

United States Patent [19]

Krämer et al.

[11] B 3,913,468

[45] Oct. 21, 1975

[54] AIR DISTRIBUTOR

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[22] Filed: **June 9, 1972**

[21] Appl. No.: **261,378**

[44] Published under the Trial Voluntary Protest
Program on January 28, 1975 as document no.
B 261,378.

[30] Foreign Application Priority Data

June 11, 1971 Germany..... 2128987

[52] U.S. Cl..... **98/2.15**; 98/40 VM; 98/110

[51] Int. Cl.²..... **B60H 1/26**

[58] Field of Search 98/2.05, 2.06, 2.07, 2.08,
98/2.15, 64, 94, 110, 40 VM; 62/262

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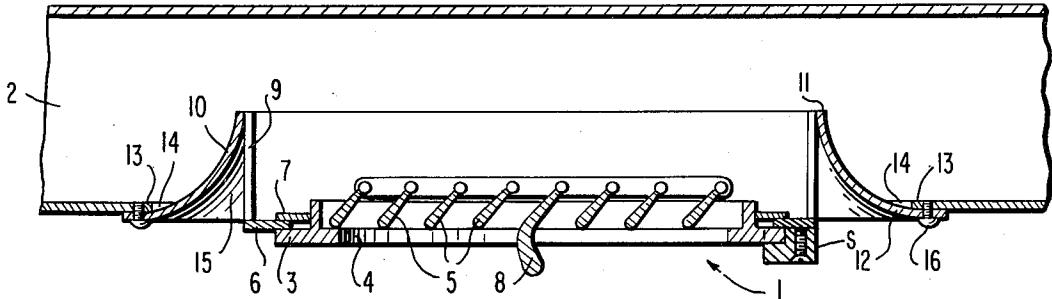
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[57] ABSTRACT

An air distributor used in an air duct for heating, ventilating and air conditioning systems in vehicles, particularly in buses, which includes a circular disk provided with an air opening and rotatably supported at a support plate; the circular disk carries slats pivotal jalousie-like about their longitudinal axis, of which one is provided with a handle to permit the circular disk as well as the slats to be pivoted independently of one another; the support plate is connected by way of webs with an annular flange whose inner edge projects into the air duct and whose outer flange-like end portion serves for the fastening of the air distributor at the edge of an opening provided in the air duct.

