on the guide part and connected to the structurally separate suction unit via a hose.

20 By means of the structural separation of the container for the taken up liquid from the suction turbine, it can be ensured in a simple manner that the suction turbine does not come into contact with liquid.

In an advantageous manner, the container for the taken up liquid is formed
25 elongated along the guide part. Even when the guide part is tilted, the liquid in the container for the taken up liquid thereby always remains as close as possible to the guide part, as a result of which the movement of the bottom part by means of the guide part is not unnecessarily made more difficult because of the weight of the liquid.

30

In an advantageous manner, the bottom part is exclusively supported on the tool for the treatment of a floor.

This has the advantage that the movability of the bottom part is not restricted by an extra supporting apparatus with rollers. An additional supporting apparatus can be dispensed with because of the low weight of the bottom part and of the guide part.

5

In an advantageous manner, the floor treatment device has at least one energy storage device and/or a power cable to an external energy supply to supply the at least one tool for the treatment of a floor and/or the suction turbine.

- 10 An external energy supply of the floor treatment device, which energy supply is connected by means of a power cable, has the advantage that the floor treatment device can be operated without an energy storage device attached to the bottom part or to the guide part, which makes it possible to keep the weight of the bottom part and of the guide part very low, as a result of which the bottom
- 15 part is highly manoeuvrable and easily movable by means of the guide part. Furthermore, the connection to an external energy supply permits an unlimited operating period of the floor treatment device.

- An energy storage device makes it possible to operate the floor treatment device
- 20 vice 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.

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

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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.

In an advantageous manner, at least one energy storage device is mounted on the bottom part and/or on the guide part.

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.

According to the invention, 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.

20

According to the invention, the liquid tank is mounted on the guide part.

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 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.

According to the invention, the liquid tank mounted on the guide part is formed elongated along the guide part.

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.

5

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.

10

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.

15

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.

20

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

25

This has the advantage that the user requires 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.

30

Brief description of the drawing

An exemplary embodiment not encompassed by Patent Claim 1 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,
- 5 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,
- 10 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,
- 15 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.

20

Exemplary embodiment

- Fig. 1 illustrates a floor treatment device. 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 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 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 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.
- 20 The floor treatment device 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 articulation 8 and being connected to the bottom part 1 via a liquid feed 11.
- 25 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 impeded as little as possible by the liquid
- 30 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 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 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.

In the exemplary embodiment illustrated, the structurally separate suction unit is designed as a unit 15 which is to be fastened to the body by a user P. Said unit 15 which is to be fastened to the body is furthermore designed as a back-mounted unit and is connected to the liquid receptacle 13 via a hose 14. The back-mounted unit 15 has a container 16 for the liquid taken up from the floor surface B, and a suction turbine 17 which can be driven with a motor 18 which is likewise arranged in the back-mounted unit 15. For the energy supply, the motor 18 is directly connected to the bottom part 1 via a power cable and optionally also via a control cable 19, wherein a connection to the back-mounted part 15 or to the bottom part 1 can be provided, and therefore said connection between back-mounted part 15 and bottom part 1 can be released.

In a further variant embodiment, the power and control cable 19 can also be guided to the bottom part 1 via the handle part 3 and/or the guide part, or a connection can be provided on the handle part 3 or on the guide part 2, to which the power and control cable 19 can be connected.

It may also be advantageous to arrange the container 16 for the liquid taken up from the floor surface B, for example on the guide part 2, and to connect said container to the liquid receptacle 13 and the suction turbine 17 via a hose in each case since a very short suction distance is thus possible, as a result of which the effective suction power of the suction turbine 17 is improved. It is advantageous in this connection to form the container 16 for the taken up liquid in an elongate shape along the guide part 2, and therefore the taken up liquid is always located as close as possible to the guide part 2 and the movability of the guide part 2 is thereby not unnecessarily loaded by the weight of the taken up liquid.

Owing to the fact that both the liquid tank for the liquid feed and the container 16 for the 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.

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, provision of the container 16 for the taken up liquid on the bottom part 1 and/or on the guide part 2 has the advantage that, when the hose which connects the container 16 for the taken up liquid to the suction turbine 17 is released, no residual liquid remaining in the hose can escape since the liquid remains in the container 16, which is located lower down, for the taken up liquid.

The back-mounted unit 15 has a carrying frame 20, as a result of which it can be comfortably carried on the back by the user P.

For other embodiments of the unit 15 to be fastened to the body, carrying frames which are adapted to the manner of carrying can correspondingly be provided and also the shape of the unit to be fastened to the body can be adapted to the manner of carrying. A back-mounted unit can be, for example, of elongate and flat design and can be provided with a rucksack-like carrying frame. If the unit which is to be fastened to the body is intended to be carried around the hips, it has to be of correspondingly smaller design and provided with a hip strap. A unit which is to be fastened in front of the stomach cannot be designed, for example, to be of such a length as is possible in the case of a back-mounted unit.

Fig. 2 illustrates the back-mounted unit from Fig. 1 in cross section. The container 16 for the taken up liquid has, in the floor region, an outlet opening 21 to which an outlet hose 22 or else an outlet stub with a closure 23 is attached. The outlet hose 22 and the closure 23 are arranged in such a manner that the shut-off valve 23 can be operated by the user P and the taken up liquid can be let out of the container 16 for the taken up liquid via the let-out hose 22 while the user P is carrying the back-mounted unit 15 on the back. In order to increase the freedom of movement of the user P while letting out the taken up liquid, a connection to a coupling can be provided for the hose 14, and therefore said connection of the back-mounted unit 15 to the bottom part 1 can be released. Alternatively, a stub can also be provided on the bottom part 1. The hose or stub on the bottom part can also be designed as a siphon which prevents residual water from emerging.

