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SEAL WITH A GUIDED, ADJUSTABLE TRIGGER

The present invention relates to a seal with an adjustable trigger.

5 From the prior art so-called automatically lowerable door seals are known. These have a housing, by means of which the seal can be attached to a door leaf. In the housing a sealing strip is guided, which can be moved transversely to the main extension direction of the housing. The sealing strip is connected via a mechanism to the housing. The mechanism makes possible, on the one hand, the movement of the sealing strip relative to the housing. On the other hand, the mechanism comprises
10 means, with which the movement of the sealing strip can be triggered relative to the housing, in particular if the door, the door leaf of which is equipped with the seal, is closed. The trigger as a rule is connected to the trigger via a rod. The rod often has an external thread on the end, on which the trigger is attached. The trigger has a blind hole with an internal thread and is screwed onto the external thread of the rod.

15

The trigger projects laterally beyond the end of the housing in a non-actuated state. By applying force to the trigger said trigger and the rod connected to the trigger will be moved, whereby the remaining mechanism is actuated and the sealing strip is moved out of the housing.

20 The path, which the trigger takes when actuated, in the known seals, is related to the path, which the sealing strip takes when actuated. The path, which the trigger takes when actuated, can be influenced by screwing the trigger more or less onto the rod. By a rotation of the trigger relative to the rod, therefore an adjustment of the trigger to the rod, the path of the trigger can thus be adjusted. However, a threaded shaft can also be provided on the trigger, as for example in the seal
25 known from the document DE 20 2011 001 104 U1, which threaded shaft is screwed into a threaded bore of a connecting part, which is connected to the rod. The path of the trigger can be adjusted by the screw-in depth of the threaded shaft of the trigger into the threaded bore of the connecting part.

30 It has been shown that it is advantageous if the trigger is guided along the path, which it takes upon actuation.

It is possible to guide the trigger in different ways. Thus, the triggers can have an outer cross-sectional contour, which is selected such that the trigger is guided by the housing. Then the trigger as a rule has an angular cross-sectional contour, which is complementary to the likewise angular inner contour of the housing. The trigger can then no longer be rotated in a fully assembled state of the seal, in order to adjust the path, about which the sealing strip is moved, also called the sealing stroke. This is managed by initially adjusting the trigger and rod to each other outside of the housing and then inserting them together in the housing and coupling them with the remaining mechanism. If the trigger is to be adjusted a further time, the trigger and rod must be removed from the housing. That is cumbersome and prevents a rapid adjustment of the trigger.

A variant of this seal, in which the outer cross-sectional contour of the trigger is adapted to an inner contour of the housing and the trigger is thus guided by the housing, is disclosed in document DE 20 2016 100 815 U1. In this variant, the seal can be adjusted via a latch mechanism between a rod, to which the trigger is attached, and a connecting part of the trigger. It is even thereby possible to automatically adjust a trigger projecting too far out of the housing in the assembled state in the event of the closing of the door and the thus caused actuation of the trigger. However, if the trigger should continue to protrude from the housing, a disassembly of the trigger and the connecting part is necessary.

Another possibility of guidance can be that a bearing- and guidance element is inserted into the housing. The bearing- and guidance element is firmly placed in the housing. It has a groove, which has a cross section, which corresponds to a three-quarter circle. Into this groove the circular in cross section trigger is inserted, which is guided in the groove in the longitudinal direction and is rotatably mounted about its longitudinal axis. The bearing- and guidance element thus guides the trigger in the longitudinal direction and supports it for a rotation about its longitudinal axis. Such a solution is selected in the case of the Planet X3.

The disadvantage of a bearing- and guidance element placed in the housing is that it is lost in a shortening of the housing either with the end cut from the housing, or must be laboriously removed from the housing, in order to be inserted again after the shortening into the shortened housing. In the case of Planet X3, a guidance element is inserted into the housing only on the side of the seal, on which the housing is not provided for shortening. On the side, on which the housing can be shortened, no guidance element is provided.

