APPARATUS FOR REMOVING GASES

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ABSTRACT
An apparatus for removing gas and similar fluids from closed areas comprises a frame in which a drum is rotatably mounted. An outlet socket is set axially into one end of the drum in fixed relation to the frame and a hose is wound on the drum and has one end connected inside the drum to the outlet socket. A spiral spring device is mounted on a shaft fixed axially to the other end of the drum for rotating the drum to wind up the hose. Stop elements are provided on the hose and the frame to stop the winding of the drum and a releasable catch is secured to the frame and cooperates with tooth segments on the spring device to hold the drum in the desired position.

3 Claims, 5 Drawing Figures
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APPARATUS FOR REMOVING GASES
The present invention relates to an apparatus for removing gases and the like from closed areas, for example from the work areas in work shops and factories. For this purpose one has hitherto used fixed elements and installations, for example pipes that are secured to the ceiling and are connected to hose sections which are usually lying indiscriminately on the floor of the work area.

It is obvious that such installations are difficult to adapt to varying requirements and that they enhance the possibility of accidents, and that damage to the hose sections is a common occurrence.

It is therefore a primary object of the present invention to provide an apparatus of the above mentioned type which can be easily mounted, and can be used at any desired location over a relatively large area, and which takes up only a small amount of space when not in use, and wherein the hose is protected against external damage and is removed from the work area of the personnel.

Other objects and advantages of the invention may be seen from the following detailed specification describing an embodiment of the invention with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of an apparatus according to the invention secured to the ceiling of a work shop.
FIG. 2 is a longitudinal section through the apparatus shown in FIG. 1.
FIG. 3 is a perspective view of a part of the mechanism for winding the hose,
FIG. 4 is a diagrammatic view, on a larger scale, of a part of a locking mechanism of the apparatus and,
FIG. 5 shows an additional way of connecting the hose to an outlet socket.

The apparatus illustrated in the drawings presents a frame 1 for mounting a rotatable drum 2. The frame may be secured to the ceiling, wall or other support according to the requirements, and has a central connecting socket 3 extending outwardly in an axial direction of the drum. To this socket a hose 4 can be connected whose opposite end is connected to a suction pump.

The drum 2 is preferably made of metal and constitutes the winding and unwinding core for a second hose 5 which is provided at its other end, or in that proximity, preferably with a handle or coupling member 6 which may also have the function of a stop during winding of the hose on the drum. An adjustable abutment 20 which may consist of a steel hose with a hose clamp that may be secured at any desired point on the hose, may also be provided. The other end of the hose 5 is connected with the outlet socket 3 in a gas tight manner, as shown for example in FIG. 2, where the drum is shown to be gas tight, and wherein the other end of the hose 5 is connected to the drum 7, and the outlet socket 3, it also connected in a gas tight manner to the left side of the drum. As the drum must be rotatable relative to the fixed outlet socket it is necessary to provide sealing elements (not shown) between the particular fixed and moving elements.

As shown in the drawings and as explained above the hose is to be wound on the drum between its lateral flanges. In order to obtain an automatic winding of the hose 5 during non use or to lock the hose in the desired extended position, the drum is preferably provided with a driving device in the form of a spiral spring construction 8 which is combined with a locking arrangement that consists of a plurality of tooth segments 9 spaced from each other along the circumference of the spring housing, and with a locking catch 10. The catch 10 is secured to the frame and may be actuated by a draw spring 11 FIG. 4. The shaft 12 of the catch 10 is mounted, as seen in the unwinding direction, behind the locking tooth of the catch, so that the catch locks the drum as long as it is in engagement with one of the segments. Since the hose must be wound on the drum the hose is pulled out until the locking catch has slid past the last tooth of the particular segment. Due to the fact that the hose is subsequently released the spiral spring 8 is free to rotate the drum in the desired direction. The locking catch which is released in the interval 13 between the segments is rotated and assumes the position shown in FIG. 2 in dash lines and slides consequent over the locking teeth of the segment. A subsequent unwinding of the hose has the effect that the catch rotates once more in the interval between two segments and returns thereby into the original position to lock against movement of the drum in one direction.

In order to guide the hose 5 in a careful manner and to provide a stop for the winding of the hose, the frame 1 is provided with a rotatably mounted roll 17 which extends parallel to the longitudinal axis of the drum and whose spacing from the jacket surface of the drum is so measured that the hose 5 may pass through the spacing while the stop 20 is retained.

In order to remove gases, for example from a motor vehicle, it is necessary only to take hold of the handle portion 6 of the hose 5, unwind the desired length of the hose and connect the end to the discharge pipe of the vehicle. When the hose 5 is to be wound again on the drum 2 it is sufficient to carry out the above mentioned unwinding of the hose in order to eliminate the locking effect so that the winding of the hose is effected by the force of the spring 8.

It will be understood that the above mentioned arrangement permits the removal of gases in work areas which are relatively far apart and also that it will be very easy to change the arrangement by providing different and supplemental structures. The apparatus of the invention can be produced at reasonable cost and would therefore also be suitable for smaller work shops.

In view of the fact that the stop is arranged at a suitable distance from the end of the hose the latter can be reached more easily, for example when it is wound up as shown in FIG. 1, and can also be introduced more easily into an opening. During removal of gases during welding operations whereby welding sparks will be removed. To collect this type of particles and others a part of the conduit between the connection of the hose 5 of the drum and the connecting socket may be designed as a replaceable collecting receptacle with a collecting net, and if desired it may be made of a heat resistant material.

As shown in FIG. 5 the hose may also be connected to the socket 3 in that the end of the sleeve is guided in a sealing manner through the jacket surface of the drum to its center point where the hose is bent in such a way that it extends essentially concentrically to the axis of rotation of the drum. The end of the hose is pulled on the sleeve 14 which is made of pressed or drawn sheet metal, the sleeve 14 being connected to
the lateral flange of the drum which carries a bearing
15 of synthetic material or the like. An inner sleeve 16
is also connected to the frame similar to the socket 3.

What is claimed is:

1. In a gas removal apparatus having a frame on
which a winding drum is rotatably mounted, a gas out-
let fixed on the frame at the axis of the drum, a hose
windable on said drum and having one end seali-
gnly connected to the gas outlet, a spring device for rotating
the drum to wind the hose thereon, cooperating stop
means on the hose and frame for limiting the winding
of hose on the drum, and releasable catch means on the
frame and engageable with the spring device to hold
said drum in a desired position of rotation against the
action of said spring device; the improvements com-
prising:
said frame having spaced drum supporting portions
to which opposite ends of said drum are journaled,
said spring device being mounted on one end of
said drum and said catch means being mounted on
the adjacent frame portion, the other end of said
drum having an axial sleeve sealingly journaled
relative to said gas outlet and which an end of said
hose sealingly surrounds;

2. Apparatus as defined in claim 1 wherein said axial
sleeve is fixedly and sealingly secured to said drum.

3. Apparatus as defined in claim 1 wherein said spring
device comprising an annular member
concentric to said drum and having recess means
in its outer periphery, said catch means being en-
gageable in said recess means to lock said drum
against rotation in one direction but being released
therefrom when said drum is rotated in the other
direction;
said cooperating stop means comprising a roller on
said frame parallel to the axis of said drum and
spaced from the surface of said drum a distance
greater than the diameter of said hose but less than
the corresponding diameter of a stop member re-
leasably secured on said hose for selective adjust-
ment therealong; and
said hose having a handle means at its outer end and
a connector for connecting said outer end to the
exhaust pipe of a motor vehicle.

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