

(17)

Device for extracting exhaust gases from vehicles having
upwardly directed exhaust pipes

5 The present invention relates to a device for extracting exhaust gases from vehicles having upwardly directed exhaust pipes.

It is noted that prior art devices for extracting exhaust gases from vehicles are of little use or at least unsuitable for vehicles having upwardly directed exhaust
10 pipes.

The object of the present invention is therefore to provide by simple means, an efficient and in certain aspects automatically operating device for extracting exhaust gases from vehicles having upwardly directed exhaust pipes.

15 According to the invention there is provided a device for extracting exhaust gases from vehicles having upwardly directed exhaust pipes, comprising a nozzle, movable along an exhaust track, having a downwardly directed exhaust pipe connection with an open entrance in at least one lateral
20 direction for catching an exhaust pipe, the nozzle having one or two movably mounted coupling means which are arranged to keep a normal position when the exhaust pipe in coupling position is in contact with the coupling means to permit the nozzle to follow the exhaust pipe along the exhaust track,
25 the coupling means being arranged to move from the normal position to release the exhaust pipe when the nozzle reaches a predetermined position on the exhaust track and the coupling means being arranged automatically to return to the normal position after releasing the exhaust pipe.

30 To help understanding of the invention, various specific embodiments thereof will now be described by way of example and with reference to the accompanying drawings in which:-

Figure 1 is a partially sectioned side view of a device
35 according to the invention;

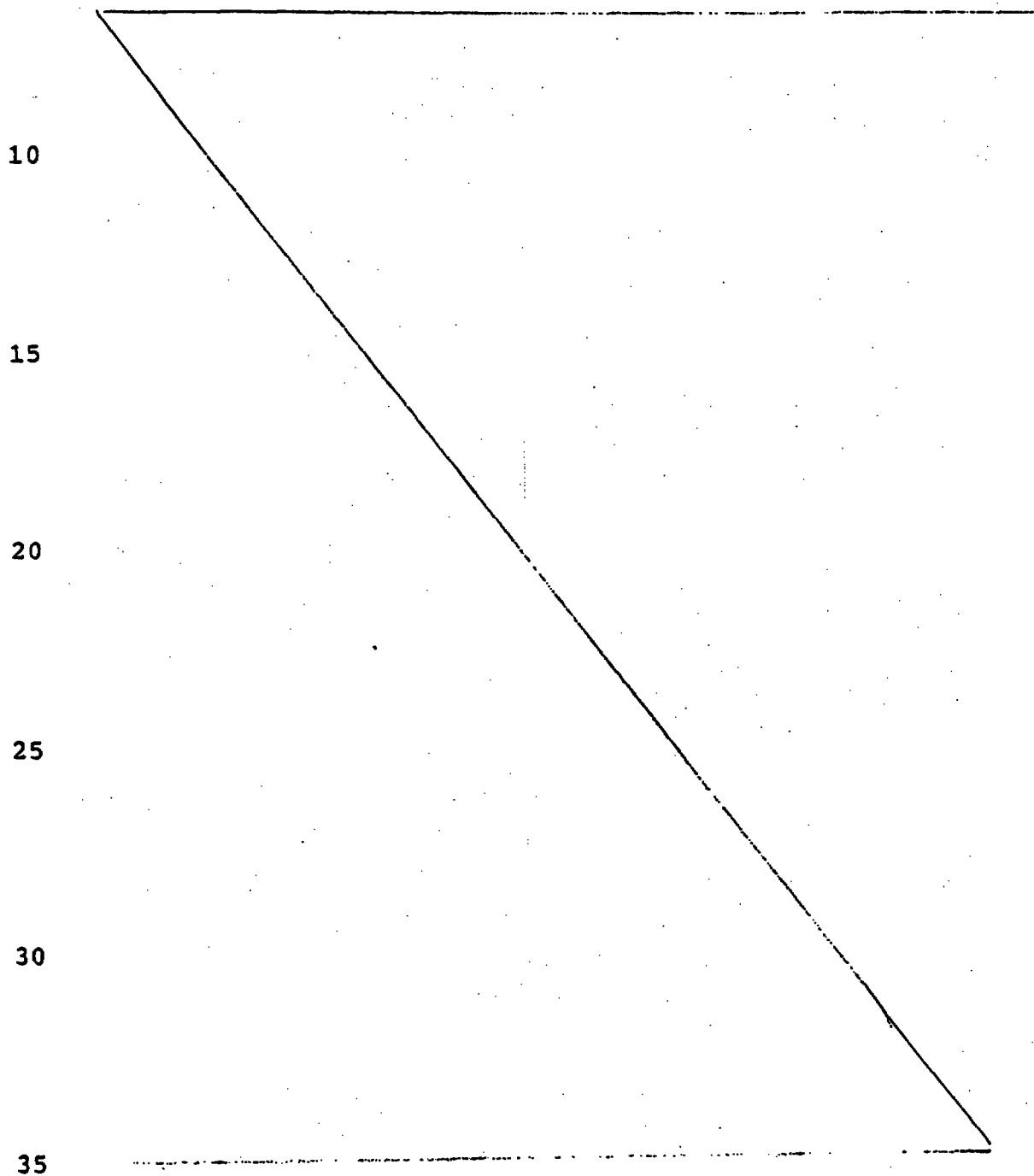
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Figure 2 is a cross-section along the line II-II in
Figure 1;