In this variant embodiment, the back-mounted unit 15 has an energy supply 24 for the motor 18 and a switch 25 for switching the suction turbine 17 on and off.

Furthermore, Fig. 2 illustrates the bottom part 1 of the floor treatment device 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.

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.

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 motor 26 as far as possible likewise has a power cable 35, which makes it possible to dispense with the energy storage device 33 and to connect the motor 26 to an external energy supply.

The liquid feed 11 of the liquid from the liquid tank 10 takes place centrally through the pad holders 27.

5 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 move the bottom part 1 and the splash guard 12 and
10 does not have to move the splash guard 12 in addition.

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.

15

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 bottom part 1 of a floor treatment device
20 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 can be turned by means of the articulations 4 and 8 about the vertical axis A1 of 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 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 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, as illustrated in Fig. 1, with the difference that the structurally separate suction unit is designed as a further floor unit 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. For the energy supply, the motor 42 is connected via a power cable and optionally also via a control cable 46 directly to the bottom part 1, wherein a connection to the floor unit 42, to the bottom part 1, to the guide part 2 or to the handle part 3 can be provided, and therefore said connection between the floor unit 42 and the bottom part 1 can be released.

In a further variant embodiment, the power and/or control cable 46 can also be guided to the bottom part 1 via the handle part 3 and/or the guide part, or a connection to the handle part 3 or to the guide part 2 can be provided, to which the power and/or control cable 46 can be connected.

Alternatively, the floor unit 42 can also have a power cable which makes it possible to connect the motor 45 to an external energy supply. As a further alternative, the floor unit 42 can also have a dedicated energy storage device 47 for powering the motor

PATENTKRAV

1. Håndført gulvbehandlingsapparat, omfattende en gulvdel (1) med mindst et værktøj (31) til gulvbehandlingen og en motor (26) til drivning af det mindst ene værktøj (31), og omfattende en føringsdel (2) med en gribedel (3), hvorved føringsdelen (2) er forbundet med bunddelen (1) via et første led (4), som er indstilleligt i behandlingsretningen (6), med en led-aksel (G1) på tværs af behandlingsretningen (6), hvorved bunddelen (1) omfatter en væsketilførsel (11) og en væskeoptager (13), og hvorved der er tilvejebragt en sugeenhed, som strukturelt er adskilt fra bunddelen, og hvorved der er tilvejebragt en sugeenhed, som strukturelt er adskilt fra bunddelen, hvilken sugeenhed mindst indeholder en sugeturbine (17) til optagelsen af væske, hvorved væskeoptageren (13) rummer en sugeliste (49) med to tætningslæber (28, 29), der i behandlingsretningen (6) har en indbyrdes afstand, hvorved den i behandlingsretningen (6) forreste tætningslæbe (28) omfatter åbninger, gennem hvilke åbninger, under bevægelsen af bunddelen (1) i behandlingsretningen (6), væsken, som skal optages, kan indtræde i et område (x) mellem de to tætningslæber (28, 29), hvorved en beholder (16) til den optagne væske er anbragt på føringsdelen (2) og forbundet til den strukturelt separate sugeenhed via en slange, hvilken beholder (16) til den optagne væske er dannet som langstrakt langs føringsdelen (2), der er tilvejebragt en væsketank (10) for væsketilførslen (11), hvilken væsketank (10) er monteret på føringsdelen (2), og væsketanken (10), som er monteret på føringsdelen (2), er dannet som langstrakt langs føringsdelen (2).

2. Gulvbehandlingsapparat ifølge krav 1, **kendetegnet ved, at** bunddelen (1) udelukkende er understøttet på værktøjet (31) til gulvbehandlingen.

3. Gulvbehandlingsapparat ifølge krav 1 eller 2, **kendetegnet ved, at** gulvbehandlingsapparatet mindst omfatter et energilager (24, 33) og/eller et strømkabel (35) til en ekstern energiforsyning med henblik på forsyning af det mindst ene værktøj (31) til gulvbehandlingen og/eller sugeturbinen (17).

4. Gulvbehandlingsapparat ifølge krav 3, **kendetegnet ved, at** mindst et energilager (33) er monteret på bunddelen (1) og/eller på føringsdelen (2).

