

(19) **DANMARK**

(10) **DK/EP 2586958 T3**



(12)

Oversættelse af
europæisk patentskrift

Patent- og
Varemærkestyrelsen

-
- (51) Int.Cl.: **E 06 B 7/22 (2006.01)** **E 06 B 3/48 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2017-03-13**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2017-01-04**
- (86) Europæisk ansøgning nr.: **12460077.6**
- (86) Europæisk indleveringsdag: **2012-10-19**
- (87) Den europæiske ansøgnings publiceringsdag: **2013-05-01**
- (30) Prioritet: **2011-10-24 PL 39673111**
- (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**
- (73) Patenthaver: **Malkowski, Zenon, ul. Grabowa nr 9, 62-051 Wiry, Polen**
- (72) Opfinder: **Malkowski, Zenon, ul. Grabowa nr 9, 62-051 Wiry, Polen**
- (74) Fuldmægtig i Danmark: **Antoni Cieszkowski, ul. Slawinska 28, PL-60-183 Pozan, Polen**
- (54) Benævnelse: **Tætningssystem for en horisontal oprullende fløjdør**
- (56) Fremdragne publikationer:
US-A- 4 368 772
US-A1- 2003 213 180

(73) Patent owner: Malkowski, Zenon

62-051 Wiry, ul. Grabowa 9 (PL)

(54) System of horizontal seals for a roll-up sectional door

Description

[0001] The invention concerns a system of horizontal seals for a roll-up sectional door used mainly in industrial buildings and public utility facilities where smoke control property of closed passages is required.

[0002] There is known a roll-up door in the form of a leaf which is built of chain interconnected leaf sections and wound in layers onto a horizontal shaft. The side edges of the leaf sections are located and slide in vertical rail guides of a contour similar to letter C which are fixed on the sides of the door. Inside each guide there are vertical slide strips fixed to its side walls. The slide strips enclose the edges of the leaf sections on both sides. On the bottom edge of the leaf there is set a pair of horizontal elastic strip-like seals which are mounted on both sides to the edges of the outermost section and, when the door is closed, adhere to its ground. There is also a roll-up door of a similar structure known from the Polish patent description no 202622. Its leaf which is rolled up in layers and built of many sections moves between two vertical guides. There are bearing-mounted guide rollers provided by the side edges of the particular sections. These rollers move between the vertical guiding strips which are set and swivel on the edges of the guides. Since a certain clearance is constantly maintained between the sectional leaf and the guides of these known roll-up doors, they do not provide efficient protection against the penetration of smokes and flues because they are unprovided with seals. From the Polish patent description no 200958 there is also known a sectional fire door built of a series of leaf sections interconnected in an articulated manner.

EP 2586958 B1

Each of them has guide elements provided on its sides in the form of rollers which are positioned adjustably in fixed guide rails with a contour similar to the letter C. These guides are fixed on both sides of the door and consist of vertical portions, positioned by the traffic opening, arched portions by the lintel and inclined portions under the ceiling of the closed room. Due to such orientation of the guides, the door, when closed, is between their vertical portions and the open door is between the inclined portions. The side edges of its leaf sections are sunk in the guides so that there are slots formed between the walls of the guides and the edges of the sections. Within these slots there are vertical intumescent seals mounted on the walls of the guides. In normal conditions, the edges of the leaf sections move with a considerable play between the intumescent seals. When fire breaks out, these seals multiply in size under the impact of a significant temperature increase in closed rooms and entirely fill up the slots on the edges of the sections. Also, in this known solution, the sectional door does not constitute an efficient smoke control barrier since it becomes sealed only after reaching a relatively high temperature. Furthermore, the patent description US 2003/0213180A1 presents a waterproof roll-up barrier with a sectional leaf, the side edges of which are located and slide in vertical guides. On the edge of the lintel, within the opening being closed, there is formed a seal in the form of a single, horizontally extended strip-like seal, the swivelling edge of which adheres to the surface of the leaf. On the other hand, the patent description US 4368772 presents a sectional door leaf equipped with intersection seals. Each of them has the form of a set of seals which are located within the articulated joints interconnecting the sections and adhere to the edges of two adjacent sections.

