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(54) FIRE-RESISTANT VENTILATION ELEMENT

(57) Fire-resistant ventilation element (1) for ventilation through a wall (2), wherein the ventilation element (1) comprises a body (3) with an outwardly facing surface (3a) and an inwardly facing surface (3b) situated opposite this outwardly facing surface (3a), wherein the inwardly facing surface (3b) surrounds a body passage and wherein this ventilation element (1) comprises one or more sealing elements (4) arranged in the body passage to form a sealable air passage opening through this body passage, wherein the ventilation element (1) comprises intumescent material (5) which is provided to expand outwards from the body (3) due to the action of heat.

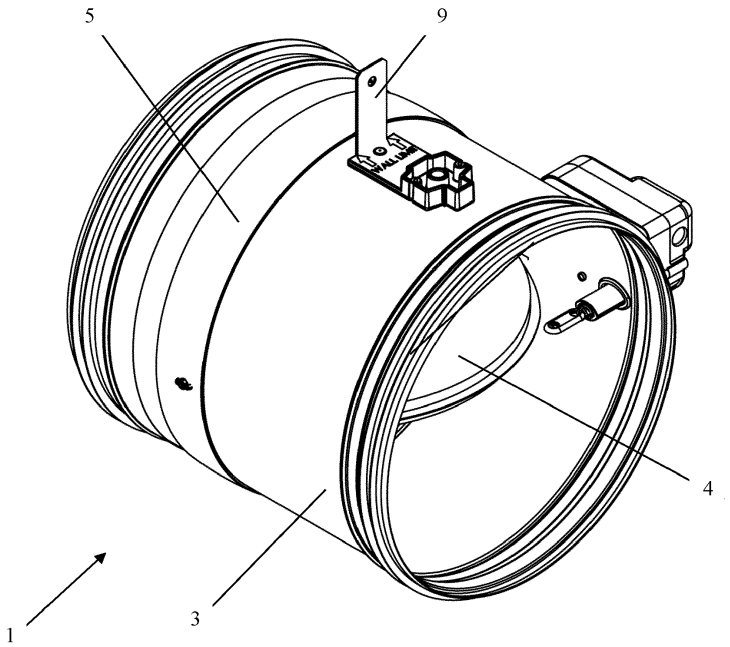

Fig. 1

EP 3 808 413 A1

Description

[0001] The present invention relates to a fire-resistant ventilation element for ventilation through a wall, wherein the fire-resistant ventilation element is provided to extend at least partly in a passage in a wall and is provided to be fitted in the passage in such a way that the ventilation element is situated in the passage, and the space between the ventilation element and the wall which extends in the passage is filled with a filler, wherein the ventilation element comprises a body with an outwardly facing surface and an inwardly facing surface situated opposite this outwardly facing surface, wherein the inwardly facing surface surrounds a body passage and wherein this ventilation element comprises one or more sealing elements arranged in the body passage to form a sealable air passage opening through this body passage.

[0002] The present invention also relates to an assembly of a wall and a fire-resistant ventilation element, wherein the wall comprises a passage and the ventilation element is provided to at least partly extend in this passage and wherein the assembly comprises a filler for filling the space between the wall and the ventilation element which extends in the passage.

[0003] The present invention also relates to a method for fitting a fire-resistant ventilation element in a passage in a wall, this ventilation element being fitted in the passage, and the space between the ventilation element and the wall which extends in the passage being filled with a filler.

[0004] Such a fire-resistant ventilation element makes ventilation through a wall possible. The ventilation element as such is fitted in a passage in the wall and comprises a body with a body passage through which ventilation is possible. The body may be tubular with a circular cross section, but may equally have a rectangular cross section. In case of fire, ventilation through the wall is undesirable. To this end, the ventilation element is provided with one or more sealing elements arranged in the body passage to form a sealable air passage opening through this body passage. Also, the existing ventilation elements are built into the passage in the wall in a fire-resistant way. In practice, this means that in case of fire, air cannot move through the wall at the location of the ventilation element for a certain time. This results in flame penetration being blocked for a certain period of time. Fitting the ventilation element in the passage in the wall in a fire-resistant way currently takes place by filling the space between the ventilation element and the wall with a non-flammable filler, such as mortar or plaster. Plaster and mortar have to dry out, as a result of which fitting of a ventilation element in a wall takes a certain amount of time. Plaster and mortar also have to be prepared in situ. A ventilation element thus not only makes ventilation through a wall possible, but also ensures that, despite the presence of the ventilation element in the wall, fire penetration can be blocked for a certain period of time.

[0005] The wall may, for example, be a wall, a ceiling or a floor, wherein this wall is preferably made from one or more materials with a certain degree of fire resistance, such as concrete, bricks, plaster, mortar, etc. According to the European classification based on NBN EN 13501-1, these one or more materials with a certain degree of fire resistance preferably have the fire rating A1 or A2 and are referred to as non-flammable materials. The body of the ventilation element is preferably made from a material with a certain degree of fire resistance, such as steel, or other ferrous or nonferrous metals, so that the body will not degrade, or only to a small degree, in case of fire. The ventilation element may, for example, be a ventilation fire damper, but may also be a ventilation grill. If the ventilation element is a ventilation fire damper, a said sealing element may then, for example, be a damper blade which is arranged in the body passage so as to be rotatable between an open and a closed position. The ventilation fire damper is then provided to at least partly extend in a passage in a wall, and is then provided, for example on either side, viewed along the wall, to be connected to a tube. In addition, the ventilation fire damper may then comprise intumescent material which is provided to, in case of fire, fill the space between the body and the damper blade in the closed position, so that it is ensured that no fire penetration is possible at the location of the damper blade. If the ventilation element is a ventilation grill, this ventilation grill may comprise several slats, the slats then, for example, being coated with intumescent material, so that the space between the slats is filled by this intumescent material in case of fire and thus stops fire penetration at the location of the slats for a certain period of time.

[0006] Since fitting the existing ventilation elements in a wall currently takes up a significant amount of time and is laborious, the object of the invention is to provide a ventilation element which can be fitted in a wall in a simpler and quicker way while still meeting the desired fire safety standards.