1

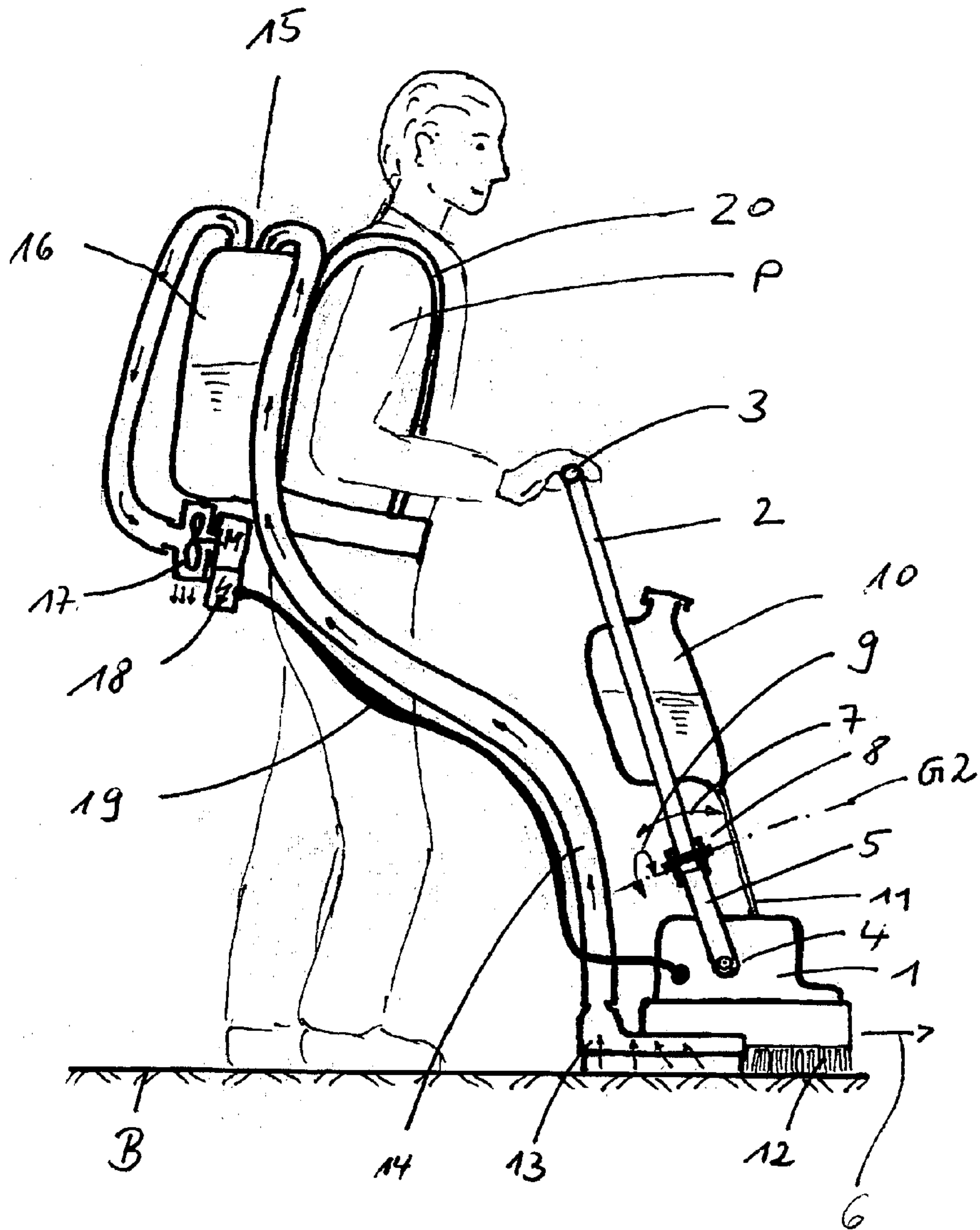


Fig.1

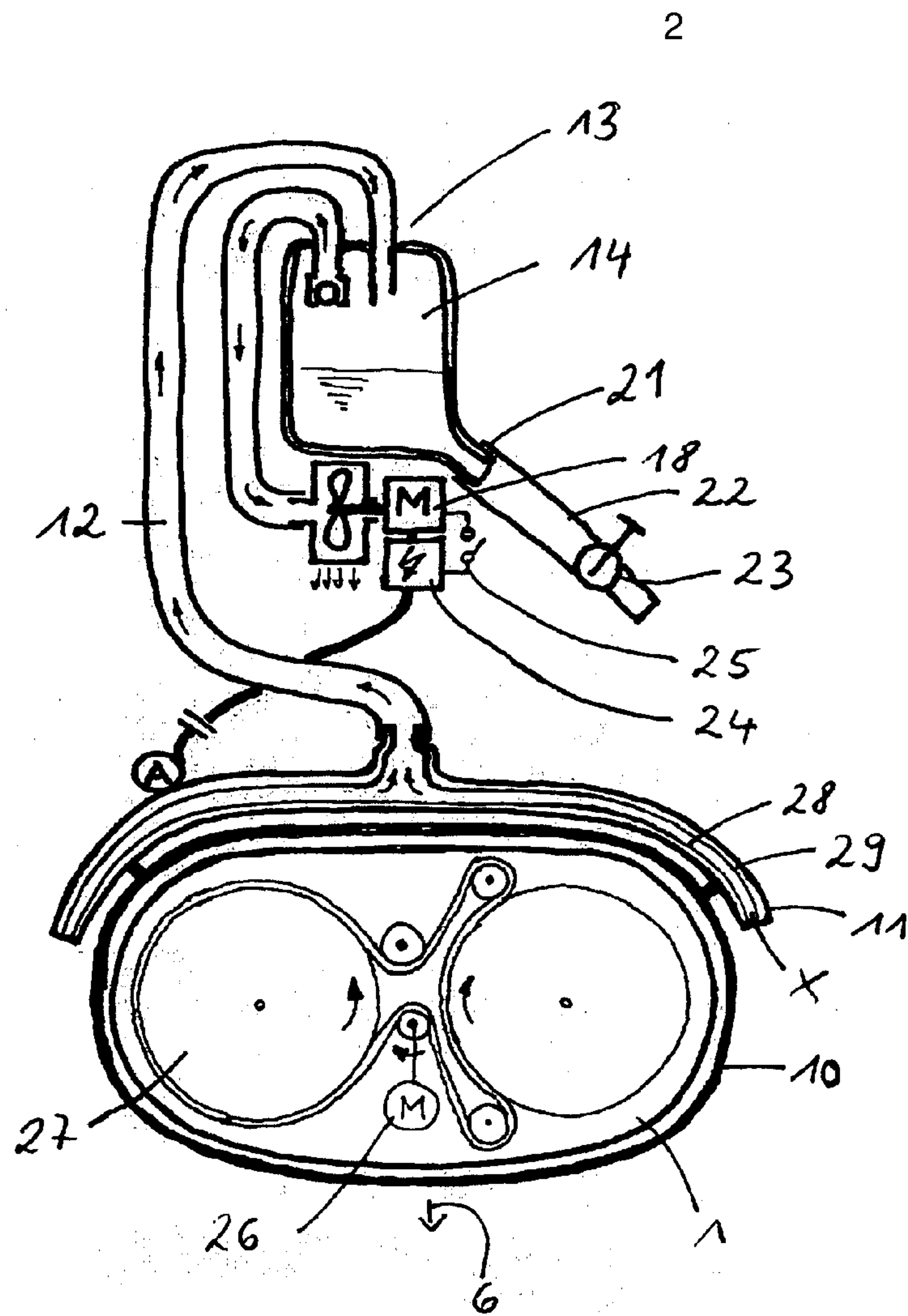


