

(19) **DANMARK**



Patent- og
Varemærkestyrelsen

(10) **DK/EP 2570158 T3**

(12) Oversættelse af
europæisk patentskrift

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- (51) Int.Cl.: **A 62 C 2/12 (2006.01)** **F 16 L 5/04 (2006.01)** **F 24 F 13/14 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2015-08-31**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2015-06-10**
- (86) Europæisk ansøgning nr.: **11181883.7**
- (86) Europæisk indleveringsdag: **2011-09-19**
- (87) Den europæiske ansøgnings publiceringsdag: **2013-03-20**
- (84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**
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- (54) Benævnelse: **Brandspjæld med et hus for et svingbart lukkespjæld lejret deri**
- (56) Fremdragne publikationer:
EP-A1- 0 635 665
DE-A1-102007 010 682
DE-U1- 9 300 413

[0001] The invention relates to a fire protection flap having a housing for a shutoff flap mounted pivotably therein about a pivot axis.

[0002] Different types of fire protection flaps are known from practice, see, for example, DE 102007010682 A1. They possess a pivotably mounted shutoff flap which can be manually operated or motorised. Fire protection flaps are installed in wall penetrations as part of ventilation ducts. In the event of fire their purpose is to isolate the ventilation duct and prevent the fire from spreading from one room to the next. Fire protection flaps are usually installed by being grouted in a wall. This is done by creating an opening in the wall and positioning the fire protection flap in this opening. The resulting surrounding gap is then packed with a mortar or similar grouting material.

[0003] A fire protection flap which is provided on the outside with a mounting box filled with a heat-absorbing sealing compound is also known. Neither embodiment is, for example, suitable for a wall projection or for use beneath a sliding ceiling.

[0004] It is the object of the invention to avoid the aforesaid disadvantages and to disclose a fire protection flap that is suitable as a mounting kit, as a sliding ceiling connection, as a wall projection and also for installation in a fireproof duct.

[0005] This object is resolved in that the housing is surrounded on the outside by at least two plates arranged next to each other, with each plate comprising at least two plate segments each having a recess for a part region of the housing, with the recess being configured such that the plate segment can be mounted onto the housing laterally from the outside, in particular in the radial direction, and with the associated plate segments of each plate touching the other plate segment(s) at two abutment edges, with the abutment edges of all plates being arranged so as not to be flush with each other when viewed in the flow direction. The housing can have any desired cross-section, such as, for example, round or rectangular. The plates that are formed from the plate segments lie close up on the outside of the housing and are therefore in contact with the housing directly or at least indirectly through the intermediary of another component. The plates lie close up against one another.

[0006] The inventive fire protection flap can be used as a mounting kit, as a sliding ceiling connection, as a wall projection and installed in a fireproof duct.

[0007] There can be any desired number of plates. This will depend, for example, on the thickness of the particular wall opening. The abutment edges of all

plates are aligned in such a way that they are arranged so as not to be flush with each other when viewed in the flow direction.

5 [0008] It is, of course, also possible for the abutment edges of two adjacent plates to be flush with each other. In this case however at least one further third plate is provided, with the abutment edges of the third plate not being flush with the abutment edges of the first two plates. The plate segments of adjacent plates can be interconnected, in particular bonded, especially if they comprise abutment edges aligned in the same way.

10 [0009] The housing can comprise a part region extending along the periphery of the shutoff flap in the closed condition and limited on both sides, configured particularly as a slot; said part region is provided with a material which expands under the effect of heat and its width – at least outside the point of intersection between the housing and the pivot axis of the shutoff flap – approximately equals the thickness of the shutoff flap. At least one bushing for the pivot axis can be
15 provided in the housing and in the material.

[0010] By way of a locking device the pivotably mounted shutoff flap can be locked against a restoring force in its open position, and can be pivoted by the restoring force from its locked position (open position or "Open" position) to its closed position ("Shut" position) when the locking device is released, for example,
20 in the event of a fire.

[0011] At least one plate can preferably comprise two plate segments, especially identically configured ones. If the housing has a circular cross-section, then each plate comprises a semicircular recess to accommodate the half cross-section of the housing.

