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## (54) A device for supporting a pole

(57) A pole retention system is described, the pole holding mechanism of the pole retention system adapted such that a user can actuate the pole holding mechanism directly from the top surface of the device, without having to reach into a side access chamber. This is achieved by presenting an actuating member directly accessible from the top surface of the pole retention system, the actuating member coupled with the holding system provided within the pole retention system.

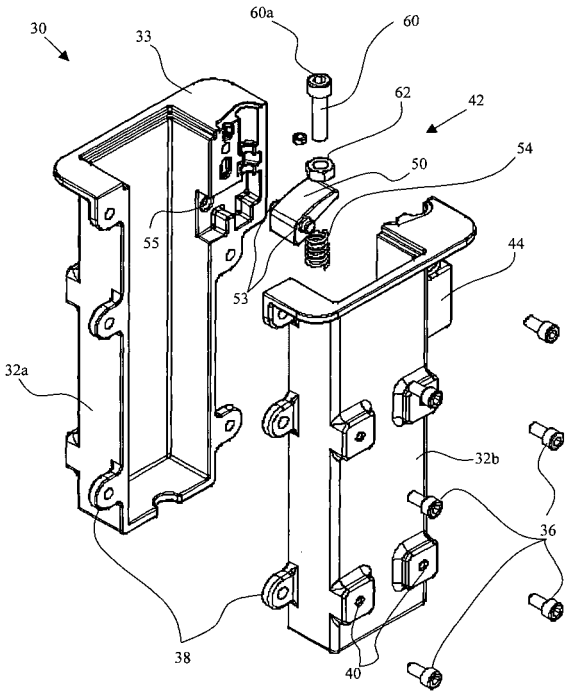


Fig. 3

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## Description

### Field of the Invention

**[0001]** This invention relates to a device for supporting a pole, more particularly to a holding system for use in such a device to releasably retain a pole in said device.

### Background of the Invention

**[0002]** With reference to Fig. 1, the Applicant's UK patent GB 2 254 349 discloses a device 10 for supporting a pole, the device 10 comprising a housing 12 set into the ground to releasably receive a suitable pole, for example a signpost or a traffic bollard. The pole (a section of which is shown at 14) is placed within a chamber 16 in the housing 12, and is secured into place in the device 10 through the tightening of setscrews 18 against the pole 14 itself. Access to the setscrews 18 is provided via a side chamber 20 adjacent the chamber 16 for receipt of the pole 14. Through use of the device 10 (also called a pole retention system), the installation and removal of such poles at a site is greatly simplified, as it eliminates the need for the excavation and accurate vertical alignment necessary for traditional installation of a pole in the ground.

**[0003]** One drawback of the device 10 is the relative inconvenience of access to the setscrews 18 through the side chamber 20. Access to the setscrews 18 may become obstructed through accumulation of detritus in the chamber 20, or the collection of run-off water in the chamber 20. In such cases, an operator may become inconvenienced when seeking to actuate the setscrews 18 in order to retain or release a pole.

**[0004]** Therefore, it is an object of the invention to provide a holding system for a device for supporting a pole for releasably retaining a pole, the device having easier access and operation of the holding system.

### Summary of the Invention

**[0005]** Accordingly, there is provided a device for supporting a pole, comprising:

a housing having a top surface and a socket defined within the housing, said socket being open to the top surface for receiving an end of a pole;
a locking mechanism disposed in a chamber adjacent said socket and operable to engage a pole in said socket to thereby lock the pole in place in the socket; and
an access port open to the top surface and having therein an actuating member, said member being presented to the top surface for actuation by a user, said member co-operating with said locking mechanism to enable said user to engage the locking mechanism by actuating said member.

**[0006]** The provision of the actuating member in an access port open to the top surface allows for easier operation of the device. As the member is directly accessible from the top surface of the device, this allows for easier actuation of the locking mechanism. Also, as only the member is directly accessible from the top surface, there is less chance of the collection of debris within the chamber, which may affect the operation of the device.

**[0007]** Preferably, said locking mechanism is a clamping means.

**[0008]** Preferably, said member is operable to act on said clamping means to advance said clamping means into the interior of said socket to receive a pole, said clamping means retaining a pole within said socket.

**[0009]** Preferably, said device further comprises a resilient biasing means provided in said chamber, said resilient biasing means acting on said clamping means to bias said clamping means away from the interior of said socket to receive a pole.

