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(54) Sweeping aiding device for sweepers

(57) A sweeping aiding device for sweepers comprises a servo-controlled articulated arm associated with the sweeper and comprising blower means provided for air supplying a blowing lance to be gripped by an operator of the sweeper.

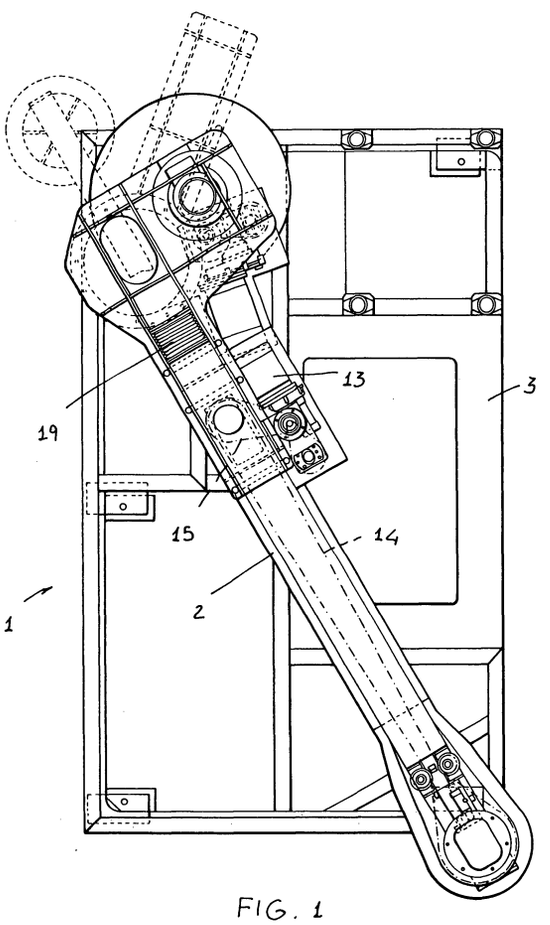

FIG. 1

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a sweeping aiding device, to be applied, in particular, to sweepers in general.

[0002] As is known, sweepers are used in urban street cleaning applications, and conventionally comprise power driven brushes, designed for sweeping the road surface and collect waste therefrom.

[0003] Prior sweepers operate in an optimum manner under particular conditions, i.e. as the street is free and devoid of obstacles.

[0004] However, as obstacles are present, such as parked car and the like, the cleaning brushes cannot arrive at the street border adjoining the sidewalk, where the main portion of dirt is collected, included that coming from the sidewalk.

[0005] In order to overcome the above mentioned drawback, a ground walking'operator can, within given limits, to collect dirt and wastes by using a brush or the like, to make the collected waste accessible for the sweeper brushes.

[0006] However, such an operation is very fatiguing and, moreover, it is not possible to remove dirt and debris arranged, for example, under the parked cars.

SUMMARY OF THE INVENTION

[0007] Accordingly, the aim of the present invention is to provide such a sweeping aiding device, adapted to solve the above disclosed problems.

[0008] Within the scope of the above mentioned aim, a main object of the present invention is to provide such a sweeping aiding device allowing a walking operator to easily and quickly collect dirt and waste to send it to the sweeper brushes.

[0009] Yet another object of the present invention is to provide such a sweeping aiding device, which does not require any physical effort by the operator and can also be used for a comparatively long time period.

[0010] Yet another object of the present invention is to provide such a sweeping aiding device which can be automatically displaced, so as to follow the movement of the sweeping operator, who must simply grip the lance.

[0011] Yet another object of the present invention is to provide such a sweeping aiding device which can be easily servo-controlled.

[0012] Yet another object of the present invention is to provide such a sweeping aiding device comprising a plurality of operating arms, to which the blowing lance is applied, and controlled by a plurality of servomotors in turn controlled by rotary displacement sensors, which are driven by the movement of the operator.