[0007] This object is achieved by providing a fire-resistant ventilation element for ventilation through a wall, wherein the ventilation element comprises a body with an outwardly facing surface and an inwardly facing surface situated opposite this outwardly facing surface, wherein the inwardly facing surface surrounds a body passage and wherein this ventilation element comprises one or more sealing elements arranged in the body passage to form a sealable air passage opening through this body passage, wherein the ventilation element comprises intumescent material which is provided to expand outwards from the body due to the action of heat.

[0008] The ventilation element here comprises said intumescent material. Intumescent material is a material which swells up/expands due to the action of heat and whose volume thus increases due to the action of heat. Said intumescent material is provided to expand outwards from the body due to the action of heat. In case of fire, this intumescent material can thus expand outwards. Such a ventilation element is provided to be fitted in a

passage in the wall in such a way that said intumescent material is largely, and preferably completely, in the passage. In practice, there is therefore always a space present between the ventilation element and the wall. In practice, this space is usually sealed during installation, so that the ventilation element remains securely in place. Since said intumescent material can expand outwards in case of fire and this intumescent material is largely in the passage, this means that this space may be filled by this intumescent material in case of fire. There is thus no longer a need to fill this space with a non-flammable material, such as plaster or mortar. It is therefore in principle also possible to fill this space with a flammable material which burns away in case of fire, since said intumescent material can then (partly) fill the space which has been created by a fire in such a way that fire penetration at the location of said space is prevented for a certain period of time and the desired fire safety standards are met. This means that fillers other than plaster, mortar, etc. may be considered, for example fillers which can be applied more quickly, such as a plastic foam, such as polyurethane foam. The installation of such a ventilation element can then also require significantly less time than the installation of existing ventilation elements. The reason for this is that the ventilation element itself will ensure that fire penetration is prevented and no filler then has to be provided between the wall and the ventilation element which prevents fire penetration. As a result thereof, installation of such a ventilation element may take place much more quickly and does not have to be laborious. If the space between the ventilation element and the wall is small, it is even possible to decide not to provide additional filling for this space, so that the air which is present then forms the filler. In case of fire, the intumescent material will then fill the space between the wall and the body, so that fire penetration through the wall at the location of this space is prevented.

[0009] When the ventilation element is fitted in a passage in a wall, the result will be the wall comprising the passage, with the ventilation element being situated in the passage and with the space between the ventilation element and the wall being filled with a filler. This result will remain intact as long as there is no fire. The filler may be made, for example, from a material which can easily be applied, such as a flammable material, such as polyurethane foam (PU foam), polyethylene foam (PE foam), polyvinylchloride foam (PVC foam), ethylene propylene diene monomer foam (EPDM foam) or polystyrene foam (PS foam). The filler may also be just air if said space is only a few millimetres wide. After a fire, the result will be the wall with the passage, wherein said expanded intumescent material of the ventilation element fills the space between the wall and the body. The filler may also be a combination of a non-flammable material and a flammable material. Thus, it is possible to first temporarily secure the ventilation element when fitting the ventilation element in a passage in a wall, for example by means of stone material which is present, such as stone waste from the stone material used on site. Subsequently, the ventilation element may be secured completely by filling the remaining space between the wall and the ventilation element with a plastic foam.

[0010] The presence of intumescent material which is provided to expand outwards does not preclude the ventilation element from also comprising other intumescent material which is not provided to expand outwards.

[0011] The passage in the wall may have any suitable shape which allows the ventilation element to at least partly extend in this passage. Thus, the passage may have a circular cross section, a square cross section, etc. The intumescent material may, for example, comprise expandable graphite or sodium silicate. Other intumescent materials may also be used.

[0012] Preferably, the intumescent material which is provided to expand outwards from the body due to the action of heat, comprises a strip of intumescent material which envelops the body substantially completely. Preferably, said strip of intumescent material is said intumescent material. Here, the body is then surrounded by said strip of intumescent material and, viewed along a plane at right angles to the body passage, this strip of intumescent material surrounds the entire body. This strip may, since this envelops the body substantially completely, simply expand in the direction of the wall in which the ventilation element extends and thus seal the space between the body and the wall in a fire-resistant way in order thus to prevent fire penetration for a certain period of time in case of fire. This strip is then, for example, a strip of intumescent material which is fitted directly and/or indirectly against the outwardly facing surface.

[0013] Furthermore preferably, the strip of intumescent material directly and/or indirectly adjoins the outwardly facing surface of the body. In this way, it is ensured that, in case of fire, the expanded intumescent material fills the space between the wall and the body in such a way that air and flames cannot come between the body and the wall for a certain period of time.

[0014] Also furthermore preferably, the ventilation element comprises a strip of heat-resistant material, wherein this strip of heat-resistant material extends between the strip of intumescent material and the outwardly facing surface of the body. This strip of heat-resistant material is then, for example, a heat-resistant fabric, such as a glass fibre cloth. The strip of intumescent material then bears against, for example, the strip of heat-resistant material, wherein preferably both the strip of heat-resistant material and the strip of intumescent material then completely surround the body. If the dimensions of the strip of intumescent material, viewed along the body passage, are greater than those of the strip of heat-resistant material, i.e. if the strip of intumescent material is wider than the strip of heat-resistant material, a part of the strip of intumescent material may bear directly against the outwardly facing surface of the body and another part of the strip of intumescent material may directly bear against the strip of heat-resistant material. The strip

of heat-resistant material will limit the heat transfer between the strip of intumescent material and the body in case of fire, during expansion of the strip of intumescent material and also thereafter. Consequently, the body will heat up less quickly, as a result of which the body can maintain its position sufficiently long during a fire to resist fire penetration for a sufficiently long time.

[0015] Preferably, viewed along the body passage, the strip of intumescent material is wider than the strip of heat-resistant material and the strip of intumescent material completely covers the strip of heat-resistant material.

