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(54) Benævnelse: **Persienneklap til indføring i en ledning i et klima- og rumluftteknisk anlæg eller et maskinelt røgudsugningsanlæg**

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Description

[0001] The invention relates to a louvre for use in a conduit of an air-conditioning system or a mechanical smoke ventilation assembly (MRA), comprising as one feature a frame, which forms a rectangular opening for the flowing of a gaseous medium, and as another feature at least two rectangular shaped slats, wherein each slat, preferably running coaxially with at least one further slat, is mounted in the frame such as to be able to pivot between its closed position and its open position about a respective pivot axis, and each slat likewise comprises on one side two longitudinal edges aligned parallel to its pivot axis, and, on the other side, two side edges aligned orthogonally to its pivot axis, wherein the pivot axis is preferably arranged in the middle, between the longitudinal edges, and wherein at least one of the longitudinal edges of adjacent slats, interacting in the closed position, comprises a seal.

[0002] US 2014/0008561 A discloses a generic louvre, wherein the oblique edged pairs in each case comprise a pair of longitudinal edges, and wherein, on each longitudinal edge of a longitudinal edged pair, a cold seal is arranged, wherein the two seals of a longitudinally edged pair in the closed position are arranged next to one another and at a distance interval from one another.

[0003] In the closed position, louvres are intended, with the slats in the closed position, to close off the flow cross-section and prevent the flow of a medium. With known louvres, the slats exhibit a rectangular cross-section. Provided on one of the two longitudinal edges of each louvre is a lip seal, projecting over the longitudinal edge. At the pivoting of the slats out of their open position into the closed position, each lip seal, on coming in contact with the longitudinal edge, is laid around the adjacent slat. Disadvantageous in this situation is the fact that, in order to open again, a high degree of torque must be applied, since, at the upwards pivoting movement, the lip seals which are laid around in one direction must be pivoted back into the other direction. As well as this, a pressure may take effect on both sides of a louvre. It is essentially not foreseeable on which side a pressure will take effect. Due to the lip seals laid around the slat in the closed position, the louvre sustains a perceptibly higher pressure in relation to the sealing tightness with one side than

with the other side.

[0004] The object of the invention is to avoid the disadvantages referred to, and to provide a louvre which, with at least an equivalent sealing effect, is in particular easier to open, and also, inasmuch as the louvre is being used as a technical fire protection component, it can still be opened after the occurrence of the fire within a particular period of time.

[0005] This object is solved in that each of the two surfaces of the longitudinal edges, interacting in the closed position, of at least one pair of adjacent slats, with the formation of an oblique edged pair opposite the orthogonal O, which stands perpendicular on the plane E which is spanned by the respective slat, is aligned at an angle α, which lies between 10° and 60°, preferably between 25° and 40°, and for particular preference is 30°, and that, in the closed position, the two surfaces of this pair of adjacent slats, facing towards one another, in particular parallel, are aligned in such a way that the height of the slat, in relation to the pivot axis, increases over the width of the slat in the direction of pivoting from the from the closed position into the open position. Preferably, the pivot axis, related to the thickness of the slat concerned, is likewise arranged in the middle. The frame can be configured as being of one piece, or, for example, can consist of four frame elements arranged at right angles to one another.

[0006] The configuration according to the invention allows for a homogenous closing of the slats. The torque required for the opening in particular is lower.

[0007] Accordingly, the drive unit can be dimensioned as smaller. Due to the oblique alignment of the two surfaces forming an oblique edge pair, inasmuch as, for example, a lip seal is provided as the seal element, when the slats pivot upwards no folding backwards takes place of the seal which has been laid around the slat, since the surfaces in the first part piece are not moved in a straight line away from one another. A further advantage of the configuration according to the invention lies in the fact that, due to the oblique alignment of the two surfaces forming the pair of oblique edges, in the closed position the seal(s) is/are better protected. This is particularly relevant when the louvre is used as a technical fire protection component. Inasmuch as the louvre is used as a technical fire protection component, and at least one seal is configured as a heat seal, the oblique alignment

still allows, after a fire incident, for the opening of the slat within a specific period of time.

[0008] Inasmuch as each slat is configured not as rectangular but, for example, as triangular or diamond shaped, the pivot axis is arranged on the widest side of the slat concerned. The width of the slat then decreases in both directions. With a triangular configuration of the slat, the pivot axis lies in one of the three side edges. The width then decreases continuously in the direction of the two other side edges. Since the slat does not extend any further in the opposite direction, the width amounts to zero.

[0009] At least two slats, and preferably all the slats, can, for example, be connected by means of a common coupling element, in such a way that, at the displacement of the coupling element, the position of all the slats which are connected to one another by means of this coupling element can be changed by the same amount. The coupling element, which is preferably arranged outside the frame, can take effect directly or indirectly on the pivot axes of the slats which are coupled to one another.

[0010] The frame can comprise, at least in one of the two regions which extend, in the closed position of the slats, parallel to the upper and lower slats, a contact surface, which is aligned in such a way that it is aligned at least approximately parallel with the surface of the longitudinal edge of the adjacent slat, when this is in its closed position, with the formation of an oblique edged pair. The contact surface can be, for example, a part of a contact strip, which is mounted on the inside of the frame. The surface of the longitudinal edge of the adjacent slat is aligned opposite the orthogonal O, which stands perpendicular on the plane E which extends through the slat, and lies at an angle α, which is between 10° and 60°, preferably between 25° and 40°, and for particular preference 30°. Preferably, the contact surface and the surface of the longitudinal edge of the adjacent slat are precisely parallel. It is, however, conceivable that a deviation up to a maximum of 20° can apply.