Here is where the invention starts.

5 The object of the invention is that no known seal guides the trigger, the trigger can be adjusted without disassembly and at the same time the trigger readily remains guided after a shortening of the housing.

This object is achieved by a seal according to the present invention according to claim 1.

10 A seal according to the present invention is characterised compared with the prior in that

- the trigger has a first trigger part and a second trigger part,
- wherein the first trigger part is displaceably guided by the housing and
- wherein the second trigger part is non-displaceable to the first trigger part, but is

15 rotatably mounted on or in the first trigger part.

15 In the case of a seal according to the present invention the trigger therefore has the first and the second trigger part. The first trigger part makes it possible that the trigger is guided in the housing. The second trigger part is adjustable to the rod and thus makes possible an adjustment of the path, about which the trigger can be moved and thus an adjustment of the stroke of the sealing strip.

20 In the case of a seal according to the present invention the first trigger part can have an outer contour, which at least sectionally is complementary to the inner contour of the housing. The mutually complementary sections of the contour can engage in one another. The mutually complementary contours can be uniform in a longitudinal direction of the seal.

25 The housing of a seal according the present invention can have webs, which engage in grooves of the first trigger part. The housing of the seal according to the present invention can additionally or alternatively have grooves, in which webs of the first trigger part engage.

30 The first trigger part of a seal according to the present invention can have at least one recess, in which the second trigger part is rotatably mounted. The at least one recess of the first trigger part can have at least one first section, which at least partially engages around a section of the second trigger part. The section of the second trigger part can be clipped into the first section of the first

trigger part. The first section of the first trigger part can have two resilient arms, which engage around the second of the second trigger part, in particular engage around in a clamp-like manner.

5 The first trigger part of a seal according to the present invention can comprise a through hole, through which the rod adjustable to the second trigger part engages. The rod can engage through the through hole with clearance to the ring-like section.

10 The recess of the first trigger part, in which the second trigger part is rotatably mounted, can be provided at a first end of the first trigger part and the through hole, which is engaged through by the rod, can be provided at a second end of the first trigger part.

15 The second trigger part can have a section, which has a blind hole with an internal thread, into which an end of the rod provided with an external thread is screwed. The second trigger part can be adjusted to the rod by the thread.

The first and/or the second section of the second trigger part can have a circular cylindrical shape.

The cross section of the one section can be smaller than the cross section of the other section.

20 The second trigger part can have a third section, which has a key surface, for example, a cross slot or an internal hexagon, to which a tool can be attached, in order to adjust the second trigger part relative to the rod.

25 Further features and advantages of the present invention become clear by means of the following description of a preferred embodiment with reference to the attached figures.

Fig. 1 shows a perspective representation of an end of a seal according to the present invention,

30 Fig. 2 shows a perspective representation of a trigger and a rod,

Fig. 3 shows a perspective representation of a first trigger part,

- Fig. 4 shows a view of a first trigger part from below,
- Fig. 5 shows a side view of the first trigger part, partly in section,
- 5 Fig. 6 shows a view of a first end face of the first trigger part,
- Fig. 7 shows a view of a second end face of the first trigger part,
- Fig. 8 shows a perspective representation of a second trigger part,
- 10 Fig. 9 shows a first sectional view of the second trigger part,
- Fig. 10 shows a side view of the second trigger part,
- 15 Fig. 11 shows a view of a first end face of the second trigger part,
- Fig. 12 shows a view of a second end face of the second trigger part,
- Fig. 13a to d show the mounting of the trigger and the rod,
- 20 Fig. 14 shows an end view of the seal on the trigger side,
- Fig. 15 shows a sectional representation of the seal along the line XV-XV in Fig. 14,
- Fig. 16 shows a sectional representation of the seal along the line XVI-XVI in Fig. 14,
- 25 Fig. 17 shows a sectional representation of the seal along the line XVII-XVII in Fig. 14 and
- Fig. 18 shows a sectional representation of the seal along the line XVIII-XVIII in Fig. 14.
- 30 The seal according to the present invention has a housing 1, in which a sealing strip 2, 3 is displaceably arranged via a mechanism.

