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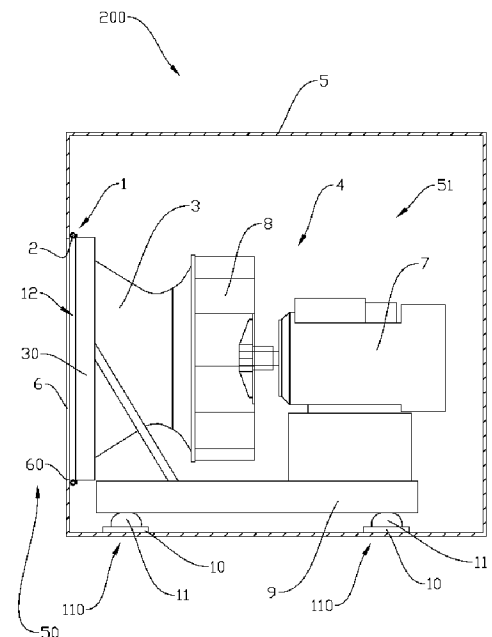
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(54) Title **Gasket assembly**  
(57) Abstract

It is described a gasket assembly (1) for providing a channel for air (100) to a fan (8) arranged in a fan chamber (5), the fan (8) being operable for suction of air (100) from outside (50) the fan chamber (5), wherein the fan chamber (5) comprises an opening (6) for enabling air to be supplied to the fan (8), the fan (8) being provided with a conduit (3) shaped and placed for guiding air (100) from the opening (6) towards the fan (8), wherein a gasket (2) is arranged between an internal surface (500) of the fan chamber (5) and the conduit (3), the gasket (2) encircling the opening (6), and wherein the gasket (2) is configured for sealing a gap (12) between the fan chamber (5) and the conduit (3) by deformation of the gasket (2) as a result of an underpressure in the conduit (3) in operational use of the fan (8).



## GASKET ASSEMBLY

The invention relates to a gasket assembly for providing a channel for air to a fan arranged in a fan chamber. More particularly, the invention relates to a gasket assembly wherein the gasket is configured to form a seal between the fan chamber and a conduit on the fan when the fan operates to suck air from an outside of the fan chamber, and the suction of air creates an under-pressure in the conduit which deforms the gasket.

It is known to have a fan system arranged in a housing, wherein the fan system sucks air from outside the housing and ejects the air inside the housing. The housing is sealed, such that the pressure inside the housing will increase. The housing comprises outlets connected to a system, such as a ventilation system, for distributing the air throughout e.g. a building. Because of the overpressure created inside the housing, the air will be pressed out through the outlets and further into the system. The fan sucks air in through an opening in the housing. The connection between the opening and the fan conduit must be sealed to avoid air from escaping or avoid that the fan sucks from inside the fan chamber. Today, this is usually done by means of a fabric connected to the conduit and housing by means of a bolted flange.

The bolted flange connection is time consuming to release if the fabric needs to be replaced or the fan needs to be taken out of the housing. The seal between the fan and the housing must be flexible due to movements in the fan during operation.

The invention has for its object to remedy or to reduce at least one of the drawbacks of the prior art, or at least provide a useful alternative to prior art.

The object is achieved through features, which are specified in the description below and in the claims that follow.

The invention is defined by the independent patent claim. The dependent claims define advantageous embodiments of the invention.

In a first aspect, the invention relates to a gasket assembly for providing a channel for air to a fan arranged in a fan chamber, the fan being operable for suction of air from outside the fan chamber, wherein the fan chamber comprises an opening for enabling air to be supplied to the fan, the fan being provided with a conduit shaped and placed for guiding air from the opening towards the fan, wherein a gasket is arranged between an internal surface of the fan chamber and the conduit, the

gasket encircling the opening, and wherein the gasket is configured for sealing a gap between the fan chamber and the conduit by deformation of the gasket as a result of an under-pressure in the conduit in operational use of the fan.

The invention solves the abovementioned challenges by providing a gasket between the conduit  
5 and the fan chamber which may seal the gap between the two when the fan is operating to suck air through the opening. Sealing is achieved by the under-pressure created inside the conduit as air is sucked towards the fan. The gasket may be produced in a flexible material. Because of the under-pressure, the shape of the gasket may change such that it is pressed against the surface opposite to the surface it is connected to, either the fan chamber or the conduit, and forming a seal. In  
10 stand-by mode, when the fan is not operating, the gasket returns to its initial shape and does not seal. The invention enables the fan to be relocated relative to the fan chamber without having to release any bolts.

