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⑤④ **INTAKE AIR DISPERSER.**

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Description

The present invention concerns a ceiling disperser for intake air conducted into rooms or equivalent, comprising at least one intake air duct (11) in which the air flows substantially downwards, and a disperser component (12) proper in which the air flows substantially to the sides, and control and guiding means for guiding the air flowing from the disperser component (12), said control and guiding means comprising one or several air deflectors (17) located in the disperser component (12) outside the centre-line of the intake air duct (11) and pivoting under the effect of the air flow, disposed to change the effective outflow area of the disperser component (12) as the volumetric flow rate changes.

Through Patent DE-A-1 753 283 an apparatus arrangement is known in which the air is carried into the room through a hinged control plate covering the intake aperture, and said control plate operating according to the counterweight principle. The air is conducted from the intake duct with about 90° deflection to one side and it is made to flow into the room along the ceiling. In this design of prior art, the aim to keep both the initial velocity of the air and the ultimate velocity of the air at a given distance constant while the volumetric flow rate varies within a given range. In said design, the direction in which the air comes into the room is also substantially constant.

In the design disclosed in U.S. Patent No. 4, 259, 898, the air flow is divided among two flow paths, starting at the connector component of the disperser. By effect of a gravity-loaded control damper, the flow path leading to the margin of the disperser opens as the volumetric flow rate increases; similarly, it closes with diminishing volumetric flow rate by effect of the force which the air flow creates. The flow path leading to the central part of the disperser is continuously open, and through it the air is conducted, depending on the design, either to the side or straight downwards. It is thus understood that in this design the air is conducted into the room in such manner that when large air quantities are concerned the air will flow into the room space through the marginal as well as central region of the disperser, and in this case of small air quantities the air flows through the disperser's central region into the room.

In the design of DE-A-2 310 147, in each intake air disperser is used one gravity-loaded blow-in aperture shutter. As the air quantity changes, the shutter operating according to the counterweight principle opens/closes. The air is conducted into the room with substantially constant air inflow direction in the vertical cross section.

DE, A 31 39 997 describes a ceiling disperser (1) for intake air conducted into rooms or equivalent, comprising at least one air intake duct in which the air flows substantially downwards (8, 9), and a disperser

component proper in which the air flows substantially to the sides, and control and guiding means for guiding the air flowing from the disperser component, where said control and guiding means comprise one or several air deflectors (5) located in the disperser component outside the centre-line of the intake air duct and which pivot under the effect of the air flow, disposed to change the effective outflow area of the disperser component as the volumetric flow rate changes.

DE-C- 32 41 268 discloses another design of ceiling disperser. More particularly, DE-C-32 41 268 discloses a ceiling air outlet for air conditioning installations, comprising a housing (10) which is connected to an air inlet connecting piece (12), an air conduction grille (14), which closes off the underside of the housing (10), with air conduction surfaces (16) which extend downwards and laterally outwards, a separating wall (18) in the housing (10), said separating wall separating an inlet chamber (20), which is connected to the air inlet connecting piece (12), from a chamber (22) which is bounded by the air conduction grille (14), a ring of air outlet nozzles (24) which are located in the separating wall (18) and which are directed towards the edge parts of the air conduction grille (14), a central passage (26) in the separating wall (18) opposite the centre parts of the air conduction grille (14), and means of regulating the air flow through the central passage (26). The separating wall (18) forms an annular chamber (28) surrounding the central passage (26). The annular chamber is connected to the air outlet nozzles (24). The air inlet connecting piece (12) is divided into two ducts (30, 32), of which the first duct (30) is connected to the annular chamber (28) and the second duct (32) discharges in the inlet chamber (20). The means of regulating the air flow through the central passage (26) is formed by a valve element (34) in the form of a flap, arranged in the second duct (32), which valve element can be adjusted in the opening direction by the air flow against a restoring force. A lever (38) is connected to the axle (36) of the flap (34), the lever carrying a weight (40) for creating the restoring force. A shield-like throttle element (42) is arranged opposite the central passage (26). The annular chamber (28) is divided by a perforated plate (44) into a chamber (46) in which the first duct (30) of the air inlet connecting piece (12) discharges, and a chamber (48) which is connected to the air outlet nozzles (24).

However, there has not been presented in any of the mentioned publications a construction which is characterized by our invention, in which the disperser component comprises a first duct section from which the air flow is adapted to flow substantially following the ceiling, and a second duct section from which the air flow is adapted to flow at least partly obliquely downwards and/or downwards, and that the control means are adjusted to operate in such a way that the

air flow at low volumetric flow rates is directed into the first duct section and at higher volumetric flow rates into both the first duct section and the second duct section.

In DE-A-31 39 997 for instance there is not any second duct at all. Correspondingly the control means of the air flow are lacking in DE-C-32 41 268, by which means the air flow is directed either into the first duct, only, at low flow rates or into both the first duct and the second duct at higher flow rates.

The general objective of the present invention is to provide a simple and reliably operating intake air disperser to be mounted on the ceiling by which it is possible without using any external or extra energy to distribute the intake air in an efficient way causing no draft and no noise, in various instances and situations of application.

