

(19) **DANMARK**

(10) **DK/EP 3754146 T3**



Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

-
- (51) Int.Cl.: **E 06 B 7/215 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2022-10-17**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2022-08-10**
- (86) Europæisk ansøgning nr.: **19181310.4**
- (86) Europæisk indleveringsdag: **2019-06-19**
- (87) Den europæiske ansøgnings publiceringsdag: **2020-12-23**
- (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: **Athmer oHG, Sophienhammer, 59757 Arnsberg, Tyskland**
- (72) Opfinder: **Kowski, Julian, Auf der Burg 32, 59494 Soest, Tyskland**
Hartung, Sergej, An der Wilhelmshöhle 10, 57413 Finnentrop-Heggen, Tyskland
Ludwig, Maico, Wallburgerstraße 2, 59494 Soest, Tyskland
- (74) Fuldmægtig i Danmark: **Plougmann Vingtoft A/S, Strandvejen 70, 2900 Hellerup, Danmark**
- (54) Benævnelse: **AUTOMATISK TÆTNING MED DÆMPER TIL FORHALING AF SÆNKNINGEN**
- (56) Fremdragne publikationer:
EP-A1- 2 924 224
EP-A1- 3 284 898
DE-A1-102017 100 149

The present invention relates to an automatic seal for a door leaf,

- having a single-part or multi-part holding means, in particular a housing, an outer profile, or similar,

5 - having a force-introducing element which is mounted on the holding means so as to be displaceable from a first position into a second position,

- having a sealing strip which is movable with respect to the holding means from a first position into a second position,

10 - having a mechanism which is coupled at least indirectly to the force-introducing element and the sealing strip, such that a movement of the force-introducing element can be translated into a movement of the sealing strip from the first position into the second position,

- having movement-transferring parts which transfer a movement of the force-introducing element to the mechanism,

15 - having a first spring and a damper, wherein

o the first spring is arranged at least indirectly between the force-introducing element and the movement-transferring parts and

o the damper is arranged at least indirectly between the movement-transferring parts and the holding means.

20

Such a seal is known from document EP 2 924 224 A1.

Automatic seals are used in particular to seal gaps between a door leaf and a floor. By applying pressure to the force-introducing element, a force can be applied to the seal to move the sealing strip from the first position, in which a gap between the door leaf
25 fitted with the seal is not sealed, to a second position, in which the gap is sealed by means of the sealing strip.

As long as no force is applied to the force-introducing element, it is in a first position and usually protrudes beyond the door leaf. By closing the door, a force is applied to the force-introducing element. This is usually done by the force-introducing element striking
30 against a stop element, for example the door frame. When the force is applied, the force-introducing element is displaced and moved from its first position to its second position. In the case of the seal known from document EP 2 924 224 A1, the force-introducing element acts on the still untensioned first spring and tensions it. The first spring pushes

on a single- or multi-part rod of the movement-transferring parts that interact with the damper. The force of the first spring is transferred through the rod to the damper, which dampens a movement of the rod in the direction of the force exerted by the first spring. The rod thus moves with a delay compared to the force-introducing element. Since the rod causes the movement of the sealing strip in cooperation with the mechanism, the movement of the sealing strip from the first to the second position is also delayed in comparison to the movement of the force-introducing element from the first position to the second position due to the delayed movement of the rod. Instead of the rod, the movement-transferring from the first spring to the damper could be done by other means or elements of the movement-transferring parts.

Due to the displaceability of the force-introducing element, it results that in an automatic seal with a delay in the movement of the sealing strip relative to the movement of the force-introducing element, the force-introducing element protrudes more from the holding means than in a seal without this delay.

This can lead to the fact that due to the space conditions on a door, the seal with the delay can not be used.

This is where the invention comes in.

The invention is based on the problem of improving a seal of the type described above so that the force-introducing element protrudes less.

According to the invention, this task is solved in that the first spring is tensioned in a non-actuated state of the seal when the force-introducing element is in the first position, so that the distance that the force-introducing element has to travel in order to introduce the force into the first spring that is necessary for the damper to allow movement is reduced.

In the seal known from document EP 2 924 224 A1, the first spring is not pretensioned. Paragraph [0087] of the document describes that when the force-introducing element is moved to the second position, the first spring is compressed to allow the rod to be pushed against the damper. The pressure of the rod on the damper causes the damper to operate and ultimately allows the rod to move.

The effect of the rod on the damper depends, among other things, on how great the force is that acts on the damper. Many dampers require that a minimum force be applied to the damper before the damper will allow movement. This force must be stored in the first spring before the damper allows movement. To store this force in the first

spring, the force-introducing element must be moved. When the force-introducing element is actuated, therefore, the minimum force required to actuate the damper must be applied. First then the damper is actuated and the movement-transferring parts can be moved and transfer their movement to the mechanism to move the sealing strip to the second position.

In contrast, in a seal without a damper, as soon as a force is applied to the force-introducing element, the movement of the force-introducing element is transferred to the movement-transferring parts without delay. In this way, the force applied to the force-introducing element is transferred to the sealing strip without delay and without the force-introducing element having to travel any distance, and the sealing strip is set in movement. For this reason, the projection of the force-introducing element over the holding means of the seal can be smaller in a seal without a damper than in a seal with a damper for the same stroke of the sealing strip.

By pretensioning the first spring in a seal according to the invention, the distance that the force-introducing element must travel to introduce the force into the first spring necessary to allow the damper to move can be reduced.

Automatic seals typically have at least one return spring that is used to move the sealing strip and force-introducing element from the second position to the first position when force is no longer applied to the force-introducing element. In one aspect, the return spring is tensioned by actuation of the mechanism or movement-transferring parts when a force is applied to the force-introducing element to move the sealing strip and the force-introducing element from the first position to the second position. Secondly, the at least one return spring is also tensioned in the first position of the sealing strip. The force then stored in the return spring holds the sealing strip securely in the first position.

This pretension of the at least one return spring must be overcome when the seal is actuated and the sealing strip is moved from the first to the second position. That is this force to overcome the pretension of the return spring must also be applied to the first spring via the force-introducing element before the sealing strip moves from the first position to the second position.

It may be provided that the first spring is biased such that tension of the first spring in the first position of the force-introducing element is greater than or equal to the tension of the return spring in the first position of the sealing strip. The tension of the first spring in the first position of the force-introducing element can be greater than the sum of the

tension of the return spring in the first position of the sealing strip and the force that is at least necessary to actuate the damper.

The first spring can be a spiral spring. However, other springs can also be used. Preferably, the first spring is a compression spring.

5 A seal may have a trigger. The force-introducing element can be part of the trigger. In addition to the force-introducing element, the trigger may include the first spring. Further, a coupling element may be a part of the trigger. The coupling element may be at least indirectly connected to the movement-transferring parts.

10 The trigger may have a bearing. The force-introducing element and the coupling element can be connected via the bearing so as to be linearly displaceable relative to each other. The first spring can be arranged between the force-introducing element and the coupling element under pretension. Moving the force-introducing element from its first position to its second position displaces the force-introducing element relative to the coupling element. This allows the first spring, located between the force- introducing
15 element and the coupling element, to be tensioned beyond the pretension. The force thus stored can be used, at least in part, to act on the damper and thus to actuate the movement-transferring parts and the mechanism for moving the sealing strip from the first to the second position, which is damped by the damper.