The gasket may be connected to the conduit or the fan chamber. In one embodiment, the gasket may be connected to a peripheral edge of the conduit. In one embodiment, the gasket may be con-  
15 nected to a peripheral edge of the opening on the fan chamber.

The gasket may be connected to the conduit or fan chamber by clamping means. The gasket may be connected by clamping means to the peripheral edge of the conduit. The gasket may be con-  
20 nected by clamping means to the peripheral edge of the opening. The clamping means may be threaded onto the peripheral edge of the conduit or the opening. Clamping means may be a quick way to connect the gasket. Clamping means may also enable quick replacement of the gasket. The clamping means may comprise an adhesive layer.

In one embodiment, an inlet on the conduit may be parallel to an internal surface of the fan chamber, the opening being arranged on the internal surface. Arranging the inlet parallel to the internal  
25 surface of the fan chamber may result in a uniform width of the gap between the internal surface and the conduit, increasing the likelihood of the gasket forming a tight seal.

In one embodiment, the fan chamber may comprise braces for strengthening the fan chamber against the pressure differential between an inside and the outside of the fan chamber created by the fan when it is operating. The braces may strengthen the fan chamber around the opening to withstand the under-pressure created in the conduit.

The gasket may comprise a rubber material. The rubber material may give the gasket sufficient  
30 flexibility to deform under influence of the under-pressure in the conduit. The gasket may comprise additional materials, such as plastic or metal, for increased durability.

In a second aspect, the invention relates to a fan system comprising the seal assembly, a fan chamber and a fan assembly, the fan assembly comprising a motor, a fan and a conduit, wherein  
35 the fan assembly is arranged on a skidding system inside the fan chamber. A skidding system may

be tracks or guides for relocating the fan assembly. The fan assembly may be pulled out of the fan chamber along the skidding system, for example during maintenance. The gasket assembly enables the fan assembly to be pulled out of the fan chamber without having to release any bolts.

In one embodiment, the fan system may comprise vibration dampers for restricting transfer of vibrations from the fan assembly to the fan chamber when the fan is operating. The vibration dampers may be arranged between the skidding system and the fan assembly.

In the following is described an example of a preferred embodiment illustrated in the accompanying drawings, wherein:

Fig. 1 shows the seal assembly according the one embodiment of the invention;

Fig. 2 shows a cross section of the seal assembly in a larger scale than figure 1, and

Fig. 3 shows the seal assembly in the same scale as figure 2, when the fan is operating to suck air through the opening in the fan chamber.

The figures are depicted in a simplified manner, and details that are not relevant to illustrate what is new with the invention may have been excluded from the figures. The different elements in the figures may necessarily not be shown in the correct scale in relation to each other. Equal reference numbers refer to equal or similar elements. In what follows, the reference numeral 1 indicates a gasket assembly 1 according to one embodiment of the invention.

Figure 1 shows a fan assembly 4 comprising a motor 7, a fan 8 and a conduit 3. The fan assembly 4 is arranged in a fan chamber 5. The fan assembly 4 is arranged on a frame 9 inside the fan chamber 5. The frame 9 is connected to tracks 10 by means of vibration dampers 11. The vibration dampers 11 restrict transfer of vibrations from the fan assembly 4 to the fan chamber 5. The fan assembly 4 may be relocated along the tracks 10.

The conduit 3 has an inlet 30 arranged close to an opening 6 in the fan chamber 5. The opening 6 enables air to be supplied to the fan 8 from an outside 50 of the fan chamber 5. A gasket 2 is connected to a periphery 31 (see figure 2) of the inlet 30 by a clamping means 20. The gasket 2 envelops the opening 6 in the fan chamber 5 to seal a gap 12 between the fan chamber 5 and the inlet 30 when the fan 8 is operating.

Figure 2 shows a cross section of a portion of the gasket assembly 1. The gasket 2 is arranged in the gap 12 between the fan chamber 5 and the inlet 30. In this particular embodiment, the gasket 2 is not in contact with an internal surface 500 of the fan chamber 5 when the fan 8 is not operating. In another embodiment, the gasket 2 may be in contact with the internal surface 500 when the fan 8 is not operating, but the contact pressure between the gasket 2 and the internal surface 500 may increase to seal the gap 30 when the fan 8 is operating. In another embodiment the gasket 2 may

be connected to a periphery 60 of the opening 6 and seal against a surface 300 of the inlet 30.

