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HANDLE AND SPRINKLING DEVICE FOR VIBRATION PLATE

Description

The invention relates to a carrying device for a vibration plate for ground compaction. In particular, the invention relates to a handle and a sprinkling device
5 for such a vibration plate.

A variety of vibration plates or shaker plates for ground compaction are known.

Such a vibration plate generally has an upper mass and a lower mass movable relative to the upper mass. The drive of the vibration plate can be arranged, for example, as an internal combustion engine on the upper mass. It is also possible
10 to realize the drive as an electric motor and then optionally arrange it on the upper mass or the lower mass.

The lower mass has a ground contact plate which is made to vibrate by a vibration exciter provided on the lower mass, whereby the ground compaction effect can be achieved.

15 In addition to the compaction of rocky or sandy soils or also the vibrating of laid stones, such machines can be used effectively for asphalt compaction. To avoid the adhesion of asphalt to the ground contact plate (base plate), it is known to provide a sprinkling system for outputting water at the underside of the ground contact plate. Such a sprinkling system is known, for example, from DE 10 2007
20 026 419 A1.

For the better transportation of such vibration plates, the devices often have one or more handles or lifting handles by which one or more persons can lift the machine.

Such a carrying handle is provided on the one hand by a guide bracket which is frequently provided for operating and guiding the vibration plate and is fastened at
25 the rear end of the vibration plate, usually to the upper mass. In addition, a further support bracket can be provided on the front side of the vibration plate as is known for example, from DE 31 14 947 A1.

The arrangement of both a carrying handle and a sprinkling device in the front region of a vibration plate, as known for example from US 4 113 403 A, requires corresponding installation space. It is therefore known to fasten the sprinkling system in another way, i.e. not in the front region of the machine, which, however,
5 can entail disadvantages for wetting with water. It is also possible to arrange handles for example laterally on the machine, but this can impair the ergonomics.

In addition, the different components must each be fastened to the actual vibration plate, which calls for corresponding fastening points and increases the manufacturing or assembly effort.

10 The object of the invention is therefore that of finding a suitable handle solution which can be fastened in the front region of a vibration plate and also enables a sprinkling function in addition to the actual carrying function.

The object is achieved according to the invention by a carrying device having the features of Claim 1. Advantageous embodiments are presented in the dependent
15 claims.

A carrying device is presented for a vibration plate for ground compaction with a gripping device having a gripping region for gripping with at least one hand by a user, a sprinkling device for outputting water, and with a fastening device for fastening the carrying device to the vibration plate, wherein the gripping device,
20 the sprinkling device and the fastening device are formed in one piece in a common component.

The carrying device therefore represents an integrated combination of the gripping device and sprinkling device. In addition, it can be fastened to the vibration plate by means of the integrated fastening device.

25 The vibration plate itself is not the subject of the claim. Rather, the specified carrying device serves to be fastened to the vibration plate by means of the fastening device.

The gripping size of the gripping region is to be suitably designed to enable gripping by at least one hand or also with two hands.

The sprinkling device serves to discharge water such that the water can reach the intended location of the vibration plate, in particular on the underside of a ground contact plate for ground compaction. Accordingly, the sprinkling device is designed to enable the water to be discharged in a suitable manner.

- 5 The sprinkling device does not comprise a water reservoir or water tank, as will be explained later. Rather, the sprinkling device (integrated into the carrying device) represents the element which serves to dispense the water.

- The water reservoir, for example a water tank, can be fastened separately to the sprinkling device on the vibration plate. If the vibration plate does not require any
10 water sprinkling (for example if no asphalt is to be compressed), the water reservoir can be removed from the vibration plate. It therefore only has to be fastened to the vibration plate as needed.

- The carrying device can be made in one piece from plastic. This allows the carrying device to be highly resistant and at the same time lightweight, with low
15 thermal conductivity and a pleasant gripping feel at low and high temperatures. The gripping device or the gripping region can be ergonomically designed in such a way that a pleasant gripping feel is imparted to the user. For example, it can be achieved that, at least in the gripping region, no unpleasant edges are formed, but essentially roundings.

