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EXHAUST FAN ASSEMBLY AND FILTER

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FIG 1

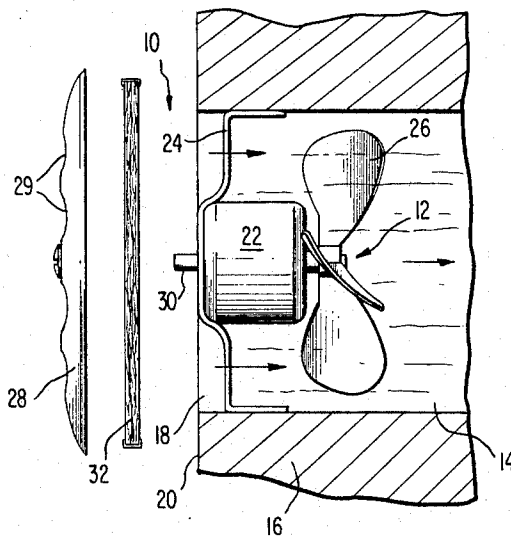


FIG 2

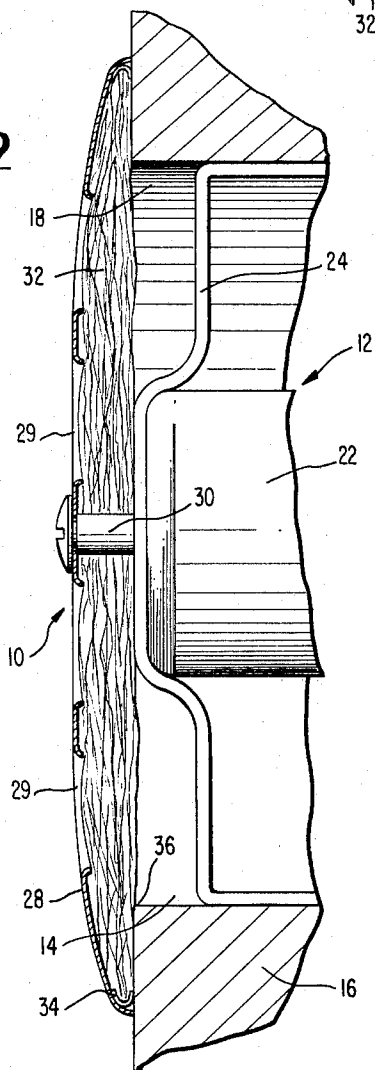
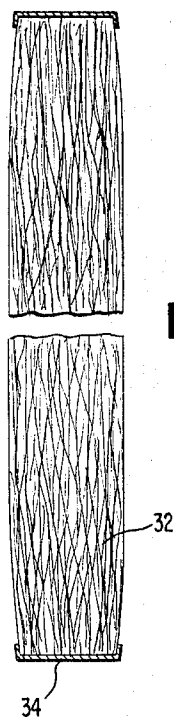


FIG 3



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1

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EXHAUST FAN ASSEMBLY AND FILTER
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1 Claim. (Cl. 230—120)

The present invention generally appertains to improvements in exhaust fan assemblies, which are used to exhaust air from the interior of an enclosure to the exterior thereof, and, more particularly, relates to novel improvements in exhaust fan assemblies or ventilating devices which are intended primarily for use in the kitchen of a house or similar cooking area to draw off smoke and cooking odors or vapor, and exhaust such to the atmosphere.

Generally considered, conventional exhaust fan assemblies for such use comprise an opening in the wall or ceiling of a kitchen, which opening communicates the interior of the kitchen with the exterior of the house, with an exhaust fan unit removably mounted in the opening. The exhaust fan unit includes an electric motor, having means mounting it in the opening, for driving a blade assembly housed within the opening. The outer end of the opening is closed off by a hinged cover that can be opened from the inside, and a guard or grill overlies the inner end of the opening to prevent accidental contact with the blade assembly. The opening may be of any cross-sectional shape and, consequently, the guard or grill will be of any shape complementing the cross-sectional shape of the opening.

The air, drawn through the opening by the exhaust fan unit operatively mounted therein, contains grease, dirt and other foreign material which tends to cling to the motor, its associated mounting means, the wiring for the motor, and the blade assembly. The exterior surface of the guard or grill also will have grease or dirt formed thereon, but this poses no problem since the surface can be cleaned easily without removing the guard or grill.

However, in order to clean the motor, its mounting means, the wiring and the blade assembly, it is necessary to remove all such components from the wall opening. This not only entails a considerable effort and requires time but also leads to the possibility, during the cleaning operation of the removed fan unit, of offbalancing the blades of the blade assembly, and of causing damage to the motor wires. However, if the fan unit is not removed and thoroughly cleaned, the various parts thereof will become caked with grease and dirt, resulting in loss of operating effectiveness of the fan unit and leading to possible flash fires in the wall opening. Any attempt to clean the fan unit, without removing the same from the opening, is almost impossible and futile.

An important object of the present invention is to provide an exhaust fan assembly for a kitchen or cooking area, which overcomes the above-stated drawbacks of removing and cleaning the fan unit and the hazards associated with noncleaning thereof without requiring any structural alteration in the standard fan assembly, and any change in the usual mounting arrangement thereof in association with a wall opening.