Fig.2

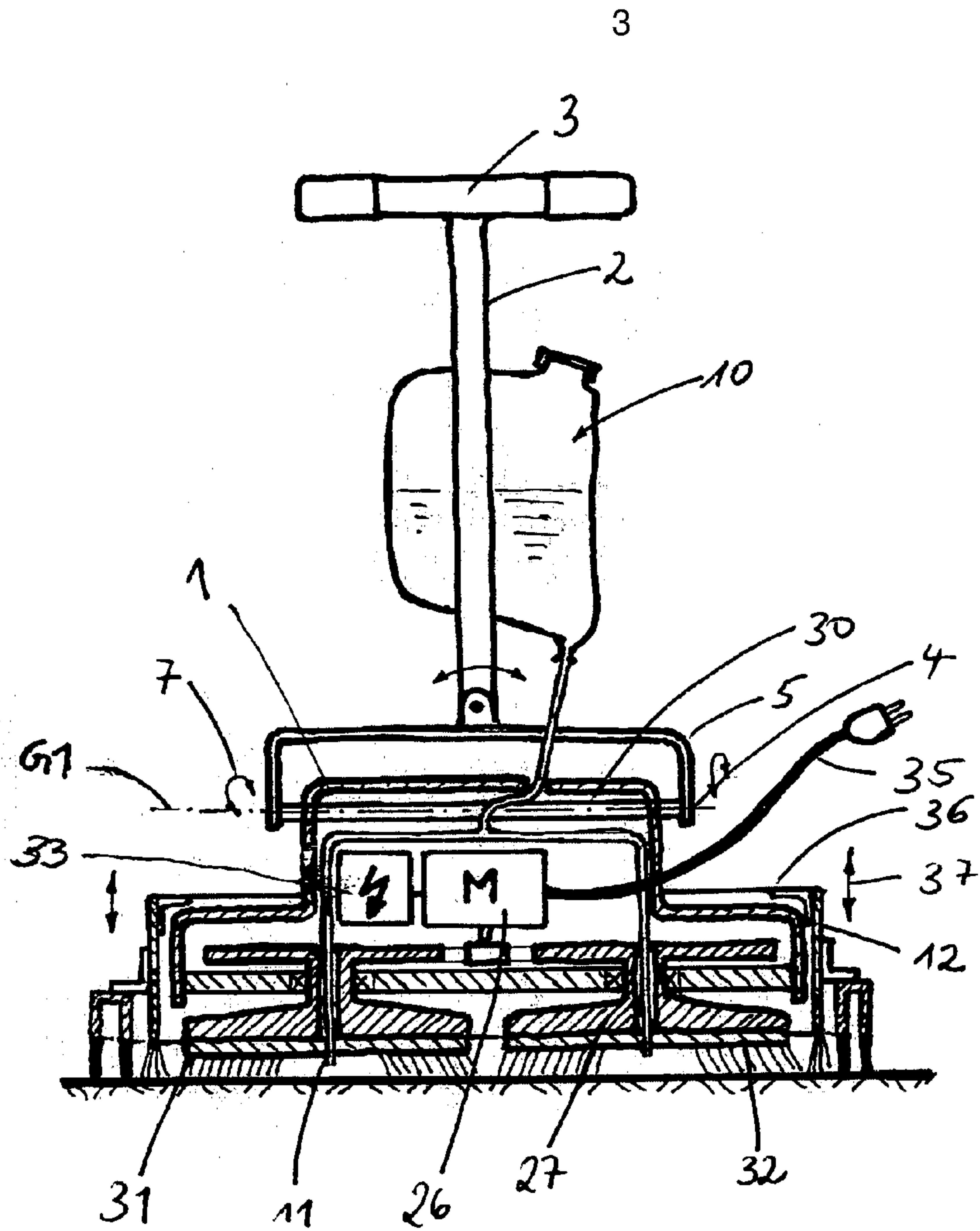


Fig.3

4