- 20 The gripping device can have a closed handle. The handle can in particular be closed laterally in order to prevent the hands from slipping laterally. The handle opening, i.e. the distance between the actual gripping region and the remaining components of the carrying device, in particular the sprinkling device, can be dimensioned such that it is optimally suitable for gripping and provides sufficient
25 space for the fingers of the operator.

- The sprinkling device can have at least one sprinkling opening via which water can exit. Accordingly, the sprinkling opening can be arranged at a suitable location, so that the water exiting there also reaches the ground contact plate or a sole
30 attached to the ground contact plate during operation of the vibration plate. Such a sole is described, for example, in DE 31 14 947 A1.

The sprinkling device can have a water supply connection for connecting a water supply and introducing water into the sprinkling device, and a distributor channel coupled to the water supply connection for distributing and discharging the water.

Accordingly, the sprinkling device has an inlet in the form of the water supply connection to which the water supply, for example in a water tank, can be connected.
The actual water supply can be provided separately from the carrying device.

The water supply connection can be, for example, a hose connection or hose nipple, which in turn can also be integrated in one piece into the carrying device.

A component of the sprinkling device can also be the distributor channel which is coupled to the water supply connection in such a way that the water supplied via the water supply connection enters the distributor channel. From there, the water can be distributed and finally discharged in a suitable manner.

For this purpose, the sprinkling opening described above can be formed in the distributor channel.

In particular, a plurality of sprinkling openings can also be formed in the distributor channel, wherein these sprinkling openings can be arranged offset along the distributor channel to allow the water to be discharged at several points, and therefore to allow the water to be discharged in an effectively planar manner.

The one sprinkling opening or also the plurality of sprinkling openings can be oriented upwards or downwards, so that the water can escape and ultimately seep downward in order to reach the region below the ground contact plate.

The distributor channel can extend parallel to an extension direction of the gripping device. This results in a compact design.

The distributor channel can be formed at least partially as a continuous tube and extend in the extension direction.

The distributor channel can have an opening in at least one of its two end faces. The opening can be used for the end-face water outlet and in this respect can be a sprinkling opening. It is also possible to close the opening using a suitable closure

element, for example a plug, in order to prevent water from escaping at the end face of the distributor channel. In one variant, an opening is provided in both end faces in the distributor channel, each opening being closed by a plug.

The distributor channel can have at least one end-face region which can be shortened by being cut to length. In particular, the distributor channel can be designed as a tube at least in the end-face region, wherein end pieces can be separated from the tube in order to reduce the length of the distributor channel. In this way, the width of the entire carrying device, which is substantially determined by the length of the distributor channel, can be adjusted and matched to the width of the vibration plate on which the carrying device is to be fastened.

The possibility of being able to reduce the length of the distributor channel by simple cutting to length, for example by sawing, makes it possible to produce the carrying device as a common part for many different types of vibration plates, in particular for various sizes of vibration plates, and then adapt them to the individual dimensions of the vibration plate by simple cutting to length.

The fastening device can have at least two fastening points at which a screwed connection to the vibration plate can be produced. In this way, the carrying device can be screwed to the vibration plate, for example to its ground contact plate, via the fastening points.

A vibration plate for ground compaction is disclosed, comprising an upper mass having a water tank, a lower mass which is movable relative to the upper mass and has a ground contact plate and a vibration exciter acting on the ground contact plate, and a carrying device of the type described above. The carrying device may be attached to the ground contact plate, wherein the water tank is coupled to the sprinkling device of the carrying device such that water can flow from the water tank into the sprinkling device.

These and other features and advantages of the invention are explained in more detail in the following on the basis of examples, with the assistance of accompanying figures. in which:

Fig. 1 shows a carrying device according to the invention in a perspective view from the front;

Fig. 2 shows the carrying device of Fig. 1 in a perspective view from the rear;

Fig. 3 shows a carrying device fastened to a vibration plate (only incompletely shown) in a perspective view; and

Fig. 4 shows a vibration plate with a carrying device in a side view.

Fig. 1 shows a carrying device according to the invention in a perspective view from the front, Fig. 2 in a perspective view from the rear.