[0011] It is also possible, however, that at least one contact surface is a constituent part of the region which, in the closed position of the slats, extends parallel to the upper and lower slats. In this case, the contact surface can be produced by milling in the angle α.

[0012] Preferably, all the oblique edged pairs are configured as the same in relation to the oblique arrangement of the interacting surfaces.

[0013] The frame can comprise, in at least one of the two regions which, in the closed position of the slats, extend parallel to the side edges of the slats, a part region which is provided with a seal which extends along the side edges of the slats in the closed state. For example, the seal can be adhesively bonded onto the part region. Other types of securing of the seal are possible, however. Preferably, at least one part region can be delimited on both sides, configured in particular as a cut-out opening. With such a configuration, the seal is located inside the cut-out opening, wherein the seal can be configured as projecting opposite the cut-out opening. The seal can, for example, be adhesively bonded into the cut-out opening. This seal is preferably a cold seal. Suitable as a cold seal is, for example, a seal which is based on a calcium-magnesium-silica chemical. This has the following chemical composition in % by weight: SIO_2 61.0-67.0, CaO 27.0-33.0 MgO 2.5-6.5 Al_2O_3 <1.0, Fe_2O_3<0.6. Such a cold seal is obtainable, for example, under the designation Kerafix® 2000. The cold seal has a thermal and physical stability up to a function limit of 1,100 ºC and is ceramic-free. The melting point is greater than 1,300 ºC. Due to the high melting point, the seal is also suitable as a hot seal. In this way, the region is sealed between the frame and the side edges of the slats which are located in the closed position. Passage guide openings can be provided in the frame and in the seal for the pivot axes of the slats. The width of the seal can correspond preferably to approximately the thickness of the slats. As an alternative or as a supplement, at least one slat can also comprise a seal, in the region of at least one of its two side edges, preferably in the region of both its side edges, and in each case at least one seal.

[0014] At least one seal can be arranged in a cut-out opening. Preferably, the seal projects only with a part region out of the cut-out opening. It is also entirely possible, however, that the seal is located entirely in the cut-out opening. By way of this configuration it is possible for the seal, such as a cold seal configured as a hollow profile seal, for example, in the closed position of the slat allocated to it, to expand laterally into the cut-out opening.

[0015] Each of the two surfaces of at least one oblique edged pair comprises at least

one seal. An oblique edged pair is understood on the one hand to be the region of the longitudinal edges of two adjacent slats, and, on the other, to be the region of a frame-side contact surface and the longitudinal edge of the adjacent slat. Inasmuch as the oblique surface pair are formed by two adjacent slats, the two surfaces are the surfaces of the interacting longitudinal edges of a pair of adjacent slats. Inasmuch as the oblique surface pair are formed by a contact surface and the adjacent slat, the two surfaces involve the contact surface and the surface of the interacting longitudinal edge of the adjacent slat.

[0016] With at least one oblique edged pair, in each case at least one seal is arranged in a region opposite to both surfaces, seen in a direction orthogonally to both surfaces. With such a configuration, the seals are in contact in the closed position, inasmuch as the gap is smaller than the dimension by which the two seals project opposite the respective slat. Inasmuch as the seals are in each case arranged in a cut-out opening, and preferably only project with a part region out of their respective cut-out opening, a seal which is formed as a hot seal can expand, in the event of a fire, into the opposite cut-out opening. As a result of this, a certain serration effect is achieved. Due to the oblique alignment of the surfaces of each oblique edged pair, however, even if a hot seal foams outwards, a later opening of the slats is still possible.

[0017] With at least one oblique edged pair, as an alternative, in each case at least one seal can be arranged in regions offset to one another, seen in a direction orthogonal to both surfaces. With such a configuration the seals do not come in contact in the closed position.

[0018] At least one seal is a hot seal which expands under the effect of heat, preferably configured in the form of a strip.

[0019] At least one heat seal can consist of a laminate-based foaming agent. Such a foaming agent, such as can be obtained, for example, under the commercial designation of PROMASEAL®-LW, is configured as a flexible fire protection laminate which foams without the application of pressure. In the event of fire, on attaining the foaming temperature of some 300 ºC an expansion on a multiple scale takes place, such that the ensuing foam layer causes an insulating effect to occur. However, since the foaming agent does not exert any inflation pressure, once the

free space available in the form of the gap has been filled out the inflation process is brought to a conclusion. The slats can therefore also be moved out of their closed position back into their opening position by means of a smaller dimensioned drive unit.

[0020] At least one seal is configured as a cold seal, such as, for example, Kerafix ® 2000. Inasmuch as the cold seal is provided at the slat, for example, it projects with at least one part region opposite the longitudinal edge and/or side edge of the slat concerned. A cold seal serves to seal a gap against through-flow.

[0021] At least one cold seal can be configured as a hollow profile seal, in particular as a hollow profile seal exhibiting a round or semicircular cross-section. Other cross-section shapes are of course conceivable. For example, the cold seal can also be configured in the form of a strip.

[0022] At least one cold seal can consist of a thermoplastic elastomer (TPE). Such a formulation is particularly appropriate when the cold seal is applied at the slat.

