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LIQUID SEPARATOR ATTACHMENT FOR VACUUM CLEANERS

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Fig. 1.

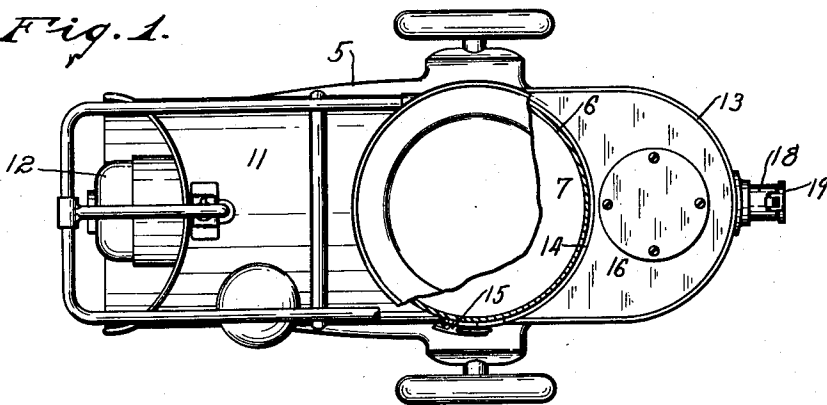


Fig. 2.

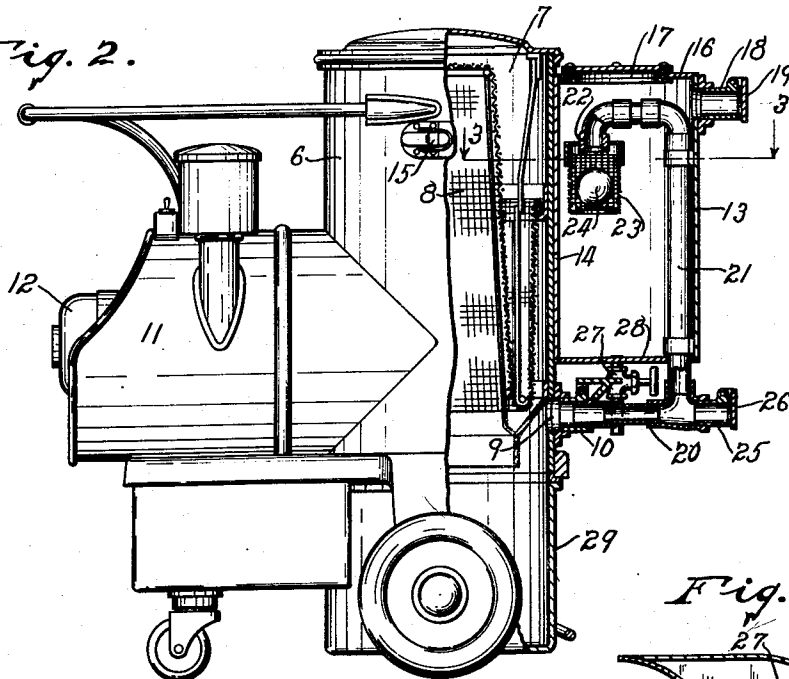
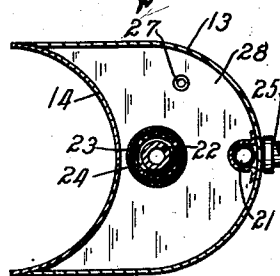


Fig. 3.



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LIQUID SEPARATOR ATTACHMENT FOR VACUUM CLEANERS

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5 Claims. (Cl. 15—331)

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This invention relates to a liquid separator attachment for vacuum cleaners and more particularly to a device which may be detachably secured to a conventional vacuum cleaner for drawing liquids into a container provided with said attachment.

An object of this invention is to provide a device which may be detachably secured to the casing of a conventional vacuum cleaner and which may be connected with the air inlet opening of said vacuum cleaner so as to provide the required vacuum in the container of said attachment for drawing up liquids from the floors of buildings or the like.

A further object of this invention is to provide such an attachment which may be retained in position upon the vacuum cleaner without interfering with the normal operation thereof.

