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(54) Titre : BALAYEUSE
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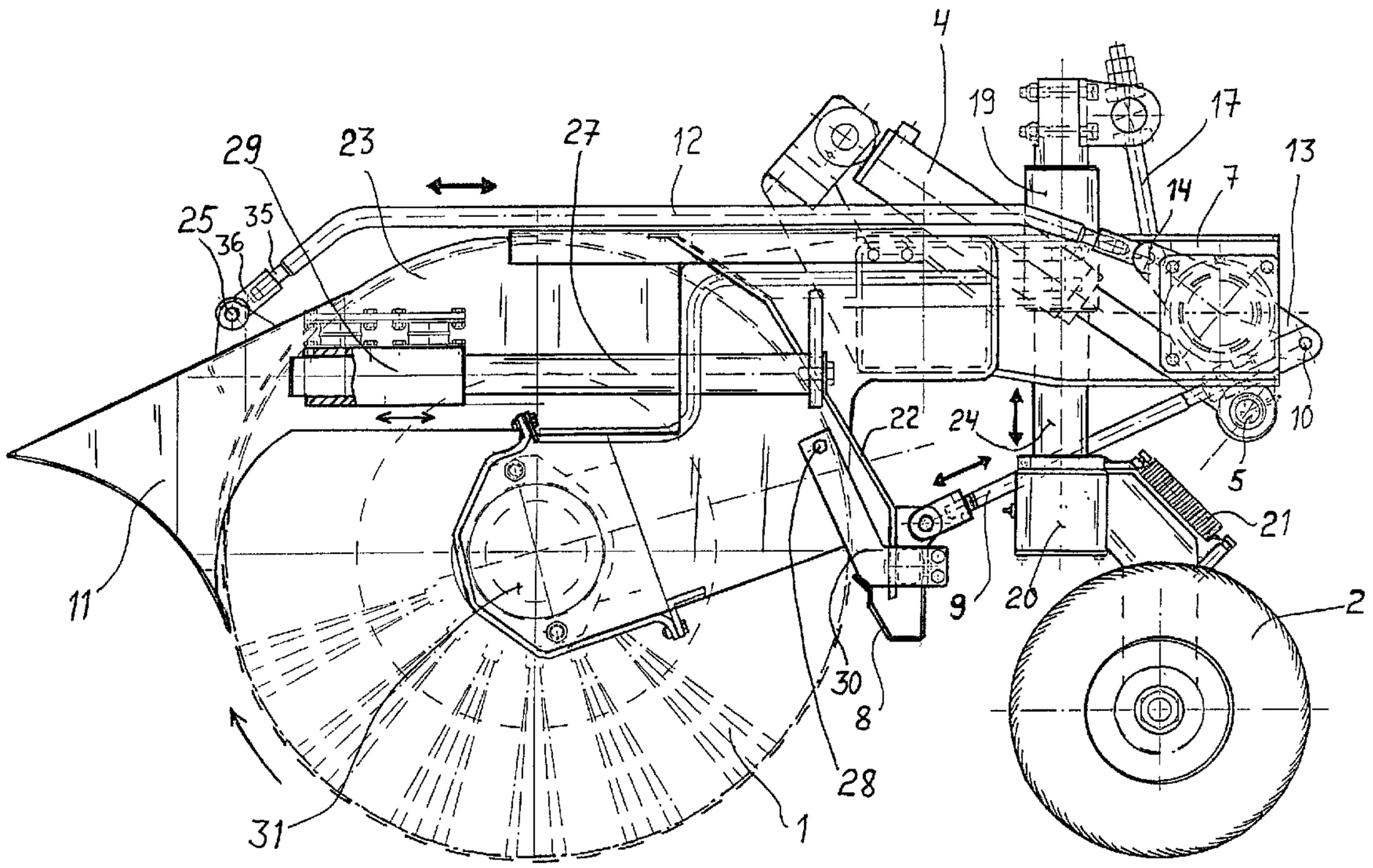


