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(54) Wheeled jack with handle for running and lifting

(57) The invention concerns a jack (1) with a handle (2) for drawing the jack (1), where the handle (2) has at least two positions, a first position in continuation of the jack (1) for drawing it and a second, locked position substantially above the jack (1) in order to act as carrying handle for the jack (1). Hereby is achieved that by means of the handle (2) one may place the jack (1) at the right position under e.g. a vehicle to be lifted. As one may also lock the handle (2) at a position above the jack (1) itself, one may carry it just by lifting the handle (2), without using a separate handle.

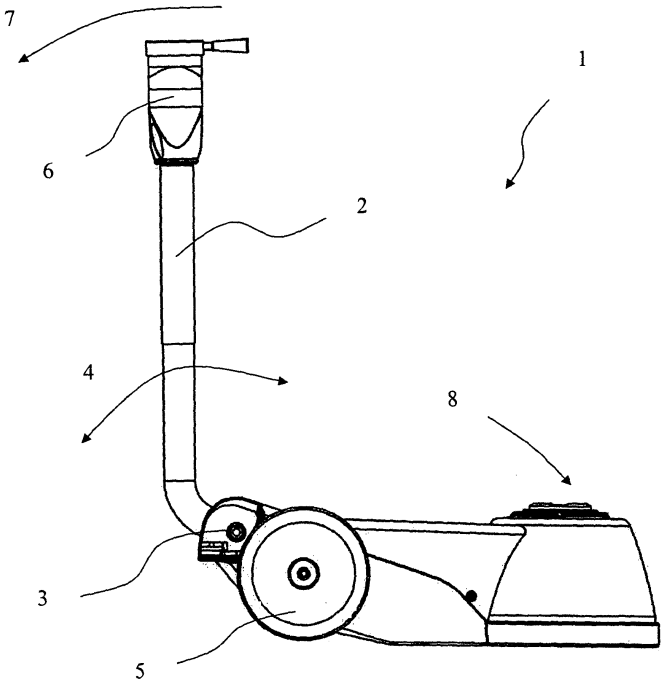

FIG. 1

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Description

Field of the Invention

[0001] The present invention concerns a jack for lifting a body in relation to a surface, where the said jack is equipped with a handle.

Description of Prior Art

[0002] Jacks exist in many different designs, from old mechanical types to more modem hydro-pneumatic. With a hydro-pneumatic jack is meant a jack which is equipped with an air-powered hydraulic pump.

[0003] The Italian firms OLMEC and Pasquin have, among others, developed hydro-pneumatic jacks, e.g. the Pasquin jack, which bears the technical name P200. The jack includes a handle which may be mounted on the jack so that it can be run in under e.g. a vehicle which is desired to be elevated. Air is supplied to the pump system of the jack via an exposed hose which is connected with an air intake on the housing of the jack. The self-weight of the jack is 28 kg. Besides, the jack is provided with a carrying handle so that it is possible to carry it from place to place.

[0004] The carrying handle with which the jack P200 is equipped may be folded down into a recess in the jacket of the jack when not in use. For space reasons the carrying handle is designed small and frail, and the handle is furthermore perpendicular to the side of the jack. This entails that the jack is to be carried with the hand at a right angle to the body, meaning that more force is to be used for stopping turning movements than if the hand was in parallel with the body. Furthermore, the frail design entails that the user is provided an poor grip about the carrying handle due to the great weight of the jack.

[0005] Providing the jack with a larger, thicker and more ergonomical carrying handle would mean that the carrying handle either has to stand free all the time, or to make a higher and wider jacket so that the larger carrying handle could be folded down into it when not in use. If the first of the above solutions is selected, there would appear the problem of the carrying handle getting caught in components at the underside of a vehicle and thus damage these, or alternatively impede removal of the jack. If the second solution is selected, this will entail increased dimensions of the jack, of which particularly the height is of critical significance, since a high jack cannot be put under a vehicle having low spacing between the bottom and the base.

[0006] Therefore, a general improvement of lifting handles for jacks are needed.

Description of the Invention

[0007] It is therefore the purpose of the invention to provide a jack which is compact and which can be lifted with a comfortable carrying handle, where the hand is not posed at a right angle to the body.

[0008] This purpose is solved according to the invention with a jack with a handle for drawing the jack, where the handle has at least two positions, a first position for drawing the jack, e.g. a position where the handle extends upwards or in continuation of the jack, and a second, locked position substantially above the jack, where the handle extends along with the underside of the jack in order thereby to act as carrying handle for the jack. Preferably the handle may be swung so far in over the jack that at least part of a shaft of the handle extends in parallel with and along with the underside of the jack.