[0013] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a sweeping aiding device, specifically designed for sweepers, characterized in that said sweeping aiding device comprises a servo-controlled articulated arm, to be associated to a sweeper and comprising blowing means, designed for air supplying an air blowing lance gripped by an operator.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of the device according to the invention, which is illustrated, by way of an indicative, but not limitative, example in the accompanying drawings, where:

Figure 1 is a partially cross-sectioned top plan view of the sweeping aiding device according to the present invention, shown in a rest or inoperative condition thereof;

Figure 2 is a schematic side elevation view of the sweeping aiding device according to the present invention, shown in an extended condition thereof;

Figure 3 is a further top plan view of the subject sweeping aiding device, shown in a partially extended condition thereof;

Figure 4 is a front elevation view of the sweeping guiding device according to the invention, applied to a sweeper, and during the use thereof; and

Figure 5 is a further top plan view showing the operation or use of the sweeping aiding device according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] With reference to the number references of the above mentioned figures, the sweeping aiding device according to the present invention, which has been generally indicated by the reference number 1, comprises a first arm 2 pivoted, at a first end portion thereof, to the cab 3 of a sweeper 4 and bearing, at its second end portion, a second arm 5.

[0016] The free end of the second arm 5 bears a support 6 for a vertically extending duct 7, to the end of which a blowing lance, which can be operated by a ground walking operator 9, is coupled.

[0017] The first arm 2 is pivoted to the cab 3 by a fifth wheel 10, said first arm 12 being rotatively controlled by a servomotor 11.

[0018] The second arm 5 is pivoted to the first arm 2 through a rotary support element 12 and is rotatively driven by a second servomotor 13 through a belt transmission system 14 and 15.

[0019] The blowing lance 8 receives the air flow from blowing means, comprising a blowing fan 16, driven by

a motor 17, and adapted to convey air through a first duct 18 extending inside the first arm 2, through a flexible fitting 19.

[0020] The first air duct 18 is coupled to a second air duct 20, extending inside the second arm 5, through a passage inside the rotary support 12.

[0021] The second air duct 20 is, in turn, coupled to the vertical duct 7 and, accordingly, to the air blowing lance 8.

[0022] Said air blowing lance 8 comprises a push-button panel 21, which can be used by the operator 9 to control the air flow and a fluid jet, typically water.

[0023] The movement of the device and, accordingly, the rotation of the arms 2 and 5 and vertically extending duct are servo-controlled, thereby the operator 9 must merely guide the air blowing lance 8, without any effort for entraining it.

[0024] To that end, the rotary supporting element 6 comprises rotation sensors 22, adapted to detect a rotary movement of the vertically extending duct 7, applied by the operator 9, in handling the lance 8, and controlling the operation of the servomotors 11 and 13.

[0025] The first arm 2 can rotate through 240° from its home or rest position, shown in figure 1, to its maximum rotation position, in use, being shown by dashed lines in figure 5.

[0026] The second arm 5, in turn, can perform a rotary movement through 340°, thereby allowing the operator to use the air blowing lance 8 at virtually any desired operating point.

[0027] The use of the sweeping aiding device, according to the invention, is schematically shown in figures 4 and 5.

[0028] As shown in the drawings, the articulated arms are so designed and arranged as to easily pass on possible obstacles present on the road border, typically parked cars 23, so as to make the blowing lance 8 easily available for the operator 9, to push away dirt and waste by causing them to pass under the parked car to be engaged by the sweeper brushes.

[0029] Since the device is of a servo-controlled type, the operator must merely orient the air blowing lance 8 to the desired direction, whereas the servomotors perform the work necessary for driving the arms.

[0030] It has been found that the invention fully achieves the intended aim and objects.

[0031] In fact, the invention provides a sweeping aiding device which, as applied to a sweeper, allow to a ground walking operator to push waste and debris toward the sweeper bushes, without any effort and in a very easy manner.

[0032] In practicing the invention, the used materials, as well as the contingent size, can be any, depending on requirements and the status of the art.

Claims

1. A sweeping aiding device, specifically designed for application to sweepers, **characterized in that** said device comprises a servo-controlled articulated arm to be coupled to a sweeper and comprising air blowing means for air supplying an air blowing lance to be gripped by an operator.

