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Description

The present invention relates to a method for supplying conditioned air to one or more locations on a particular floor or story of an apartment building, or block of flats, with the aid of air conditioning plant equipment supplied with circulated air, and a box-like supply air terminal device which is located on, or capable of being placed on or in the vicinity of, the floor surface of said apartment floor or story.

The invention also relates to a box-like air supply terminal device, and more specifically to a device of the kind set forth in the preamble of claim 6.

Known air conditioning and air delivering methods and apparatus of the aforesaid kind are instrumental in causing draughts and in generating noise, particularly when the supply air terminal device is provided with separate fans or blowers. Furthermore, the known methods and apparatus have relatively poor ventilation efficiency, and consequently the occupied areas of a room or location served by such apparatus are not free from impurities and it is necessary to supply the air conditioning plant with air which is relatively pure, which further adds to the load on the plant. Exhaust air from the location served by the plant has, instead, exhibited a relatively low degree of contamination.

Other drawbacks associated with the known apparatus and methods reside in limited flexibility, inasmuch that the supply air terminal device cannot be readily placed in desired positions on the apartment floor (story) or room to be served by the device. The construction of the supply air terminal devices of existing systems is also relatively complicated, which has further added to the cost of these systems.

A method and an apparatus of the kind disclosed in the preamble of claim 1 and 6, respectively, are described in DE-A-2 938 702 (LTG).

Further examples of the present standpoint of techniques will be found in "VVS & Energi", No. 1, January 1986, Stockholm, Sweden, Bengt Bergqvist and Engelbrekt Isfält; "KLIMATSYSTEM AND BYGGNAD I SAMVERKAN", pages 71-75, particularly page 74: "Deplacerance inblåsning"; VVS & Energi", No. 9, September 1983, Stockholm, Sweden, Ragnar Järmyr: "Deplacerande ventilation", pages 29-31, and Katalog 84/85 "BAHCO Ventilation", July 1984, Enköping, Sweden; "System Floormaster", pages 17:1.1-17:1.4 and "Tilluftsdon GKF", pages 13:5.1-13:5.4.

DE-A-2 407 448 (Kessler & Luch) and DE-A-2 754 699 (Lind) are other documents of interest in this context.

An object of the present invention is to eliminate the drawbacks of the aforesaid and other known systems, and to provide an improved air

supply system, which, among other things, will enable air flow and air temperature to be controlled separately and effectively in individual supply air terminal devices, thereby achieving high ventilation efficiency and high temperature efficiency.

A further object is to provide an air supply system which will create an improved environment and climate, particularly in occupied areas of a room served by the inventive system, while simultaneously facilitating operation of the air conditioning system and improving the efficiency thereof.

These objects are fulfilled by the inventive method, the main characterising features of which are set forth in the characterising clause of claim 1.

Because the air is supplied to the location being served by the system at a relatively low story at the same time as the circulation air is supplied to the air conditioning plant at a level below that at which the exhaust air leaves said location, air present in said location will be layered in varying degrees of impurity, therewith primarily improving the climate of the occupied zone of the location. Contaminated air gathers or collects at a high level, close to the ceiling of the room served by the system and is withdrawn from said location through exhaust air terminal devices installed at this level. The air present in the centre of the occupied zone or area of said location has a relatively high degree of purity and the air conditioning plant is supplied with circulation air of this kind, thereby relieving the plant of load to a commensurate extent.

The air cleansed in the plant is supplied to the space located immediately beneath the floor, where said air is mixed effectively with directly supplied fresh air. Supply air terminal devices positioned as desired in the location served by the plant will ensure that this mixture of fresh air and clean, treated air will be supplied to the room or location at a low level therein, in the absence of draughts and while being fully controlled, which in turn assists in the aforesaid layering of the air in said room.

In practice, it is preferred that the supply air is supplied at a level lower than 1.2 meters, i.e. at a level of about 1 meter above floor surface level, and that the circulation air is supplied to the plant at a level beneath 2.2 meters, preferably at a level of about 2 meters above floor surface level.

One or more exhaust air terminal devices will preferably be located at a higher position in the location or room served by the air conditioning plant, preferably in the vicinity of the ceiling of the room.

As before indicated, when applying the inventive method, fresh air is mixed with the treated air in the space located beneath the floor of the room,

referred to hereinafter as the floor cavity. In this respect, a substantially constant pressure is maintained in the floor cavity, preferably by controlling the speed of a fan or blower included in the air conditioning plant.