The more detailed object of the invention is to provide an intake air ceiling disperser

- by which air can be distributed in the room space substantially parallel to the ceiling and in those directions which are required in each instance,
- the throw distance of which, in desired directions, can be regulated to be as desired, within a given volumetric flow rate range,
- the throw distance of which, in desired directions, can be maintained as desired, with sufficient accuracy, while the volumetric flow rate varies within a given range,
- which operates on its own power, with low duct pressures,
- the pressure drop of which is not substantially dependent on volumetric flow rate nor blowing pattern,
- which requires no more space than a conventional ceiling disperser, particularly not above the suspended ceiling,
- which is easy to install, adjust and service,
- of which the volumetric flow rate can be ascertained from the outside,
- which is easy to substitute for a conventional ceiling disperser,
- which can be manufactured in a simple and advantageous way.

The aims of the invention are attained with a ceiling disperser which is mainly characterized in that the control and guide means comprise one or several air deflectors located in the disperser component, outside the centre-line of the intake air duct, and swivelling under effect of the air flow, disposed to change the effective outflow area of the disperser component as the volumetric flow rate changes.

The control means have been arranged to change the throw pattern of the air flow emerging from the ceiling disperser in such a way that the throw length of the air flow is constant within a given volumetric flow rate range.

In the ceiling disperser of the invention the pressure variation of the flow is applied as control force. The force counteracting the force resulting from the flow is constituted, in an advantageous embodiment of the invention, by the force which is caused by a counterweight on the control plate. The force equilibrium determines the position of the control plate at any time.

In an advantageous embodiment of the invention, guidance of the air flows in the ceiling disperser is in four cardinal directions, or sectors, with the aid of four separate guide plates, which move simultaneously and thereby control the travel of air in accordance with the volumetric flow rate. In each cardinal air dispersing direction the air entering the room is dispersed as a function of the volumetric flow rate in such manner that at low volumetric flow rate the whole air flow is directed substantially to parallel the ceiling of the room, and at high volumetric flow rates with the aid of the guide plate, or plates, the air flow is directed and controlled to start out partly substantially parallel to the ceiling and also in part obliquely downward. In accordance with the magnitude of the volumetric flow rate the control means are used to change the profile of the so-called throw pattern in the vertical and horizontal planes while the outside area of the disperser is constant.

In an advantageous embodiment of the invention, the control plates control the throw profile of the air flow, the impulse and the initial velocity of the air flow from the ceiling disperser and, thereby, at the same time the ultimate velocity of the air flow at desired distance.

The invention is described in closer detail in the following, referring to the figures of the drawings presently some advantageous embodiments of the invention.

In Fig. 1 is schematically presented an intake air ceiling disperser according to the invention, in elevational view and in section.

In Fig. 2 is presented the ceiling disperser of Fig. 1, viewed from above along the line II-II in Fig. 1.

In Fig. 3 is presented another embodiment, equivalent to Fig. 2.

In Fig. 4 is illustrated the operation of the control means of the ceiling disperser of the invention.

In Figs. 5-6 are presented various ways of mounting the control and guide plate.

The intake air ceiling disperser depicted in Figs. 1 and 2 has been generally indicated with reference numeral 10. The ceiling disperser 10 comprises an intake air duct 11 and a disperser component 12. The number of intake air ducts 11 provided is at least 1. The disperser component 12 comprises, in this embodiment, a first duct section 13 and a second duct section 14. The duct sections 13 and 14 are separated by a partition 15. The control means 16 has been disposed to be located in the disperser component 12

and, advantageously, in its second duct section 14. The control means 16 comprises a control member, e.g. an air deflector 17. To the air deflector 17 is attached a counterweight 18 carried by an arm 19. The arm 19 has been turnably pivoted with the pivot C_1 . The air deflector 17 is further disposed to be turnable about its margin, with the pivot C_2 , and its turning is indicated by the arrow D_1 . The arm 19 together with its counterweight 18 can be turned about the pivot C_1 , thereby changing the moment distance of the counterweight 18 from the pivot axis of the air deflector 17. It is possible by such adjustment of the counterweight to regulate the throw length of the air flowing into the room. The other end of the arm 19 may be formed to be pointed and on the air deflector 17 may be provided an indicator means 20, advantageously a scale on the upper surface of the air deflector 17, on which the various positions of the arm 19 relative to the pivot axis C_2 of the air deflector 17 in the control means 16 can be read.

The location of the counterweight 18 on the arm 19 may likewise be adjustable. It is possible to slide the counterweight 18 and fix it in different positions on the control arm 19, whereby the moment distance is accordingly changed.

The control means 16 further comprises a volumetric flow rate indicator means 21. The indicator means 21 may consist of a pivoted bar which hangs down freely, e.g. attached to the underside of the air deflector 17. The position of the indicator means 21 relative to the fixed structures, e.g. to the bottom face 22 of the ceiling disperser 10, is readable on a scale provided on the indicator means 21.