[0003] The invention concerns a system of horizontal seals for a roll-up sectional door, the leaf of which, formed of parallel sections interconnected with articulated joints, which is wound in layers onto a horizontal shaft where the side edges of the leaf are located and slide in vertical rail guides of

EP 2586958 B1

a contour similar to the letter C which enclose the leaf on both sides while at least one elastic seal which is set horizontally on the bottom edge of the leaf and which reaches the ground of the door when the door is closed.

[0004] According to the invention, the system is characterised in that it consists of many seals in the form of horizontally extended and essentially elastic strip-like seals which are arranged at different heights in relation to the traffic opening of the door and adhere to the sectional leaf on at least one side of the door where the upper seal of the leaf which is situated above the traffic opening consists of two interlocked swivelling seals. One of them, a fixed seal, is attached to the wall of the building while the other, an adjustable seal, is fixed to one of the sections of the leaf. In the preferable embodiment of the invention, between the upper seal and the upper edge of the traffic opening, there is formed a middle seal in the form of a single seal which is set on the wall of the building and the swivelling edge of which adheres to the leaf on the internal side of the door. The bottom seal which is situated on the edge of the outermost bottom section of the leaf has most preferably the form of a seal with an arched cross profile. The convex surface of this seal which is directed upwards adheres to the front concave surface of the outermost section and is pressed against it by a strip-like flap with an arched cross profile.

[0005] Due to the use of a multiple system of horizontal seals, the roll-up sectional door according to the invention is distinguished by a high level of the smoke control characteristics within a wide range of temperatures.

[0006] The subject of the invention is shown in an exemplary embodiment on the drawing where Fig. 1 presents a front view of the system of horizontal seals in a roll-up sectional door, Fig. 2 – a vertical cross section view of the system of seals of this door, Fig. 3 – a zoomed-in vertical cross section view of seals in the upper part of the door, Fig. 4 – a zoomed-in vertical cross

EP 2586958 B1

section view of seals in the bottom part of the door whereas Fig.5 – a zoomed-in vertical cross section view of the intersection seals.

[0007] The system of the horizontal seals is used according to the invention in the roll-up sectional door, the leaf **1** of which consists of parallel flat sections **2** interconnected in an articulated manner. The sectional leaf **1** is wound in layers onto a revolutionary and horizontally extended shaft **3**. The side edges **4** of sections **2** of the leaf **1** are located and slide in vertical rail guides **5** of a contour similar to the letter C. The guides **5** are mounted on both sides of the door and enclose the leaf **1** on both sides. The system of seals of the door consists of four seals **A**, **B**, **C**, **D** in the form of horizontal and essentially elastic seals **6**, **6'**, **7**, **8** and **9** made of rubber. These seals, positioned one above another at various heights in relation to the traffic opening **10** of the door adhere on at least one side of the door to the sectional leaf **1**. The upper seal **A** of the door, situated above the traffic opening **10**, is formed of two interlocked swivelling seals **6**, **6'**. One of them, the fixed seal **6**, is attached to the wall **11** of the building while the other, an adjustable seal **6'**, is fixed to one of the sections **2** in the upper part of the leaf **1**. The middle seal **B** of the door, situated between the upper seal **A** and the upper edge of the opening **10**, has the form of a single seal **7**. This seal is set on the wall **11** and its swivelling edge **12** adheres to the leaf **1** on the internal side of the door. The other middle seal **C** which is situated on the edge of the lintel **13** within the opening **10** also has the form of a single seal **8**. Its swivelling edge **14** adheres to the leaf **1** on the internal side of the door. The bottom seal **D** which is situated on the edge **15** of the outermost bottom section **2'** of the leaf **1** has the form of a seal **9** with an arched cross profile. The convex surface **16** of the seal **9** is directed upwards, adheres to the front, concave surface **17** of the outermost section **2'** and is pressed against it by a strip-like flap **18** with an arched cross profile. The seals **6**, **6'**, **7** and **8** have on the side of their mountings the cylindrical edges **19** which are pivotally set inside a pair of opposite doorstops **20** and hook seats **20'**

EP 2586958 B1

formed on one of the sections **2** of the leaf **1** and on the wall **11** and the lintel **13**. The system of seals according to the invention also contains intersection seals in the form of the seals **21** which are arranged on the entire surface of the leaf **1**. These seals are set within the articulated joints
5 **22** interconnecting the sections **2** of the leaf **1** where each seal **21** adheres to the edges **23**, **24** of two adjacent sections **2**.