The floor cavity has mounted therein a pressure sensor which is connected to the fan motor, via a control device, such as to ensure that the floor cavity will be maintained at a set pressure level. It is ensured in this way that all supply air terminal devices in the room or location being served will be supplied with air at a constant, predetermined pressure, which in turn will ensure that said devices will operate efficiently and reliably and each in a predetermined manner.

If the temperature in the room or location should fall in the winter months, this will be registered by the thermostat or thermostats which controls or control the throttle valves of the air supply terminal devices, so as to throttle the flow of supply air to a commensurate extent. Each supply air terminal device may be provided with a heater, so that if low ambient temperatures are constantly recorded, despite adjustments to the throttle valves, the supply air can be heated before being delivered to the room. In this case, the throttle valves will have the opposite function, i.e. a greater heating requirement will result in a corresponding wider opening of the valves.

In practice, the mixture of air treated in the air conditioning plant and fresh air will be delivered to the supply air terminal device through a centrally positioned sound insulated conduit and, subsequent to be turned through 180° in the vicinity of a throttle valve in the region of the upper part of the conduit, will be caused to depart from the device through holes or slots provided in one or more sides of the device, without increasing in pressure in said device.

This method of supplying air to the supply air terminal devices and the surrounding area will effectively dampen noise and will also ensure that the air leaving a supply a terminal device has a low impulse, i.e. creates practically no draughts, not even in the immediate vicinity of the device.

This means in practice that a supply air terminal device of the aforescribed kind can be positioned adjacent working positions in the room or location served by the system, e.g. adjacent a desk. In fact the supply air devices may be given a form such that they themselves form part of the actual work place, i.e. in practice have the same height as a desk and form a work surface or some other surface contiguous with a desk surface.

Particular advantages are afforded when the electric cables, telephone cables, etc, leading to various equipment in the room or location served by the system are located in the floor cavity. Ac-

cording to one preferred embodiment of the invention, these cables are taken up from the floor cavity through a space in respective supply air terminal devices provided especially for this purpose.

This will enable cables to be drawn directly to or to the immediate vicinity of tele-computer equipment and the like placed on a desk top and thereby obviate the problem of tangled cables, which is normal in most cable arrangements of this kind.

The fan of the air conditioning plant is preferably located in or in the immediate vicinity of the floor cavity. This will enable the treated air to be supplied effectively to the floor cavity without creating a drop in air pressure as a result of further deflection air flow.

The floor cavity concerned is preferably covered with flooring tiles, slabs or the like in accordance with a module system to which the outlet part of the air-conditioning unit and the connecting parts of the supply air terminal device are also adapted. Thus, the outlet part of said unit may be given an area which corresponds in cross-section to the area of one or a certain number of flooring tiles, which also applies to the connecting bases or plinths of the air supply terminal devices.

Thus, when installing an air supply terminal device, it is only necessary to remove one or a requisite number of flooring tiles at the appropriate location in a room and to subsequently connect up and seal the device. This affords considerable flexibility to the system and enables modifications to be made readily, for instance when positional changes are to be made in the system of a location, room, or of an apartment floor in a block of apartments.

The invention also relates to an air supply terminal device which can be positioned adjacent to or on the floor surface of a room or location, the main characterising features of said device being set forth in the characterising clause of claim 6.

Advantages of the invention will be apparent from the following description of selected embodiments of the invention.

The description is given with reference to the accompanying drawings.

Figure 1 is a perspective view which illustrates part of one floor, or story, of an office block, and shows a number of offices supplied with air that has been conditioned with the aid of the inventive air conditioning system;

Figure 2 is a plan view of part of the floor, or story, shown in Figure 1 and illustrates the supply of fresh air to and the mixture of said air with air which has been processed in accordance with the invention;

Figure 3 is a sectional view of an air conditioning unit forming part of the air supply system;

Figure 4 illustrates in perspective a box-shaped air supply terminal device according to the in-

vention;

Figure 5 is a sectional view taken on the line V-V in Figure 4; and

Figure 6 is a sectional view taken on the line VI-VI in Figure 5.

Figure 1 shows part of a floor, or story, of an office block which includes a number of offices partitioned by walls 1. Located centrally on the illustrated floor of the office block is an air conditioning unit 2, which has a vertical extension of about 2 meters from floor surface level.