The carrying device 1 has a gripping device 2, a sprinkling device 3 and a fastening device 4. It is formed integrally as a single part and is made of plastic.

The gripping device 2 has a closed handle 5 which is dimensioned such that it can be comfortably gripped by an operator using both hands. In particular, the width B extending in the longitudinal direction of the handle 5 is dimensioned such that two hands fit next to each other.

The sprinkling device 3 is provided below the handle 5, wherein the handle 5 merges directly into a distributor channel 6 (also referred to as a sprinkling strip) belonging to the sprinkling device 3. Reinforcing ribs 7 are provided for reinforcing the transition and also the entire carrying device 1.

The distributor channel 6 extends in a tubular manner over the entire length of the carrying device 1 (width B) and has a full tube opening 8 in the end face.

A plurality of openings (not shown) (sprinkling openings 6a), via which water can be discharged downwards, are provided in the underside of the distributor channel 6. The openings can be dimensioned such that water flows out or drips out in order to allow the desired quantity of water to exit below the sprinkling device 3. In addition, the sprinkling openings 6a can be arranged in such a way that they correspond to openings or perforations in a ground contact plate of a vibration plate located underneath in the operating state. In this way, the water emerging at

the sprinkling openings 6a can reach the underside of the ground contact plate directly through the openings.

The water is supplied via a water supply connection 9, which is designed as a hose nipple. The water supply connection 9 is also an integral component of the carrying device 1. A hose can be plugged onto the water supply connection 9
5 which is fed from a water tank explained later with reference to Figs. 3 and 4.

The water is therefore supplied via the water supply connection 9, and from there enters the distributor channel 6 from where the water can be discharged along the distributor channel 6.

10 The water can also exit at the end-face tube openings 8 if these remain open. It is also possible to close the tube openings 8 by a plug, not shown in Figs. 1 and 2, in order to prevent the water from escaping.

The fastening device 4 has two fastening points 10, at which a screwed connection can be created in order to fasten the carrying device 1 to a vibration plate.

15 This relationship can be seen with reference to Figs. 3 and 4, wherein Fig. 3 represents a vibration plate in a perspective view from the front, but without an internal combustion engine and vibration exciter. Fig. 4 shows the complete vibration plate of Fig. 3, i.e. with an assembled internal combustion engine and vibration exciter.

20 In particular, Fig. 3 shows the vibration plate with an upper mass 15 and a lower mass 16. The vibration plate is shown only partially in Fig. 3, while Fig. 4 shows the entire vibration plate.

The upper mass 15 has an internal combustion engine 17 which is fastened to an engine mount 18. Furthermore, a guide bar 19 on which an operator can guide
25 and direct the vibration plate is provided on the upper mass 15.

Rubber buffers 20 serving as vibration decoupling elements are provided between the upper mass 15 and the lower mass 16.

The lower mass 16 has a ground contact plate 21 which carries a vibration exciter 23 on an exciter mount 22. The vibration exciter 23 is rotationally driven by the internal combustion engine 17 and generates in a known manner an imbalance which acts directly on the ground contact plate 21 and generates the shaking force
5 used for ground compaction.

A water tank 25 is attached to the upper mass 15 on a frame 24.

The carrying device 1 is fastened to the front side of the ground contact plate 21 at the fastening points 10 with the aid of screwed connections. It is therefore possible for an operator to lift the entire vibration plate by the handle 5. Normally, the
10 vibration plate is carried by two operators, namely an operator who carrying by the handle 5 and an operator carrying the machine by the guide bracket 19. It is also possible for the vibration plate to be carried by a total of four operators, wherein in each case two persons at the front grasp the carrying device 1 and two persons at the rear grasp for example the guide bracket 19.

15 As a comparison of Figs. 3 and 4 shows, the distributor channel 6 of the carrying device 1 has been cut to length at the end faces so that the carrying device 1 of Fig. 3 has a significantly smaller width B than that of Fig. 2. The front ends of the distributor channel 6 are closed by plugs 26.

The distributor channel 6 is connected to the water tank 25 via the water supply
20 connection 9 and a hose 27. In this way, water from the water tank 25 can reach the distributor channel 6 via the hose 27 and the water supply connection 9, and can be discharged from there over the width of the ground contact plate 21 through the different sprinkling openings 6a. The water can in particular reach the underside of the ground contact plate 21 through openings or perforations 28.