25 [0012] The plates can incorporate at least that part of the housing which bears the pivot axis.

[0013] At least one plate can contain silicates, in particular calcium silicate. It is, of course, also possible for a plate to consist entirely of calcium silicate. The plate thickness is preferably between 15 and 25 mm, in particular around 20 mm.

30 [0014] At one point at least, a reinforcement element which in particular is configured flat and in particular is formed as a sheet inlay and which has an opening for the passage of the housing can be provided between two adjacent plates, with in particular the outer contour of the reinforcement element corresponding to the outer contour of the plates. The sheet inlay can absorb forces when the housing expands and so increases stability. It is preferable if the outer contour of the reinforcement element corresponds to the outer contour of the sheet-metal plates. In
35 this way the sheet-metal plate terminates flush with the plates.

[0015] The reinforcement element, in particular the reinforcement element configured as a sheet inlay, can comprise at least one angled tab in the region of the edge of the opening. This angled tab can be attached to the housing by way of rivets for example. The reinforcement element can of course also be attached to the housing by other means such as by welding on.

[0016] At least one plate can carry on its outside at least one peripheral sealing strip made from a material which expands on application of heat. In the event of fire, the material expands to seal off any remaining space or gap left between the periphery of the plates and for example the edge of the wall opening in a wall.

[0017] A cover plate can be provided on an outside of at least one of the two outer plates, in particular for the mounting of the fire protection flap in an opening of a wall. The cover plate serves to conceal the transitional region from the plates to the wall and to attach the fire protection flap.

[0018] At least one abutment edge of a plate segment may comprise a seal against hot gases, in particular a preferably strip-like seal comprising ceramic or mineral wool.

[0019] A preferably strip-like seal comprising ceramic or mineral wool can be provided at least between the plate segments of one plate on the one hand and the housing on the other hand to provide a seal against gases.

[0020] Embodiments of the invention depicted in the drawings are explained below. In the figures:

Fig. 1 shows a first embodiment of an inventive fire protection flap configured as a mounting kit,

Fig. 2 shows a second embodiment of an inventive fire protection flap configured as a sliding ceiling connection,

Fig. 3 shows a third embodiment of an inventive fire protection flap configured for the wall projection, and

Fig. 4 shows a fourth embodiment of an inventive fire protection flap for installation in a fireproof duct (L90 duct).

[0021] The same reference numerals are used in all figures for the same or same type of parts.

[0022] Figs. 1 and 4 show four different uses of the inventive fire protection flap. The fire protection flap depicted in the figures comprises a housing 1 which in the depicted embodiments has a circular cross-section. Housing 1 contains a shutoff flap 3 which is mounted so that it can rotate about a pivot axis 2.

5 [0023] Outside around housing 1 are arranged a total of five plates 4, with each plate 4 consisting of two identically configured plate segments 5. Each plate segment 5 comprises a semicircular recess 6. Plate segments 5 are mounted from the outside onto the side of housing 1. Plate segments 5 lie with the edge of recess 6 close to the outside of housing 1. Ceramic wool that is configured in the form of a strip is provided, at least between plate segments 5 of a plate 4 on the one hand and housing 1 on the other, as a seal against hot gases. The thickness of the ceramic wool is approximately 3 mm.

10 [0024] Each plate segment 5 of a plate 4 comprises two abutment edges 7. These abutment edges 7 touch the two abutment edges 7 of corresponding plate segment 5 of this plate 4. Ceramic wool is applied on at least one of the two touching abutment edges 7 of two corresponding plate segments 5 of a plate 4 as a seal against hot gases. The thickness of the ceramic wool is approximately 3 mm.

15 [0025] As can be seen from the figures, each fire protection flap comprises a total of five plates 4 in the depicted embodiment. The five plates 4 form a “three’s” group of plates and a “two’s” group of plates, with abutment edges 7 being aligned the same way within each group of plates, whereas abutment edges 7 of both groups of plates are not themselves flush with one another.