20 The position of the trigger to the movement-transferring parts can be adjustable. This makes it possible to shift the position of the trigger within the seal. The projection of the trigger over the holding means can thus be adjusted. To allow the position of the release to be adjusted relative to the movement-transferring parts, the connection between the coupling element and the movement-transferring parts can be adjustable. This connection can be a screw connection.

25 The bearing, via which the force-introducing element and the coupling element are connected so as to be linearly displaceable relative to one another, can be designed to allow rotational movement of the coupling element relative to the force-introducing element. This makes it possible to rotate the coupling element, for example for the purpose of adjusting the position of the release, without having to rotate the force-
30 introducing element. The force-introducing element can be linearly displaceably mounted on the holding means.

The coupling element can have a key surface or be in a non-twisting manner connected to an element that has a key surface. A torque can be applied via the key surface to rotate the coupling element.

Further features and advantages of the present invention will become apparent from the following description of an example embodiment shown in the figures. The following shows:

FIG. 1 a perspective view of the seal according to the invention in the non-actuated state,

FIG. 1a a perspective view of the seal according to the invention in the actuated state,

FIG. 2 a side view of the seal according to the invention in the non-actuated state,

FIG. 2a a side view of the seal according to the invention in the actuated state,

FIG. 3 a side view of the seal according to the invention in the non-actuated state, but without holding means and sealing strip,

FIG. 3a a side view of the seal according to the invention in the actuated state, but without holding means and sealing strip,

FIG. 4 a side view of the seal according to the invention in the non-actuated state, but without holding means, seal profile and a first module housing,

FIG. 4a a side view of the seal according to the invention with the force-introducing element in the second position and the sealing strip in the first position, but without holding means, sealing profile and a first module housing,

FIG. 4b a side view of the seal according to the invention in the actuated state, but without holding means, seal profile and a first module housing,

FIG. 5 a longitudinal section through the seal according to the invention in the non-actuated state,

FIG. 5a a longitudinal section through the seal according to the invention in the actuated state,

FIG. 6 a detailed view from the section according to FIG. 5 through the seal according to the invention in the non-actuated state,

FIG. 6a a detailed view from the section according to FIG. 5 through the seal according to the invention with the force-introducing element in the second position and the sealing strip in the first position,

FIG. 6b a detailed view from the section according to FIG. 5 through the seal according to the invention in the actuated state,

FIG. 7 a side view of the release with the force-introducing element in its first position,

5 FIG. 7a a side view of the release with the force-introducing element in its second position,

FIG. 8 a longitudinal section through the release with the force-introducing element in its first position, and

10 FIG. 8a a longitudinal section through the release with the force-introducing element in its second position,

FIG. 9 a detailed view from the section according to FIG. 5 through the seal according to the invention in the non-actuated state and

FIG. 9b a detailed view from the section according to FIG. 5 through the seal according to the invention in the actuated state.

15

The example of a seal according to the invention shown in the figures is a further development of the seal disclosed in the document EP 3 284 898 A1. Like the seal from document EP 3 284 898 A1, it has a modular design.

20 The seal according to the invention has a housing 1 as the holding means. A first module 4, a second module 6, a damper 8 and a sealing strip 9 are arranged in this housing 1. The first and second modules 4, 6 each have a module housing 40, 60. The modules 4, 6 each have a mechanism for moving the sealing strip relative to the housing 1 (movement mechanisms). The movement mechanisms are scissor mechanisms 42, 62. Other movement mechanisms could also be used in a seal according to the invention to move
25 the sealing strip 9 relative to the holding means. The scissor mechanisms 42, 62 cooperate with displacement members 41, 61 through which a movement of the trigger 2 is transferred to the scissor mechanisms 42, 62. Each of the two modules 4, 6 includes an overload mechanism 43, 63 which prevents damage to the seal, in particular the sealing strip 9, the mechanisms 42, 62, etc., when the movement of the sealing strip 9 is blocked
30 and a force is exerted on the seal or parts of the seal by an actuation of the seal. Each module 4, 6 also includes a guide element 44, 64 that guides a guide of the sealing strip 9 during a movement to the second position and during a movement to the first position. For this purpose, the first module 4 further comprises a trigger 47, and the second module

comprises a return mechanism 67. The return mechanism comprises a return spring 671, which causes the sealing strip 9 to be moved from its second position to its first position in the absence of a force being applied to the trigger 47.

5 The displacement member 41, 61, the shear mechanism 42, 62 and the overload mechanism 43, 63, each of the two modules 4, 6 and the reset mechanism 67 of the second module 6 of the embodiment are designed as or similar to the seal of the document EP 3 284 898 A1. Because of the description of the displacement part 41, 61, the scissor mechanism 42, 62, the overload mechanism 43, 63 and the reset mechanism 67 and the interaction of these components, reference is made to the explanations in the
10 document EP 3 284 898 A1, to which reference is made.

The displacement part 41 of the first module 4 and the displacement part 61 of the second module 6 are connected to each other by a first rod 5. Through the first rod 5, a movement of the trigger 47 transferred to the displacement part 41 of the first module 4 is transferred to the displacement part 61 of the second module 6. In the example shown,
15 the first rod 5 is made of a stiff wire with a round cross-section. The displacement part 61 of the second module 6 is coupled to the damper 8 via a second rod 7, so that the movement of the trigger 47 can be transferred to the damper 8 via the displacement part 41 of the first module 4, the first rod 5 and the displacement part 61 of the second module 6. How the coupling between the second rod 7 and the damper 8 is designed is described
20 in more detail later. In the example shown, the second rod 8 is a plastic part.

Since the embodiment example of the seal according to the invention shown in the figures is designed narrower than the seal from the document EP 3 284 898 A1, the guide elements 44, 64 are provided. The housing 1 of the seal illustrated in the document EP 3 284 898 A1 is so wide that between the two sides of the module housing, which have the
25 same width as in the illustrated seal according to the invention, and the housing 1 there are gaps which are so wide that legs of a holding profile of the sealing strip and of a sealing profile in the case of a sealing strip can dip into these gaps in the first position and also dip at least partially into the gaps in the second position of the sealing strip. Thus, in the seal disclosed in document EP 3 284 898 A1, the sealing profile and the holding profile of
30 the sealing strip are guided in the gaps between the module housings and the housing.

In the seal according to the invention shown, on the other hand, the housing 1 is narrower while the module housings 40, 60 are the same width. The gaps between the outer sides of the module housings 40, 60 and the inner side of the housing 1 are wide

enough for the legs of the sealing profile 91 to enter them. Thus, only the sealing profile 91 is guided through the gaps, but not the holding profile 90, which therefore also has no legs that could be guided.

In order that the holding profile 90 is nevertheless guided, the guide elements 44, 64 are provided in the modules 4, 6 of the illustrated seal according to the invention. These guide elements 44, 64 have a first end pivotally mounted in the module housings 40, 60. For this purpose, the first ends have two outwardly projecting first pins 441, 641 lying on an axis, which engage from the inside in holes in the legs of the module housings 40, 60. The guide elements 44, 64 are thus pivotally mounted to one of the module housings 40, 60. A second end of the guide members 44, 64 extends out of the module housing 40, 60, to which it is pivotally mounted. At this end, outwardly projecting second pins 442, 642 are provided on an axis. These engage in a channel of the holding profile 90. The second pins 442, 642 can be rotated and moved within the channel. This is the same channel that is engaged by the pins at one end of a long shear member 420, 620 of the shear mechanism 42, 62. Incidentally, the distance between the axis of rotation of the first pins 441, 641 and the axis of rotation of the second pins 442, 642 is exactly the same as the distance between the axis of rotation of the pins supported in the channel at the end of the long shear element 420, 620 and an axis of rotation of a bearing for supporting the long shear element 420, 620 on the module housing 40, 60.