Figure 3 shows the same cross section of the portion of the gasket assembly 1 as in figure 2, when the fan 8 is operating. A flow of air 100 (illustrated by arrows) is created from the outside 50 of the fan chamber 5, in through the opening 6 and through the conduit 3 to the fan 8. The flow of air 100  
5 creates an under-pressure in the conduit 3 that will act on the gasket 2. The gasket 2 is made from a flexible material such that it elastically deforms because of the under-pressure. The deformation causes the gasket 2 to be pressed against the internal surface 500 of the fan chamber 5, and thus seal the gap 30 around the opening 6. It should be understood that the gasket 2 may have different embodiments and designs while still obtaining the same effect as mentioned above.

10 The gasket assembly 1 enables the fan assembly 4 to be relocated along the tracks 10 without having to release any bolts, as known from the prior art. This saves time during maintenance work.

It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. In the claims, any reference signs placed between  
15 parentheses shall not be construed as limiting the claim. Use of the verb "comprise" and its conjugations does not exclude the presence of elements or steps other than those stated in a claim. The article "a" or "an" preceding an element does not exclude the presence of a plurality of such elements.

The mere fact that certain measures are recited in mutually different dependent claims does not  
20 indicate that a combination of these measures cannot be used to advantage.

## C l a i m s

1. A gasket assembly (1) for providing a channel for air (100) to a fan (8) arranged in a fan chamber (5), the fan (8) being operable for suction of air (100) from outside (50) the fan chamber (5), wherein the fan chamber (5) comprises an opening (6) for enabling air to be supplied to the fan (8), the fan (8) being provided with a conduit (3) shaped and placed for guiding air (100) from the opening (6) towards the fan (8), wherein a gasket (2) is arranged between an internal surface (500) of the fan chamber (5) and the conduit (3), the gasket (2) encircling the opening (6), and wherein the gasket (2) is configured for sealing a gap (12) between the fan chamber (5) and the conduit (3) by deformation of the gasket (2) as a result of an under-pressure in the conduit (3) in operational use of the fan (8).
2. The gasket assembly (1) according to claim 1, wherein the gasket (2) is connected to the conduit or fan chamber by clamping means (20).
3. The gasket assembly (1) according to any of the claims 1-3, wherein an inlet (30) on the conduit (3) is parallel to an internal surface (500) of the fan chamber (5), the opening (6) being arranged on the internal surface (500).
4. The gasket assembly (1) according to any of the preceding claims, wherein the gasket (2) comprises a rubber material.
5. A fan system (200) comprising the seal assembly (1) according to any of the preceding claims, the fan chamber and a fan assembly (4), the fan assembly comprising a motor (7), the fan (8) and the conduit (3).
6. The fan system (200) according to claim 5, wherein the fan assembly (4) is arranged on a skidding system (110) inside the fan chamber (5).
7. The fan system (200) according to claim 7 or 8, comprising vibration dampers (11) for restricting transfer of vibrations from the fan assembly (4) to the fan chamber (5) when the fan (8) is operating.

