

Floor outlet

5 This invention relates to a floor outlet which essentially consists of a cylindrical casing which can be inserted in a floor aperture, and a circular plate which covers the casing and is provided with outlet openings. Under the plate there is a disc which is mounted height-adjustably, by means of which cross-sections of the outlet openings can be completely or partially shut off or exposed depending on the position of the disc.

10 In a floor outlet of this type which is known from DE 39 28 621 A1, the cylindrical casing is provided with a collar which widens radially outwards in the form of an arc and which extends into a flange resting on an edge of the floor aperture. An insert with a curved surface in the shape of a frustum of a cone, which tapers from top to bottom in the shape of a funnel, is concentrically disposed inside the casing. The outside of this
15 curved surface and the inside of the casing delimit an annular space, which in the plane of the flange disposed on the collar of the casing is narrowed by a radially outwardly projecting flange disposed on the insert. The outlet cross-section of the insert can be closed right down to an annular gap by a disc which is mounted height-adjustably.

20 By means of this known floor outlet, a relatively large horizontal depth of penetration of the emerging supply air streams can be ensured, and a low density of placement of the air outlets can thus be selected in order nevertheless to supply the entire room uniformly with air. In this respect, the floor outlet acts as a floor well outlet, in which the supply air is blown substantially horizontally into the room. However, the effect of
25 a floor swirl outlet, through which the supply air is blown substantially vertically into the room, cannot be achieved with this floor outlet.

In order to produce a swirling flow, a floor outlet is already known from EP 0 446 557 A3 which is provided in a circular plate covering the casing with outlet slots oriented
30 slanting upwards. The plate is formed as a pair of plates, the outlet slots being aligned slanting in opposite directions in the individual plates. By means of a slight relative rotation of the individual plates the outlet slots can be correspondingly displaced in

relation to each other, due to which a limited alteration of the direction of outflow of the supply air streams is made possible.

5 With this known floor outlet, the individual streams of air blown into the room cannot be bunched, as in a conventional swirl outlet, to form a unitary, highly inductive consolidated stream which ascends steeply into the room.

10 The underlying object of the present invention is to construct a floor outlet of the type described initially so that it combines the blow-out properties of an outlet constructed as a floor well outlet and of an outlet constructed as a floor swirl outlet.

15 This object is achieved starting from a floor outlet of the type cited in the precharacterising clause of claim 1, which according to the invention has the features cited in the characterising clause of claim 1.

20 Due to the slots with their longitudinal interior curved surfaces aligned according to the invention, of which slots those which cross the inner reference circle can be completely shut off or exposed, the floor outlet can, by correspondingly adjusting the height of the plate, at times be operated as a floor well outlet having a substantially horizontal direction of blow-out and can at times be operated as a floor swirl outlet having a vertical direction of blow-out. For this purpose the plate is lowered to obtain the well outlet characteristic, so that free flow can occur through all the outlet slots, whilst for the swirl outlet characteristic the plate is raised, so that the slots disposed on the inner reference circle are shut off and flow can only occur through the slots disposed on the outer reference circle.

30 According to further embodiments of the invention the widths of the outlet cross-sections of the slots which cross the outer reference circle are narrowed by cover strips integrally formed on the plate, wherein each of these slots is provided with a cover strip on its longitudinal interior curved surface which is aligned at a slant pointing towards the inlet cross-section of the slot.

When the floor outlet is operated as a floor well outlet, the cover strips promote a deflection of the flow into the horizontal, wherein as a result of the Coanda effect the emerging air streams lie on the floor of the room to be ventilated. At the same time, the air streams which emerge through the slots disposed on the inner reference circle are deflected by the air streams emerging horizontally in the direction of the latter. If the floor outlet is operated as a swirl outlet, no air streams emerge from the slots associated with the inner reference circle, so that a reduced pressure arises inside this central region, due to which the air streams are deflected into the vertical direction, despite the cover strips, and are combined. Due to the overall stream produced in this manner, the supply air flows steeply upwards.