2. A device according to Claim 1, **characterized in that** said device further comprises a first arm pivoted, at one end portion thereof, to the sweeper cab and bearing, at the second end portion thereof, a second arm; said second arm having a free end portion including a rotary supporting element for supporting a vertically extending duct, said vertically extending duct having a duct end to which said air blowing lance is coupled.

3. A device according to Claim 2, **characterized in that** said first arm is coupled to said sweeper cab by a fifth wheel assembly, the rotary movement of said first arm being controlled by a first servomotor.

4. A device according to one or more of the preceding claims, **characterized in that** said second arm is pivoted to said first arm through a rotary supporting element, said second arm being rotatively driven by a second servomotor through a belt transmission system.

5. A device according to one or more of the preceding claims, **characterized in that** said air blowing lance is supplied by an air flow by air blowing means comprising a motor driven fan for conveying air through a first duct extending inside said first arm through a flexible fitting.

6. A device according to one or more of the preceding claims, **characterized in that** said first air duct is coupled to a second air duct extending inside said second arm through a passage arranged inside said rotary supporting element.

7. A device according to one or more of the preceding claims, **characterized in that** said second air duct is coupled to said vertically extending duct and hence to said air blowing lance.

8. A device according to one or more of the preceding claims, **characterized in that** said air blowing lance comprises a push-button panel which can be used by the operator in order to control the air flow and a fluid jet.

9. A device according to one or more of the preceding claims, **characterized in that** said device and said rotary arms and vertically extending duct are driven

by a servo-system, the rotary supporting element of said vertically extending duct comprising rotation sensors adapted to detect a rotary movement of said vertically extending duct, applied by the operator in handling the air blowing lance, and being adapted to drive or control the operation of said arm driving servomotors.

10. A device according to one or more of the preceding claims, **characterized in that** said first arm can perform a rotary movement through 280° and said second arm can perform a rotary movement through 340°.

11. A device according to one or more of the preceding claims, **characterized in that** said device comprises one or more of the disclosed and/or illustrated features.