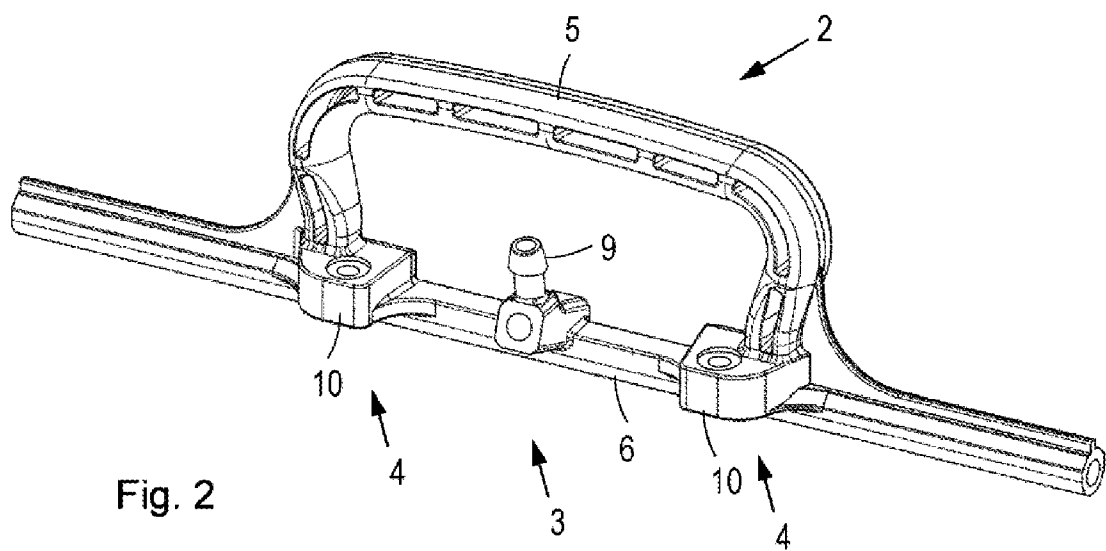
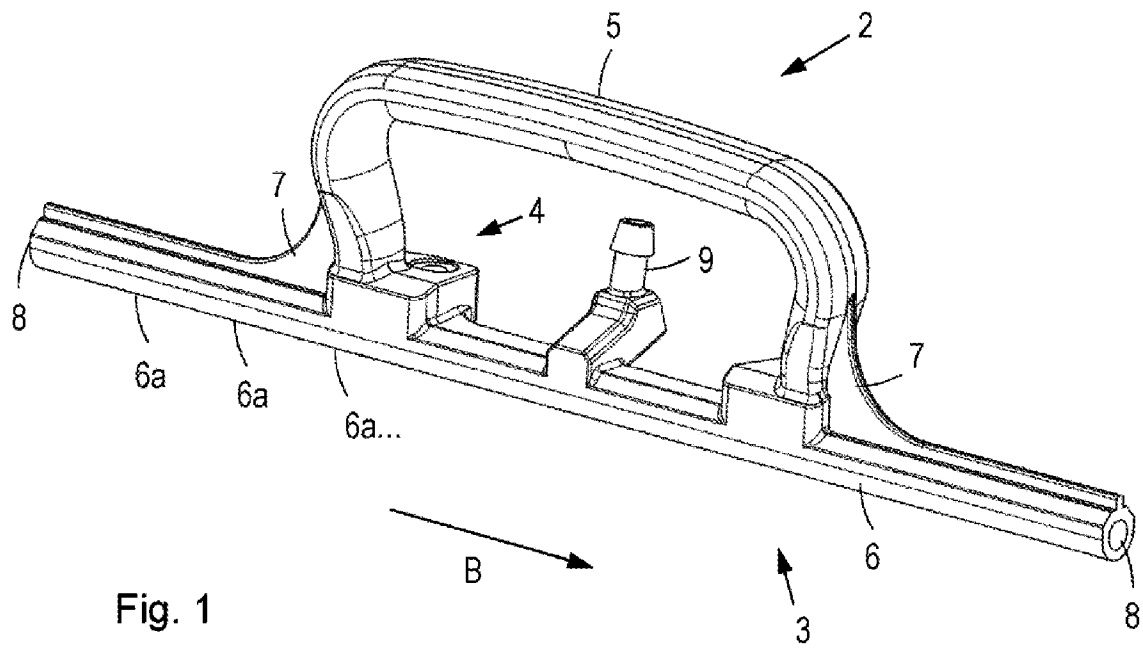
25 The ground contact plate 21 is raised to the front so that it ends approximately at the level of the sprinkling strip (distributor channel 6) or extends beyond it. The ground contact plate 21 has the perforations 28 or U-shaped recesses which correspond to the sprinkling openings 6a. The water leaves the distributor channel 6 through the sprinkling openings 6a and passes through the perforations 28 or
30 recesses. A portion of the water in this case drops directly onto the ground. However, much of the water is thrown against the ground contact plate 21 by the