[0009] Hereby is achieved a jack which is compact when the handle is in the second position, where it is acting as a carrying handle, which is particularly a great advantage by jacks carried in a service car to the repairing site. Thus is avoided a handle extending rather high up as in the prior art, which would otherwise make difficult the transport in a service car. Furthermore, a comfortable carrying grip in parallel with the side of the jack is achieved. The handle may furthermore have such thickness so that it fits well in the hand. Furthermore, this design has the advantage compared with prior art that the number of components is reduced and the design of the carrying handle is simplified, an advantage with regard to manufacturing.

[0010] With the handle in a first, approximately vertical position or in a position in continuation of the jack, the jack may be placed at the right position under e.g. a vehicle which is to be lifted.

[0011] A jack according to the invention may have the handle pivotably connected at one end to the jack for pivoting between the first position and the second position. Hereby is achieved a continuous design with the possibility of creating hidden joints. Furthermore, it entails an easy and convenient way for bringing the handle from one position to the other. The continuous design furthermore ensures that the handle is not lost inadvertently.

[0012] Advantageously, the clearance between the handle and the jack is at least 40 mm when the handle is disposed in locked position above the jack, in order thereby to ensure sufficient space for the user's fingers, so that the lifting may occur without bruises or squeezing.

[0013] With the handle in the second position over the jack, the jack may be lifted at the point of balance in order to ensure the user against injuries and against using unnecessary force for outbalancing during lifting. Furthermore, the handle may be provided with a carrying grip which may be ergonomically shaped. Hereby is achieved a more comfortable lifting, partly because the user gets a better hold of the handle and partly because it is indicated where on the handle the user is to place his hand in order to avoid using force in outbalancing during the lifting itself.

[0014] If the jack is elongated, it may alternatively be lifted outside its point of balance in order thereby firstly to lift part of the jack from the ground and then the rest

of it. Hereby is achieved a lifting which will not be so hard on the back, as the last part of the lifting will be performed while the user is essentially standing up.

[0015] By using the handle as carrying handle, there is furthermore achieved the advantage that one does not have to mount a separate carrying handle on the jack which in some cases my be caught by components at the underside of a vehicle when using the jack, and thereby damage these and possibly impede removal of the jack after using it.

[0016] The maximum mass that a person is allowed to lift close to the body while working, cf. the rules of the working environment service in a number of countries (EU), is 25 kg. In a preferred embodiment, when making a jack according to the invention there is aimed at a weight under 25 kg. This is particularly enabled because of the fewer required components and the smaller housing compared with prior art, as no handle is to be folded down into the housing. A reduction in weight may furthermore be achieved by making a large part of the jack in aluminium. In the case where the external part of the housing is made of aluminium, it is advantageous that the surface is treated for reducing the risk of corrosion.

[0017] The compressors carried by a service car and used for driving hydro-pneumatic jacks are often poorly serviced, implying that the air produced by the compressor has a high content of impurities and water. This water may cause widespread corrosion in a hydro-pneumatic jack connected thereto if the latter is mainly made of steel. This may lead to short operational life of the jack. According to the invention, by making the pump system of the jack of aluminium, the serious disadvantage caused by corrosion is counteracted.

[0018] Many of the more heavy jacks according to prior art are made with four wheels, of which the two rearmost, i.e. those situated closest to the fastening point of the handle, are swivelling. If one accidentally places the jack at the wrong point under a vehicle, it has to be pulled back, turned and finally run in under the vehicle again, which is a tedious and time-consuming procedure. A jack according to the invention will therefore be equipped with only two wheels which may be disposed close to the point of fastening of the handle. By pulling the handle, a moment about the wheel axles is transmitted to the jack, whereby the housing of the jack is lifted off the base and only rests on the wheels. If the user inadvertently sets the jack a short distance beside the point under a vehicle intended for receiving a jack, he may suffice with pressing the handle down in order to lift the end of the jack, whereafter the jack may be turned into correct position. Hereby a rapid and easy manoeuvre may be achieved.

[0019] It has been indicated previously that the handle can be set in two locked positions so that the user by forcible action at the outer end of the handle may tilt the jack so much that the housing of the jack is lifted off the ground, after which he may roll the jack to the place where it is to be used. In a further development, one may lock the handle in more positions than these two. With the handle connected pivotably to an elongated jack at the same end as where the wheels are provided, the handle may be locked in position in continuation of the jack, enabling using it as a kind of lever, even when the jack is disposed in under a relatively low space under a vehicle.

[0020] The handle may preferably be swung so much in over the jack that at least part of it extends in parallel with and along the underside of the jack, and may furthermore be locked in this position. In this collapsed position, such a jack will take up little space and therefore save space, which may be an advantageous factor in many situations, as e.g. service cars which are also required to carry other space-consuming equipment.

