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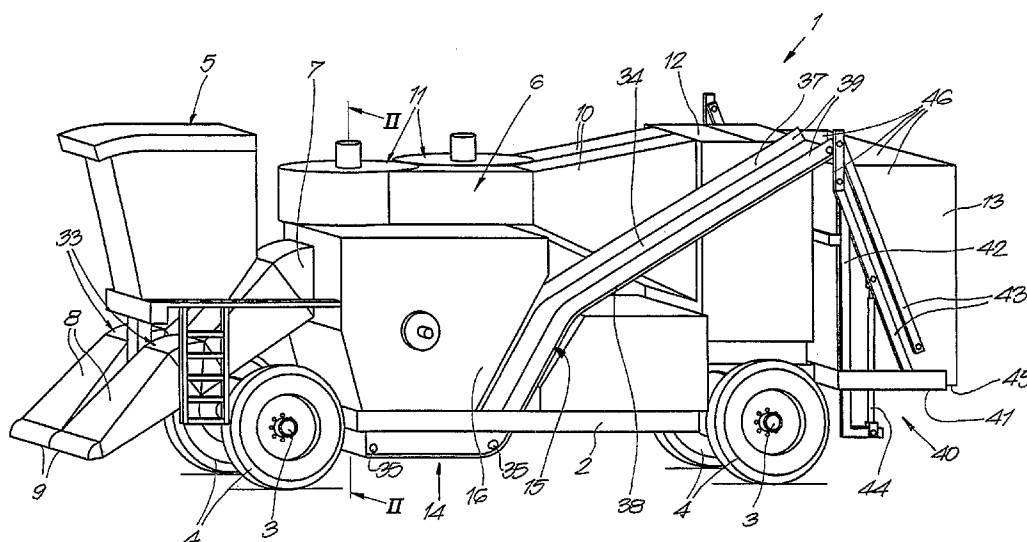
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(54) Title: DEVICE FOR CLEANING STREETS, SQUARES, FIELDS AND THE LIKE.



(57) Abstract: Device for cleaning streets, squares, fields or the like which mainly consists of a mobile frame (2) onto which is provided at least a suction device (6) which consists of a housing (16), whereby the space inside the housing (16) is divided in two compartments by means of a partition, a first compartment (22) in which an inlet (7) for waste opens and a second compartment (23) onto which a drain (10) for air is connected, whereby the partition is at least partly made of a net (25), and whereby means for cleaning the net (25) are provided in the above-mentioned first compartment (22).

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Device for cleaning streets, squares, fields and the like.

The present invention concerns a device for cleaning streets, squares, fields and the like, in particular a  
5 vehicle on which is provided a suction device.

A device for cleaning streets and the like is already known which is provided with a suction device which consists of a housing in which is provided a chamber with an inlet and an outlet. The above-mentioned chamber is  
10 divided in two compartments by means of a fine-meshed net, whereby the inlet opens in a first compartment of the chamber and the outlet is connected to the second compartment of the chamber.

In the outlet of this suction device is provided a fan  
15 which makes it possible to create an underpressure in the chamber, whereas the inlet is provided with a non-return valve which can be only opened towards the inside of the chamber.

When operational, the above-mentioned fan is driven, such  
20 that an underpressure is created in the chamber and as a result of which the non-return valve opens, such that waste from the street or the like is sucked into the chamber via the inlet.

As the cross section of the chamber is larger than the  
25 cross section of the inlet, the air flow through the

chamber will be less powerful than the one through the inlet, such that relatively heavy waste is removed from the air flow by means of the force of gravity. Light waste is retained in the chamber thanks to the above-  
5 mentioned net, through which the air flow streams to the outlet and leaves the chamber.

A disadvantage of such a known device is that the above-mentioned net in the suction device is clogged up relatively quickly, especially when a lot of paper or  
10 plastic packings and the like are sucked in.

In order to make the device operational again in that case, the waste has to be manually removed from the net, and the waste which has been removed from the net has to be taken out of the chamber, in order to prevent  
15 it from being sucked out of the chamber against the net again.

Another disadvantage of the known device is that the air leaves the suction device untreated, whereby particles  
20 of dust are inevitably ejected, which is not only unpleasant among others for the operator of the device, but which is also environmentally harmful.

The aim of the present invention is to remedy one or several of the above-mentioned and other disadvantages.

25

To this end, the invention concerns a device for cleaning streets, squares, fields or the like which mainly consists of a mobile frame on which is provided at

least a suction device which consists of a housing with an inlet for waste and a drain in which are provided means for sucking in air, whereby a partition is provided in the housing which divides the space in the housing in two compartments, namely a first compartment in which the inlet opens and a second compartment onto which the drain is connected and whereby the partition is at least partly made of a net, characterised in that in the above-mentioned first compartment are provided means for cleaning the net.

