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(54) **Locking device, esp. for covers, caps, door and window wings**

Verschlussvorrichtung, insbesondere für Abdeckungen, Deckel, Türen und Fensterflügel

Dispositif de verrouillage en particulier pour des couvercles, bouchons et ailes de porte ou de fenêtre

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Description**Field of the art**

5 [0001] The invention relates to a locking device, especially for covers, caps, door and window wings, the locking device comprising a case having a bottom and a cap, wherein a toothed pinion is pivoted inside the case and tangentially slidingly thereto a locking pin is arranged in the case.

Background of the invention

10 [0002] Several locking devices for said use are known, however, the closest prior art is disclosed in the Japanese Patent No. 261920 which describes an elastically arranged vertical pivot shaft, onto which a toothed pinion is fastened for an engagement with a rod having a lateral gearing. A lateral handle is provided on the lower part of the shaft under the bottom of the case, inside which the apparatus is arranged. The upper end of the shaft is formed for an application of a tackle key. By pulling the lateral handle against the spring tension the toothed pinion gets into engagement with the lateral gearing of the rod and by a following turning the rod is shifted and inserted into the respective opening in the cover frame or pulled out of said opening in the cover frame.

15 [0003] The drawbacks of the above apparatus consist in that the toothed pinion has to be vertically shifted in order to get into engagement with the ratchet and therefore there might be some difficulties to interlock the teeth of the pinion with the teeth of the rod precisely. Moreover, said rod has got a circular cross section and the teeth are on one side only, so that the rod may be guided without any rotation. Because of the vertical shifting of the pinion the case is rather high. Said device allows only a mechanical locking of a cover or a cap in the closed position and it may prevent from an unauthorised opening from outside only. The device does not comprise any safety elements preventing any unauthorised manipulation. As the toothed rod has got its teeth on one side only, the rod has to be oriented at mounting and the orientation must be ensured during the use. JPH0493423 discloses a locking device comprising features defined in the preamble of claim 1.

Summary of the invention

30 [0004] The objective of the invention is to provide a locking device, especially for covers, caps, door and window wings, comprising safety elements for preventing any undesirable manipulation, being of a relatively small size and easily mounted and comprising a small number of components, thus favourably effecting the production costs. The locking device has to be suitable for covers located in roadways, too, i.e. in a place substantially polluted by a mixture of water, sand and other mechanical dirt.

35 [0005] Said objectives are achieved and the above mentioned disadvantages are removed with a locking device, especially for covers, caps, door and window wings, comprising a case having a bottom and a cover, wherein a toothed pinion is pivoted inside the case and tangentially slidingly thereto a locking pin is arranged, wherein according to the invention a circular socket is arranged at least in the bottom, the toothed pinion is pivoted in the circular socket, an axially shifting control pin is arranged in the axis of the toothed pinion and wherein a longitudinal socket is arranged at least in the bottom and oriented tangentially with respect to the toothed pinion, the locking pin being arranged slidingly in the longitudinal socket and being provided at its central part with annular notches by means of which the locking pin engages the respective teeth of the toothed pinion.

40 [0006] According to the invention the control pin is provided with two adapted ends, wherein a driver is fixed on the first adapted end, the driver having a shaped head for a control key provided with a complementary shaped hollow and the second adapted end is provided with a transversally arranged securing pin for an engagement with stop noses formed outside the bottom of the case uniformly around a bearing aperture of the control pin, wherein the central part of the control pin is provided with a carrier collar for a pressure spring arranged between the carrier collar and the toothed pinion.

45 [0007] It is also advantageous to provide the first adapted end of the control pin with a pair of mutually parallel flattened surfaces so that the driver having a complementary shaped hollow may be set thereon forming a fixed joint and to provide the second adapted end of the control pin with another pair of mutually parallel flattened surfaces so that the toothed pinion having a complementary shaped through-hole may be set thereon forming a fixed joint.

50 [0008] It is also advantageous to provide the locking pin with an elongated end behind the last annular notch to stop the action of the toothed pinion in the locked position by an engagement of its respective tooth with the cylindrical surface of the elongated end and with a locking part before the first annular notch for stopping the action of the toothed pinion in the unlocked position by an engagement of its respective tooth with the cylindrical surface of the locking part of the locking pin.

55 [0009] It is also advantageous to form stop noses as a part of the bottom of the case by bending the material out of

the bearing aperture.

[0010] The locking device according to the invention may comprise longer screws with spacing bushings to mount it spaced from the cover and with pressure springs arranged between the head of a longer screw and the bottom of the case for a tighter attachment of the cover to the frame optionally using a seal.

[0011] An advantage of the locking device according to the invention is that the teeth of the teathed pinion are engaged permanently and with the annular notches of the locking device so that it is not necessary to assure the position of the teathed pinion. As the teathed pinion is arranged in the case to pivot only and not to be height adjusted the height of the case could be reduced considerably. It is especially advantageous that for any unauthorised person the unlocking of the cover is made difficult by the code of the key and by the shaped head of the driver as well by the stop noses outside the bottom of the case which are intended for the engagement with the securing pin.

Brief description of the drawings

[0012] An exemplifying embodiment is shown at the drawings, wherein Fig. 1 depicts an axonometric bottom view of the exploded locking device, Fig. 2 depicts an axonometric top view of the bottom of the locking device in the locked position, the cover being removed from the case, Fig. 3 depicts an axonometric top view of the closed case of the locking device, Fig. 4 depicts an axonometric bottom view of the sewer cover in a frame with an installed locking device, Fig. 5 depicts an enlarged bottom view of the locking device installed on the sewer cover, Fig. 6 depicts a cross sectional view of a part of the sewer cover and of its frame with a part of the locking device taken along line VI-VI in Fig. 5, Fig. 7 depicts a cross sectional view of the locking device mounted on the sewer cover by means of spacing bushings, springs and longer screws, taken along the line VII-VII in Fig. 8 but revolved, for 180°, and Fig. 8 depicts a bottom view of a circular sewer cover inserted into a frame and provided with a pair of locking devices.