[0021] In order that the jack does not slide while driving with the service car, it may be provided with a skid-proof bottom coating and designed so that the wheels are not in contact with the base. Thereby is achieved a jack which stands firm during use, as the skid-proof coating at the underside of the jack will ensure that the it does not slide on the base. Further securing may be an actual fixing bracket on the jack that may be used for securing the jack in the vehicle. Alternatively, there may be utilised a securing fitting provided in the service car, where the jack is placed in the securing fitting. The securing fitting includes e.g. a back plate for fastening on a supporting surface, e.g. a wall, and to flanges with cutout connected to the back plate, where the cutouts are intended for supporting interaction with the wheel axles on a pair of wheels of the jack. Such a securing fitting prevents the jack from sliding around in the service car with possible risk of damages in the car and risk of injury to persons. Such a fitting also facilitates a suitable arrangement in a service car. Similar securing fittings may be used in workshops in order to place the jack in a suitable way when not in use.

[0022] A jack according to the invention may be provided with a telescopic handle/drawbar. Hereby is achieved that the user may extend the handle so that the user is capable of moving the jack farther in under e.g. a vehicle to be lifted. Besides, the handle in the collapsed position with take up very little space and thereby fulfil the object of compactness in design.

[0023] A jack according to the invention may be equipped with a hydraulic or a hydro-pneumatic pump, i.e. a jack equipped with an air-powered hydraulic pump. Many of the hydro-pneumatic jacks found on the market today are equipped with a separate air hose for air supply. This causes that the air hose may be overrun by the jack during use, which may entail damage to the air hose. A jack according to the invention may therefore with advantage be equipped with a handle that comprises means for air supply for the above mentioned hydro-pneumatic pump, as this will lower the risk of overrunning the hose with the jack.

[0024] In a preferred embodiment, the air hosed conducting air to the hydro-pneumatic pump will be provided inside the handle itself. Hereby is achieved that the overall design becomes more compact. Besides, it will be

practical to provide the means for air supply at the outer end of the handle instead of on the housing of the jack. In case that the handle is telescopic, the air pipes inside the handle can also be made telescoping, e.g. with Teflon packings between the telescopic pipes.

[0025] A jack according to the invention may be equipped with a handle including a valve for controlling air supply to the same jack. Hereby is achieved a simple control mechanism for the air supply. In a preferred embodiment of the invention, it may be a control valve which may be disposed where the supply nipple is provided. Actuation of the jack may be effected via a rotary knob, e.g. spring-biased, which may be turned to one side or the other for lifting or lowering, respectively, the jack. Lowering occurs by conducting pressurised air to the opposite side of the piston in order thereby to press the piston back.

[0026] In order to facilitate use of the jack, the handle or jack may include an indicator for the position of the piston for easing the use, so that the user does not have to look in under the vehicle lifted or lowered by means of the jack.

[0027] A jack according to the invention may be equipped with a telescopic lifting device. Hereby is achieved a very compact design which is in line with the inventive purpose of providing a compact and portable jack that also has great lifting capacity at the same time.

[0028] As a part of providing a compact jack, the oil reservoir is disposed in a chamber formed by the interspace between the cylinder and the casing surrounding it.

[0029] The carrying grip as part of the handle and the housing may furthermore be constructed so that it is disposed above the jack as carrying handle, while when out of use it may be lowered into the housing of the jack for resulting in a more compact and more integrated design.

[0030] The jack according to the invention may be of hydro-pneumatic type, but the invention is general and may also find application in hydraulic or mechanical jacks.

Short Description of the Drawing

[0031] The invention is described in more detail with reference to the drawing, where:

Fig. 1 shows a jack according to the invention as seen from the side;

Fig. 2 shows a jack according to the invention as seen from the side and with the handle locked in a position that enables using same drawbar as lifting handle;

Fig. 3 shows a jack according to the invention as seen from the side and with the handle locked in a third, alternative position;

Fig. 4 shows a cross-section of a jack according to the invention as seen from the side; and

Fig. 5 shows a securing fitting for a jack according to the invention.

Detailed Description of the Invention

[0032] Fig. 1 shows a jack 1 according to the invention as seen from the side. The jack is provided with a handle 2 in the shape of a shaft which is pivotably connected to the jack 1 at the joint 3, so that it may be swung in over the jack 1, or back as indicated with arrow 4. At the joint 3, the jack 1 may be provided with a locking mechanism that enables locking the handle 2 in a plurality of positions, e.g. in the shown position.