Markings**[0008]**

- 1** - leaf
- 10 **2** - section
- 2'** - section
- 3** - shaft
- 4** - edge
- 5** - guide
- 15 **6** - seal
- 6'** - seal
- 7** - seal
- 8** - seal
- 9** - seal
- 20 **10** - opening
- 11** - wall
- 12** - edge

EP 2586958 B1

13 – lintel

14 - edge

15 - edge

16 - surface

5 **17** - surface

18 - flap

19 – edge

20 – doorstep

20' - seat

10 **21** - seal

22 – articulated joint

23 - edge

24 - edge

A – seal

15 **B** – seal

C – seal

D – seal

(54) Tætningssystem for en horisontal oprullende fløjdør**Patentkrav**

1. Tætningssystem for en horisontal oprullende fløjdør, hvor fløjen (1), består af parallelle og med glideled forbundne segmenter (2), som er omsnoet i lag på en horisontal aksel (3), og hvor kanterne på siden (4) er anbragt, og som kan glide i en vertikal skinnekonstruktion, fastgjort på fløjdørens sider (5) i en C-formet sammenfatning, som indbefatter fløjen (1) fra to sider, og på den nedre side er fløjen fastgjort horisontalt med en elastisk fortætning, som ligger ind til gulvet ved døren, efter den er lukket, *kendetegnet ved*, at den består af flere forseglinger (**A, B, C, D**) i form af horisontalt forlængede, fuldt elastiske, listeforseglinger (**6, 6', 7, 8, 9**), som er anbragt på forskellige højder i forhold til dørens trafikåbning (**10**) og som ligger ind til segmentfløjen (**1**) på mindst en side af døren, og hvor den øvre forsegling (**A**), er anbragt over trafikåbningen (**10**), og som består af to gensidigt sammenknyttede, drejelige forseglinger (**6, 6'**), hvoraf en er en fastmonteret forsegling (**6**) monteret på væggen (**11**) i bygningen, og den anden er en regulerbar forsegling(**6'**) som er fastgjort til et af segmenterne (**2**) på fløjen (**1**).
2. Tætningssystem i følge krav 1, *kendetegnet ved*, at den midterste forsegling (**B**), er anbragt mellem den øvre forsegling (**A**) og den øvre kant på trafikåbningen (**10**), har form som en enkelt pakning (**7**), påmonteret væggen (**11**) på bygningen, og hvis drejelige kant (**12**) ligger ind til fløjen (**1**) på dørens inderside.

- 5 3. Tætningssystem i følge krav 1, *kendetegnet ved*, at den nederste forsegling **(D)**, som er anbragt på kanten **(15)** yderst på det nedre segment **(2')** på fløjen **(1)**, har form som pakninger **(9)** med en buet tværprofil, hvor den opadbuede, opadrettede overflade **(16)** ligger tæt ind til forsænkede endestykke **(17)** på det yderste segment **(2')** og er presset ind mod den, ved hjælp af listebelægning **(18)** med en buet tværprofil.

