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(54) Ventilation system for ventilating a fire compartment in a building

Lüftungsanlage für ventilieren einen Brandabschnitt eines Gebäudes

Système de ventilation pour aérer un compartement de confinement d'incendie dans un bâtiment

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Description

[0001] The present invention relates to a ventilation system for ventilating a fire compartment in a building with two or more fire compartments which are separated from one another by means of fire partitions, comprising one or more ventilation fans for supplying and/or discharging air to and/or from the fire compartment, ventilation fan control means for controlling the one or more ventilation fans and comprising at least one compartment through-passage for supplying or discharging the air to be supplied or the air to be discharged through the fire partition to or from the one or more ventilation fans.

[0002] The present invention also relates to a method for controlling the one or more ventilation fans of such a ventilation system.

[0003] Buildings with different fire compartments to which the ventilation systems according to the invention relate, are typically apartment buildings, student flats, serviced flats, etc. The different apartments, studios, (part of a) corridor with student apartments and associated bathrooms or shower rooms, etc. in such buildings form the different fire compartments thereof. The different fire compartments are usually separated from one another by means of fire partitions.

[0004] With ventilation systems according to the present invention, one or more ventilation fans are provided for each fire compartment. These can, if necessary, also be used to supply air through the fire partitions towards the fire compartment. It is also possible to discharge air, if necessary, via one or more discharge lines from one or more spaces, towards the ventilation fan, in which case said air can then be discharged from the ventilation fan via a common discharge duct to the outside. When a ventilation system for ventilating such a fire compartment is used to discharge air, a compartment through-passage of the ventilation system of this fire compartment usually passes the air to be discharged through the abovementioned fire partition to a common discharge duct for several fire compartments together, in which the air to be discharged of these various fire compartments together is discharged from the building. If such a ventilation system is used to supply air, this air is often also supplied via a common supply duct for several fire compartments together, following which the air is passed through a fire partition via a compartment through-passage for each fire compartment towards the ventilation fan.

[0005] Such a ventilation system for supplying air in a mechanical way but discharging it in a natural way is referred to as a so-called B system. When air is discharged from the fire compartment only by mechanical means, this is referred to as a so-called C system. Fresh air is then supplied to the fire compartment, usually via natural air supply (adjustable supply openings, ventilation grilles). When the ventilation system both discharges and supplies air by mechanical means, this is referred to as a so-called D system. Both with a C system and with

a D system, fresh air is normally supplied to so-called "dry spaces", while air is discharged from so-called "moist spaces" (or "wet spaces"). Living rooms, bedrooms, offices form the so-called "dry spaces", while kitchens, bathrooms, toilets and sculleries form the so-called "moist spaces". There are also ventilation systems in which, when required by environmental factors (such as, for example, the CO₂ in the air), air is discharged from (usually a limited number of) "dry spaces". The ventilation system according to the present invention may be any of these systems.

[0006] In order to satisfy the requirements regarding fire safety in such buildings with different fire compartments, this fire compartment has to be sealed off from the other fire compartments as quickly as possible if a fire breaks out in one of the fire compartments in order to prevent fire spreading between the different fire compartments. With existing ventilation systems, fire valves are provided for this purpose for such a fire compartment in each compartment through-passage at the location of the corresponding fire partition. This is amongst others the case in the ventilation system such as described with respect to the state of the art in US 5 788 571 A, wherein a ventilation system according to the preamble of claim 1 is described. Such a fire valve comprises one or more valve leaves by means of which the compartment through-passage can be sealed. During normal use, the valve leaves of such fire valves are in an open position in which there is as little obstruction as possible for the airflow through the compartment through-passage. These valve leaves are retained in this open position, for example, by means of a fusible link. In case of fire, such a fusible link will melt when the temperature at the location of the fusible link rises sufficiently, in which case the valve leaves are brought to their closed position under the effect of, for example, a spring force, in which case they seal the compartment through-passage. Electronic alternatives for this fusible link mechanism are also known. However, such fire valves are relatively expensive parts for such ventilation systems.

[0007] It is therefore an object of the present invention also to provide a less expensive ventilation system for ventilating a fire compartment in a building with two or more fire compartments which also satisfies the requirements regarding fire safety.

[0008] This object of the invention is achieved by providing a ventilation system for ventilating a fire compartment in a building with two or more fire compartments, which are separated from one another by means of fire partitions, comprising one or more ventilation fans for supplying and/or discharging air to and/or from the fire compartment, ventilation fan control means for controlling the one or more ventilation fans, comprising at least one compartment through-passage for supplying or discharging the air to be supplied or the air to be discharged through the fire partition to or from the one or more ventilation fans, in which the ventilation system comprises a measuring system with one or more fire sensors for de-

tecting fire via the air to be supplied and/or via the air to be discharged, in which the ventilation control means are adapted to shut down the one or more ventilation fans if a fire is detected by means of the one or more fire sensors, in which the ventilation system does not comprise fire valves, but comprises a fire-resistant sealing ring for each compartment through-passage which is fitted around said compartment through-passage, at the location of the corresponding fire partition.