10 Claims, 2 Drawing Figures



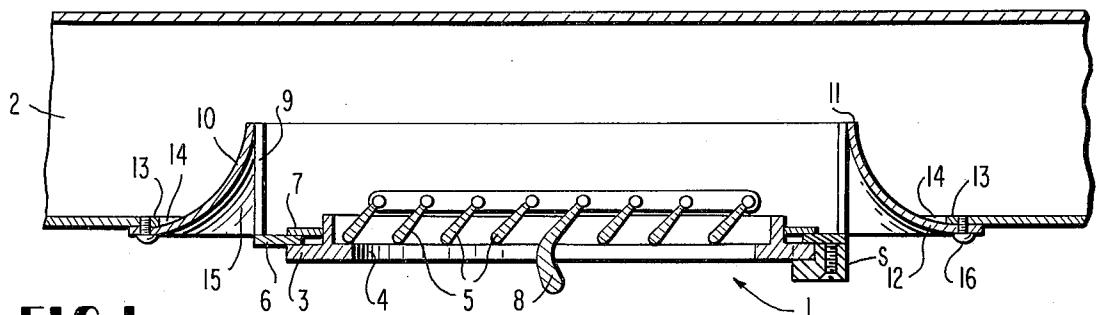


FIG. 1

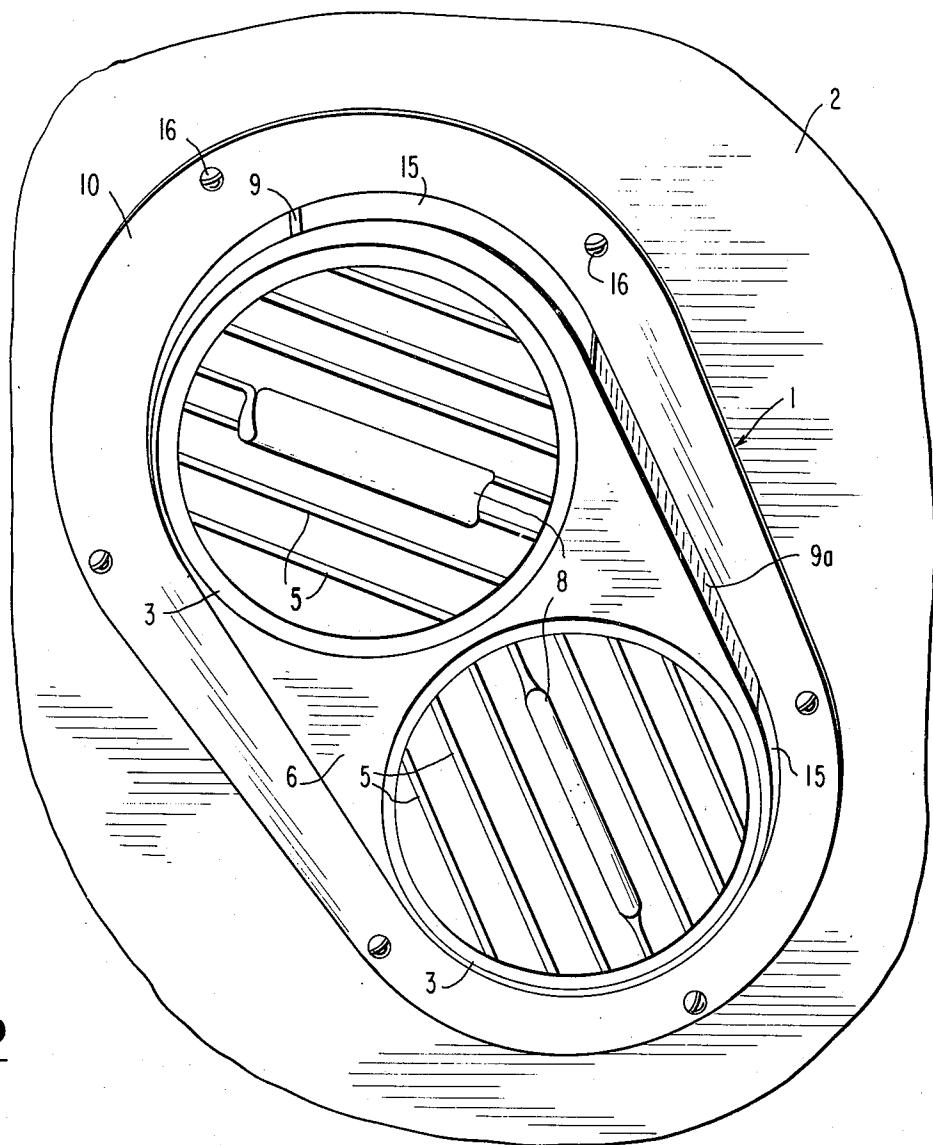


FIG. 2

AIR DISTRIBUTOR

The present invention relates to an air distributor for heating, ventilating and air-conditioning installations in vehicles, especially in buses, installed at an air channel or duct, with a circular disk rotatably supported at a support plate and provided with an air passage, which disk carries slats pivotal about their longitudinal axis in a jalousie-like manner, of which one slat is provided with a handle by means of which the circular disk as well as the slats can be pivoted independently of one another.

Especially in buses, ever greater demands are made in recent times as regards the freedom from draft, on the one hand, and the individual adjustability of heating, venting and air conditioning systems, on the other. These requirements led, on the one hand, to the installation of anemostats in buses, which assure a good freedom from drafts, but are not adjustable. These anemostats permit the air to leave horizontally along the ceiling and ensure the mixing of cool channel or duct air and warmed-up space air. On the other hand, adjustable and closable louvers (jalousies) or nozzles are installed at times, which fulfill the requirements for individual adjustability but give to the passenger the possibility to interfere in the basic venting and air conditioning system of the vehicle and thereby to impair the same.

The present invention is concerned with the task to provide an air distributor which combines in itself the advantages of the anemostat with the possibility of an individual air flow without disturbing thereby the basic ventilation or basic air condition of the vehicle.