(57) Abrégé/Abstract:
A movable sweeper having a frame to which a rotatable cylindrical brush is coupled, a flap arrangement locating at least in front of said rotatable brush said flap leading brushed loose water and snow to the side, an adjustable support wheel for controlling the height of said sweeper and means for adjusting the distance between said flap arrangement and said brush. The sweeper comprising a rotatable axle, which has a plurality of fixing arms locating on the outer surface of said axle, a plurality of connection rods being fixed to said arms from their ends and said rods transmitting adjusting motion far the supporting wheel and the flap arrangement when the axle is rotated by means of an activator, like a hydraulic cylinder said activator being fixed to the frame from its one end and to the arm on said axle from its other end.

Abstract

A movable sweeper having a frame to which a rotatable cylindrical brush is coupled, a flap arrangement locating at least in front of said rotatable brush said flap leading brushed loose water and snow to the side, an adjustable support wheel for controlling the height of said sweeper and means for adjusting the distance between said flap arrangement and said brush. The sweeper comprising a rotatable axle, which has a plurality of fixing arms locating on the outer surface of said axle, a plurality of connection rods being fixed to said arms from their ends and said rods transmitting adjusting motion for the supporting wheel and the flap arrangement when the axle is rotated by means of an activator, like a hydraulic cylinder said activator being fixed to the frame from its one end and to the arm on said axle from its other end.

A SWEEPER

The invention relates to a movable sweeper for cleaning large flat areas as airport runways. The sweeper comprises a broad cylindrical brush which is rotated round its axle, a flap arrangement for leading loose water, snow and particles to the side and further supporting wheels by means of which the working heigth of the brush is adjusted.

The earlier known sweepers have separate adjusted support wheels and separate adjusted flap constructions in front of the rotatable brush and also some types have it moreover behind the brush. The heigth of the brush from the cleaned surface is adjusted and maintained by means of the support wheels. The position of said wheels in relation to the frame of the machine can be changed. By said heigth adjustment different contact areas can be achieved i.e. the contact length in the surface in the working direction of the brush can be adjusted larger or smaller.

The rotating brush in use easily transports light particles around it and maybe back to the cleaned surface. In order to prevent this drift the flap arrangement in front of the brush is used to lead loose material out of the brush. Also similar construction behind the brush is used. When the brush wears the separate brush wires becomes shorter and thus the brush diameter becomes smaller. It follows that the support wheels have to be lifted in relation to the frame and the flap arrangements have to be moved nearer the brush. The sweepers of earlier known types have inconvenient adjustments separately for support wheels and flaps. The new invention is eliminating this disadvantage and for the invention is characteristic what is claimed in the enclosed claims.

By means of this invention all adjustments can be carried out at same time using only one activator which preferable is hydraulic cylinder. The support wheels is lifted i.e. the brush is lowered and the flap arrangements are moved towards the brush simultaneously. The adjustment is easy and fast to use.

In the following the invention is explained by referring the enclosed drawings, wherein:

FIG. 1 is a side view of a sweeper.

FIG. 2a is a side view of an adjusting axle having arms for a plurality of connection rods fixed said arms.

FIG. 2b is a side view of an adjusting axle having arms.

FIG. 3 is a top view of the brush machine.

FIG. 4 is a side view of a brush with an alternative flap construction.

DESCRIPTION OF THE INVENTION

In the figure 1 there is shown a sweeper having a frame 7, a rotatable brush 1 mounted with a bearing system on said frame construction, a hydraulic motor 31 to rotate said brush and a support wheel 2 fixed to said frame. The support wheel can be lifted and lowered in relation to the frame 7. A sleeve 19 is fixed to the frame 7 and the vertical axle 24 of the support wheel can move inside said sleeve vertically. In the lower end of said vertical axle there locates bearing 20 allowing the wheel 2 to turn. Spring 21 is keeping the wheel in the wanted direction.