The air flow coming from the intake air duct 11 of the ceiling disperser 10 tends to deflect the air deflector 17 of the control means 16. When the volumetric flow rate is low, the second duct section 14 of the disperser component 14 will not open, and the whole air flow will pass through the first duct section 13 of the disperser component 12 to one side in the direction P_1 , substantially following the ceiling. When the air flow increases, a greater deflecting force acts on the air deflector 17 of the control means 16. At low volumetric flow rates the air flow is not able to deflect the air deflector 17; instead, the second duct section 14 remains closed. At higher volumetric flow rate the air deflector 17 of the control means 16 will turn about the pivot C_2 until a new moment equilibrium is reached between the force from the air flow deflecting the air deflector 17 and the counter-moment produced by the counterweight 18. As the volumetric flow rate grows even further, the air deflector 17 opens more and more, and increasingly more air flows through the second duct section 14. The control means 16 thus controls the air flow distribution between the first duct section 13 and the second duct section 14 in accordance with the magnitude of the volumetric flow rate at any moment.

In the embodiment of Figs 1, 2 and 3 is presented an advantageous apparatus design according to the invention, in which the output duct consists of a first duct section 13 and a second duct section 14, these two being separated by a partition 15. The incoming flow of the ceiling disperser, indicated by L_1 , may thus be distributed, depending on the volumetric flow rate, exclusively to the first duct section 13 of the disperser component 12, when the flow is small in amount, as indicated by arrow L_2 , or the incoming flow L_1 may be divided into flows L_2 and L_3 , of which the flow L_3 proceeds in the second duct section 14 when the air deflector 17 of the control means 16 is opened.

With the aid of the control means 16 the throw pattern of the air entering the room from the ceiling disperser 10 is changed. Changing of the throw pattern is here understood to refer to the profile of the air flow in the vertical and horizontal plane, i.e., to the distribution in the room space of the air flow starting out from the ceiling disperser 10. The ceiling disperser 10 of the invention may for instance be dimensioned so that in the extreme range of the throw pattern, that is in that region up to which it is desired that the throw pattern extends, substantially constant ultimate velocity is achieved. This is attained in that as the volumetric flow rate increases, by opening the air deflector 17 a given part of the air flow is directed at least partly obliquely downward. Therefore when the volumetric flow rate increases, that part of the air flow which is directed to follow the ceiling and which due to the Coanda effect travels intimately along the ceiling is reduced as to its relative proportion. In the ceiling disperser 10 of the invention it is possible at all times to adjust the throw pattern and throw length to be as desired. The throw pattern and throw length can be kept such as is desired when the volumetric flow rates vary.

In the advantageous embodiment of the invention depicted in Figs 1 and 2 the air is directed, as viewed in the horizontal plane, in four cardinal directions P_1 , P_2 , P_3 and P_4 . For each cardinal direction there is a specific control means 16 with air deflector 17, counterweight 18 and arm 19. On the underside of the partition 15 may advantageously be provided a separate air-deflecting, adjustable guide 25. In Fig. 1 the guide 25 has been schematically indicated, and in Fig. 2 likewise one of these guides has been depicted with interrupted lines. The guide 25 comprises an air deflector plate 25a and, on this plate, bendable fixing parts 25b, of which there are advantageously two. The fixing parts 25b are advantageously welded to the underside of the partition 15. The guide 25 can be bent to assume different positions.

In Fig. 3 is presented another advantageous embodiment of the invention, equivalent to that of Fig. 2. In the embodiment of Fig. 3, the air deflectors 17 of the control means 16 consist of a circular sector structure. The curved outer peripheries d_1 , d_2 , d_3 and d_4 join in seamless continuity when the duct section 14 is

closed. When the volumetric flow rate increases, the air deflectors 17 open up similarly as in the embodiment of Figs 1 and 2.

In the embodiment both of Figs 1 and 2 and of Fig. 3 there may be provided a predisperser 26 before the disperser component 12; this predisperser may for instance be a conical structural component. Its task is to direct the flow into the disperser component 12.

In the advantageous embodiments of Figs 1, 2 and 3 the ceiling disperser 12 divides the air flow in the horizontal plane among at least four cardinal directions P_1 , P_2 , P_3 and P_4 . It should be noted that even though in the foregoing only the most advantageous embodiments have been presented, the ceiling disperser may equally consist of a design in which in one cardinal direction, for instance in the direction P_1 , has been provided a control arrangement according to the invention in order to obtain the desired throw profile while in the other directions the duct system and control equipment may also consist of conventional designs of prior art.

Also such embodiments are conceivable in which the partition 15 itself is absent and the air deflector 17 of the control means 16 has been given such shape that it will direct the flow either to run parallel with the ceiling and/or obliquely downwards. Hereby the control means 16 will substantially change the direction of the air flow in accordance with the volumetric flow rate.