[0033] The jack 1 has two wheels 5, one at each side. The wheels 5, which e.g. may be solid rubber wheels or plastic wheels, are located on the jack 1 so that they do not touch the base in the shown position. The hub caps are designed so that they prevent dirtying.

[0034] In order to tow or draw the jack 1 during use, the user may seize the outer end 6 of the handle and pull the direction indicated by arrow 7. The handle 2 will hereby act as a lever whereby the opposite end of the jack 1 at which the wheels 5 are located will be lifted off the base, while the wheels 5 simultaneously are provided contact with the same base. When the wheels 5 are in contact with the base and the rest of the jack 1 is lifted off the base, the user may readily run the jack 1 to the location at which he may want to use it.

[0035] Alternatively, the handle 2 is swung in over the jack as shown on Fig. 2, and is locked into this second position. Hereby is achieved that one may use the handle 2 as carrying handle, why mounting a separate carrying handle is made redundant. Besides it is achieved that the jack 1 in this configuration is very compact, entailing that it will not take up much in height. Height may be an important space parameter, particularly when running under vehicles or when storing the jack.

[0036] The distance between the top 20 of the jack and the shaft of the handle may be at least 40 mm in this configuration in order to make enough room for the fingers so that the user avoids bruises or squeezing of the fingers.

[0037] The jack 1 may be equipped with a telescopic lifting device 8 which is actuated by means of pressurised air. The bottom 21 of the jack 1 may be equipped with a skid-proof coating so as to ensure that it will stand firm during use. For jacks that are transported by service cars to breakdown locations, a skid-proof coating also prevents the jack from sliding to and fro on the platform of the driving service car.

[0038] Fig. 3 shows a jack 1 according to the invention as seen from the side, with the handle 2 turned to a third, alternative position. This position may be useful if it is desired to move the jack 1 far in under e.g. a vehicle desired to be lifted. In this position too there may be an arresting in order to enable using the handle/drawbar for lifting the front end of the jack while placing the jack far in under a vehicle.

[0039] The handle 2 may furthermore be telescopic and consist of at least two parts 30 and 31 so that it may be extended. Hereby is achieved that the jack may readily

be pushed even farther in under the vehicle.

[0040] On fig. 4 is seen a cross-section of a jack 1 according to the invention. On the Figure is seen a hydro-pneumatic pump 40 which is powered by pressurised air supplied via the air hoses 41 and 42. The air hoses 41 and 42 are laid into the handle 2 itself. The air supply may be controlled by means of a control valve 43 so that by turning the latter, the telescopic lifting device 8 may be lowered and lifted, respectively.

[0041] The handle 2 is depicted on the Figures as an essentially straight shaft, but the handle 2 may have another shape, e.g. have a more curving profile.

[0042] Fig. 5 shows a securing fitting for a jack according to the invention. The securing fitting includes a back plate 50 for fastening to a supporting face, e.g. a wall, and two flanges 51 with cutout 52 connected with the back plate, where the cutouts 52 are intended for supporting interaction with the wheel axles on a pair of the wheels 5 of the jack. The securing fitting furthermore includes a support projection 53 in which the front part of the jack rests when the jack is placed in the fitting. At the bottom of Fig. 5 the securing fitting is shown with the jack 1 placed therein.

[0043] Such a securing fitting for placing the jack 1 may be provided in the service car for preventing the jack 1 from sliding around on the platform with possible danger of damages to the car and risk of persons being injured. Such a fitting also makes it easier to provide a suitable arrangement in the service car. Similar securing fittings may be used in workshops for appropriate placing of the jack when this is not in use.

Claims

1. A jack (1) with a handle (2) for drawing the jack (1), **characterised in that** the handle (2) has at least two positions, a first position for drawing the jack and a second, locked position substantially above the jack (1), where the handle (2) extends along with the underside of the jack (1) in order thereby to act as carrying handle for the jack (1).

2. Jack according to claim 1, wherein the handle (2) may be swung so far in over the jack that at least part of a shaft of the handle (30, 31) extends in parallel with and along the underside of the jack (1).

3. Jack according to claim 1 or 2, wherein the handle (2) at one end is pivotably connected to the jack (1) for pivoting between the first position and the second position.

4. Jack according to any preceding claim, wherein the handle (2) includes an ergonomically correctly shaped carrying grip.

5. Jack according to any preceding claim, wherein the jack is designed with skid-proof bottom coating.

6. Jack according to any preceding claim, wherein the jack (1) is equipped with a hydro-pneumatic pump (40), and where the handle (2) includes means (43) for air supply for the hydro-pneumatic pump (40).