A still further object of the invention is to provide such an attachment which may be connected to the conventional vacuum cleaner without requiring any material changes in the construction thereof.

Further objects and advantages of this invention will be more clearly understood from the following description and from the accompanying drawings in which:

Fig. 1 is a plan view, partly in section, of a conventional vacuum cleaner with my improved attachment connected thereto.

Fig. 2 is a side view, partly in vertical section, of said vacuum cleaner and attachment.

Fig. 3 is a sectional plan view of my improved attachment on line 3—3 of Fig. 1.

As illustrated in the drawings, the numeral 5 denotes a vacuum cleaner of a type having a casing 6 containing a suction chamber 7 in which is mounted a filter or separator 8 and which has an air inlet opening 9 in the wall of said casing. A connector 10 is commonly provided in said air inlet opening to receive the end of a hose or the like extending from a manually operated cleaning attachment. The usual suction creating mechanism is contained in the portion 11 of the vacuum cleaner casing and is commonly driven by an electric motor indicated at 12.

My improved attachment comprises a liquid container 13 preferably having a curved wall 14 which conforms with the contour of the casing 6 and is detachably secured thereto by means of suitable fasteners 15. The said container is provided with a top 16 having an opening 17 with a closure secured thereover. A connector 18 is provided in the form of a tubular member which is mounted at the upper portion of the

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container 13 and communicates with the interior thereof. The said connector is preferably provided with a closure 19 which is pivotally mounted and adapted to automatically close under the influence of a partial vacuum occurring within the container 13.

In order to communicate the interior of the container with the chamber 7, I provide a suction tube 20 which is located below said container and is adapted to fit into the connector 10. This suction tube communicates with a suction pipe 21 in the container 13 which opens downwardly as at 22 and has connected thereto a float valve including a screen cage 23 having a float ball 24 therein positioned below the open end of the pipe 21 as shown in Fig. 2.

The suction tube 20 is provided with a connector 25 that communicates directly with the chamber 7 and is adapted to receive the end of a hose attached to any desired cleaning tool as is well known to those skilled in the art. The said connector is also provided with a pivotally mounted closure 26 that closes under the influence of a vacuum in the chamber 7.

It will be noted that the opening 22 into the pipe 21 is located in the upper portion of the container 13 and below the plane of the inlet connector 18. This permits the suction to be applied to the container 13 until the container is filled to a predetermined level at which level the liquid is located below the plane of said connector 18 so that any further rise of the liquid level will serve to operate the float valve to shut off the suction before the liquid can reach the said opening.

My improved attachment may be secured to a vacuum cleaner such as shown by simply inserting the end of the suction tube 9 into the conventional connector 10 and clamping the attachment to the side of the casing 6 by means of the fastening members 15.

A drain valve 27 is connected to the bottom 28 of the container 13 for the purpose of draining the liquid therefrom when desired.

When it is desired to use my improved attachment for drawing liquids into the container 13, the conventional coupling on the end of a hose extending from a suitable manually operated cleaning tool is inserted into the connector 18 and the operation of the vacuum cleaner is started by connecting the motor 12 to a suitable electric supply. This causes a partial vacuum in the chamber 7 which is communicated with the interior of the container 13 through the tubes 20 and 21 and thereby provides a partial vacuum in said container which serves to draw the

liquid through the hose into said container as the cleaning tool is moved through the liquid. Should a mixture of liquid and air be drawn into the tank 13 by the partial vacuum therein, the liquid, being heavier than air, will fall to the bottom of the tank while the said air will pass through the suction pipe 21 and into the suction chamber 7. When the container is filled to a predetermined level, the float 24 will be raised until it is drawn into engagement with the seat at the open end 22 of the pipe 21 and thereby discontinue the withdrawal of air from the said container and prevent further rise of the liquid level which would cause said liquid to be drawn into the chamber 7.