[0009] According to the fire safety requirements, in order to ensure adequate fire safety, a fire valve has to be provided in a duct to which a working ventilation fan is connected at the location of the fire partition through which this duct is passed. Due to the measuring system by means of which a fire is detected, it is possible to shut down the one or more ventilation fans in case of fire. By shutting down the one or more ventilation fans, a compartment through-passage is no longer connected to a duct to which a working ventilation fan is connected in case of fire. With such unpressurized ducts, a sufficient degree of fire safety may already be ensured by means of a fire-resistant sealing ring instead of by means of a fire valve. Therefore, according to the invention, the same level of fire safety can thus be ensured in case of fire by shutting down the one or more ventilation fans and by providing a fire-resistant sealing ring in order to seal the duct in time to prevent fire expansion for a certain amount of time.

[0010] In a specific embodiment of such a ventilation system, at least one of the abovementioned one or more fire sensors is arranged in said compartment through-passage.

[0011] Furthermore, it is, more specifically, possible with a ventilation system according to the invention, to arrange at least one of the abovementioned one or more fire sensors in a housing, in which at least one of the abovementioned one or more ventilation fans is arranged and to which at least one said compartment through-passage is connected.

[0012] In a preferred embodiment of a central ventilation system according to the present invention, the fire compartment comprises, one or more spaces, the ventilation system comprises one or more corresponding discharge ducts for discharging air to be discharged from the spaces to the one or more ventilation fans, each discharge duct comprises a flow regulator (for example a regulator valve) for controlling the flow of air to be discharged through said discharge duct, the ventilation system comprises flow control means for controlling this flow regulator and this flow regulator and the flow control means are adapted to seal the corresponding discharge duct by means of the flow regulator if a fire is detected by means of the one or more fire sensors. These one or more spaces may, more specifically, be moist spaces.

[0013] In such a preferred embodiment, it is possible, in case of fire, not only to shut down the one or more ventilation fans, but also to seal the discharge ducts from spaces which are connected to the ventilation fan. Such

flow regulators are often already present in such ventilation systems for controlling the flow of air to be supplied and discharged during normal operation of the ventilation system. According to the invention, these flow regulators which are already present can now be used as an additional barrier to delay the fire spreading between compartments in case of fire. In addition, as a result of closing the flow regulators, it is ensured that no smoke spreads from one part of the burning fire compartment to another part of the fire compartment.

[0014] In such a preferred embodiment, said fire sensor is furthermore preferably arranged at the location of each flow regulator.

[0015] A specific embodiment of a ventilation system according to the present invention furthermore comprises an alarm system for generating an alarm signal when the one or more ventilation fans are being shut down in case a fire is detected by means of the one or more fire sensors.

[0016] Each compartment through-passage of a ventilation system according to the invention is preferably made of plastic, at least at the location of the corresponding fire partition.

[0017] Each compartment through-passage of a ventilation system according to the invention furthermore preferably also comprises a non-return valve between the one or more ventilation fans and the fire-resistant sealing ring. As a result of such a non-return valve, no air from other fire compartments is passed into the fire compartment where the fire is taking place. The ventilation system remains unpressurized in the burning fire compartment.

[0018] A ventilation system according to the invention furthermore preferably comprises a calculation unit for loading quantities measured by means of the abovementioned one or more fire sensors of the air to be supplied and/or the air to be discharged, for comparing these measured quantities to a fire threshold for detecting fire and for transmitting a signal upon detection of a fire to the ventilation control means in order to shut down the one or more ventilation fans.

[0019] In a particularly inexpensive embodiment, the abovementioned one or more fire sensors comprise one or more temperature sensors for measuring the temperature of the air to be supplied and/or to be discharged.

[0020] A particularly inexpensive embodiment of a ventilation system according to the present invention comprises one single temperature sensor as fire sensor for each compartment through-passage which is arranged in this compartment through-passage to determine the temperature of the air which flows through this compartment through-passage, so that the temperature of the air flows between the various fire compartments is known.

[0021] Alternatively or additionally, the abovementioned one or more fire sensors may also comprise one or more VOC sensors (sensors which measure Volatile Organic Compounds) for detecting smoke and thus fire.

[0022] Furthermore, the abovementioned one or more fire sensors preferably comprise one or more sensors for measuring the relative humidity of the air to be supplied and/or to be discharged.