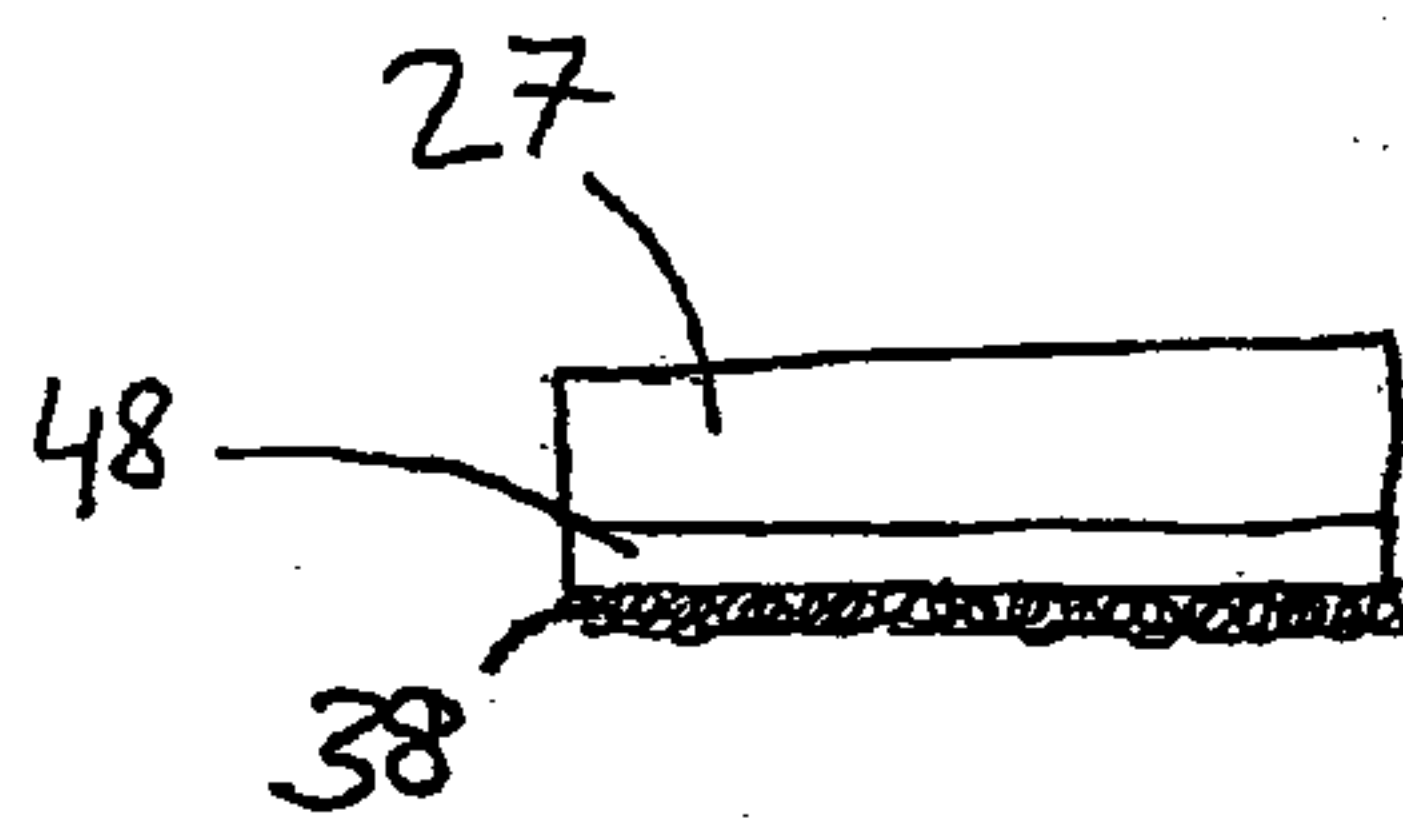


Fig. 4A

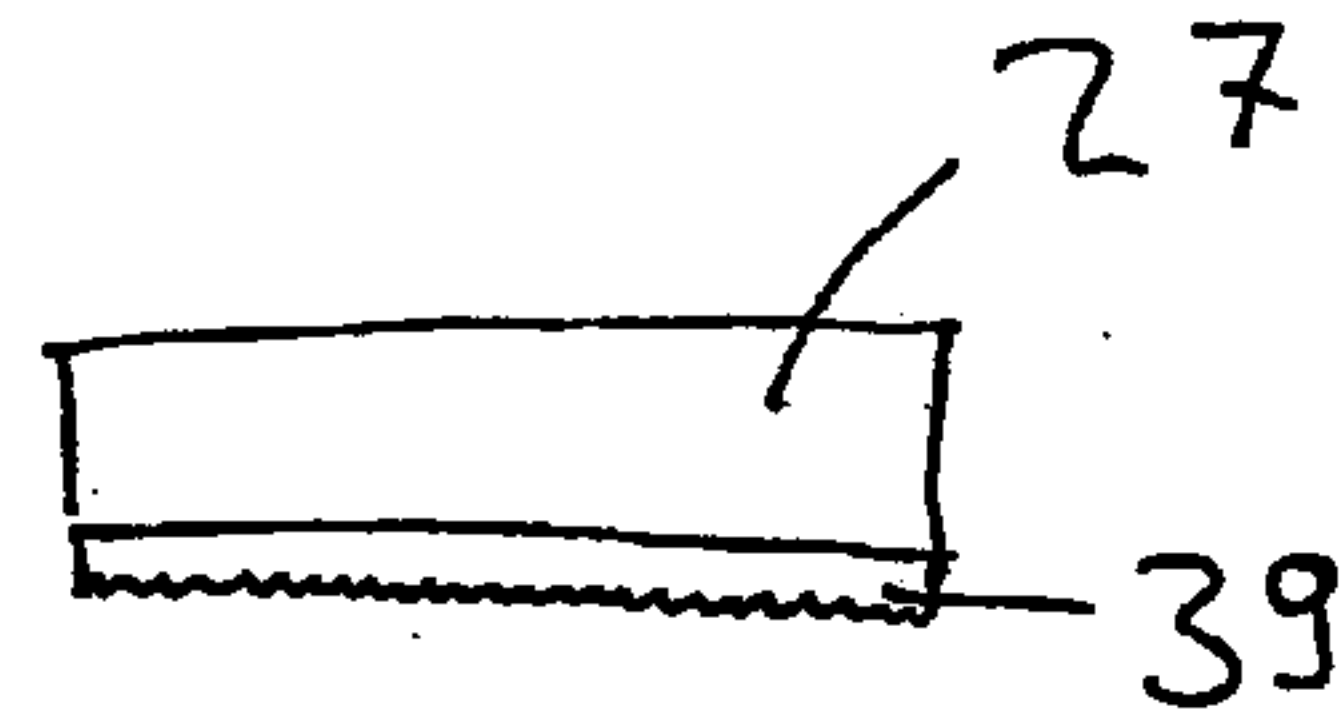