Circulated air is introduced into the unit 2, through the top thereof, and is there filtered and cooled, before being passed to a cavity 3 beneath the floor surface 4 of the room or location. The floor surface 4 comprises a multiple of square flooring tiles 5. In the case of the illustrated embodiment, the area of each flooring tile corresponds to the cross-sectional area of the unit 2, which means that only one tile is removed in the place where the unit 2 is to stand.

The flooring tiles may optionally be divided into sections, one or more of which will correspond to the cross-sectional area of the base parts or plinths on which the air supply terminal devices used are supported, these devices being generally referenced 10 in the drawings. An inventive air supply terminal device will be described in more detail hereinafter. The arrows 7 drawn in the floor cavity indicate that the conditioned air leaving the unit 2 will spread throughout the cavity 3.

As illustrated in Figure 2, fresh air is also delivered to the floor cavity 3, through a fresh air conduit 8 which is perforated with holes 9 and located adjacent the unit 2, such that air leaving the unit will be mixed with the fresh air in the conduit 8. The cut-away area in Figure 2 illustrates the approximate size of the mixing zone thus achieved.

When wishing to supply conditioned air to a selected area in a room or other location on the floor or story served by the system, e.g. a working area around a desk 20 for instance, part of a flooring tile 5 is removed and an air supply terminal device of the kind illustrated in Figure 4 is fitted over the space thus exposed.

The illustrated terminal device 10 has a main body part 11, a base or plinth 12 and a top cover 13, which may be located on a level with the top of the desk 20 and therewith itself serve as the desk top or desk working surface.

As shown in Figures 5 and 6, the device 10 also includes a centrally positioned air supply channel 14, which is lined with sound absorbing material and which widens out in the region of the base 12, to form a lower connecting part 14a.

The device 10 further comprises two side panels 16, which are perforated with outlet holes 15, and a front panel 17, which is also perforated with

outlet holes. The outlet holes 15 are arranged in vertical columns and outwardly of each such column there is found a vertically extending plate 18 with inwardly bent end parts. This arrangement will ensure that the air is delivered to the surroundings gently, at a low impulse and that the air will be mixed well with the ambient room air.

Arranged in the device 10 is a throttle valve 21 which comprises two curved parts 21a and 21b and which is controlled by a temperature sensor 22 in a manner to regulate the quantity of air delivered to the surroundings. When the prevailing room temperature is low, the setting of the valve will be adjusted accordingly, so as to deliver a minimum air flow.

The valve parts 21a and 21b deflect the air entering from the channel 14 through 180°. The inner, upper corners of the air supply terminal device are curved commensurately, so as achieve deflection of the air flow substantially in the absence of turbulence.

The valve parts 21a and 21b guide the major part of the incoming air flow towards the two opposing vertical side panels 16, whereas a minor part of the air flow departs through the holes 15 located in the front panel 17.

The fourth side panel 23 of the box-like air supply terminal device consists in a vertically displaceable wall element which defines a space 24 in the device. This space is intended for the accommodation of telephone cables and electric cables 24 extending to the work place concerned. Such a cable arrangement 24 drawn through the floor cavity 3 is also shown in Figure 1.

The space 24 in the device 10 is also defined on its inwardly located side by a partition wall 25 adjacent the inlet channel 14. The main part of the device 10 is moveable vertically in relation to the plinth or base 12. This will enable the device to be given a desired vertical extension within certain limits, e.g. so that the top surface or panel 13 of the device will coincide with the level of the work surface of the desk 20. The main part of the device can be detachably secured to the base 12 with the aid of pins 27 which pass through holes provided in said base.

A nozzle 30 capable of distributing the supply air uniformly along the surfaces of the device is fitted into each of the holes 15.

The reference numeral 31 identifies an electric heater for heating the supply air, when necessary or so desired, e.g. during the winter months. When the heater is in use, the aforesaid valve 21 will function in reverse, i.e. the valve will be opened wider at lower temperatures.

The air conditioning unit 2 illustrated in Figure 3 is fitted with an air filter 35 which is effective in filtering the supplied circulated air, the filtered air

subsequently being treated in a heating/cooling battery 36. A variable speed fan 37 is effective in moving the air to the cavity 3 beneath the floor surface 4. The pressure prevailing in the floor cavity 3 is sensed by means of a sensor, not shown. When a tendency towards lower pressure is sensed in the floor cavity, an impulse is sent to a control device which, in response thereto, increases the speed of the fan so as to maintain the pressure at a predetermined level.