[0023] It is advantageous if at least one cold seal comprises, for securing to the slat, on its side facing the slat or, at the contact surface, on the side facing the said contact surface, a web, extending at least over a part region of the cold seal, preferably over the entire length of the cold seal, which can be introduced into a groove provided in the longitudinal edge and/or the side edge of the slat or in the contact surface.

[0024] The web of at least one cold seal can additionally comprise a laterally projecting engagement nose.

[0025] With at least one oblique edge pair, at least one cold seal can be provided in the one surface, and at least one hot seal in the other surface. As a result, in each gap between the longitudinal edges of two adjacent slats, both a cold seal and a hot seal can be provided. The expression ‘oblique edge pair’ is understood to mean, on the one hand, the region of the longitudinal edges of two adjacent slats and, on the other, the region of a frame-side contact surface and the longitudinal edge of the adjacent slat. Inasmuch as the oblique surface pair are formed by two adjacent slats, the two surfaces are the surfaces of the interacting longitudinal edges of a pair of adjacent slats. Inasmuch as the oblique surface pair are formed by a contact surface and the adjacent slat, the two surfaces are the contact surface and the

surface of the interacting longitudinal edge of the adjacent slat.

[0026] The louvre can be configured as a smoke ventilation flap. Smoke ventilation flaps serve to keep regions in a building free of smoke, such as, for example, an emergency exit region. The actuation range of a smoke ventilation flap is at a temperature which lies between the ambient temperature of the respective region which is to be kept free of smoke (cold smoke ventilation) and a temperature of up to 1000 ºC or more (hot smoke ventilation). Accordingly, smoke ventilation flaps must on the one hand ensure a cold sealing effect and, on the other, also a hot sealing effect. Due to the potentially high temperatures, the housing, the slats, and a motor encapsulation of a drive device, usually arranged on an outer side of the housing, consist of a calcium silicate. Smoke ventilation flaps are usually activated by a smoke alarm. Other activation devices are of course also conceivable, such as, for example, a manual activation device, a remote activation device, or the like. The energy for opening and closing must be permanently available at the slats. Smoke ventilation flaps are configured in such a way that, even after activation, i.e. after pivoting out of the open position into the closed position, subsequent opening, i.e. pivoting into the open position, is still ensured. This of course also applies vice-versa.

[0027] The louvre can also be configured as a fire protection flap. Fire protection flaps usually comprise a housing made of metal, in which the slats, consisting of calcium silicate, are mounted such as to be capable of pivoting. A fire protection flap can, for example, be activated manually. In order to pivot the slats out of their closed position, against the resetting force, into the open position, i.e. in order to tension the spring, an activation element is usually arranged on the outside of the housing, such as, for example, an activation handle. The slats are fixed in their open position by means of a fixing device, against a resetting force. For example, in the event of a fire, i.e. when the temperature exceeds a value of about 72 ºC, the slats are pivoted out of the fixed position, after the activation of an activation device, for example a fusible link, by means of the resetting force provided by the spring, out of their open position into their closed position. At the same time, each hot seal inflates. The foaming heat seal(s) now fill(s) completely any gap which may still be present between the frame and the slats and also between two adjacent slats.

[0028] The louvre can of course also be configured as a combined fire protection flap and as a smoke ventilation flap.
[0029] Exemplary embodiments of the invention are explained hereinafter as represented in the drawings. These show:

Fig. 1 An oblique view from above onto a louvre according to the invention,

Fig. 2 a section through the object according to Fig. 1, as well as details a), b), and c) of the characterisation regions in Fig. 2,

Fig. 3 a detailed view of Fig. 2 a),

Fig. 4 the object according to Fig. 3, without a hot seal and slat,

Fig. 5 a detailed view of Fig. 2 c) without a slat,

Fig. 6 the object according to Fig. 5, without a cold seal,

Fig. 7 an enlarged view of the region of the interacting surfaces of a pair of adjacent slats (oblique edged pair),

Fig 8 the region “X” from Fig. 7,

Fig. 9 the region “Y” from Fig. 7, and

Fig. 10 an oblique view onto the inner side of the frame, with a slat in the open position.

[0030] In all the figures, concordant reference numbers are used for components which are the same or of the same type.
[0031] The figures show a louvre which is configured as a combined fire protection flap and smoke ventilation flap. The louvre is intended for use in a line of an air-

conditioning and ventilating system, not represented, or of a mechanical smoke ventilation assembly (MRA).

[0032] The louvre comprises a frame 1, which forms a rectangular opening for the flowing of a gaseous medium. The frame 1 consists of four frame elements, which are connected to one another. The louvre further comprises ten rectangular-shaped slats 2. An adjacent housing 3 delimits the frame 1 at the side. Arranged in this are a drive unit, and a coupling element which can be displaced by the drive unit. All the slats 2 are connected by means of the coupling element, such that, when the coupling element is displaced, the setting position of all the slats 2 which are connected by means of this coupling element can be changed equally. The coupling element can take effect directly or indirectly on the pivot axes 4 of the slats 2 coupled to one another. With such an arrangement, the slats 2 can be pivoted in step with one another, i.e. in one common direction.