**[0010]** The use of resilient biasing means to bias the clamping means away from the socket allows for the releasable retention of poles within the device socket, as the clamping means is brought out of contact with a pole within the socket as the actuating member is retracted, due to the biasing action of the biasing means.

**[0011]** Preferably, said resilient biasing means comprises a helical spring.

**[0012]** Preferably, said resilient biasing means comprises a conical spring.

**[0013]** Preferably, said clamping means comprises a locating member projecting from said clamping means, said resilient biasing means coupled with said locating member.

**[0014]** The use of the locating member prevents the biasing means from becoming dislodged from the clamping means during use.

**[0015]** Alternatively, said actuating member is further operable to retract said clamping means from the interior of said socket to receive a pole.

**[0016]** This configuration allows for the actuating member to selectively advance or retract said clamping means into the socket, allowing for the clamping means to releasably retain a pole within said socket. Such selective advancing and retracting may be accomplished through use of, for example, a rack and pinion mechanism.

**[0017]** Preferably, said clamping means are pivotably mounted within said chamber.

**[0018]** Preferably, said device further comprises a pivot provided within said chamber, said clamping means pivotably mounted on said pivot.

**[0019]** Alternatively, said clamping means comprises a pair of projecting members.

**[0020]** Preferably, said clamping means comprises a substantially L-shaped clamp body, wherein a first free end of said clamp body is operable to advance into the interior of said socket to receive a pole, said first free end acting on a surface of said received pole to retain said

pole within said socket, and wherein said actuating member acts on a second free end of said clamp body.

**[0021]** Preferably, said first free end of said clamp body is formed by a plurality of projecting members, said projecting members operable to advance into the interior of said socket to receive a pole.

**[0022]** Preferably, the actuating member comprises a threaded bolt.

**[0023]** Preferably, the clamping means comprises a threaded pin coupled to said threaded bolt.

**Description of the Invention**

**[0024]** An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a prior art post retention system;
Fig. 2 is a perspective view of a post retention system having a holding system according to the invention;
Fig. 3 is an exploded view of the post retention system of Fig. 2; and
Fig. 4 is a cross-sectional view of a second post retention system having a holding system according to the invention.

**[0025]** With reference to Fig. 2, a device for supporting a pole is indicated generally at 30. The device 30 comprises a body 32 having a first top surface 33, which is exposed when the device 30 is installed for use located substantially beneath the surface of the ground, with the top surface 33 exposed. The body 32 has a chamber 34 defined therein, chamber 34 having an opening defined in said first surface 33.

**[0026]** Chamber 34 acts to receive a post or a pole to be supported within the device 30. In the embodiment shown in Fig. 2, the chamber 34 has a square cross-section, to receive a post having a similarly dimensioned cross-section. However, it will be understood that the device 30 may have a chamber 34 having a differently-shaped cross-section, e.g. circular, in order to accommodate poles or posts of various cross-section shapes.

**[0027]** In the embodiment shown in Fig. 2, the body 32 of the device 30 is shown as formed from two separate symmetrical halves 32a,32b, which are secured together using suitable bolts 36 acting as bolting means applied to appropriate eyes 38 acting as receiving means located at various positions around the edges of the halves 32a, 32b of the body 32 of the device 30. However, it will be understood that the body 32 may be integrally formed from a single piece of material e.g. cast metal.

**[0028]** A plurality of coupling ports 40 are located on the exterior surface of the lower portion of the device body 32. Said coupling ports 40 may be coupled with suitable anchoring means (not shown) to secure the device in place beneath the surface, for example within a concrete foundation, with the coupling ports 40 secured to sections of a reinforcing steel mesh within the foundation. It will be understood that said coupling ports 40 are optionally provided on the device body 32.

In use, a pole (or post) is located within the chamber 34. The pole is releasably retained in place by a holding system acting on the surface of the pole. In the device of Fig. 2, the holding system 42 is contained in a side housing 44, located adjacent the pole-receiving chamber 34. Actuation of the holding system 42 is achieved via an access port 46, defined in the first top surface 33 of the device body 32, said access port 46 located adjacent the opening of said chamber 34.