It will be seen from Figure 1 that the supply air terminal devices will also deliver air at a level beneath 1 meter, whereas the circulating air is supplied to the unit 2 at a level which is approximately twice this height above floor level, i.e. at a level as high as about 2 meters. Contaminated air will gather in a region slightly beneath the ceiling of the room and is vented therefrom through an exhaust air terminal device 38. The system assumes that the various locations or rooms on the floor or story of the building served by the system communicate with each other, e.g. through appropriate gratings fitted above respective doors.

The high quality of the air achieved when practicing the inventive method is due to the fact that the circulated air is introduced into the unit 2 at a level which is located in the occupied zone of a room or location, whereas contaminated air which collects immediately beneath the ceiling of said room is discharged through exhaust air terminal devices located on a corresponding level.

In practice, the pressure of the air in the floor cavity 3 may be from 20 to 30 Pa. An excessively high pressure in said cavity may create sealing problems in the overlying floor surface. It may also result in problematic noise levels.

However, the illustrated configuration of the supply air terminal device provides an advantageous solution to the type of problem described in the foregoing.

Claims

1. A method for supplying conditioned air to one or more locations (1) on the floor or story of a multistory building with the aid of an air conditioning unit (2) supplied with circulated air and also with the aid of box-like supply air terminal devices capable of being positioned on or in the vicinity of the floor surface (5) of said location (1), the outlet opening of the air conditioning unit (2) being connected to said floor surface (5) such that conditioned air under pressure is delivered to a cavity (3) beneath said floor surface (5), wherewith holes for an auxiliary member (14a) connecting with the supply air terminal devices (10) are provided in the floor surface (5) at desired locations on said floor or story of said building, and said supply air terminal devices (10) being mounted over said holes and sealed, said air terminal devices (10) delivering a displacing air flow of low impulse at a level which is lower than that at which exhaust air is discharged from said location, **characterized** by admixing fresh air with the treated air in said cavity (3) and maintaining a substantially constant pressure in said cavity (3); supplying the displacing air flow of low-impulse to said location through the supply air terminal devices (10) at a level beneath that at which the circulated air is supplied to the air conditioning unit (2); and regulating the displacing air flow in response to temperature, in individual supply air terminal devices (10).
2. A method according to Claim 1, **characterized** in that the displacing air flow is supplied at a level beneath 1.2 meters, preferably beneath about 1 meter above the floor surface; and in that the circulated air is supplied to the unit (2) at a level beneath 2.2 meters, preferably at a level of about 2 meters above the level of said floor surface.
3. A method according to Claim 1 or Claim 2, **characterized** by maintaining a substantially constant pressure in said cavity by regulating the speed of a fan (37) coacting with the air conditioning unit (2).
4. A method according to Claim 3, **characterized** in that the air conditioned in the unit (2) and admixed with fresh air is supplied to the supply air terminal devices (10) through a centrally positioned, sound insulated channel (14); in that the air is deflected through an angle of 180° in the region of a throttle valve (21) located adjacent the upper region of the channel; and in that the deflected air flow is caused to depart through holes (15) or slots provided in one or more of the side panels (16) of the device, without being subjected to an increase in pressure.
5. A method according to any one of Claims 1-4, when electric cables, telephone cables and the like are drawn through the cavity (3) beneath the floor surface (4), **characterized** in that respective cables are taken up through the floor surface via a space (24) provided in respective supply air terminal devices (10) to this end.
6. A supply air terminal device for positioning on or in the vicinity of a floor surface (4) of a

location or room, said device being intended for coaction with an air conditioning unit (2) which is supplied with circulated air and the outlet opening of which is intended to be connected to the floor surface, such as to enable conditioned air under pressure to be delivered to a cavity (3) beneath said floor surface, said supply air terminal device including:

- a) a main body (16) having a plinth (12) and a top panel (13);
- b) an air supply channel (14) provided in the device;
- c) at least one side panel (16) provided with air outlet holes (15) or slots; and
- d) a lower connecting part (14a) which is joined to the plinth (12) and/or the air supply channel (14) and which is intended for connection with an opening in said floor surface so as to enable conditioned air under pressure to be delivered from the cavity (3) beneath the floor surface (4) to the supply air terminal device, which is constructed to deliver a displacing air flow of low impulse at a level lower than the level at which exhaust air is discharged from said location or room,

characterized in that the supply channel (14) which is preferably positioned centrally in the device (10), has fitted at the top thereof a thermostat controlled valve means (21) for controlling the amount of air which, with the exception of a minimum flow, will be deflected through 180° to a space located between the channel (14) and said panel (16) provided with outlet holes (15) or slots; and in that the supply air terminal device is constructed to deliver the displacing air flow of low impulse at a level beneath the level at which the circulated air is introduced into the air conditioning unit (2).