[0016] Also furthermore preferably, the body, at the location of the strip of intumescent material, comprises holes which extend through the body from the inwardly facing surface towards the outwardly facing surface. These holes limit the heat transfer between the strip of intumescent material and the body during expansion of the strip of intumescent material and also thereafter. Consequently, the body will heat up less quickly, as a result of which the body can maintain its position sufficiently long during a fire to resist fire penetration for a sufficiently long time. In this embodiment, the ventilation element preferably comprises said strip of heat-resistant material, such as a heat-resistant fabric, so that these holes are closed off in an aesthetically pleasing manner in use. This strip of heat-resistant material will also prevent expansion of said strip of intumescent material through the holes. In this case, the body then comprises said holes at the location of the strip of heat-resistant material.

[0017] In a highly preferred embodiment, the ventilation element is a ventilation fire damper and the sealing element is a damper blade which is arranged in the body passage so as to be rotatable between an open and a closed position. By means of a ventilation fire damper with a rotatable damper blade, it is very simple to make ventilation through a wall possible. In case of fire, said intumescent material prevents fire penetration between the body and the wall for a certain amount of time and the damper blade prevents fire penetration through the body passage for a certain amount of time. In this way, fire penetration at the location of the ventilation fire damper is prevented for a certain amount of time.

[0018] Furthermore preferably, the ventilation element then comprises a second strip of intumescent material which extends at the location of the inwardly facing surface of the body, and preferably against the inwardly facing surface, wherein this second strip is provided to fill the space between the damper blade and the inwardly facing surface of the body, after it has swelled up and in the closed position of the damper blade. In this way, fire penetration at the location of the damper blade is prevented even more efficiently.

[0019] In a specific embodiment, the ventilation element is a ventilation grill comprising several slats, wherein the slats are then, for example, coated with intumescent material, so that the space between the slats is filled with this last-mentioned intumescent material in case of fire and fire penetration between the slats is thus prevented for a certain period of time.

[0020] In a preferred embodiment, the ventilation element comprises one or more fastening elements for additionally fastening the ventilation element to a wall. The position of the fastening elements is then such that when the ventilation element is attached to the wall, the section of the ventilation element comprising said intumescent material extends in a passage of the wall. Thus, the ventilation element may comprise one or more fastening plates by means of which the ventilation element is fastenable to the front side or the rear side of the wall, for example by means of screws. By means of these fastening elements, it is ensured that the ventilation element remains in place when, for example, the filler between the wall and the ventilation element burns away during a fire and the space between the wall and body has not yet been completely filled with the expanding intumescent material. The fastening elements are thus an additional means to ensure that fire penetration is prevented for a certain period of time. These fastening elements also facilitate the installation of the ventilation element in the passage in a wall, since it is then possible to simply apply a filler between the wall and the ventilation element without having to hold the ventilation element as well.

[0021] The intumescent material preferably comprises graphite.

[0022] The object of the invention is also achieved by providing an assembly of a wall and a fire-resistant ventilation element, wherein the wall comprises a passage and the ventilation element is provided to at least partly extend in this passage and wherein the assembly comprises a filler for filling the space between the wall and the ventilation element which extends in the passage, wherein the ventilation element is a ventilation element as described above, and that the filler, in case of fire, allows heat transfer through the space in the direction of the ventilation element, and that the filler, in case of fire, allows outward expansion of the intumescent material of the ventilation element, which is provided to expand outwards from the body of the ventilation element due to the action of heat, in order thus to fill said space in case of fire. The ventilation element is preferably fitted in the wall in such a way that the passage through the wall and the body passage extend virtually along the same direction. Also, the ventilation element is preferably fitted in the wall in such a way that the intumescent material is largely situated in the passage and is preferably completely in the passage.

[0023] Since the filler allows the heat produced in case of fire to be transferred (virtually immediately) via said space to the ventilation element, the ventilation element quickly comes into contact with the heat and the intumescent material will thus heat up quickly and consequently also expand quickly. As the intumescent material expands in the direction of the wall and the filler allows said space to be filled, the intumescent material will fill said space quickly. In other words, the space between the

wall and the body is quickly sealed off in a fire-resistant way by means of the expanding intumescent material, as a result of which fire penetration can be prevented for a certain period of time and this assembly is able to meet sufficiently high fire safety standards. The filler may be made, for example, from a material which can easily be applied, such as a flammable material, such as polyurethane foam (PU foam), polyethylene foam (PE foam), polyvinylchloride foam (PVC foam), ethylene propylene diene monomer foam (EPDM foam) or polystyrene foam (PS foam). The filler may also be just air if said space is only a few millimetres wide. After a fire, the result will be the wall with the passage, wherein said expanded intumescent material of the ventilation element fills the space between the wall and the body in such a way that fire penetration at the location of this space is prevented for a certain amount of time.

[0024] Preferably, the filler has a minimum degradation temperature which is between 50°C and 150°C. The term degradation may refer to melting, burning away, degradation, etc. The filler may be, for example, a flammable material, such as a polyurethane foam, wherein this flammable material has a minimum degradation temperature of between 50°C and 150°C. Known polyurethane foams which are used in the construction industry retain their shape up to, for example, +/- 100°C and are thus resistant to temperatures up to +/- 100°C. They will thus degrade at temperatures from +/- 100°C. The characterizing feature 'the filler has a minimum degradation temperature which is between 50°C and 150°C' could thus also be referred to as the characterizing feature 'the filler is temperature-resistant up to a temperature which is between 50°C and 150°C'. This assembly is used to fit a ventilation element in a wall in a fire-resistant way. To this end, the ventilation element and the filler are provided in said passage in the wall. The result is thus the wall with the passage, wherein a ventilation element extends in this passage, and wherein, at the location of the passage, the space between the ventilation element and the wall is filled with the filler. This result remains intact as long as there is no fire. Since the filler has a minimum degradation temperature of between 50°C and 150°C, i.e. degrades from a temperature which is higher than a value between 50°C and 150°C, this filling material will quickly degrade in case of fire. Thus, the filler may, for example, burn up. If the filling material degrades, said space will be freed up again, as a result of which this filler then allows heat transfer through the space in the direction of the ventilation element and the ventilation element thus quickly comes into contact with the heat and will thus quickly heat up the intumescent material which will thus quickly expand. Since the intumescent material expands in the direction of the wall, this intumescent material will quickly start to fill said freed-up space. In other words, the freed-up space is quickly sealed off by means of the expanding intumescent material, as a result of which fire penetration can be prevented for a certain period of time and this assembly is able to meet sufficiently high fire safety standards. The filler is at least partly and preferably substantially completely burned up/degraded in case of fire. Since a filler which has a minimum degradation temperature of between 50°C and 150°C allows heat transfer through the space in the direction of the ventilation element in case of fire and allows expansion of the intumescent material in the direction of the wall in order thus to fill said space in case of fire, the filler in this preferred embodiment may concisely be described as follows: "the filler has a minimum degradation temperature which is between 50°C and 150°C".