[0023] The object of the present invention is also achieved by providing a method for controlling the one or more ventilation fans of a ventilation system using an above-described calculation unit, in which the fire sensors measure quantities of the air to be supplied and/or the air to be discharged, in which the calculation unit loads the quantities measured by means of the fire sensors and compares them to a fire threshold in order to detect a fire, and in which the calculation unit, upon detecting a fire, transmits a signal to the ventilation control means in order to shut down the one or more ventilation fans.

[0024] In a particular such method for controlling the one or more ventilation fans of a ventilation system using one or more temperature sensors, the one or more temperature sensors measure the temperature of the air to be supplied and/or the air to be discharged, the calculation unit loads the measured temperature and compares this measured temperature to a temperature threshold as a fire threshold and the calculation unit detects fire if the measured temperature rises above this temperature threshold.

[0025] The temperature threshold is in this case preferably set at 72°C. Still more preferably, the calculation unit in this case detects a fire if the measured temperature remains above the fire threshold for more than 90 seconds.

[0026] In a particular method according to the present invention, the calculation unit determines the temperature of the air to be discharged as the maximum temperature of the temperatures measured by the various temperature sensors as fire sensors.

[0027] In a further particular method according to the present invention for controlling the one or more ventilation fans in a ventilation system with one or more sensors for measuring relative humidity, the sensors for measuring relative humidity measure the relative humidity of the air to be supplied and/or the air to be discharged, the calculation unit loads the measured relative humidity and compares the measured relative humidity with a humidity threshold value as a fire threshold, and the calculation unit detects a fire if the measured relative humidity drops below this humidity threshold value.

[0028] Preferably, the humidity threshold value is set at 60%.

[0029] Particularly preferably, the calculation unit, if both temperature sensors and sensors are present for measuring relative humidity, only detects fire if the temperature is above the temperature threshold and if the relative humidity drops below the humidity threshold value.

[0030] The present invention will now be explained in more detail by means of the following detailed description of a preferred ventilation system according to the present

invention and of a method for controlling the ventilation fan thereof. The sole aim of this description is to give illustrative examples and to indicate further advantages and features of this ventilation system, and can therefore by no means be interpreted as a limitation of the area of application of the invention or of patent rights defined in the claims.

[0031] In this detailed description, reference numerals are used to refer to the attached drawing (Fig. 1) which diagrammatically shows a ventilation system according to the present invention.

[0032] The illustrated ventilation system (1) is designed to be installed in an apartment in an apartment building. The various apartments in this apartment building are separated from a common shaft which comprises a common discharge duct (8) by means of fire partitions (2). This common discharge duct (8) is concentric with a supply duct (9) for gas boilers in the various apartments and concentric with a waste gas discharge duct (10). All compartment discharge ducts (4) of the various ventilation systems (1) in this apartment building are usually connected to one or more common discharge ducts (8). The air which is discharged by the corresponding ventilation system (1) from the corresponding apartment is brought through the fire partition (2) into the common discharge duct (8) via each compartment discharge duct (4).

[0033] This illustrated ventilation system (1) comprises a ventilation fan (3) for discharging air from the apartment. The housing (3) which contains the ventilation fan is connected, on one side, to the compartment discharge duct (4) and, on the other side, to different discharge ducts for discharging air from moist spaces in the apartment and optionally from one or more dry spaces in this apartment, such as, for example, a bedroom, towards the housing (3). The discharge ducts which are connected to the moist spaces and optionally dry spaces are not shown. However, the different flow regulators (6) which are connected on one side to openings in the housing (3) and to which these discharge ducts can be connected on the other side are illustrated.

[0034] The compartment discharge duct (4) is made from plastic at the location of the fire partition (2). Around this plastic portion of the compartment discharge duct (4), a fire-resistant sealing ring (5) is fitted at the location of the fire partition (2).

[0035] Between the ventilation fan (3) and the fire-resistant sealing ring (5), the compartment discharge duct (4) comprises a non-return valve (7).

[0036] The ventilation system (1) furthermore comprises:

- ventilation fan control means for controlling the ventilation fan (3);
- a measuring system with, for each flow regulator (6) to which a bathroom, kitchen or scullery is connected, a temperature sensor for measuring the temperature of the air to be discharged via the correspond-

ing discharge duct which is fitted in the discharge duct at the location of this flow regulator (6) and, for each flow regulator (6) to which a bathroom, kitchen or scullery is connected, a sensor for measuring the relative humidity of the air to be discharged which is also fitted in the discharge duct at the location of this flow regulator (6);

- a calculation unit for comparing the measured temperature of the air to be discharged to a temperature threshold and for comparing the measured relative humidity to a humidity threshold value;
- flow control means for controlling the flow regulators (6).