**[0029]** The holding system 42 will now be described with reference to Figs. 3 and, in greater detail, Fig. 4. Fig. 3 is an exploded view of the device 30 of Fig. 2, while Fig. 4 shows in cross-section an implementation of the holding system 42 in an alternative pole retention device to device 30 (for ease of understanding, the same terms and reference numerals are used for both devices). In the pole retention device of Fig. 4, chamber 34 is of a shallower depth than in the device of Fig. 3. Otherwise all feature of the device of Fig. 4 are the same as the device of Fig. 3. Also, it will be understood that chamber 34 may be replaced with a through-going aperture.

**[0030]** With reference to Fig. 4, antechamber 48 is provided in housing 44, the antechamber 48 having an opening 48a into an interior surface 34a of pole-receiving chamber 34. Access port 46 extends through said housing 44, extending from a first end 46a at said first top surface 33 of the device 30 to a second end 46b opening into said antechamber 48.

**[0031]** A clamp 50 is pivotably mounted within said antechamber 48, on pivot 52. Pivot 52 is arranged transverse to the housing 44 such that the axis of the pivot 52 is parallel to the interior surface 34a of the chamber 34 and to the first top surface 33 of the device body 32. The pivot 52 is located towards the opening 48a of the antechamber 48, adjacent the pole-receiving chamber 34.

**[0032]** Alternatively, as illustrated in Fig. 3, said clamp 50 may comprise a pair of circular projections 53 on opposite side of said clamp 50, said projections 53 being received in corresponding apertures 55 on opposed sides of antechamber 48. The projections 53 allow for the clamp 50 to pivot within the antechamber 48.

**[0033]** Clamp 50 is substantially L-shaped, with the pivot point located such that the free end of the relatively shorter first portion 50a of the clamp 50 is operable to pivot from the interior of the antechamber 48 into the interior of the pole-receiving chamber 34. The relatively longer second portion 50b of the clamp 50 extends away from said opening 48a of said antechamber 48, towards said second end 46b of said access port 46.

**[0034]** With reference to Figs. 3 and 4, helical spring 54 acts as resilient biasing means and is located in said antechamber 48, positioned substantially beneath the second end 46b of said access port 46. The spring 54 is arranged such that a first end 54a of said biasing means 54 bears upon the base of said antechamber 48 opposite

said second end 46b of said access port 46, and a second end 54b of said biasing means 54 bears upon the free end of said relatively longer second portion 50b of said clamp 50. The biasing means 54 biases the free end of said relatively longer second portion 50b of said clamp 50 is forced towards said second end 46b of said access port 46.

**[0035]** As can be seen from Fig. 4, said clamp 50 may be provided with a locating member 56 projecting from the underside of the free end of said relatively longer second portion 50b, said locating member 56 coupling with the first end 54a of said biasing means 54. The locating member 56 acts to prevent said biasing means 54 from becoming dislodged from its position acting on the second portion 50b of said clamp.

**[0036]** As can be seen in the embodiment of Fig. 4, the devices may further comprise a receiving channel 58 defined in the wall of said antechamber 48 opposite said second end 46b of said access port 46. The receiving channel 58 accommodates said first end 54a of said biasing means 54, and prevents movement or buckling of said biasing means 54 within said antechamber 48 while also providing a recess to contain said biasing means 54 when compressed.

**[0037]** Alternatively, the helical spring illustrated as biasing means 54 may be replaced by a conical spring, which has a smaller solid height due to telescoping, and which therefore does not require use of the receiving channel 58 to contain the spring when compressed and is less prone to buckling.

**[0038]** A threaded bolt 60 acting as a tightening means is located within said access port 46. The bolt 60 comprises a head end 60a and a bearing end 60b, the head of said bolt 60 (at said head end 60a) being exposed at the first end 46a of said access port 46. The head 60a is generally provided parallel to and below the top surface 33 of the device. This arrangement of the bolt head 60a means that the bolt head 60a is presented in an easily accessible position, which does not require a relatively complicated operation to actuate.

**[0039]** The bolt 60 is threaded through a retaining nut 62, said nut 62 maintained in position within said access port 46 by shoulder projections 64 projecting from the walls of said access port 46 directly above and below said nut 62. It will be understood that said retaining nut 62 may be replaced by a suitably threaded portion integrally formed in the body of the device.

**[0040]** As can be seen in Fig. 4, said bolt 60 extends through said nut 62 to the second end 46b of said access port 46, where it can be seen that said bearing end 60b of said bolt 60 bears against the free end of said relatively longer second portion 50b of said clamp 50, substantially opposite said locating member 56.