[0025] Furthermore preferably, the filler has a minimum degradation temperature which is between 70°C and 130°C, preferably between 80°C and 120°C. The filler is only intended to degrade in case of fire and therefore not at high temperatures which are caused, for example, by the weather or industrial activities which take place in the space which is partly surrounded by said wall. The filler is also intended to degrade sufficiently quickly in case of fire, so that the intumescent material can heat up sufficiently quickly and will thus expand quickly.

[0026] In a preferred embodiment, the filler is made from a flammable material. The expression a flammable material here preferably refers to a material which has a fire rating of B, C, D or E, according to the European classification based on NBN EN 13501-1. Thus, the filler may be, for example, polyurethane foam with a fire rating B. A flammable material will burn up in case of fire. In case of fire, this again frees up said space which was previously filled with the filler, as a result of which heat transfer through the space becomes possible and this space can be filled again by the expanding intumescent material. Since a filler that is made from a flammable material thus, in case of fire, allows heat transfer through the space in the direction of the ventilation element and allows expansion of said part of the intumescent material in the direction of the wall in order thus to fill said space in case of fire, the filler in this preferred embodiment may concisely be described as follows: "the filler is made from a flammable material".

[0027] In a preferred embodiment, the filler comprises a plastic foam, such as a polyurethane foam. Other possible plastic foams are PE foams, PVC foams, EPDM foams or PS foams. Preferably, the filler is a plastic foam. Plastic foams are easy to apply in a space. This may be done, for example, by means of a spray can. Plastic foams will thus also readily adjoin the ventilation element and the wall, so that the space between the wall and the ventilation element is sealed well and no ventilation can occur at the location of this space. Furthermore preferably, these plastic foams have a density which is between 40 and 200 kg/m^3. Such plastic foams are highly flammable. Also preferably, these plastic foams have an open-cell structure, thus burning up quickly.

[0028] Furthermore preferably, it is intended to apply the filler in said space by means of a spray can. Spray cans comprising plastic foams, such as polyurethane

foams, are used for many purposes in the construction of buildings and are thus present on a building site as standard. In addition, they are also readily available. Specialists who will install ventilation elements can thus easily be provided with such spray cans. Applying plastic foams by means of spray cans is also very simple and can be carried out very quickly. Most plastic foams have a limited curing time, as a result of which ventilation elements can be installed very quickly using such an assembly.

[0029] The wall is preferably a wall, a ceiling or a floor and still more preferably, this wall is substantially made from one or more fireproof materials such as concrete, bricks, mortar, plaster, etc.

[0030] This object is also achieved by providing a method for fitting a fire-resistant ventilation element in a passage in a wall, wherein this ventilation element is fitted in the passage, and the space between the ventilation element and the wall which extends in the passage is filled with a filler, wherein the ventilation element is a ventilation element as described above, and that the filler, in case of fire, allows heat transfer through the space in the direction of the ventilation element and that the filler allows outward expansion of the intumescent material of the ventilation element, which is provided to expand outwards from the body of the ventilation element in the direction of the wall due to the action of heat, in order thus to fill said space in case of fire.

[0031] Here, for this method, thus a wall, a ventilation element and a filler are present, wherein this wall, this ventilation element and this filler correspond to the assembly according to the invention as described above. In other words, by means of this method, a ventilation element is thus fitted in a passage in a wall in a fire-resistant way. The advantages described for the above-described assembly also apply to this method and the preferred embodiments of, inter alia, the ventilation element and the filler of the assembly, are also preferred embodiments for this method. Thus, the filler preferably has a minimum degradation temperature of between 50°C and 150°C.

[0032] Preferably, the filler comprises a plastic foam and this plastic foam is applied in said space by means of a spray can. Applying a plastic foam by means of a spray can is very simple to do and can also be done very quickly. This method is therefore not laborious and can be performed quickly. In addition, it is possible to provide a plastic foam with a limited curing time. The plastic foam may be, for example, polyurethane foam. Preferably, use is made of a polyurethane foam with a minimum degradation temperature of +/- 100°C.

[0033] If the ventilation element comprises one or more of said fastening elements, the ventilation element is mechanically attached to the wall by means of the one or more fastening elements prior to or during filling of the space with the filler.

[0034] The present invention will now be explained in more detail by means of the following detailed description of a preferred embodiment of a ventilation element, an assembly and a method according to the present invention. The sole aim of this description is to give illustrative examples and to indicate further advantages and particulars and can therefore by no means be interpreted as a limitation of the area of application of the invention or of the patent rights described in the claims.

[0035] Reference numerals are used in this detailed description to refer to the attached drawings, in which:

- *Fig. **1*** shows a perspective view of a ventilation fire damper according to the invention;
- ***Fig. 2*** shows a detail view of a cross section through the ventilation fire damper illustrated in Fig. 1, at the location of the body where the strips of intumescent material and the glass fibre cloth are situated;
- ***Fig. 3*** shows a side view of the ventilation fire damper illustrated in Fig. 1, in which a part of the first strip of intumescent material and the glass fibre cloth have not been shown, so that the body at the location of this strip and this glass fibre cloth is visible;
- ***Fig. 4*** shows a perspective view of the ventilation fire damper illustrated in Fig. 1 prior to the installation of this ventilation fire damper in a wall;
- ***Fig. 5*** shows a perspective view of the ventilation fire damper illustrated in Fig. 1 after this ventilation fire damper has been installed in a wall.