The housing 1 has substantially the shape of an inverted U. It has a connecting web, which connects two legs with one another. On the inner side of the leg, inwardly projecting webs 11 are arranged on opposite sides. These webs 11 have a shoulder on their free ends.

5 The sealing strip 2, 3 has a retaining strip 2, which is connected to the mechanism. The retaining strip 2 is rigid and preferably an aluminium extruded profile. It supports an elastic sealing profile 3 made of rubber, silicone or another suitable material. Instead of the cross-sectional profile depicted in the figures, the retaining profile could also have another cross-sectional profile. In the retaining profile channels 21 are provided, in which the sealing profile 3 is secured by webs 31. Instead of the
10 cross-sectional profile depicted in the figures, the sealing profile 3 could also have another cross-sectional profile.

The mechanism, which fastens the sealing strip 2, 3 movably in the housing, is only partially shown. A two-part trigger 4, 5, a rod 6 and a further rod 7 are shown. The mechanism makes it possible
15 that the sealing strip 2, 3 is displaced transversely to its longitudinal direction. The movement is triggered by a pressure on the trigger 4, 5, which is displaced by the pressure. The pressure and the movement is passed on via the rods 4, 5 and converted by the remaining mechanism into the movement of the sealing strip 2, 3.

20 The trigger 4, 5 is displaceably guided by the housing 1. It projects from the housing 1 on one side.

A first trigger part 4 of the trigger 4, 5 is used, on the one hand, to guide the trigger 4, 5 through the housing 1. On the other hand, the first trigger part 4 is used for bearing a second trigger part 5, which is rotatably mounted on the first trigger part 4.

25 The first trigger part 4 has a base section, which has two laterally protruding webs 41. These webs 41 extend over the entire length of the first trigger part 4. They are used to guide the first trigger part 4 through the housing and cooperate for this purpose with the webs 11 of the housing and in particular the shoulder on the free ends of the webs 11.

30 On a first end of the trigger part a recess is provided, which is formed by two arms 42. These arms 42 are resilient and enclose a space, which has a surface in cross section, which forms a circular

segment, which is somewhat larger than the surface of a semi-circle. Basically it is sufficient, if the arms 42, in particular the ends of the arms 42, project inwardly.

On a second end of the first trigger part a through hole is provided. The through hole has a circular cross-sectional surface in the example. The through hole is formed by a ring-like section 43 on the second end of the first trigger part.

A centre of the cross-sectional surface of the through hole and a centre of an imaginary circular surface, which arises through a completion of the circular segment defined by the arms 42, lies on a straight line parallel to the base and in the direction, in which the trigger 4 can be displaced in the housing 1.

The first trigger part 4 can be made from plastic or from a metal, in particular from aluminium. The plastic can be reinforced by fibres.

The second trigger part 5 is rotatably mounted in the first trigger part 4 and connected with the rod 6.

The second trigger part 5 has three sections 51, 52, 43.

A first section 51 forms a head of the trigger 4, 5, by means of which pressure can be exerted on the trigger and with which the trigger 4, 5 can abut in particular against a door frame. The head 51 has a cross slot on the end face, the function of which will be elucidated.

A second, centre section 52 has a cylindrical, outer form. The diameter of this section 52 is dimensioned such that the section 52 is rotatably mounted by clipping between the arms 42 of the first trigger part. The section 52 can thereby have a slight clearance to the arms 42, so that the second trigger part 5 freely rotatable.

A third section 53 also has a cylindrical, outer form. It has a blind hole with an internal thread. The third section 53 has a length, which corresponds to the length of the first trigger part 4 between the arms 42 and the ring-like section 43. If the second section 52 is clipped between the arms 42, the third region lies between the arms 42 and the ring-like section 43.