The first end of each guide element 44, 64 engages the module housing 40, 60 to which or in which it is attached. Each of the guide elements 44, 64 has outer surfaces which, when the guide member 44, 64 is pivoted, is guided by the inner sides of the legs of the module housing 40, 60 to which it is attached. The guide element can thus not deviate laterally with respect to the module housing 40, 60. The second end of each guide element 44, 64 engages the holding profile 90. Each guide element 44, 64 has second outer surfaces in the region of the second end, which are guided by contours on an inner side of the holding profile 9. This stabilizes the position of the holding profile 90 attached to the second end of the guide element 44, 64, so that it too cannot deflect laterally, or only slightly.

The guide elements 44, 64 have a substantially U-shaped profile in a plane transverse to the longitudinal direction of the seal. In this case, the profile is oriented so that the guide elements 44, 64 overlap the first and second rods 5, 7. The guide element 44, 64 of the first module 4 overlaps the first rod 5, which connects the connecting parts

41, 61 of the two modules 4, 6. The guide element 64 of the second module 6 engages over the second rod 7 between the second module 6 and the damper 8.

Also, the damper 8 was not provided in the seal disclosed in the document EP 3 284 898 A1. The damper 8 cooperates with the trigger 47 to cause, after a force is applied to the trigger 47, a delayed movement of the sealing strip from its first position to its second position relative to the time the force is applied to the trigger 47. For this purpose, the trigger 47 of a seal according to the invention is modified compared to the trigger 47 of the seal disclosed in the document EP 3 284 898 A1.

The damper 8 comprises a holder 80 and a damping element 81. The holder 80 is attached to a web of the housing 1. It has a receptacle in which the damping element 81 is arranged. The damping element 81 is attached to the holder 80. The damping element 81 may be a commercially available, known damping element. It has a cylindrical body 810 from which a plunger 811 protrudes. The plunger 811 rests against the second rod 7 in the first position of the sealing strip. The body 810 of the damping element 81 may have a chamber filled with a liquid, for example an oil, in which a piston is displaceably arranged. The piston has an overflow orifice that allows fluid to flow from one side of the piston to the other side of the piston when the piston is moved in the chamber. The piston is connected to the plunger 811, which protrudes from the front of the body 810. If a force is now applied to the damper 8 via the plunger 811, this results in a movement of the plunger which is only as fast as the overflow of liquid from one side of the plunger to the other side of the plunger allows. This can dampen the movement of an object coupled to the plunger 811.

In the illustrated seal according to the invention, the second rod 7 is coupled to the plunger 811. This second rod 7 abuts against the plunger 811. This allows pressure to be transmitted from the second rod 7 to the plunger 811. Since the second rod 7 and the plunger 811 abut but are not attached to each other, no tension can be transmitted from the second rod 7 to the plunger 811. This means that although the damper 8 causes damping of the movement of the second rod 7 in the direction in which the plunger 811 is pushed into the body of the damping element, in the opposite direction damping of the movement of the second rod 7 (and all associated components of the seal) is unaffected by the damper 8. The damper 8 thereby exerts an effect when the sealing strip 9 moves from its first position to its second position, but not when the sealing strip 9 moves from its second position to its first position.

The damper 8 interacts with a first spring 473 in the release 47 to retard movement of the sealing strip 9 from the first position to the second position.

The trigger 47 includes a force-introducing element 470, an adjusting element 471, a coupling element 472, and the first spring 473. In the illustrated embodiment, the force-introducing element 470 protrudes beyond one end face of the housing 1. However, it is also possible for the force-introducing element 470 to protrude laterally or upward beyond the housing 1. For this purpose, the force-introducing element 470 may protrude through a window in the housing 1.

The force-introducing element 470 is guided in the module housing 40 of the first module 4 of the seal so as to be linearly displaceable in the longitudinal direction. It has a receptacle in which the adjustment element 471 is rotatably, but not longitudinally, displaceably mounted. The adjustment element 471 has a key surface at a first end that is accessible from the exterior. A suitable tool can be applied to this key surface to turn the adjustment element 471. At a second, inboard end, the adjustment member 471 includes a receptacle 4710 for rotationally fixed, but linearly displaceable, receipt of a pin. The receptacle 4710 has a clear cross-section which has the shape of a polygon, in particular a hexagon. A pin 4720 of the coupling element 472 having a complementary outer contour is inserted into this receptacle 4710 and is thereby arranged to be rotationally fixed with the adjusting element 471 but displaceable relative thereto. The displacement path of the coupling element 472 relative to the adjusting element 471 and the force-introducing element 470, which is not displaceable relative to the adjusting element 471, is limited by a collar 4721 on the journal 4720. This collar 4721 abuts a stop 4700 of the force-introducing element 470 at a maximum length of the release 47.

The first spring 473 is a helical compression spring disposed on the pivot 4720 of the coupling member 472. The first spring 473 thereby supports itself with a first end on the force-introducing element 470 and with a second end on a shoulder 4722 of the coupling element 472. The first spring 473 is under tension even when the seal is not actuated. It is thus pretensioned and consistently pushes apart the force-introducing element 470 and the coupling element 472. Unless the seal is actuated, the first spring 473 pushes the force-introducing element 470 and the coupling element 472 apart so that the release 47 has its maximum length.

The coupling member 472 includes a blind hole 4723 having an internal thread. A connecting part 48 is screwed into this blind hole 4723, which connects the trigger 47 to

the displacement part 41 of the first module 4. For this purpose, the connecting part 48 has an area with an external thread. A screw-in depth of the connecting part 48 into the blind hole 4723 of the coupling element 472 of the release 47 can be varied. This allows adjustment of how far the force-introducing element 470 of the release 47 protrudes from the housing 1 of the seal when no force is applied to the force-introducing element 470 from the outside. To adjust the projection of the force-introducing element 470 over the housing 1, the adjustment element 471 is turned by means of a tool, for example an Allen key. The rotation is transmitted to the coupling element 472, which is thereby rotated either more or less towards the external thread of the connecting part 48. Rotation of the adjustment element 471 only changes the position of the release 47 with respect to the housing 1 or the connecting part 48. In contrast, rotation of the adjustment element 471 does not change the length of the release 47.

To move the sealing strip 9 from its first position to its second position, the scissor mechanisms of the modules 4, 6 must be actuated. The scissor mechanisms are driven by the displacement members 41, 61 of the modules 4, 6, which are connected to the coupling member 472. A movement of the coupling element 472 causes a movement of the displacement members 41, 61. The coupling element 472 is driven to move the sealing strip 9 from its first position to its second position by the first spring 473. As long as the force applying element 470 is in its first position, the force of the first spring 473 is not sufficient to move the coupling element 472 and the parts of the seal connected to it. When the force-introducing element 470 is in its first position, the force of the first spring 473 acting on the coupling element 472 is less than the forces opposing the force of the first spring 473. Thus, the first spring cannot move the coupling element 472 and any parts of the seal connected to it. In addition to frictional forces, these forces opposing the first spring 473 are essentially the force of the return spring 671 and the minimum force necessary to move the plunger 811 of the damper 8.