7. Jack according to claim 6, **characterised in that** the handle (2) includes a valve (43) for controlling the air supply to the jack (1), where the valve (43) regulates the air supply optionally at one or the other side of an air piston for the lifting device of the jack, for elevating or lowering the lifting device with the air.

8. Jack according to claim 6 or 7, wherein the handle (2) is telescopic with internal telescoping air pipes.

9. Jack according to any preceding claim, wherein the handle (2) and the housing of the jack are constructed for lowering the handle (2) into the housing of the jack.

10. A securing fitting for a jack according to any preceding claim, wherein the securing fitting includes a back plate (50) for fastening on a support face, e.g. a wall, and two flanges (51) connected to the back plate and with cutout (52), where the cutouts are intended for supporting interaction with the wheel axles of a pair of wheels (5) of the jack.

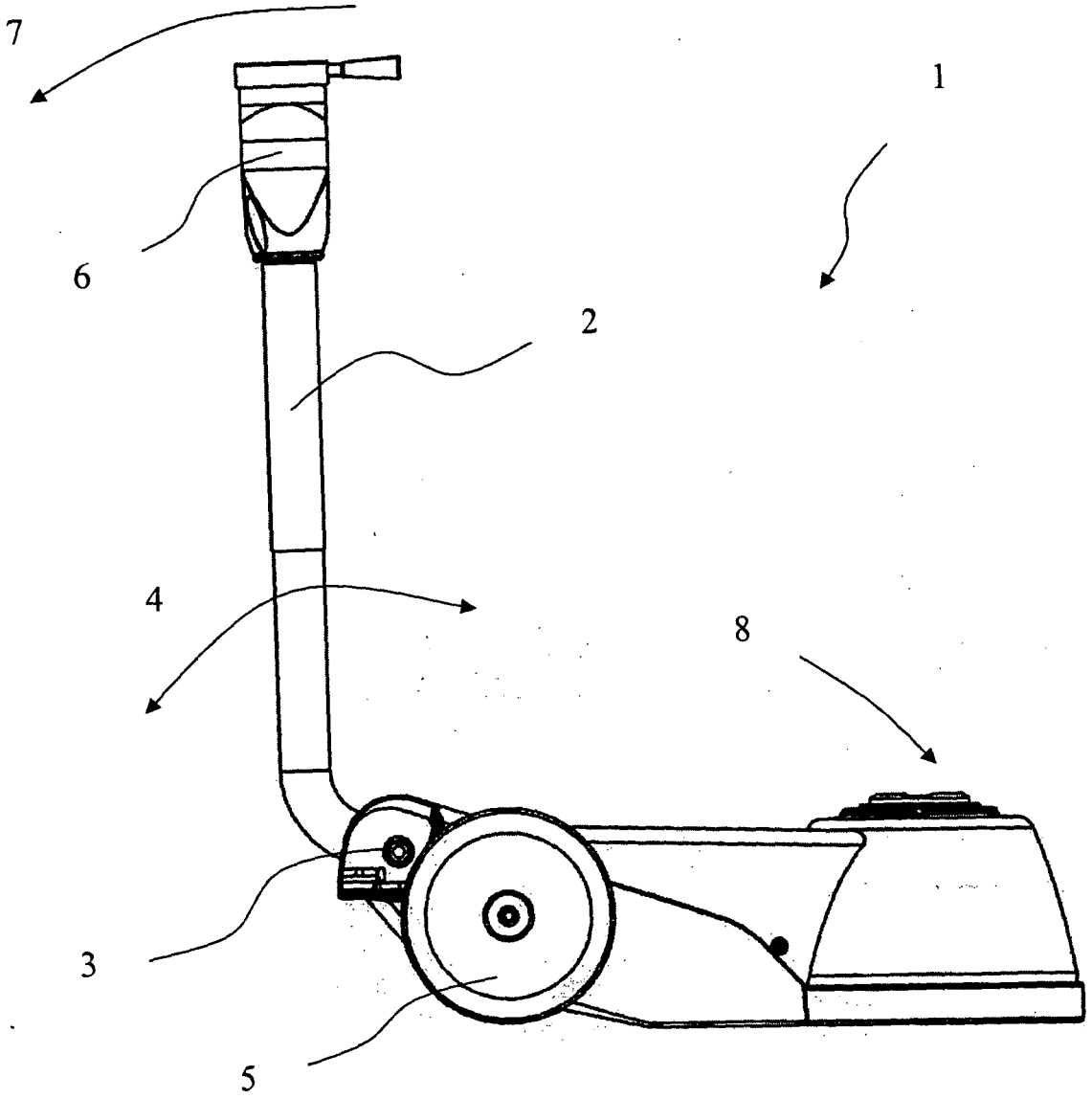

FIG. 1

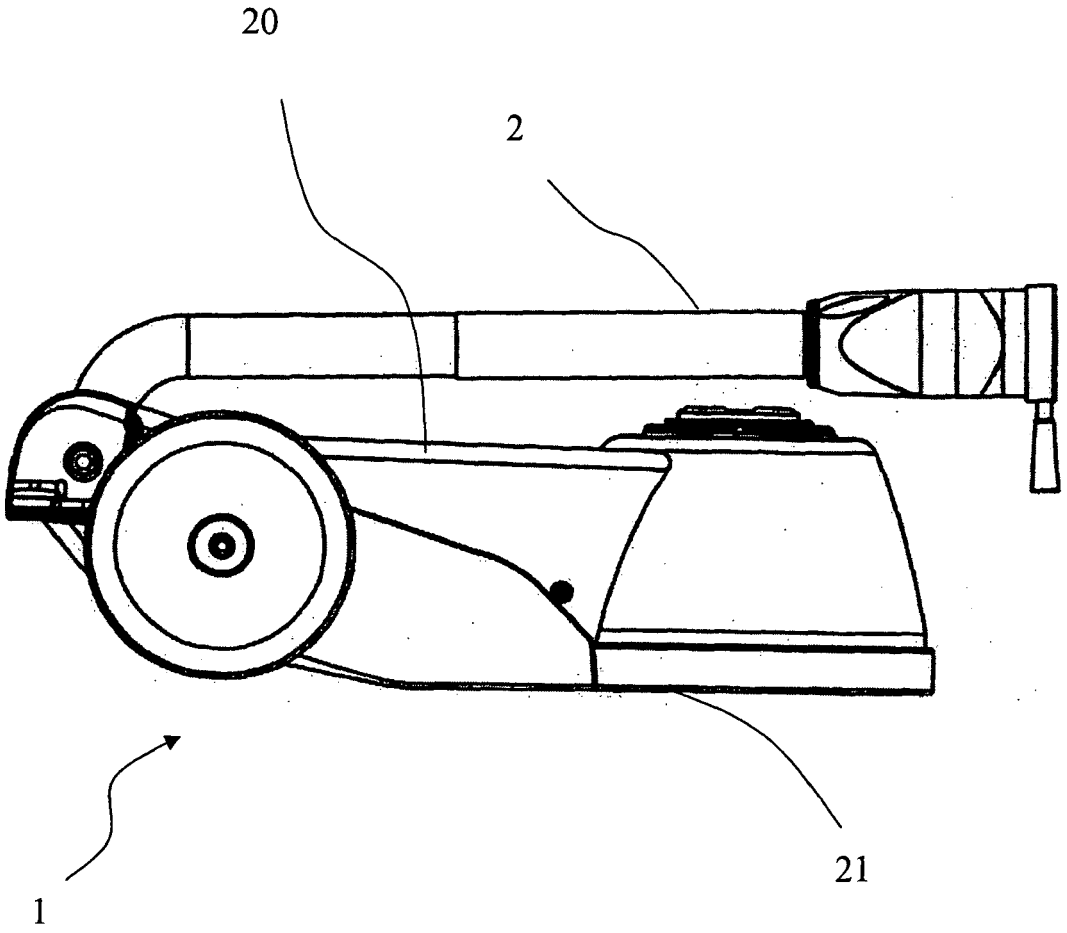

FIG. 2

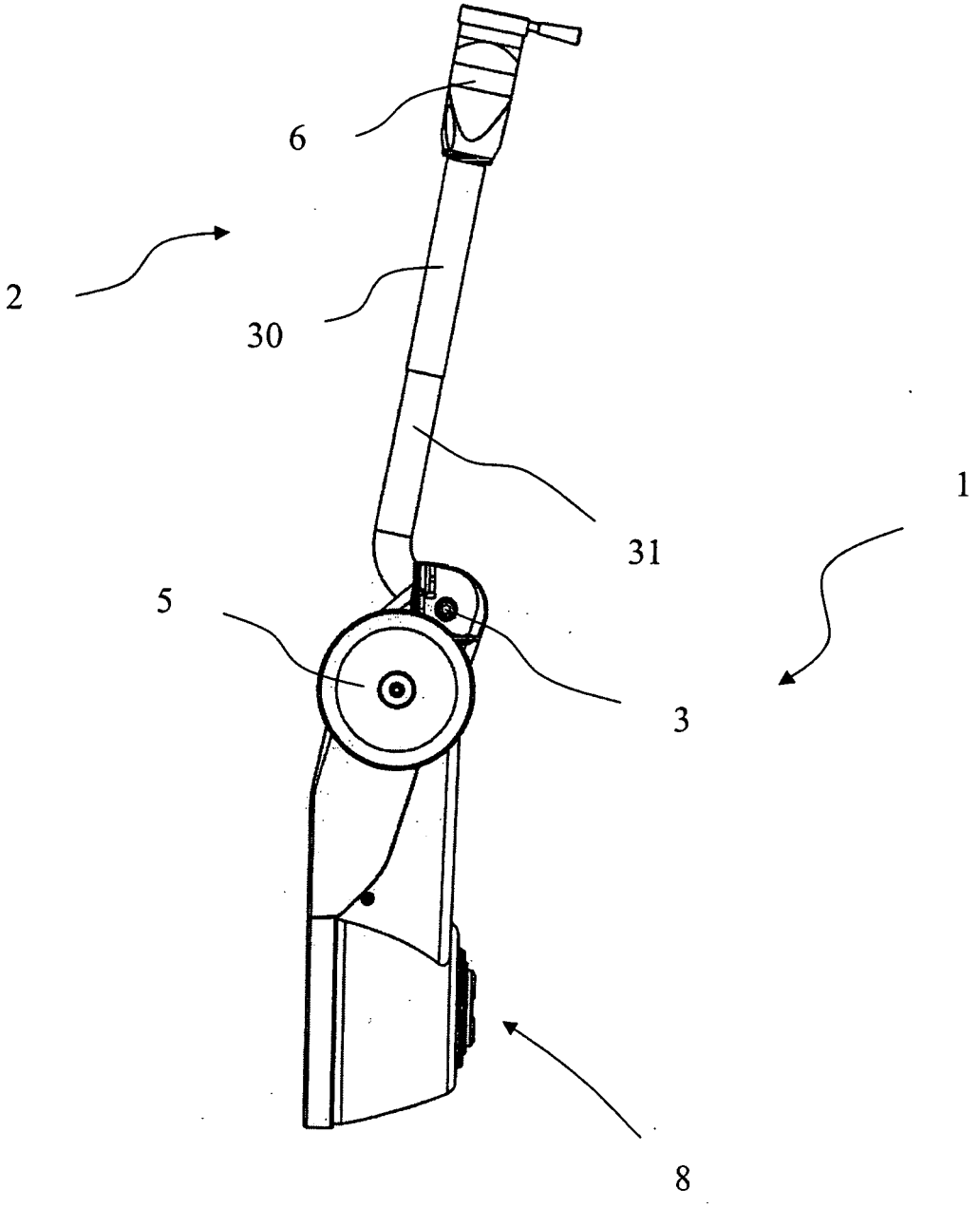

FIG. 3

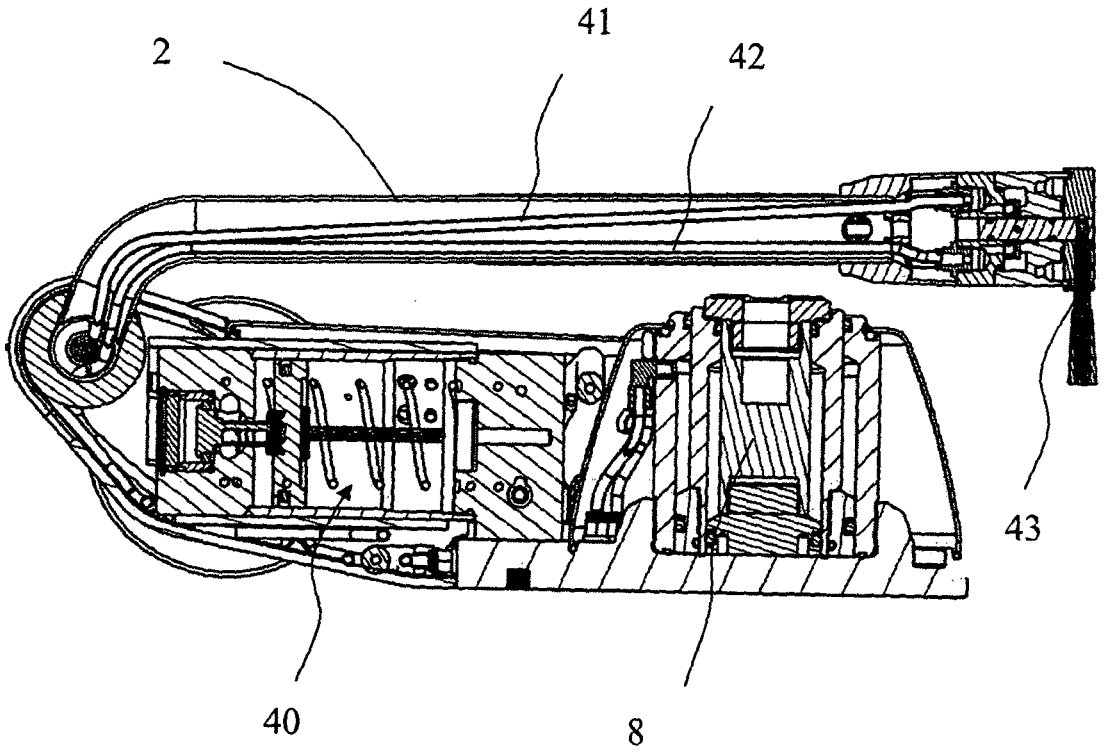

FIG. 4

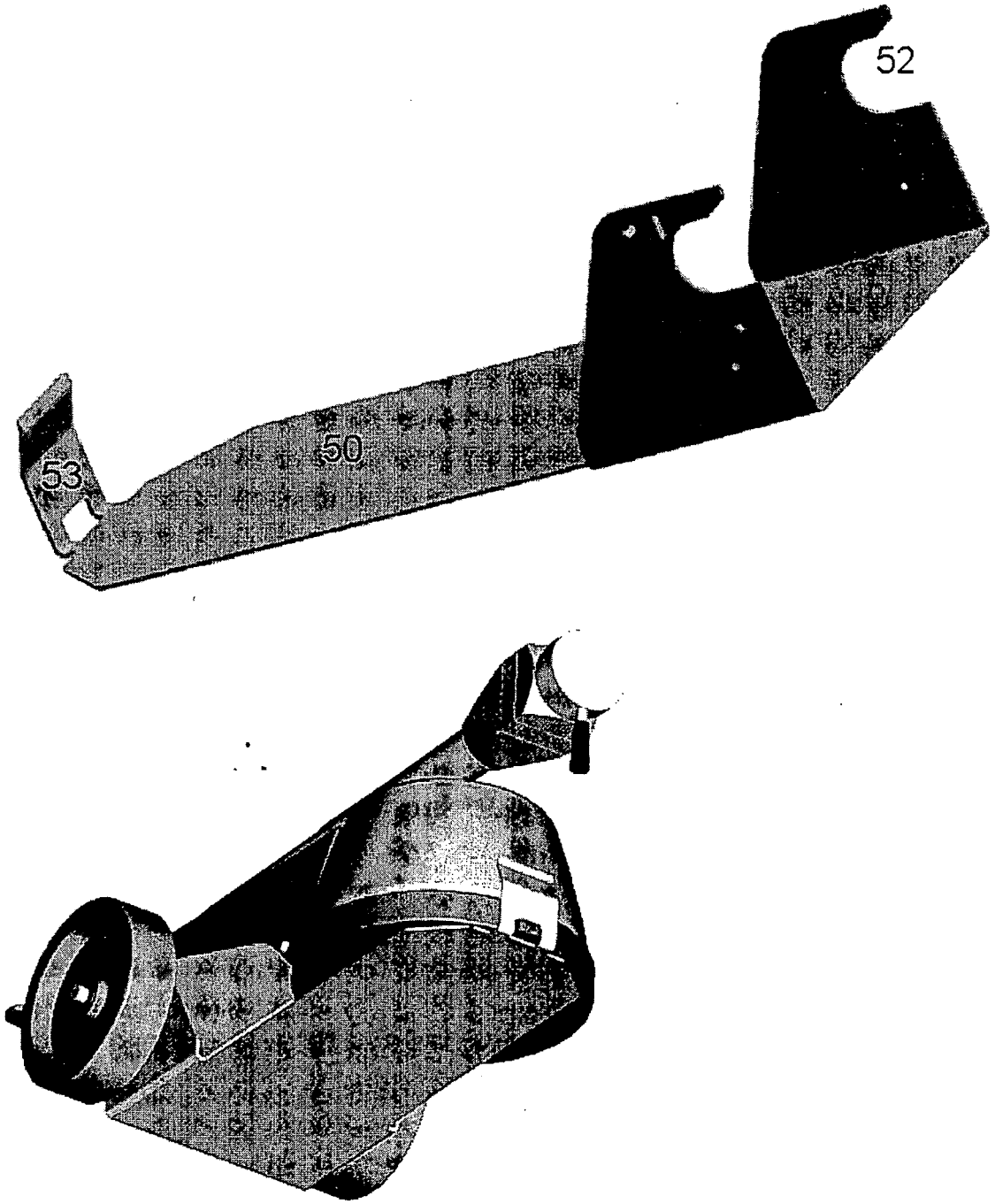

FIG. 5