**[0041]** The head of said bolt 60 is arranged to receive a tool (screw driver, Allen key, etc.) to tighten or loosen said threaded bolt 60 within said retaining nut 62, and thereby advance said bolt 60 within said access port 46. Furthermore, a cover 66 for said access port 46 is provided on said top surface 33, to prevent the accumulation of debris within the access port 46. Said cover 66 may also be lockable, to prevent unauthorised access to the holding system.

**[0042]** In use, the clamp 50 is initially in its at rest position, as indicated in Fig. 4, with said free end of said first portion 50a contained within said antechamber 48, said bolt 60 completely contained within said access port 46, and said free end of said second portion 50b of said clamp 50 abutting said bearing end 60b of said bolt 60.

**[0043]** The lower end of a pole to be installed (not shown) is then positioned within the device chamber 34. To secure the pole in position, the holding system 42 is actuated by applying a screwing motion to the head of said bolt 60 (through use of an appropriate tool, as described above). As the bolt 60 advances through the retaining nut 62 in direction indicated by the arrow in Fig. 4, the bearing end 60b of said bolt 60 acts on the free end of the second portion 50b of said clamp 50, forcing the free end of the second portion 50b away from said access port 46 and compressing said biasing means 54. The free end of the first clamp portion 50a is consequently pivoted in the direction of the chamber 34 (as indicated by the arrow), the free end acting to bear against the surface of the contained pole. The further that the bolt 60 is advanced, the greater the pivoting force that is applied through the clamp to the surface of the pole, resulting in the pole being securely retained within the device.

**[0044]** When it is desired to remove a pole retained in the device, a reverse screwing force is applied to the head of the bolt 60. As the bolt 60 is retracted back into the access port 46, said biasing means 54 acts to return the clamp 50 to the at-rest position, removing the first portion 50a of the clamp 50 from bearing against the pole, allowing the pole to be removed from the device.

**[0045]** It will be understood that different configurations of the holding system 42 may be employed. For example, instead of the bolt 60 bearing on the free end 50b of the clamp 50, a rack-and-pinion mechanism may be used, wherein a first end of a rack is accessible at said top surface 33 of the device body 32. In such an embodiment, the clamp 50 further comprises a toothed pinion section provided at the free end 50b of the clamp 50, said pinion section coupled with said rack. As the rack is advanced or retracted by a user, the clamp 50 is pivoted within the device housing, such that the first end 50a of the clamp is advanced or retracted relative to the pole-receiving chamber 34, allowing for a pole to be releasably retained within the chamber 34.

**[0046]** In an alternative embodiment, a threaded pin may be provided within the free end 50b of the clamp 50, the threaded pin coupled with said threaded bolt 60. As the bolt 60 is rotated, the threaded pin will travel along the length of the bolt 60, coupling the clamp 50 with the bolt 60. Such an arrangement allows for the translation of the rotational movement of the bolt 60 into the pivoting movement of the clamp 50, allowing for a pole to be releasably retained within the socket 34.

**[0047]** It will be understood that different configurations of the clamp 50 may be used. For example, free end 50a or bearing face of the clamp 50 may be formed as two or more separate fingers, which would either bear directly on a pole within chamber 34 at two or more locations, or bear on a pad (or a plurality of pads), which then act on the contained pole. Alternatively, the free end 50a or bearing face of the clamp 50 may be toothed.

**[0048]** The invention is not limited to the embodiments described herein but can be amended or modified without departing from the scope of the present invention.

## Claims

**1.** A device for supporting a pole, comprising:

a housing having a top surface and a socket defined within the housing, said socket being open to the top surface for receiving an end of a pole;
a locking mechanism disposed in a chamber adjacent said socket and operable to engage a pole in said socket to thereby lock the pole in place in the socket; and
an access port open to the top surface and having therein an actuating member, said member being presented to the top surface for actuation by a user, said member co-operating with said locking mechanism to enable said user to engage the locking mechanism by actuating said member.

**2.** The device of claim 1, wherein said locking mechanism is a clamping means.

**3.** The device of claim 2, wherein said actuating member is operable to act on said clamping means to advance said clamping means into the interior of said socket to receive a pole, said clamping means adapted to retain a pole within said socket.

**4.** The device of claim 3, said device further comprises a resilient biasing means provided in said chamber, said resilient biasing means acting on said clamping means to bias said clamping means away from the interior of said socket to receive a pole.