However, when the force-introducing element 470 is actuated, the force introduced into the force-introducing element 470 for this purpose is transmitted to the first spring 473, which is further tensioned as a result. The force then stored in the first spring 473 and acting on the coupling element 472 is now greater than the force acting on the coupling element from the opposite direction. The coupling element 472 transfers this force to the plunger 811 of the damper 8 via the movement-transferring parts 48, 41,

5, 61, 7, namely the connecting part 48, the displacement part 41 of the first module, the first rod 5, the displacement part 61 of the second module 6, the second rod 7.

5 In order that the force which must be introduced into the first spring 473 via the force-introducing element 470 in order to move the coupling element 472 is as small as possible and consequently the path of the force-introducing element 470 which must be covered by the force-introducing element in order to introduce this force into the first spring 473 is as small as possible, whereby a protrusion of the force-introducing element can be kept small, it is useful that the force of the first spring 473 in the first position of the force-introducing element 470 and the sealing strip 9 is preferably only slightly smaller than the forces counteracting the force of the first spring 473, such as frictional forces, the force of the return spring and the minimum force necessary to actuate the damper. 10 Therefore, in the seal according to the invention, the first spring 473 is pretensioned.

Patentkrav**1. Automatisk tætning til en dørfløj,**

- med et holdemiddel (1) i en eller flere dele,
- med et kraftindføringsselement (470), der er monteret forskydeligt fra en
- 5 første stilling til en anden stilling på holdemidlet (1),
- med en tætningsliste (9), der kan bevæges fra en første stilling til en anden stilling i forhold til holdemidlet (1),
- med en mekanisme (42, 62), der i det mindste indirekte er koblet med kraftindføringsselementet (470) og tætningslisten (9), således at en
- 10 bevægelse af kraftindføringsselementet (470) kan overføres til en bevægelse af tætningslisten (9) fra den første stilling til den anden stilling,
- med bevægelsesoverføringsdele (48, 41, 5, 61, 7), der overfører en bevægelse af kraftindføringsselementet (470) til mekanismen (42, 62),
- med en første fjeder (473) og en dæmper (8), hvor
- 15 - den første fjeder (473) i det mindste indirekte er anbragt mellem kraftindføringsselementet (470) og bevægelsesoverføringsdelene (48, 41, 5, 61, 7), og
- dæmperen (8) i det mindste indirekte er anbragt mellem bevægelsesoverføringsdelene (48, 41, 5, 61, 7) og holdemidlet (1),
- 20 **kendetegnet ved, at**
- den første fjeder (473) er spændt i en ikke aktiveret tilstand af tætningen, når kraftindføringsselementet (470) befinder sig i den første stilling, således at den vej, som kraftindføringsselementet (470) skal tilbagelægge for at indføre den kraft i den første fjeder (473), som er nødvendig, for at
- 25 dæmperen (8) skal muliggøre en bevægelse, er reduceret.

2. Tætning ifølge krav 1, kendetegnet ved, at tætningen har en tilbagestillingsfjeder, som udøver en kraft på tætningslisten (9), der trækker eller trykker tætningslisten (9) fra den anden stilling til den første stilling.

3. Tætning ifølge krav 2, **kendetegnet ved, at** tilbagestillingsfjederen er spændt i tætningslistens (9) første stilling.

4. Tætning ifølge krav 3, **kendetegnet ved, at** tilbagestillingsfjederens spænding i
5 tætningslistens (9) første stilling er mindre end eller lig med den første fjeders (473) spænding i kraftindføringselementets (470) første stilling.

5. Tætning ifølge et af kravene 1 til 4, **kendetegnet ved, at** den første fjeder (473) er en skruefjeder.

10

6. Tætning ifølge et af kravene 1 til 5, **kendetegnet ved, at** tætningen har en udløser (47), der omfatter kraftindføringselementet (470).

7. Tætning ifølge krav 6, **kendetegnet ved, at** udløseren (47) omfatter den første
15 fjeder (473).

8. Tætning ifølge krav 6 eller 7, **kendetegnet ved, at** udløseren (47) har et koblingselement (472), der er forbundet med bevægelsesoverføringsdelene (48, 41, 5, 61, 7).

20

9. Tætning ifølge krav 6, 7 og 8, **kendetegnet ved, at** udløseren (47) har et leje, og at kraftindføringselementet (470) og koblingselementet (472) er forbundet i det mindste indirekte gennem lejet, således at de kan forskydes lineært i forhold til hinanden.

25

10. Tætning ifølge krav 8 eller 9, **kendetegnet ved, at** den første fjeder (473) er anbragt mellem kraftindføringselementet (470) og koblingselementet (472).

11. Tætning ifølge krav 8, 9 eller 10, **kendetegnet ved, at** forbindelsen mellem
30 koblingselementet (472) og bevægelsesoverføringsdelene (48, 41, 5, 61, 7) er indstillelig.

12. Tætning ifølge krav 11, **kendetegnet ved, at** forbindelsen mellem koblingselementet (472) og bevægelsesoverføringsdelene (48, 41, 5, 61, 7) er en skrueforbindelse.

5 **13.** Tætning ifølge krav 12, **kendetegnet ved, at** kraftindføringsselementet (470) og koblingselementet (472) gennem lejet også er forbundet drejeligt i forhold til hinanden.

14. Tætning ifølge krav 13, **kendetegnet ved, at** kraftindføringsselementet (470)
10 har en nøgleflade eller er udrejeligt forbundet med et element (471), der har en nøgleflade, gennem hvilken et drejningsmoment til drejning af kraftindføringsselementet (470) kan indføres.