Fig. 4B

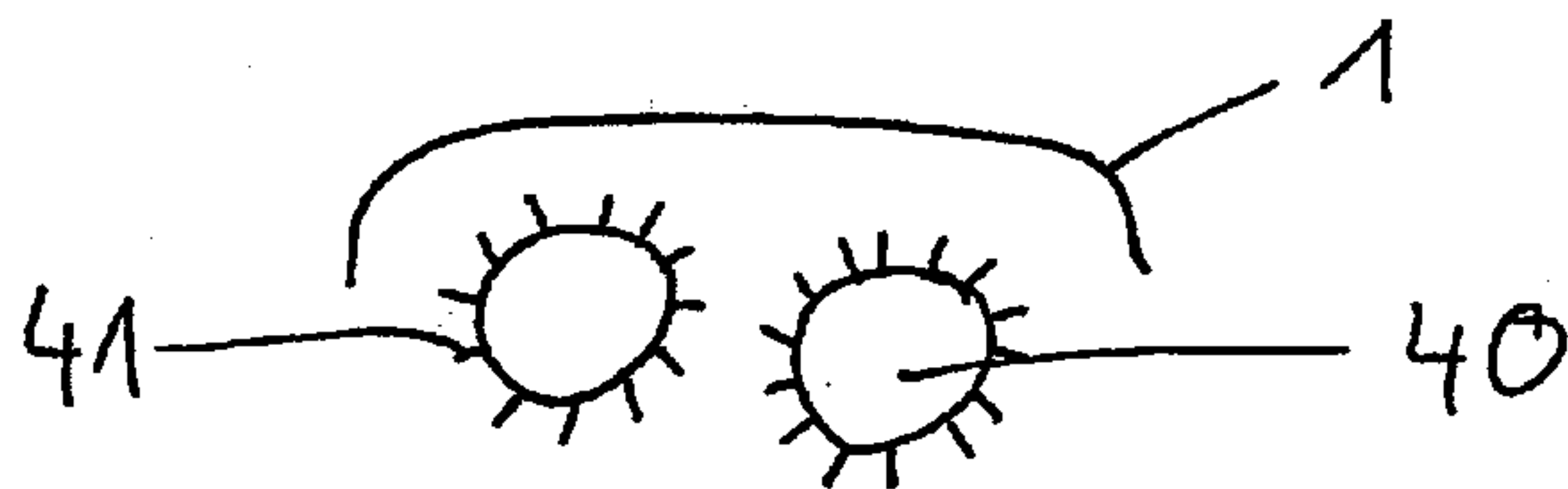


Fig. 4