An advantage of a device according to the invention is that it can efficiently suck up waste, such as paper and plastic packings, without its operation being disturbed as the waste obstructs the air flow which is required to suck up the waste.

According to a preferred embodiment, means are provided in the first compartment which divide the first compartment in two sections, namely a first section in which the above-mentioned inlet opens and which is partly confined by the above-mentioned net, and a second section which is confined by a plate, such that this second section is closed off from the first section and from the second compartment in the suction device.

An advantage of this preferred embodiment is that the waste, after it has been sucked up from the air flow, is removed and stored in the section which is confined by the plate, where it cannot be sucked in against the above-mentioned net again, such that the suction force of

the device stays guaranteed and such that a device according to the invention allows for an efficient cleaning.

Preferably, in the above-mentioned outlet, upstream of  
5 the above-mentioned means, is provided an air washer to suck in air from the chamber.

Such an air washer makes it possible to remove dust particles, which are sucked in while cleaning, from the  
10 air flow before ejecting the sucked-in air, such that relatively pure air is ejected.

In order to better explain the characteristics of the invention, the following preferred embodiments of a  
15 device according to the invention for cleaning streets, squares, fields and the like, is given as an example only without being limitative in any way, with reference to the accompanying drawings, in which:

figure 1 schematically represents a device according  
20 to the invention;

figure 2 represents a section according to line II-II in figure 1 to a larger scale;  
figures 3 to 5 represent a section according to line III-III, line IV-IV and line V-V in figure 2  
25 respectively;  
figure 6 represents the same view as in figure 1, but with the device in another position.

Figure 1 schematically represents a device 1 according to the invention which mainly consists of a frame 2 which is suspended in a mobile manner between two shafts 3 on which are provided wheels 4.

5 On the frame 2 is in this case provided a control cabin 5 from where the device 1 can be controlled. Such a control cabin 5 is generally known in the field of for example agricultural vehicles and it is not further explained here.

10

Further, a suction device 6 is provided on the frame 2 with an inlet 7 onto which are connected two chutes 8 in this case which are provided with a suction mouth 9 on their free ends.

15

Onto the suction device 6 is connected a drain duct 10 for air, in which are provided two fans 11 in this case and in which a gas washer 12, in particular an air washer, is preferably provided.

20

Naturally, on the frame 2 is also provided a container 13 for waste which is situated under an outlet 14 of the suction device 6 or, as is represented in figure 1, which is situated at a far end of transport means 15  
25 which extend under the outlet 14 of the suction device 6.

The suction device 6 which is represented in greater detail in figures 2 to 5 mainly consists of a housing 16 which is in this case funnel-shaped.

In the housing 16 are in this case provided four openings 17, 18, 19 and 20. Onto two of these openings 17 and 18, the above-mentioned drain duct 10 for air is connected, whereas the above-mentioned ducts 8 of the inlet 7 of the suction device 6 are commonly connected to a third opening 19.

In the housing 16 is provided a partition 21 which divides the space in the housing 16 in two compartments 22 and 23.

10 The partition 21 in this case consists of a hollow cylindrical element whose shell is partly made of a plate 24 and partly of a net 25.

As is represented in figure 5, a passage 26 is provided in the section of the cylindrical element 21, which is confined by the net 25, whereby a chute 27 is connected to the circumferential edge of said passage 26 which chute is connected with its free end to the circumferential wall of the inlet opening 19 of the suction device 6.

20

In the section of the cylindrical element 21 which is confined by the plate 24 is provided a hole 28. On the circumferential edge of said hole is provided a standing collar 29 which is connected to the circumferential wall of the opening 20 which forms the outlet 14 of the housing 16.

Finally, in the cylindrical element 21 is provided a

rotating blade wheel 30, whereby the blades 31 of this wheel 30 are lengthened with a strip 32 made of rubber or the like which extends up to the shell of the cylindrical element 21.

- 5 It should be noted that the blade wheel 30 is not represented in figure 5 for clarity's sake.

Further, it should be noted that the blade wheel 30 is designed such that there is no direct connection at any  
10 time between the above-mentioned hole in the cylindrical element 21 and the section of this element 21 which is confined by the net 25.

The chutes 8 on the inlet 7 of the suction device 6 are preferably of a hinged part 33 which makes it possible to  
15 move the suction mouths 9 vertically between an operating position in which the suction mouths 9 are situated practically against the ground and an inactive position in which the suction mouths 9 are pulled up.

20 The above-mentioned gas washer 12 may be based on numerous existing principles and in the first place, it is preferably designed to remove dust from an air flow. An example of such a gas washer 12 comprises a number of water atomizers which are directed against the stream  
25 direction of the air, whereby downstream of these atomizers is provided what is called a drip tray in the shape of, for example, a fine-meshed net.

Since such a drip tray 12 is generally known, it will not

be further described in detail.