Fig. 1

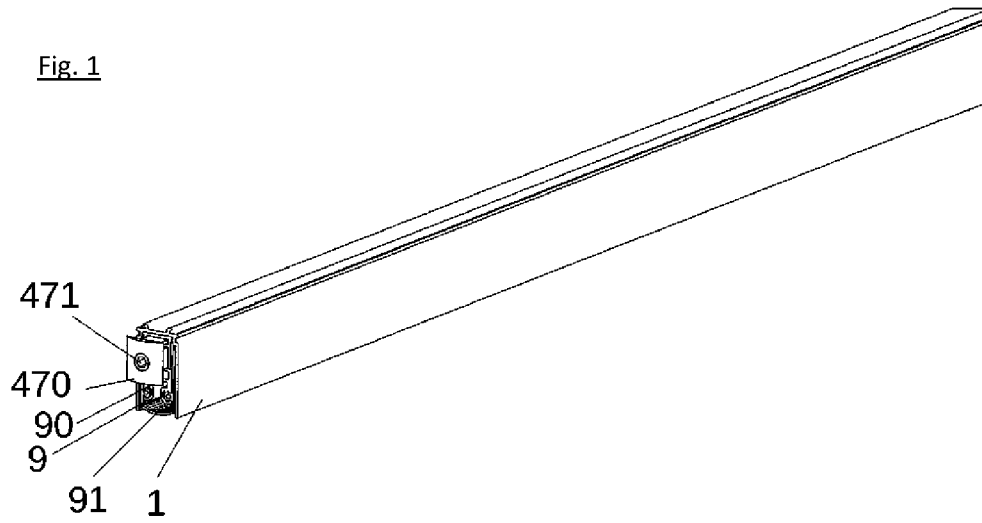


Fig. 1a

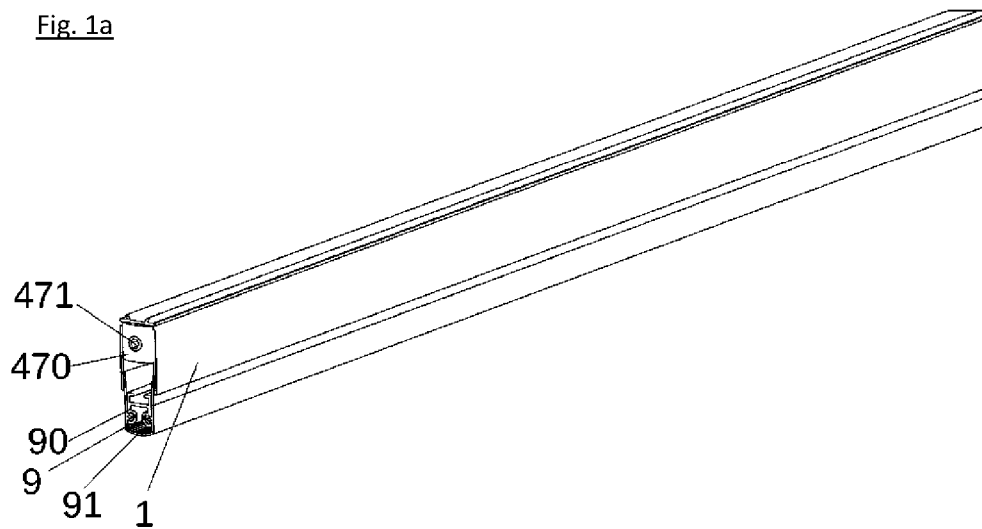


Fig. 2

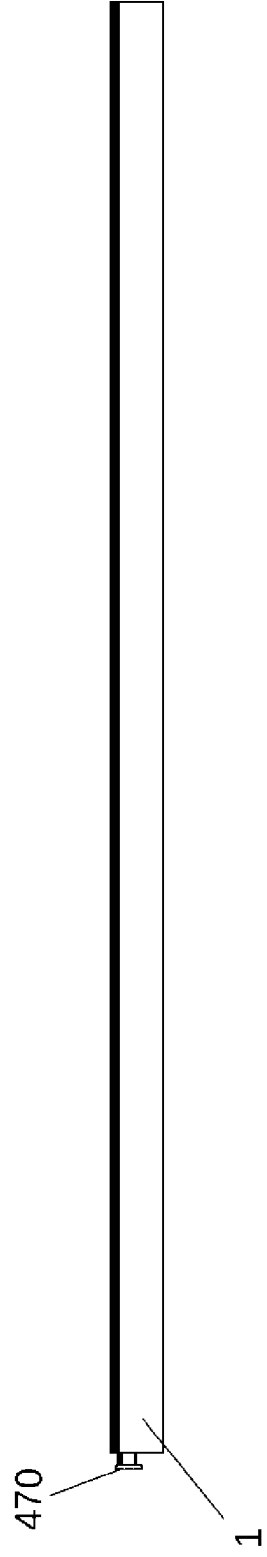


Fig. 2a

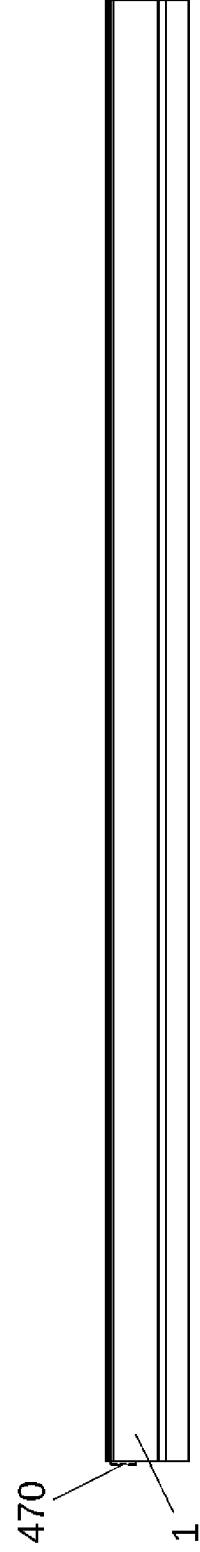


Fig. 3

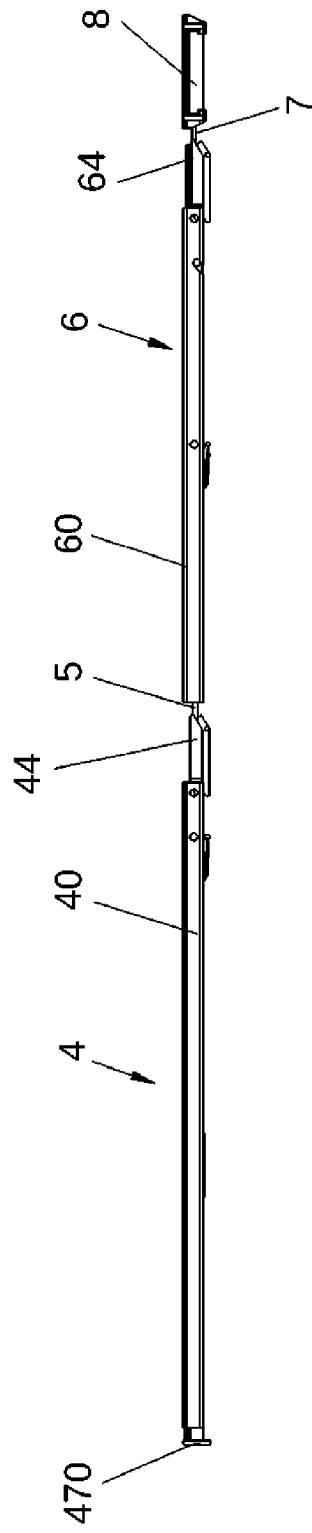