[0037] These ventilation fan control means, the measuring system, the calculation unit and the flow control means are all arranged in this ventilation system (1) at the location of the housing (3) of the ventilation fan, partly on a central electronic circuit board containing a central processing unit which, for example, comprises a micro-processor, and partly on the flow regulators.

[0038] The temperature threshold in this ventilation system (1) is set at 72°C and the humidity threshold value at 60%. The temperature of the air to be discharged is defined as the maximum temperature of the temperatures measured using the various sensors. The relative humidity of the air corresponding to this maximum temperature is also used as a control parameter. The control of both the ventilation fan (3) and the flow regulators (6) is adjusted in such a manner that, in addition to the normal control of the ventilation fan (3) and the flow regulators (6) with regulation of the ventilation flow of air to be discharged from the various spaces, the ventilation fan control means now also shut down the ventilation fan (3) and the flow control means close the flow regulators (6) to seal the respective discharge ducts when the calculation unit indicates to the ventilation fan control means and to the flow control means that the temperature of the air to be discharged remains above 72°C for 90 seconds and the relative humidity drops below 60% at the same time.

[0039] In case of a fire in the apartment in which this ventilation system (1) is fitted, the ventilation fan (3) is thus shut down by means of this ventilation system (1), resulting in an unpressurized system, and the flow regulators (6) seal the various discharge ducts to prevent smoke from spreading. The fire-resistant sealing ring (5) throttles the plastic section of the compartment discharge duct (4) at the location of the fire partition (2) and thus seals this compartment discharge duct (4) in order to prevent fire spreading between the various fire compartments for a certain period of time. During the short period of time when the fire-resistant sealing ring (5) does not yet completely seal the compartment discharge duct (4), the non-return valve (7) prevents air from the other apartments from entering the burning apartment via the common discharge duct (8).

Claims

1. Ventilation system (1) for ventilating a fire compartment in a building with two or more fire compartments which are separated from one another by means of fire partitions (2), comprising one or more ventilation fans (3) for supplying and/or discharging air to and/or from the fire compartment, ventilation fan control means for controlling the one or more ventilation fans (3), comprising at least one compartment through-passage (4) for supplying or discharging the air to be supplied or the air to be discharged through the fire partition (2) to or from the one or more ventilation fans (3), and comprising a measuring system with one or more fire sensors for detecting fire via the air to be supplied and/or via the air to be discharged, in that the ventilation control means are adapted to shut down the one or more ventilation fans (3) if a fire is detected by means of the one or more fire sensors, **characterized in that** the ventilation system (1) does not comprise fire valves, but comprises a fire-resistant sealing ring (5) for each compartment through-passage (4) which is fitted around said compartment through-passage (4), at the location of the corresponding fire partition (2).
2. Ventilation system (1) according to one of the preceding claims, **characterized in that** at least one of the abovementioned one or more fire sensors is arranged in said compartment through-passage (4).
3. Ventilation system (1) according to one of the preceding claims, **characterized in that** at least one of the abovementioned one or more fire sensors is arranged in a housing (3), in which at least one of the abovementioned one or more ventilation fans (3) is arranged and to which at least one said compartment through-passage (4) is connected.
4. Ventilation system (1) according to one of the preceding claims, **characterized in that** the fire compartment comprises one or more spaces, **in that** the ventilation system (1) comprises one or more corresponding discharge ducts for discharging air to be discharged from the spaces to the one or more ventilation fans (3), **in that** each discharge duct comprises a flow regulator (6) for controlling the flow of air to be discharged through said discharge duct, **in that** the ventilation system (1) comprises flow control means for controlling this flow regulator (6), and **in that** this flow regulator (6) and the flow control means are adapted to seal the corresponding discharge duct by means of the flow regulator (6) if a fire is detected by means of the one or more fire sensors.
5. Ventilation system (1) according to Claim 4, **characterized in that** said fire sensor is arranged at the location of each flow regulator (6).

