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(54) **Room for smokers**

(57) The invention relates to a smoking room in which arranged in an inner enclosure (14) demarcated by an outer partition (1) there air purifiers (2) absorbing the air contaminated with smoke, the outer partition being formed by two opposite and separated U shaped closing elements (9,10) generating two accesses (13). Inside the inner enclosure (14) there is an air case (5) absorbing the air of the inner enclosure (14) cleaned by the purifiers (2) and driving it to the upper area in which the air is

divided into a current towards the inner enclosure (14), generating an air ceiling (22), preventing the air not cleaned by the purifiers (2) from leaving, and into a current towards the outside of the room generating a decompensation between the inner enclosure (14) and the outside of the room, forcing the circulation of the air from the outside to the inner enclosure (14) through the accesses (13) and the upper part not covered by the air ceiling (22) at this time.

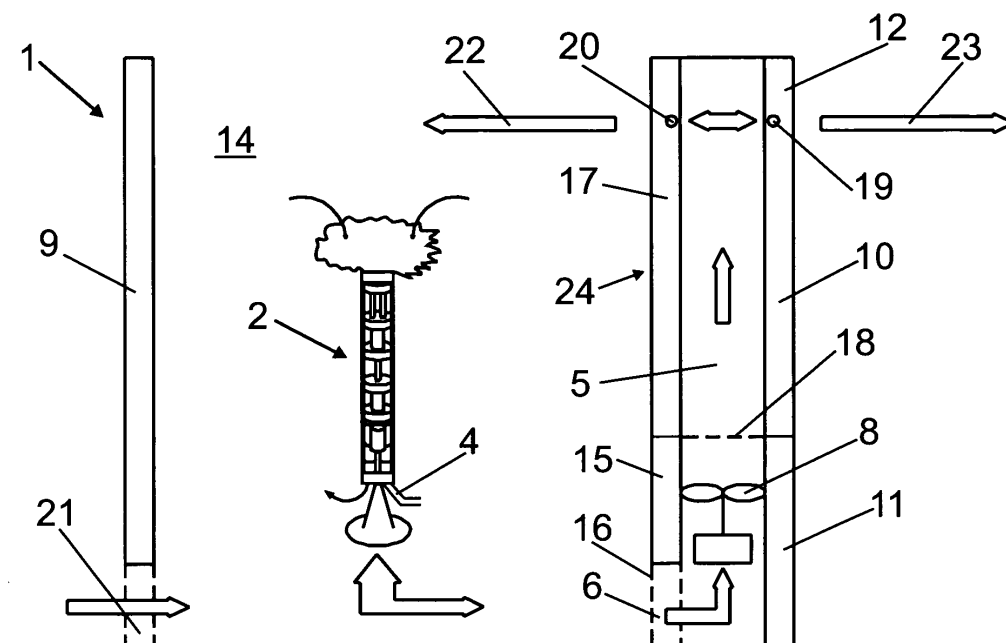


FIG. 3

Description

Technical Field of the Invention

[0001] The present invention belongs to the technical field of closed enclosures for purifying contaminated air and more specifically to the technical field of smoking rooms for purifying the air contaminated by smoke.

Background of the Invention

[0002] Given the need to maintain the air clean and unharmed by smoke in closed enclosures but also to provide spaces for smokers, there are different smoking rooms located inside closed enclosures in the state of the art.

[0003] These rooms have a dual purpose. On one hand they prevent smoke from the cigarettes from leaving the room and contaminating the air of the closed enclosure, and on the other hand, they purify the air of the smoking room in order to make, insofar as it is possible, the air of this room smoke-free.

[0004] Until now there have been different spaces for smokers located in enclosed premises, such as airports, stations, shopping centers, etc.

[0005] One of these spaces simply consisted of designating a certain space for smokers and installing a set of tables with ashtrays. An effort was made so that this space was separated from the most crowded areas, or near the outside of the premises so that the air contaminated with smoke caused the fewest possible inconveniences.

[0006] An alternative to this situation, and most similar to the present invention, consisted of placing a series of dividers thus achieving a side partition and without a ceiling in order to facilitate the circulation of the air, and a set of purifiers for cleaning the air contaminated with smoke. The problem of this system is that the contaminated air which rises that the purifier does not have time to clean, exits the enclosure through the upper area, which is not covered, and contaminates the outside of the enclosure.