- 7. A device according to claim 6, **characterized** in that the valve means (21) comprises two curved parts (21a, 21b) and in that the valve means is intended to control the flow of air to two opposing perforated side panels (16) of the device (10).
- 8. A device according to Claim 7, **characterized** in that located between the two perforated side panels (16) is a third perforated side panel (17) through which air is delivered.
- 9. A device according to any one of Claims 6-8, **characterized** in that one side panel (23) of the device (10) is movable, or has a movable section, and forms one defining wall of a space (24) in said device (10), said space being intended to accommodate electric cables, tele-

phone cables or the like taken up from the cavity (3) beneath said floor surface.

- 10. A device according to any one of Claims 6-9, in which the holes (15) or slots in the side panel or side panels (16; 17) are disposed in vertical columns, **characterized** in that positioned slightly outwardly of each such column of holes or slots is a vertically extending plate (18) that has end parts which are bent inwardly towards the side panels in a manner to deflect the exiting supply air flow and create eddy currents or turbulence therein.
- 11. A device according to any one of Claims 6-10, **characterized** in that said main part of the device is capable of being moved to different height positions in relation to the plinth (12) and detachably secured in said positions.

Patentansprüche

- 1. Verfahren zum Zuführen klimatisierter Luft an einen oder mehrere Orte (1) auf der Etage oder dem Stockwerk eines vielgeschossigen Gebäudes mittels einer Luftklimatisiereinheit (2), der zirkulierte Luft zugeführt wird, und auch mittels schrankartiger Anschlußvorrichtungen für Zufuhrluft, die auf oder in der Nähe des Etagenbodens (5) dieses Ortes (1) angeordnet sind, wobei die Auslaßöffnung der Luftklimatisiereinheit (2) mit dem Etagenboden (5) derart verbunden ist, daß klimatisierte Luft unter Druck an einen Hohlraum (3) unter dem Etagenboden (5) geliefert wird, womit Bohrungen für ein Hilfsteil (14a), die eine Verbindung mit den Anschlußvorrichtungen (10) für Zufuhrluft herstellen, in dem Etagenboden (5) an gewünschten Orten auf der Etage oder dem Stockwerk des Gebäudes vorgesehen sind, und wobei die Anschlußvorrichtungen (10) der Luftzufuhr über den Löchern montiert und abgedichtet sind, wobei die Luftanschlußvorrichtungen (10) einen Verdrängungsluftstrom niedrigen Dralls auf einem Niveau liefern, das niedriger ist als das, bei dem Abluft aus diese Ort ausgestoßen wird, **gekennzeichnet** durch ein Zumischen von Frischluft zu der behandelten Luft in dem Hohlraum (3) und Halten eines im wesentlichen konstanten Druckes in dem Hohlraum (3), Zuführen des Verdrängungsluftstromes niedrigen Dralls zu diesem Ort über die Anschlußvorrichtungen (10) für die Zufuhrluft auf einem Niveau unter dem, bei dem die zirkulierte Luft der Luftklimatisiereinheit (2) zugeführt wird; und Regulieren des Verdrängungsluftstromes in Reaktion auf die Temperatur in individuellen Anschlußvorrichtungen (10)

für Zufuhrluft.