The rod 6 protrudes through the through hole of the ring-like section 43 of the first trigger part 4 and into the blind hole in the third section of the second trigger part 5. The rod 6 is provided with an external thread. The second trigger part 5 is screwed with the internal thread in the blind hole onto the rod 6, so that the rod 6 protrudes with a specific screw-in depth into the blind hole. The screw-in depth thereby determines the length, which the trigger 4, 5 and the rod 6 together have. The screw-in depth also determines the extent to which the trigger 4, 5 protrudes beyond the housing 1. Moreover, the screw-in depth thus determines the stroke, which the sealing strip has when the seal is actuated, therefore when the trigger is pressed. Figures 13b to 13d show triggers 4, 5 and rod 6 with different screw-in depths.

The screw-in depth can be changed, in which one rotates the second trigger part 5 mounted in the first trigger part 4. For this purpose, a screwdriver can be attached to the cross slot on the first section 51 of the second trigger part 5.

By the rotation of the second trigger part 5 the first trigger part 5 and thus the entire trigger 4, 5 is displaced relative to the rod 6.

To connect the rod 6 with the further rod 7 the rods 6, 7 have coupling elements 61, 71.

Patentkrav**1. Automatisk sænkbar tætning**

- med et hus (1),
- 5 - med en tætningsliste (2, 3) omfattende en holdeliste (2) og en tætningsprofil (3),
- med en mekanisme med hvilken tætningslisten (2, 3) er bevægeligt anbragt i huset (1),
- idet mekanismen har en udløser (4, 5) og en stang (6),
- 10 - idet udløseren (4, 5) og stangen (6) er forbundet med hinanden,
- idet den relative position af udløseren (4, 5) i forhold til stangen (6) er justerbar, **kendetegnet ved, at**
- udløseren (4, 5) har en første udløserdel (4) og en anden udløserdel (5),
- idet den første udløserdel (4) er forskydeligt styret af huset (1), og
- 15 - idet den anden udløserdel (5) er ufskydelig i forhold til den første udløserdel (4) men er drejeligt monteret på eller i den første udløserdel (4).

- 2. Tætning ifølge krav 1, kendetegnet ved, at** den første udløserdel (4) har en
- 20 ydre kontur, som er mindst afsnitsvist komplementær med den indre kontur af huset (1), og at de gensidigt komplementære afsnit af konturerne griber ind i hinanden.

- 3. Tætning ifølge krav 2, kendetegnet ved, at** de gensidigt komplementære
- 25 konturer er ensartede i en længderetning af tætningen.

- 4. Tætning ifølge et af kravene 1 til 3, kendetegnet ved, at** huset (1) har forbindelsesstykker (11), som griber ind i noter af den første udløserdel, og/eller at huset har noter, i hvilke forbindelsesstykker (41) af den første udløserdel (4)
- 30 griber ind.

- 5. Tætning ifølge et af kravene 1 til 4, kendetegnet ved, at** den første udløserdel (4) har mindst en fordybning, i hvilken den anden udløserdel (5) er

drejeligt monteret.

6. Tætning ifølge krav 5, **kendetegnet ved, at** den mindst ene fordybning af den første udløserdel (4) har mindst et første afsnit, som mindst delvist omslutter et
5 afsnit (52) af den anden udløserdel (5).

7. Tætning ifølge krav 6, **kendetegnet ved, at** afsnittet (52) af den anden udløserdel (5) er klippet ind i det andet afsnit af den første udløserdel (4).

10 8. Tætning ifølge krav 6 eller 7, **kendetegnet ved, at** det første afsnit af den første udløserdel (4) har to fjedrende arme (42), som omslutter afsnittet af den anden udløserdel (52).