[0007] Another different system consisted of creating a closed space by means of dividers or walls and a ceiling with a set of purifiers inside. The problem of the contaminated air leaving to the outside was thus solved, but in this case since the enclosure was closed the air did not circulate from the outside to the inside, therefore the air of the inner space was loaded with smoke and furthermore the user experienced an irritating sensation of heat and of feeling enclosed.

[0008] A system solving the drawbacks existing in the previous systems of the state of the art was therefore desirable.

Description of the Invention

[0009] The present invention solves the problems ex-

isting in the state of the art by means of a room for smokers with a side outer partition which does not have doors or a ceiling. This provides the advantage of airing the inner enclosure of the room for smokers in addition to providing a sensation of a very comfortable open space for the user of the room. Inside the room there is a plurality of air purifiers responsible for extracting the air from the inside contaminated with smoke, purifying said air, and returning it again clean to the inside of the room. Furthermore, in the inner enclosure there is a group of tables on which ashtrays are arranged.

[0010] In a preferred embodiment of the invention, the purifiers are evenly distributed and arranged in a regular manner inside the room in order to optimize the extraction and purification of the air. The tables are further fixed to the purifiers and it is thus achieved that the smokers are near said purifiers in order to obtain a more effective purification. The purifiers comprise a main vertical cylindrical body sucking up the air contaminated with smoke through its upper part and returns it already purified to the inner enclosure through its lower part.

[0011] The outer partition is formed by two U shaped closing elements with their ends opposite and separated. Therefore there are two accesses to the inside of the room which are permanently open.

[0012] These closing elements are formed by a vertical outer panel, which in a preferred embodiment is transparent in order to provided visibility, and by an outer frame securing said panel.

[0013] In the inner enclosure there is an inner wall parallel to one of the closing elements and connected to the latter, both elements forming an air case providing the circulation of air necessary for the ventilation of the room. In a particular embodiment of the invention, the inner wall is formed by an additional inner frame and an additional inner panel such that the air case is formed by the outer and inner frames and the outer and inner panels.

[0014] In the lower area of this air case, between the frames, there is a set of fans which, through a grating arranged in the inner frame, is responsible for extracting the purified air expelled by the purifiers and propelling it towards the upper area of the air case between the panels.

[0015] In a preferred embodiment of the invention, there is a deflector fixed to the air outlet area of each of the purifiers for the purpose of directing the air towards the lower grating so that it is extracted by the fans.

[0016] When the extracted air reaches the upper area of the air case between the panels, it is divided into two currents, one of them being expelled through perforations in the vertical panel towards the outside of the smoking room, and the other expelled through perforations in the additional vertical panel towards the inner enclosure.

[0017] The current of air expelled towards the inside creates an air ceiling preventing the air with smoke which the purifiers were not able to purify from leaving the inner enclosure without needing the presence of a solid ceiling closing the room.

[0018] The current of air expelled towards the outside creates a decompensation of air between the inner enclosure of the room and the outside, forcing a circulation of the outside ventilation air from the outside to the inner enclosure through the only existing open spaces, which are the accesses to the room for smokers, and the portion of the upper area of the room which is not covered by the air ceiling formed by the current circulating from the air case to the inside of the enclosure.

[0019] With this circulation of air, ventilation and cooling of the room is achieved at the same time that the air contaminated with smoke which the purifiers have not had time to clean is prevented from leaving the inside.

[0020] A ventilation grating has been provided in the outer frame of the first closing element in order to achieve the entry of that air to the inner enclosure and therefore suitable ventilation and cooling of the latter for the cases in which the cooling of the area of the room occurs at ground level.

Description of the Drawings

[0021] An embodiment of the invention making reference to a series of drawings will be described below in an illustrative but non-limiting manner in order to facilitate the understanding of the invention.

[0022] Figure 1 is a schematic plan view of the smoking room showing the side partition and the arrangement of the purifiers in the inner enclosure.

[0023] Figure 2 shows a purifier according to a preferred embodiment of the invention with a table fixed thereto.

[0024] Figure 3 is a partial sectional view of the frames and panels housing the air case therein, in which the circulation of the air is shown by means of arrows.