2. Verfahren gemäß Anspruch 1, dadurch gekennzeichnet, daß der Verdrängungsluftstrom bei einem Niveau unter 1,2 m, vorzugsweise unter etwa 1 m über dem Etagenboden zugeführt wird; und dadurch daß die zirkulierte Luft der Einheit (2) bei einem Niveau unter 2,2 m, vorzugsweise bei einem Niveau von etwa 2 m über dem Niveau des Etagenbodens zugeführt wird.
 - a) einen Hauptkörper (16) mit einem Anschlußsockel (12) und einer oberen Platte (13);
 - b) einen Luftzufuhrkanal (14), der in der Vorrichtung vorgesehen ist;
 - c) mindestens eine Seitenplatte (16), die mit Luftauslaßbohrungen (15) oder Schlitten versehen ist; und
 - d) ein unterer Verbindungsteil (14a), der mit dem Anschlußsockel (12) und/oder dem Luftzufuhrkanal (14) verbunden ist und der für eine Verbindung mit einer Öffnung in dem Etagenboden vorgesehen ist, damit klimatisierte Luft unter Druck von dem Hohlraum (3) unter dem Etagenboden (4) zu der Anschlußvorrichtung für die Zufuhrluft geliefert werden kann, die so konstruiert ist, daß sie einen Verdrängungsluftstrom geringen Dralls bei einem Niveau liefert, das niedriger als das Niveau ist, bei dem Abluft aus dem Ort oder dem Raum ausgegeben wird, dadurch **gekennzeichnet**, daß an dem Zufuhrkanal (14), der vorzugsweise zentral in der Vorrichtung (10) angeordnet ist, an dessen Oberteil eine thermostat-gesteuerte Ventileinrichtung (21) zum Steuern der Menge von Luft angebracht ist, die, mit der Ausnahme einer minimalen Strömung, um 180° zu einem Raum umgelenkt wird, der zwischen dem Kanal (14) und der Platte (16), die mit Auslaßbohrungen (15) oder Schlitten versehen ist, umgelenkt wird; und dadurch, daß die Anschlußvorrichtung für die Luftzufuhr so konstruiert ist, daß sie einen Verdrängungsluftstrom niedrigen Dralls bei einem Niveau unterhalb des Niveaus liefert, bei dem die zirkulierte Luft in die Luftklimatisiereinheit (2) eingeleitet wird.
3. Verfahren gemäß Anspruch 1 oder 2, gekennzeichnet durch Halten eines im wesentlichen konstanten Druckes in dem Hohlraum durch Regulieren der Drehzahl eines Ventilators (37), der mit der Luftklimatisiereinheit (2) zusammenwirkt.
4. Verfahren gemäß Anspruch 3, dadurch gekennzeichnet, daß die Luft, die in der Einheit (2) klimatisiert wird und der Frischluft zugemischt wird, zu den Anschlußvorrichtungen (10) für die Zufuhrluft über einen zentral angeordneten, schallisolierten Kanal (14) zugeführt wird; daß die Luft um einen Winkel von 180° im Bereich eines Drosselventils (21) umgelenkt wird, das neben dem oberen Bereich des Kanals angeordnet ist; und daß der umgelenkte Luftstrom veranlaßt wird, sich durch die Bohrungen (15) oder Schlitten, die in einer oder mehreren der Seitenplatten (16) der Vorrichtung vorgesehen sind, abgeleitet wird, ohne einer Druckerhöhung zu unterliegen.
5. Verfahren gemäß einem der Ansprüche 1 bis 4, wenn elektrische Kabel, Telefonkabel und ähnliches durch den Hohlraum (3) unter den Etagenboden (4) gezogen werden, dadurch gekennzeichnet, daß entsprechende Kabel durch den Etagenboden über einen Raum (24) aufgenommen werden, der in entsprechenden Anschlußvorrichtungen (10) für Zufuhrluft an diesem Ende vorgesehen ist.
6. Anschlußvorrichtung für Zufuhrluft zum Positionieren auf oder in der Nähe eines Etagenbodens (4) eines Ortes oder eines Raumes, wobei die Vorrichtung zum Zusammenwirken mit einer Luftklimatisiereinheit (2) vorgesehen ist, der zirkulierte Luft zugeführt wird und deren Auslaßöffnung für eine Verbindung mit dem Etagenboden vorgesehen ist, so daß klimatisierte Luft unter Druck an einen Hohlraum (3) unter dem Etagenboden geliefert wird, wobei die Anschlußvorrichtung für Zufuhrluft aufweist:
 - a) einen Hauptkörper (16) mit einem Anschlußsockel (12) und einer oberen Platte
7. Vorrichtung gemäß Anspruch 6, dadurch gekennzeichnet, daß die Ventileinrichtung (21) zwei gekrümmte Teile (21a, 21b) aufweist und daß die Ventileinrichtung zum Steuern der Luftströmung auf zwei gegenüberliegende perforierte Seitenplatten (16) der Vorrichtung (10) beabsichtigt ist.
8. Vorrichtung gemäß Anspruch 7, dadurch gekennzeichnet, daß zwischen den zwei perforierten Seitenplatten (16) eine dritte perforierte Seitenplatte (17) angeordnet ist, durch die Luft geliefert wird.
9. Vorrichtung gemäß einem der Ansprüche 6 bis 8, dadurch gekennzeichnet, daß eine Seitenplatte (23) der Vorrichtung (10) beweglich ist oder einen beweglichen Abschnitt aufweist und eine definierende Wand eines Raumes (24) in der Vorrichtung (10) bildet, wobei der Raum zum Unterbringen von elektrischen Kabeln, Telefonkabeln oder ähnlichem vorgesehen ist, die

aus dem Hohlraum (3) unter dem Etagenboden aufgenommen werden.