The frame 7 comprises a horizontal directed axle 3 the outer surface of which axle has an arm 18. The connection rod 17 from the support wheel heigth adjustment system is lead to the arm 18 and fixed thereto with a joint 16. By rotation of the axle 3 the support wheel 2 can be lifted and lowered.

The axle 3 rotation is arranged by means of an activator, like a hydraulic cylinder 4, the upper end of said cylinder is fixed to said frame 7 and the lower end is fixed with a joint 5 to an arm 6. The arm 6 is also fixed on the axle 3. In front of the brush there is a flap arrangement 11 which can be moved horizontally forward and backwards. The frame 7 has guiding means, rails or similar gliding bars 27 on which means the flap 11 can be moved. A gliding sleeve 29 is mounted on the bar 27 and fixed to the flap 11. The motion for the flap 11 is transmitted by a rod 12 from the arm 15 said arm being fixed to the outer surface of the axle 3. Between arm

15 and rod 12 there is a joint 14. By turning of the axle 3 the flap arrangement 11 is moved towards the brush centre and likely away from said centre. The flap arrangement comprises the front flap 11 and a shield 23 extending to the brush top and moreover partly extending to the side area of the brush top.

Behind the brush 1 there is a flap arrangement which can collect loose particles and water, comprising a channel 8 and a shield 22. The shield 22 extends to the top of the brush. The flap arrangement 8,22 can be moved towards the brush axle by means of articulated arm 30, articulated with a joint 28 to the frame side sheet. The motion for the flap 8,22 is transmitted by a rod 9 from the arm 13 to which arm the rod 9 is fixed by a joint 10. The arm 13 is fixed to the outer surface of the axle 3.

As an alternative embodiment the rear flap arrangement 8,22 can also be fixed on the gliding bar 27 through another sleeve 29 instead of arm 30 and joint 28 wherein the linear motion can also be obtained for the rear flap.

When the adjusting axle 3 is rotated by the cylinder 4 and arm 6 each arm 13,15,18 (Fig. 2a) are turning simultaneously. By the elected lengths of said arms the motion distances of the wheel and the flaps can be adjusted. The preferred solution is that by the elected arm lengths the motion distances of the flaps 11, 8 towards the brush centre become the same what is the adjusted distance upwards of the support wheel 2. The motion distances of the flaps 11, 8 are depending on the adjusted motion in the vertical direction of the wheel 2. It is moreover advantageous that the lengths of each connection rods 9,12 and 17 can also be adjusted for example by equipping at least one end of each connection rod with thread 35 and on said thread screwed threaded coupling sleeve 36 (Fig. 1).

In the Fig. 2a there are shown only the rotatable adjusting axle 3, arms 6,13,15 and 18 thereon and by joints 5,10,14 and 16 to said arms connected connection rods 9,12,17 and cylinder 4. In the figure 2b the connection rods are removed.

In Fig. 3 there is shown as a top view the whole sweeper. The adjusting axle 3 comprises bearings on its both ends and said axle has rotatable coupled to the frame 7 by means of said bearings. The sweeper can be constructed very broad, for example 4 - 6 meters. It is therefore advantageous to use two or more parallel mounted rods for flaps and two activators 4 as presented in Fig. 3.

In Figure 4 there is a flap construction system comprising hinged front flap 11 which is moved by means of the rod 12. The hinge point 32 is on the flap top and said flap 11 is turned by means of the rod 12. In order to secure reliable operation the system may comprise, as presented, auxiliary articulated arms 33 and 34. The flap 11 can also be turned up for facilitating the removing of the brush.

As an activator 4 also a screw system producing linear motion can be used. Also such an embodiment is moreover possible that the activator 4 is first connected to move for example the vertical axle 24 of the wheel 2 while adjusting the brush height. The rod 17 is rotating in this case the axle 3. Also the activator 4 can be connected first to move one of the flap arrangements wherein the rod 9 or 12 is mounted to turn the axle 3.