**5.** The device of claim 4, wherein said resilient biasing means is selected from one of: a helical spring; or a conical spring.

**6.** The device of claim 4 or claim 5, said device further comprising a locating member projecting from said clamping means, said resilient biasing means coupled with said locating member to retain said biasing means relative to said clamping means.

**7.** The device of claim 3,wherein said actuating member is further operable to retract said clamping means from the interior of said socket to receive a pole.

**8.** The device of claim 7, wherein said actuating member and said clamping means form a rack and pinion mechanism.

**9.** The device of any one of claims 2-8, wherein said clamping means is pivotably mounted within said chamber.

**10.** The device of claim 9, wherein said device further comprises a pivot provided within said chamber, said clamping means pivotably mounted on said pivot.

**11.** The device of any one of claims 2-10, wherein said clamping means comprises a substantially L-shaped clamp body, wherein a first free end of said clamp body is operable to advance into the interior of said socket to receive a pole, said first free end acting on a surface of said received pole to retain said pole within said socket, and wherein said actuating member acts on a second free end of said clamp body.

**12.** The device of claim 11, wherein said first free end of said clamp body is formed by a plurality of projecting members, said projecting members operable to advance into the interior of said socket to receive a pole.

**13.** The device of any one of claims 2-11, wherein said clamping means comprises a pair of projecting members.

**14.** The device of any preceding claim, wherein the actuating member comprises a threaded bolt.

**15.** The device of claim 14, wherein the clamping means comprises a threaded pin coupled to said threaded bolt.

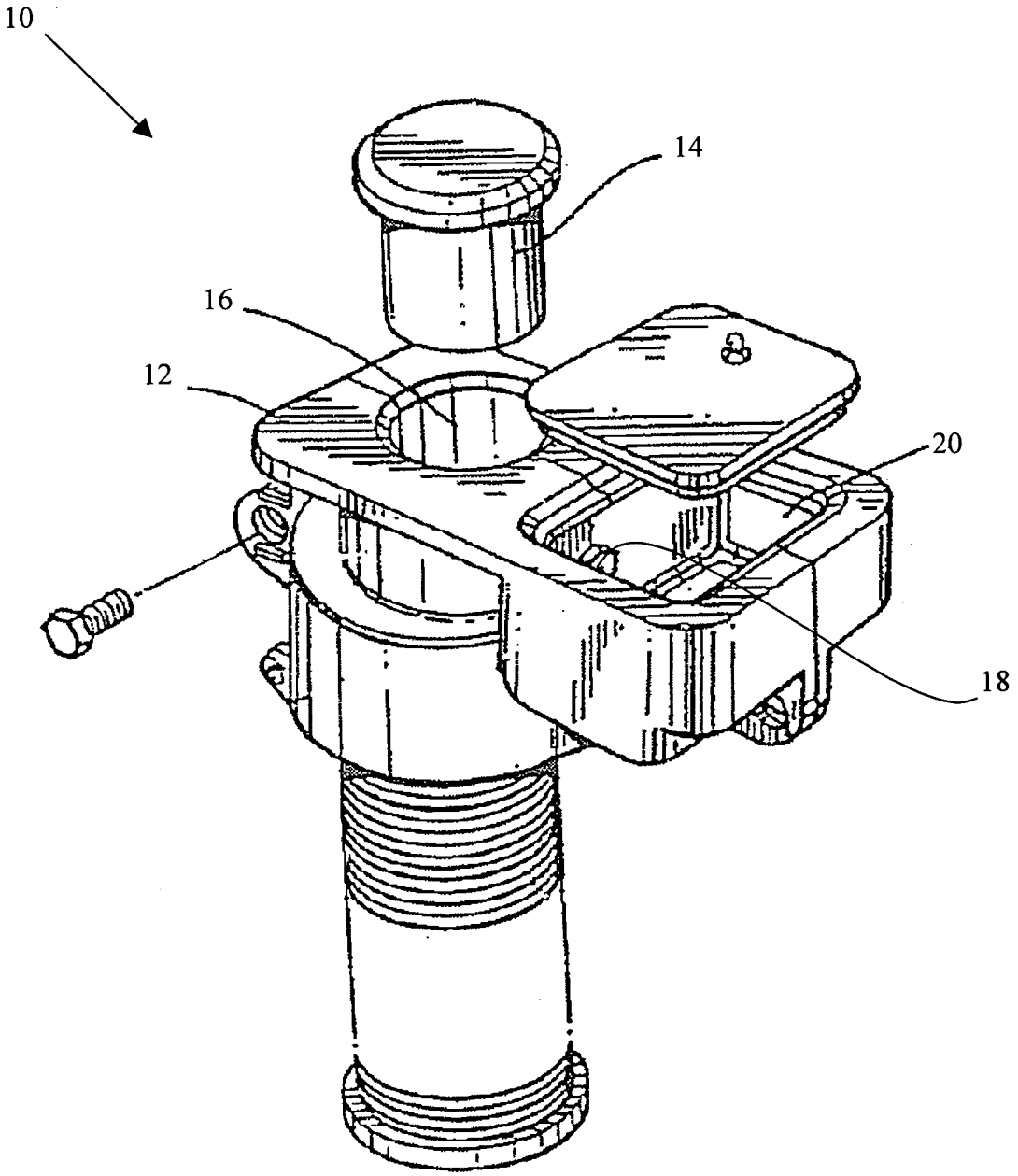



Fig. 1
(Prior Art)