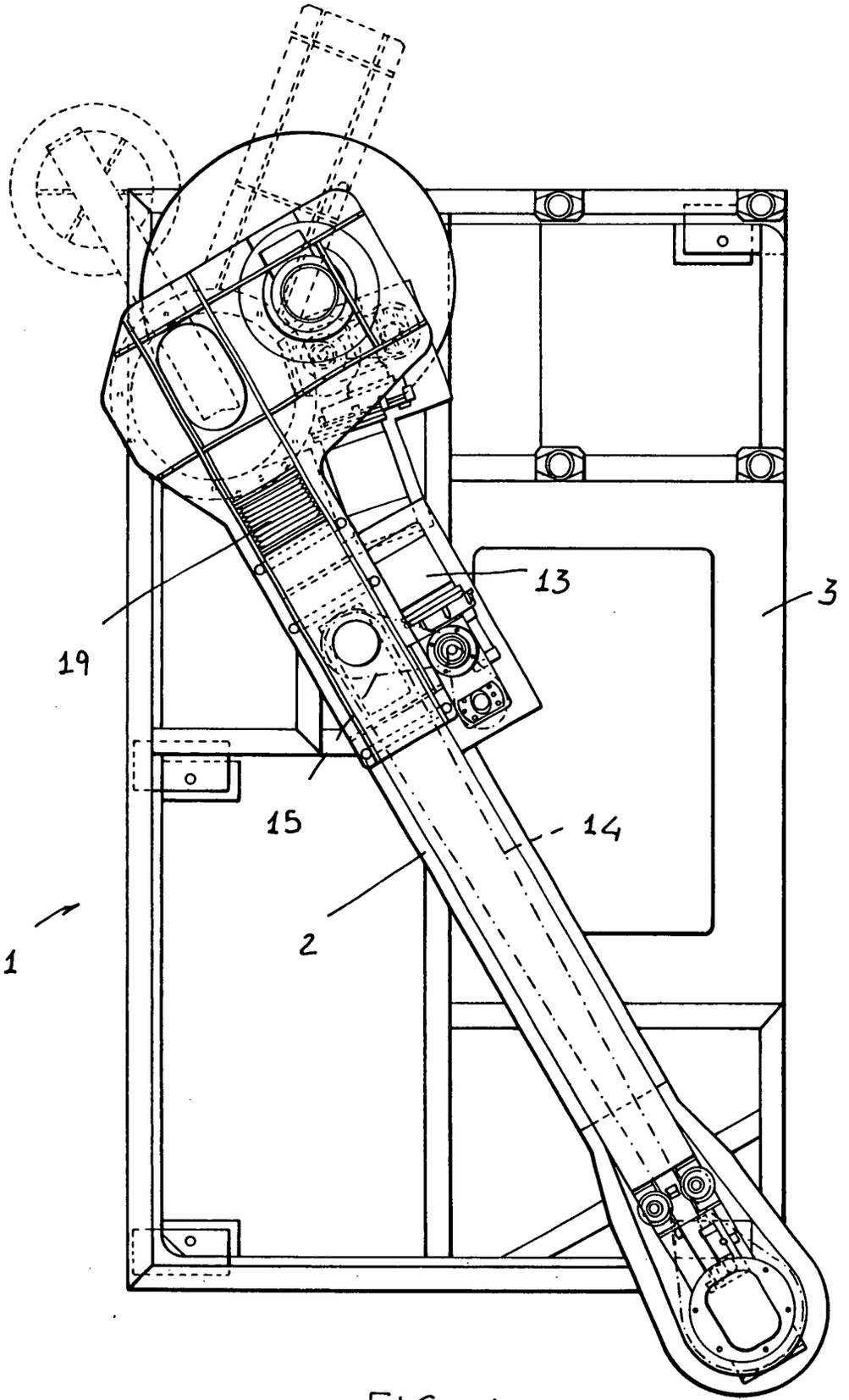

FIG. 1