Figure 3 is a side view of an alternative embodiment of
a device according to the invention;

5 Figure 4 is a plan view of a second alternative embodi-



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ment of a device according to the invention; and

Figures 5A - 5C schematically illustrate various situations arising in use of the device of Figure 1.

In Figure 1 is illustrated a flue 1 in the form of a
5 so-called exhaust track provided at its bottom edge with
sealing lips 2 that engage each other for sealing the track.
The sealing lips 2 may be separated temporarily by means of
an exhaust receiving carriage 3 for passing exhaust gases
into the track via the carriage 3. The carriage 3 is sus-
10 pended on the track 1 (not shown in detail) and the track is
mounted in the ceiling via wheeled alignment devices 5,
permitting the track 1 to move perpendicular to its longi-
tudinal axis.

The exhaust receiving carriage 3 is provided underneath
15 with a terminal tube 6 to which a nozzle 8 is connected via
a connecting device 9. The nozzle 8 has an exhaust pipe
connection 10 for co-operation with an upwardly directed
exhaust pipe 11 on a vehicle (not shown). In the embodiment
of Figure 1, the exhaust pipe connection 10 comprises on one
20 hand a wall portion 12 of the nozzle 8 and on the other hand
two spring-loaded coupling arms 13, 14. Each coupling arm
13, 14 is pivotally mounted on the nozzle 8 via axes 15, 16
and outside these axes, the coupling arms 13, 14 are acted
on by springs 17, 18 which constantly urge inner portions
25 19, 20 of the arms 13, 14 to swing towards the wall portion
12.

By means of the springs 17, 18, the coupling arms 13,
14 may swing aside when a vehicle moves along beneath the
track 1 and its exhaust pipe 11 contacts the coupling arms
30 13, 14. The exhaust pipe 11 will move relative to the
nozzle 8 until it strikes the wall portion 12, whereafter
the nozzle 8 is forced to follow the exhaust pipe 11 until
the vehicle stops. From the moment that the exhaust pipe 11
reaches the nozzle 8, the exhaust gases therefrom are sucked
35 into the nozzle 8 and via said nozzle and the carriage 3

passed to the track 1 and therefrom to a suitable area or purifying plant.

When the vehicle moves in the opposite direction (e.g. when driving out from a garage 21; see Figures 5A-5C), the exhaust pipe 11 will strike the coupling arms 13, 14. Because of the force of the springs 17, 18, these cannot swing aside and the nozzle 8 is forced to follow the exhaust pipe 11. Hereby, the exhaust pipe 11 will move towards one end of the track 1 (e.g. at the garage door 22) and a buffer 23 arranged at this end, see Figure 1. The nozzle 8 will be stopped immediately by the buffer 23, whereby the load of the exhaust pipe 11 on the coupling arms 13, 14 is momentarily increased to a high extent such that the springs 17, 18 yield and the coupling arms 13, 14 may swing aside and release the exhaust pipe 11. Thus, exhaust gases will have been sucked away via the nozzle until the vehicle has reached a certain area (e.g. the garage door) and at the same time, the nozzle 8 has been displaced to a receiving position (see Figure 5A) for receiving the exhaust pipe 11 of a vehicle to be moved along the track 1 (e.g. into the garage 21).

When a vehicle is driven into the garage 21 via the garage door 22 in the direction of arrow A in Figure 5A, the exhaust pipe 11 thereof will move into the nozzle 8 or strike one of two, preferably resilient, guide rails 24 extending forward and outwards from the said nozzle 8. If the vehicle continues in direction A into the garage 21, the exhaust pipe 11 will, through its load on one guide rail 24, draw the track 1 in the direction of arrow B, see Figure 5B, until the exhaust pipe 11 has reached the wall portion 12 of the nozzle 8. Thereafter, the exhaust pipe 11 will move the nozzle 8 along the track 1 until the vehicle has reached its desired position, see Figure 5C, in the garage 21 or corresponding place.

Since the exhaust track 1 is movable sideways (via the

wheeled alignment devices 5), the exhaust pipe 11 of the vehicle may itself draw the nozzle to the correct position if the vehicle is not driven into the garage 21 with its exhaust pipe 11 positioned straight in line with the nozzle 8.