Exemplifying embodiments of the invention

[0013] The locking device, especially for covers, caps, door and window wings, i.e. covers 1, comprises a control pin 2 having cylindrical form with two adapted ends 3, 4 and provided with a carrier collar 5 in the middle part of the control pin 2. According to the first exemplifying embodiment the first adapted end 3 of the control pin 2 is provided with a pair of flattened surfaces 6, 7 which are parallel to each other, to be inserted into a driver 8 having a complementary cavity 9 to form a fixed joint; and the second adapted end 4 of the control pin 2 is provided with another pair of flattened surfaces 10, 11 which are parallel to each other, to be inserted into a teathed pinion 12 having a complementary through-hole 13 to form a fixed joint. The driver 8 is provided with a shaped head 14 to be inserted into a control key 15, e.g., a tackle key, as shown partially in Fig. 6. The first adapted end 3 of the control pin 2 is provided with a lateral through hole 16 and the driver 8 is provided with a corresponding lateral opening 17, too, to be connected with a safety pin 18. The second adapted end 4 of the control pin 2 has got at its end another lateral through opening 19 for a securing pin 20. In the assembled state the teathed pinion 12 is mounted on the second end 4 of the control pin 2 and a pressure spring 21 is set on the control pin 2 between said teathed pinion 12 and the carrier collar 5. The assembly as described above is arranged in a case 22 (Fig. 3) consisting of a bottom 23 and a cover 24, wherein the circumferential edge 25 of the cover 24 corresponds to the circumferential edge 26 of the bottom 23. The teathed pinion 12 is floating in a circular socket 27 (Fig. 2) formed in the bottom 23 of the case 22 and the second adapted end 4 of the control pin 2 goes through a bearing aperture 28 (Fig. 1) formed in the bottom 23 of the case 22. Four evenly spaced stop noses 29, 30, 31, 32 are formed around the bearing aperture 28 outside the bottom 23, e.g. by bending out its material. Gaps 33, 34, 35, 36 between those are intended for an insertion of the securing pin 20. The bottom 23 of the case 22 is provided with a longitudinal socket 37 arranged tangentially with respect to the circular socket 27 and intended for a locking pin 38, which has got a cylindrical form and a part of the locking pin 38 is provided with annular notches 39, 40, 41, 42, 43 for the engagement with the teeth 44 of the teathed pinion 12. The locking pin 38 has got an extended end 45 behind the last annular notch 43, the extended end 45 being intended for stopping the motion of the teathed pinion 12 in the locked position by the engagement of its respective tooth 44 with the cylindrical surface of the extended end 45, and it has got a locking part 46 before the first annular notch 36 for stopping the motion of the teathed pinion 12 in the unlocked position by the engagement of its respective tooth 44 with the cylindrical surface of the locking part 46. The free end of the locking pin 38 is provided with a taper 47 having a conical or spherical form.

[0014] To enable a closing of the case 22 by the cover 24 the cover 24 is provided with a circular socket 27a formed according to the inner components and a longitudinal socket 37a for the locking pin 38. The cover 24 is connected with the bottom 23 by means of rivets 48 (Fig. 3). When the locking device is assembled, only the driver 8 with a part of the control pin 2 extends beyond the cover 24. In some cases the cover 24 may be flat without the circular socket 27a and without the longitudinal socket 37a, in case the circular socket 27 and the longitudinal socket 37 in the bottom 23 are of deeper form.

[0015] As may be seen in Figs. 4 and 5 the locking device is to be mounted on the lower side of the cover 1 at its edge

so that the locking pin **38** immediately after it has started shifting out of the case **22** gets into the locking aperture **49** in the frame **50**, which is mounted e.g. in a roadway (not shown). Where necessary the opposite end **51** of the cover **1** may be provided with another locking device **52**, as shown in Fig. 8 or with at least one bolt **53**, the exemplifying embodiment of Fig. 4 comprises two bolts **53**. In this case the cover **1** is inserted into the frame **50** with its opposite end **51** first so that the bolt **53** gets under the lower edge of the frame **50** and then the insertion of the cover **1** may be completed. The cover **1** is provided with an operational hole **54** above the driver **8**, the operational hole **54** being intended for an insertion of the control key **15** and for putting its shaped hollow **55** (Fig. 6) on the shaped head **14** of the driver **8**. The shaped hollow **55** of the control key **15** and the shaped head **14** of the driver **8** have to be identical. But it is possible to use several alternative embodiments of the matched forms for various locking devices to ensure that it may be difficult for an unauthorised person to open the cover **1**. In this way the code of the whole locking device is formed.

[0016] The locking device is fastened to the cover by means of screws **56** (Fig. 5) driven into the cover **1** from the lower side. As shown in Fig. 7 the locking device and a possible another locking device **52** may also be spaced apart fastened to the cover **1** by means of longer screws **57**. Spacing bushings **58** may be applied on the longer screws **57** between the lower side of the cover **1** and the locking device and a possible another locking device **52**. A pad **60** is put under the head **59** of each longer screw **57** and a pressure spring **61** is mounted between the pad **60** and the bottom **23** of each locking device to enable a tighter fastening of the cover **1** during the locking by means of the locking pin **38**, e.g. into the seal **62**. As the whole locking device is arranged under the cover **1** at a distance, its function is good even in an environment highly polluted with a mixture of water and dirt. The free space around the shaped head **14** of the driver **8** makes a smooth insertion of the control key **15** possible.

[0017] The locking device according to the invention works as follows:

A locking of the cover **1** into the frame **50** is achieved in that the operating person inserts the control key **15** into the operational hole **54** in the cover **1** and the shaped hollow **55** of the control key **15** is set on the respective shaped head **14** of the driver **8**. Continually pressing on the control key **15** against the force of the pressure spring **21** the securing pin **20** is shifted out of a pair of opposing securing gaps of the total number of four securing gaps **33, 34, 35, 36** between the stop noses **29, 30, 31, 32** depending on the actual insertion of the locking pin **20**. So continually pressing the control key **15** it may be consequently turned and before finishing the whole rotation for 180° the operating person releases the pressure on the control key **15** and finishes the rest of the 180° without any pressure. The control key **15** being in that position the pressure spring **21** returns the control pin **2** in its original position, wherein the securing pin snaps in the respective pair of the securing gaps **33, 34, 35, 36**. As the control key **15** is turned, the teathed pinion **12** is turned as well and it gets gradually with its teeth **44** into engagement with the annular notches **39, 40, 41, 42** on the locking pin **38** which is shifted in the longitudinal sockets **37, 37a** in the bottom **23** and in the cover **24** of the case **22** of the locking device. The shifting locking pin **38** gets with its locking part **46** into the locking aperture **49** in the frame **50** (Fig. 4 and 5) or at least under an edge of the frame **50** (Fig. 7, 8). If the pressure on the control key **15** is released in the position between 0° to 90°, the locking pin **20** snaps into the respective pair of securing gaps **33, 34, 35, 36** and prevents any further movement of the locking pin **38** into the locking position. After the pressure on the control key is renewed the locking movement of the locking pin **38** is completed. Such an arrangement is important to enhance security against any unauthorised manipulation with the cover **1**, especially in case of an unauthorised attempt to take the cover **1** out of the frame **50**. First it is necessary to use the control key **15** having a shaped hollow **55** which is complementary to the shaped head **14** of the driver **8**. The unauthorised person unlike the authorised person does not know the suitable control key **15**, which may be used for the respective cover **1**, because there may be many possible shapes of the shaped head **14** of the driver **8**. If the unauthorised person succeeds in turning the driver **8** using an alternate tool instead of the control key **15**, there is another problem caused by an intentional complication of the necessary mode of turning, as there must be a constant pressure on the control pin **2** to keep the securing pin free and to prevent it from snapping into the securing gaps **33, 34, 35, 36** between the stop noses **29, 30, 31, 32** before the opening of the cover **1** is completed.

[0018] In case the locking device is mounted on the cover **1** as shown in Fig. 7. i.e. using the longer screws **57** with spacing bushings **58** and the pressure springs **61**, upon locking the cover **1** at first the locking pin **28** gets with its taper **47** under an edge of the frame **50** and moving further on the thicker locking part **46** of the locking pin **38** gets under the edge too. During said movement the case **22** of the locking device is shifted against the action of the pressure springs **61**, by means of which the cover **1** is more tightly pressed against the frame **50** which may be provided with a sealing **62**.

Industrial applicability

[0019] The locking device, especially for covers, caps, door and window wings, according to the invention may be used especially for sewer covers and manhole covers as a protecting element against vandalism, theft and for a protection of covers made of recyclable materials, especially plastics, which have got a low weight and therefore they may get

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released from the frames and may be drawn out of the frames if loaded by heavy motor vehicles.

List of reference numerals

5	1	covers	48	rivet
	2	control pin	49	locking aperture
	3	first adapted end	50	frame
	4	second adapted end	51	opposite end
	5	carrier collar	52	another locking device
10	6	flattened surfaces	53	bolt
	7	flattened surface	54	operational hole
	8	driver	55	shaped hollow
	9	shaped cavity	56	screw
	10	flattened surface	57	longer screw
15	11	flattened surface	58	spacing bushing
	12	teethed pinion	59	head
	13	through-hole	60	pad
	14	shaped head	61	pressure spring
20	15	control key	62	seal
	16	through hole		
	17	opening		
	18	safety pin		
	19	through opening		
25	20	securing pin		
	21	pressure spring		
	22	case		
	23	bottom		
30	24	cover		
	25	circumferential edge		
	26	circumferential edge		
	27	circular socket		
	27a	circular socket		
35	28	bearing aperture		
	29	stop nose		
	30	stop nose		
	31	stop nose		
40	32	stop nose		
	33	securing gap		
	34	securing gap		
	35	securing gap		
	36	securing gap		
45	37	longitudinal socket		
	37a	longitudinal socket		
	38	locking pin		
	39	annular notch		
50	40	annular notch		
	41	annular notch		
	42	annular notch		
	43	annular notch		
	44	tooth		
55	45	elongated end		
	46	locking part		
	47	taper		

Claims

- 5 1. A locking device, especially for covers, caps, door and window wings, comprising a case (22) having a bottom (23) and a cover (24), wherein a teathed pinion (12) is accommodated in pivoting manner inside the case (22) and a locking pin (38) is arranged tangentially slidably thereto, wherein a circular socket (27) is arranged at least in the bottom (23), the teathed pinion (12) is accommodated in a pivoting manner in the circular socket (27), a control pin (2) is axiatly slidably arranged in the axis of the teathed pinion (12), wherein a longitudinal socket (37) is arranged at least in the bottom (23) and oriented tangentially with respect to the teathed pinion (12), the locking pin (38) being arranged slidably in the longitudinal socket (37), **characterised in that** the locking pin (38) is provided with annular notches (39, 40, 41, 42) at its central part, by means of which the locking pin (38) engages the respective teeth (44) of the teathed pinion (12), the control pin (2) is provided with two adapted ends, wherein a driver (8) having a shaped head (14) for a control key (15) provided with a complementary shaped hollow (55) is fixed to a first adapted end (3) and a second adapted end (4) is provided with a transversally arranged securing pin (20) for an engagement with stop noses (29, 30, 31, 32) formed outside the bottom (23) of the case (22) uniformly around a bearing aperture (28) of the control pin (2), wherein the central part of the control pin (2) is provided with a carrier collar (5) for a pressure spring (21) arranged between the carrier collar and the teathed pinion (12)
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- 20 2. The locking device according to claim 1, **characterised in that** the first adapted end (3) of the control pin (2) is provided with a pair of mutually parallel flattened surfaces (6, 7) so that the driver (8) having a complementary shaped hollow (9) may be set thereon forming a non-rotational connection and the second adapted end (4) of the control pin (2) is provided with another pair of mutually parallel flattened surfaces (10, 11) so that the teathed pinion (12) having a complementary shaped through-hole (13) may be set thereon forming a non-rotational connection.
- 25 3. The locking device according to claim 1, **characterised in that** the locking pin (38) has an elongated end (45) behind the last annular notch (43) to stop the action of the teathed pinion (12) in the locked position by an engagement of its respective tooth (44) with the cylindrical surface of the elongated end (45) and a locking part (46) before the first annular notch (39) for stopping the action of the teathed pinion in the unlocked position by an engagement of its respective tooth (44) with the cylindrical surface of the locking part (46) of the locking pin (38).
- 30 4. The locking device according to claim 1, **characterised in that** the stop noses (29, 30, 31, 32) are a part of the bottom (23) of the case (22) and that they are formed by bending the material out of the bearing aperture (28).
- 35 5. The locking device according to claim 1, **characterised in that** it comprises longer screws (57) with spacing bushings (58) to mount it spaced from the cover (1) and with pressure springs (61) arranged between the head (59) of a longer screw (57) and the bottom (23) of the case (22) for a tighter attachment of the cover (1) to the frame (50), optionally using a seal (62).