In Fig. 4 has more closely been presented the operation of the control means 16 of the invention. At low volumetric flow rates, the counterweight 18 keeps the air deflector 17 in the position in which it closes the second duct section 14, this position being indicated with e_1 . The flow will then take the direction from the ceiling disperser 10 exclusively through the first duct section 13 of the disperser component 12 and along the ceiling. When the volumetric flow rate increases, the force produced by the flow opens the air deflector 17 of the control means 16. In the figure, the reference e_2 has been used to indicate the fully open position of the second duct section 14. The flow now goes through both the first duct section 13 and the second duct section 14. In Fig. 4 is depicted an embodiment in which the vertical wall 23 and the bottom enclosure 22 both consist of a grating or have been provided with exit apertures. In the embodiment of Fig. 4 also a predisperser 26 has been provided, which directs the flow entering the ceiling disperser 10 into the disperser component 12, into its first duct section 13 and second duct section 14. The predisperser 26 may equally consist of a reticular structure.

In Figs 5-6 have been shown various embodiments of the control means 16. In Fig. 5 is shown the pivotal attachment of the air deflector 17 of the control means 16 to the lower enclosure 22. As the magnitude of the volumetric flow rate increases, the air flow moves the air deflector 17 out of the position in which

it closes the flow path, as indicated with arrow D_2 .

In Fig. 6 is depicted the pivotal attachment of the air deflector 17 of the control means 16 to the upper enclosure 24. Increasing volumetric flow rate moves the air deflector 17 out of the position in which it closes the flow path, as indicated by arrow D_3 . The apparatus designs of Figs 5 and 6 are appropriate, for instance, in an embodiment of the invention in which in one or several directions the control means 16 is used to open respectively close only one flow duct, and in which in one direction deflection of the air flow takes places as illustrated by Figs 1-4.

In the embodiment of Figs 1, 2, 3 and 4, the deflector plates 17 are functionally interconnected by the aid of the corner parts of the plates so that when one plate is deflected all the other deflector plates 17 thus also are positively deflected. It is therefore also possible to balance several control plates with one counterweight. It is however advantageous in view of stable operation of the ceiling disperser if for each direction of control a specific counterweight 18 has been provided in the control means 16, by the aid of which the throw length of the air flow emerging from the ceiling disperser 10 is changed by changing the moment distances of the counterweights 18 in the control means 16 from the pivot axis of the air deflector 17. For adjusting the counterweights 18, and thereby the throw length, indication has been provided in the control means 16 of the positions of the counterweights 18. Advantageously, this indication is provided on the air deflectors 17 serving as air guiding and deflecting plates.

Claims

1. A ceiling disperser (10) for intake air conducted into rooms or equivalent, comprising at least one intake air duct (11) in which the air flows substantially downwards, and a disperser component (12) proper in which the air flows substantially to the sides, and control and guiding means for guiding the air flowing from the disperser component (12), said control and guiding means comprising one or several air deflectors (17) located in the disperser component (12) outside the centre-line of the intake air duct (11) and pivoting under the effect of the air flow, disposed to change the effective outflow area of the disperser component (12) as the volumetric flow rate changes, characterized in that the disperser component (12) comprises a first duct section (13) from which the air flow is adapted to flow substantially following the ceiling, and a second duct section (14) from which the air flow is adapted to flow at least partly obliquely downwards and/or downwards, and that the control means (16) are adjusted to operate in such a way that the air flow at low volumetric flow rates is directed into the first duct section (13) and at higher volumetric flow

rates into both the first duct section (13) and the second duct section (14).

2. Ceiling disperser according to claim 1, characterized in that the control means (16) comprise an air deflector (17), a counterweight (18) and an arm (19) or equivalent, on which the counterweight (18) has been mounted, and that the air deflector (17) has been so disposed in the disperser component (12) that the air deflector (17) will in accordance with the magnitude of the volumetric flow rate increase or decrease the effective outflow area of the disperser component (12) until moment equilibrium is established between the moment produced on the air deflector (17) by the air flow, the moment produced by the proper mass of the air deflector (17) and the counter-moment produced by the counterweight (18).

3. Ceiling disperser according to claim 2, characterized in that the location of the counterweight (18) relative to the pivoting point (C_2) of the air deflector (17) is changeable by turning the counterweight (18) together with its arm (19) about a turning pivot (C_1) provided on the air deflector (17).

4. Ceiling disperser according to claim 2 or 3, characterized in that the control means (16) comprises, for indicating the throw pattern, an indicator (20) which has been disposed to indicate the position of the counterweight at any given time.

5. Ceiling disperser according to any one of the preceding claims, characterized in that the control means (16) comprise an air flow volumetric flow rate indicating means (21).

6. Ceiling disperser according to any one of the preceding claims, characterized in that the ceiling disperser (10) comprises a predisperser (26) consisting of a conical component, which directs the air into the disperser component (12).

7. Ceiling disperser according to any one of the preceding claims, characterized in that a partition (15) is disposed to separate the first duct section (13) and the second duct section (14) from each other, and that on said partition (15) is disposed a guide plate (25), adjustable as to its position, guiding the passage of the air flow.

8. Ceiling disperser according to any one of the preceding claims, characterized in that the ceiling disperser (10) comprises an air disperser component (12) for dividing the air among four cardinal directions (P_1, P_2, P_3, P_4), for each direction having been provided an air deflector (17) of its own.

9. Ceiling disperser according to claim 8, characterized in that the ceiling disperser (10) comprises coupling elements (17b) by the aid of which mutually adjacent air deflectors (17) can be interconnected on their margins so that the opening or closing movement of one air deflector also opens, respectively closes, the other air deflectors.