20 [0026] As can be seen from the exploded drawings, plate segments 5 of each group of plates are interconnected – for example by adhesive bonding – preferably prior to mounting, then mounted on housing 1. Abutment edges 7 of plate segments 5 of the three’s group of plates are positioned at 12.00 o’clock and 6.00 o’clock, and abutment edges 7 of plate segments 5 of the two’s group at 3.00 o’clock and 9.00 o’clock. Thus when viewed in flow direction 8, abutment edges 7 of all plates 5 are not arranged flush with one another but are offset by 90° relative to each other.

30 [0027] A reinforcement element 9 configured as a sheet inlay is provided between the two’s group of plates and the three’s group of plates. The reinforcement element can have a thickness of 1.5 mm for example. Reinforcement element 9 is fastened to housing 1 of the fire protection flap by way of rivets (not shown). Angled tabs 11 are provided for this purpose on reinforcement element 9 at the edge of opening 10.

35 [0028] During installation, the housing of the fire protection flap is guided through opening 10 in the sheet inlay and the sheet inlay is then fastened to housing 1 by riveting, for example.

[0029] Plate segments 5 of the three’s group of plates and of the two’s group of plates are then attached from the outside to housing 1. Screws 12 which engage

through plate segments 5 of the two's and of the three's group of plates and through reinforcement element 9 are provided to fasten plate segments 5. Holes 13 are provided in reinforcement element 9 for this purpose.

5 [0030] Plates 4 are arranged such that they enclose that part of housing 1 in which pivot axis 2 is mounted. Those plate segments 5 which are positioned in the longitudinal extension of pivot axis 2 comprise a clearance 14 to accommodate pivot axis 2 protruding from housing 1 on the outside.

10 [0031] Plate segments 5 of the two's group of plates and plate segments 5 of the three's groups of plates are thus offset relative to each other by 90° so that no gases are able to flow through abutment edges 7. Since reinforcement element 9 is connected to housing 1, the entire mounting kit is permanently connected to the fire protection flap.

15 [0032] In the case of the embodiment shown in Fig. 1, a diaphragm 15 whose dimensions are greater than the dimensions of plates 4 is additionally provided on the outermost plate 4 of the two's group of plates. This embodiment represents a mounting kit for dry installation in a wall 16. Wall 16 can be a solid wall or a lightweight wall.

20 [0033] On the one hand, cover plate 15 seals the surrounding gap between the wall opening in wall 16 and the fire protection flap, so ensuring that no 'cold' waste gases can be transmitted from one side of wall 16 to the other side of wall 16. On the other hand, cover plate 15 also serves to additionally fasten the fire protection flap in the opening of wall 16. Cover plate 15 has a central opening 17. Tabs 18 are provided at the edge of the opening so that cover plate 15 can be locked on housing 1 after housing 1 has been introduced into opening 17.

25 [0034] Fig. 2 shows the use of the inventive fire protection flap as a sliding ceiling connection. In the case of a sliding ceiling connection, wall 16 is usually a lightweight wall comprising a supporting structure 19 in its interior. Plasterboard panels 20 are attached to either side of supporting structure 19. In order to realise a movement of a ceiling 21 relative to wall 16, a usually U-shaped section 22 is provided on the underside of ceiling 21, with the two downward-facing shanks of said section 22 engaging in a space 23 in wall 16 so that a vertical displacement motion of ceiling 21 under load is possible in this way.

30 [0035] As shown in Fig. 2, instead of cover plate 15 on one outside as in Fig. 1, two brackets 24 are screwed onto each outside of the two outermost plates 4 to allow the fire protection flap to be mounted onto ceiling 21.

35 [0036] Instead of or as well as U-shaped section 22, a plurality of layers of plasterboard strip can also be attached beneath ceiling 21 to create the sliding region of ceiling 21. Plasterboard panels 20 lie against, and can slide against, both sides

of these plasterboard strips. Because the fire protection flap and the ventilation duct are both attached to ceiling 21, these parts do not move relative to ceiling 21.

5 **[0037]** Fig. 3 shows the use of the inventive fire protection flap as a wall projection. Here, plates 4 do not touch the inner edge of the opening in a wall 16 with their outer periphery. Instead, the opening in wall 16 is only large enough to allow housing 1 to be pushed into it. The fire protection flap is fastened to wall 16 by way of screws 25 which pass through plates 4. The outside of the right-hand outer plate 4 in the depicted embodiment is therefore in contact with wall 16.