vibrating motion of the ground contact plate 21 during operation of the machine and flows down it, directly into the gap between the ground contact plate 21 and the ground to be compacted.

PATENTKRAV

1. Bæreanordning (1) til en vibrationsplade til jordkomprimering, med
 - en grebsanordning (2) med et grebsområde, som en bruger kan gribe fat i med mindst én hånd; og med
- 5 - en fastgørelsesanordning (4) til fastgørelse af bæreanordningen (1) på vibrationspladen;
 - kendetegnet ved
 - en overrislingsanordning (3) til tilførsel af vand;
 - hvor
- 10 - grebsanordningen (2), overrislingsanordningen (3) og fastgørelsesanordningen (4) er udformet i ét stykke i en fælles komponent.
2. Bæreanordning (1) ifølge krav 1, hvor bæreanordningen (1) er fremstillet i ét stykke af plast.
3. Bæreanordning (1) ifølge et af de foregående krav, hvor
- 15 grebsanordningen (2) indbefatter et lukket håndtag (5).
4. Bæreanordning (1) ifølge et af de foregående krav, hvor overrislingsanordningen (3) er forsynet med mindst én overrislingsåbning (6a), via hvilken der kan udledes vand.
5. Bæreanordning (1) ifølge et af de foregående krav, hvor
- 20 overrislingsanordningen (3)
 - har en vandtilførselstilslutning (9) til tilslutning af en vandbeholdning (25) og tilførsel til af vand til overrislingsanordningen (3); og
 - en fordelerkanal (6), der er koblet til vandtilførselstilslutningen (9), til fordeling og tilførsel af vandet.
- 25 6. Bæreanordning (1) ifølge krav 4 og 5, hvor overrislingsåbningen (6a) er udformet på fordelerkanalen (6).

7. Bæreanordning (1) ifølge krav 6, hvor der er udformet flere overrislingsåbninger (6a) på fordelerkanalen (6).
8. Bæreanordning (1) ifølge et af kravene 5 til 7, hvor fordelerkanalen (6) strækker sig parallelt med en udstrækningsretning af grebsanordningen (2).
- 5 9. Bæreanordning (1) ifølge et af kravene 5 til 8, hvor fordelerkanalen (6) i det mindste delvist er udformet som et rør.
10. Bæreanordning (1) ifølge et af kravene 5 til 9, hvor fordelerkanalen (6) på i det mindste en af sine to endesider har en åbning (8).
11. Bæreanordning (1) ifølge et af kravene 5 til 10, hvor fordelerkanalen (6) i
10 det mindste indbefatter et område på endesiden, der kan forkortes ved afkortning.
12. Bæreanordning (1) ifølge et af de foregående krav, hvor fastgørelsesanordningen (4) har mindst to fastgørelsespunkter (10), ved hvilke der kan fremstilles en skrueforbindelse med vibrationspladen.
13. Vibrationsplade til jordkomprimering, med
- 15 - en overdel (15) med en vandtank (25);
- en underdel (16), som kan bevæges i forhold til overdelen (15), og som indeholder en jordkontaktplade (21); og med
- en bæreanordning (1) ifølge et af de foregående krav,
- hvor
- 20 - bæreanordningen (1) er fastgjort til jordkontaktpladen (21); og hvor
- vandtanken (25) er koblet til overrislingsanordningen (3) i bæreanordningen (1) på en sådan måde, at der kan strømme vand ud af vandtanken (25) og ind i overrislingsanordningen (3).



