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(54) A damper for gases

(57) The object of the invention is a damper for gases, which includes a frame (1) with sealing edges (9) forming a duct section and inside it a hatch part (4) rotating on an axle (11), as well as a rotation device for rotating the axle (11) and with it the hatch part (4) tightly against the sealing edges of the frame. The penetration of the fame (1) by axle (11) of the hatch part (4) consists of a flexible cylindrical element (7) locked to the frame and a concentric counter sleeve (8) in the hatch part (4) fitted tightly to it. The sealing edges (9) of the frame extend to the flexible cylindrical element (7).

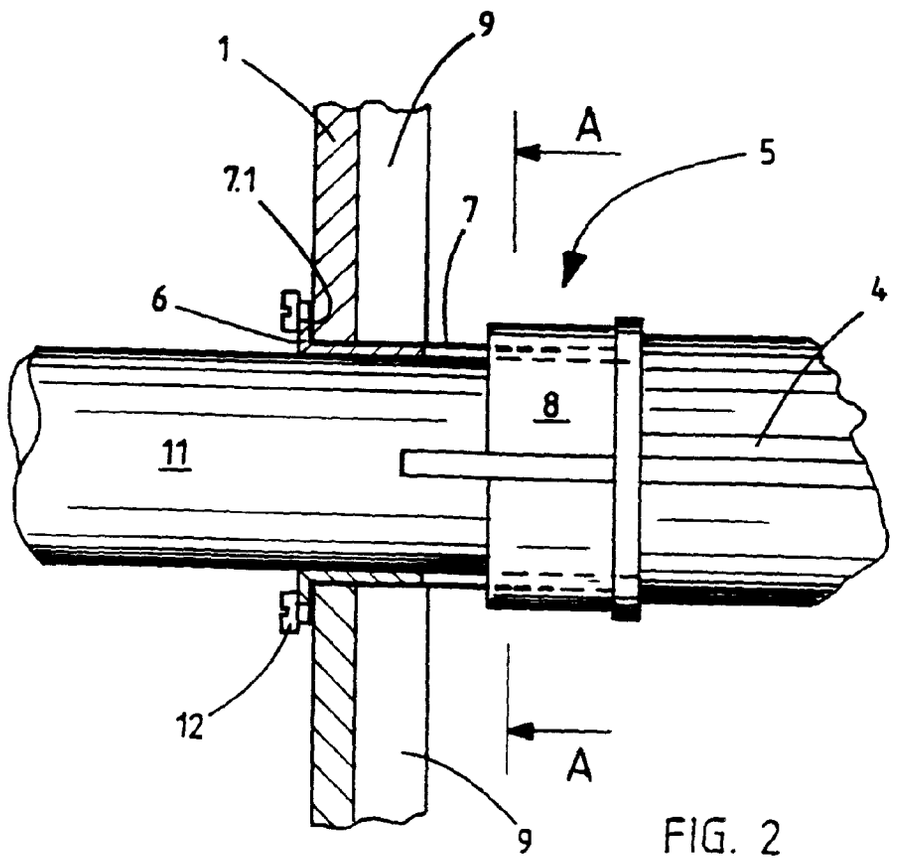

FIG. 2

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Description

The object of the invention is a damper for gases, which includes a duct section formed of a frame with sealing edges and inside it a hatch part that rotates on an axle and a rotation device for rotating the axle, and with it the hatch part, tightly against the sealing edges of the frame, and in which the axle is taken through the frame.

Dampers referred to in the introduction are known from, among other sources, Finnish utility models numbers 1671 and 2289, as well as Finnish Patent Application 954454. Means are well known from these for sealing the frame and edges of the hatch part quite well against each other. If necessary, two shutoff edges are used in tandem, in addition, shutoff air can be pumped between them, when it is possible to effectively isolate detrimental gas.

Even though the axle point forms only a small part of the hatch, when the rest of the damper is very well sealed, it forms a significant place for leaks. Until now, it has not been possible to seal the axle point effectively, because a reasonable tolerance has had to be left between the opposing moving parts, because of thermal expansion.

Box-sealing of the ends of the axle is known, but this does not prevent gas from escaping on the inner side of the axle tolerance from the pressurized to the non-pressurized side.