A further important object of the present invention is to provide a filter means for a standard type exhaust fan assembly, the filter means being effective, durable and inexpensive, and being mounted in position to filter the air before it passes over the fan unit in the wall opening by utilizing means normally associated with a standard type exhaust fan assembly.

A still further important object of the present invention is to provide a filtered exhaust fan assembly which includes a replaceable filter that is formed as a panel from suitable fibers, synthetic or vegetable, and is held in place under a spring action by the guard or grill, so that the

2

filter completely overlies the inner end of the wall opening and so that it forms a seal between the guard or grill and the edges of the inner end of the opening, whereby air cannot pass through the opening without first passing through the filter.

The foregoing and ancillary objects are attained, novel features of construction and advantages realized and the stated difficulties overcome by the present invention, the preferred embodiment of which is set forth in the following description, succinctly pointed out in the appended claim and illustrated in the accompanying drawing, wherein:

FIG. 1 is a cross-sectional view of a wall or ceiling, for a kitchen or other cooking area, having an opening within which an exhaust fan unit is mounted, with the guard or grill and the filter shown in unattached relation;

FIG. 2 is a detailed cross-sectional view of the exhaust fan assembly, showing the filter and grill or guard in position, and

FIG. 3 is a cross-sectional view of the filter, per se.

Referring now more particularly to the accompanying drawing, and initially to FIG. 1, the exhaust fan assembly 10 includes an exhaust fan unit 12 which is housed within an opening 14 formed through the wall or ceiling 16 of a kitchen or other cooking area. The opening communicates the interior of the kitchen with the atmosphere and may be of any cross-sectional shape, and has an inner end 18 at the inner surface 20 of the wall 16.

The fan unit 12 includes an electric motor 22 mounted within the opening 14 by a removable mounting means 24, and having a fan blade unit 26 fixed on the outwardly extending end of the armature shaft thereof. A guard or grill 28 is provided and is mounted by suitable means to overlie the inner end 18 of the opening. The guard or grill is formed with openings 29 for the passage therethrough of air drawn by the fan unit through the opening.

Many ways may be employed to secure the guard or grill in place so that it contacts the inner surface of the wall 16. For example, screws may be fastened into the wall at the corners or along the edges of the guard or grill or, as illustrated, the motor mounting means 24 may have an inwardly projecting stud 30 to which the center of the guard or grill is secured. In any event, the peripheral edges of the guard or grill are brought to bear against the inner surface 20 of the wall so that the guard or grill completely overlies the inner end of the opening 14.

A filter 32, formed as a panel from fibers of synthetic or vegetable material, preferably spun glass, and of a shape and size corresponding to the cross-sectional shape and size of the grill 28. The fibers are loosely spaced so that the filter is relatively thick but is compressible. The panel has a peripheral binding or frame 34 which is formed from flexible material, such as paper, cloth, plastic or the like, that will collapse from a width approximating the thickness of the panel when the filter is installed in place. The filter is greater in planar extent than the cross-sectional area of the opening 14, and only slightly less than the size of the guard or grill 28.

The filter 32 is positioned between the guard or grill 28 and the inner surface 20 of the wall and is held in place by the guard or grill, utilizing the mounting means of the guard or grill for this purpose. The frame 34 of the filter panel is collapsed by the guard or grill and the panel is bulged into the grill openings 29 and the inner end 18 of the opening 14 so that it makes a tight seal between the guard or grill 28 and the bounding edges 36 of the opening 14 at its inner end 18. This ensures that no air can pass through the opening 14 without first passing through the filter, as the air is drawn by the fan blades in the direction of the arrows in FIG. 1 through the opening 14.

Grease, dirt or other foreign particles in the air, exhausted by the fan unit 12 through the wall opening 14,

3

will be entrapped and collected by the filter and will be prevented thereby from coming into contact with any parts of the fan unit. All that is required is that the filter, which is inexpensive, be removed and replaced when it becomes so clogged with grease or dirt as to impede the passage of air therethrough. As can be appreciated, such removal and replacement of the filter entails only the simple and quick removal of the guard or grill 28.

While the best known and preferred embodiment of this invention has been illustrated in the accompanying drawing and described herein, various modifications may be realized, as come within the spirit and the scope of the appended claim.

What is claimed is:

An exhaust fan assembly for an enclosure, having a wall element, said wall element having an inner surface and being formed with an opening having an inner end at the inner surface communicating with the interior of the enclosure, said exhaust fan assembly comprising an exhaust fan unit and a support structure therefor removably mounted in the opening, a guard completely overlying the inner end of the opening, anchoring means removably securing the guard in place and including an anchor element projecting from the support structure toward the inner surface of the wall element and disposed coaxially of the opening and a fastener element cooperating with the anchor element and engaging the guard to hold it in place, a fibrous filter removably secured in position be-

4

tween the inner end of the opening and the guard and completely overlying the opening and having boundary portions bearing against the inner surface of the wall element around the opening, said guard bearing into the fibers of the portion of the filter overlying the opening and pressing the boundary portions of the filter tightly against the inner surface of the wall element so that the filter is sealed between the bounding edges of the inner end of the opening and the guard, and said anchoring means for the guard passing through the filter, said guard and filter being removable whereby removal of the guard and the filter permits ready access to the support structure and fan unit for servicing thereof.

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