Finally, the above-mentioned transport means 15 in this case consist of a conveyor belt 34 which is guided round rotatable rollers 35 and which is provided with standing  
5 ribs 36.

The conveyor belt 34 is preferably provided with a guide 37 which consists of a base plate 38 onto which is provided a standing edge 39 on either side.

10 As is represented in figure 5, the above-mentioned container 13 is provided on a supporting structure 40 which is provided with means which make it possible to empty the container 13.

15 The supporting structure to this end consists of a base 41 onto which are fixed two standing supports 42.

On the free ends of these standing supports 42 are each time fixed two rotatable rods 43, which rods 43 are fixed  
20 in a rotating manner to the lower side of the container 13 with their free ends, such that a parallelogram is formed.

Finally, between the standing supports and one of the above-mentioned rods 43 is provided a piston 44 to drive  
25 the above-mentioned means for emptying the container 13.

The container 13 itself is preferably provided with a bottom 45 which is hinge-mounted to the walls 46 of the

container 13.

The working of the device according to the invention is simple and as follows.

5 In order to clean a street, square, field or the like after a happening, such as for example a festival or a market, the device is put in an operational position whereby the suction mouths 9 are placed right above the ground, and the above-mentioned fans 11, the blade  
10 wheel 30, the gas washer 12 and the conveyor belt 34 are being driven.

Next, the device 1 is driven to and fro across the street, field or the like to be cleaned. As the fans 11 are being driven, air is sucked in and an underpressure  
15 is created inside the suction device, as a result of which air and waste are sucked in through the suction mouths 9.

The sucked-in air and the waste thus end up in the  
20 cylindrical element 21, via the chutes 8, whereby the air is sucked in through the net 25 in the drain duct 10 for air and is subsequently carried off through the gas washer 12 to the environment.

Dust which may possibly be present in the air flow and  
25 which is smaller than the meshes of the net 25 is removed from the air flow in the gas washer 12 as it is absorbed in the atomized water which is carried off via a drip tray to a reservoir designed to that end.

Larger waste is checked by the net 25 of the cylindrical element 21, whereby relatively heavy elements 15 end up between the blades 31 of the wheel 30 under the influence of the force of gravity, whereas  
5 lighter waste, such as paper and plastic packing material, sticks against the net 25.

As the blade wheel 30 rotates, the light waste is scraped off the net by the above-mentioned rubber strips 32, whereby this waste is moved until it is  
10 situated in the section of the cylindrical element 21 which is confined by the plate 24 and where there is no underpressure.

In this section, the sucked-in waste leaves the cylindrical element 21 via the outlet 14, after which it  
15 drops on the conveyor belt 34.

By means of the conveyor belt 34, the waste is finally moved up to above the container 13, after which it drops in this container.

20 In order to empty the container 13, one only has to activate the above-mentioned piston 44, as a result of which the rods 43 of the supporting structure 40 are turned away from the standing supports 42, as is represented in 5, so that the container 13 is lifted from  
25 the base 41 of the supporting structure 40 and as a result of which the bottom 45 of the container 13 opens.

It is clear that the type of fan 11 which is applied

depends on the use of the device, as well as the length L of the suction mouths 9 which, when the device 1 is used to clean up festival fields, preferably amounts to three meters or more.

- 5 Finally, it should be noted that the device according to the invention may be a vehicle, as in the above-described embodiment, but that it may also be realised as a trailer.

10 The present invention is by no means limited to the above-described embodiment represented in the figures; on the contrary, such a device according to the invention can be realised according to many variants while still remaining within the scope of the invention.

Claims.

1.- Device for cleaning streets, squares, fields or the like which mainly consists of a mobile frame (2), onto  
5 which is provided at least a suction device (6) which consists of a housing (16) with an inlet (7) for waste and a drain (10) for air, in which means are provided for sucking in said air, whereby a partition is provided in the housing (16) which divides the space inside the  
10 housing (16) in two compartments, a first compartment (22) in which the inlet opens and a second compartment (23) onto which the above-mentioned drain (10) for air is connected, and whereby the partition is at least partly made of a net (25), characterised in that in the above-  
15 mentioned first compartment (22) are provided means for cleaning the net (25).

2.- Device according to claim 1, characterised in that in the first compartment (22) of the suction device (6) are provided means which divide the first compartment  
20 (22) in two sections, namely a first section in which the above-mentioned inlet (7) opens and which is partially confined by the above-mentioned net (25) and a second section which is confined by a plate (24), such that this second section is closed off from the  
25 first section and from the second compartment (32) in the suction device (6).

3.- Device according to claims 1 or 2, characterised in that the above-mentioned partition consists of a hollow cylindrical element (21) whose shell is partly made of a plate (24) and partly of a net (25), whereby in the  
5 section of this element which is confined by the net (25) is provided a passage (26) which is connected to the above-mentioned inlet (7) for waste.