I claim:

1. A movable sweeper having a frame 7 to which a rotatable cylindrical brush 1 is coupled, a flap arrangement 11 locating at least in front of said rotatable brush said flap leading brushed loose water, snow and particles to the side, an adjustable support wheel 2 for adjusting the working heigth of said sweeper and means for adjusting the distance between said flap arrangement and said brush, wherein the sweeper comprising:
a rotatable axle 3, which has a plurality of fixing arms 6,13, 15,18 locating on the outer surface of said axle, a plurality of connection rods 9,12,17 being fixed to said arms from their ends wherein said rods transmitting adjusting motion for the support wheel and the flap arrangement when the axle 3 is rotated by means of an activator, like a hydraulic cylinder 4, said activator being fixed to the frame 7 from its one end and the other end of said activator being connected to turn the axle 3 by means of arm 6 or by means of one of the rods 9,12,17 and corresponding arms 13,15,18.

2. A sweeper according to claim 1 wherein an adjustable flap arrangement is moreover located behind the brush.

3. A sweeper according to claim 1 wherein the lengths of the arms for connecting rods are elected so that the flaps 11,8 are moving towards the brush axle and the motion distances of said flaps are depending on the adjusted motion distance transmitted in the vertical direction for the support wheel.

4. A sweeper according to claim 1 wherein the flaps 11,8 are moved towards the brush when the supporting wheel is lifted up by means of the activator, like hydraulic cylinder.

5. A sweeper according to claim 1 wherein at least two parallel connection rods are coupled from the arms of the adjusting axle to each flap arrangement.