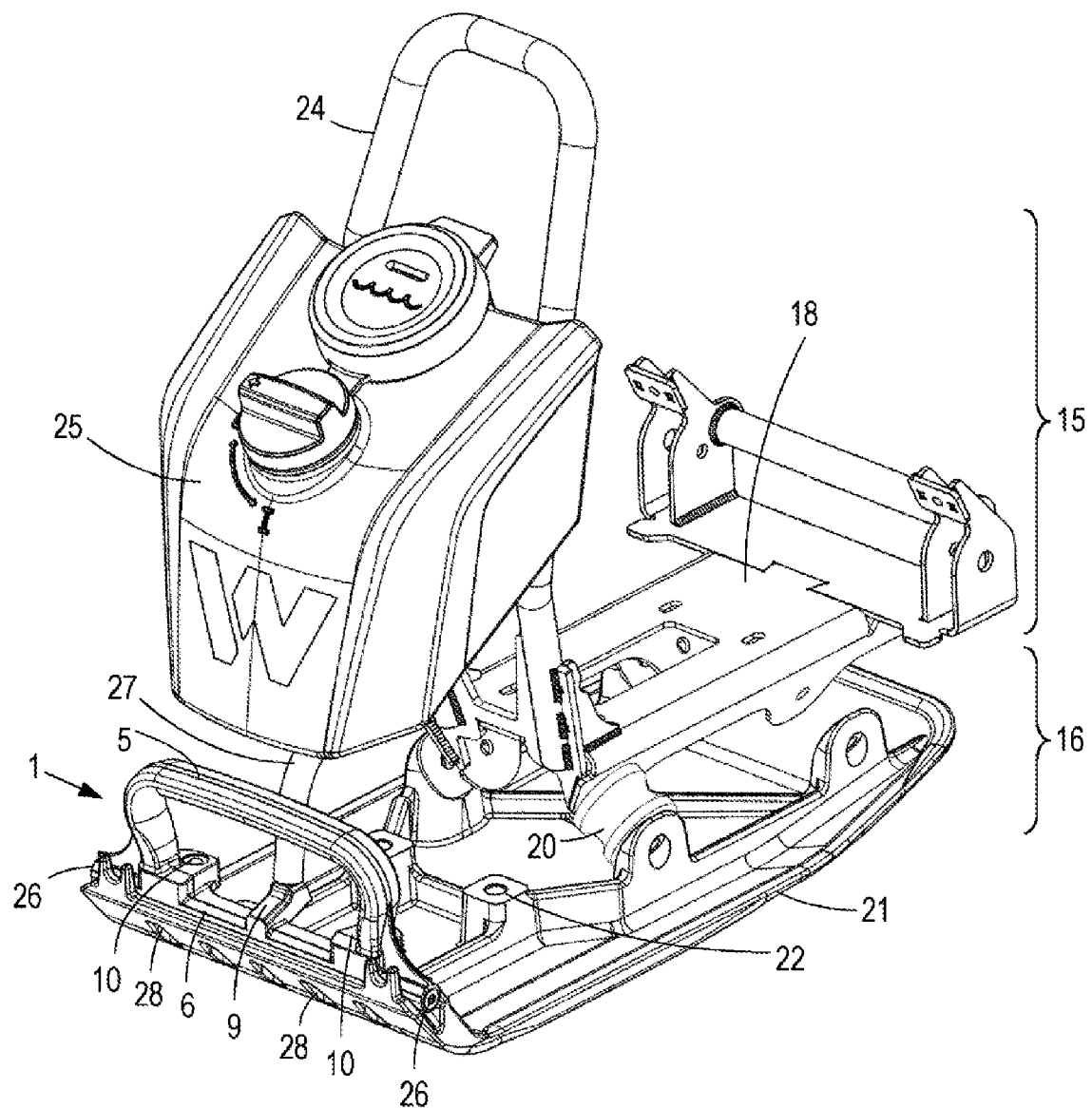


Fig. 3