4.- Device according to claim 3, characterised in that in the cylindrical element (21) is provided a blade wheel  
10 (30) with blades (31) which make it possible to clean the net.

5.- Device according to claim 4, characterised in that each of the above-mentioned blades (31) are provided with a rubber strip (32) on their free ends which  
15 extends up to the shell of the cylindrical element (21).

6.- Device according to claim 5, characterised in that in the section of the cylindrical element (21), which is confined by the plate (24), is provided a hole (28) which is connected to an outlet (14) for waste and in  
20 that the above-mentioned blades (31) constantly screen off this hole (28) in relation to the section of the cylindrical element (21) which is confined by the net (25).

7.- Device according to claim 5, characterised in that  
25 under the above-mentioned outlet (14) are provided transport means (15) for moving waste to a container (13).

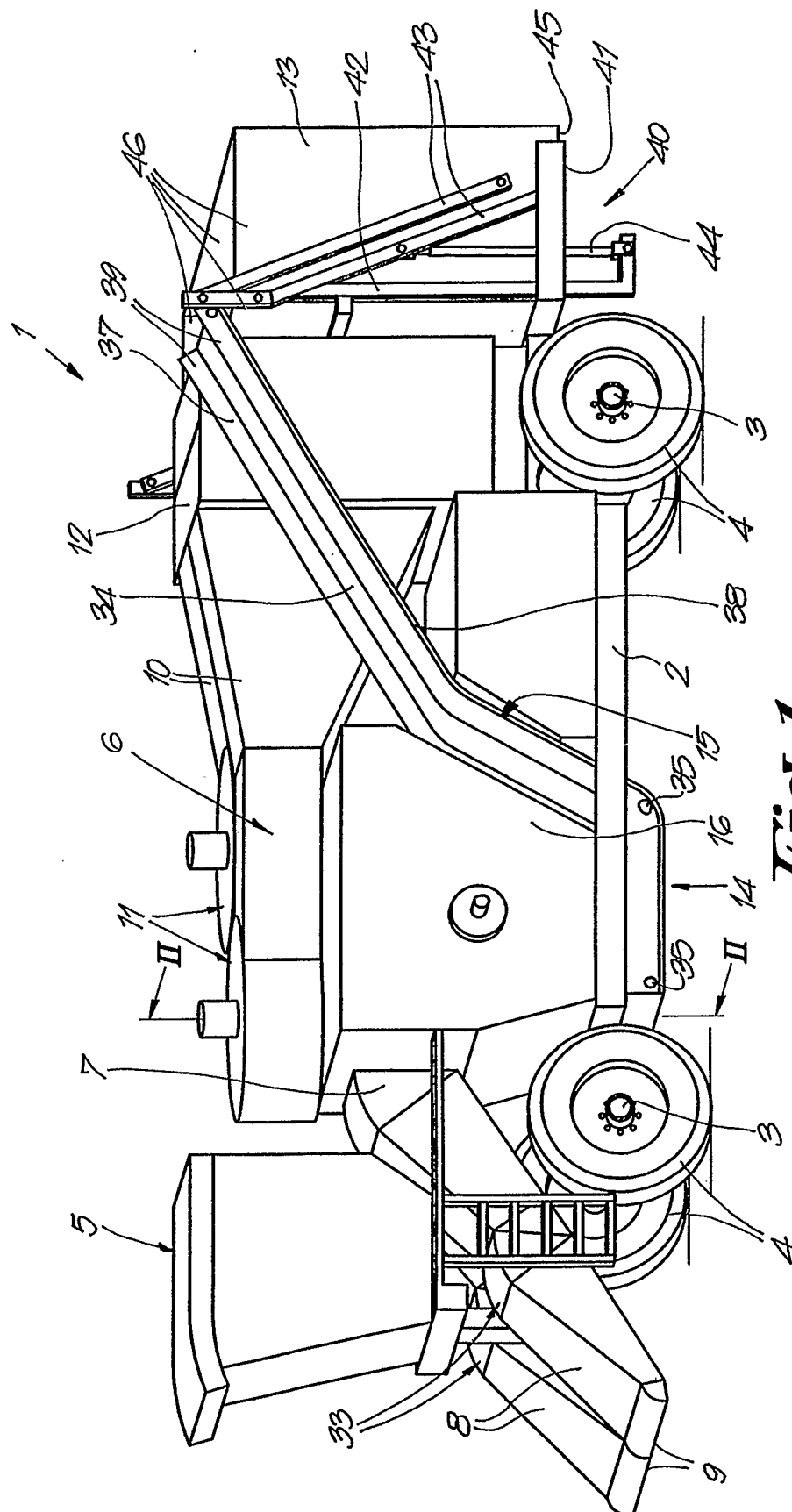
8.- Device according to claim 7, characterised in that the transport means (15) consist of a conveyor belt (34).

