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(54) **Wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside**

(57) A wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside, the grille being constituted by a perimetric frame (11) inside which a series of deflecting vanes (12a, 12b, 12c, 12z) are fixed in a parallel arrangement and have a

substantially concave transverse cross-section with the concavity directed upward, the vanes (12a, 12b, 12c, 12z) having, on their bottom (13), drainage openings (14) for draining rainwater toward an underlying sloping wing (15) which is interposed between the last lower deflecting vane (12a) and the lower edge (16) of the frame (11).

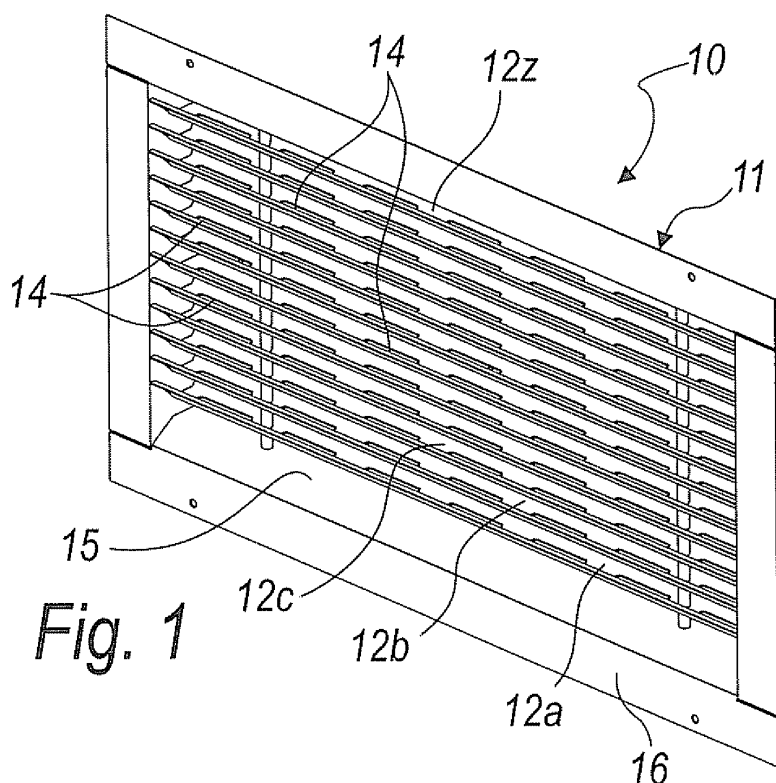


Fig. 1

Description

[0001] The present invention relates to a wall-mounted grille particularly for the passage of air from a conditioning unit toward the outside.

[0002] Currently known air-conditioning units often have the option known as free cooling.

[0003] The free cooling option is based on the ability of the climate control unit to use, for the air-conditioning of an enclosed space, air which arrives from outside when said air has a higher enthalpy value than the air of the interior space.

[0004] Free cooling allows considerable energy saving on the part of the user as well as a healthier management of the air of the interior space, which is appropriately changed upon activation of free cooling.

[0005] Known types of free cooling air-conditioning units are installed generally flush-mounted with respect to the walls that form the enclosed space to be climate-controlled, or inside said enclosed space, and are connected to the outside environment by means of a port for drawing air from the outside environment and a port for discharging the warm air outside.

[0006] Such ports, which are opened in a wall, are generally close to each other, and for this reason they are protected by grilles intended to allow the passage of air and prevent the entry of rain if applied to the perimetric walls of buildings.

[0007] Currently known grilles installed at the discharge port are indeed contoured so as to allow any water that rains against them to be drained, by comprising a series of horizontal deflecting vanes which slope from the inside outward.

[0008] In some operating conditions of the air-conditioning unit, such a grille is unable to deflect the outgoing stream of warm air so as to avoid the occurrence of a so-called "short circuit" i.e., direct recirculation, through the nearby intake port, of the warm air that has just been expelled from the climate-controlled space by means of the discharge port.

[0009] The aim of the present invention is to provide a wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside which is capable of deflecting the air discharged by the air-conditioning unit so that recirculations of warm air with the nearby intake port are not produced.