This invention is intended to create a new kind of axle-sealing construction, by means of which the problem of sealing the axle can be solved simply and reliably. The characteristic features of the invention are described in the accompanying Patent Claims. A flexible sleeve used as an axle seal according to the invention permits tolerance-free constructions. It should be noted, that the axle need not be sealed over the entire circumference, it is sufficient when the pressurized side is sealed as a separate compartment.

In the following, the invention is illustrated by reference to the accompanying Figures, which show one damper according to the invention, together with its details.

Figure 1 shows the damper seen from the direction of the duct.
Figure 2 shows the sealing construction of the axle.
Figure 3 shows the metal blank for the flexible cylindrical element.
Figure 4 shows a cross-section of Figure 2 at point A - A.

Frame 1 of the version of the shutoff damper shown here is divided into three compartments, in each of which there is a hatch part 4. These are secured to the frame part by means of axle 11 and they can be rotated with the aid of a conventional mechanism. Sealing devices, which correspond to the counter-surfaces in the frame, are set in the edges of hatch part 4. If desired, sealing constructions equipped with two sealing edges can be used. The sealed penetration of the frame by the axle is marked with the reference number 5.

In Figure 2, the surface of the hatch part 4 is at right angles to the surface of the figure. Axle 11, which turns hatch part 4, is supported from frame 1 with the aid of collar 6. In addition to this support, separate bearings are generally used on the outside of the frame. In this solution, a flexible cylindrical component 7 is set between the collar 6, which seals at least half the circumference against the counter-sleeve 8 attached to both the frame 1 and the hatch part 4. According to the figure, flexible cylindrical component 7 extends inside counter-sleeve 8 and fits into it with a sealing fitting. In practice, sealing in achieved when the flexible component tries to straighten itself, when its internal forces create a natural pressure against the sealing surface. Sealing edges 9, which run round frame 1, end tightly in the flexible cylindrical component 7.

Cylindrical component 7 includes nibs 7.1 at the outer end, which remain under the flange of collar 6. Collar 6 can be attached by the flange to frame 1, with the aid of screws 12, which also secure the flexible cylindrical component 7. Collar 6 may be of the type BRM 10 TFF.

The flexible cylindrical component is advantageously manufactured from spring steel, when the cut blank for it is as in Figure 3. At its ends, narrow flanges 7.2 are bent from the blank, with nibs 7.1, which are bent to an angle of 90°, bent at the other edge.

According to Figure 4, blank 7' is bent into a cylinder, with flanges 7.2 opposite each other, these fitting into the axial break in collar 6. The break in the bearing collar may have to be slightly enlarged.

In Figure 4, the pressurized side is above the hatch, so that the break in the flexible element 7 is of no significance. This break is always placed on the non-pressurized side. In any event, the length of the sealed section of the circumference forms more than half the entire circumference.

If required, a sealing construction according to the invention can be dismantled and assembled from outside, as can clearly be seen from Figure 2. After removing screw 12, collar 6 and with it cylindrical component 7 can be pulled out along the axle. Bearing this kind of installation in mind, a small cut can be machined in the front edge of counter collar 8.

Claims

1. A damper for gases, which includes a frame (1) with sealing edges (9) forming a duct section and inside it a hatch part (4) rotating on an axle (11), as well as a rotation device for rotating the axle (11) and with it the hatch part (4) tightly against the sealing edges of the frame, and in which axle (11) runs

through the frame (1), characterized in that the penetration of the frame (1) by axle (11) consists of a flexible cylindrical element (7) locked to the frame and a concentric counter sleeve (8) in the hatch part (4) fitted tightly to it, and in which the sealing edges (9) of the frame extend to the flexible cylindrical element (7).

2. A damper according to Claim 1, characterized in that the flexible cylindrical element (7) is a spring steel strip bent into a cylinder, in the ends of which opposing flanges (7.2) are set.

3. A damper according to Claim 2, characterized in that inside the flexible cylindrical element (7) there is a bearing collar (6), which forms a support for axle (11), and in which bearing collar (6) there is a longitudinal groove or break for the aforementioned opposing flanges (7.2) of the cylindrical element (7).