Instead of or in combination with arranging the track 1 to be movable sideways, the nozzle 8 may be pivotable sideways. To enable this, the exhaust receiving carriage 3 shown in Figure 5 has an axis 25 arranged parallel with the track 1 and on which the nozzle 8 is pivotally mounted via a collar 26 extending into the connecting tube 6. In order to provide sufficient sealing, a flexible hose 27 is threaded onto the connecting tube 6 and a corresponding portion of the nozzle 8.

Instead of or as an alternative to the above-mentioned embodiments, the nozzle 8 may be pivotally arranged on the exhaust receiving carriage 3 such that it may pivot around a vertical axis when it is engaged by the exhaust pipe 11. This alternative is not shown in the drawings.

At the nozzle 8 of Figure 4, the exhaust pipe connection comprises two pairs of coupling arms 13, 14 instead of one pair of coupling arms 13, 14 and the wall portion 12 which thus has been deleted. The other pair of coupling arms 13, 14 is reversely arranged and the nozzle has two substantially identical but reverse inlets/outlets for the exhaust pipe 11.

This nozzle embodiment permits movement of the exhaust pipe 11 into and out from the exhaust pipe connection 10 from two opposite sides. This means that a vehicle can drive into a location through a door, carry the nozzle along with it through the location and pass out through another door, where the nozzle strikes a buffer. Thereafter, a vehicle may drive through the second door and carry along the nozzle to the first gate or the nozzle may be automatically displaced between the gates by means of a special



driving device, not shown in the drawings.

As an alternative or complement to the arrangements described above, a releasing device, which is not shown in the drawings, may be arranged within the area of movement of the nozzle 8 for co-operation with the exhaust pipe connection 10 such that the connection is released for disengaging the nozzle 8 when the releasing device is reached. Such a releasing device is preferably adjustable as to whether it releases the exhaust pipe connection or not, and if the connection has coupling arms 13, 14, it may be designed to operate on these arms.

The invention is not intended to be limited to the above embodiments. Thus all details shown may have different shapes. The nozzle 8 may have another design without losing its sucking function and the exhaust pipe connection 10 may have another shape than that shown in the drawings. This applies also on the guide rails 24 and the connecting device 9, which is only schematically shown in Figure 1.

The nozzle 8 is via the exhaust track 1 connected to an exhaust gas suction device, e.g. a fan, which is not shown as such arrangements are already known. The device according to the invention may be used wherever exhaust suction from upwardly directed exhaust pipes is required, e.g. in garages, work shops, warehouses, fire stations.

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CLAIMS

1. A device for extracting exhaust gases from vehicles having upwardly directed exhaust pipes, comprising a nozzle, movable along an exhaust track, having a downwardly directed exhaust pipe connection with an open entrance in at least one lateral direction for catching an exhaust pipe, the nozzle having one or two movably mounted coupling means which are arranged to keep a normal position when the exhaust pipe in coupling position is in contact with the coupling means to permit the nozzle to follow the exhaust pipe along the exhaust track, the coupling means being arranged to move from the normal position to release the exhaust pipe when the nozzle reaches a predetermined position on the exhaust track and the coupling means being arranged automatically to return to the normal position after releasing the exhaust pipe.

2. A device according to claim 1, wherein the track and/or the nozzle are movable sideways relative to the longitudinal direction of the track for adjustment to a moving exhaust pipe.

3. A device according to claim 2, wherein the exhaust track is displaceably suspended on wheeled alignment devices for movement sideways.

4. A device according to claim 2 or claim 3, wherein the nozzle is pivotally suspended for swinging movement sideways.

5. A device according to any preceding claim, wherein the exhaust pipe connection has releasable coupling means at one end and a fixed coupling portion at the other end to permit passage of the exhaust pipe from one direction only relative to the nozzle.

6. A device according to any one of claims 1 to 4, wherein the exhaust pipe connection has releasable coupling means at both ends of the exhaust pipe, when the exhaust pipe is connected to the nozzle, to permit passage of the





exhaust pipe in either direction relative to the nozzle.

7. A device according to either claim 5 or claim 6,
wherein the releasable coupling means are coupling arms
5 which are swingable aside when the exhaust pipe strikes
them.

8. A device according to any preceding claim, wherein
the nozzle comprises guide rails for providing a wide inlet
10 for the exhaust pipe from one direction only relative to the
nozzle.

9. A device according to any preceding claim, wherein
one or more releasing devices are provided along the exhaust
15 track and are adapted to release the exhaust pipe connection
of the nozzle when the nozzle reaches a said releasing
device.

10. A device according to any preceding claim, wherein
20 the nozzle is connected to a tubular portion of a carriage
movable along the exhaust track.

11. A device for extracting exhaust gases from vehicles
substantially as hereinbefore described with reference to
25 Figures 1 and 2 or Figure 3 or Figure 4 of the accompanying
drawings.

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