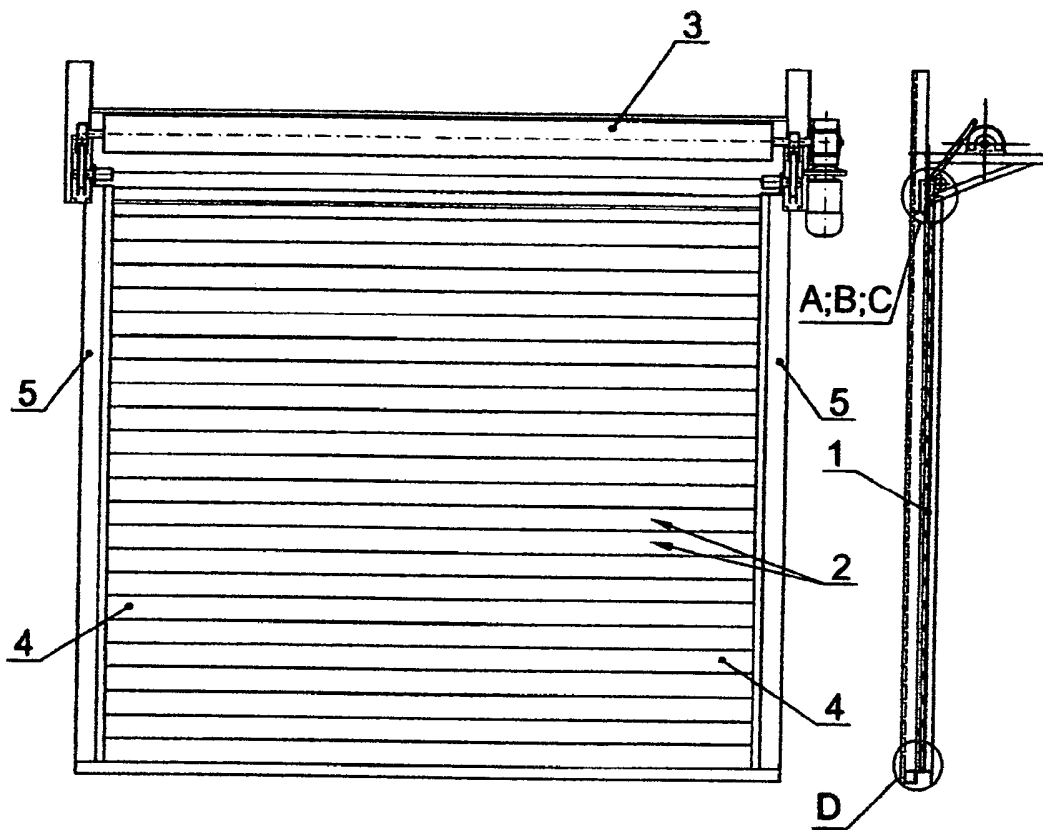


Fig. 1

Fig. 2

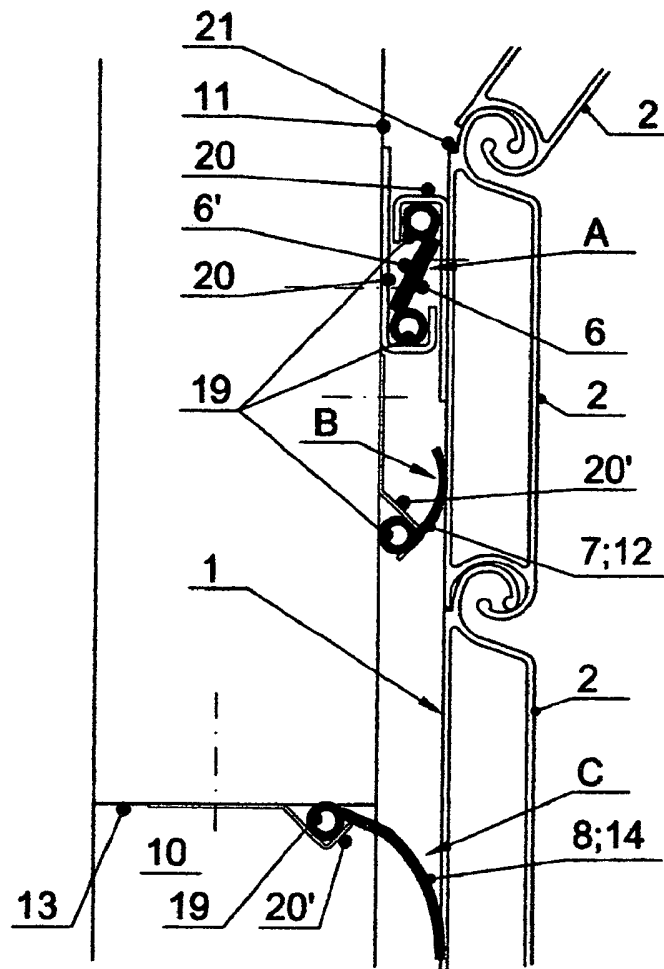