10 **[0038]** Fig. 4 shows the installation of an inventive fire protection flap in a fire-proof duct (L90 duct) 26. As the figure shows, duct 26 is run by way of a supporting structure 27 beneath a ceiling (not shown). Duct 26 is surrounded on all sides by an enclosure 28. The fire protection flap is installed in such a way that the outside edge of the five plates 5 is in contact with the inside of enclosure 28. In the
15 case of the embodiment according to Fig. 1, a continuous sealing strip 29 made from a material which expands on the application of heat and whose width in the depicted embodiment is approximately equal to the thickness of two adjacent plates 4 is provided around the outside.

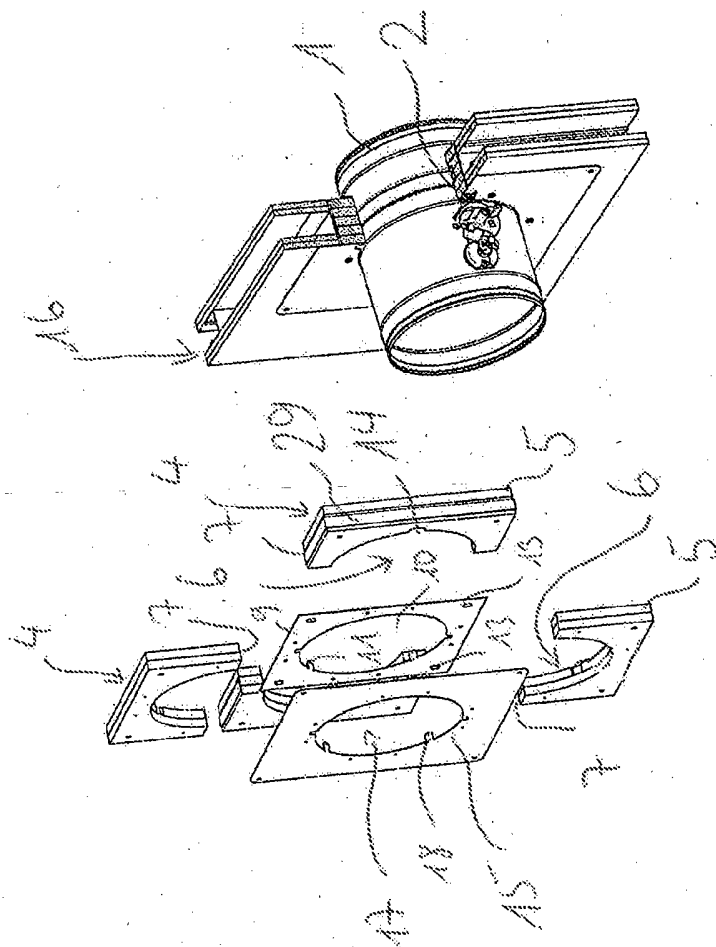
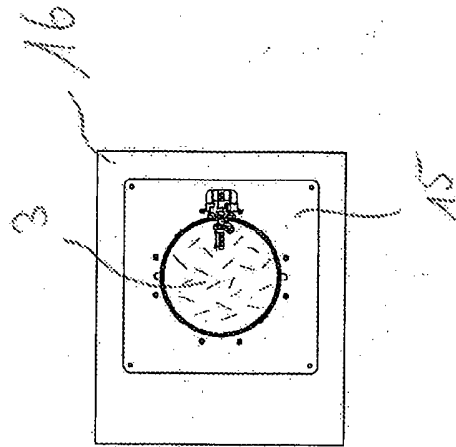
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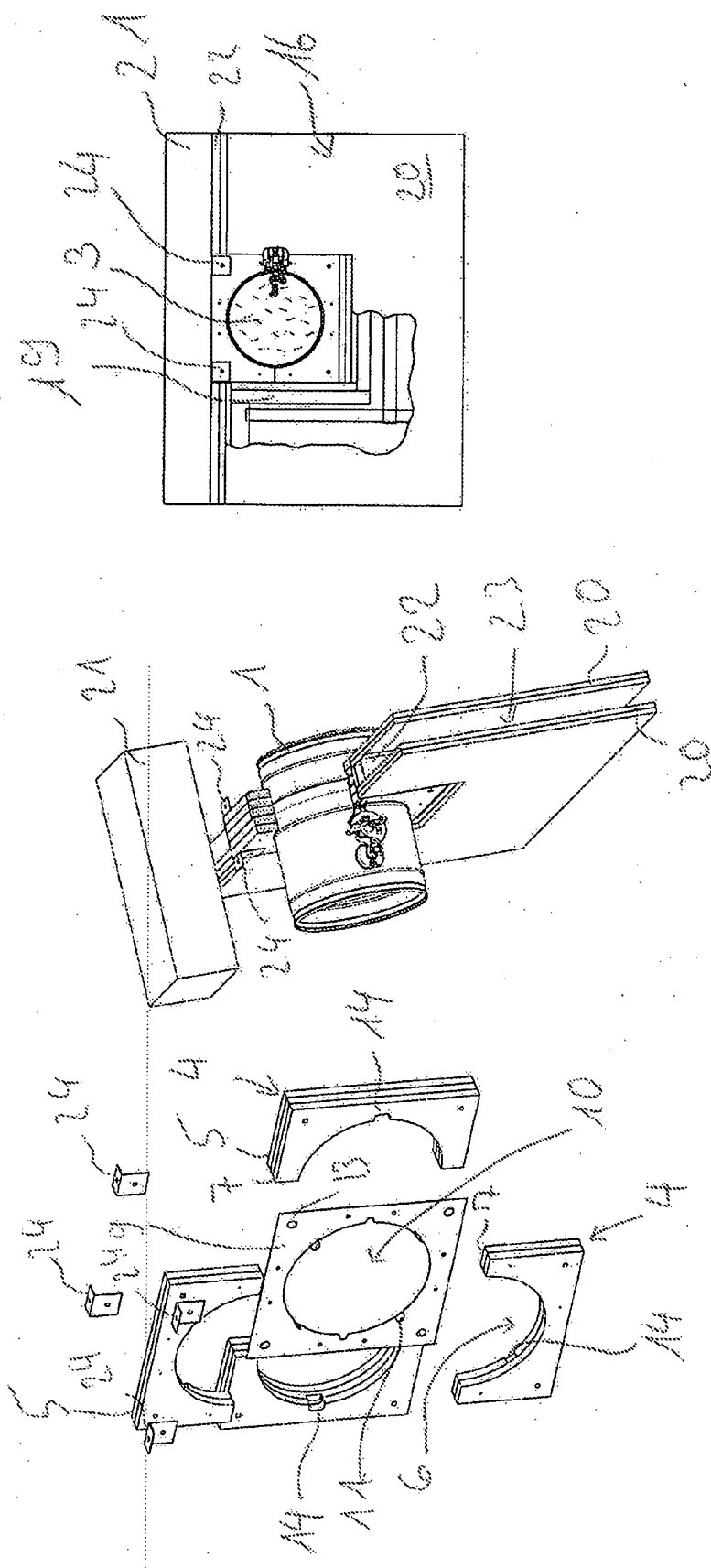
1. Brandspjæld med et hus (1) til en afspærringsklap (3), som lejret svingbart
5 deri om en svingaksel (2), hvori huset (1) på ydersiden er omgivet af mindst to
plader (4) arrangeret ved siden af hinanden, hvori hver plade (4) er dannet af
mindst to pladesegmenter (5), hver med et udtag (6) for et delområde af huset
(1), hvori udtaget (6) er udformet sådan, at pladesegmentet (5) kan anbringes på
10 huset (1) sideværts udefra, især i radialretningen, og hvori de tilhørende plade-
segmenter (5) af hver plade (4) rører de andre pladesegment(er) (5) ved to stød-
kanter (7), hvori stødkanterne (7) af alle plader (4) er arrangeret, så de ikke flug-