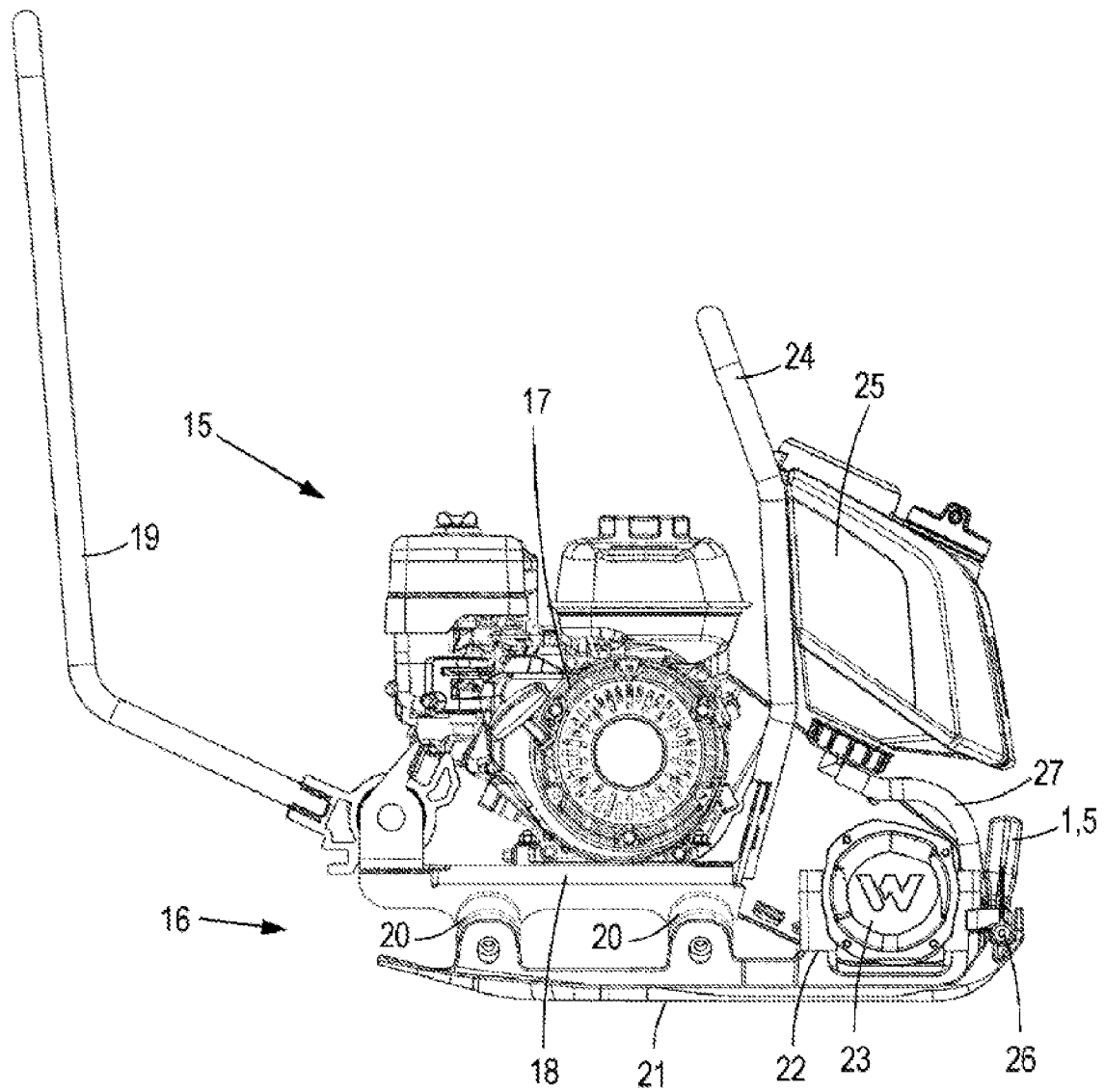


Fig. 4