9.- Device according to claim 7, characterised in that the container (13) is provided on a supporting structure  
5 (40) which is provided with means (42, 43, 44) which make it possible to empty the container (13).

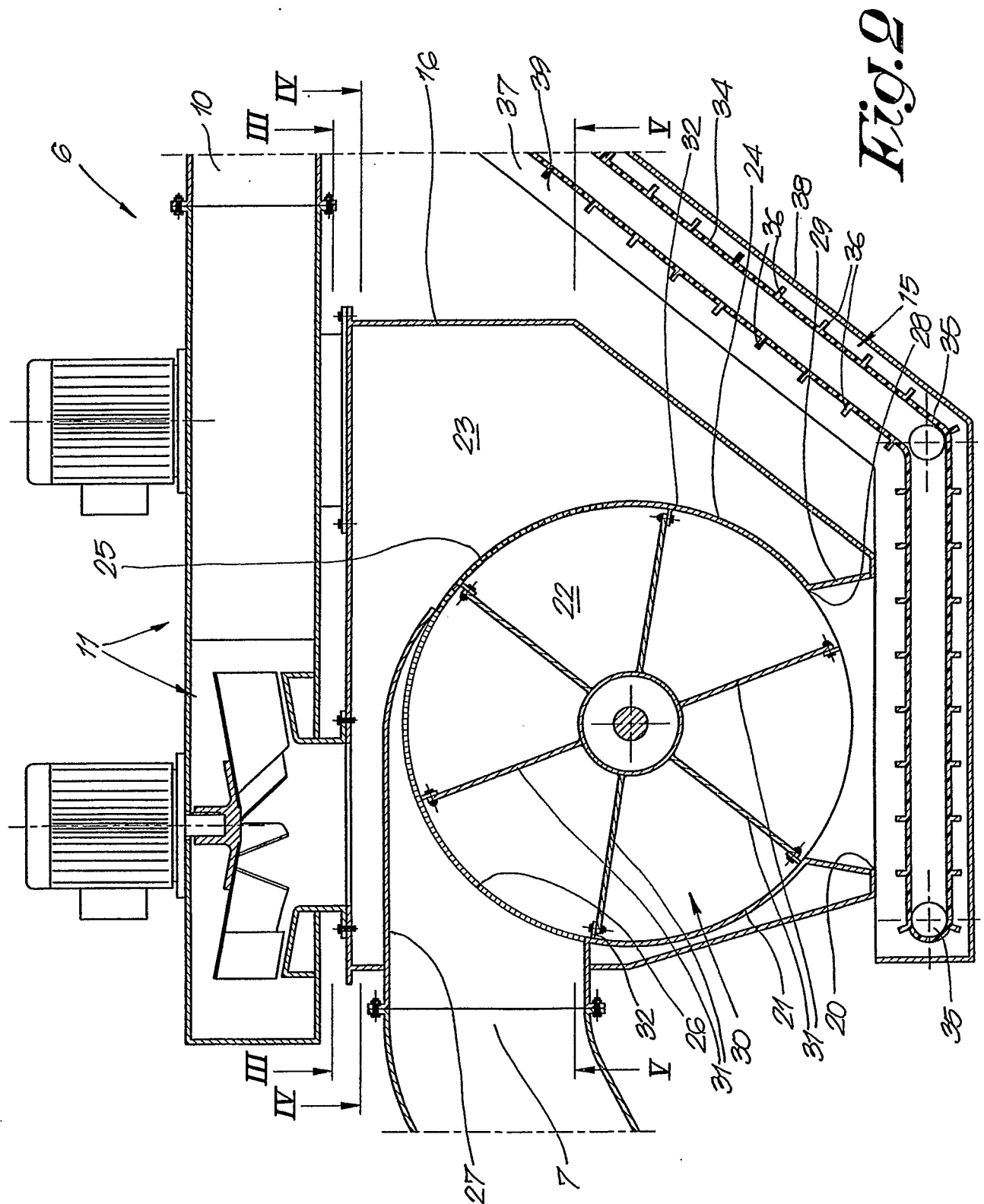
10.- Device according to any one of the preceding claims, characterised in that the above-mentioned drain  
10 (10) for air consists of a drain duct in which is provided a gas washer (12).