[0010] Within this aim, an object of the present invention is to provide a grille which is simple to compose and install.

[0011] Another object of the present invention is to provide a grille which protects the conditioning unit from the rain at least as much as known grilles.

[0012] Another object of the invention is to provide a grille which can also be applied to currently existing discharge ports occupied by grilles of a known type.

[0013] Another object of the present invention is to provide a wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside which

can be manufactured cheaply with known systems and technologies.

[0014] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside, characterized in that it is constituted by a perimetric frame inside which a series of deflecting vanes are fixed in a parallel arrangement and have a substantially concave transverse cross-section with the concavity directed upward, said vanes having, on their bottom, a drainage opening for draining rainwater toward an underlying sloping wing which is interposed between the last lower deflecting vane and the lower edge of the frame.

[0015] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a grille according to the invention;

Figure 2 is an exploded perspective view of parts of the grille;

Figure 3 is a sectional cutout side view of the grille according to the invention.

[0016] With reference to the figures, a wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside, i.e. from the enclosed space to be conditioned toward the outside environment according to the invention is generally designated by the reference numeral 10.

[0017] For the purposes of the description of a preferred but not exclusive embodiment of the invention, terms used hereinafter such as "lower", "upper", "upward", "downward", "horizontal" or "vertical", all refer to the grille, as shown in the figures, in a normal operation configuration.

[0018] The grille 10 is constituted by a perimetric frame 11, inside which a series of deflecting vanes 12a, 12b et cetera are fixed in a parallel configuration and have a substantially concave transverse cross-section in which the concavity is directed upward.

[0019] Drainage openings 14 for draining rainwater toward a lower, underlying sloping wing 15, formed by a profile element interposed between the last lower deflecting vane 12a and the lower edge 16 of the frame 11, are formed on the bottom 13 of the vanes 12a, 12b et cetera.

[0020] In the embodiment of the invention described here by way of non-limiting example, the vanes 12a et cetera are parallel and horizontal, and the openings 14 are constituted by a plurality of suitably equidistant slots.

[0021] The vanes 12a, 12b et cetera are fixed to the frame 11 by means of fixing means constituted by two vertical bars 17 which have threaded ends 18, each bar being retained between two bolts 19 which are screwed against the upper wall 20 and the lower wall 21 of the

frame 11.

[0022] The vanes 12a et cetera are spaced from each other and from the lower and upper walls 20 and 21 by means of tubular spacers 22, which are fitted concentrically on the bars 17 alternately with respect to the vanes 12a et cetera.

[0023] The grille 10 is completed by a net 23 for protection against the entry of insects, which is arranged so as to affect the internal face, i.e., the face directed toward the interior environment, of the grille 10.

[0024] In the embodiment of the grille 10 shown here by way of non-limiting example of the invention, the cross-section of the vanes 12a et cetera is substantially V-shaped, with the outer wing 24 which is longer than the inner wing 25 and is inclined symmetrically with respect to the inner wing 25; the outer wing 24 ends with a substantially horizontal end flap 26.

[0025] Conveniently, the vanes 12a, 12b, 12c et cetera are assembled so that the bottom 13 of the overlying vane, for example 12b, lies substantially on the same plane of arrangement as the end flap 26 of the lower vane 12a; in this manner, the two vanes form a substantially S-shaped air deflection path, and said air is deflected upward in output by the two nearby outer wings 24 of the two subsequent vanes 12a and 12b.

[0026] Of course, as mentioned, the tubular spacers 22 can be provided with any height according to requirements and needs, and the dimensions of the cross-section of the path for the air between two successive vanes vary accordingly with them.

[0027] The net 23 for protection against insects is electrogalvanized and is fixed by means of rivets 27 to the rear fold of the upper vane 12z and of the lower profile which forms the sloping wing 15.

[0028] As an alternative, the net 23 can be spot-welded to the vanes.

[0029] The vanes 12a et cetera, the frame 11 and the profile element with sloping wing 15 are manufactured cheaply by using sheet metal.