[0033] In this way, the slats 2 are mounted in the frame 1 such as to be capable of pivoting about their respective pivot axes 4, between their closed position and their open position. Each slat 2 comprises two longitudinal edges 5 aligned parallel to its pivot axis 4, and two side edges 6 aligned orthogonally to its pivot axis 4. Each pivot axis 4 is arranged in the middle between the longitudinal edges 5 of its slat 2, and also in the middle in relation to the thickness of its slat 2.

[0034] As can be seen in particular in Fig. 7, each of the two surfaces, interacting in the closed position, of the longitudinal edges 5 of each pair of adjacent slats 2, is aligned at an angle α of 30°, forming an oblique edge pair opposite the orthogonal O, which stands perpendicular on the plane E spanned by the respective slat 2. In the closed position, the two surfaces of each pair of adjacent slats 2 are facing towards one another, and, in the exemplary embodiment represented, are aligned parallel to one another. As can be seen from Fig. 2, for example, the height h_1 of the slat 2 increases in relation to the pivot axis 4, over the width of the slat 2, to the height h_2 of the slat 2 in the direction of the pivoting (arrow V) from the closed position into the open position, which is not represented.

[0035] As can be seen, for example, from Fig. 2 and Figs. 4 and 6, the frame 1 comprises in its upper and in its lower region, which in the closed position of the slats 2 extend parallel to the upper and lower slats 2, a contact surface 7. Each contact surface 7 is a part of a contact strip 8, mounted on the inner side of the frame 1. Each contact surface 7 is aligned in such a way that it is aligned parallel to the surface of the longitudinal edge 5 of the adjacent slat 2, when this slat is in the closed position, thereby forming an oblique edged pair.

[0036] Each of the two surfaces of all the oblique edged pairs comprises in each case a seal. The term 'oblique edged pair' is understood to mean, on the one hand, the region of the longitudinal edges 5 of two adjacent slats 2, and, on the other, the region of a frame-side contact surface 7 and the longitudinal edge 5 of the adjacent slat 2.

[0037] The upwards facing surface of each oblique edged pair comprises a seal, configured as a cold seal 9, while the downwards facing surface, in the closed position, is provided as a hot seal 10 to achieve the sealing effect.

[0038] As can be seen from Fig. 7, with all the oblique edged pairs the two seals are

arranged in opposing regions, seen in a direction orthogonally to both surfaces. The two seals 9, 10, are therefore in contact in the closed position.

[0039] As Fig. 4 shows, for example, the hot seal 10, configured in strip form, is arranged in a cut-out opening 11 in the surface or in the frame-side contact surface 7, and projects out of the cut-out opening 11 only with a part region.

[0040] Each cold seal 9 arranged at the slats 2 is configured as a hollow profile seal with a round cross-section, and consists of a thermoplastic elastomer (TPE). Such a configuration can be seen, for example, in Figs. 7 and 9. For securing to the slat 2, a web 12 is provided on the side facing towards the slat 2, which extends over the entire length of the cold seal 9, and which can be introduced into a groove 13 provided in the longitudinal edge 5 of the slat 2 or, respectively, in the contact surface 7. The web 12 comprises on both sides engagement noses 14, which project laterally. The groove 13 is introduced into a cut-out opening 11, such that the hollow profile seal projects out of the cut-out opening 11 with only a part region.

[0041] The arrangement of the two seals 9, 10 of each oblique edged pair, represented in Fig. 7, seen in a direction orthogonally to both surfaces, in opposing regions has further advantages. For example, on the one hand, in the closed position of the slat 2, the cold seal 9, configured as a hollow profile seal, can expand laterally in the cut-out opening 11, in the lower slat 2 in Fig. 7. At the same time, the cut-out opening 11 in the lower slat 2 in Fig. 7, i.e. in the surface which is arranged opposite the hot seal 10, makes it possible, in the event of a fire, for the hot seal 10 to be able to expand into the opposing cut-out opening 11. As a result of this, a certain degree of serration is achieved. Due to the oblique alignment of the surfaces of each oblique edged pair, however, a later opening of the slats 2 is still possible even with the hot seal 10 having foamed outwards.

[0042] For lateral sealing, the frame 1 comprises, in both regions which, in the closed position of the slats 2, extend parallel to the side edges 6 of the slats 2, a part region 15, which is provided with a seal 9. This part region 15 extends along the side edges 6 of the slats 2 in the closed position. In the two regions which, with the slats 2 in the closed position, extend parallel to the side edges 6 of the slats 2, the seal 9 is adhesively bonded only in the part region 15, and not arranged in a cut-out opening 11, as is the case with the seal 10 in the two regions which, in the closed

position of the slats 2, extend parallel to the upper and the lower slats 2.

[0043] Provided in the frame 1 and in the seal are passage openings 16 for the pivot axes 4 of the slats 2. In the exemplary embodiment represented, the width of the seal corresponds approximately to the thickness of the slats 2. In the exemplary embodiment represented, the seal applied on the inner side of the frame 1 is configured as a strip-shaped cold seal 9. This cold seal 9 applied here is based on a calcium-magnesium-silica chemical formulation. Such a cold seal 9 can be obtained, for example, under the designation Kerafix® 2000. Kerafix® 2000 also takes effect as a hot seal.