The underlying problems are solved according to the present invention by a combination of structural elements from an anemostat with the structural elements of adjustable jalousies adapted to be closed in that the support plate is connected by way of webs with an annular flange whose inner edge projects into the air channel and whose outer flange-like end serves for the fastening of the air distributor at the edge of an opening disposed in the air channel.

According to a further feature of the present invention, two circular disks provided with slats may be arranged adjacent one another on one support plate. These air distributors combined into a single unit, which are arranged in the vehicle above a double-seat space, permit each passenger owing to their universal adjustability to adjust an air flow with a directed air jet in a desired manner or to close the air passage. However, also with a closed air passage, the air slots disposed between the webs ensure a draft-free basic ventilation which cannot be influenced by the passenger. This is so as with opened slats the portion of the area of the air slots in the entire discharge cross section is relatively small. The air therefore preferably flows through the slats in the respectively desired direction. Upon closing of the slats, the static counter-pressure increases in the channel or duct as a result of the reduced discharge area and an increase of the rate of air flow through the annular anemostat formed by the air slots is produced thereby. Thus, as a result of the closing of the slats in the air passage, an automatic shifting from the adjustable direct air flow into a draft-free pure ceiling air distribution is realized. Therebeyond, of course, every intermediate position is also possible.

In order to prevent that a passenger disturbs his or her neighbor with a directed air flow blowing against such neighbor, provision is made according to a still further feature of the present invention to limit the 5 pivotability of the circular disks to a predetermined range by means of abutments or stops. For the purpose of the adaptation to the respective vehicle, these abutments or stops may additionally be adjustable.

Accordingly, it is an object of the present invention 10 to provide an air distributor for vehicles, especially buses, which avoids by simple means the aforementioned shortcomings and drawbacks encountered in the prior art.

Another object of the present invention resides in an 15 air distributor which combines a draft-free ventilation and air conditioning of the vehicle with individual adjustability to suit individual desires.

A further object of the present invention resides in an 20 air distributor structure which is simple in construction and easy to install, yet offers great versatility as regards individual selective adjustment without adversely affecting the basic ventilating and/or air conditioning of the vehicle.

These and further objects, features and advantages of 25 the present invention will become more apparent from the following description when taken in connection with the accompanying drawing which shows, for purposes of illustration only, one embodiment in accordance with the present invention, and wherein:

FIG. 1 is a cross-sectional view through an air distributor in accordance with the present invention; and

FIG. 2 is a plan view of an air distributor with two circular disks in accordance with the present invention.

Referring now to the drawing wherein like reference numerals are used throughout the two views to designate like parts, an air distributor generally designated by reference numeral 1 for the heating, ventilating and air conditioning installations is illustrated in the drawing which is mounted at the ceiling of a bus on a ceiling air duct or channel 2. The air distributor 1 includes one or two pivotal circular disks 3 each having an air passage 4 that is adapted to be closed by slats 5 adapted to be pivoted at will in the longitudinal axis thereof. The circular disk 3 is inserted into a circular aperture at a support plate 6 and is secured by a ring 7 fastened thereon. The pivoting or closing of the slats 5 can be realized by rotation or movement of a handle 8. The passenger thus has the possibility to adjust the air directionally discharged through the air aperture 4 in the direction desired by him and thereby to adjust also the strength or intensity of the air jet by a more or less large opening of the slats 5.

Since in buses for the most part two seats are arranged adjacent one another, an air distributor with two air passages 4 arranged adjacent one another (FIG. 2) is also provided above each double seat. Each circular disk 3 belonging to a respective air passage 4 is constructed to be pivotal and the slats 5 thereof can be adjusted to a predetermined opening width by the passengers or can be closed by the passenger. Each passenger can therefore adjust his ceiling air distributor with respect to the discharged air direction and the quantity and intensity of the discharged air and appropriately uses for that purpose the existing handle 8. In order that a passenger cannot disturb his neighbor by the adjustment of the slats 5, the latter are provided with stops 9 which limit the pivotability of the circular disks

3. The stops may also be arranged adjustable for adaptation to the respective vehicle type.

The support plates 6 are connected by way of webs 9 with a ring flange 10 whose inner edge 11 projects into the air channel or duct 2. The annular flange 10 is constructed curved in cross section (FIG. 1) and is secured with its bent-off flange 12 at the edge 13 of an aperture 14 disposed in the air channel 2 by means of bolts or screws 16. The entire ceiling air distributor 1 is held at the ceiling air duct 2 by means of these screws 16.