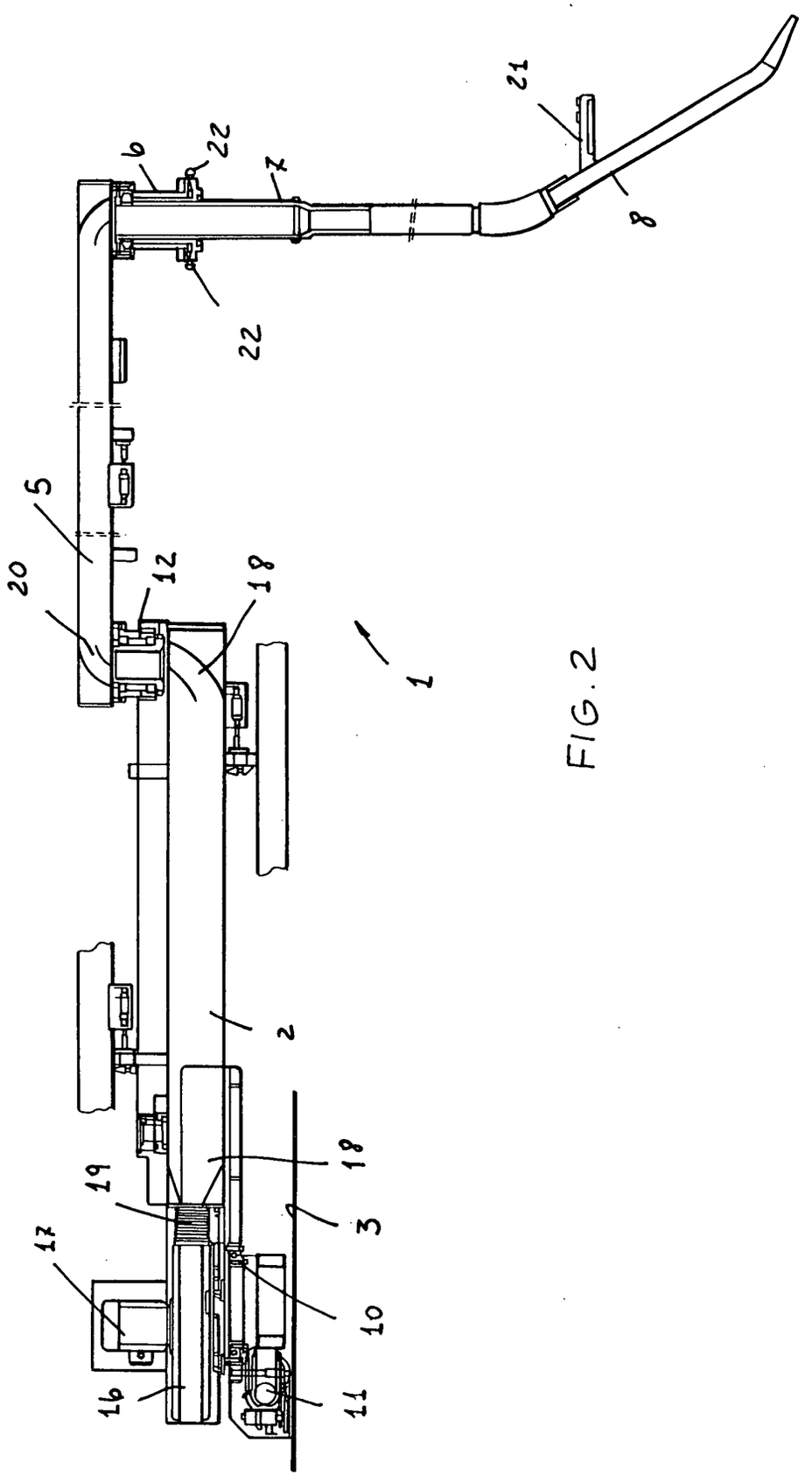

FIG. 2

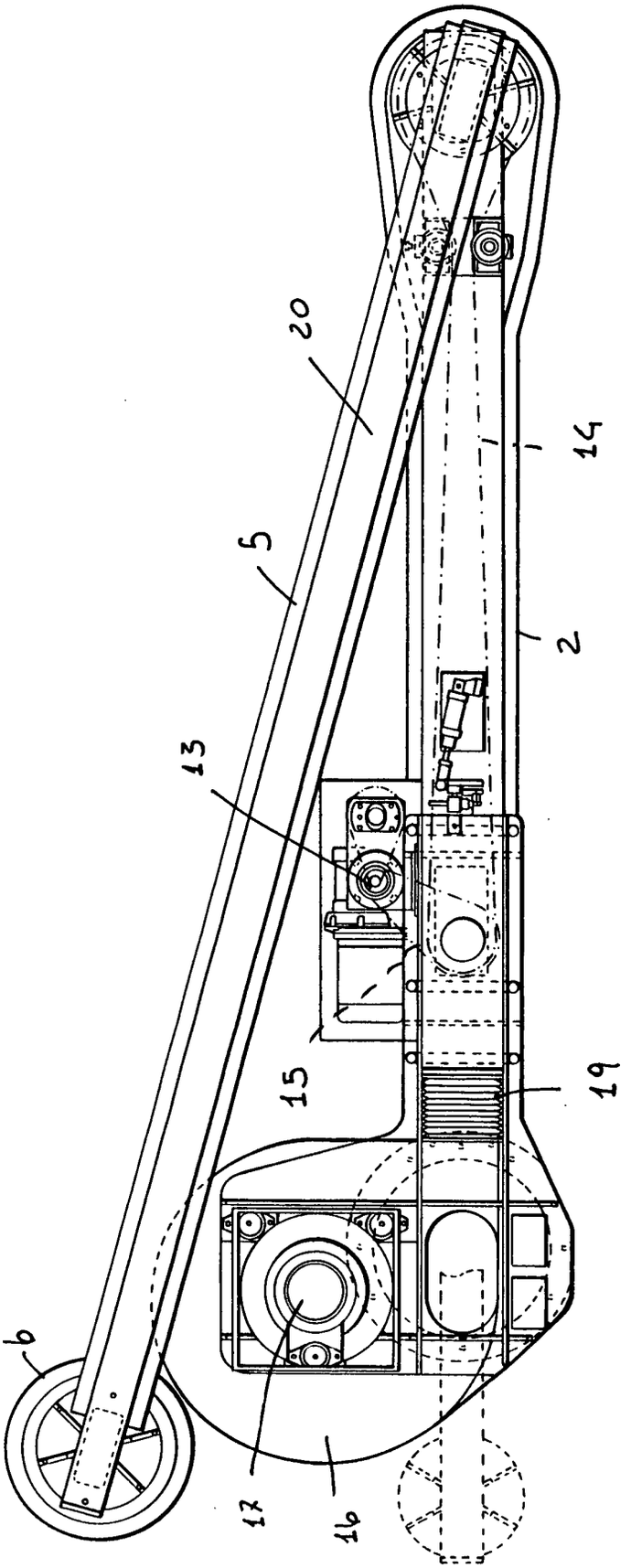