Patentansprüche

1. Deckenverteiler (10) für das Einlassen von in Räume oder dgl. geleiteter Luft, der zumindest einen Einlaßluftkanal (11), in dem die Luft im wesentlichen nach unten strömt, ein Verteilerbauteil (12), in dem die Luft im wesentlichen zu den Seiten hin strömt, und eine Steuer- und Leitvorrichtung zum Führen der aus dem Verteilerbauteil (12) strömenden Luft aufweist, wobei die Steuer- und Leitvorrichtung mindestens eine Luftablenkklappe (17) aufweist, die in dem Verteilerbauteil (12) außerhalb der Mittellinie des Einlaßluftkanals (11) angeordnet und durch Einwirkung der Luftströmung verschwenkbar ist, um die effektive Ausströmfläche des Verteilerbauteils (12) zu ändern, sobald sich die Volumen-Durchströmgeschwindigkeit ändert, **dadurch gekennzeichnet**, daß das Verteilerbauteil (12) einen ersten Kanalabschnitt (13), aus dem der Luftstrom im wesentlichen der Decke folgend ausströmen kann, und einen zweiten Kanalabschnitt (14) aufweist, aus dem der Luftstrom zumindest teilweise schräg nach unten und/oder nach unten strömen kann, und daß die Steuervorrichtung (16) zum Wirken in der Weise eingestellt ist, daß der Luftstrom bei niedrigen Volumendurchströmgeschwindigkeiten in den ersten Kanalabschnitt (13) und bei höheren Volumendurchströmgeschwindigkeiten sowohl in den ersten Kanalabschnitt (13) als auch in den zweiten Kanalabschnitt (14) geleitet wird.

2. Deckenverteiler nach Anspruch 1, **dadurch gekennzeichnet**, daß die Steuervorrichtung (16) eine Luftablenkklappe (17), ein Gegengewicht (18) und einen Arm (19) oder dgl. aufweist, an dem das Gegengewicht (18) angebracht ist, und daß die Luftablenkklappe (17) in dem Verteilerbauteil (12) derart angeordnet ist, daß sie entsprechend der Höhe der Volumendurchströmgeschwindigkeit die effektive Ausströmfläche des Verteilerbauteils (12) vergrößert oder verkleinert, bis zwischen dem an der Luftablenkklappe (17) durch den Luftstrom hervorgerufenen Moment, dem durch die Eigenmasse der Luftablenkklappe (17) hervorgerufenen Moment und dem durch das Gegengewicht hervorgerufenen Gegenmoment das Momentengleichgewicht hergestellt ist.

3. Deckenverteiler nach Anspruch 2, **dadurch gekennzeichnet**, daß die Lage des Gegengewichts (18) in bezug auf den Anlenkpunkt (C_2) der Luftablenkklappe (17) durch Verschwenken des Gegengewichts (18) zusammen mit dessen Arm (19) um einen an der Luftablenkklappe (17) vorgesehenen Schwenkdrehpunkt (C_1) veränderbar ist.

4. Deckenverteiler nach Anspruch 2 oder 3, **dadurch gekennzeichnet**, daß die Steuervorrichtung (16) zum Anzeigen des Ausstoßschemas eine Anzeigevorrichtung (20) aufweist, die zum Anzeigen der Lage des Gegengewichts zu irgendeinem gegebenen Zeitpunkt angeordnet ist.

5. Deckenverteiler nach irgendeinem der vor-

angehenden Ansprüche, **dadurch gekennzeichnet**, daß die Steuervorrichtung (16) eine Luftstrom-Volumendurchströmgeschwindigkeit-Anzeigevorrichtung (21) aufweist.

6. Deckenverteiler nach irgendeinem der vorangehenden Ansprüche, **dadurch gekennzeichnet**, daß der Deckenverteiler (10) einen Verteiler (26) aus einem konischen Bauteil aufweist, das die Luft in das Verteilerbauteil (12) leitet.

7. Deckenverteiler nach irgendeinem der vorangehenden Ansprüche, **dadurch gekennzeichnet**, daß eine Trennwand (15) zum Trennen des ersten Kanalabschnitts (13) und des zweiten Kanalabschnitts (14) voneinander angeordnet ist und daß an der Trennwand (15) eine in ihrer Lage einstellbare Führungsplatte (25) angeordnet ist, die den Luftstromdurchlaß lenkt.

8. Deckenverteiler nach irgendeinem der vorangehenden Ansprüche, **dadurch gekennzeichnet**, daß der Deckenverteiler (10) ein Luftverteilerbauteil (12) für das Aufteilen der Luft auf vier Hauptrichtungen (P_1 , P_2 , P_3 , P_4) aufweist, für die jeweils eine eigene Luftablenkklappe (17) vorgesehen ist.

9. Deckenverteiler nach Anspruch 8, **dadurch gekennzeichnet**, daß der Deckenverteiler (10) Koppелеlemente (17b) aufweist, mit deren Hilfe aneinander angrenzende Luftablenkklappen (17) an ihren Rändern derart verbunden werden können, daß die Öffnungs- oder Schließbewegung einer Luftablenkklappe auch die anderen Luftablenkklappen öffnet bzw. schließt.