Finally, one form of the invention also provides for each of the of the slots crossing the outer reference circle to be provided in the region of its inlet cross-section with a longitudinal interior curved surface which is aligned at a slant pointing away from the inlet cross-section and which defines a convex arc.

By means of this form of construction, not only is the inflow aperture cross-section of the slots associated with the larger reference circle increased compared with the outflow cross-section of these slots, which is narrowed due to the cover strips, but in addition a sharp-edged construction of the inlet cross-section, which could cause noise at high flow rates, is avoided.

An example of an embodiment of a floor outlet according to the invention is described in detail below and illustrated in the drawings, where:

25

Figure 1 is a vertical transverse section through the floor outlet;

Figure 2 is a plan view of the floor outlet; and

30

Figure 3 is a portion of a transverse section of a plate covering the casing of the floor outlet, in the region of a slot.

The floor outlet, which can be inserted in a floor aperture, which is not illustrated, and the upper face of which terminates flush with the floor surface, comprises a cylindrical casing 1, which is provided with a conventional throttle device, which is therefore not illustrated, for the total volume flow which is to be supplied to the floor outlet. A dirt trap gauze 2 of the usual construction, which is also cylindrical, is inserted in the casing 1.

The top of the casing 1 is covered by a circular plate 3 which forms an outlet body. Under the plate 3 a disc 4 is mounted height-adjustably on a spindle 5 which is coaxial with the plate 3, so that the disc 5 is seated tight against the underside of the plate 3 in its upper position or can be moved into the lower position illustrated.

As shown in Figure 2, the plate 3 is provided with radial slots 5 and 6, the slots 5 being disposed uniformly distributed on an outer reference circle 7 and the slots 6 being disposed uniformly distributed on an inner reference circle 8.

As is made clear for the example of a slot 5 shown in Figure 3, the slots 5 and 6 are delimited by longitudinal interior curved surfaces 9 and 10 which run at a slant. As distinct from the slots 6, in each slot 5 an outlet cross-section 11 is narrowed by a cover strip 12, which is integrally formed on the plate 3 and which projects above the plane of the longitudinal interior curved surface 9. An inlet cross-section 13 is enlarged due to the longitudinal interior curved surface 10 which runs out downwards in a convex arc 14.

**CLAIMS**

1. A floor outlet, consisting of a cylindrical casing which is provided with a connecting sleeve and can be inserted in a floor aperture and a circular plate
5 which covers the casing and is provided with outlet openings, and of a disc which is mounted height-adjustably under the plate, by means of which disc cross-sections of the outlet openings can be completely or partially shut off depending on the position of the disc, characterised in that the outlet openings, which are uniformly distributed over at least two concentric reference circles (7, 8), consist
10 of radial slots (5, 6), the cross-sections of the slots (6) thereof which cross one inner reference circle (8) can be completely shut off by the height-adjustable disc, and that the longitudinal interior curved surfaces (9, 10) of all the slots (5, 6) are aligned slanting at an angle to the vertical.
- 15 2. A floor outlet according to claim 1, characterised in that the widths of the outlet cross-sections (11) of the slots (5) which cross the outer reference circle (7) are narrowed by cover strips (12) integrally formed on the plate (3).
- 20 3. A floor outlet according to claim 1 or 2, characterised in that each of the slots (5) crossing the outer reference circle (7) is provided with a cover strip (12) on its longitudinal interior curved surface (9) which is aligned at a slant pointing towards the inlet cross-section (13) of the slot (5).
- 25 4. A floor outlet according to any one of claims 1 to 3, characterised in that each of the of the slots (7) crossing the outer reference circle (7) is provided in the region of its inlet cross-section (13) with a longitudinal interior curved surface (10) which is aligned at a slant pointing away from the inlet cross-section and which defines a convex arc (14).