[0036] The fire-resistant ventilation element (1) according to the invention which is illustrated in the figures is a ventilation fire damper (1). This ventilation fire damper (1) is used to make ventilation through a wall (2) possible. The ventilation fire damper (1) comprises a tubular body (3) with an outwardly facing surface (3a) and an inwardly facing surface (3b) situated opposite this outwardly facing surface (3a), with the inwardly facing surface (3b) surrounding a body passage. Furthermore, the ventilation fire damper (1) comprises a damper blade (4) which is arranged in the body passage so as to be rotatable between an open and a closed position. By means of this damper blade (4), a sealable air passage opening through the body passage is formed. Furthermore, the ventilation fire damper (1) comprises, inter alia, a first strip of intumescent material (5), a glass fibre cloth (6), a second strip of intumescent material (8) and a fastening plate (9). The second strip of intumescent material (8) is fitted against the inwardly facing surface (3b) of the body (3) at a position in which the second strip of intumescent material (8) completely surrounds the damper blade (4) in the closed position of the damper blade (4). The glass fibre cloth (6) is situated against the outwardly facing surface (3a) at the location of the second strip of intumescent material (8) and surrounds the entire body (3). The first strip of intumescent material (5) lies against the glass fibre cloth (6) and the body (3) in such a way that the glass fibre cloth (6) extends between the body (3) and the first strip of intumescent material (5), with the first strip of intumescent material (5) being wider than the

glass fibre cloth (6), so that the glass fibre cloth (6) is completely covered by the first strip of intumescent material (5). This is clearly visible in Fig. 2. Furthermore, the body (3) comprises holes (7) at the location of the glass fibre cloth (6) (see Fig. 3).

[0037] The ventilation fire damper (1) is provided to be fitted in a passage (10) in a wall (2) in the following way. First, the ventilation fire damper (1) is mechanically anchored to the wall (2) by means of the fastening plate (9) and a fastening means, such as a screw, in such a way that the portion of the ventilation fire damper (1) comprising the first strip of intumescent material (5) is situated in the passage (10) (see Figs. 4 and 5). The body passage and the passage (10) of the wall (2) extend virtually along the same direction. Then, the space between the wall (2) and the ventilation fire damper (1) is filled with a sprayable polyurethane foam (11) by applying polyurethane foam (11) in this space by means of a spray can. The result is an assembly of a wall (2), polyurethane foam (11) and a ventilation fire damper (1) as illustrated in Fig. 5.

[0038] Under normal circumstances, i.e. when there is no fire, ventilation through the wall (2) is made possible by means of the ventilation fire damper (1). When there is a fire, the temperature will increase and the polyurethane foam (11) will burn away. As a result thereof, the first strip of intumescent material (5) quickly comes into contact with heat and this first strip of intumescent material (5) will swell up in the direction of the wall (2), that is to say expand outwards, so that the space between the body (3) and the wall (2) is quickly filled with the expanded intumescent material. When there is a fire, the damper blade (4) will move to the closed position and the second strip of intumescent material (8) will also come into contact with heat and this second strip of intumescent material (8) will expand. In this way, it is ensured that the space between the inwardly facing surface (3b) of the body (3) and the damper blade (4) is quickly filled. Here, fire penetration at the location of the ventilation fire damper (1) is therefore prevented for a long period of time.

Claims

1. Fire-resistant ventilation element (1) for ventilation through a wall (2), wherein the fire-resistant ventilation element (1) is provided to extend at least partly in a passage (10) in a wall (2) and is provided to be fitted in the passage (10) in such a way that the ventilation element (1) is situated in the passage (10) and the space which extends in the passage (10) between the ventilation element (1) and the wall (2) is filled with a filler (11), wherein the ventilation element (1) comprises a body (3) with an outwardly facing surface (3a) and an inwardly facing surface (3b) situated opposite this outwardly facing surface (3a), wherein the inwardly facing surface (3b) surrounds a body passage and wherein this ventilation element (1) comprises one or more sealing elements (4) arranged in the body passage to form a sealable air passage opening through this body passage, **characterized in that** the ventilation element (1) comprises intumescent material (5) which is, due to the action of heat, provided to expand outwards from the body (3).

2. Fire-resistant ventilation element (1) according to Claim 1, **characterized in that** the intumescent material (5), which is, due to the action of heat, provided to expand outwards from the body (3), comprises a strip of intumescent material (5) which envelops the body (3) substantially completely.

3. Fire-resistant ventilation element (1) according to Claim 2, **characterized in that** the strip of intumescent material (5) directly and/or indirectly adjoins the outwardly facing surface (3a) of the body (3).

4. Fire-resistant ventilation element (1) according to Claim 2 of 3, **characterized in that** the ventilation element (1) comprises a strip of heat-resistant material (6), wherein this strip of heat-resistant material (6) extends between the strip of intumescent material (5) and the outwardly facing surface (3a) of the body (3).

5. Fire-resistant ventilation element (1) according to Claim 4, **characterized in that**, viewed along the body passage, the strip of intumescent material (5) is wider than the strip of heat-resistant material (6), and that the strip of intumescent material (5) completely covers the strip of heat-resistant material (6).

6. Fire-resistant ventilation element (1) according to one of Claims 2 to 5, **characterized in that**, at the location of the strip of intumescent material (5), the body (3) comprises holes (7) which extend through the body (3) from the inwardly facing surface (3b) towards the outwardly facing surface (3a).

7. Fire-resistant ventilation element (1) according to one of the preceding claims, **characterized in that** the ventilation element (1) is a ventilation fire damper (1) and the sealing element (4) is a damper blade (4) which is arranged in the body passage so as to be rotatable between an open and a closed position.

8. Fire-resistant ventilation element (1) according to Claim 7, **characterized in that** the ventilation element (1) comprises a second strip of intumescent material (8) which extends at the location of the inwardly facing surface (3b) of the body (3), wherein this second strip of intumescent material (8) is provided to fill the space between the damper blade (4) and the inwardly facing surface (3b) of the body (3), after it has swelled up and in the closed position of the damper blade (4).

9. Assembly of a wall (2) and a fire-resistant ventilation element (1), wherein the wall (2) comprises a passage (10) and the ventilation element (1) is provided to at least partly extend in this passage (10) and wherein the assembly comprises a filler (11) for filling the space between the wall (2) and the ventilation element (1) which extends in the passage (10), **characterized in that** the ventilation element (1) is a ventilation element (1) according to one or more of Claims 1 to 8, and that the filler (11), in case of fire, allows heat transfer through the space in the direction of the ventilation element (1), and that the filler (11), in case of fire, allows outwards expansion of the intumescent material (5) of the ventilation element (1), which is provided to expand outwards from the body (3) of the ventilation element (1) due to the action of heat, in order thus to fill said space in case of fire.