Patentansprüche

- 40 1. Eine Verriegelungsvorrichtung, insbesondere für Abdeckungen, Kappen sowie Tür- und Fensterflügel, die ein mit einem Boden (23) und einem Deckel (24) versehenes Gehäuse (22) umfasst, wobei ein verzahnter Ritzel (12) innerhalb des Gehäuses (22) schwenkbar gelagert ist und ein Verriegelungsbolzen (38) tangential zu dem verzahnten Ritzel (12) verschiebbarer angeordnet ist, wobei zumindest in dem Boden (23) eine kreisförmige Buchse (27) vorgesehen ist und der verzahnte Ritzel (12) in dieser kreisförmigen Buchse (27) schwenkbar gelagert ist, wobei in dem verzahnten Ritzel (12) ein axial verschiebbarer Betätigungsbolzen (2) mittig angeordnet ist, wobei zumindest in dem Boden (23) eine Längsbuchse (37) vorgesehen ist, die tangential zu dem verzahnten Ritzel (12) orientiert ist, wobei der Verriegelungsbolzen (38) verschiebbar in der Längsbuchse (37) angeordnet ist, dadurch gekennzeichnet, dass der Verriegelungsbolzen (38) in seinem mittleren Abschnitt mit ringförmigen Schlitzen (39, 40, 41, 42) versehen ist, mittels deren der Verriegelungsbolzen (38) in den Eingriff mit den entsprechenden Zähnen (44) des verzahnten Ritzels (12) bringbar ist, und der Betätigungsbolzen (2) mit zwei angepassten Enden versehen ist, wobei an dem ersten angepassten Ende (3) ein mit einem Formkopf (14) versehene Mitnehmer (8) angebracht ist, während der Formkopf für einen mit einem komplementären Hohlraum (55) ausgebildeten Betätigungsschlüssel (15) bestimmt ist, und das zweite angepasste Ende (4) mit einem quer angeordneten Sicherungsstift (20) versehen ist, der in den Eingriff mit Anschlagnasen (29, 30, 31, 32) bringbar ist, die ausserhalb des Bodens (23) des Gehäuses (22) gleichmässig um eine Lagerungsöffnung (28) des Betätigungsbolzens (2) herum ausgebildet sind, wobei der mittlere Abschnitt des Betätigungsbolzens (2) mit einem für eine Druckfeder (21) vorgesehen Trägerbund (5) versehen ist, welche Druckfeder zwischen dem Trägerbund (5) und dem verzahnten Ritzel (12) angeordnet ist.
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2. Die Verriegelungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das erste angepasste Ende (3) des Betätigungsbolzens (2) mit einem Paar von zueinander parallel abgeflachten Oberflächen (6, 7) versehen ist, so dass der mit dem komplementären Hohlraum (9) versehene Mitnehmer (8) daran angebracht werden kann, um eine verdrehungssichere Verbindung zu bewerkstelligen, und das zweite angepasste Ende (4) des Betätigungsbolzens (2) mit einem anderen Paar von zueinander parallel abgeflachten Oberflächen (10, 11) versehen ist, so dass der mit einem komplementär ausgeformten Durchgangsöffnung (13) versehene verzahnte Ritzel (12) daran angebracht werden kann, um eine andere verdrehungssichere Verbindung zu bewerkstelligen.
3. Die Verriegelungsvorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass der Verriegelungsbolzen (38) einerseits mit einem langgestreckten, hinter dem letzten ringförmigen Schlitz (43) angeordneten Ende (45) versehen ist, um die Bewegung des verzahnten Ritzels (12) in der verriegelten Stellung anzuhalten, indem der jeweilige Zahn (44) des letzteren in den Eingriff mit der zylinderförmigen Oberfläche des langgestreckten Endes (45) gebracht wird, und andererseits mit einem vor dem ersten ringförmigen Schlitz (43) angeordneten Verriegelungsstück (46) versehen ist, um die Bewegung des verzahnten Ritzels (12) in der entriegelten Stellung anzuhalten, indem der jeweilige Zahn (44) des letzteren in den Eingriff mit der zylinderförmigen Oberfläche des Verriegelungsstücks (46) des Verriegelungsbolzens (38) gebracht wird.
4. Die Verriegelungsvorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Anschlagnasen (29, 30, 31, 32) einteilig mit dem Boden (23) des Gehäuses (22) ausgebildet sind und dass sie durch Ausbiegen des Werkstoffs der Lagerungsöffnung (28) ausgeformt sind.
5. Die Verriegelungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** sie längere Schrauben (57) umfasst, die mit Abstandhülsen (58) versehen sind, so dass die Verriegelungsvorrichtung beabstandet von dem Deckel (1) eingebaut werden kann, und die ferner mit Druckfedern (61) versehen sind, welche zwischen dem Kopf (59) einer der längeren Schrauben (57) und dem Boden (23) des Gehäuses (22) angeordnet sind, um eine dichtere Verbindung des Deckels (1) und des Rahmens (50) zu erreichen, die wahlweise mit einer Dichtung (62) zusätzlich unterstützt werden kann.