[0044] As can be seen from the drawings, the cold seal 9 arranged in the regions of the frame 1 which, in the closed position of the slats 2, extend parallel to the side edges 6 of the slats 2, and the cold seal 9, arranged at each slat 2 and at the lower contact surface 7, are of different configurations. Accordingly, the cold seal 9 which is arranged in the regions of the frame 1 which, in the closed position of the slats 2, extend parallel to the side edges 6 of the slats 2, is configured in each case in the form of a strip, while the cold seal 9, arranged at each slat 2 and at the lower contact surface 7, is configured as a hollow profile seal exhibiting a round cross-section.

Patentkrav

1. Persienneklap til indføring i en ledning i et klima- og rumluftteknisk anlæg eller et maskinelt røgudsugningsanlæg (MRA), omfattende dels en ramme (1), der danner en rektangulær åbning for at et gasformigt medium kan strømme, og dels mindst to rektangulært udformede lameller (2), hvor hver lamel (2), fortrinsvis sideløbende med mindst en yderligere lamel (2), er monteret i rammen (1) svingbart omkring en pågældende svingakse (4) mellem den lukkede stilling og den åbne stilling, og hver lamel (2) dels omfatter to langsgående kanter (5), der er orienteret parallelt med svingaksen (4), og dels to sidekanter (6), der er orienteret ortogonalt med svingaksen (4), hvor svingakserne (4) er anbragt, fortrinsvis i midten, mellem de langsgående kanter (5), og hvor mindst en af de langsgående kanter (5) af naboliggende lameller, der arbejder sammen i den lukkede stilling, har en tætning (9, 10), hvor hver af de to flader af de langsgående kanter (5), der arbejder sammen i den lukkede stilling, af mindst et par naboliggende lameller (2) under dannelse af et skråkantpar i forhold til den ortogonale linje (O), der står vinkelret på planet E, der er udspændt i kraft af den pågældende lamel (2), er orienteret i en vinkel a, der ligger mellem 10° og 60°, fortrinsvis mellem 25° og 40°, fortrinsvis ved 30°, og hvor de to flader af dette par af naboliggende lameller (2), der vender mod hinanden, især parallelt, i den lukkede stilling er orienteret således, at lamellens (2) højde i forhold til svingaksen (4) tiltager over bredden af lamellen (2) i svingretningen (V) fra den lukkede stilling til den åbne stilling, at hver af de to flader af mindst et skråkantpar mindst har en tætning (9, 10), hvor det ved mindst en tætning drejer sig om en varmetætning (10), der udvider sig ved varmepåvirkning og fortrinsvis er udformet strimmelformet, hvor mindst en tætning er udformet som koldtætning (9), og hvor der ved mindst et skråkantpar i hvert tilfælde er anbragt mindst en tætning (9, 10) i et i det mindste delvist modsat beliggende område set i en retning ortogonalt med begge flader.

2. Persienneklap ifølge det foregående krav, **kendetegnet ved, at** rammen (1) i det mindste i et af de to områder, der strækker sig i den lukkede stilling af lamellerne (2) parallelt med den øvre og nedre lamel (2), har en anslagsflade (7), der er orienteret således, at den med fladen af den tilstødende lamels (2)

langsgående kant (5), når denne befinder sig i den lukkede stilling, under dannelse af et skråkantpar i det mindste omtrent er orienteret parallelt.

3. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** rammen (1) i mindst et af de to områder, der strækker sig i lamellernes (2) lukkede stilling parallelt med lamellernes (2) sidekanter (6), har et delområde (15), der er forsynet med en tætning (9, 10), og som strækker sig langs sidekanterne (6) af lamellerne (2), der befinder sig i den lukkede stilling.

4. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** mindst en tætning (9, 10) er anbragt i en udsparing (11) og fortrinsvis kun rager ud af udsparingen (11) med et delområde.

5. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** der ved mindst et skråkantpar i hvert tilfælde er anbragt mindst en tætning (9, 10) i områder, der er anbragt forskudt i forhold til hinanden, i en retning set ortogonalt i forhold til begge flader.

6. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** mindst en varmetætning (10) består af et laminatbaseret opskumningsmiddel.

7. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** mindst en koldtætning (9) er udformet som hulprofiltætning, især som en hulprofiltætning med et rundt eller halvcirkelformet tværsnit.

8. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** mindst en koldtætning (9) består af en termoplastisk elastomer (TPE).

9. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** mindst en koldtætning (9) til fastgørelse på lamellen (2) på den side, der vender mod lamellen, eller på anslagsfladen (7) på den side, der vender mod anslagsfladen (7), omfatter et mellemstykke (12), der i det mindste strækker sig over et delområde af koldtætningen (9), fortrinsvis over hele længden af koldtætningen (9), og som kan indføres i en not (13), der er tilvejebragt i den langsgående kant (5) og/eller sidekanten (6) af lamellen (2) eller i anslagsfladen (7).

10. Persienneklap ifølge det foregående krav, **kendetegnet ved, at** mellemstykket (12) af mindst en koldtætning (9) omfatter mindst en indgrebsnæse (14), der rager frem i siden.

11. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** persienneklappen er udformet som røgudsugningsklap.

12. Persienneklap ifølge et af de foregående krav, **kendetegnet ved, at** persienneklappen er udformet som brandbeskyttelsesklap.