[0030] In practice it has been found that the invention thus described solves the problems shown by known types of grille.

[0031] In particular, the present invention provides a wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside which, by virtue of the V-shaped cross-section with outer wings 24 which are longer than the inner wings 25, is capable of deflecting the air discharged by the air-conditioning unit so as to not generate warm air recirculations with the underlying intake port.

[0032] Further, the present invention provides a grille that is simple to compose and install.

[0033] Moreover, the present invention provides a grille which protects the conditioning unit against rain at least as much as known grilles, with the concave shape of the vanes and the draining slots 14.

[0034] Further, the grille 10 according to the invention can be applied also to existing discharge ports occupied

by known types of grille, since it is sufficient to manufacture it of the appropriate size.

[0035] Moreover, the present invention provides a wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside which can be manufactured cheaply with known systems and technologies.

[0036] In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.

[0037] The disclosures in Italian Patent Application No. PD2007A000064 from which this application claims priority are incorporated herein by reference.

[0038] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A wall-mounted grille particularly for the passage of air from an air-conditioning unit toward the outside, **characterized in that** it is constituted by a perimetric frame (11) inside which a series of deflecting vanes (12a, 12b, 12c, 12z) are fixed in a parallel arrangement and have a substantially concave transverse cross-section with the concavity directed upward, said vanes (12a, 12b, 12c, 12z) having, on their bottom (13), drainage openings (14) for draining rainwater toward an underlying sloping wing (15) which is interposed between the last lower deflecting vane (12a) and the lower edge (16) of the frame (11).
2. The grille according to claim 1, **characterized in that** said openings (14) are constituted by a plurality of suitably equidistant slots.
3. The grille according to the preceding claims, **characterized in that** said vanes (12a, 12b, 12c, 12z) are fitted so that they are substantially horizontal once the grille is installed.
4. The grille according to the preceding claims, **characterized in that** the cross-section of the vanes (12a, 12b, 12c, 12z) is substantially V-shaped, with the outer wing (24), which is longer than the inner wing (25), inclined symmetrically with respect to the inner wing (25).
5. The grille according to the preceding claim, **characterized in that** said outer wing (24) ends with a substantially horizontal flap (26).

6. The grille according to one or more of the preceding claims, **characterized in that** said vanes (12a, 12b, 12c, 12z) are fixed to the frame (11) by means of at least two vertical bars (17) with threaded ends (18), each of which is retained between two bolts (19) which are screwed against the upper wall (20) and the lower wall (21) of the perimetric frame (11). 5

7. The grille according to one or more of the preceding claims, **characterized in that** said vanes (12a, 12b, 12c, 12z) are spaced from each other and from the lower and upper walls (20, 21) by means of tubular spacers (22) which are fitted concentrically over the bars (17) alternately with respect to the vanes (12a, 12b, 12c, 12z). 10 15

8. The grille according to one or more of the preceding claims, **characterized in that** said vanes (12a, 12b, 12c, 12z) are assembled so that the bottom (13) of an overlying vane lies substantially on the same plane of arrangement as the end flap (26) of the underlying vane, so that the two vanes form a substantially S shaped air deflection path, said air being diverted upward in output by the two nearby outer wings (24) of the two subsequent deflection vanes. 20 25

9. The grille according to one or more of the preceding claims, **characterized in that** said tubular spacers (22) can be provided of any height depending on requirements and needs. 30