[0025] These figures make reference to a set of elements which are:

1. outer partition
2. air purifier
3. vertical cylindrical body of the purifier
4. deflector
5. air case
6. filtering surface
7. table
8. extraction means, fans
9. first closing element
10. second closing element
11. outer frame
12. outer panel
13. access to the inner enclosure
14. inner enclosure
15. inner frame
16. lower grating
17. inner panel
18. horizontal upper grating
19. outer perforations
20. inner perforations

21. ventilation grating
22. inner current
23. outer current
24. inner wall

Description of Preferred Embodiments of the Invention

[0026] The present invention relates to a smoking room comprising a side outer partition 1 demarcating an inner enclosure 14. The main features of this outer partition 1 are that it has accesses which are always open, i.e. no doors, and is open at its upper part, i.e. it also has no ceiling. The advantage which this embodiment has with respect to other closed enclosures is that it facilitates the circulation of the air between the inside and the outside of the room and offers a pleasant open space sensation for the user of the room.

[0027] In order to achieve this configuration of the room, the outer partition 1 comprises a first U shaped closing element 9 and a second U shaped closing element 10 being arranged such that the ends of both closing elements 9,10 are opposite one another and are separated a sufficient distance in order to form two accesses 13 to the inner enclosure 14, through which the users will enter the room, and additionally the air will circulate from the outside of the room towards the inner enclosure 14.

[0028] Figure 1 shows a plan view in which the arrangement of the closing elements 9 and 10 is shown.

[0029] In a particular embodiment of the invention, both the first closing element 9 and the second closing element 10 are formed by an outer frame 11 and by a vertical outer panel 12 fixed to said outer frame 11.

[0030] In a preferred embodiment the outer frames 11 are made of stainless steel, thus providing high rigidity and strength while at the same time preventing the deterioration of the assembly. The panels 12 are further made of glass which allows the passage of light to the inner enclosure 14 and allows the users to see there-through.

[0031] In the inner enclosure 14 there is a set of air purifiers 2 formed by a vertical cylindrical body 3 and a support for said vertical cylindrical body 3. Figure 2 shows an embodiment of the purifiers 2 in which it is observed how each of them extracts the air contaminated with smoke through its upper part, cleans said air therein and expels the air again to the inner enclosure 14 through its lower part.

[0032] In addition to the air purifiers 2 there is a set of tables 7 in the inner enclosure 14 which are used to support ashtrays used by the users of the room.

[0033] In a particular embodiment the tables 7 are fixed to the air purifiers 2 for the purpose of achieving greater efficacy in the extraction and purification of the air contaminated with smoke, given that since the tables 7 supporting the ashtrays are fixed to the purifiers 2, the smoke coming out of the cigarettes of the smokers will be nearer to the upper part of the purifier 2.

[0034] In a preferred embodiment these tables are cir-

cular and are concentrically and outwardly fixed to each of the vertical cylindrical purifiers 2 which are evenly distributed throughout the room, whereby greater efficacy in the extraction of the contaminated smoke is achieved with a simple configuration of tables 7 and purifiers 2 occupying little space. Figure 1 shows the even and regular distribution of the sets of purifiers 2 and tables 7 in the inner enclosure 14.

[0035] In the inner enclosure 14 there is an inner wall 24 parallel to the second closing element 10 and connected to the latter, said closing element 24 and the inner wall 24 forming an air case 5 providing the circulation of air necessary for the ventilation of the room. In a particular embodiment of the invention the inner wall 24 is formed by an inner frame 15 and an inner panel 17, such that the air case 5 is a gap or conduit going from the lower part of the frames 11, 15 to the upper part of the panels 12, 17.

[0036] In a preferred embodiment of the invention, the inner frame 15 is made of stainless steel and the inner panel 17 is made of glass.

[0037] The air case 5 comprises in its lower area extraction means 8 which, through a lower grating 16 in the inner frame 15, extract the clean air expelled through the lower part of the purifiers 2 of the inner enclosure 14. In a preferred embodiment of the invention the extraction means 8 with a set of fans.

[0038] In this preferred embodiment of the invention, there is a deflector 4 fixed to the lower part of each of the air purifiers 2 for the purpose of directing the clean air expelled through the lower part of the purifier 2 towards the lower grating 16 of the inner frame 15, thus achieving that this cleaned air is the only air which is extracted by the air case 5. In said preferred embodiment, the lower grating 16 is arranged at the floor for the purpose of preventing, insofar as it is possible, the extraction of air not purified by the purifiers 2, which will be to a large extent in the upper area of the inner enclosure 14. The lower grating 16 has a blanket or filtering surface which will clean the air which could have entered in the air case 5 without having previously passed through the purifiers 2 and having been cleaned in the latter.