30 Revendications

1. Un dispositif de verrouillage, en particulier pour les couvercles, chapeaux, battants de portes et fenêtres, comprenant un boîtier (22) ayant un fond (23) et un couvercle (24), dans lequel un pignon denté (12) est logé de manière pivotante à l'intérieur du boîtier (22) et le pivot de verrouillage (38) est disposée tangentiellement de manière coulissante à celui-ci, et un logement circulaire (27) est disposée au moins dans le fond (23), et le pignon denté (12) est logé d'une manière pivotante dans le logement circulaire (27), un pivot de commande (2) est disposé de manière axialement coulissante dans l'axe du pignon denté (12), où un logement longitudinal (37) est disposé au moins dans le fond (23) et orienté tangentiellement par rapport au pignon denté (12), le pivot de verrouillage (38) étant arrangé de manière coulissante dans le logement longitudinal (37), **caractérisé en ce que** le pivot de verrouillage (38) est muni d'encoches annulaires (39, 40, 41, 42) en sa partie centrale, par moyen de lesquelles le pivot de verrouillage (38) est en prise avec les dents respectives (44) du pignon denté (12), le pivot de commande (2) est munie de deux extrémités adaptées, où un entraîneur (8) ayant une tête façonnée (14) pour une clé de commande (15) munie d'un creux de forme complémentaire (55) est fixé à la première extrémité adaptée (3) et la seconde extrémité adaptée (4) est munie d'une goupille de sécurité disposée transversalement (20) pour un contact avec les saillants d'arrêt (29, 30, 31, 32) formés à l'extérieur du fond (23) du boîtier (22) uniformément autour d'une ouverture de palier (28) du pivot de commande (2), où la partie centrale du pivot de commande (2) est munie d'un collet d'appui (5) pour une ressort de pression (21) disposé entre le collet d'appui (5) et le pignon denté (12).
2. Le dispositif de verrouillage selon la revendication 1, **caractérisé en ce que** la première extrémité adaptée (3) du pivot de commande (2) est munie d'une paire de surfaces aplaties mutuellement parallèles (6, 7) de sorte que l'entraîneur (8) ayant un creux de forme complémentaire (9) puisse être fixé sur celle-ci pour former une liaison non rotative et la seconde extrémité adaptée (4) du pivot de commande (2) est munie d'une autre paire de surfaces aplaties mutuellement parallèles (10, 11) de sorte que le pignon denté (12) ayant un trou traversant (13) de forme complémentaire puisse être fixé sur celle-ci formant ainsi une liaison non rotatif.
3. Le dispositif de verrouillage selon la revendication 1, **caractérisé en ce que** le pivot de verrouillage (38) comporte une extrémité de forme allongée (45) derrière la dernière encoche annulaire (43) pour arrêter l'action du pignon denté (12) dans la position verrouillée par le contact de sa dent respective (44) avec la surface cylindrique de

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l'extrémité allongée (45) et une section de verrouillage (46) avant la première encoche annulaire (39) pour arrêter l'action du pignon denté dans la position déverrouillée par le contact de sa dent respective (44) avec la surface cylindrique de la section de verrouillage (46) du pivot de verrouillage (38).

- 5 **4.** Le dispositif de verrouillage selon la revendication 1, **caractérisé en ce que** les saillants d'arrêt (29, 30, 31, 32) forment une partie du fond (23) du boîtier (22) et qu'ils sont formés par cintrage du matériau en dehors de l'ouverture de palier (28).
- 10 **5.** Le dispositif de verrouillage selon la revendication 1, **caractérisé en ce qu'il** comprend des vis plus longues (57) avec des douilles d'écartement (58) pour le monter espacé du couvercle (1) et avec des ressorts de pression (61) disposés entre la tête (59) d'une vis plus longue (57) et le fond (23) du boîtier (22) pour une fixation plus serrée du couvercle (1) sur le châssis (50), éventuellement à l'aide d'un joint d'étanchéité (62).

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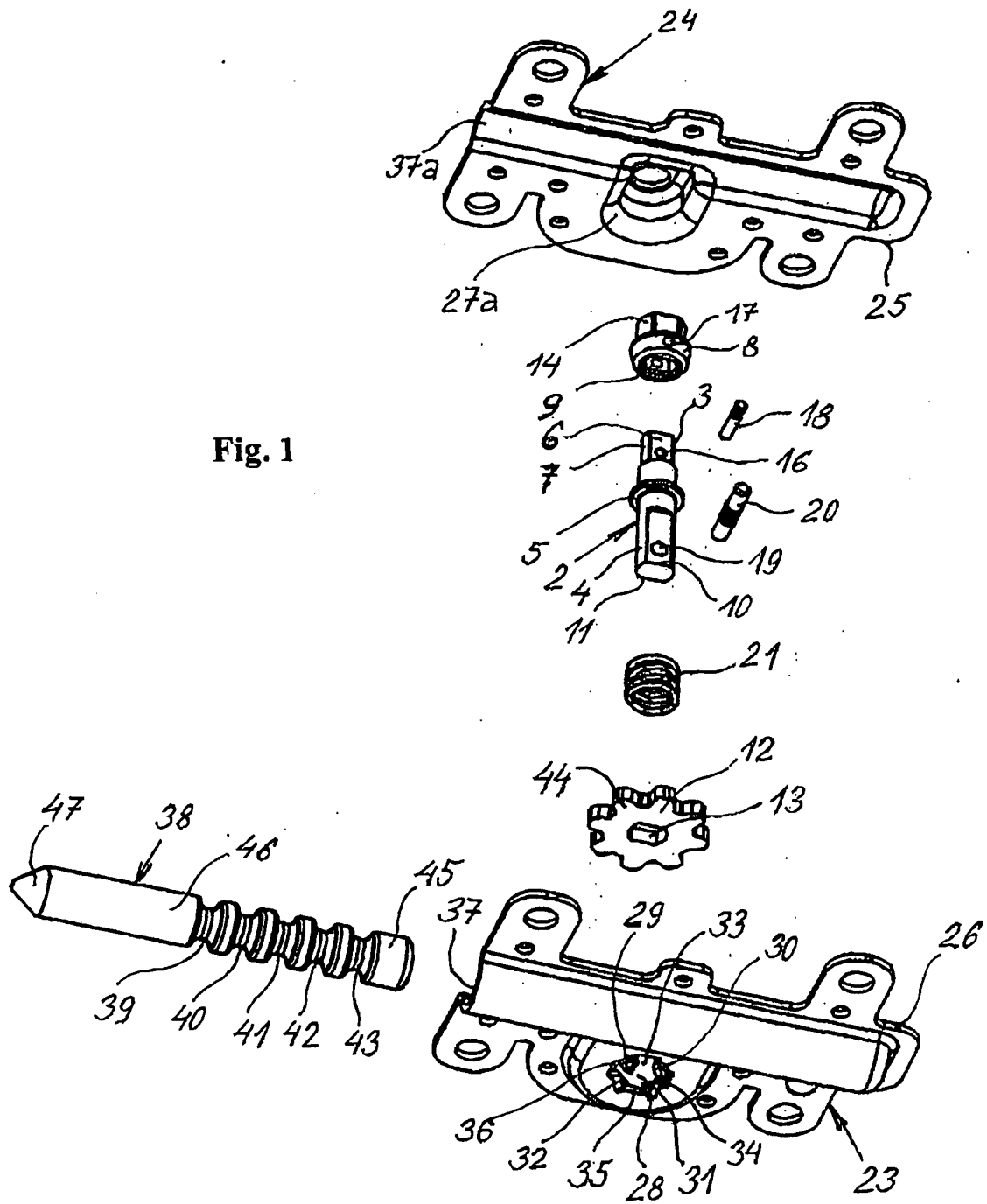