10. Assembly according to Claim 9, **characterized in that** the filler (11) has a minimum degradation temperature which is between 50°C and 150°C.

11. Assembly according to Claim 9 or 10, **characterized in that** the filler (11) is made from a flammable material.

12. Assembly according to one of Claims 9 to 11, **characterized in that** the filler (11) comprises a plastic foam, such as a polyurethane foam.

13. Method for fitting a fire-resistant ventilation element (1) in a passage (10) in a wall (2), wherein this ventilation element (1) is fitted in the passage (10), and the space between the ventilation element (1) and the wall (2) which extends in the passage (10) is filled with a filler (11), **characterized in that** the ventilation element (1) is a ventilation element (1) according to one or more of Claims 1 to 8, and that the filler (11), in case of fire, allows heat transfer through the space in the direction of the ventilation element (1), and that the filler (11) allows outward expansion of the intumescent material (5) of the ventilation element (1), which is provided to expand outwards from the body (3) of the ventilation element (1) in the direction of the wall (2) due to the action of heat, in order thus to fill said space in case of fire.

14. Method according to Claim 13, **characterized in that** the filler (11) has a minimum degradation temperature which is between 50°C and 150°C.

15. Method according to Claim 13 or 14, **characterized in that** the filler (11) comprises a plastic foam and this plastic foam can be applied in said space by means of a spray can.