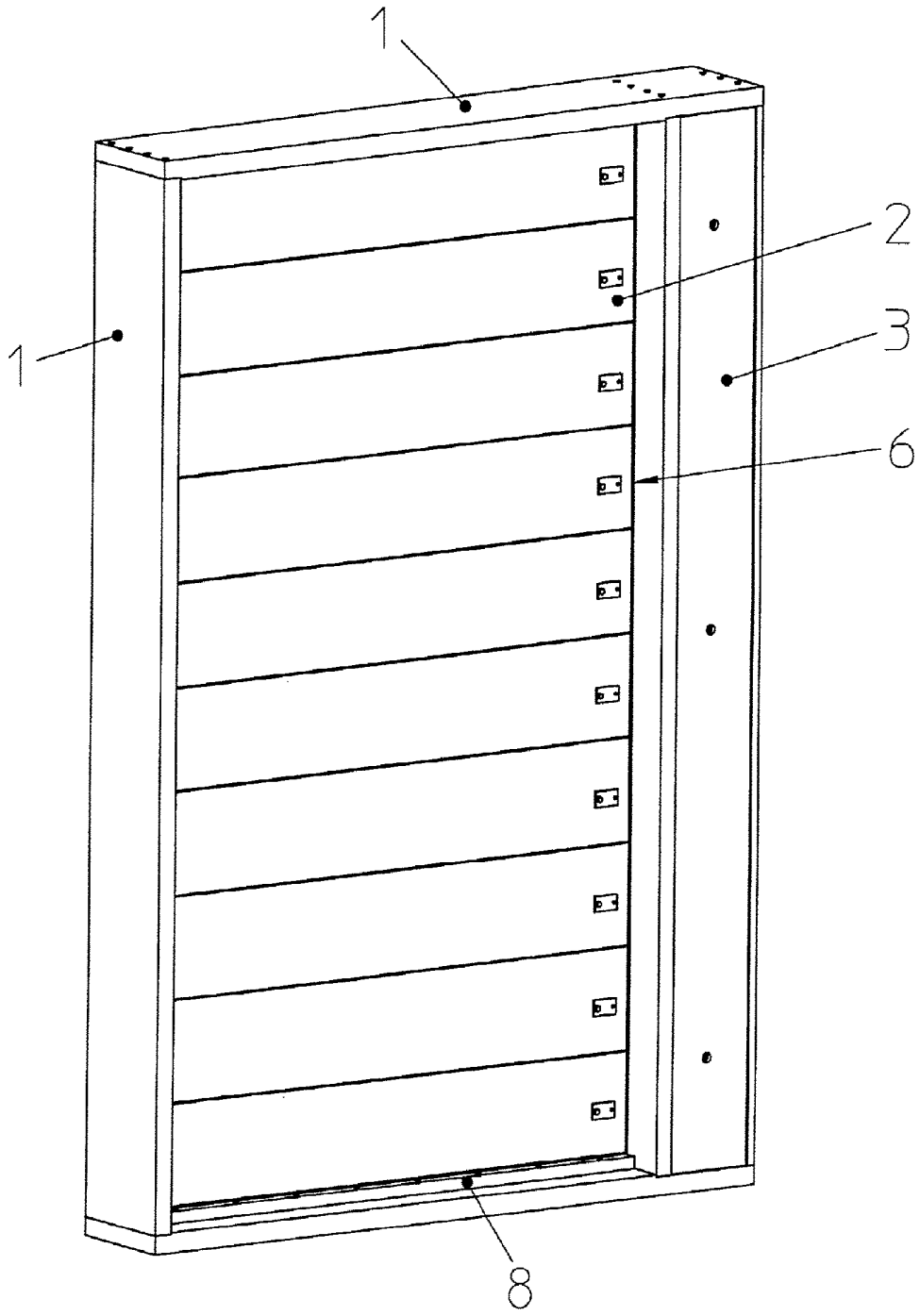


Fig. 1

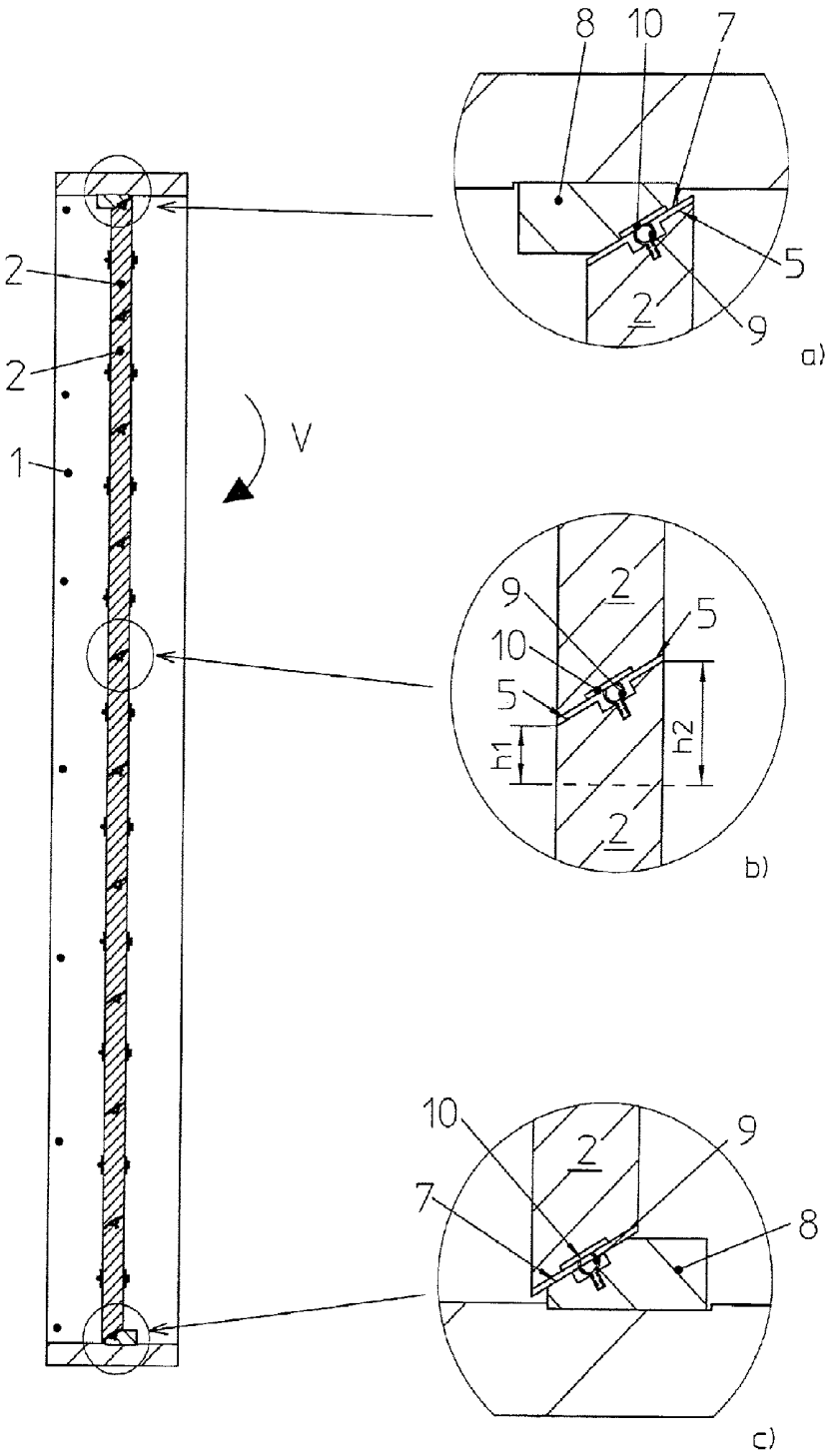


Fig. 2

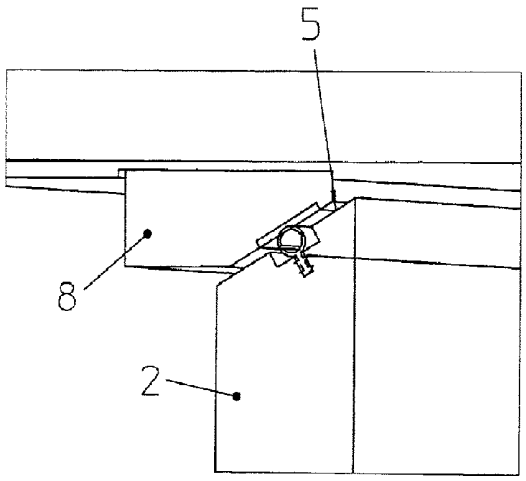


Fig. 3

