Aug. 27, 1957 F. J. KURTH 2,804,007

ANTI-SMUDGING ELEMENT FOR AIR OUTLET DEVICE

Filed May 25, 1951

Fig. 1.

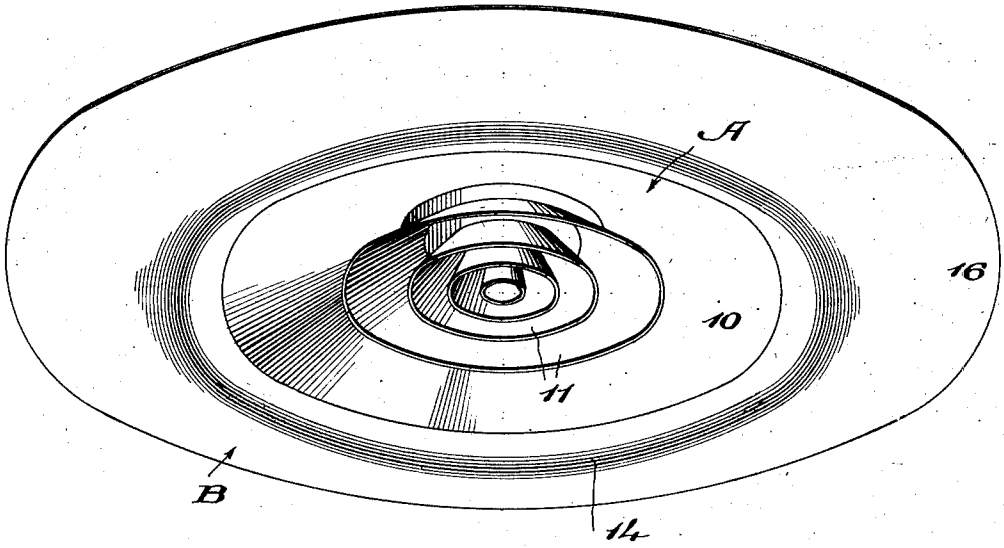


Fig. 2.

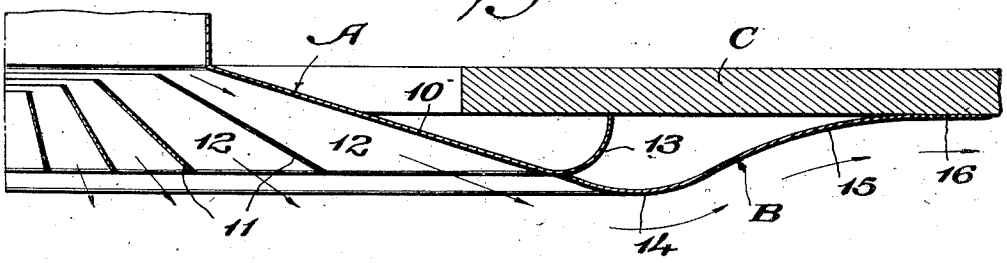
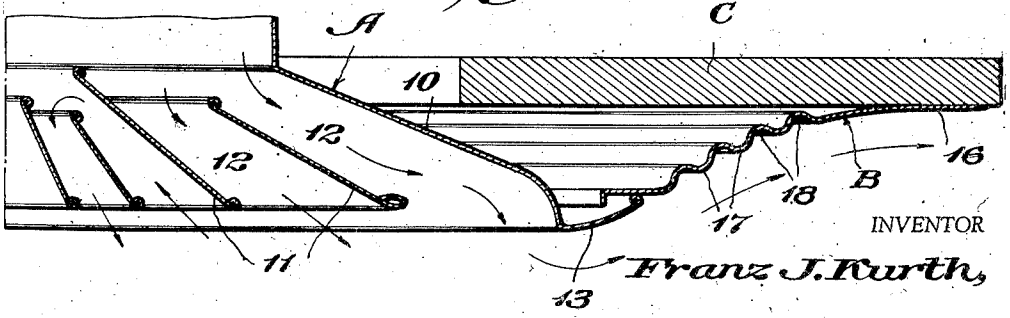


Fig. 3.



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ANTI-SMUDGING ELEMENT FOR AIR OUTLET DEVICE

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11 Claims. (Cl. 98—40)

This invention relates to ventilating apparatus, and has particular reference to ceiling or wall anti-smudging elements for use in association with the air outlet devices of such apparatus.

