Sept. 23, 1952 W. H. HAULENBEEK ET AL 2,611,679

AIR TREATMENT DEVICE

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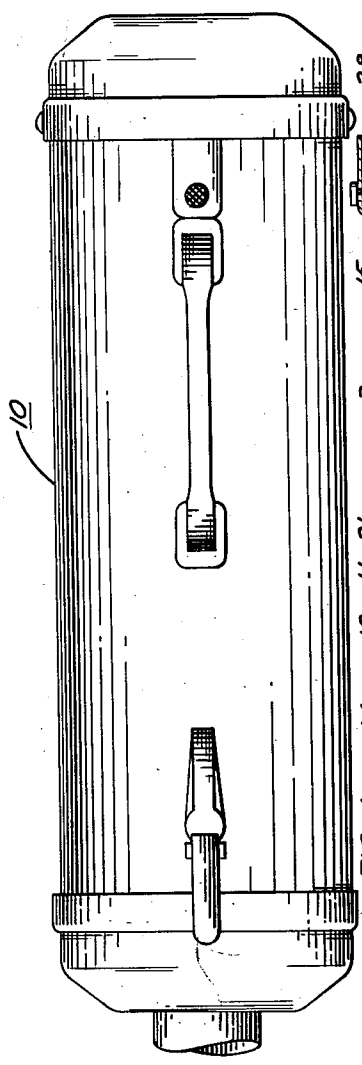


FIG. 1

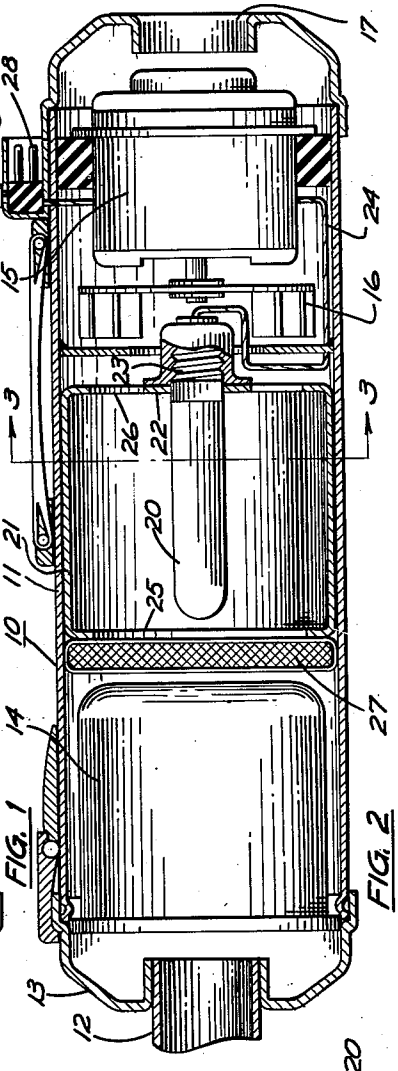


FIG. 2

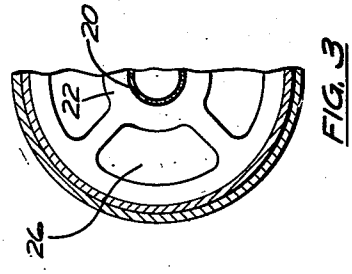


FIG. 3

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AIR TREATMENT DEVICE

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5 Claims. (Cl. 21—127)

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The invention relates in general to air treatment devices and more particularly to air treatment devices for vacuum cleaners.

An object of the invention is to provide for treating the air which passes through a vacuum cleaner for killing air-borne bacteria.

Another object of the invention is the provision of mounting a germicidal lamp means within the casing of a vacuum sweeper, whereby the air which passes through the vacuum cleaner is treated for killing air-borne bacteria.

Another object of the invention is the provision of mounting the germicidal lamp means in the casing of a vacuum cleaner intermediate the dust collection means and the motor driven fan.

Another object of the invention is to provide for mounting the germicidal lamp means within an annular member which constitutes a reflector for energy waves emitted by the germicidal lamp means.

Another object of the invention is to provide for energizing the germicidal lamp means from terminals on the vacuum cleaner, which are adapted to be energized by a suitable source of current.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing, in which:

Figure 1 shows a vacuum cleaner in which the invention may be incorporated;

Figure 2 is a longitudinal cross-sectional view of the vacuum cleaner shown in Figure 1, and illustrates the invention being incorporated therein and;

Figure 3 is a fragmentary cross-sectional view taken along the line 3—3 of Figure 2.