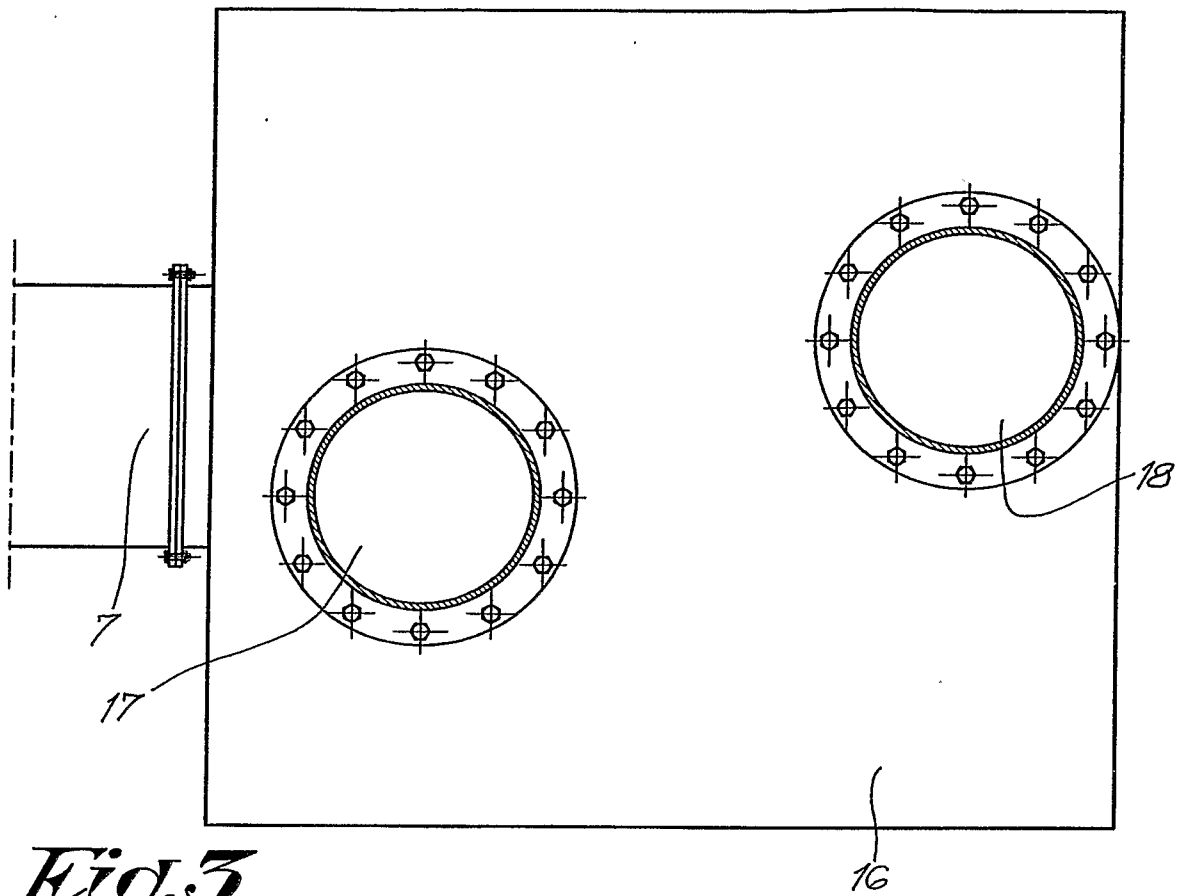
11.- Device according to any one of the preceding claims, characterised in that it is a vehicle.

12.- Device according to any one of claims 1 to 10, characterised in that it is made as a trailer.