9. Tætning ifølge et af kravene 1 til 8, **kendetegnet ved, at** den første
15 udløserdel (4) omfatter et gennemgangshul, hvilket stangen (6), som kan justeres i forhold til den anden udløserdel, griber gennem.

10. Tætning ifølge krav 9, **kendetegnet ved, at** stangen (6) griber gennem gennemgangshullet med spil.

20

11. Tætning ifølge et af kravene 5 til 8 og ifølge krav 9, **kendetegnet ved, at** fordybningen er tilvejebragt ved en første ende af den første udløserdel (4), og gennemgangshullet er tilvejebragt ved en anden ende af den første udløserdel (4).

25

12. Tætning ifølge et af kravene 1 til 11, **kendetegnet ved, at** den anden udløserdel (5) har et afsnit (53), som har et blindhul med et indvendigt gevind, som er skruet på enden, forsynet med et udvendigt gevind, af stangen.

30 13. Tætning ifølge krav 12, **kendetegnet ved, at** afsnittene eller et af afsnittene af den anden udløserdel (5) har en cirkulær cylindrisk form.

14. Tætning ifølge krav 13, **kendetegnet ved, at** tværsnittet af et afsnit (52) er mindre end tværsnittet af det andet afsnit (53).

35

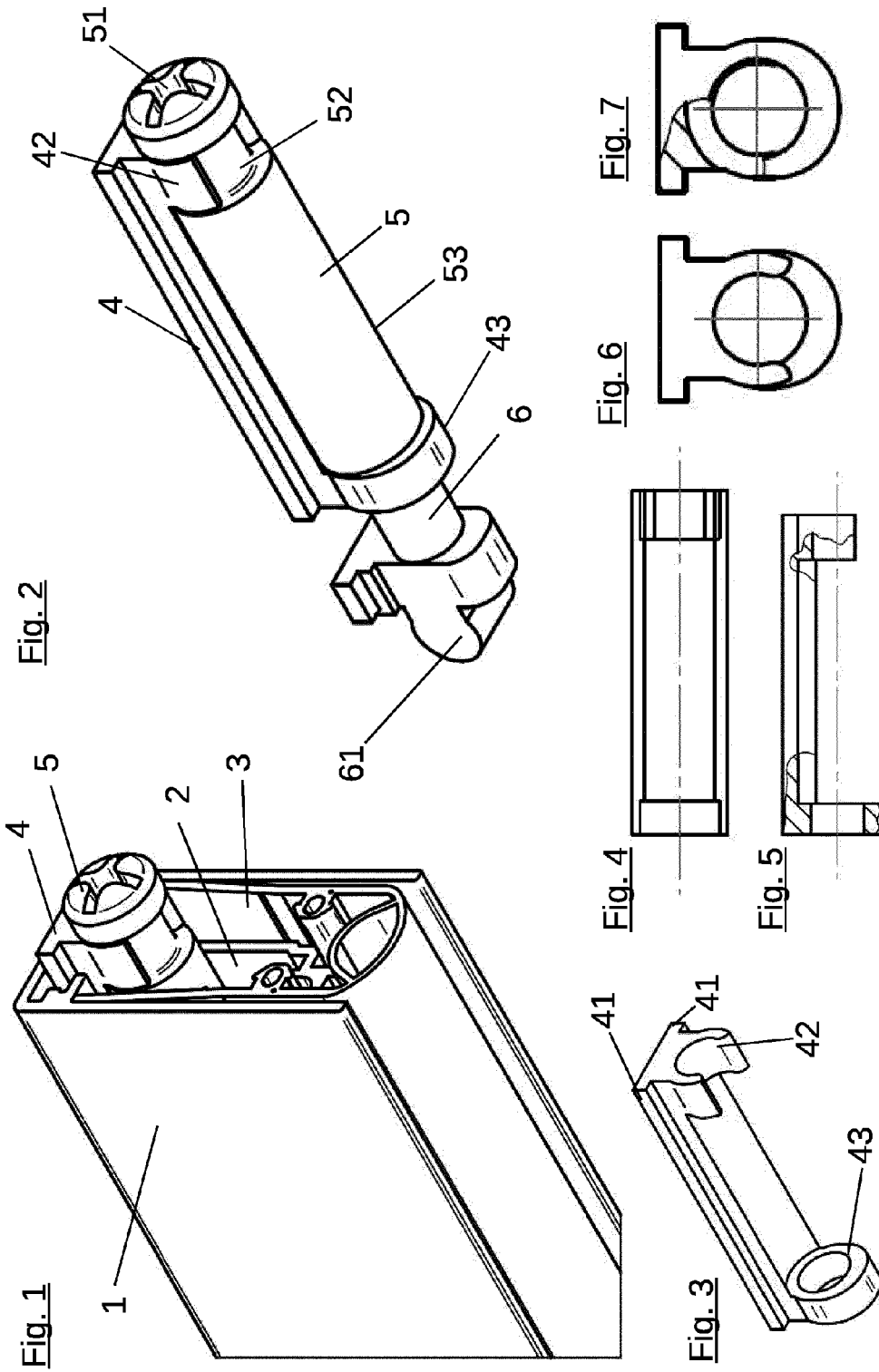


Fig. 8

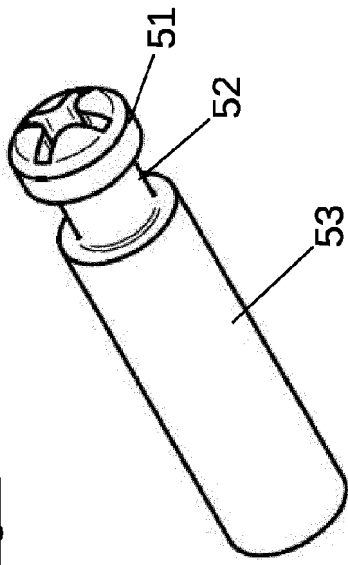


Fig. 9

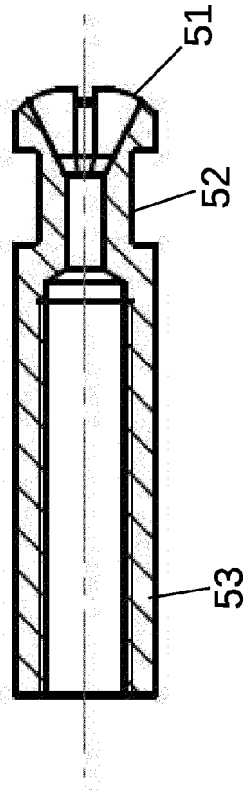


Fig. 10

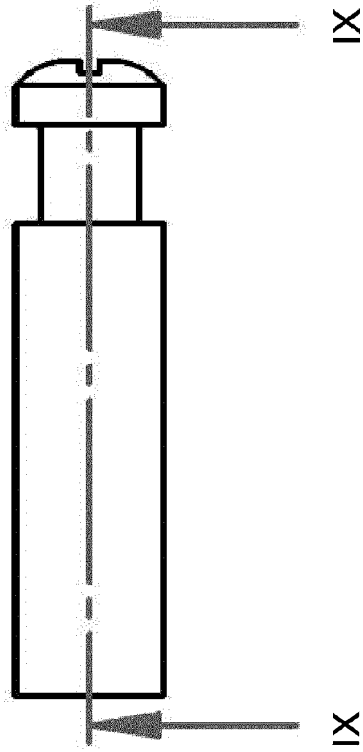


Fig. 11

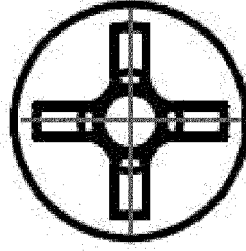
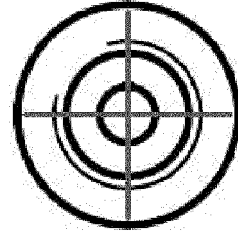