FIG. 3

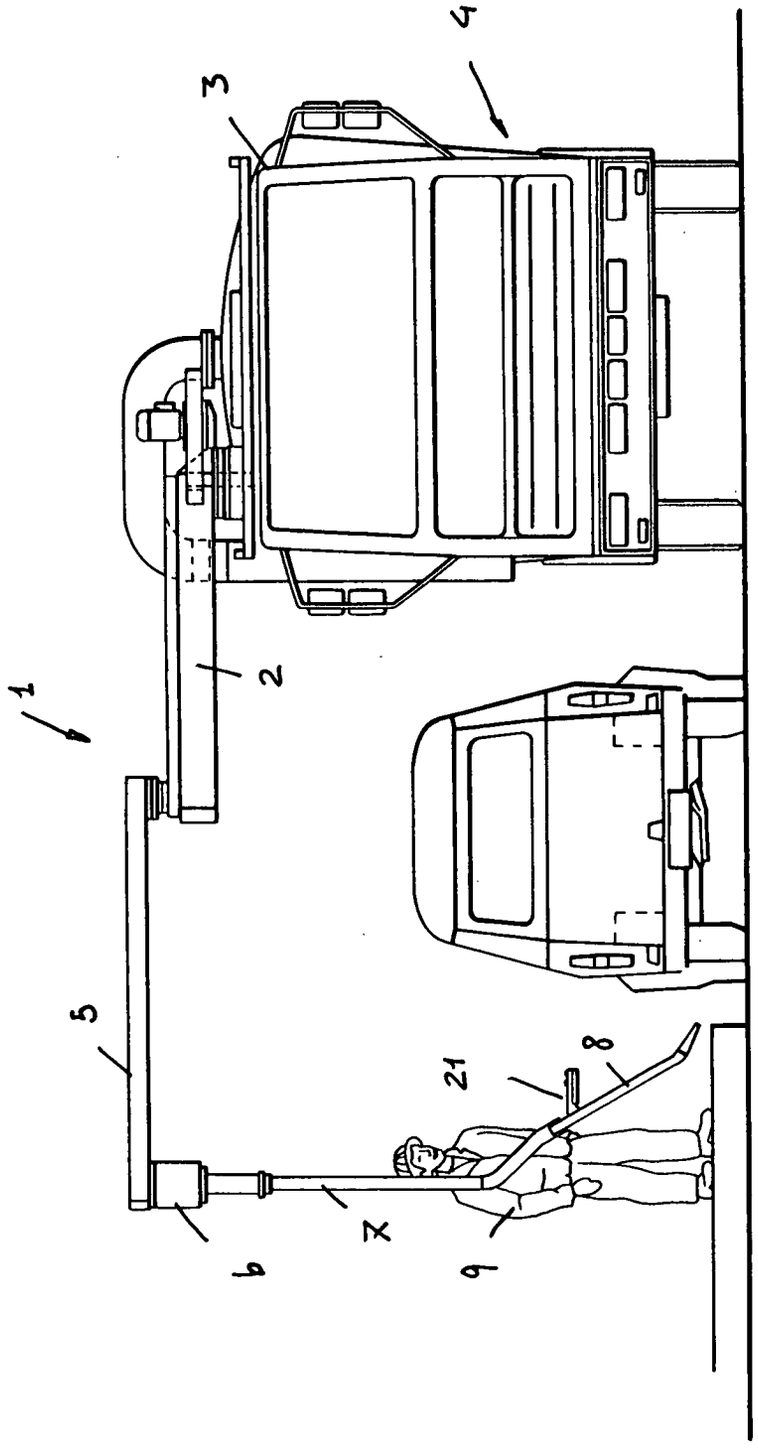