Fig. 1

Fig. 2

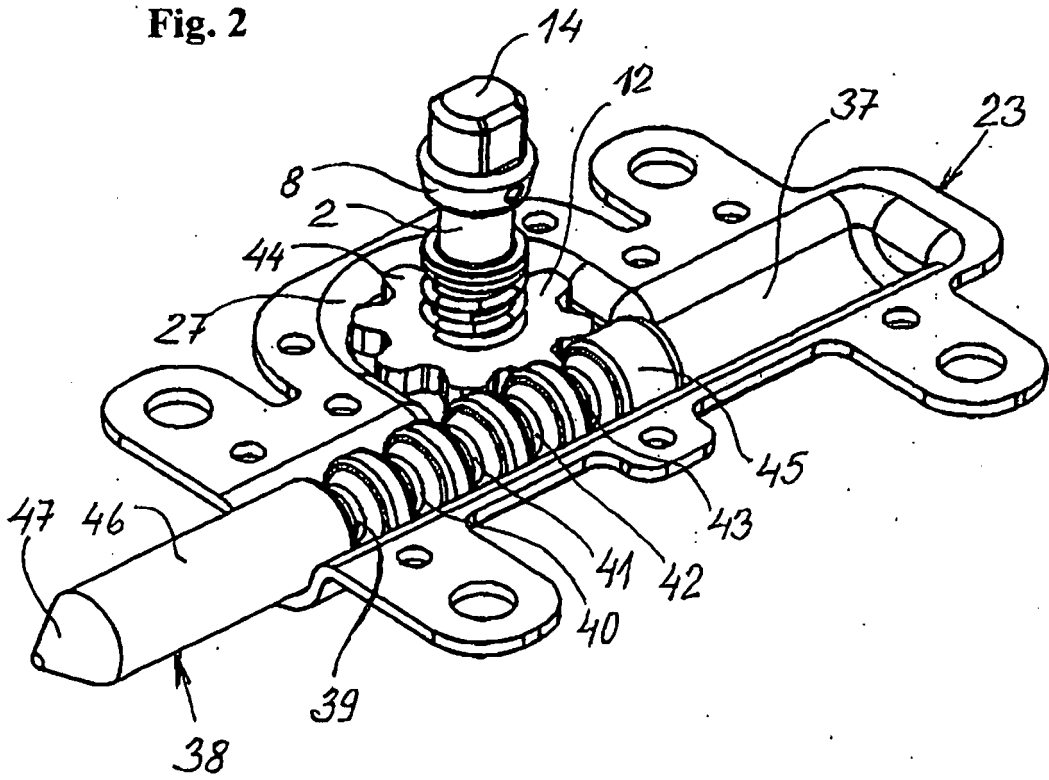


Fig. 3

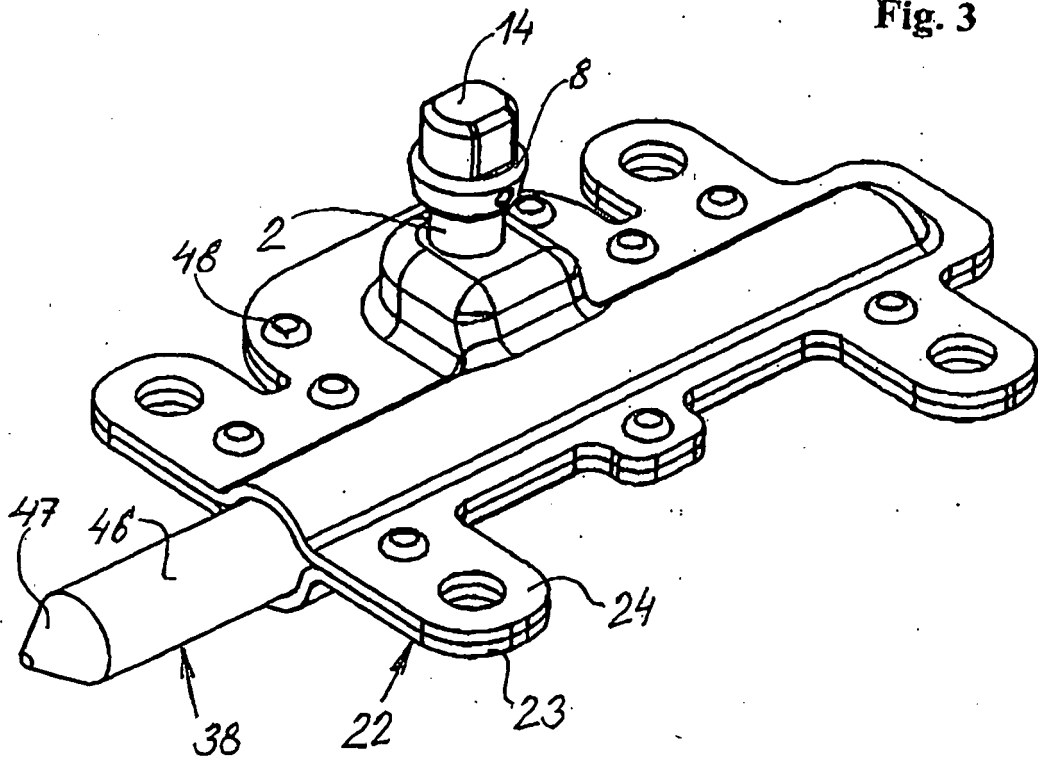


Fig. 4

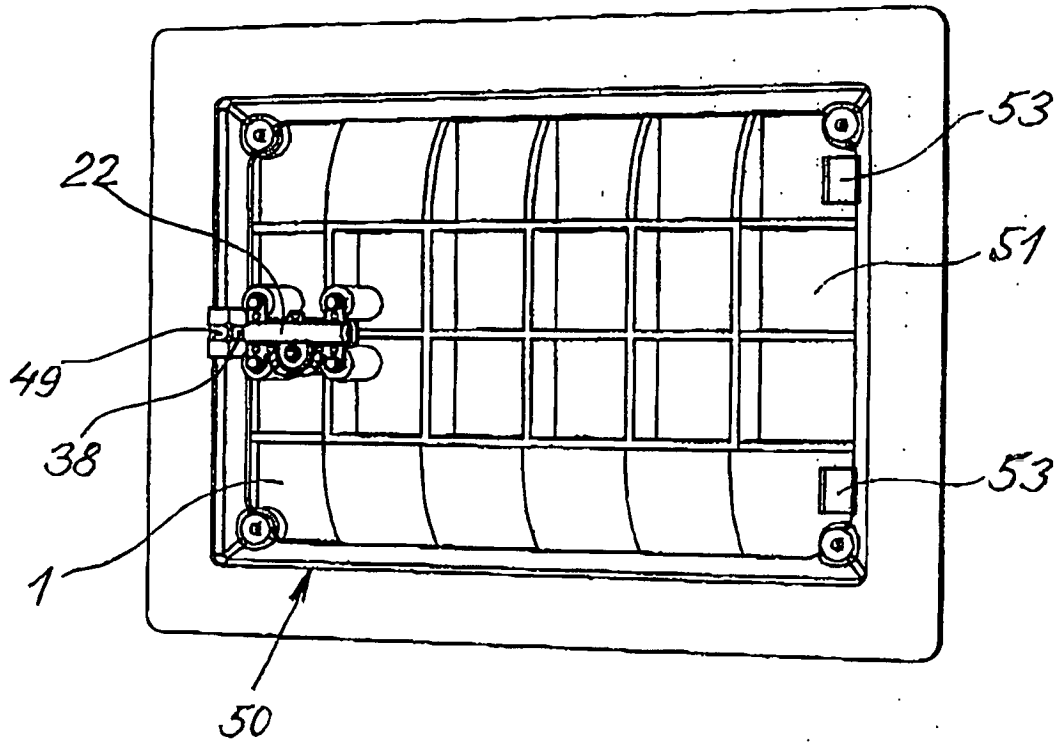