Fig. 3a

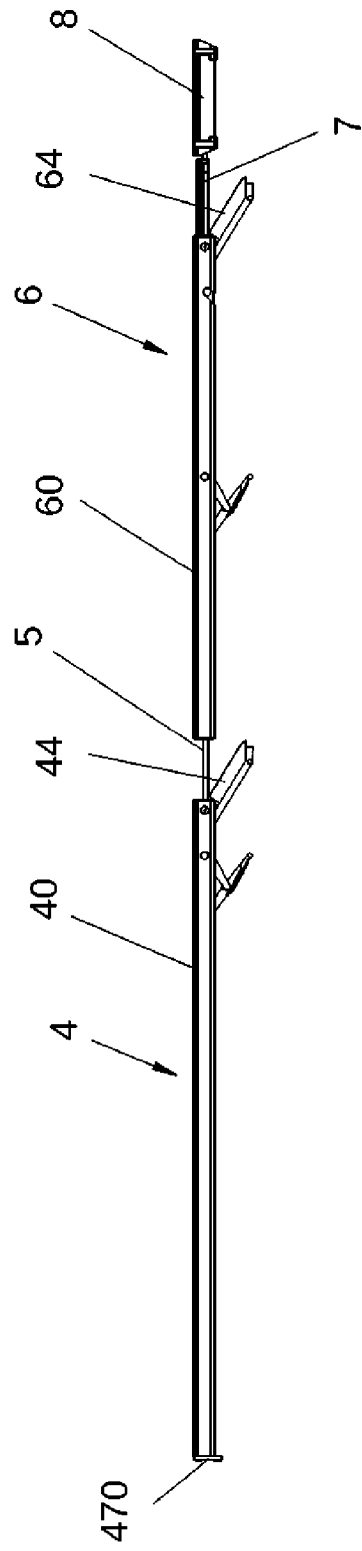


Fig. 4

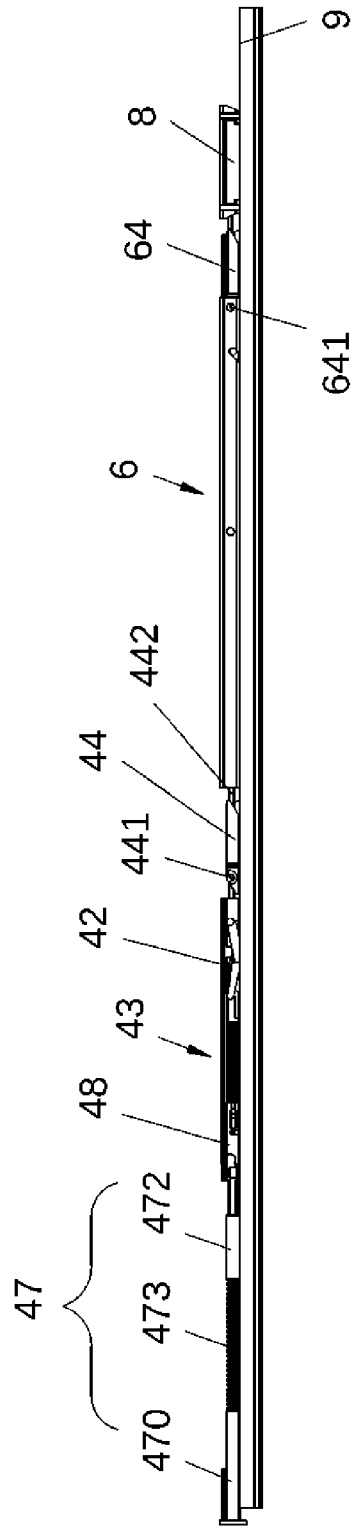


Fig. 4a

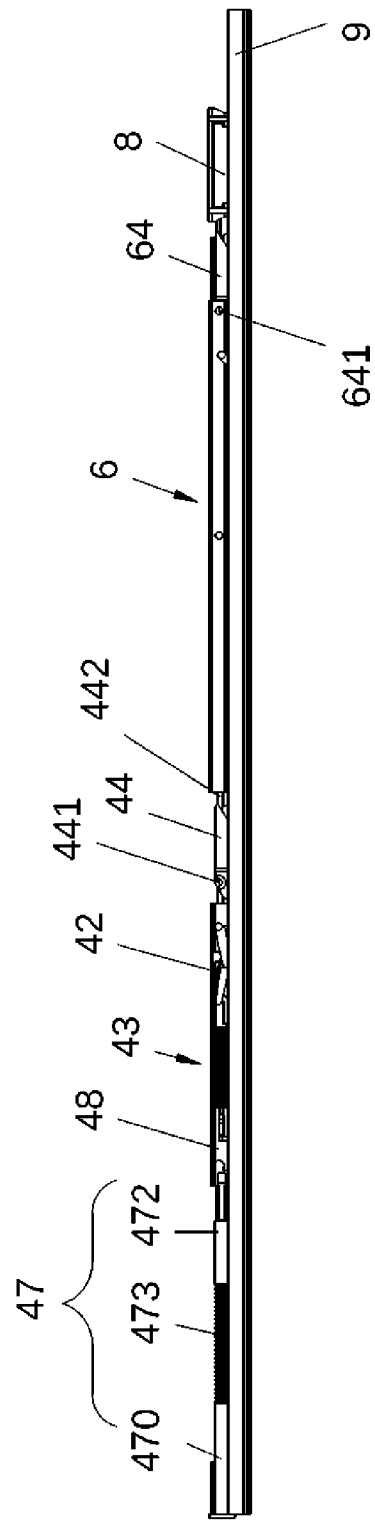


Fig. 4b

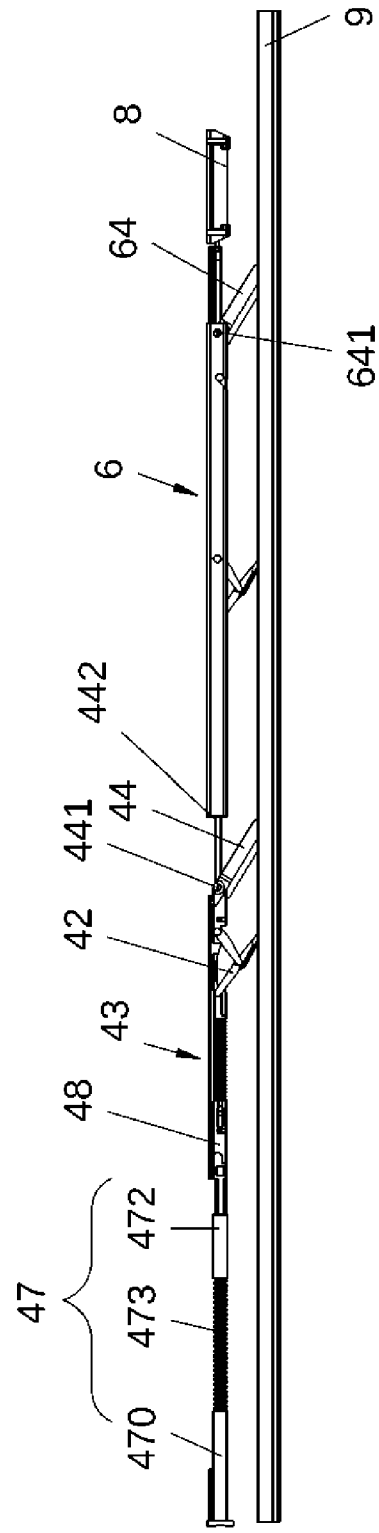


Fig. 5

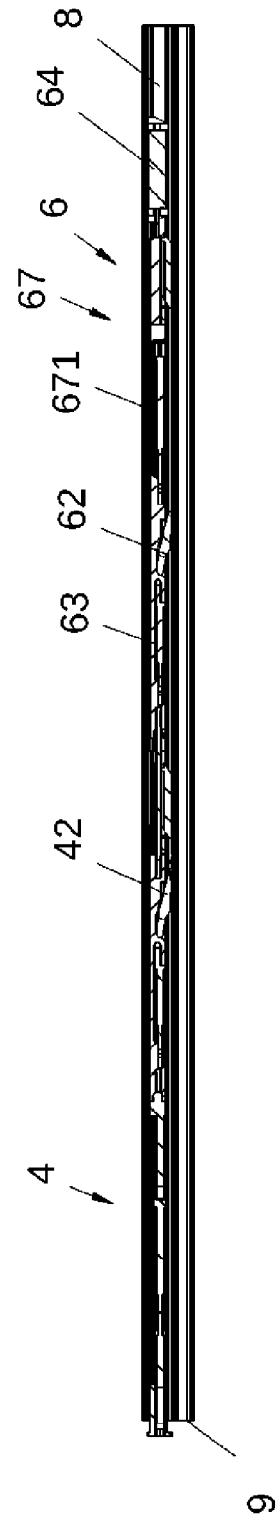