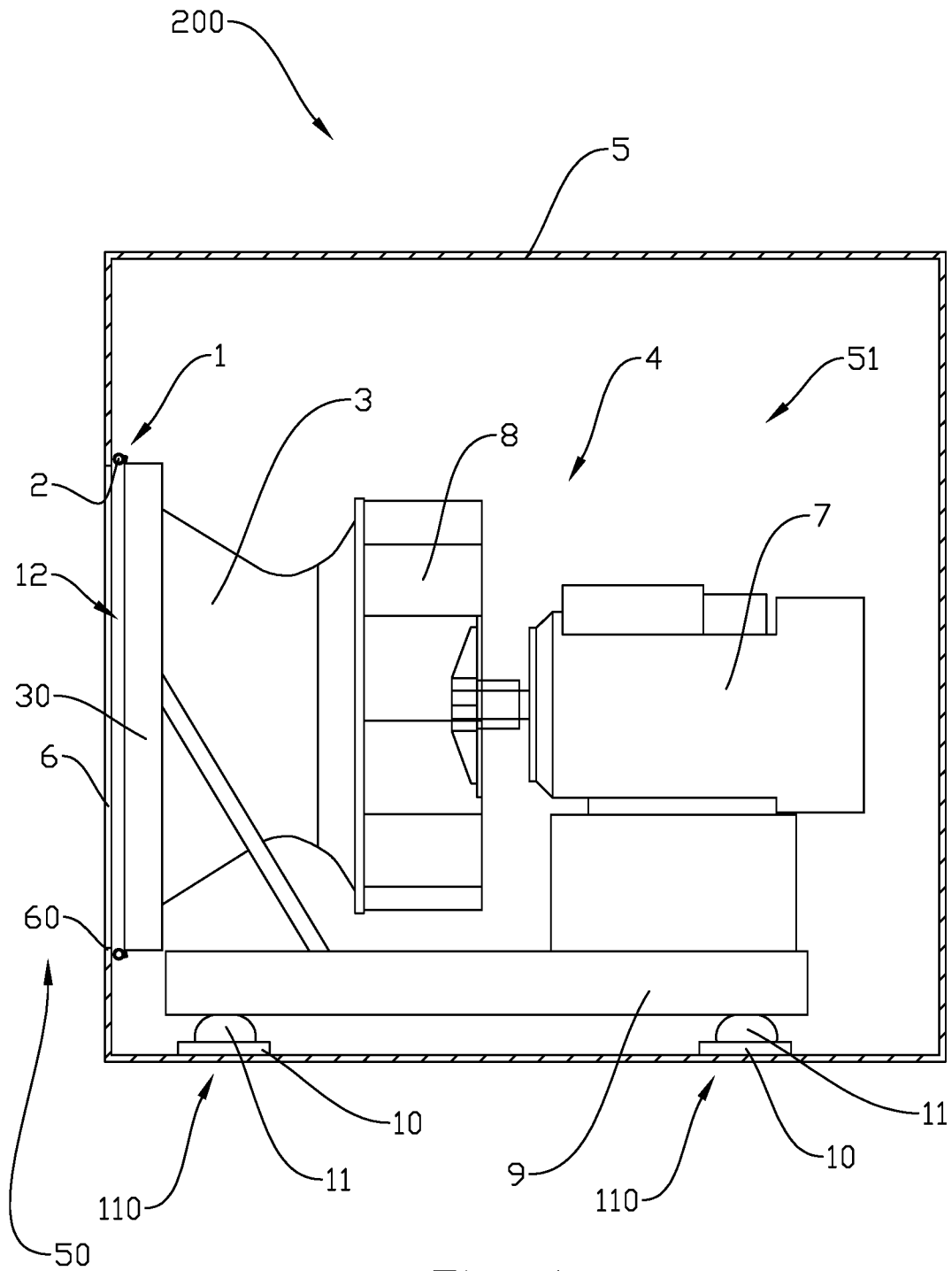


Fig. 1

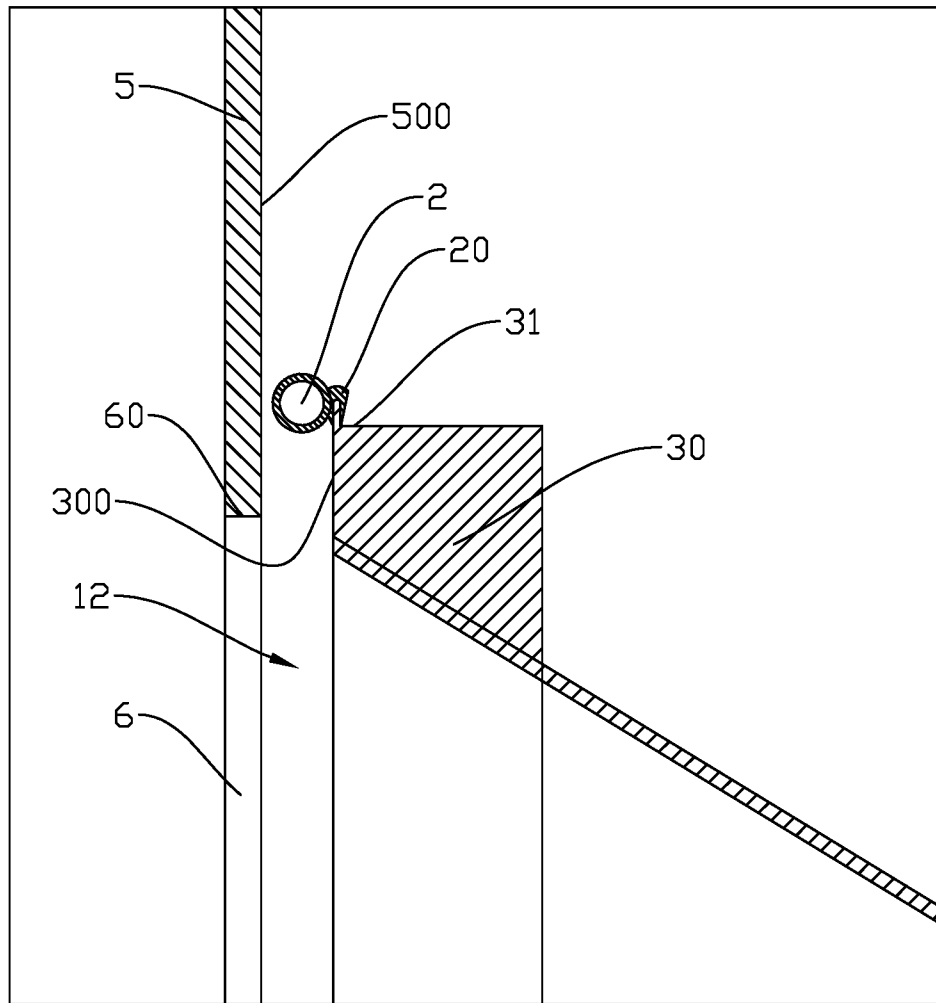