A commonly used type of air outlet device for ventilating apparatus is one which has its air outlet end located more or less in advance of the exposed surface of a ceiling or wall and which acts to effect more or less lateral deflection of air across the surrounding ceiling or wall area. The air delivered from the device may contain dust particles or it may pick up dust particles from the air contained in the room or other enclosure into which it is delivered. In either case flow of air from the air outlet device over the surrounding ceiling or wall area usually produces, sooner or later, on said area an unsightly settling or deposit of dust, or smudge, which is most pronounced adjacent to the air outlet device and which gradually diminishes outwardly therefrom.

Most ceilings and walls have more or less rough surfaces and are more or less porous. Therefore, they retain dust which penetrates their pores and are difficult if not impossible to clean, especially in cases where considerable amounts of dust settle or are deposited thereon in relatively small areas as, for example, in surrounding relationship to air outlet devices.

It is in association with air outlet devices of the type mentioned that the present anti-smudge element particularly is designed for use, and the purpose of said element is to reduce and largely to eliminate settling or deposit of dust or so-called "smudging" of ceilings or walls in surrounding relationship to the air outlet devices due to flow of air from the latter.

The present anti-smudging element is in the form of a relatively wide ring or plate of circular, square or other shape, depending upon the shape of the air outlet device with which it is intended for use, and is designed to be mounted in surrounding or partially surrounding relationship to an associated air outlet device in covering relationship to that portion of a ceiling or wall which ordinarily is subjected to most pronounced smudging whereby said ceiling or wall portion is shielded against smudging. In accordance with the invention said ring or plate preferably is mounted so that it may readily be removed for cleaning and preferably is formed from a material which may easily be cleaned.

It has been found that a stream of air flowing adjacent to any given surface is attracted toward that surface due, no doubt, to the stream tending to carry along with it air between the stream and the surface with consequent creation of a low pressure area between the stream and the surface into which the stream is urged by the higher pressure at the outer side of the stream. It also has been found that a stream of air flowing over any given surface parallel or substantially parallel thereto has far less tendency to deposit dust upon the surface than a stream of air directed more or less against the surface. Therefore, since air is attracted toward a surface adjacent to which it flows, and since air flowing more or less parallel to a surface has less tendency to effect smudging of the surface, a special and important object of the present invention is to shape the front or exposed surface of the present anti-smudging ring or plate so that, either alone or in conjunction with a finishing flange at the front end of the outermost member of an air outlet device with which said ring or plate is used, it acts to attract air flowing more or less laterally outward from the air outlet device toward itself and to direct the air first rearwardly toward the surrounding ceiling or wall area and then laterally outward over said area parallel or substantially parallel thereto. Consequently, not only is the ceiling or wall area which is covered by said ring or plate completely shielded by said ring or plate against becoming smudged, but the ceiling or wall area outwardly of said plate is subjected to minimum smudging.

It has further been found that if the surface surrounding an air outlet device is corrugated or provided with rounded hills and valleys extending transversely to the path of flow of air from the air outlet device, a considerable amount of the dust contained in or picked up by the air settles or is deposited primarily in the corrugations, leaving the air more or less free of dust with correspondingly reduced capability of causing smudging of the ceiling or wall surface outwardly of the ring or plate. Accordingly, another special and important object of the present invention is to corrugate the present anti-smudging ring or plate in the manner and for the purpose indicated. Periodically or whenever considered necessary or desirable the ring or plate may, of course, readily be cleaned to remove dust therefrom.

Other objects of the invention are to provide an anti-smudging ring or plate which may readily be produced economically and which embodies a construction whereby it may readily be mounted in proper relationship to an air outlet device.

With the foregoing and other objects in view, as will become more fully apparent as the nature of the invention is better understood, the same consists in an anti-smudging ring or plate embodying the novel features of construction and its novel association with an air outlet device as are illustrated by way of example in the accompanying drawing and as will be hereinafter more fully described and claimed.

In the accompanying drawing, wherein like characters of reference denote corresponding parts in the different views:

Fig. 1 is a perspective view of an air outlet device and of an anti-smudging ring constructed and operatively mounted relative thereto in accordance with the invention.

Fig. 2 is an enlarged cross sectional view through a portion of the air outlet device and the anti-smudging ring shown in Fig. 1; and

Fig. 3 is a view similar to Fig. 2 illustrating an alternative form of the invention.

Referring to the drawing in detail, A designates, generally, an air outlet device of a type with which the present anti-smudging element is designed for use, and B designates, generally, an anti-smudging element formed in accordance with the invention and operatively mounted relative to said air outlet device.