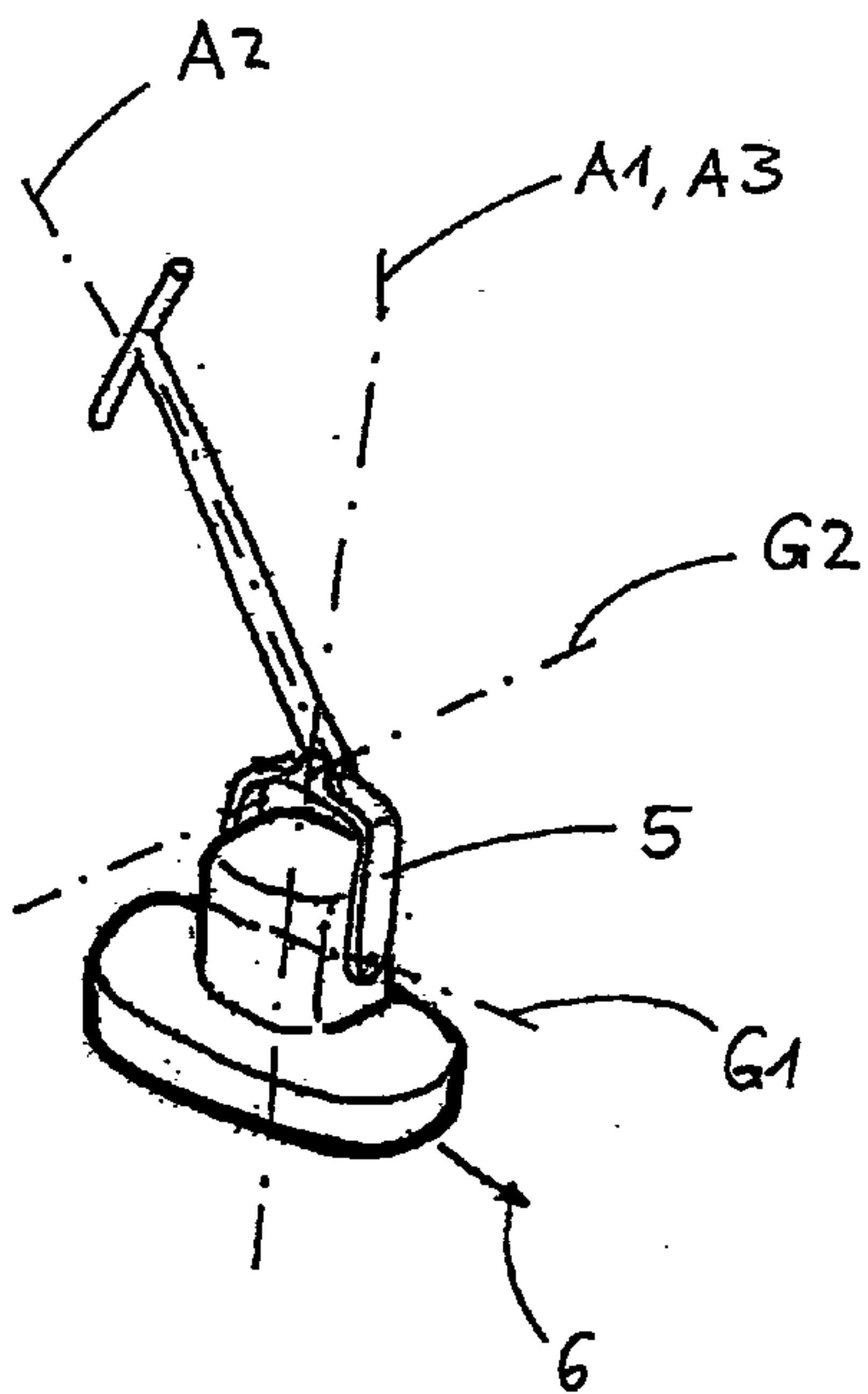


Fig 5A

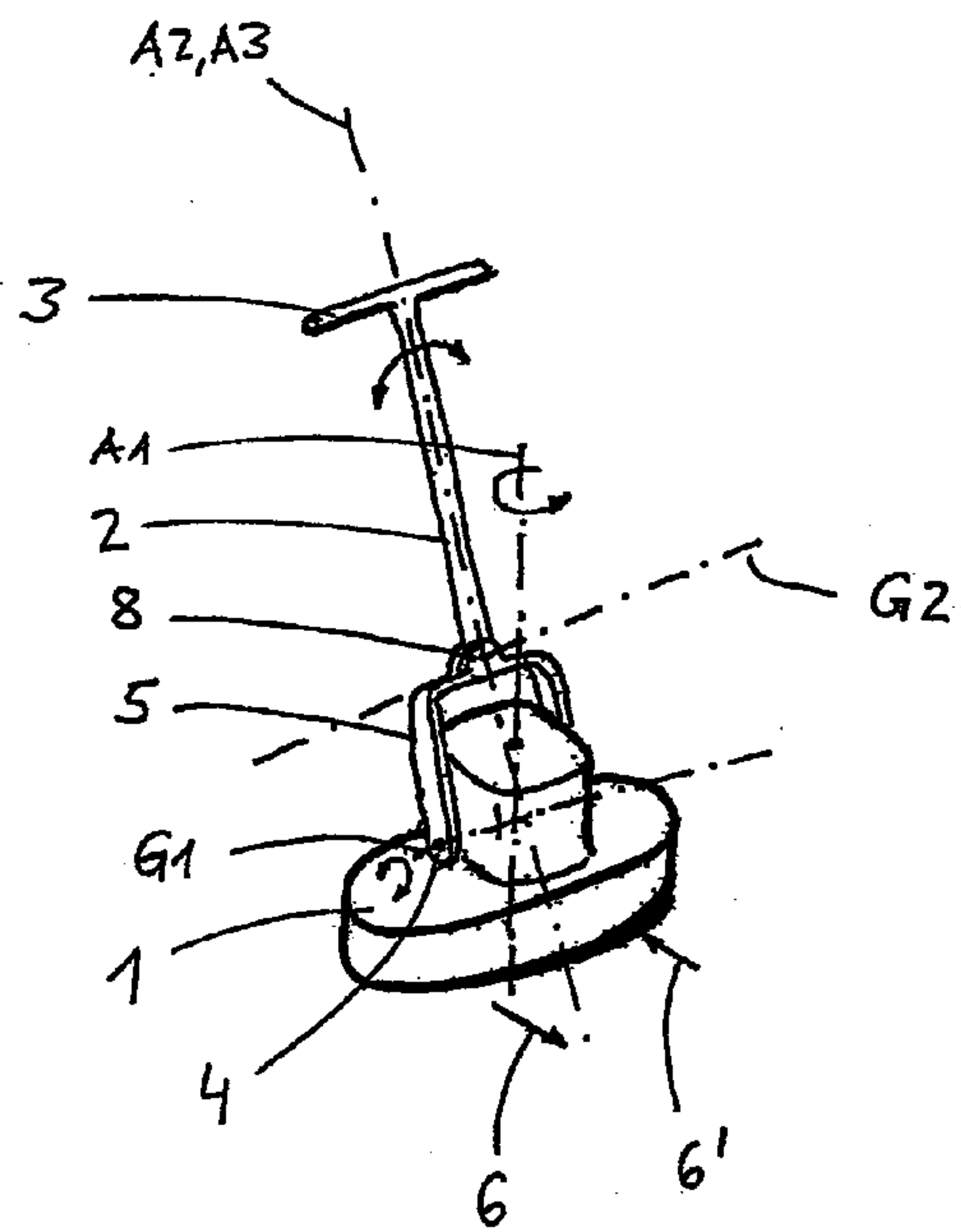