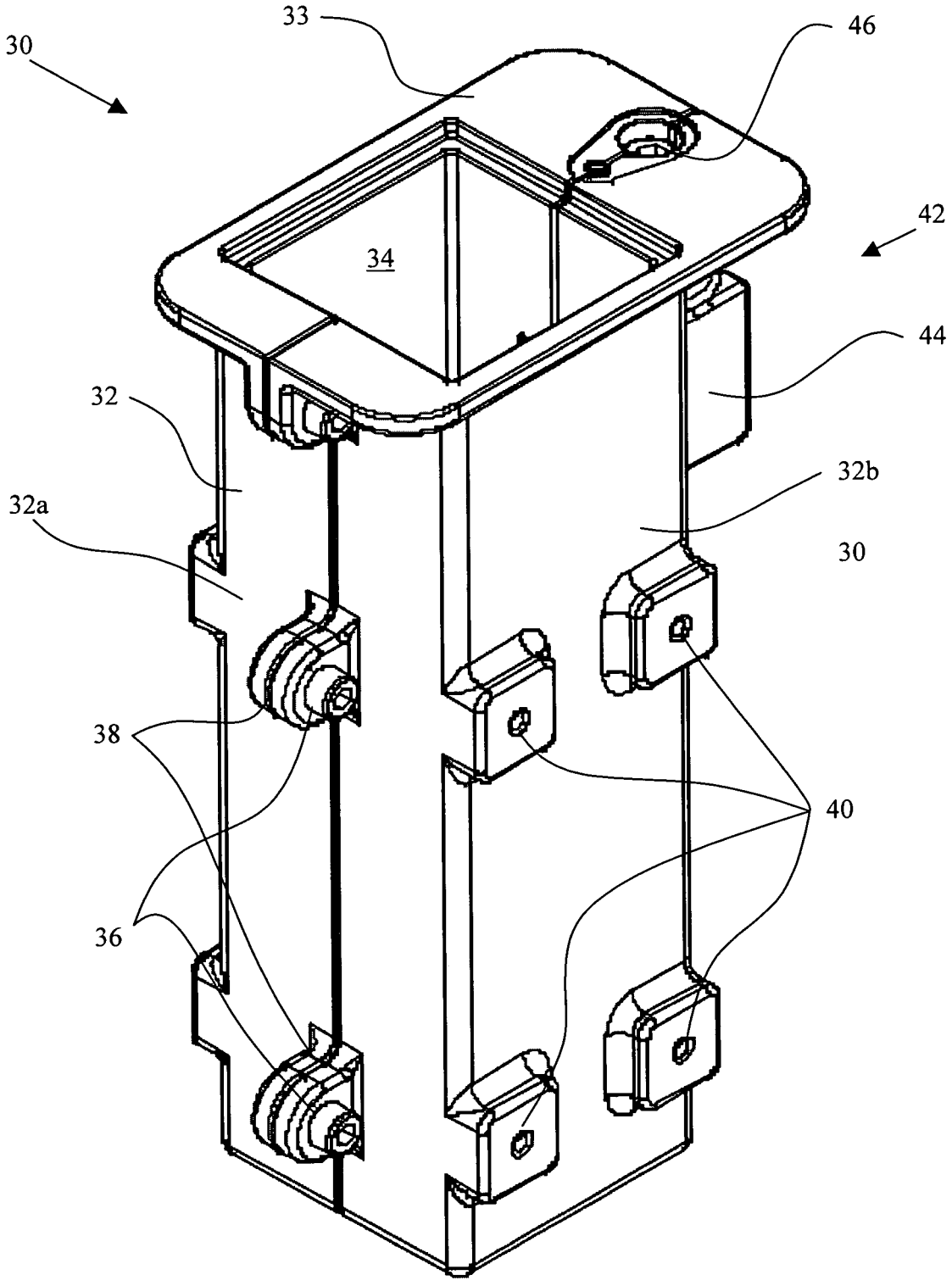



Fig. 2

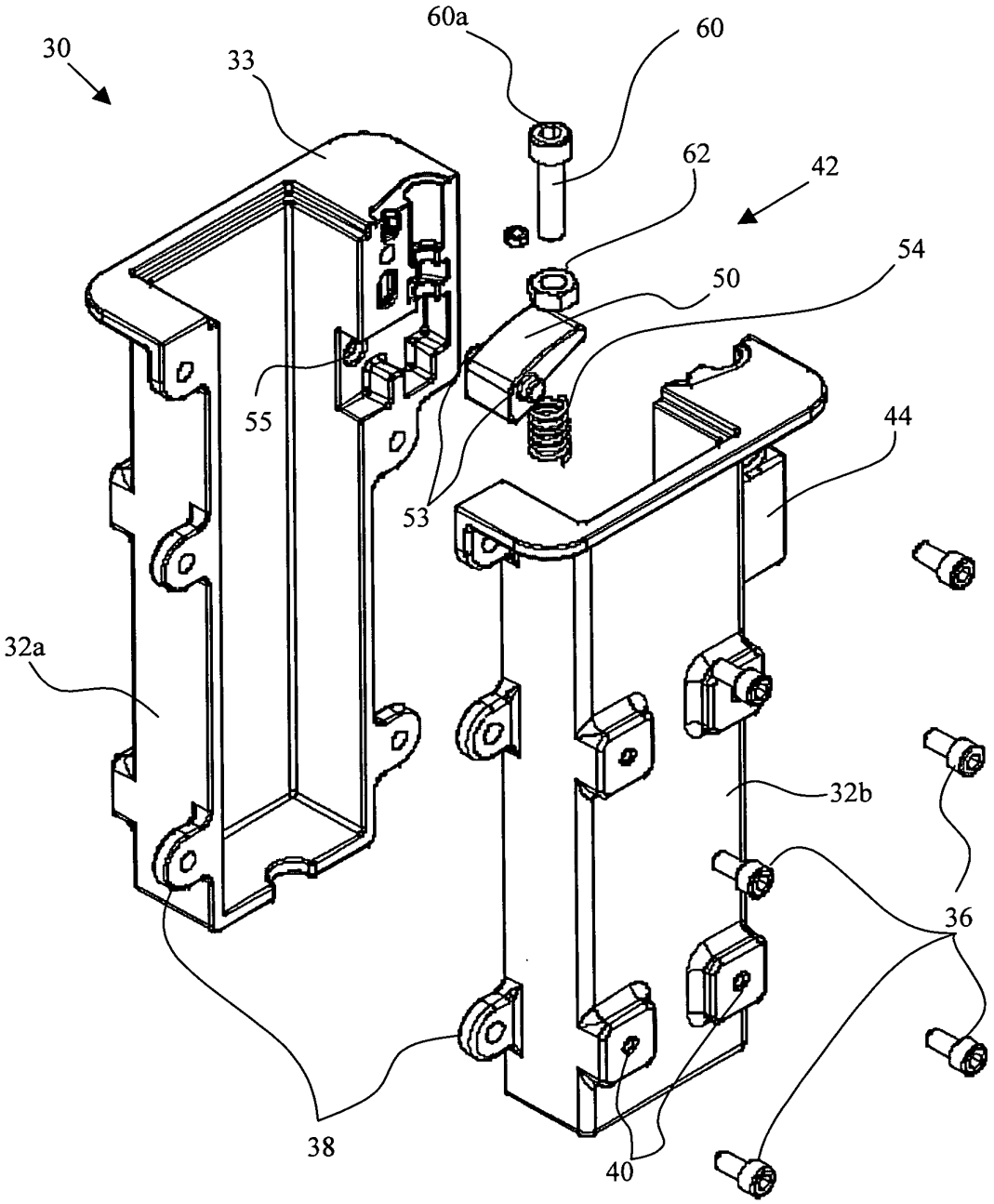
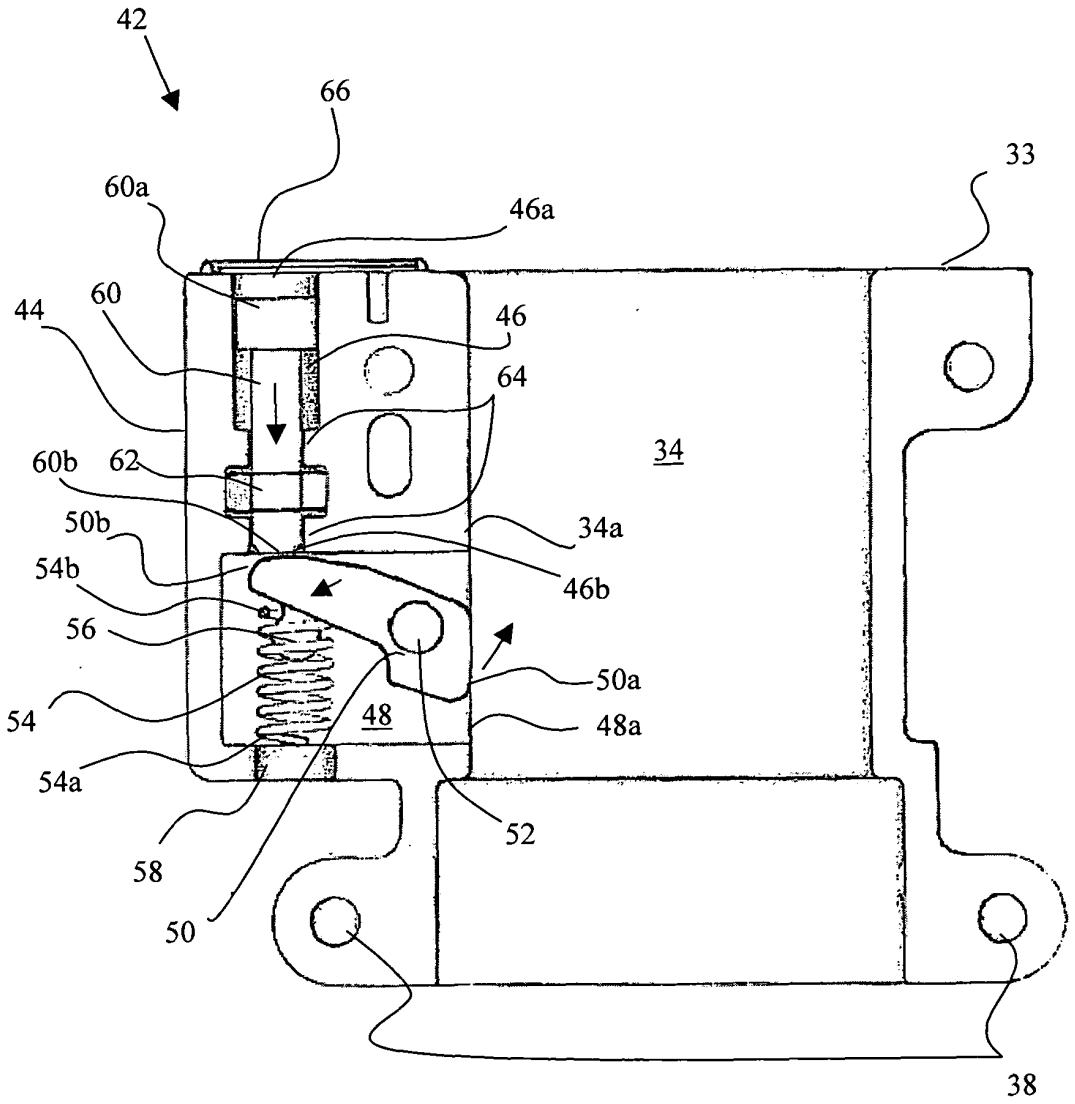



Fig. 3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46a
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64
34
60b
62
50b
34a
54b
46b
56
50a
54
48
48a
54a
52
58
50
38

Fig. 4

## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


- GB 2254349 A **[0002]**