Fig. 12



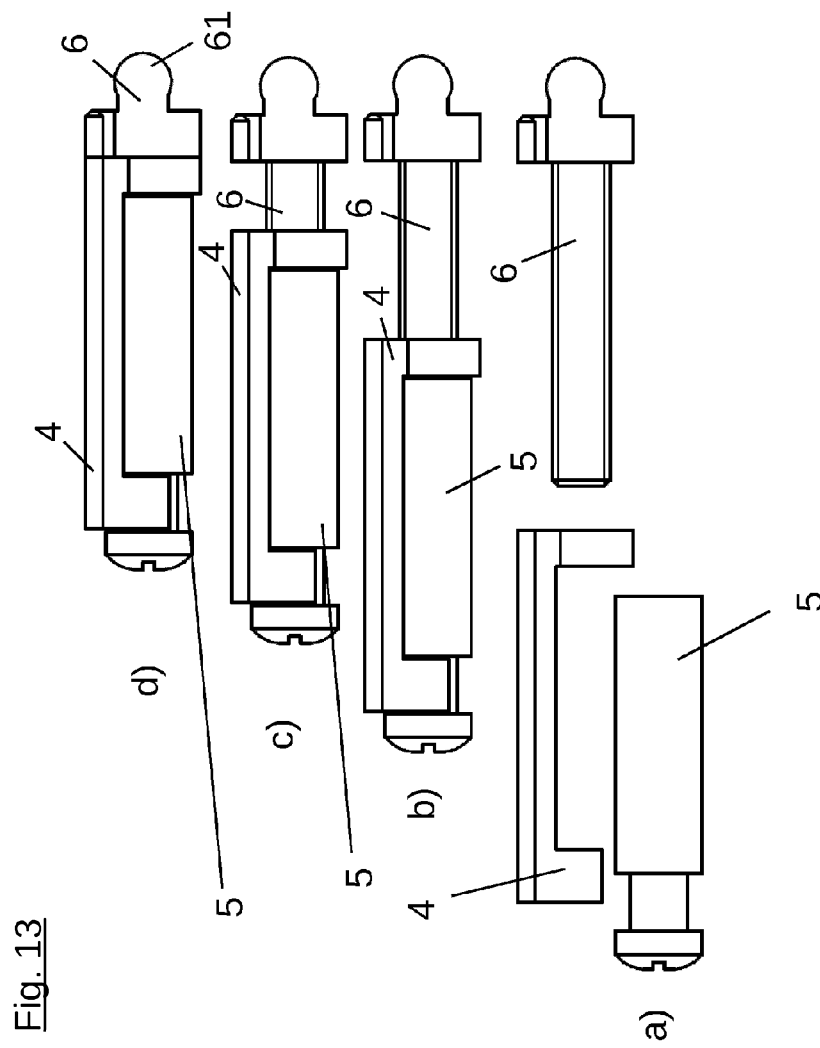
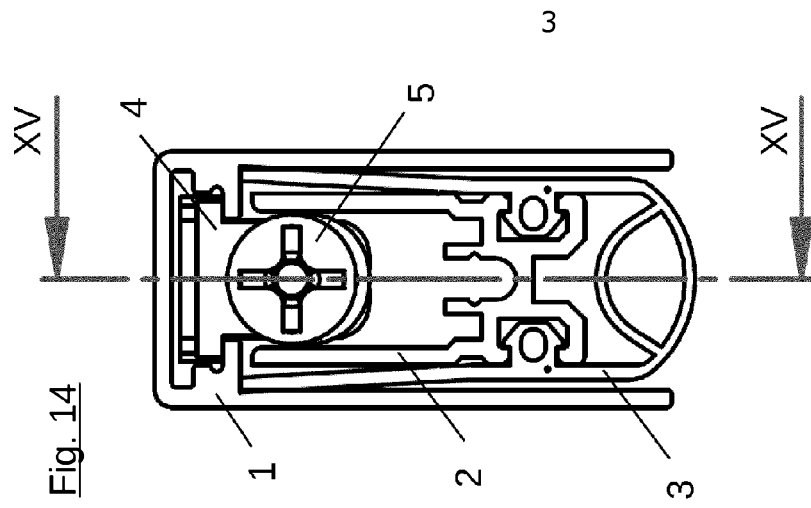