Fig. 5B

5

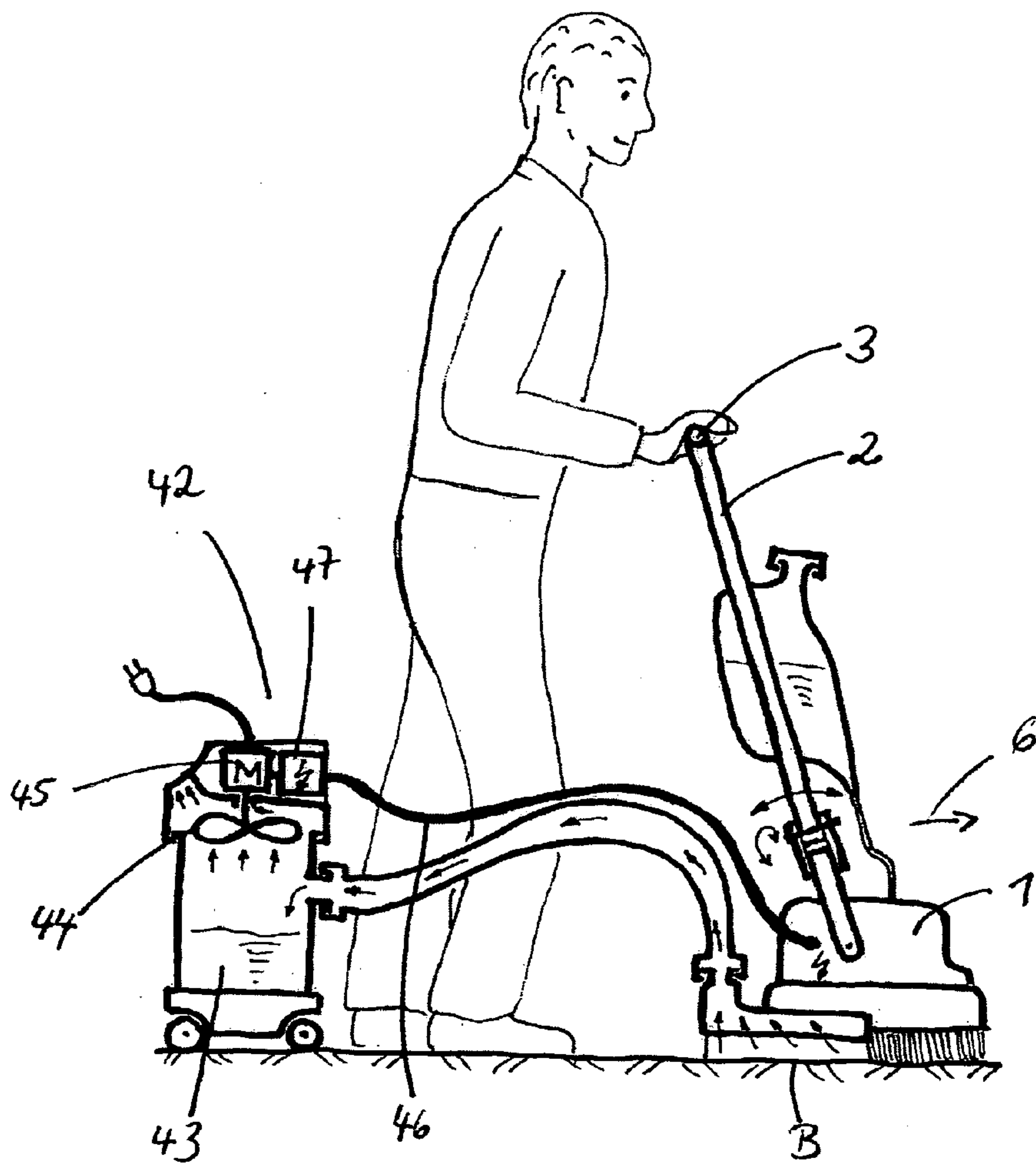


Fig.6