

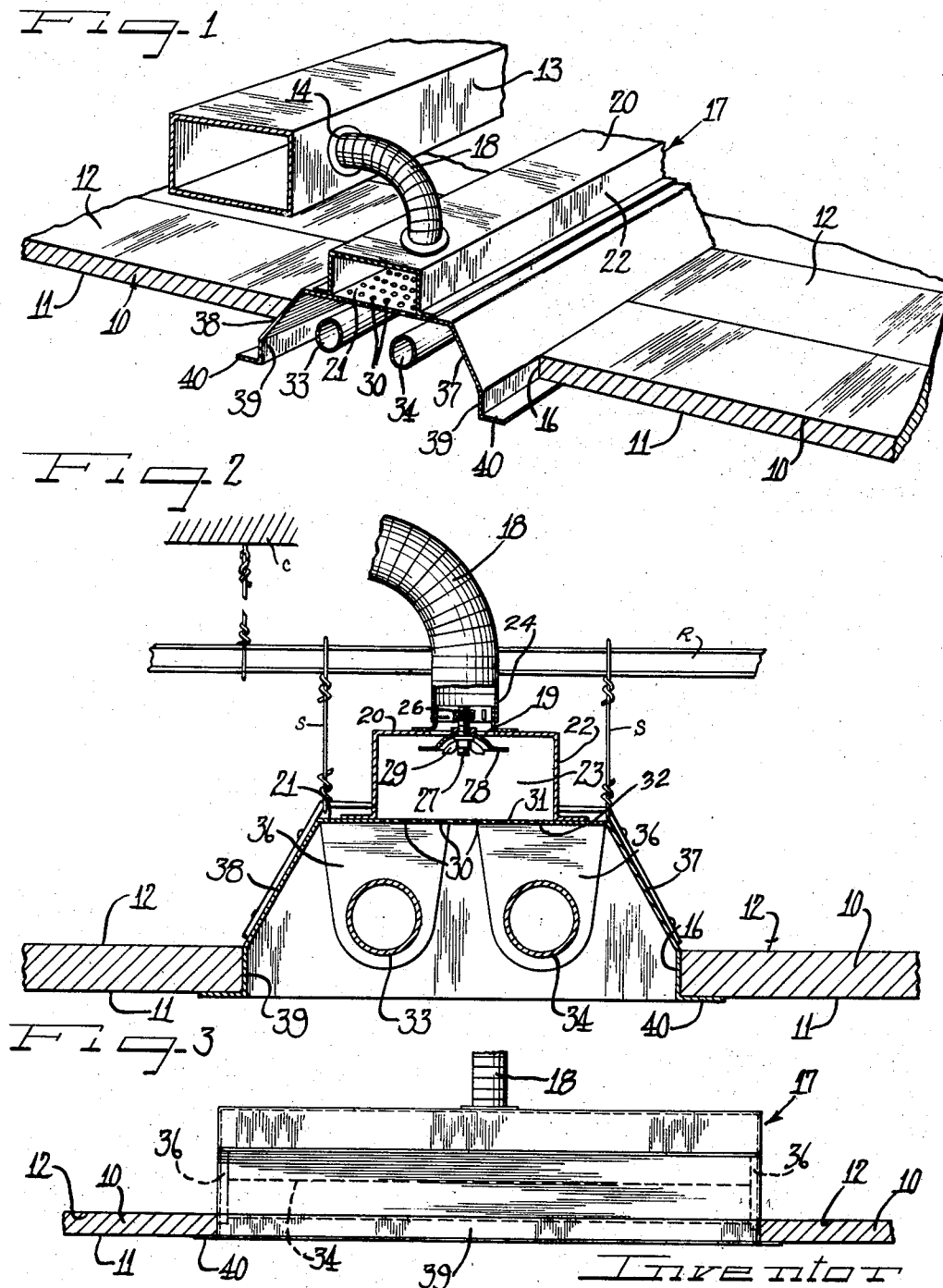
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COMBINATION LIGHT FIXTURE AND VENTILATING APPARATUS

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COMBINATION LIGHT FIXTURE AND VENTILATING APPARATUS

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This invention relates generally to ventilating apparatus and more particularly to a ventilating apparatus of the type wherein an air distributor unit comprises a combination air and light distributing means including wall means forming a plenum chamber having an inlet to admit air from a source at higher pressure and having an outlet formed in one of the wall means, particularly characterized by the formation thereon of a light reflective surface in registry with a light source so that the unit will distribute ventilating air into a space being ventilated concurrently with the reflection of light rays off the surface of the distributing unit into the same space.

It is an object of the present invention to provide a combination air and light distributor unit. It is another object of the present invention to provide a combination ventilating apparatus which will effect the simultaneous distribution of light rays.