Fig. 5

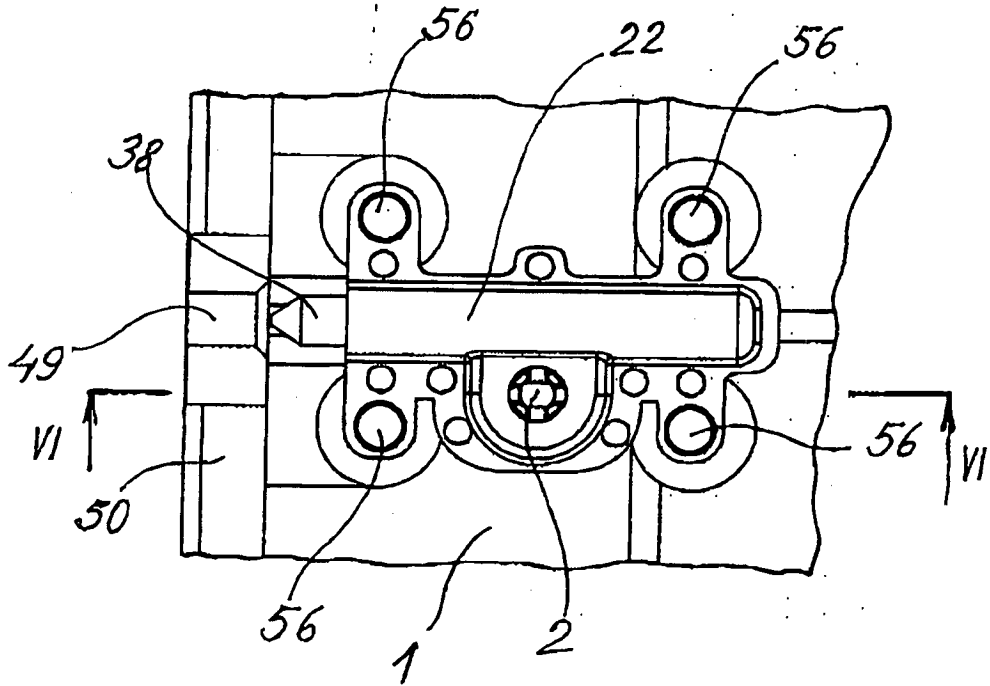


Fig. 6

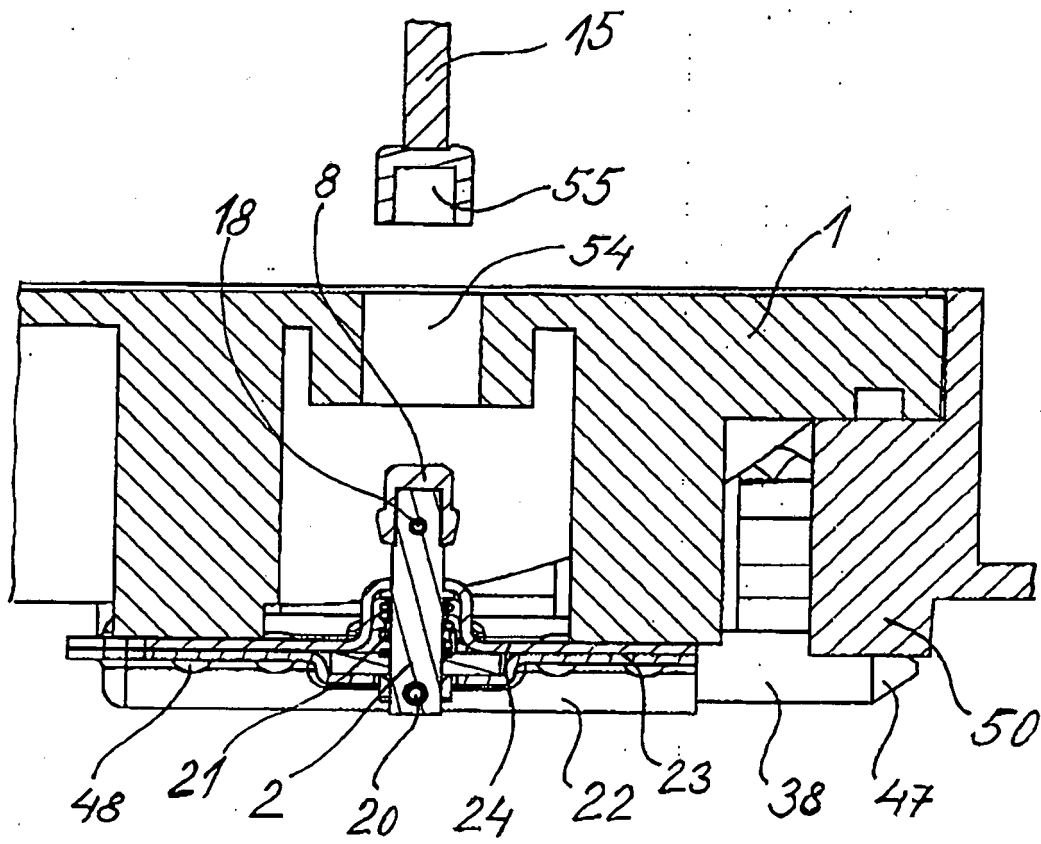


Fig. 7

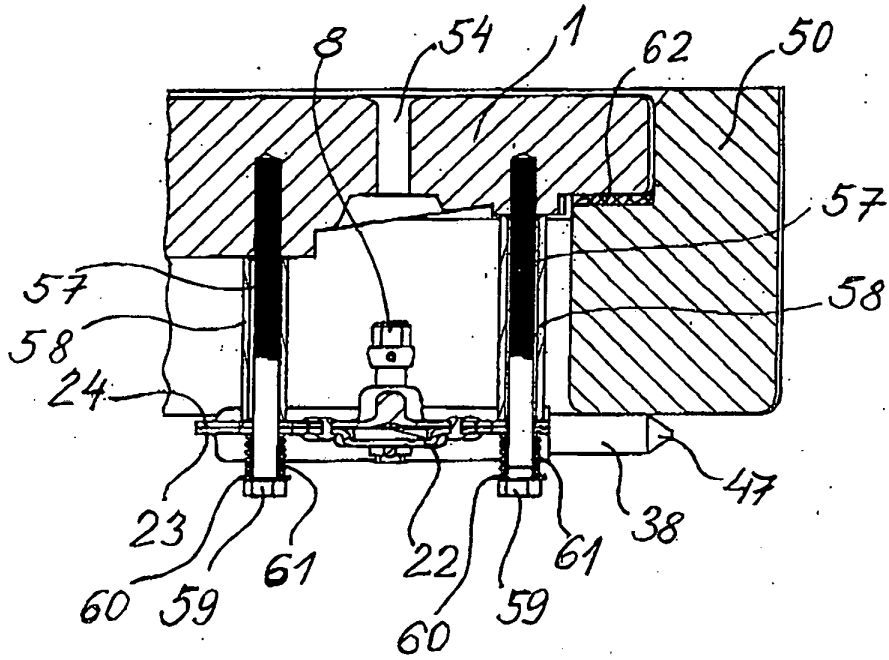