The air outlet device A is of a well known type comprising an outermost, open-ended, hollow flaring member **10** designed to be connected at its smaller or rear end to an air supply duct and containing a plurality of other successively smaller, open-ended, hollow, flaring members **11** spaced inwardly from said member **10** and from each other to provide between said members a plurality

of passageways **12** which flare relative to the longitudinal axis of the device and through which the supplied air flows. The members **11** serve to divide the supplied air into a plurality of separate streams and to deflect the streams more or less laterally outward, whereby the air is delivered more or less laterally from the device in diffused, substantially draftless form.

As will be understood, the air outlet device A is not necessarily of the specific construction illustrated, but may be of any other specifically different construction such that air flows more or less laterally therefrom. Moreover, said device A may be of circular shape, as illustrated, or of any other shape such, for example, as square or substantially semi-circular as illustrated in my prior Patent No. 2,300,049, of October 27, 1942.

The anti-smudging element B may be either in the form of a ring disposed in surrounding relationship to the air outlet device A, as shown, or it may be of such other shape, depending upon the shape of the air outlet device, as to cover that portion of a ceiling or wall over which air is discharged from the air outlet device A. Moreover, said element B may be formed in any suitable manner from any suitable material and may be either separate from or integral with the air outlet device A.

As aforesaid, an air outlet device such as the device A usually is mounted in an opening in a ceiling or wall C and has its front or air outlet end disposed more or less in advance of the exposed surface of said ceiling or wall. Hence, air discharged more or less laterally from such an air outlet device flows outwardly across the exposed surface of the ceiling or wall C and is urged toward said surface because it tends, as aforesaid, to carry along therewith the air in the space between the air stream and the surface and thus creates in said space a low pressure zone into which the stream is urged by the greater pressure of the room or enclosure air in front of said stream. Accordingly, for the purposes of completely protecting the ceiling or wall area in the immediate vicinity of the air outlet device A against the smudging effect of air flowing from the air outlet device and of directing the air parallel or substantially parallel across the exposed surface of the ceiling or wall C outwardly of the ring or plate B, the front or exposed face of said ring or plate B is of a contour to extend from the front end of the air outlet device to the said exposed surface of the ceiling or wall C and to have a gradual rearward and outward or concave curvature, as indicated at **15**, leading to an outer terminal portion **16** which is disposed parallel or substantially parallel to and against or closely adjacent to the exposed surface of the ceiling or wall C. Thus, the air in following the curvature of the front face of said ring or plate is led or guided first rearwardly and outwardly in a suitable curve to the exposed surface of the ceiling or wall C outwardly of said ring or plate and finally is directed across said surface parallel or substantially parallel thereto, whereby it has least tendency to cause smudging of said surface. In this connection it will be understood that the ring or plate B is of a width to protectively cover a suitably wide portion of the ceiling or wall surface adjacent to the air outlet device A so that said removable, readily cleanable ring or plate is subjected to a major amount of the total smudging and the ceiling or wall surface outwardly of said ring or plate is subjected to very little smudging.

As shown, the front or exposed face of the inner or forwardmost part **14** of the element B may be convexly curved to guide the air in a smooth and regular curve from the outlet end of the device A to the concavely curved portion **15** of the front face of said element B. This, however, is not essential since the concave curvature of the front face of the element B may begin at or adjacent to the front or outlet end of the device A. This is particularly true in certain instances where the member **10** of an air outlet device may have at its front end a finishing flange **13** of a shape to lend itself as a transformation piece between the front end of the air outlet device and the ring or plate B. In any such instance the element B need be only concavely curved and be disposed to constitute, in effect, an outward continuation of the flange **13**.

If desired, the front or exposed face of the element B may be continuously smooth and uninterrupted, as illustrated in Figs. 1 and 2 of the drawing. On the other hand, a suitable portion of said face may be corrugated as illustrated in Fig. 3 of the drawing, to provide any desired number of rounded hills **17** and intermediate rounded valleys **18** extending transversely to the direction of flow of air over said face. If such hills and valleys are provided, the air flowing over them creates in the valleys eddy currents which have the effect of causing dust contained in or picked up by the air flowing over said face to settle and collect in said valleys. Thus, by corrugating the element B in the manner indicated, much of the dust contained in or picked up by the air will be removed by the corrugations before the air reaches the ceiling or wall surface outwardly of the element B, whereby little smudging of said surface will occur.

If the element B is formed from sheet material it may readily, easily and economically be produced by a stamping or spinning operation, and if it should be formed from sheet material and have corrugations the latter serve also to stiffen and reinforce the same.