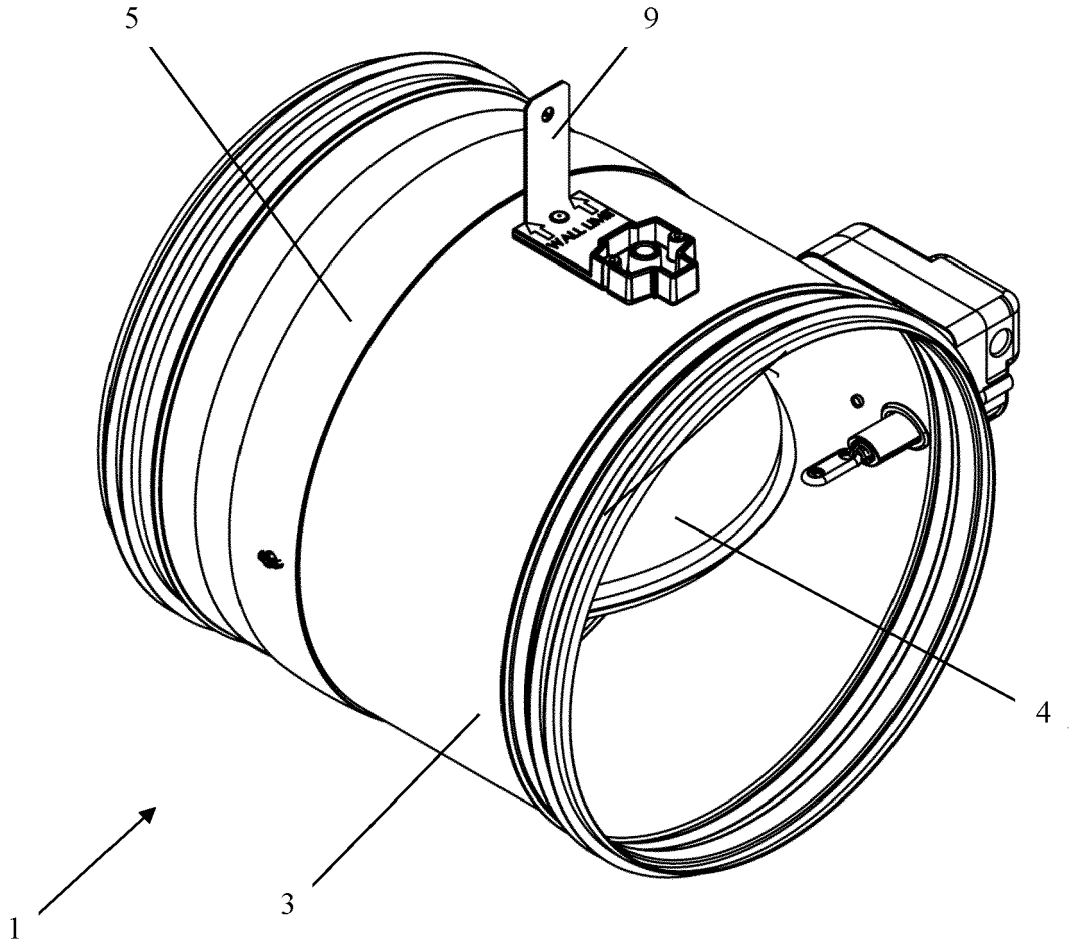

Fig. 1

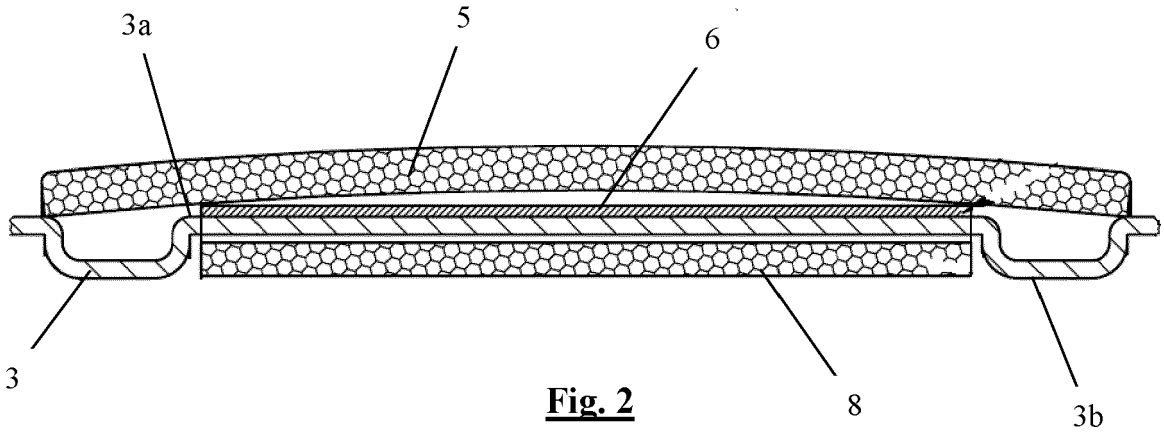

Fig. 2

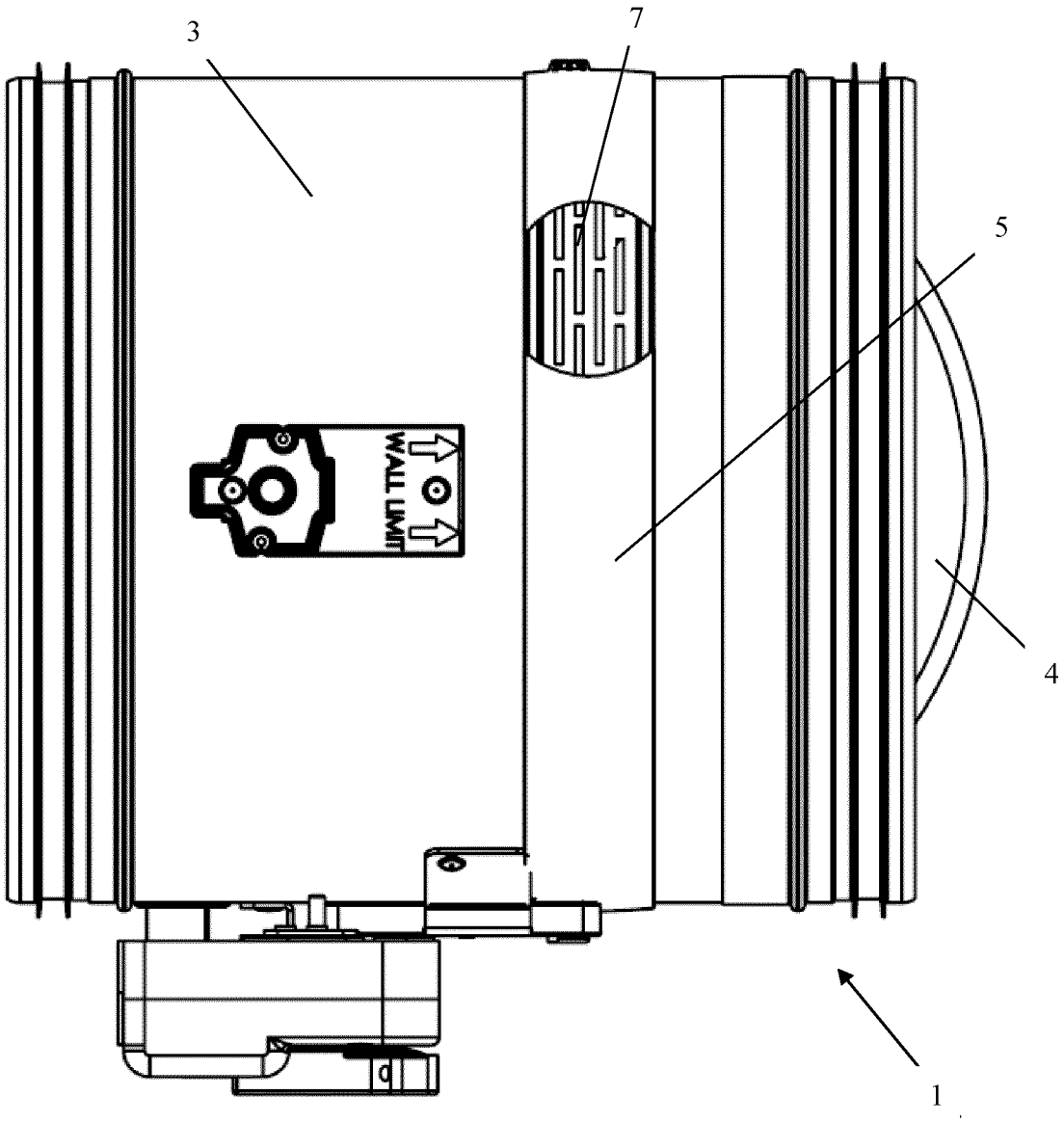

Fig. 3

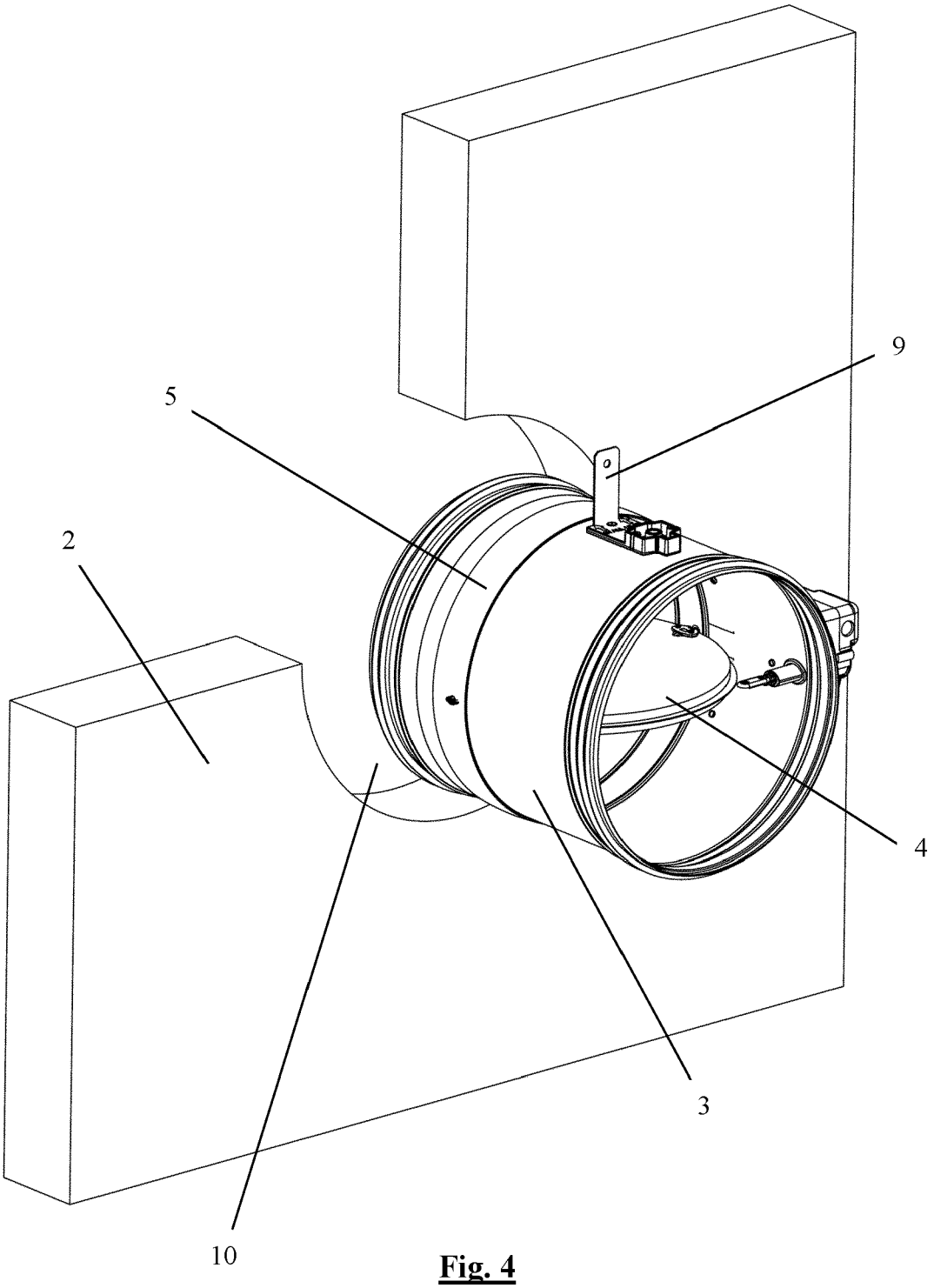

Fig. 4

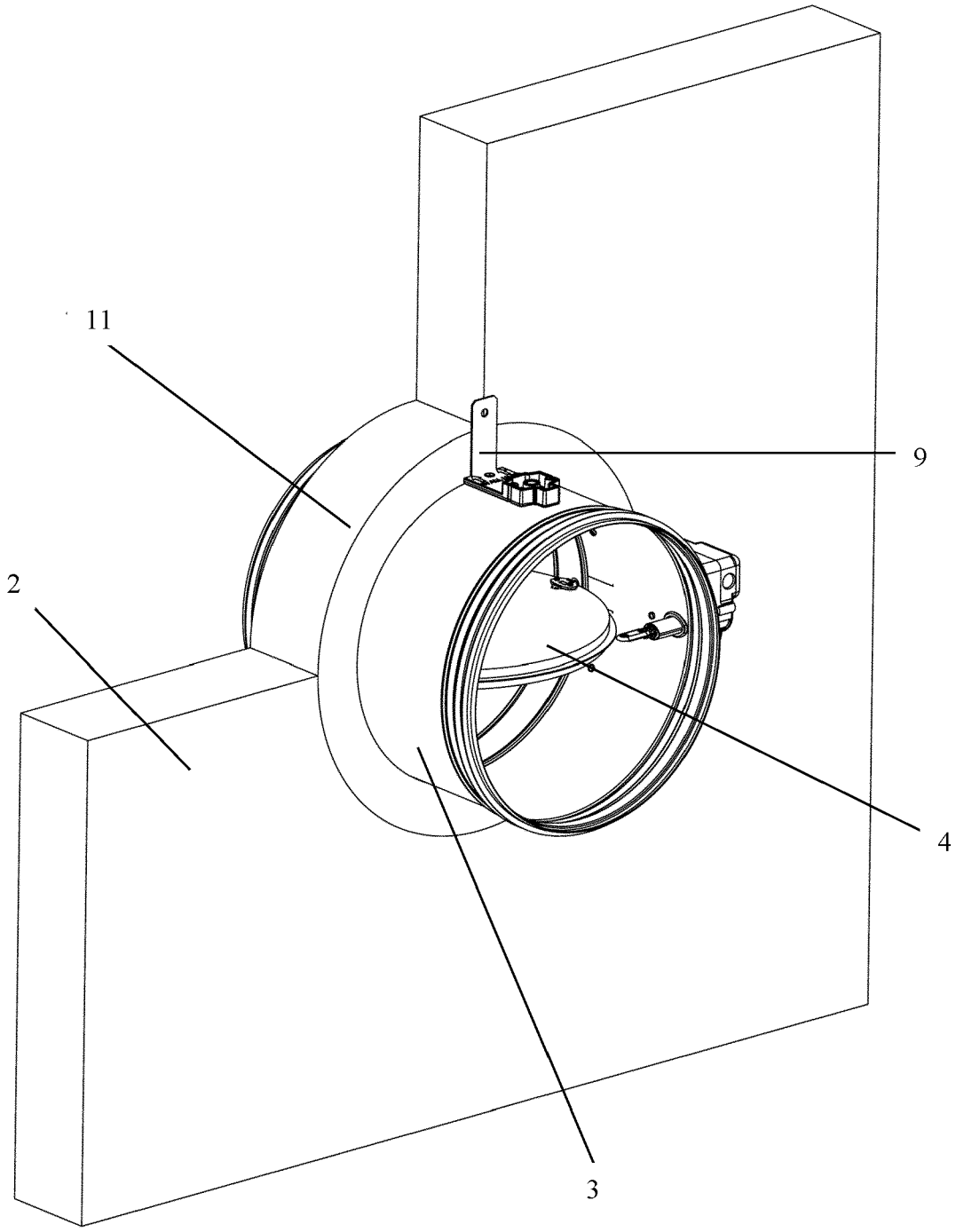

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 20 20 2178

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 February 2021	Vervenne, Koen

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