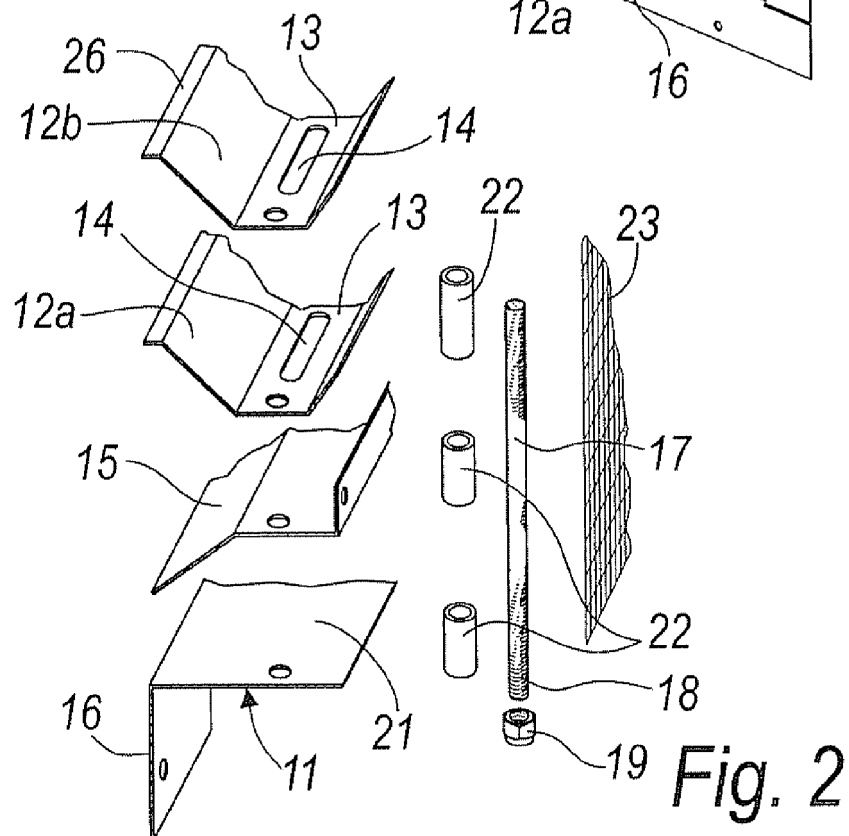
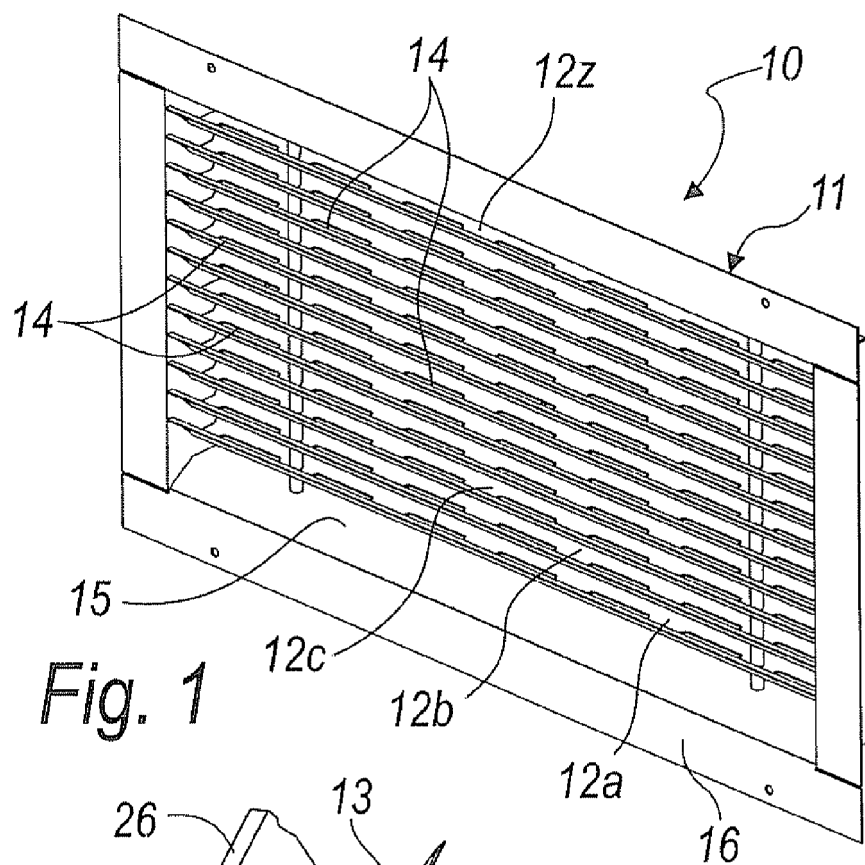
10. The grille according to one or more of the preceding claims, **characterized in that** it comprises a net (23) for protection against the entry of insects, which is arranged so as to affect the inner face, i.e., the face directed toward the interior environment, of the grille (10). 35