Another object of the present invention is to provide an improved ceiling ventilating apparatus.

Yet another object of the present invention is to provide an air distributing apparatus which is concealed behind and forms a part of a ceiling or a wall surface.

A still further object of the present invention is to provide improved apparatus for ventilating equipment operable on the so-called pressure-displacement principle.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description which follows and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

Figure 1 is a fragmentary perspective view illustrating the application of a combination air and light distributor according to the present invention in a ventilating apparatus;

Figure 2 is a cross-sectional view of the combination air and light distributor unit provided in accordance with the principles of the present invention; and

Figure 3 is a side elevational view with parts broken away and with parts shown in cross-section of the unit shown in Figure 2.

As shown on the drawings:

A particularly useful application of the principles of the present invention is made in connection with the provision of a ceiling ventilating apparatus, although it will be understood that the ventilating apparatus of the present invention can be advantageously employed with any wall surface of an enclosure or space to be ventilated.

In the preferred embodiment shown by way of illustrative example, an inner wall 10 is spaced interiorly of the wall or ceiling of a space to be ventilated. Thus, in the illustrative embodiment shown in the drawings, the underside of the inner wall 10 and more specifically indicated by the reference numeral 11 constitutes a finished surface forming a part of the decorative treatment of the space

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being ventilated, while the upper side of the inner wall 10 and more specifically indicated by the reference numeral 12 forms the floor of a space which is located behind the inner wall and which will be understood to be the space enclosed between the inner wall and either the wall or ceiling of the space being ventilated. In other words, the inner wall 10 functions as a "false ceiling" in the illustrative embodiment herein described.

Extending through the space behind the inner wall 10 and concealed from the interior of the space being ventilated is a supply duct indicated at 13. The supply duct carries ventilating air at increased pressure and it will be understood by those versed in the art that the supply duct 13 forms a part of an air flow mechanism which can customarily include temperature conditioning means as well as pressurizing means such as a fan or blower.

The air supply duct 13 is provided with a plurality of openings each forming an outlet indicated at 14. It will be understood by those versed in the art that more than one air supply duct 13 may be provided or branch ducts may be connected to the outlet openings 14 which, in turn, will be supplied with separate outlet openings. In any event, a number of outlets 14 will be distributed in spaced relation behind the inner wall to effect the distribution of ventilating air throughout the space being ventilated.

In accordance with the principles of the present invention, the inner wall 10 is provided with an opening 16. Preferably, there are as many openings 16 in the inner wall 10 as there are spaced outlets 14 in the supply duct 13.

According to the principles of the present invention, a plurality of separate spaced apart outlet units are provided for each respective outlet 14 and opening 16. The outlet units are indicated generally at 17 and comprise combination air and light distributing units.

In a typical ceiling structure of an architectural unit, spaced supports are suspended from a plurality of runners R hung from a structural frame or main ceiling C of the architectural unit and the inner wall or ceiling 10 may be made up of acoustic tile parts. Thus, the outlet units 17 may conveniently comprise one of the spaced supports suspended as at S from the runners R and the tiles which form the inner wall 10 may be supported at one edge by a flange 40 formed on the outlet unit 17.

More specifically, each outlet unit 17 includes a flexible conduit 18 communicating with and leading from the supply duct 13. One end of the flexible conduit is connected to the supply duct 13 at the outlet opening 14 and the opposite end of the flexible conduit 18 is connected to an inlet 19 formed in the outlet unit 17.

Referring to Figure 2 in conjunction with Figure 1, it will be noted that the outlet unit 17 comprises a troffer light housing having side wall portions constructed to receive and engage the edges of an opening in a false ceiling and having other wall portions extending upwardly and inwardly to form a lighting trough above the level of the false ceiling. Thus, the outlet unit 17 comprises upper wall portions 20, lower wall portions 21, and side wall portions 22, all of the wall portions 20, 21 and 22 cooperating together to form a plenum chamber 23.

The inlet 19 constitutes an inlet for the plenum chamber 23 and air at increased pressure is supplied to the plenum chamber 23 from the supply duct 13 through the flexible conduit 18.

In order to selectively control the quantity of air supplied to the plenum chamber 23, a suitable control valve may be provided which, in this particular embodiment, takes the form of an upstanding flanged ring 24 mounted on the upper wall portions 20 and providing a collar for the conduit 18 at the inlet 19 and carrying a frame or

bracket 26 in which is adjustably carried an adjustment screw 27 supporting a disk-type valve 28 movable towards and away from the inlet 19 to selectively adjust the quantity of air flowing from the conduit 18 into the plenum chamber 23. A fastener 29 is provided to lock the valve 28 in selected positions of adjustment.

The lower wall portions 21 are preferably provided with means forming an outlet in communication with the space being ventilated, thereby permitting the distribution of air from the plenum chamber 23 into the space being ventilated.