Fig. 5a

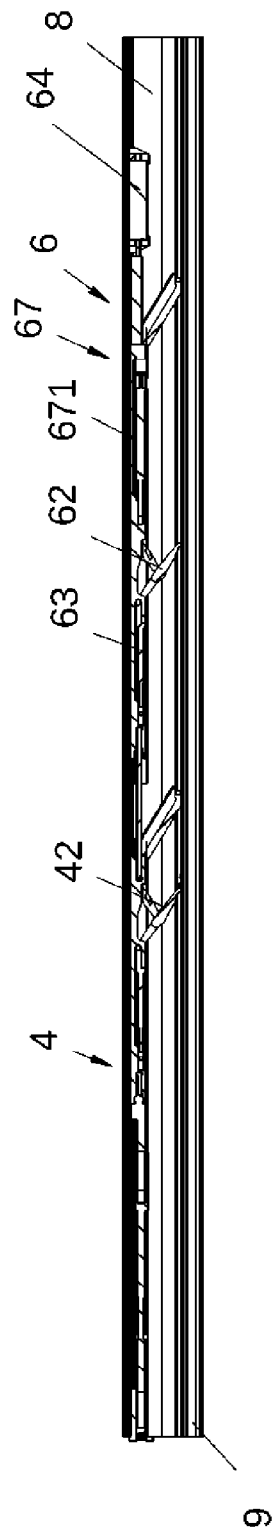


Fig. 6

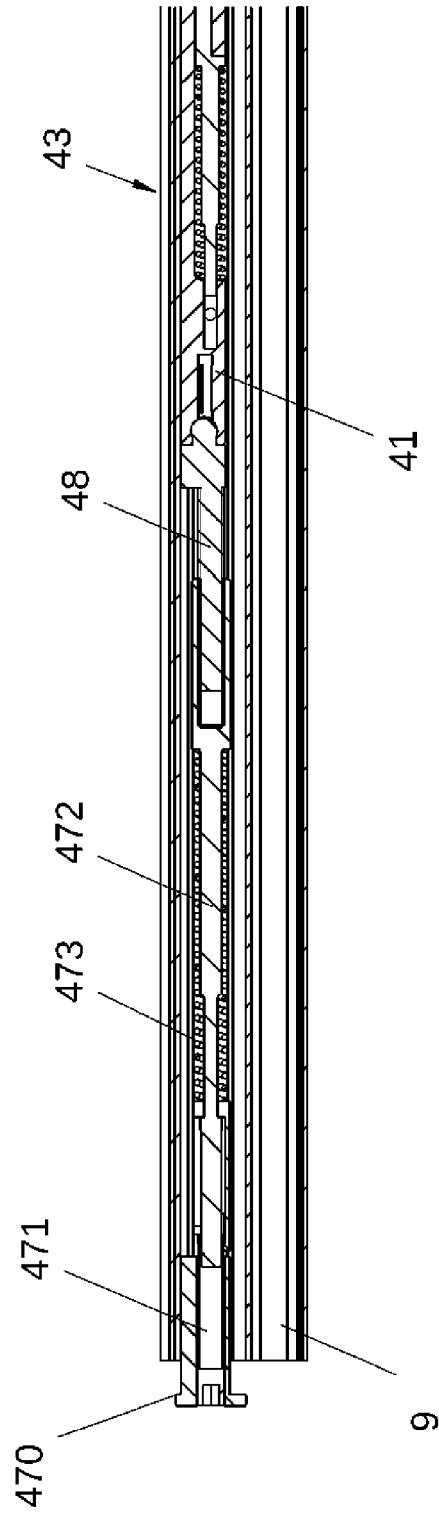


Fig. 6a

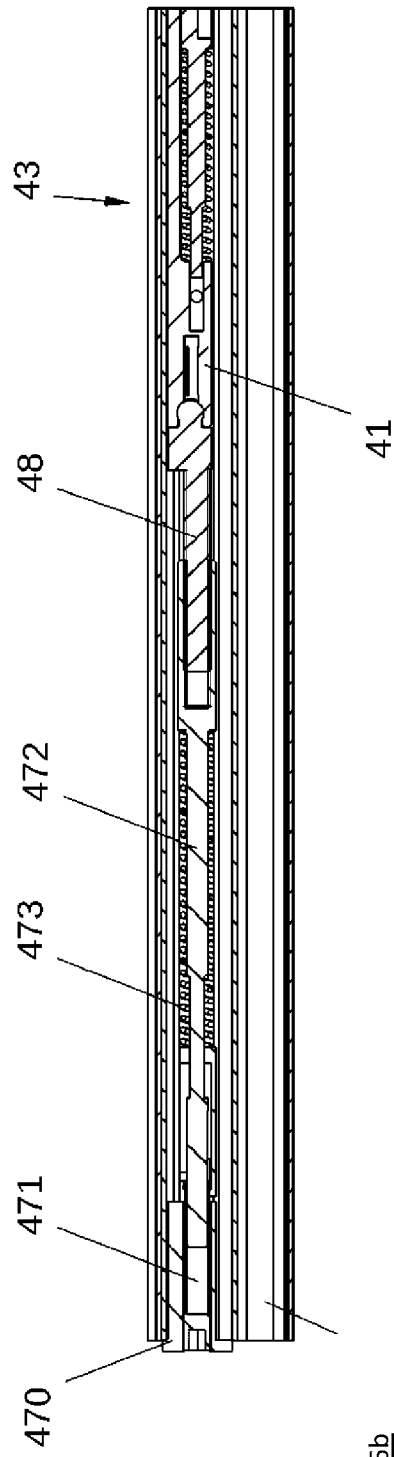


Fig. 6b

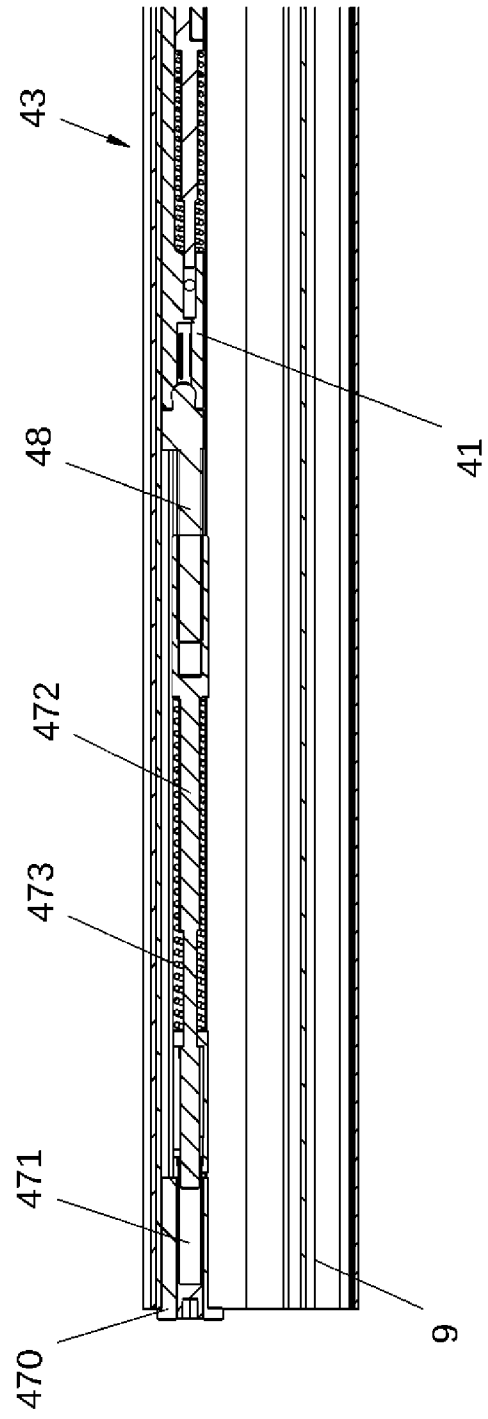


Fig. 7