The air stream, especially with closed slats 5, is always conducted through the air slots 15 remaining between the webs 9 in the same manner as in an anemostat in predetermined directions extending parallelly to the surface of the air channel 2. A basic draft-free ventilation of the vehicle is assured through these air slots 15 in every case also with closed slats 5.

For the adaptation to the particular requirements in a vehicle, the webs 9 may be made narrower or wider. Thus, for example, the air can be shielded in a predetermined direction by a wide web 9a (FIG. 2) and the air quantity discharged in this direction can be reduced thereby. On the other hand, the webs may also be made of wire.

While we have shown and described only one embodiment in accordance with the present invention, it is understood that the same is not limited thereto but is susceptible of numerous changes and modifications as known to those skilled in the art, and we therefore do not wish to be limited to the details shown and described herein but intend to cover all such changes and modifications as are encompassed by the scope of the appended claims.

What we claim is:

1. An air distributor at an air channel for heating, ventilating an air conditioning systems in vehicles, with a circular disk means provided with an air passage and rotatably supported at a support plate means, said circular disk means carrying slats pivotally adjustable about their respective longitudinal axis, one of said slats being provided with a handle to enable the circular disk means as well as the slats to pivot independently of one another, characterized in that the support plate means is connected by way of a web means with an annular flange means whose inner edge projects into the air channel and whose outer flange-like end portion serves for the fastening of the air distributor structure at the edge of an aperture provided in the air channel, the annular flange means includes a wall portion between the inner edge and the outer flange-like end portion, the wall portion extending into the air channel, the web means extends from the support plate means into the air channel for connecting a peripheral portion of the support plate means with the inner edge of the annular flange means and in that air slot means are defined between the wall portion of the annular flange, said support plate means and said web means for directing at least a portion of the distributed air in a predetermined direction parallel to the exterior of said air 60

channel.

2. An air distributor according to claim 1, characterized in that the vehicle is a bus.

3. An air distributor according to claim 1, characterized in that two circular disk means provided with slats are arranged adjacent one another on a single support plate means.

10 4. An air distributor according to claim 3, characterized in that the pivotability of each circular disk means is limited to a predetermined range by a stop means.

5 5. An air distributor according to claim 4, characterized in that the stop means is adjustable.

15 6. An air distributor according to claim 1, characterized in that the pivotability of each circular disk means is limited to a predetermined range by a stop means.

7. An air distributor according to claim 6, characterized in that the stop means is adjustable.

20 8. A fluid distributor arrangement comprising: channel means for conveying the fluid to be distributed, passage means for distributing said conveyed fluid including at least one disk means provided on said channel means at an opening thereof, a plurality of slat means pivotally mounted in said disk means for directing the flow of said distributed fluid, means for operatively interconnecting said plurality of slat means for movement in unison, means for rotatably mounting said disk means on said channel means, means for pivoting said slat means and for rotating said disk means independently of one another to control the direction and quantity of the distributed fluid, said means for rotatably mounting said disk means including flange means disposed on said channel means at the opening thereof, a support plate means for rotatably supporting said disk means, and web portions for connecting said flange

25 30 35 means with the periphery of said support plate means, said flange means including an outer end portion for fastening the fluid distributor arrangement at the opening of said channel means and a wall portion extending from said outer end portion into said channel means, and wherein additional fluid slot means defined between the wall portion of said flange means, said support plate means and said web means are provided in said channel means for directing at least a portion of the distributed fluid in predetermined directions substantially parallel to the exterior of said channel means.

40 45 50 55 9. A fluid distributor according to claim 8, wherein at least two rotatably mounted disk means are provided on said channel means arranged in close proximity to each other, each of said disk means being provided with a plurality of operatively interconnected pivotally mounted slat means, and means are provided for each of said two disk means for pivoting said slat means and for rotating said disk means independently of one another.

10. A fluid distributor according to claim 9, wherein web means are provided for shielding in a predetermined direction at least a portion of the distributed fluid.

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