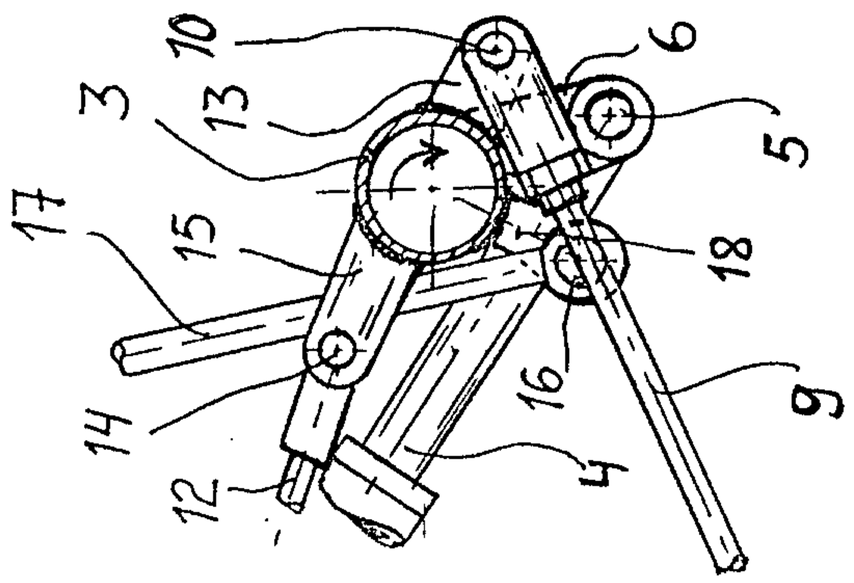


Fig.2a

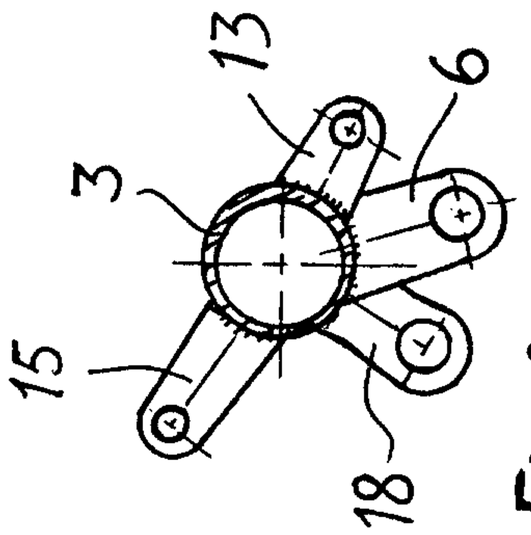