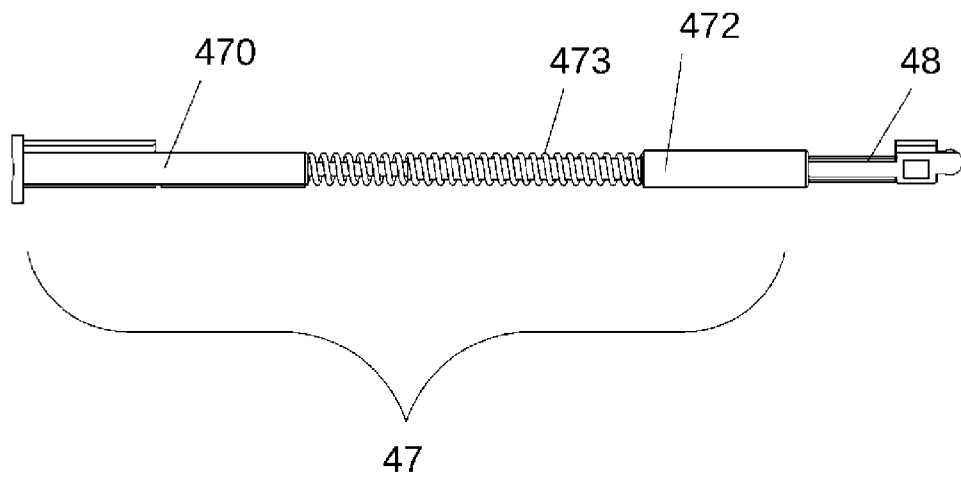


Fig. 7a

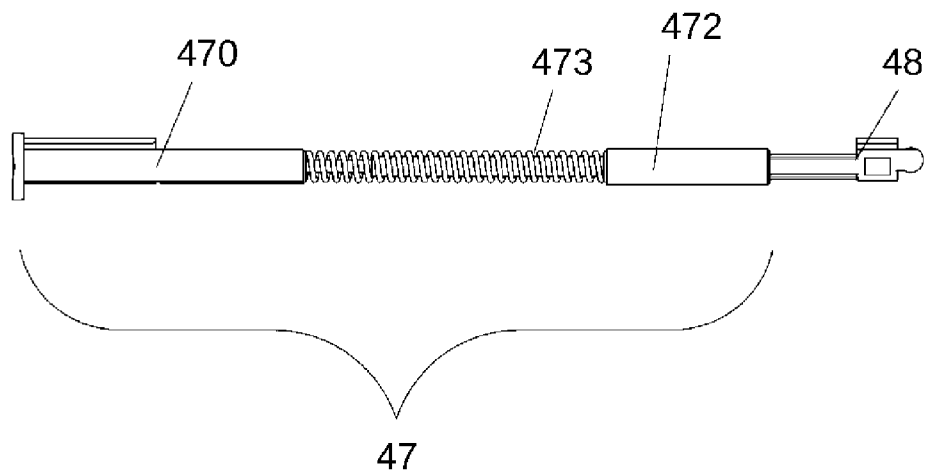


Fig. 8

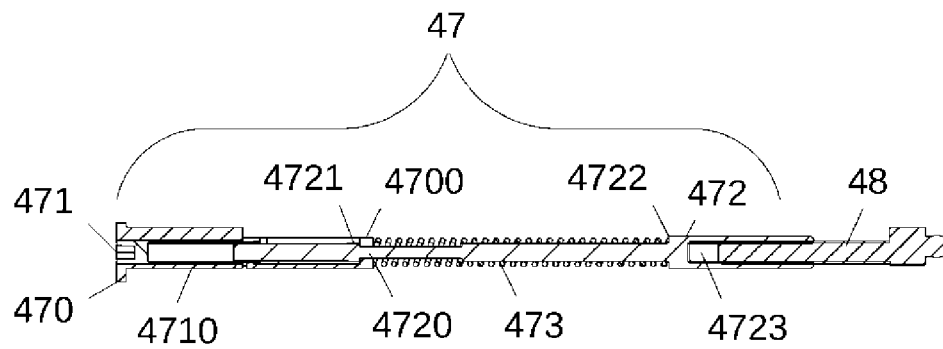


Fig. 8a

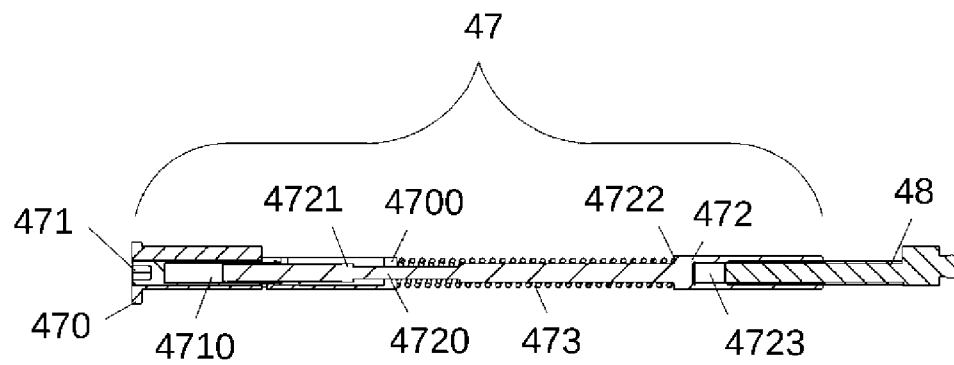


Fig. 9

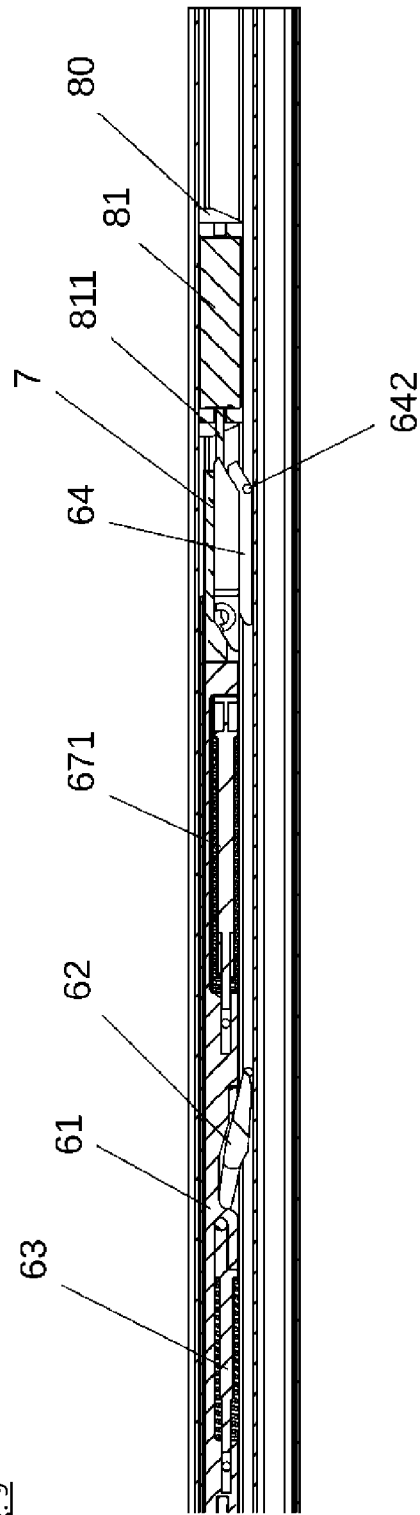


Fig. 9a