10. Vorrichtung gemäß einem der Ansprüche 6 bis 9, bei der die Bohrungen (15) oder Schlitze in der Seitenplatte oder den Seitenplatten (16; 17) in vertikal Reihen angeordnet sind, dadurch gekennzeichnet, daß, leicht nach außen weisend, von jeder derartiger Reihe von Löchern oder Schlitzen eine vertikal sich erstreckende Platte (18) angeordnet ist, die Endteile hat, die nach innen in Richtung auf die Seitenplatten in einer Art gebogen sind, um den ausströmenden Zufuhrluftstrom umzulenken und Wirbelströmungen oder Turbulenzen darin zu schaffen.

11. Vorrichtung gemäß einem der Ansprüche 6 bis 10, dadurch gekennzeichnet, daß das Hauptteil der Vorrichtung zu verschiedenen Höhenpositionen bezüglich des Anschlußsockels (12) bewegt werden kann und demontierbar in den Positionen befestigt ist.

Revendications

1. Un procédé d'amenée d'air conditionné à un ou plusieurs emplacements (1) au sol ou à un étage d'un bâtiment à étages multiples, à l'aide d'une unité de conditionnement d'air (2) où est amené de l'air mis en circulation et aussi à l'aide de dispositifs terminaux d'air d'amenée en forme de caissons, susceptibles d'être positionnés sur la surface (5) de sol dudit emplacement (1) ou au voisinage de celle-ci, l'ouverture de sortie de l'unité de conditionnement d'air (2) étant reliée à ladite surface (5) de sol d'une manière telle que de l'air conditionné sous pression est envoyé à une cavité (3) située au-dessous de la surface (5) de sol, des trous destinés à un organe auxiliaire (14a) et qui se relie aux dispositifs terminaux (10) d'air d'amenée étant ménagés dans la surface (5) du sol à des emplacements souhaités sur ledit sol ou dans ledit étage dudit bâtiment, et lesdits dispositifs terminaux (10) d'air d'amenée étant montés au-dessus desdits trous et raccordés de façon étanche, lesdits dispositifs terminaux (10) d'air amenant un flux d'air en déplacement avec une faible impulsion à un niveau qui est inférieur à celui auquel de l'air d'évacuation est extrait à partir dudit emplacement,

caractérisé en ce que de l'air frais est mélangé avec l'air traité dans ladite cavité (3) et qu'une pression sensiblement constante est maintenue dans ladite cavité (3), ce qui amène audit emplacement le flux d'air en déplace-

ment avec une faible impulsion à travers lesdits dispositifs terminaux (10) d'air d'amenée à un niveau inférieur à celui auquel l'air mis en circulation est amené à l'unité de conditionnement d'air (2), et en ce que le flux d'air en déplacement est régulé, en réponse à la température, dans des dispositifs terminaux individuels (10) d'air d'amenée.

2. Procédé selon la revendication 1, caractérisé en ce que le flux d'air de déplacement est amené à un niveau inférieur à 1,2 mètres, de préférence inférieur à environ 1 mètre au-dessus de la surface du sol; et en ce que l'air mis en circulation est amené à l'unité (2) à un niveau inférieur à 2,2 mètres, de préférence à un niveau d'environ 2 mètre au-dessus du niveau de ladite surface de sol.

3. Procédé selon la revendication 1 ou la revendication 2, caractérisé par un maintien d'une pression sensiblement constante dans ladite cavité, obtenu en régulant la vitesse d'un ventilateur (37) qui coopère avec l'unité de conditionnement d'air (2).

4. Procédé selon la revendication 3, caractérisé en ce que l'air conditionné dans l'unité (2) et mélangé avec de l'air frais est amené aux dispositifs terminaux (10) d'air d'amenée à travers un canal (14) positionné au centre, à isolation sonore; et en ce que l'air est défléchi d'un angle de 180° dans la région d'une valve d'étranglement (21) située près de la région supérieure du canal; et en ce que le flux d'air défléchi est amené à sortir par des trous (15) ou fentes ménagés dans un ou plusieurs des panneaux latéraux (16) du dispositif, sans être soumis à une augmentation de pression.