Fig.2b

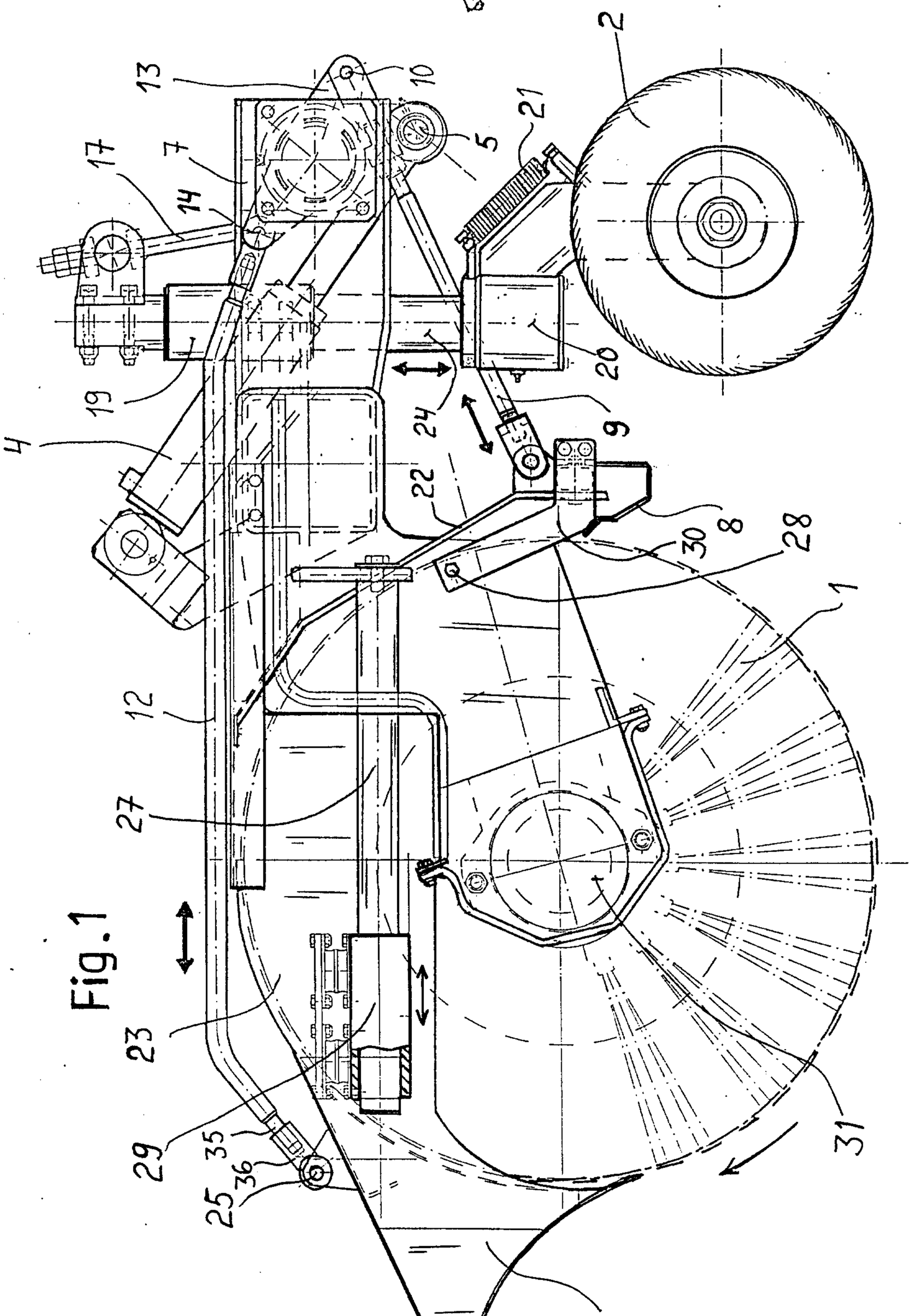


Fig.1

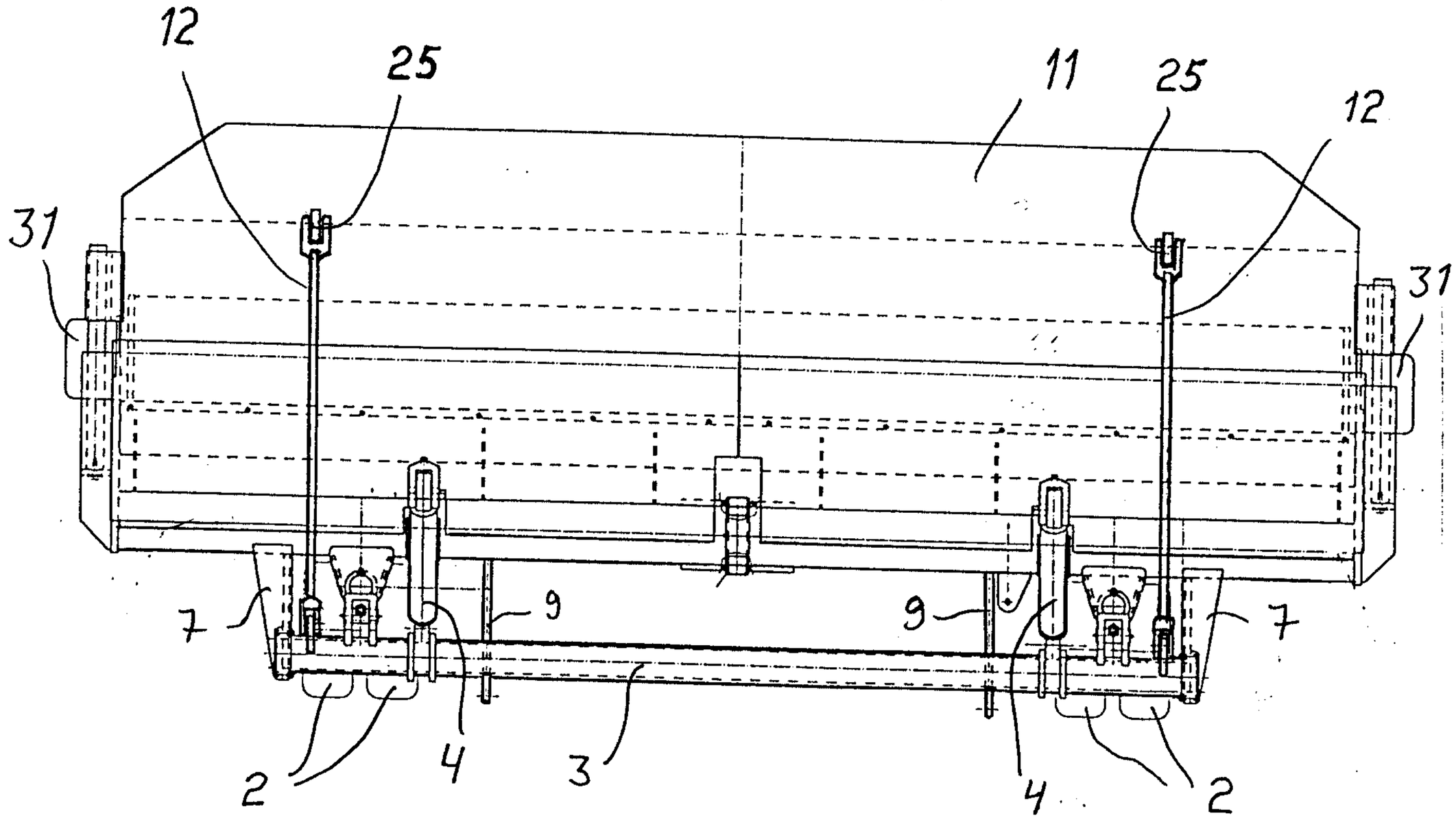