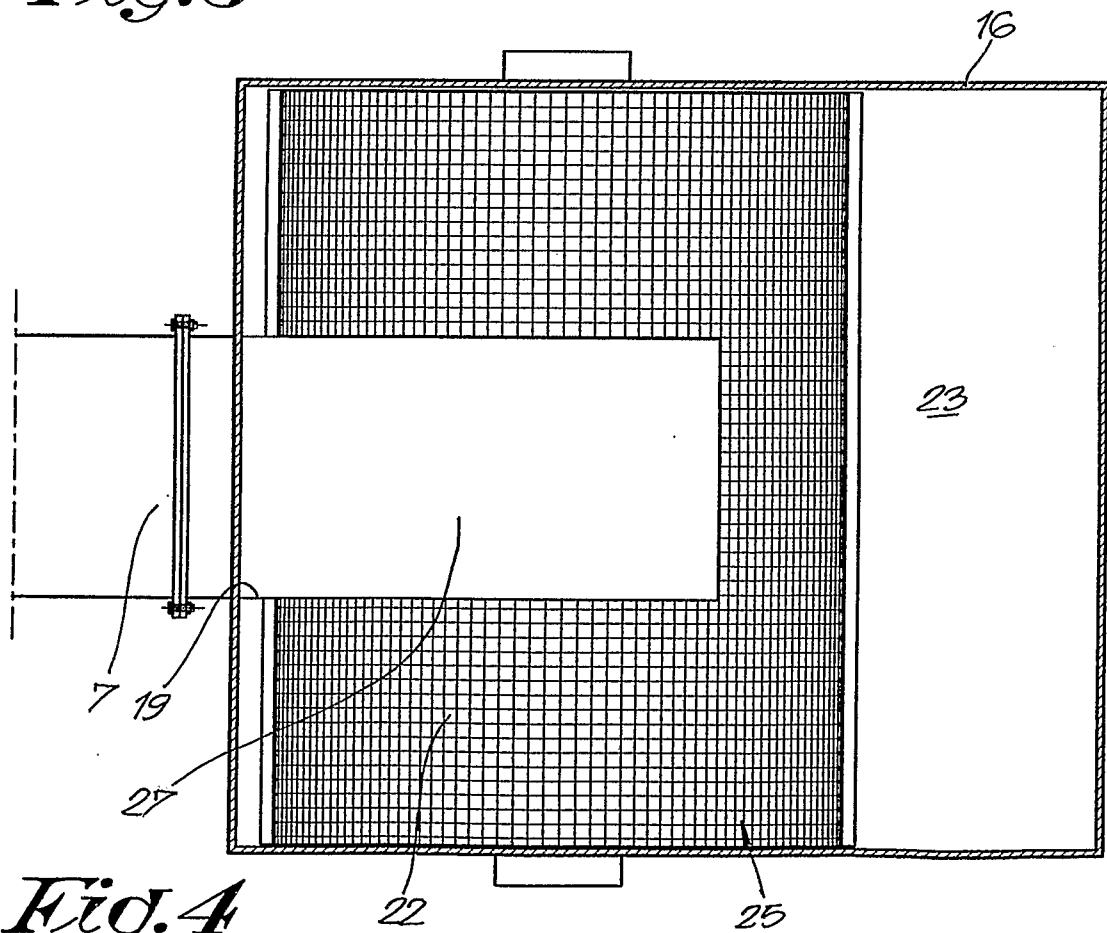


**Fig. 1**

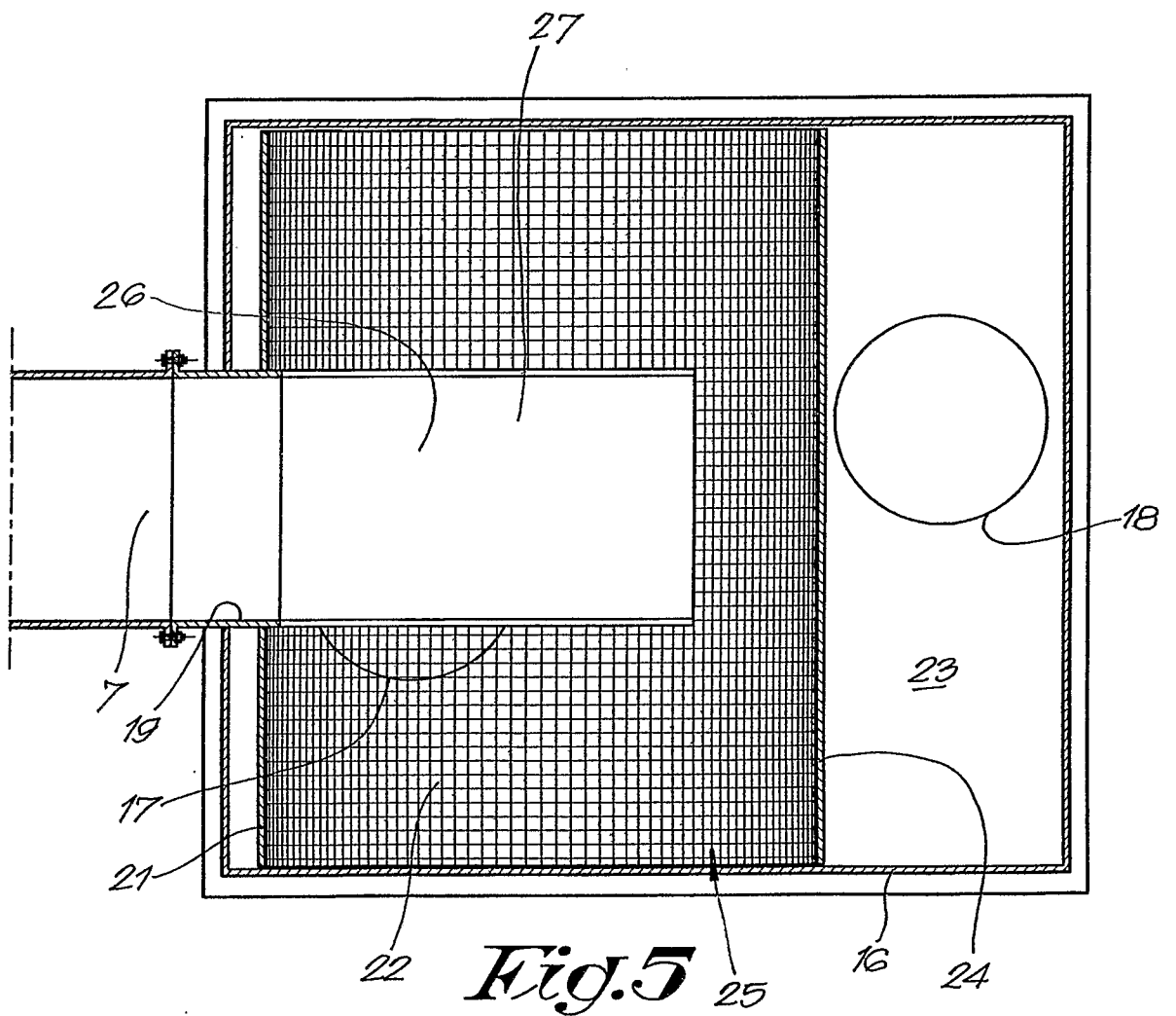




*Fig. 3*