Revendications

1. Diffuseur de plafond (10) pour l'air d'admission acheminé dans des pièces ou locaux équivalents, comprenant au moins une gaine d'air d'entrée ou d'aspiration (11) dans laquelle l'air s'écoule sensiblement du haut vers le bas, et un élément diffuseur (12) proprement dit dans lequel l'air s'écoule sensiblement vers les côtés, et les moyens de commande et de guidage pour diriger l'air s'écoulant à partir de l'élément diffuseur (12), ces moyens de commande et de guidage comprenant un ou plusieurs déflecteurs d'air (17) situés dans l'élément diffuseur (12) à l'extérieur de l'axe de la gaine d'air d'entrée ou d'aspiration (11) et pivotant sous l'effet de l'écoulement d'air, disposés de façon à modifier le passage utile d'écoulement de sortie de l'élément diffuseur (12) à mesure que varie le débit volumétrique, caractérisé en ce que l'élément diffuseur (12) comprend une première section de gaine (13) à partir de laquelle le flux d'air est adapté pour s'écouler sensiblement en suivant le plafond, et une seconde section de gaine (14) à partir de laquelle le flux d'air est adapté pour s'écouler au moins partiellement obliquement du haut vers le bas et/ou directement du haut vers le bas et en ce que les moyens de

commande (16) sont ajustés pour fonctionner de telle manière que l'air à bas débit volumétrique est dirigé dans la première section de gaine (13) et à haut débit volumétrique à la fois dans la première section de gaine (13) et dans la seconde section de gaine (14).

2. Diffuseur de plafond selon la revendication 1, caractérisé en ce que les moyens de commande (16) comprennent un déflecteur d'air (17), un contrepoids (18) et un bras (19) ou équivalent, sur lequel a été monté le contrepoids (18), et en ce que le déflecteur d'air (17) a été disposé de telle manière dans l'élément diffuseur (12) que ce déflecteur d'air (17), en fonction du débit volumétrique, augmentera ou diminuera le passage utile d'écoulement de sortie de l'élément diffuseur (12) jusqu'à l'établissement d'un équilibre des moments entre le moment produit sur le déflecteur d'air (17) par l'écoulement d'air, le moment produit par la propre masse du déflecteur d'air (17) et le contremoment produit par le contrepoids (18).

3. Diffuseur de plafond selon la revendication 2, caractérisé en ce que l'emplacement du contrepoids (18) par rapport au point de pivotement (C_2) du déflecteur d'air (17) est modifiable en faisant tourner le contrepoids (18) avec son bras (19) autour d'un pivot de rotation (C_1) prévu sur le déflecteur d'air (17).

4. Diffuseur de plafond selon la revendication 2 ou 3, caractérisé en ce que les moyens de commande (16) comprennent pour l'indication de la configuration de jet, un indicateur (20) qui a été disposé de façon à indiquer à tout moment donné la position du contrepoids.

5. Diffuseur de plafond selon l'une quelconque des revendications précédentes, caractérisé en ce que les moyens de commande (16) comprennent un indicateur de débit volumétrique d'écoulement d'air.

6. Diffuseur de plafond selon l'une quelconque des revendications précédentes, caractérisé en ce que le diffuseur de plafond (10) comprend un prédifuseur (26) constitué par un élément conique qui dirige l'air dans l'élément diffuseur (12).

7. Diffuseur de plafond selon l'une quelconque des revendications précédentes, caractérisé en ce qu'une cloison (15) est disposée pour séparer la première section de gaine (13) et la seconde section de gaine (14) l'une de l'autre, et en ce que sur la cloison (15) est disposée une plaque de guidage (25) réglable quant à sa position, pour diriger le passage d'écoulement d'air.

8. Diffuseur de plafond selon l'une quelconque des revendications précédentes, caractérisé en ce que le diffuseur de plafond (10) comprend un élément diffuseur d'air (12) pour diviser l'air parmi les quatre directions cardinales (P_1 , P_2 , P_3 , P_4) pour chaque direction, un déflecteur d'air (17) spécifique ayant été prévu.

9. Diffuseur de plafond selon la revendication 8, caractérisé en ce que le diffuseur de plafond (10) comprend des éléments d'accouplement (17b) à

l'aide desquels des déflecteurs d'air contigus entre eux (17) peuvent être reliés sur leurs bords de façon que le mouvement d'ouverture ou de fermeture d'un déflecteur d'air ouvre ou ferme également les autres déflecteurs d'air.