Fig. 3

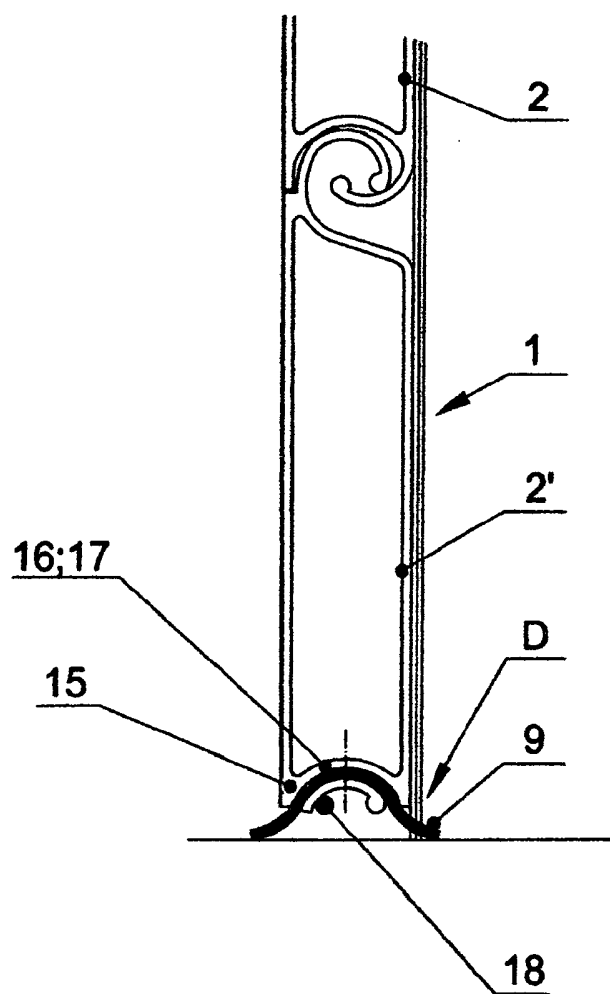


Fig. 4

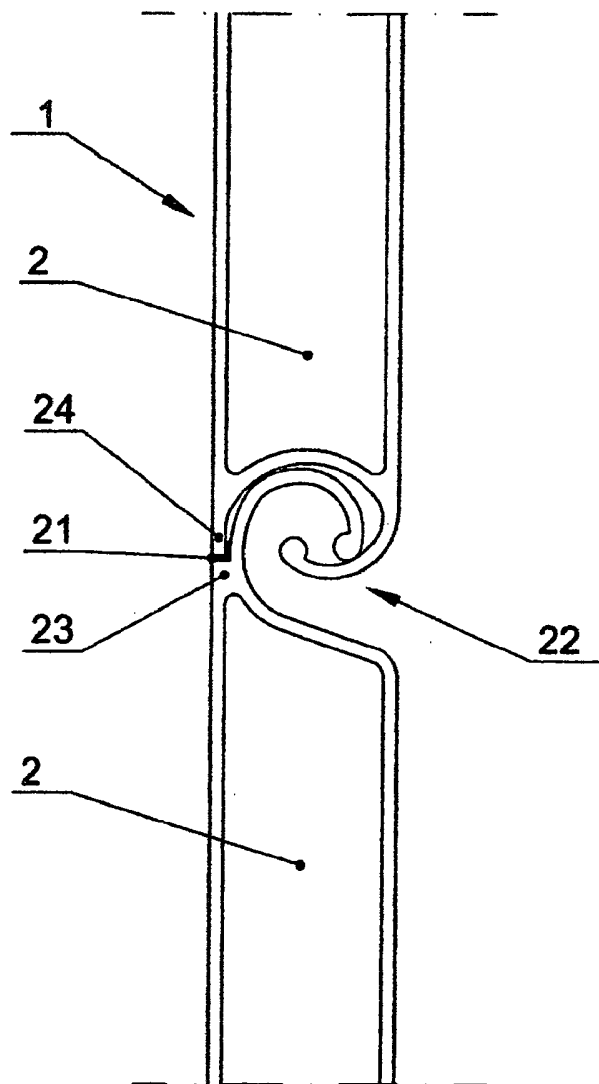


Fig. 5