Although the air outlet could take other forms, in this illustrative embodiment, it is contemplated that the lower wall portions 21 be provided with a great number of uniformly spaced perforations or apertures indicated at 30, thereby providing at the bottom of the plenum chamber 23 an open area of a predetermined proportion which will operate to diffuse air outwardly from the plenum chamber 23.

The upper surface of the lower wall portions 21 is indicated at 31 and constitutes the inner wall of the plenum chamber 23. The opposite side of the lower wall portions 21 is indicated at 32 and it will be appreciated that this side forms a surface which is exposed to the interior of the space being ventilated.

In accordance with the principles of the present invention, the surface 32 is formed as a light-reflective surface. It will be understood that the closed areas between the perforations or apertures 30 is also formed as a light-reflective surface so that the lower wall portions 21 actually develop a dual function in that these wall portions not only diffuse air but also reflect rays of light impinging thereupon. The plenum chamber formed in the troffer light housing is behind the air diffusion passages formed by the apertures 30 so that ventilating air is actually discharged through the air diffusion passages or apertures 30 through the lighting trough and into the space being ventilated.

The surface 32 may be endowed with light-reflective characteristics or properties in any well known manner, for example, by plating or silvering or by selecting a material such as a metal having a high gloss suitable for functioning as a reflector.

The distributing unit 17 carries a light source in register with the reflective surface 32 whereupon rays of light are emitted into the space being ventilated and are also impinged against the reflective surface 32. Thus, light rays are emitted through the lighting trough and into the space being illuminated.

In this particular embodiment, it will be noted that a pair of fluorescent tubes 33 and 34 are extended between mounting brackets 36 located at opposite ends of the distributing unit 17. It will be understood that the usual electric circuitry is provided to effect energization of the light source and in this specific instance, energization of the fluorescent tubes 33 and 34.

In order that the light sources will not actually protrude below the level of the finished surface 11 on the inner wall 10, the lower wall portions 21 of the present invention are extended to provide additional wall portions 37 and 38 diverging generally outwardly and downwardly away from the plenum chamber 23. The wall portions 37 and 38 are spaced laterally of the light source, or the fluorescent tubes 33 and 34, and it will be understood that the interior surface of the wall portions 37 and 38 is also formed as a reflective surface to assist

in reflecting light rays from the tubes 33 and 34 towards the interior of the space being ventilated.

The wall portions 37 and 38 terminate in a vertically extending flange 39 which fits closely in the opening 16 of the inner wall 10. Additionally, a horizontal flange 40 underlies the edges of the inner wall 10 at the opening 16 as described above.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon, all such modifications as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. In combination with a ceiling of a space to be illuminated and ventilated, a false ceiling spaced below said ceiling, a supply duct extending into the space above said false ceiling, a combination lighting-ventilating unit in said false ceiling and comprising a troffer light housing having side wall portions flanged to receive and engage the edges of an opening in said false ceiling, and having other wall portions extending upwardly and inwardly to form a lighting trough above the level of the false ceiling, elongated fluorescent tubes in said lighting trough, said other wall portions having a light-reflective surface formed on one side thereof behind said tubes, a plurality of air diffusion passages extending through said inwardly extending portions of said other wall portions and intersecting said reflective surfaces, said troffer light housing including additional means above said lighting trough forming with said inwardly extending portions a plenum chamber behind said air diffusion passages, and a flexible conduit interconnecting said troffer light housing at said plenum chamber and said supply duct to supply ventilating air, thereby to simultaneously diffuse ventilating air and emit and reflect light rays through said false ceiling via the lighting trough of the troffer light housing and into the space being illuminated and ventilated.

2. In the combination of claim 1, said inwardly extending portions of said other wall portions having a plurality of uniformly spaced perforations forming said air diffusion passages to diffuse air outwardly through the lighting trough.

3. In the combination of claim 1, valve control means in said flexible conduit between said plenum chamber and said supply duct to control the quantity of ventilating air supplied to the combination lighting-ventilating unit.

4. In the combination of claim 1, there being at least two of said elongated fluorescent tubes spaced apart from one another, said inwardly extending portions of said other wall portions having a plurality of spaced apertures forming said air diffusion passages therein and discharging air between the tubes outwardly through the lighting trough.

References Cited in the file of this patent

UNITED STATES PATENTS

2,210,589	Kurth	Aug. 6, 1940
2,564,334	Kennedy	Aug. 14, 1951
2,568,044	Wallen	Sept. 18, 1951
2,683,408	Brown et al.	July 13, 1954
2,701,998	Wulle	Feb. 15, 1955

FOREIGN PATENTS

375,862	Great Britain	July 4, 1932
117,399	Australia	Aug. 17, 1943