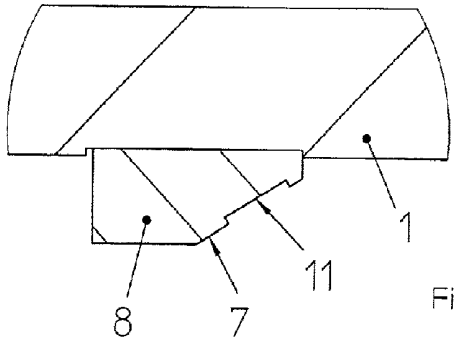


Fig. 4

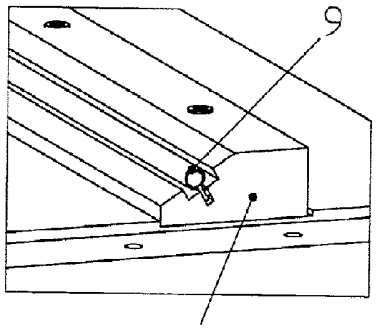


Fig. 5

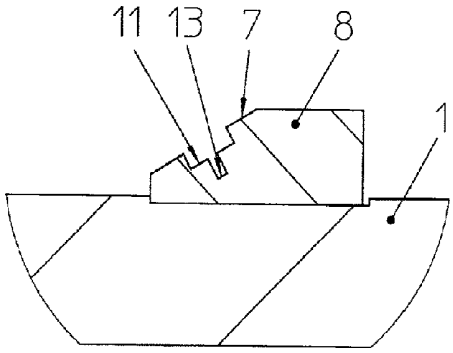


Fig. 6

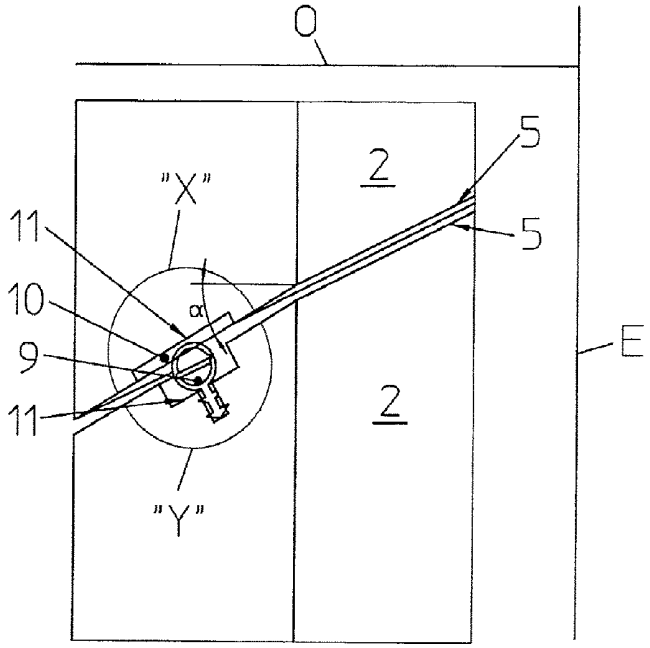