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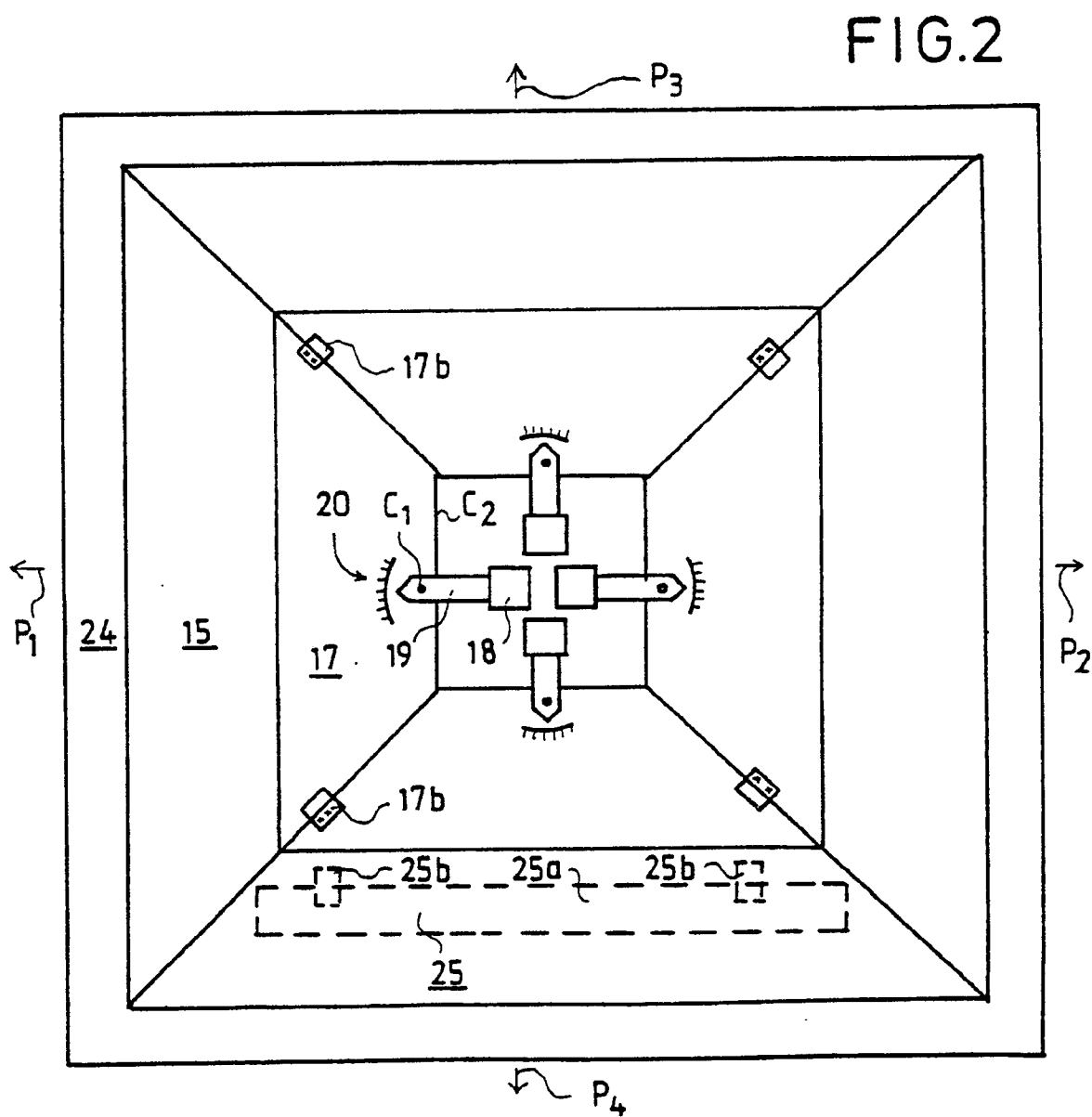
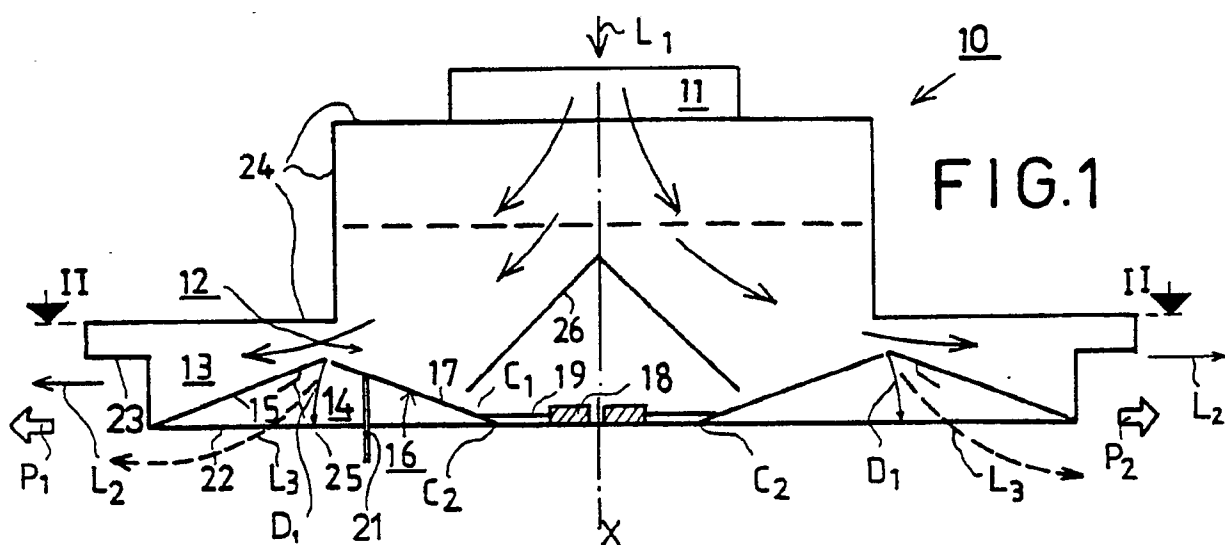
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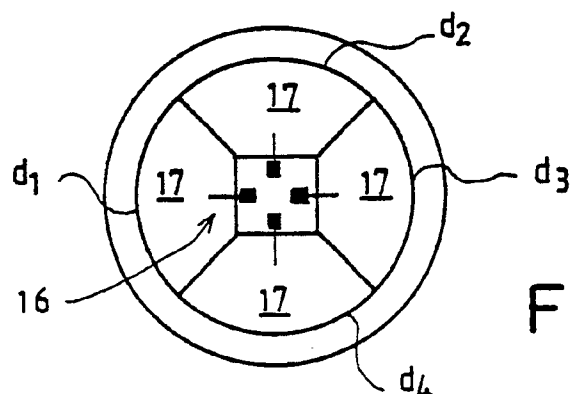