6. Ventilation system (1) according to one of the preceding claims, **characterized in that** said ventilation system (1) comprises an alarm system for generating an alarm signal when the one or more ventilation fans (3) are being shut down in case a fire is detected by means of the one or more fire sensors. 5
7. Ventilation system (1) according to one of the preceding claims, **characterized in that** each compartment through-passage (4) is made of plastic, at least at the location of the corresponding fire partition (2). 10
8. Ventilation system (1) according to one of the preceding claims, **characterized in that** each compartment through-passage (4) between the one or more ventilation fans (3) and the fire-resistant sealing ring (5) comprises a non-return valve (7). 15
9. Ventilation system according to one of the preceding claims, **characterized in that** the ventilation system (1) comprises a calculation unit for loading quantities measured by means of the abovementioned one or more fire sensors of the air to be supplied and/or the air to be discharged, for comparing these measured quantities to a fire threshold for detecting fire and for transmitting a signal upon detection of a fire to the ventilation control means in order to shut down the one or more ventilation fans (3). 20
10. Ventilation system (1) according to one of the preceding claims, **characterized in that** the abovementioned one or more fire sensors comprise one or more temperature sensors for measuring the temperature of the air to be supplied and/or to be discharged. 25
11. Ventilation system (1) according to one of the preceding claims, **characterized in that** the abovementioned one or more fire sensors comprise one or more VOC sensors for detecting smoke. 30
12. Ventilation system (1) according to one of the preceding claims, **characterized in that** the abovementioned one or more fire sensors comprise one or more sensors for measuring the relative humidity of the air to be supplied and/or to be discharged. 35
13. Method for controlling the one or more ventilation fans (3) of a ventilation system (1) according to Claim 9, **characterized in that** the fire sensors measure quantities of the air to be supplied and/or the air to be discharged, **in that** the calculation unit loads the quantities measured by means of the fire sensors and compares them to a fire threshold in order to detect a fire, and **in that** the calculation unit, upon detecting a fire, transmits a signal to the ventilation control means in order to shut down the one or more ventilation fans (3). 40

14. Method according to Claim 13, for controlling the one or more ventilation fans (3) of a ventilation system according to Claim 10, **characterized in that** the temperature sensors measure the temperature of the air to be supplied and/or the air to be discharged, **in that** the calculation unit loads the measured temperature and compares it to a temperature threshold as a fire threshold, and **in that** the calculation unit detects fire if the measured temperature rises above this temperature threshold. 45
15. Method according Claim 13 or 14 for controlling the one or more ventilation fans (3) in a ventilation system (1) according to Claim 12, **characterized in that** the sensors for measuring relative humidity measure the relative humidity of the air to be supplied and/or the air to be discharged, **in that** the calculation unit loads the measured relative humidity and compares it with a humidity threshold value as a fire threshold, and **in that** the calculation unit detects a fire if the measured relative humidity drops below this humidity threshold value. 50

25 Patentansprüche

1. Lüftungssystem (1) zum Lüften eines Brandabschnitts in einem Gebäude mit zwei oder mehreren Brandabschnitten, die voneinander mittels Brandmauern (2) getrennt sind, umfassend einen oder mehrere Lüftungsgebläse (3) zum Zuführen und/oder Abführen von Luft zu und/oder von dem Brandabschnitt, Lüftungsgebläsesteuermitteln zum Steuern des einen oder der mehreren Lüftungsgebläse (3), umfassend mindestens einen Abschnittsdurchgang (4) zum Zuführen oder Abführen der zuzuführenden Luft oder der abzuführenden Luft durch die Brandmauer (2) zu oder von dem einen oder den mehreren Lüftungsgebläsen (3), und umfassend ein Messsystem mit einem oder mehreren Brandsensoren zum Erkennen eines Brandes über die zuzuführende Luft und/oder über die abzuführende Luft, wobei die Lüftungssteuermittel ausgelegt sind, das eine oder die mehreren Lüftungsgebläse (3) abzuschalten, falls ein Brand mittels des einen oder der mehreren Brandsensoren erkannt wird, **dadurch gekennzeichnet, dass** das Lüftungssystem (1) keine Brandventile umfasst, jedoch einen feuerfesten Dichtungsring (5) für jeden Abschnittsdurchgang (4) umfasst, der an der Position der entsprechenden Brandmauer (2) um den Abschnittsdurchgang (4) gepasst ist. 55
2. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** mindestens einer der oben erwähnten einen oder mehreren Brandsensoren in dem Abschnittsdurchgang (4) angeordnet ist.

3. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** mindestens einer der oben erwähnten einen oder mehreren Brandsensoren in einem Gehäuse (3) angeordnet ist, in dem mindestens eines der oben erwähnten einen oder mehreren Lüftungsgebläse (3) angeordnet ist und mit dem mindestens ein Abschnittsdurchgang (4) verbunden ist. 5
4. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Brandabschnitt einen oder mehrere Räume umfasst, dadurch, dass das Lüftungssystem (1) einen oder mehrere entsprechende Abführleitungen zum Abführen von abzuführender Luft aus den Räumen zu dem einen oder den mehreren Lüftungsgebläsen (3) umfasst, dadurch, dass jede Abführleitung einen Strömungsregler (6) zum Steuern der Strömung von abzuführender Luft durch die Abführleitung umfasst, dadurch, dass das Lüftungssystem (1) Strömungssteuermittel zum Steuern dieses Strömungsreglers (6) umfasst und dadurch, dass dieser Strömungsregler (6) und die Strömungssteuermittel ausgelegt sind, die entsprechende Abführleitung mittels des Strömungsreglers (6) abzudichten, falls ein Brand mittels des einen oder der mehreren Brandsensoren erkannt wird. 10 15 20 25
5. Lüftungssystem (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** der Brandsensor an der Position jedes Strömungsreglers (6) angeordnet ist. 30
6. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Lüftungssystem (1) ein Alarmsystem zum Erzeugen eines Alarmsignals umfasst, wenn das eine oder die mehreren Lüftungsgebläse (3) abgeschaltet werden, falls ein Brand mittels des einen oder der mehreren Brandsensoren erkannt wird. 35 40
7. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** jeder Abschnittsdurchgang (4) zumindest an der Position der entsprechenden Brandmauer (2) aus Kunststoff hergestellt ist. 45
8. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** jeder Abschnittsdurchgang (4) zwischen dem einen oder den mehreren Lüftungsgebläsen (3) und dem feuerfesten Dichtungsring (5) ein Rückschlagventil (7) umfasst. 50
9. Lüftungssystem nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Lüftungssystem (1) eine Berechnungseinheit zum Laden von Mengen umfasst, die mittels des oben erwähnten einen oder der mehreren Brandsensoren 55
- der zuzuführenden Luft und/oder der abzuführenden Luft gemessen werden, um diese gemessenen Mengen mit einem Brandschwellenwert zu vergleichen, um einen Brand zu erkennen und nach Erkennung eines Brandes ein Signal an die Lüftungssteuermittel zu übermitteln, um das eine oder die mehreren Lüftungsgebläse (3) abzuschalten.
10. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der oben erwähnte eine oder die mehreren Brandsensoren einen oder mehrere Temperatursensoren zum Messen der zuzuführenden und/oder abzuführenden Luft umfassen.
11. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der oben erwähnte eine oder die mehreren Brandsensoren einen oder mehrere VOC-Sensoren zum Erkennen von Rauch umfassen.
12. Lüftungssystem (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der oben erwähnte eine oder die mehreren Brandsensoren einen oder mehrere Sensoren zum Messen der relativen Feuchte der zuzuführenden und/oder abzuführenden Luft umfassen.
13. Verfahren zum Steuern des einen oder der mehreren Lüftungsgebläse (3) eines Lüftungssystems (1) nach Anspruch 9, **dadurch gekennzeichnet, dass** die Brandsensoren Mengen der zuzuführenden und/oder abzuführenden Luft messen, dadurch, dass die Berechnungseinheit die von den Brandsensoren gemessenen Mengen lädt und sie mit einem Brandschwellenwert vergleicht, um einen Brand zu erkennen, und dadurch, dass die Berechnungseinheit nach Erkennen eines Brandes ein Signal an die Lüftungssteuermittel übermittelt, um das eine oder die mehreren Lüftungsgebläse (3) abzuschalten.
14. Verfahren nach Anspruch 13 zum Steuern des einen oder der mehreren Lüftungsgebläse (3) eines Lüftungssystems nach Anspruch 10, **dadurch gekennzeichnet, dass** die Temperatursensoren die Temperatur der zuzuführenden und/oder abzuführenden Luft messen, dadurch dass die Berechnungseinheit die gemessene Temperatur lädt und sie mit einem Temperaturschwellenwert als einen Brandschwellenwert vergleicht, und dadurch, dass die Berechnungseinheit einen Brand erkennt, falls die gemessene Temperatur über diesen Temperaturschwellenwert ansteigt.
15. Verfahren nach Anspruch 13 oder 14 zum Steuern des einen oder der mehreren Lüftungsgebläse (3) in einem Lüftungssystem (1) nach Anspruch 12, **dadurch gekennzeichnet, dass** die Sensoren zum

Messen der relativen Feuchte der zuzuführenden und/oder abzuführenden Luft messen, dadurch, dass die Berechnungseinheit die gemessene relative Feuchte lädt und sie mit einem Schwellenwert der relativen Feuchte als einen Brandschwellenwert vergleicht, und dadurch, dass die Berechnungseinheit einen Brand erkennt, falls die gemessene relative Feuchte unter diesen Feuchtschwellenwert fällt.