With reference to the drawing, the invention is illustrated as being incorporated in a cylindrical type of vacuum cleaner indicated generally by the reference character 10. As illustrated, the vacuum cleaner comprises a hollow casing 11 through which is mounted at one end a dust bag 14 and at the other end a motor 15 and a fan 16 driven thereby for drawing air through the hollow casing. Incoming air flows through a hose 12 which is connected through a removable end cap 13 which may be removed to gain access to the dust bag 14. The air which is drawn through the hollow casing 11 flows through an air exit opening 17 in rear of the motor 15.

In the intermediate portion of the hollow casing 11 and between the dust bag 14 and the motor driven fan 16 is mounted a germicidal lamp 20 for killing air-borne bacteria which pass through the vacuum cleaner. As illustrated, the germicidal lamp 20 may be of the type which is adapted

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to be threadably connected within a socket 23 supported by a bracket 22 which may be integrally formed with an outer annular member 21 which fits closely within the hollow casing 11 of the vacuum cleaner. The annular member 21 and the bracket 22 comprise a cup-shaped receptacle having a forward open end 25 through which air passes after flowing through a filter 27. The rear end of the cup-shaped receptacle which comprises the bracket 22, is provided with openings 26 for permitting the air to flow therethrough. The germicidal lamp 20 may be energized by an electrical wire 24 which is connected to the terminals 28 of the vacuum cleaner, which in turn are adapted to be energized by a source of current by conventional cord and plug. The motor 15 is also energized from the terminals 28.

The annular member 21, the bracket 22 and the germicidal lamp 20 constitute a unit which may be slidably mounted in the casing and held against longitudinal movement therein by any suitable means. The annular member 21 constitutes a reflector for energy waves emitted by the germicidal lamp means 20 whereby the amount of air which can be disinfected by the lamp will be materially increased. Aluminum has been found to be a good reflector.

The arrangement of the invention shown in Figures 2, and 3 may be incorporated in new vacuum cleaners as they are manufactured. The flow of air through a vacuum cleaner is somewhat defeated by the dust bag and the fiber 27, and because of this reduced flow of air the germicidal lamp 20 is capable of killing the air-borne bacteria. In the event that the speed of the air is too fast, then additional germicidal lamps may be added to meet the requirement for killing substantially all of the air-borne bacteria as they pass through the vacuum cleaner. The germicidal lamp 20 may be of any well-known design for emitting energy waves which have the property of killing air-borne bacteria.

Although we have described our invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. In a vacuum cleaner having electrical terminals adapted to be energized by a source of current and having a hollow casing with dust collection means in one end and a motor and a fan driven thereby in the other end to drive air through the dust collection means in the casing, the improvement for treating the air, said improvement comprising germicidal lamp means,

bracket means for supporting the lamp means in the casing intermediate the dust collection means and the motor-driven fan, and means for energizing the lamp means and the motor from the electrical terminals.

2. In a vacuum cleaner having a hollow casing through which air passes, the improvement for treating the said air, said improvement comprising an annular member mounted in the casing, said annular member having open ends through which said air passes, germicidal lamp means, bracket means connected to the annular member for supporting the lamp means in the annular member, said annular member constituting a reflector for energy waves emitted by the lamp means.

3. In a vacuum cleaner having a hollow casing through which air passes, the improvement for treating the said air, said improvement comprising an annular member mounted in the casing, said annular member having open ends through which said air passes, germicidal lamp means, bracket means connected to the annular member for supporting the lamp means in the annular member, said annular member constituting a reflector for energy waves emitted by the lamp means, said annular member, bracket means and lamp means constituting a unit which may be slidably mounted in the casing.

4. In a vacuum cleaner having electrical terminals adapted to be energized by a source of current and having a hollow casing with dust collection means in one end and a motor and a fan driven thereby in the other end to drive the air through the dust collection means in the casing, the improvement for an air treating mechanism, said improvement comprising an annular member mounted in the casing intermediate the dust collection means and the motor driven fan, said annular member having open ends through which said air passes, germicidal lamp means, bracket means connected to the annular member for supporting the lamp means

in the annular member, said annular member constituting a reflector for energy waves emitted by the lamp means, and means for energizing the lamp means and the motor from the electrical terminal.

5. In a vacuum cleaner having electrical terminals adapted to be energized by a source of current and having a hollow casing with dust collection means in one end and a motor and a fan driven thereby in the other end to drive air through the dust collection means in the casing, the improvement for an air treating mechanism, said improvement comprising a reflector member mounted in the casing intermediate the dust collection means and the motor driven fan, said reflector member having open ends through which said air passes, germicidal lamp means, bracket means connected to the reflector member for supporting the lamp means in the reflector member, and means for energizing the lamp means and the motor from the electrical terminals.

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