[0039] The air extracted by the extraction means or fans 8 rising through the air case 5 to its upper part, arranged between the panels 12, 17, and upon reaching the highest area is divided into an inner current 22 and into an outer current 23 by means of inner perforations 20 and outer perforations existing in the air case 5.

[0040] The inner current 22 of clean air passes to the inner enclosure 14 through the inner perforations 20 in the inner panel 17, generating an air ceiling in the upper area of the inner enclosure 14 of the smoking room.

[0041] The outer current 23 of clean air leaves the smoking room through outer perforations 19 in the outer panel 18. This generates a decompensation of air between the inner enclosure 14 and the outside of the smoking room and this decompensation forces a circulation of air from the outside of the smoking room to the inner

enclosure 14 through the open spaces in the smoking room, i.e. the side accesses 13, and the upper area of the room which is not covered at this time by the air ceiling formed by the inner current 22. The air entering from the outside of the room comes from the outer cooling air which on many occasions is produced in the upper part of the place in which the smoking room is arranged. Two main advantages are thus achieved. The first is that cooling air circulates from the outside towards the inner enclosure, therefore there is continuous airing and cooling of the inner enclosure 14. In addition when the air enters the inner enclosure 14 through the only spaces through which it can do so, the accesses 13 and the upper area which is not covered by the air ceiling formed by the inner current 22, the contaminated air which was not cleaned by the purifiers 2 is prevented from leaving through these accesses 13 and the upper area.

[0042] The movements of the air both at the inlet and outlet of the purifier 2, and the circulation of the outer current 23 between the outside of the room and the inner enclosure 14, and the generated inner current 22, can be observed in Figure 3 by means of arrows.

[0043] In a preferred embodiment of the invention, the number of inner perforations 20 is greater than the number of outer perforations 19 and therefore the inner current 22 of clean air passing to the inner enclosure 14 and generating the air ceiling is greater than the outer current 23 of clean air leaving the smoking room and generating the decompensation between said inner enclosure 14 and the outside of the room forcing the circulation of air.

[0044] In a particular embodiment of the air case 5, the outer frame 11 and inner frame 15 are separated from the outer panel 12 and inner panel 17 by means of a horizontal upper grating 18 with a series of perforations. This embodiment provides the advantage of distributing the air flow in a regular manner through the entire section of the air case 5.

[0045] The previously described room for smokers is intended to be preferably located in places in which ventilation and cooling come from the upper part. In the case of places in which ventilation or cooling come from the lower part, or from the floor, a particular embodiment of the room has been provided in which the outer frame 11 of the first closing element 9 comprises a ventilation grating 21 in its lower area. Thus, when the decompensation occurs between the inner enclosure 14 and the outside of the room, the outer cooling air will enter the inner enclosure through the ventilation grating 21.

Claims

1. A room for smokers comprising a side outer partition (1) demarcating an inner enclosure (14), and a plurality of air purifiers (2) arranged in the inner enclosure (14) absorbing air contaminated with smoke and expelling it after having purified it inside said