4. A damper according to Claim 3, characterized in that the cylindrical element (7) includes nibs (7.1) that turn outside the frame, which lock into place in the flange of the bearing collar (6).

5. A damper according to one of Claims 1 - 4, characterized in that the length of the flexible cylindrical element (7) is the size of its diameter ±20 %.

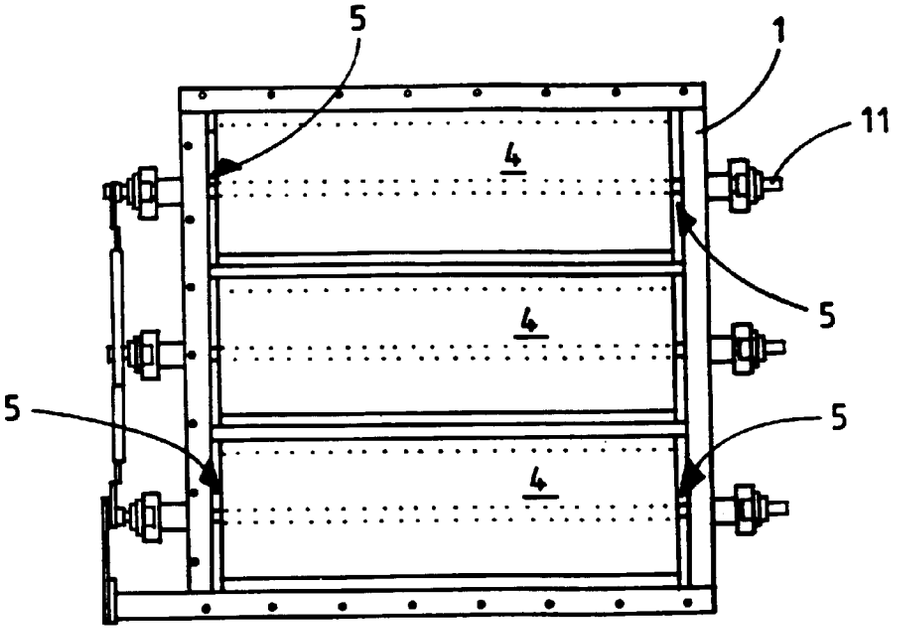

FIG. 1

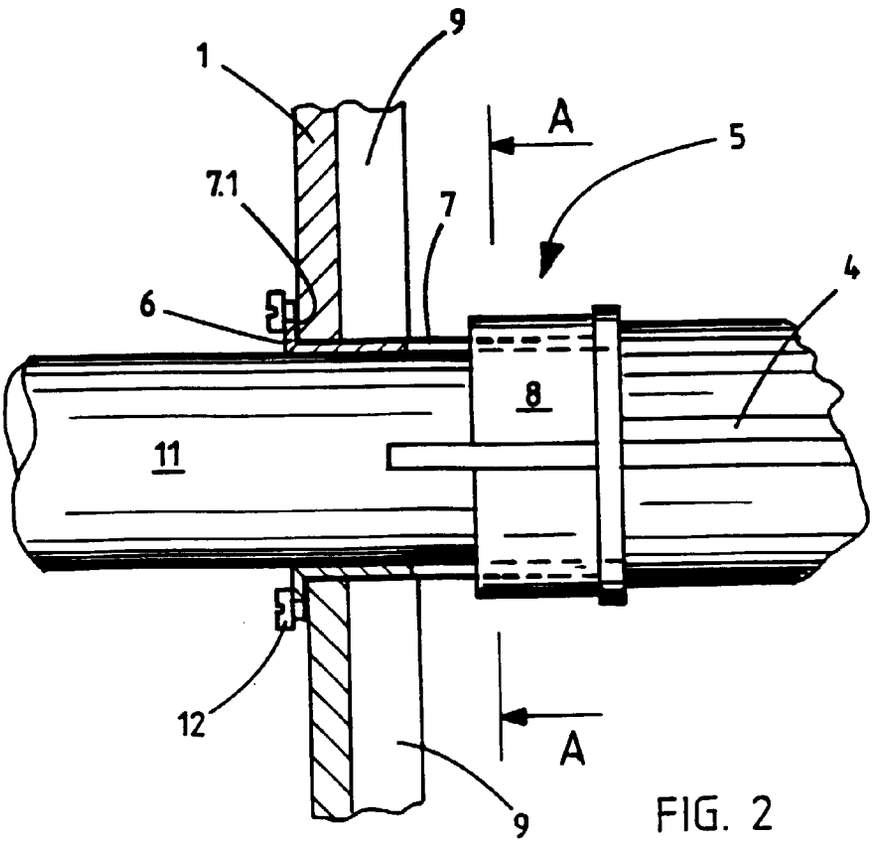

FIG. 2

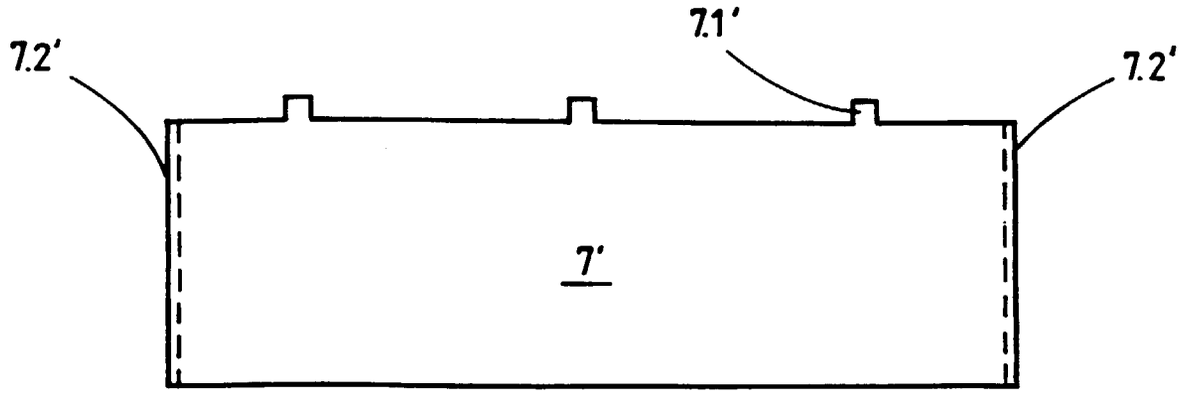

FIG. 3

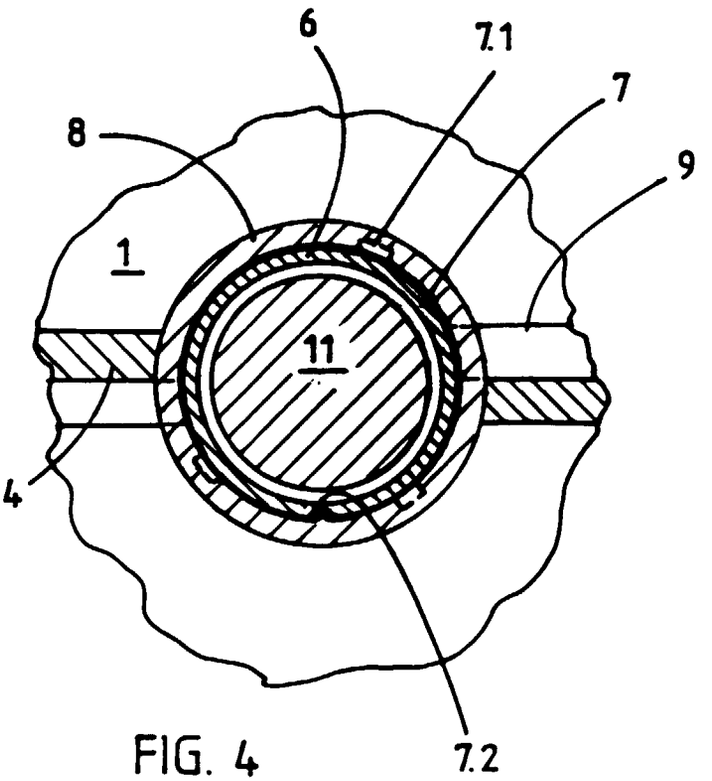

FIG. 4