*Fig. 4*



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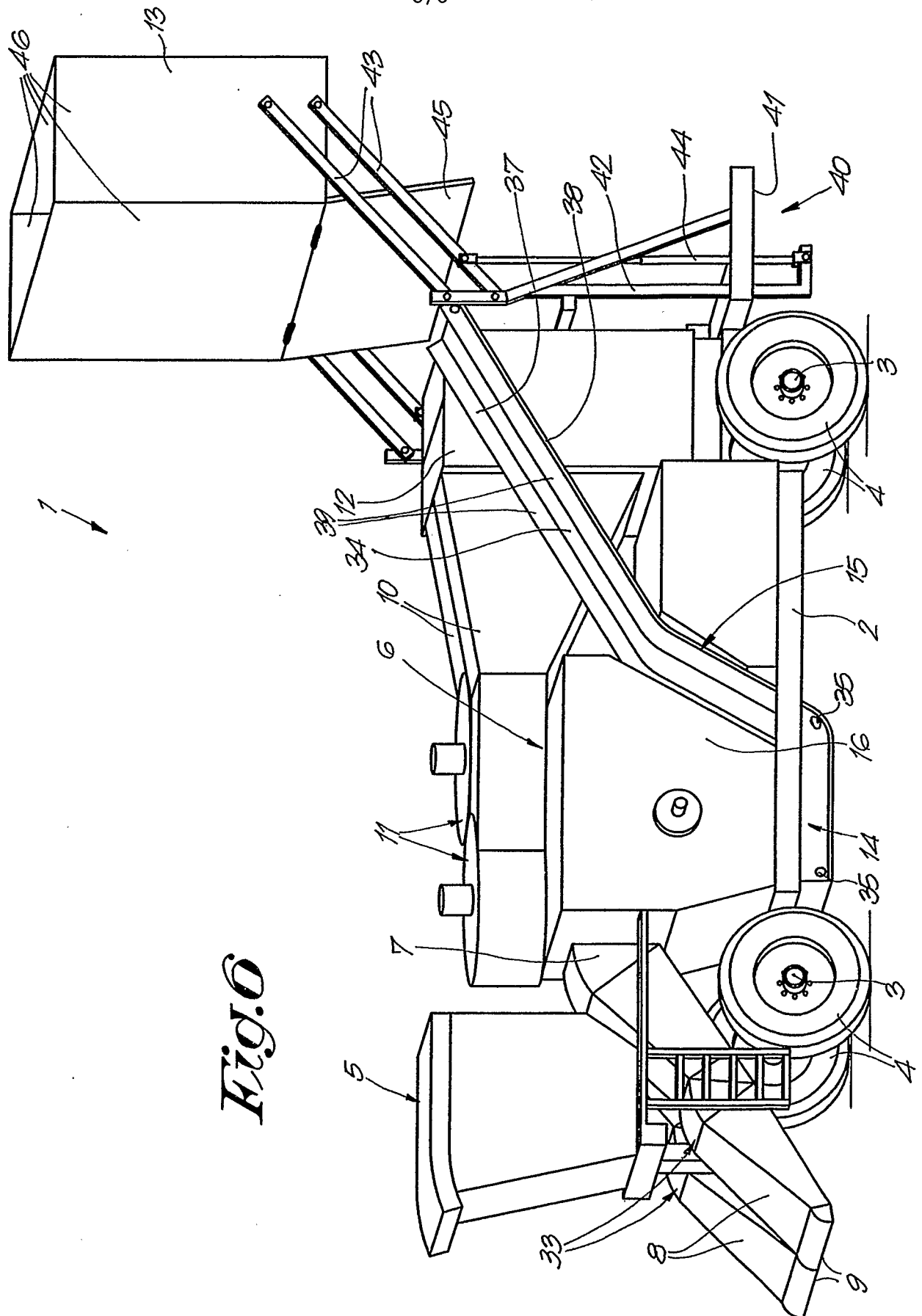


Fig. 0