Fig. 2

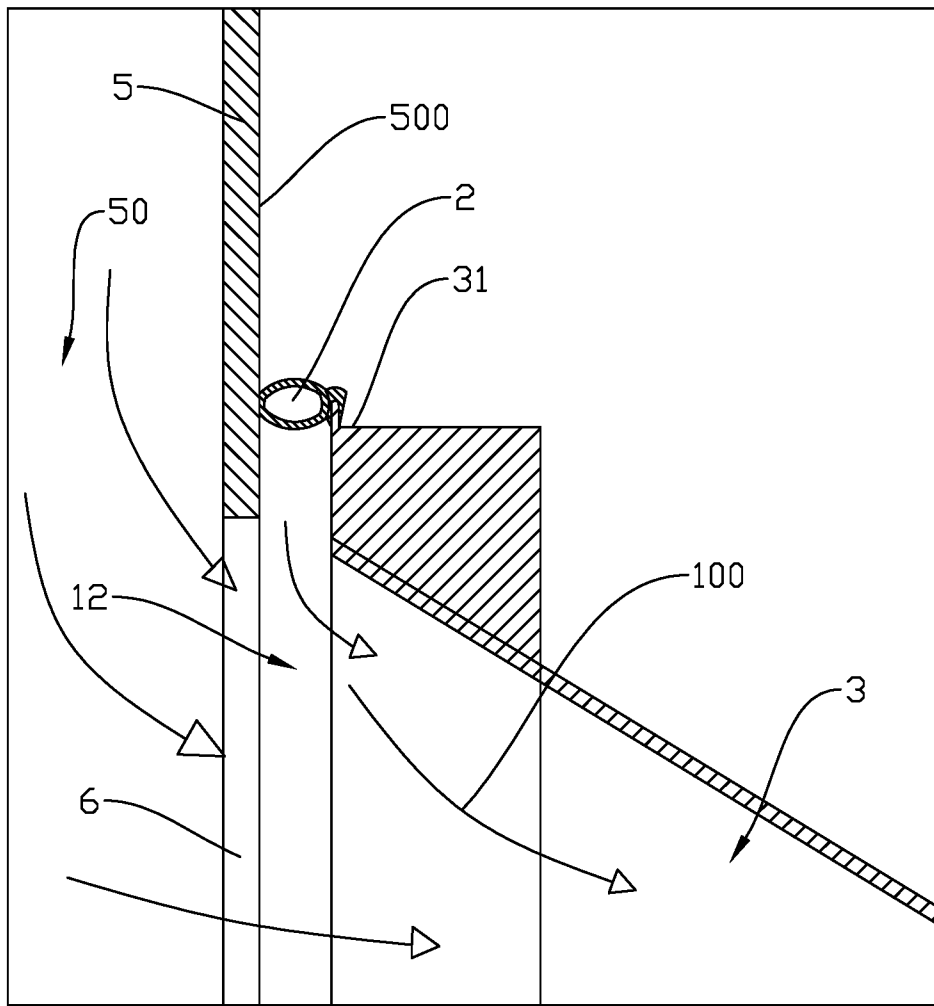


Fig. 3