- smoking room, **characterized in that** the outer partition (1) comprises a first closing element (9) and a second closing element (10), both U shaped closing elements (9,10) with their ends opposite to and separated from one another forming two accesses (13) to the inner enclosure (14), and **in that** the smoking room additionally comprises in the inner enclosure (14) an inner wall (24) parallel to the second closing element (10) and connected to the latter, said second closing element (10) and the inner wall (24) forming an air case (5) comprising extraction means (8) in its lower part extracting the air expelled by the purifiers (2), and inner perforations (20) in its upper part returning to the inner enclosure (14) an inner current (22) of the air extracted by the extraction means (8) generating an air ceiling, and outer perforations (19) expelling to the outside of the smoking room an outer current (23) of the extracted air and generating a decompensation of air between the inner enclosure (14) and the outside of the smoking room, forcing a circulation of air to the inner enclosure (14) from the outside of the room through the accesses (13) and through the upper area not covered by the air ceiling generated by the inner current (22).
2. A room for smokers according to claim 1, **characterized in that** the air purifiers (2) comprise a vertical cylindrical body (3) absorbing air with smoke through its upper part and expelling clean air through its lower part after having purified it inside.
 3. A room for smokers according to any one of the previous claims, **characterized in that** the first closing element (9) and the second closing element (10) comprise an outer frame (11) and a vertical outer panel (12), and **in that** the inner wall (24) comprises an inner frame (15) and an inner panel (17).
 4. A room for smokers according to any one of the previous claims, **characterized in that** the extraction means (8) are fans.
 5. A room for smokers according to any one of the previous claims, **characterized in that** the air case (5) extracts the air expelled by the air purifiers (2) through a lower grating (16) arranged in the inner frame (15) at the floor.
 6. A room for smokers according to the previous claim, **characterized in that** the lower grating (16) comprises a filtering surface (6).
 7. A room for smokers according to one any of claims 5 or 6, **characterized in that** it comprises a deflector (4) fixed to the lower part of the vertical cylindrical body (3) of the air purifier (2) directing the air purified inside said air purifier (2) towards the lower grating (16) of the inner frame (15).
 8. A room for smokers according to any one of the previous claims, **characterized in that** the frames (11,15) of the air case (5) are separated from the vertical panels (12,17) by means of a horizontal upper grating (18) comprising small perforations.
 9. A room for smokers according to any of claims 3 to 8, **characterized in that** the outer frames (11) and the inner frame (15) are made of stainless steel.
 10. A room for smokers according to any of claims 3 to 9 **characterized in that** the vertical outer panels (12) and the inner panel (17) are made of glass.
 11. A room for smokers according to any one of the previous claims, **characterized in that** the air purifiers (2) are evenly distributed in the inner enclosure (14).
 12. A room for smokers according to any one of the previous claims, **characterized in that** it comprises a plurality of tables (7) arranged in the inner enclosure (14).
 13. A room for smokers according to the previous claim, **characterized in that** the tables (7) are fixed to the air purifiers (2).
 14. A room for smokers according to the previous claim, **characterized in that** the tables (7) are circular and are arranged concentrically and outwardly from the air purifiers (2).
 15. A room for smokers according to any one of the previous claims, **characterized in that** the outer frame (11) of the first closing element (9) comprises a ventilation grating (21) in its lower area.
 16. A room for smokers according to any one of the previous claims, **characterized in that** the number of inner perforations (20) is greater than the number of inner perforations (19) the inner current 22 of clean air returned to the inner enclosure (14) being greater than the outer current (23) of clean air expelled to the outside of the smoking room.