Revendications

1. Système (1) de ventilation pour aérer un compartiment de confinement d'incendie dans un bâtiment doté d'au moins deux compartiments de confinement d'incendie qui sont séparé l'un de l'autre au moyen de cloisons pare-feu (2), comportant un ou plusieurs ventilateurs (3) d'aération servant à amener et/ou à évacuer de l'air vers et/ou depuis le compartiment de confinement d'incendie, des moyens de commande de ventilateurs d'aération servant à commander le ou les ventilateurs (3) d'aération, comportant au moins un passage (4) de traversée entre compartiments servant à amener ou à évacuer l'air à amener ou l'air à évacuer à travers la cloison pare-feu (2) vers ou depuis le ou les ventilateurs (3) d'aération, et comportant un système de mesure doté d'un ou plusieurs capteurs d'incendie servant à détecter un incendie via l'air à amener et/ou via l'air à évacuer, **caractérisé en ce que** les moyens de commande d'aération sont prévus pour couper le ou les ventilateurs (3) d'aération si un incendie est détecté au moyen du ou des capteurs d'incendie, **caractérisé en ce que** le système (1) de ventilation ne comporte pas de clapets coupe-feu, mais comporte une bague (5) d'étanchéité résistant au feu pour chaque passage (4) de traversée entre compartiments, qui est montée autour dudit passage (4) de traversée entre compartiments, à l'emplacement de la cloison pare-feu (2) correspondante.
2. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** le capteur ou au moins un des capteurs d'incendie susmentionnés est disposé dans ledit passage (4) de traversée entre compartiments.
3. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** le capteur ou au moins un des capteurs d'incendie susmentionnés est disposé dans un boîtier (3) dans lequel est disposé le ventilateur ou au moins un des ventilateurs (3) d'aération susmentionnés et auquel est relié au moins un desdits passages (4) de traversée entre compartiments.
4. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** le com-

partiment de confinement d'incendie comporte un ou plusieurs espaces, **en ce que** le système (1) de ventilation comporte un ou plusieurs conduits d'évacuation correspondants servant à évacuer de l'air à évacuer des espaces vers le ou les ventilateurs (3) d'aération, **en ce que** chaque conduit d'évacuation comporte un régulateur (6) de débit servant à réguler le débit d'air à évacuer à travers ledit conduit d'évacuation, **en ce que** le système (1) de ventilation comporte des moyens de régulation de débit servant à commander ce régulateur (6) de débit, et **en ce que** ce régulateur (6) de débit et les moyens de régulation de débit sont prévus pour isoler le conduit d'évacuation correspondant au moyen du régulateur (6) de débit si un incendie est détecté au moyen du ou des capteurs d'incendie.

5. Système (1) de ventilation selon la revendication 4, **caractérisé en ce que** ledit capteur d'incendie est disposé à l'emplacement de chaque régulateur (6) de débit.
6. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** ledit système (1) de ventilation comporte un système d'alarme servant à générer un signal d'alarme lorsque le ou les ventilateurs (3) d'aération sont en cours d'arrêt dans le cas où un incendie est détecté au moyen du ou des capteurs d'incendie.
7. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** chaque passage (4) de traversée entre compartiments est constitué de plastique, au moins à l'emplacement de la cloison pare-feu (2) correspondante.
8. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** chaque passage (4) de traversée entre compartiments entre le ou les ventilateurs (3) d'aération et la bague (5) d'étanchéité résistant au feu comporte un clapet anti-retour (7) .
9. Système de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** le système (1) de ventilation comporte une unité de calcul servant à charger des grandeurs mesurées au moyen du capteur ou d'au moins un des capteurs d'incendie susmentionnés de l'air à amener et/ou l'air à évacuer, pour comparer ces grandeurs mesurées à un seuil d'incendie servant à détecter un incendie et envoyer un signal suite à la détection d'un incendie aux moyens de commande d'aération afin de couper le ou les ventilateurs (3) d'aération.
10. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** le ou les capteurs d'incendie susmentionnés comportent

un ou plusieurs capteurs de température servant à mesurer la température de l'air à amener et/ou à évacuer.

11. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** le ou les capteurs d'incendie susmentionnés comportent un ou plusieurs capteurs de COV servant à détecter de la fumée. 5
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12. Système (1) de ventilation selon l'une des revendications précédentes, **caractérisé en ce que** le ou les capteurs d'incendie susmentionnés comportent un ou plusieurs capteurs servant à mesurer l'humidité relative de l'air à amener et/ou à évacuer. 15
13. Procédé de commande du ou des ventilateurs (3) d'aération d'un système (1) de ventilation selon la revendication 9, **caractérisé en ce que** les capteurs d'incendie mesurent des grandeurs de l'air à amener et/ou de l'air à évacuer, **en ce que** l'unité de calcul charge les grandeurs mesurées au moyen des capteurs d'incendie et les compare à un seuil d'incendie afin de détecter un incendie, et **en ce que** l'unité de calcul, suite à la détection d'un incendie, envoie un signal aux moyens de commande d'aération afin de couper le ou les ventilateurs (3) d'aération. 20
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14. Procédé selon la revendication 13 de commande du ou des ventilateurs (3) d'aération d'un système de ventilation selon la revendication 10, **caractérisé en ce que** les capteurs de température mesurent la température de l'air à amener et/ou de l'air à évacuer, **en ce que** l'unité de calcul charge la température mesurée et la compare à un seuil de température en tant que seuil d'incendie, et **en ce que** l'unité de calcul détecte un incendie si la température mesurée s'élève au-dessus de ce seuil de température. 30
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15. Procédé selon la revendication 13 ou 14 de commande du ou des ventilateurs (3) d'aération dans un système (1) de ventilation selon la revendication 12, **caractérisé en ce que** les capteurs servant à mesurer l'humidité relative mesurent l'humidité relative de l'air à amener et/ou de l'air à évacuer, **en ce que** l'unité de calcul charge l'humidité relative mesurée et la compare à une valeur seuil d'humidité en tant que seuil d'incendie, et **en ce que** l'unité de calcul détecte un incendie si l'humidité relative mesurée tombe au-dessous de cette valeur seuil d'humidité. 40
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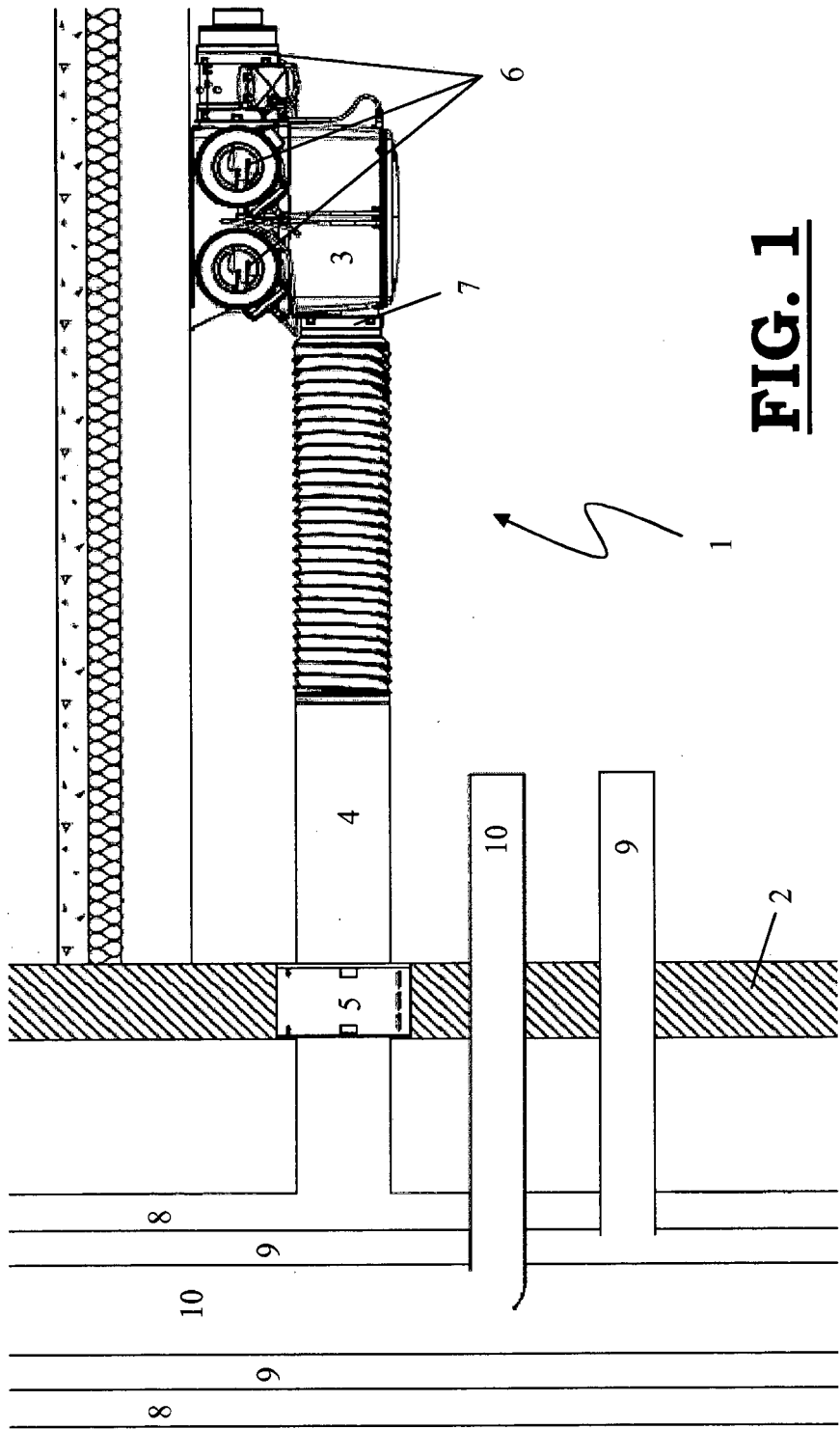


FIG. 1

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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