5. Procédé selon l'une quelconque des revendications 1 à 4, dans lequel des câbles électriques, des câbles téléphoniques et similaires sont tirés à travers la cavité (3) au-dessous de la surface (4) du sol, caractérisé en ce que des câbles respectifs montent à travers la surface du sol par l'intermédiaire d'un espace (24) ménagé à cet effet dans les dispositifs respectifs de terminaux (10) d'air d'amenée.

6. Dispositif de terminal d'air d'amenée à positionner sur une surface (4) de sol d'un emplacement ou d'un local ou au voisinage de celle-ci, ledit dispositif étant prévu pour coopérer avec une unité de conditionnement d'air (2) à laquelle est amené de l'air mis en circulation et dont l'ouverture de sortie est prévue pour être reliée à la surface du sol de façon à permettre

à de l'air conditionné sous pression d'être envoyé à une cavité (3) située au-dessous de ladite surface de sol, ledit dispositif terminal d'air d'amenée incluant:

- a) un corps principal (16) comprenant une plinthe (12) et un panneau supérieur (13); 5
- b) un canal d'amenée d'air (14) ménagé dans le dispositif; 10
- c) au moins un panneau latéral (16) dans lequel sont ménagés des trous (15) ou fentes de sortie d'air; et 15
- d) une partie inférieure de liaison (14) qui est assemblée à la plinthe (12) et/ou au canal (14) d'amenée d'air et qui est prévue pour être reliée à une ouverture dans ladite surface du sol de façon à permettre à de l'air conditionné sous pression d'être envoyé depuis la cavité (3) située au-dessous de la surface (4) de sol vers le dispositif de terminal d'air d'amenée, ce dernier étant réalisé de façon à envoyer un flux d'air de déplacement à faible impulsion à un niveau inférieur au niveau auquel de l'air d'échappement est extrait, depuis ledit emplacement ou local, 20

caractérisé en ce que le canal d'amenée (14) qui est de préférence positionné au centre dans le dispositif (10), comporte, fixé à son sommet, un dispositif à vanne (21) commandée par thermostat pour commander la quantité d'air qui est défléchie, à l'exception d'un écoulement minimal, de 180° vers un espace situé entre le canal (14) et ledit panneau (16) où sont ménagés des trous (15) ou des fentes de sortie; et en ce que le dispositif terminal d'air d'amenée est réalisé de façon à envoyer le flux d'air de déplacement à faible impulsion à un niveau inférieur au niveau auquel l'air mis en circulation est introduit dans l'unité de conditionnement d'air (2). 25 30 35 40

- 7. Dispositif selon la revendication 6, caractérisé en ce que le dispositif à vanne (21) comprend deux parties incurvées (21a, 21b) et en ce qu'il est prévu pour commander le flux d'air vers deux panneaux latéraux perforés opposés (16) du dispositif (10). 45
- 8. Dispositif selon la revendication 7, caractérisé en ce qu'un troisième panneau latéral perforé (17), à travers lequel est envoyé de l'air, est disposé entre les deux panneaux latéraux perforés (16). 50
- 9. Dispositif selon l'une quelconque des revendications 6 à 8, caractérisé en ce qu'un panneau latéral (23) du dispositif (16) est mobile, ou comprend une section mobile, et forme une 55

paroi définissant un espace (24) dans ledit dispositif (10), ledit espace étant prévu pour loger des câbles électriques, des câbles téléphoniques ou similaires, qui montent depuis ladite cavité (3) située au-dessous de ladite surface de sol.

- 10. Dispositif selon l'une quelconque des revendications 6 à 9, dans lequel les trous (15) ou fentes du panneau latéral ou des panneaux latéraux (16; 17) sont disposés en colonnes verticales, caractérisé en ce qu'une plaque s'étendant verticalement, qui comprend des parties d'extrémité qui sont incurvées vers l'intérieur en direction des panneaux latéraux de manière à défléchir le flux d'air d'amenée sortant et à créer des tourbillons ou turbulences dans ce dernier, est positionnée légèrement à l'extérieur de chacune de ces colonnes de trous ou de fentes.

- 11. Dispositif selon l'une quelconque des revendications 6 à 10, caractérisé en ce que la partie principale du dispositif est susceptible d'être déplacée pour prendre différentes positions en hauteur par rapport à la plinthe (12), et à être fixée de façon amovible, dans lesdites positions.