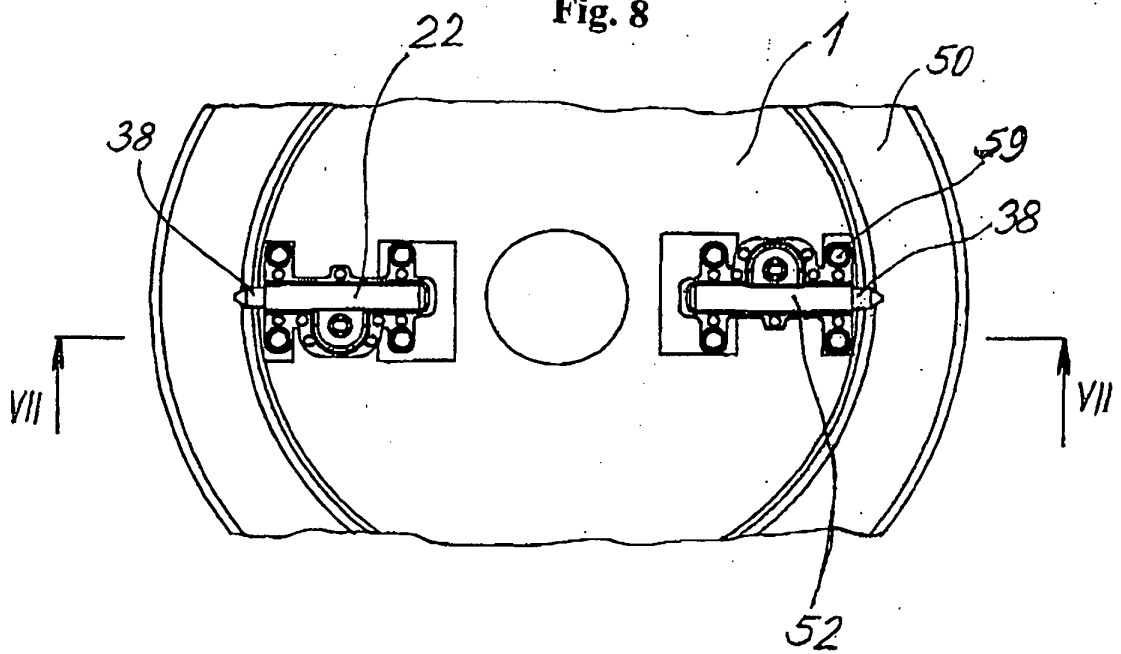


Fig. 8



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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