FIG. 3

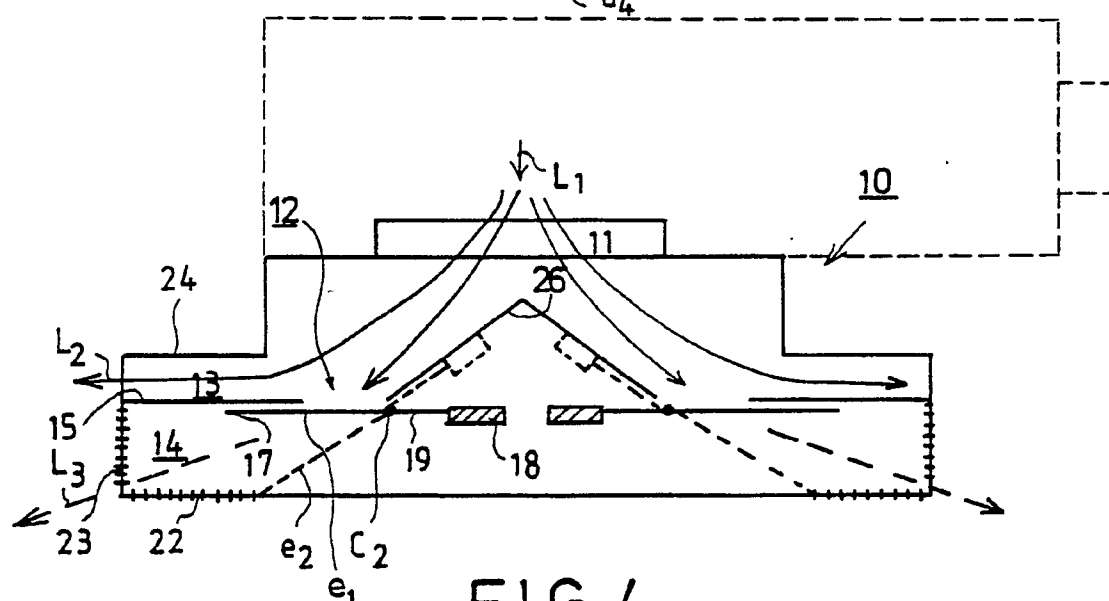


FIG. 4

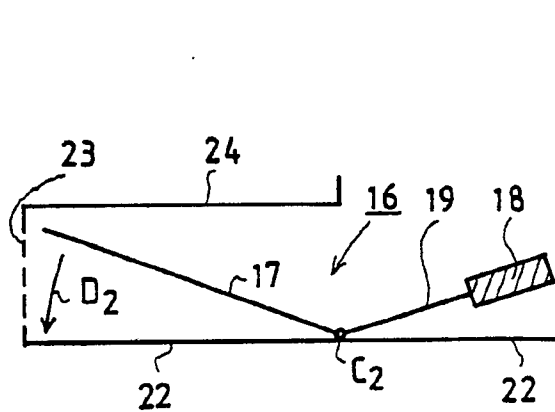


FIG. 5

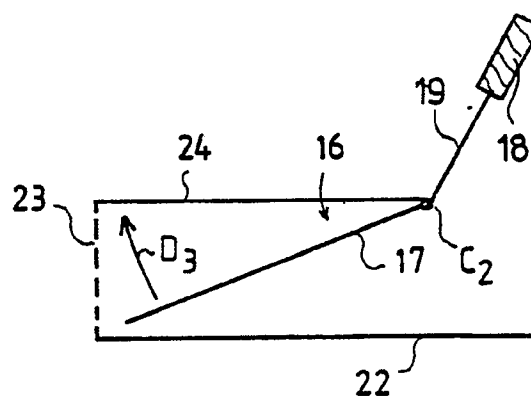


FIG. 6