Fig. 7

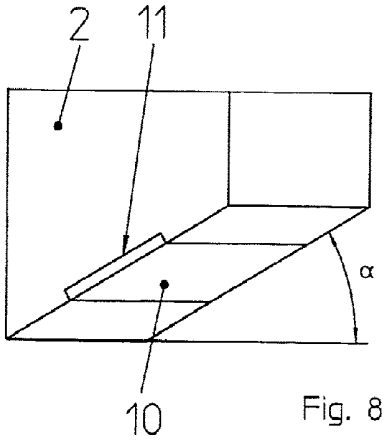


Fig. 8

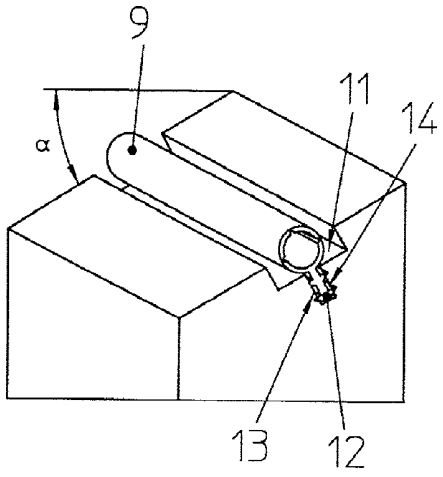


Fig. 9

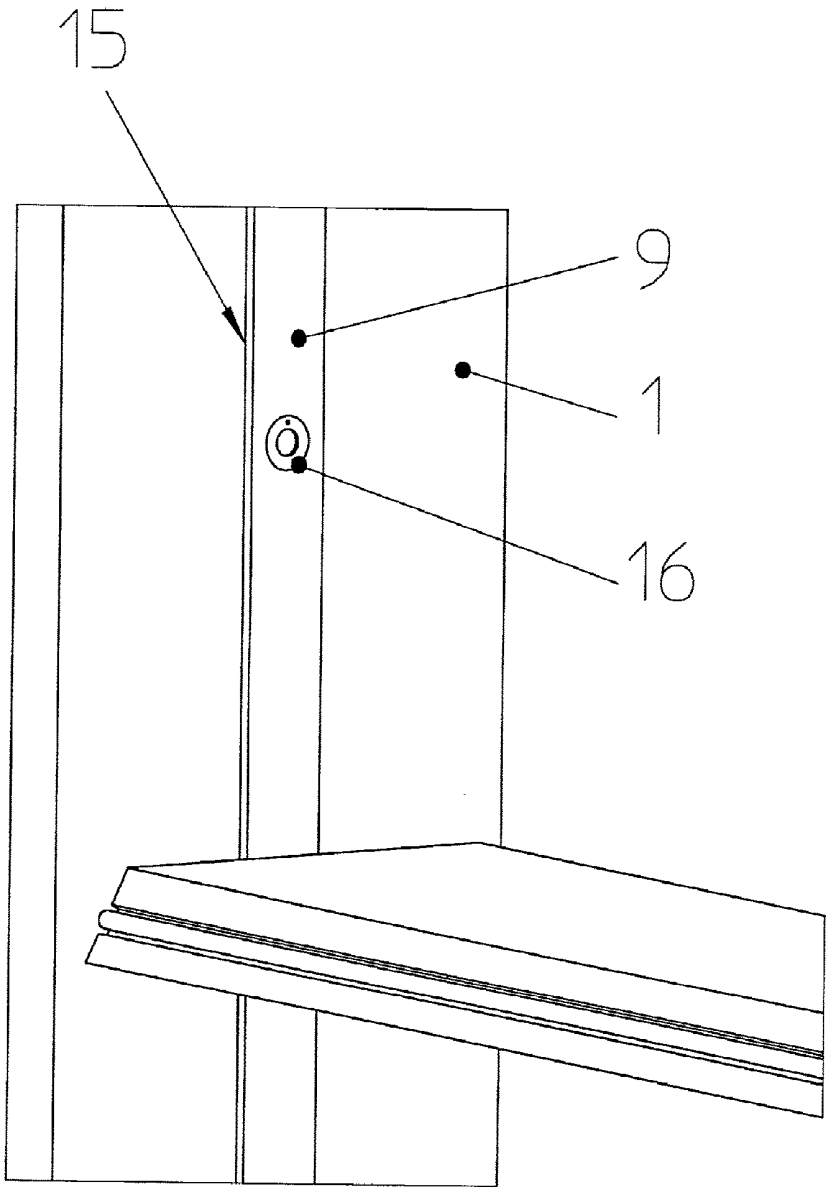


Fig. 10