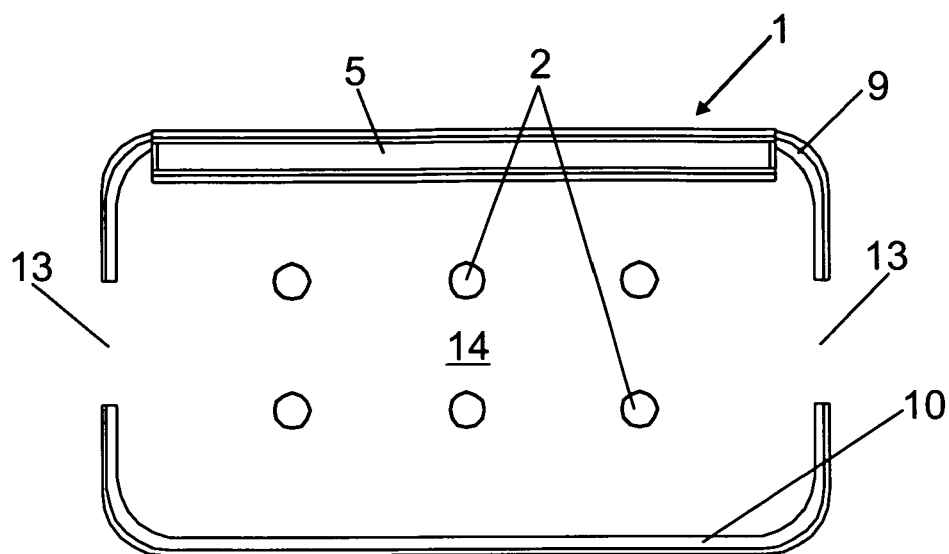


FIG. 1

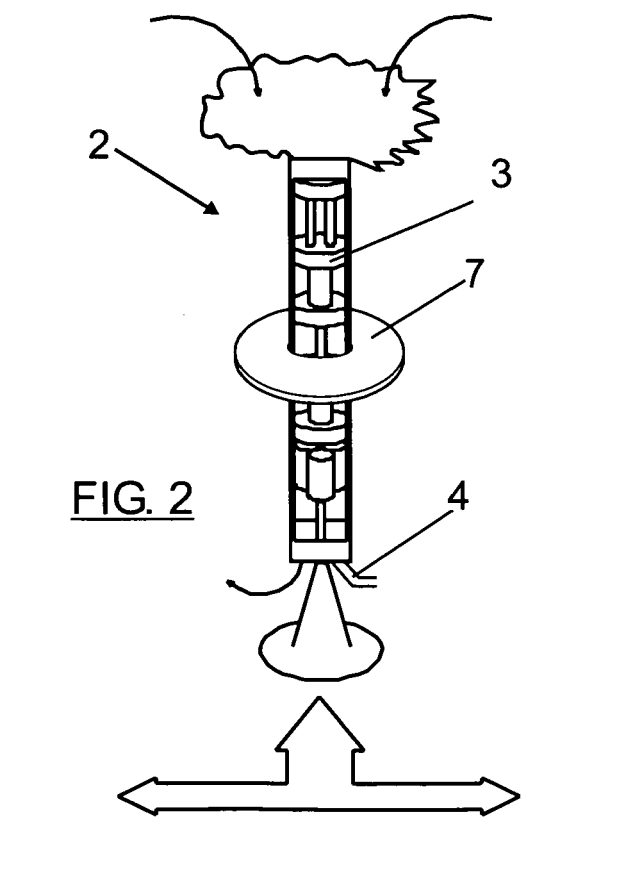


FIG. 2

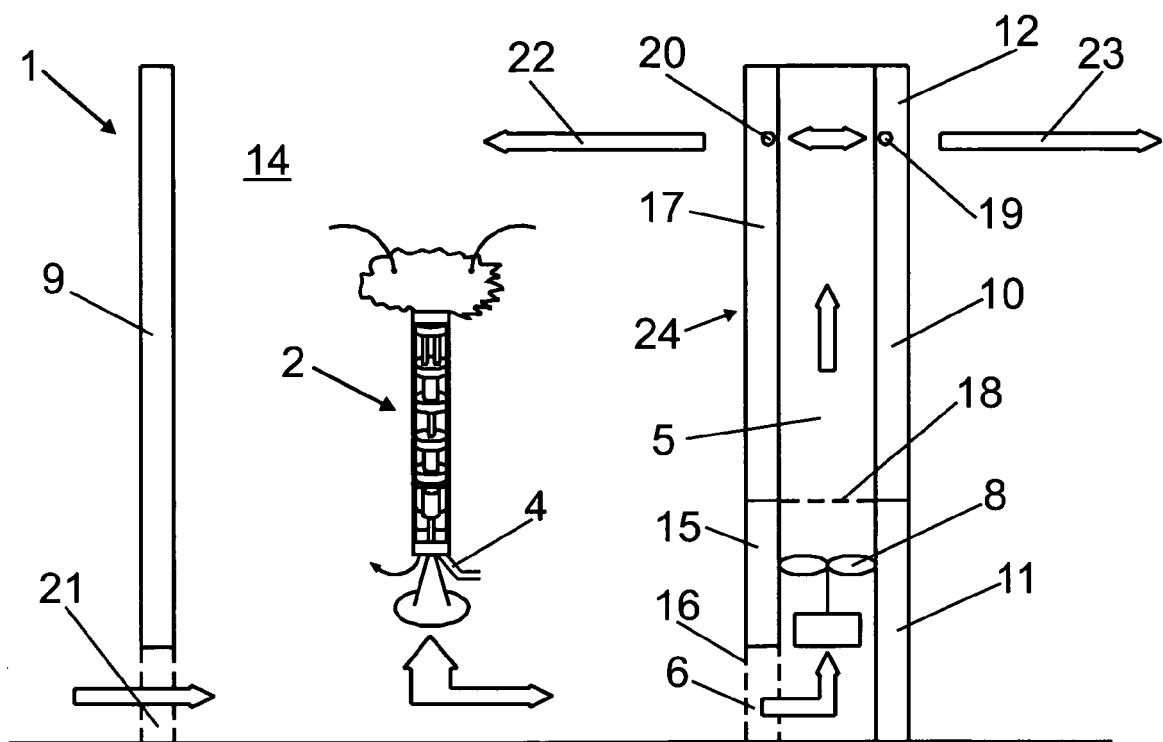


FIG. 3