ter med hinanden, set i strømningsretningen (8).
2. Brandspjæld ifølge det foregående krav, **kendetegnet ved, at** mindst en plade
15 (4) består af to pladesegmenter (5), som især er udformet ens.
3. Brandspjæld ifølge et af de foregående krav, **kendetegnet ved, at** pladerne
(4) omgiver mindst den del af huset (1), der bærer svingakslen (2).
- 20 4. Brandspjæld ifølge et af de foregående krav, **kendetegnet ved, at** mindst en
plade (4) indeholder silikater, især kalciumsilikat.
5. Brandspjæld ifølge et af de foregående krav, **kendetegnet ved, at** et afstiv-
ningselement (9) er tilvejebragt ved mindst et sted mellem to tilstødende plader
25 (4), som især er udformet fladt og især udformet som en pladeindlæg med en
åbning (10) for passage af huset (1), hvori især den udvendige kontur af afstiv-
ningselementet (9) svarer til pladernes (4) udvendige kontur.
6. Brandspjæld ifølge et af de foregående krav, **kendetegnet ved, at** afstiv-
ningselementet (9), især udformet som pladeindlæg, har mindst en vinkelformet
30 laske (11) i området af åbningens (10) kant.
7. Brandspjæld ifølge et af de foregående krav, **kendetegnet ved, at** mindst en
plade (4) på ydersiden bærer mindst en perifer tætningsstrimmel (29) lavet af et
35 materiale, som udvides ved varmepåvirkning.
8. Brandspjæld ifølge et af de foregående krav, **kendetegnet ved, at** en blænde
(15) er tilvejebragt på en yderside af mindst en af de to ydre plader (4), især til
montering af brandspjældet i en åbning i en væg (16).