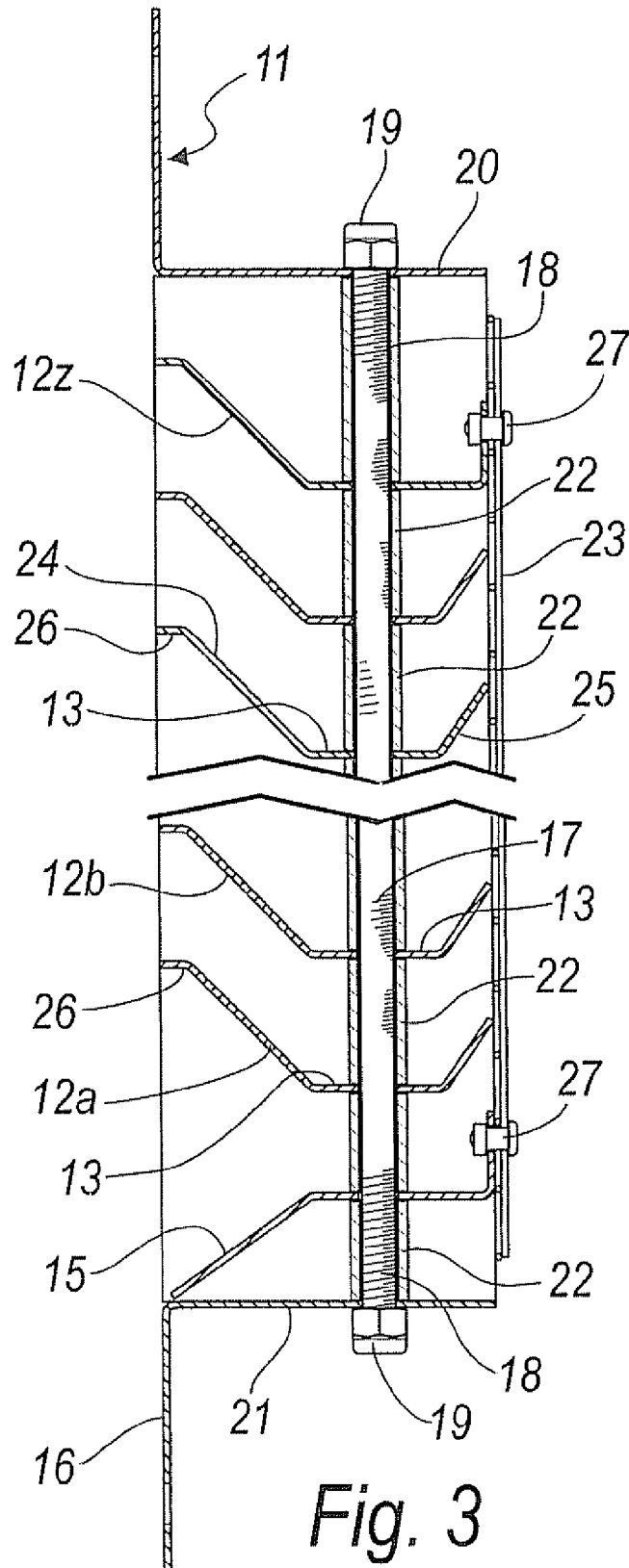
11. The grille according to the preceding claim, **characterized in that** said net (23) is fixed by means of rivets (27) to the rear fold of the upper vane (12z) and of the lower profile which forms the sloping wing (15). 40

12. The grille according to one or more of the preceding claims, **characterized in that** said net (23) is spot-welded to the vanes or to the frame (11). 45

13. The grille according to one or more of the preceding claims, **characterized in that** the vanes (12a, 12b, 12c, 12z), the frame (11) and the profile with a sloping wing (15) are made of sheet metal. 50

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT PD20070064 A [0037]