When the container 13 is to be emptied, the valve 27 is opened to permit the liquid to flow therethrough. When it is desired to use the vacuum cleaner for its originally intended purpose without removing the attachment therefrom, the closure 19 is permitted to seal the opening in the connector 18 by removing the hose therefrom and inserting the said hose into the connector 25. This causes the air to be drawn directly from the cleaning tool through the hose and through the suction tube 20 into the chamber 7. Any dirt drawn into said chamber will be separated from the air by means of the filter or screen 8 and dropped into the collector container 29 located below the suction chamber. It will be noted that the partial vacuum created in the chamber 13 during the normal use of the vacuum cleaner will serve to retain the closure 19 in its closed position thereby rendering the attachment inoperative and permitting convenient use of the vacuum cleaner in the conventional manner.

I claim:

1. In combination with a vacuum cleaner comprising a casing having a suction chamber therein and an inlet opening in a wall of said casing which opening communicates with said chamber, a device comprising a container mounted upon said casing, a suction pipe having an open end in the upper portion of the said container, the said container having an inlet opening that opens to atmosphere and is disposed above the level of the open end of the suction pipe, means for closing said inlet opening, a suction tube disposed below said container and communicating with the said suction pipe and connected to the inlet opening in said casing, the said suction tube further having an inlet opening that opens to the atmosphere, and means for closing said inlet opening of the suction tube, said closure means for the inlet opening of said container and for the inlet opening of said suction tube being selectively operable to permit attachment of a suction tool to either of said openings.

2. In combination with a vacuum cleaner comprising a casing having a suction chamber therein and an air inlet opening in a wall of said casing which opening communicates with said chamber, a device including a container mounted upon the exterior of said casing, a suction pipe extending into said container through the bottom thereof and having an opening in the upper portion of the interior of said container, the said container having an inlet opening that opens to atmosphere and is located above the level of the opening of said suction pipe, means for closing said inlet opening of the container, a suction tube disposed below said container and communicating with said suction pipe, the said suction tube being inserted into the air inlet open-

ing of said casing and having an open end that opens to the atmosphere and is located exteriorly of said container, said open end being provided with a closure member, said closure means for the inlet opening of said container and for the inlet opening of said suction tube being selectively operable to permit attachment of a suction tool to either of said openings.

3. In combination with a vacuum cleaner comprising a casing having a suction chamber therein and an air inlet opening in a wall of said casing, an attachment including a liquid container fitting the exterior of said casing and conforming to the contour thereof, a suction pipe extending vertically through the bottom of said container and having an opening in the upper portion thereof, a float valve adapted to close said opening upon liquid in said container reaching a predetermined level, the said container having an inlet opening in the wall thereof that opens to atmosphere and is located above the level of said opening of the suction pipe, the inlet opening in the wall of said container being provided with a closure member a horizontal suction tube disposed below the container and communicating with said suction pipe, the said suction tube being inserted into the said air inlet opening of said casing and having an inlet opening that opens to atmosphere and is located exteriorly of the container, and means for closing the inlet opening of said tube said closure means for the inlet opening of said container and for the inlet opening of said suction tube being selectively operable to permit attachment of a suction tool to either of said openings.

4. An attachment for a vacuum cleaner comprising a casing having a suction chamber therein and an inlet opening in said casing that communicates with the suction chamber; the said attachment comprising a container having a wall portion conforming to the shape of the said casing and adapted to fit snugly against it, means for detachably securing the container to the casing, a suction tube mounted on said container below the bottom thereof and adapted to fit into the said inlet opening of the casing to communicate with the suction chamber, the said suction tube having an inlet opening, means for closing said inlet opening of the suction tube, a suction pipe extending upwardly from the suction tube through the bottom of the container and having an opening in the upper portion of the interior of said container, an inlet opening in the wall of said container located above the level of the opening in said suction pipe, and means for closing said inlet opening of the container, said closure means for the inlet opening of said container and for the inlet opening of said suction tube being selectively operable to permit attachment of a suction tool to either of said openings.

5. The combination as set forth in claim 1, wherein the open end of said suction pipe is provided with float valve means adapted to close said opening upon liquid in said container reaching a predetermined level.

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