In any instance where the inner portion of the element B overlies the finishing flange **13** of an air outlet device A, said element B may be secured in proper position relative to the air outlet device in any desired manner as, for example, by being secured either to the air outlet device or to the ceiling or other wall C by screws or other suitable fasteners. On the other hand, the flange B may overlie the inner portion of the element B as illustrated in Fig. 3 of the drawing and thus act to retain said element against the ceiling or other wall C in proper relationship to the air outlet device.

From the foregoing description considered in connection with the accompanying drawing, it is believed that the construction and operation of the present anti-smudging element for air outlet device will be clearly understood and its advantages appreciated. It is desired to point out, however, that while only certain specific embodiments of the invention have been illustrated and described, the same is readily capable of specifically different embodiments within its spirit and scope as defined in the appended claims.

I claim:

1. In combination with an air outlet device mounted with its front or air discharge end in advance of the exposed surface of a ceiling or wall and operable to effect lateral discharge of air over said surface, said air outlet device having at its front end an outwardly extending finishing flange, an air guiding element of material width separate from said air outlet device extending outwardly from said flange over a relatively wide portion of said surface and having its front or exposed face cooperating with the front or exposed face of said flange to provide a surface a major portion of which is curved generally continuously and gradually rearwardly and outwardly toward said surface and terminates in a flat portion disposed adjacent and substantially parallel to said surface.

2. In combination with an air outlet device mounted with its front or discharge end in advance of and adjacent to a ceiling or wall surface and which is operable to effect lateral discharge of air over said surface, an air guiding element of substantial width extending laterally outward from the front end of said air outlet device and forming a continuation thereof, said element extending over a substantial portion of said ceiling or wall surface and having a major portion of its front or exposed face continuously and gradually concavely curved outwardly and rearwardly with respect to said ceiling or wall surface to guide air from the front end of said air

outlet device toward said surface, said element terminating in a flat portion disposed adjacent and substantially parallel to said surface to guide the air substantially parallel to said surface.

3. In combination with an air outlet device mounted with its front or air discharge end adjacent to a ceiling or wall surface and which is operable to effect lateral discharge of air over said surface, an air guiding element of substantial width extending laterally outward from the front end of said air outlet device and forming a continuation thereof, said element extending over a substantial portion of said ceiling or wall surface and having its front or exposed face continuously and gradually curved first convexly outwardly and forwardly relative to the front end of said device and then concavely outwardly and rearwardly with respect to said ceiling or wall surface to guide air from the front end of said air outlet device toward said surface, said element terminating in a flat portion to lie adjacent to and substantially parallel to the ceiling or wall surface to guide the air substantially parallel to said surface.

4. An anti-smudging element for use in association with an air outlet device of a type to be mounted with its front or air discharge end adjacent to and in advance of a ceiling or wall surface and which is operable to effect lateral discharge of air over said surface, said element being designed to be mounted to extend laterally outward from the front end of said device, said element being formed so that when it is so mounted its front face constitutes a continuation of the front end of said device, said element being of substantial width to overlie a substantial portion of said surface, a major portion of the front or exposed face of said element being continuously and gradually concavely curved outwardly and rearwardly to guide air from the front end of the air outlet device toward the ceiling or wall surface, said element terminating in a flat portion to lie adjacent to and substantially parallel to the ceiling or wall surface to guide the air substantially parallel to said surface.

5. An anti-smudging element for use in association with an air outlet of a type to be mounted with its front or air discharge end adjacent to a ceiling or wall surface and which is operable to effect lateral discharge of air over said surface, said element being designed to be mounted to extend laterally outward from the front end of said device, said element being formed so that when

it is so mounted its front face constitutes a continuation of the front end of said device, said element being of substantial width to overlie a substantial portion of said surface, the front or exposed face of said element being continuously and gradually curved first convexly and then concavely outwardly and rearwardly to guide air from the front end of the air outlet device toward the ceiling or wall surface, said element terminating in a flat portion to lie adjacent to and substantially parallel to the ceiling or wall surface to guide the air substantially parallel to said surface.

6. The combination as set forth in claim 2 in which the front or exposed face of the anti-smudging element embodies corrugations extending transversely to the direction of flow of air from the air outlet device over said element.

7. An anti-smudging element as set forth in claim 4 in which the front or exposed face of said element embodies corrugations extending transversely to the direction of flow of air from the air outlet device over said surface.

8. The combination as set forth in claim 2 in which the air guiding element encompasses the air outlet device.

9. The combination as set forth in claim 3 in which the air guiding element encompasses the air outlet device.

10. An anti-smudging element as set forth in claim 4, said element being of ring-like form to encompass the air outlet device.

11. An anti-smudging element as set forth in claim 5, said element being of ring-like form to encompass the air outlet device.

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