9. Brandspjæld ifølge et af de foregående krav, **kendetegnet ved, at** mindst en stødkant (7) af et pladesegment (5) har en tætning mod varme gasser, især en fortrinsvis strimmelformet tætning omfattende keramisk eller mineralskuld.

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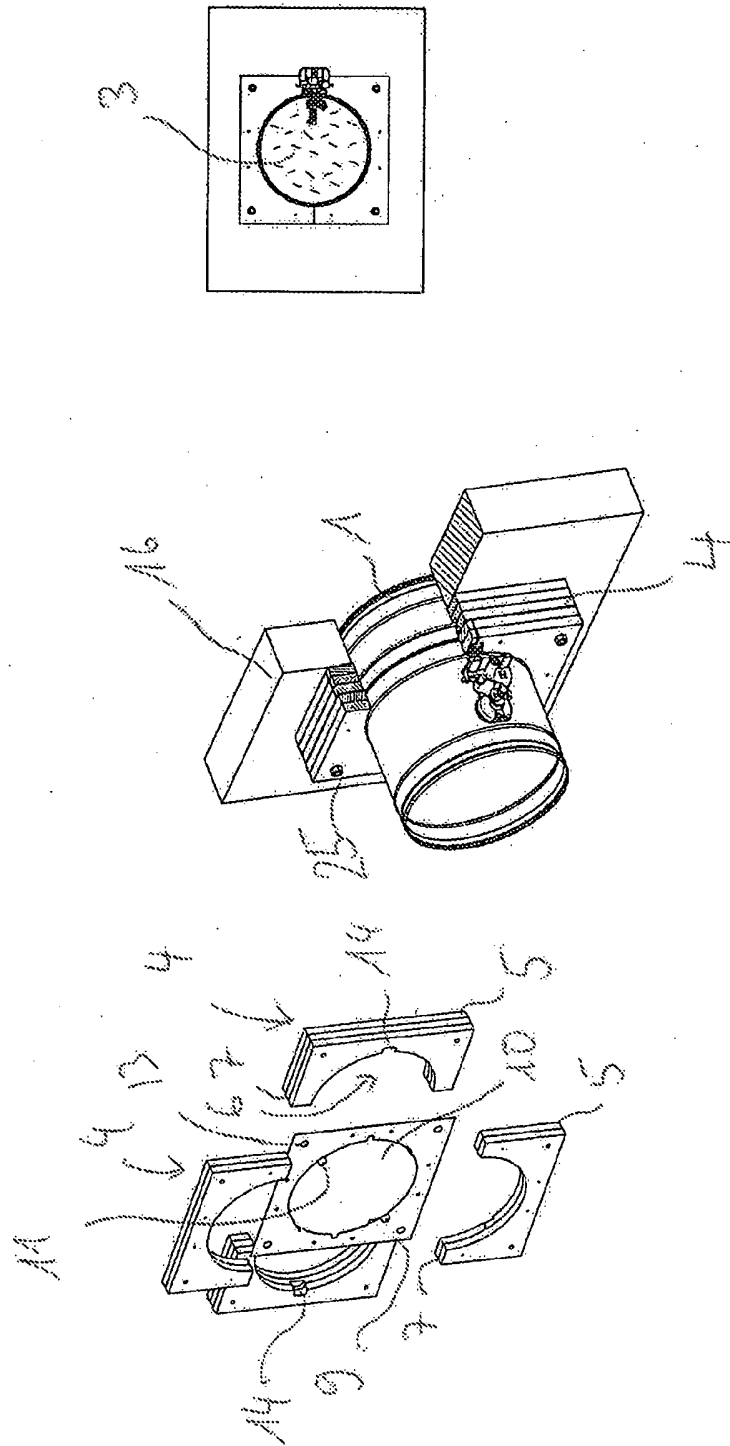
10. Brandspjæld ifølge et af de foregående krav, **kendetegnet ved, at** en fortrinsvis strimmelformet tætning omfattende keramisk eller mineralskuld er tilvejebragt i det mindste mellem en plades (4) pladesegmenter (5) på en side og huset (1) på den anden side.