Fig. 15

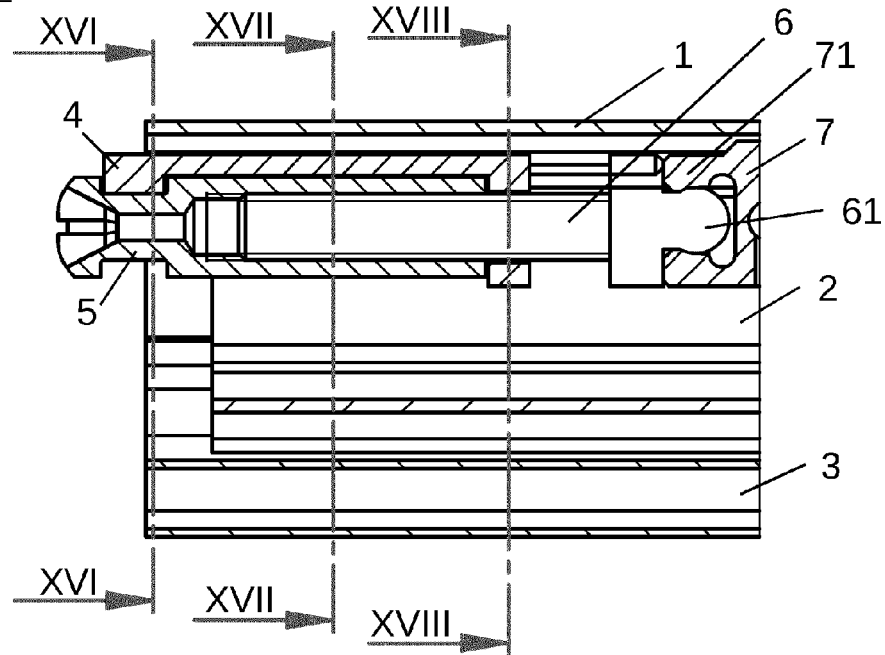


Fig. 16

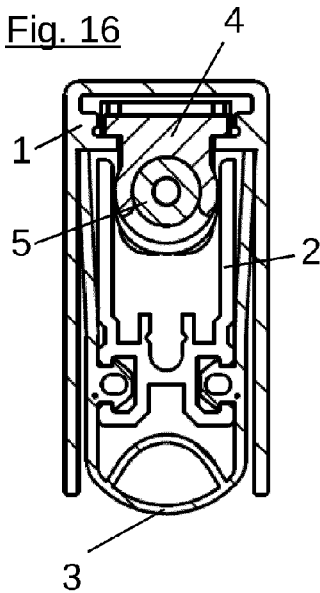


Fig. 17

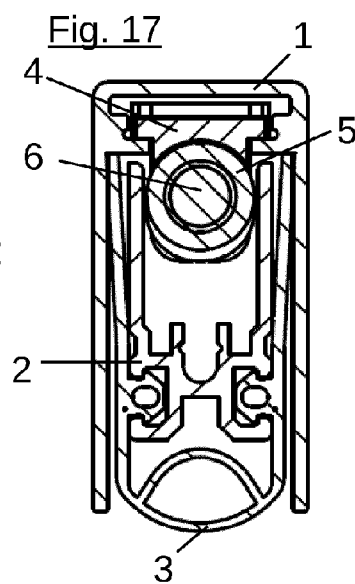


Fig. 18