Fig. 3

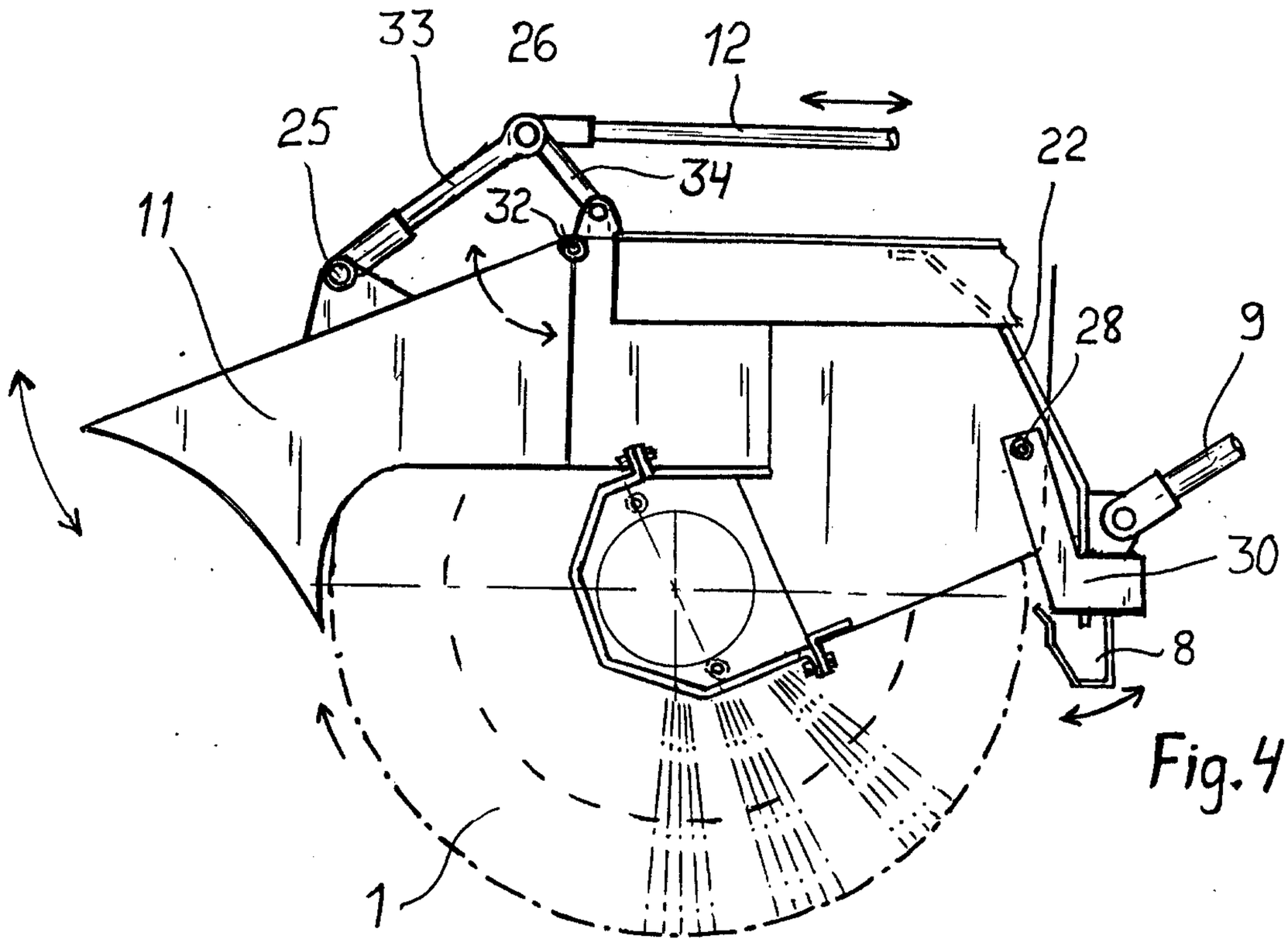