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23



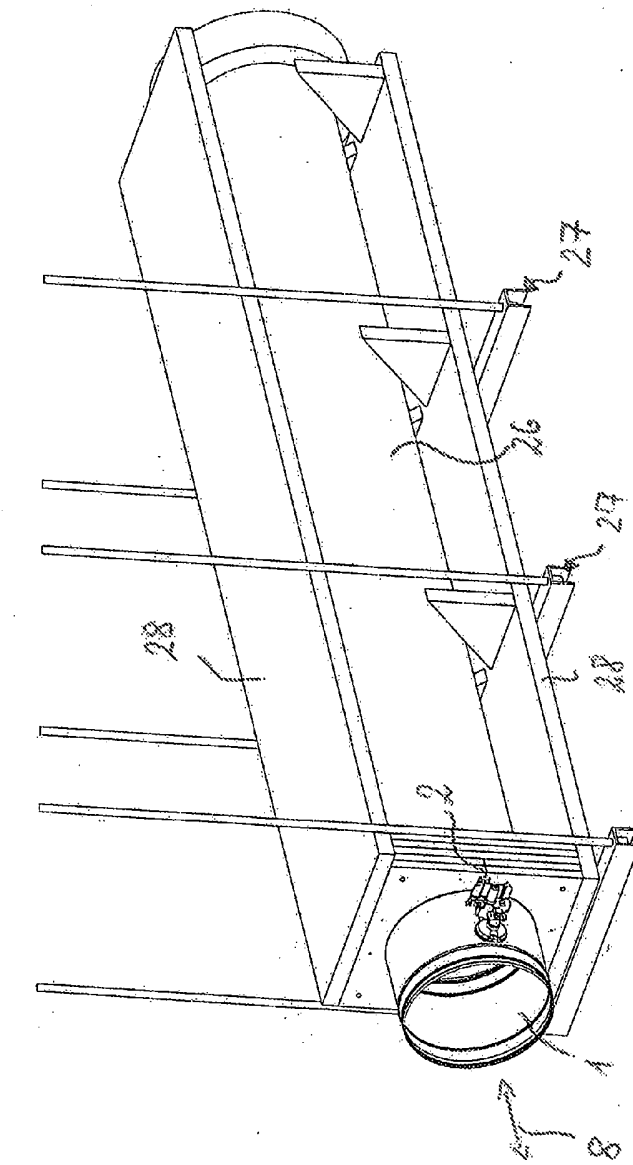


Fig. 4