FIG. 4

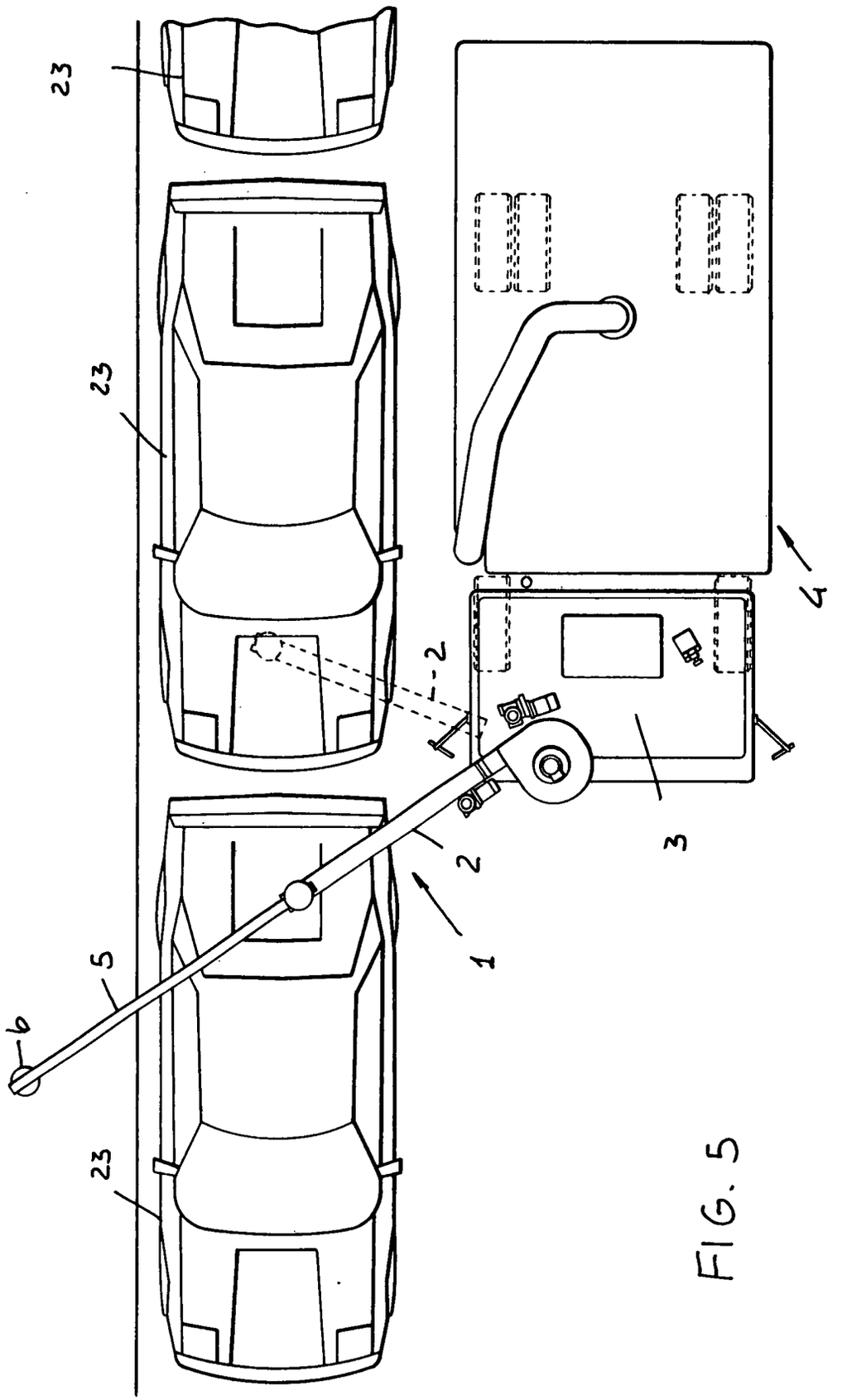

FIG. 5