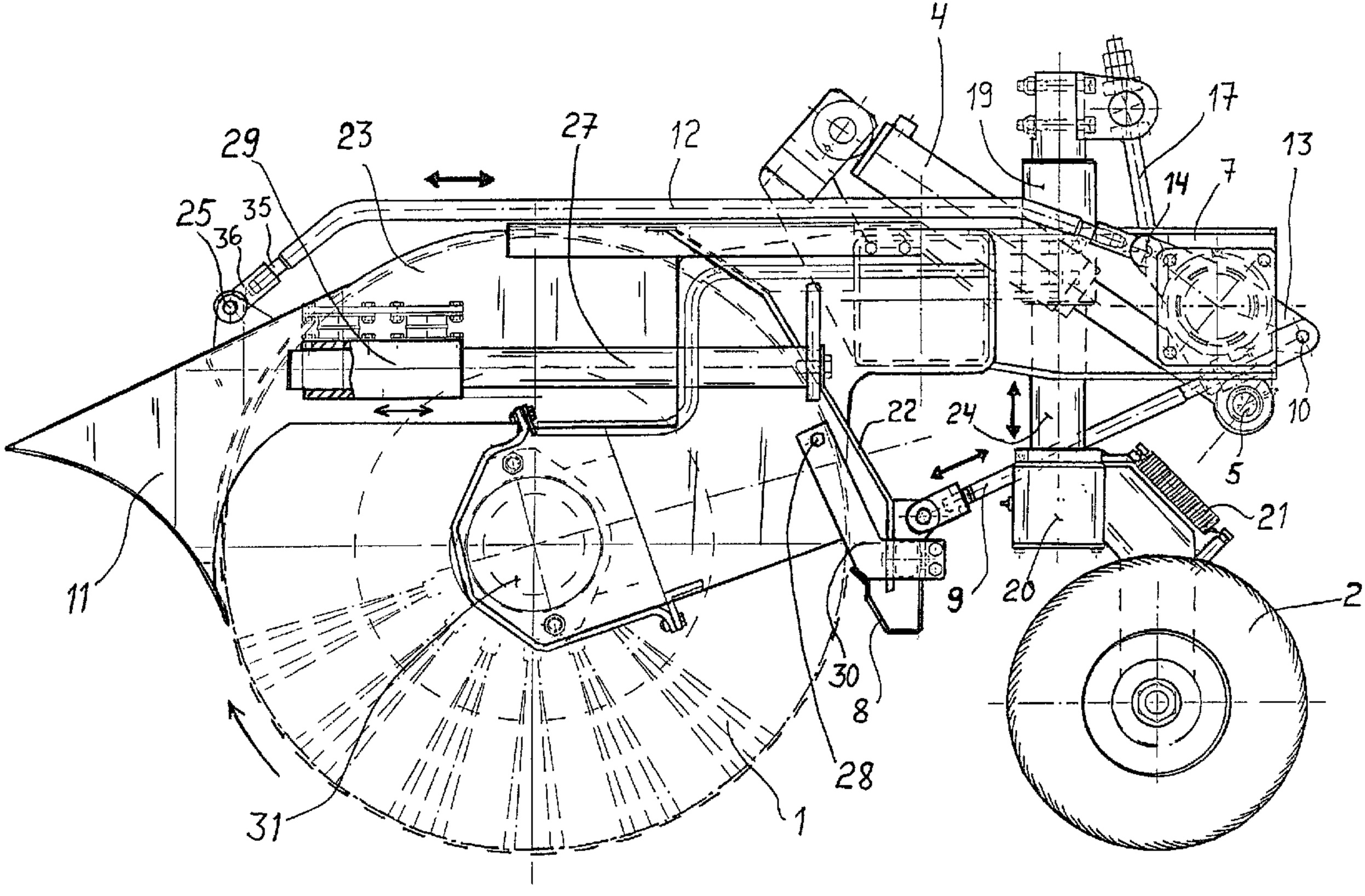


Fig. 4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