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(54) **CONCEALED ADJUSTABLE MOUNTING DEVICE WITH IMPROVED FIXING SYSTEM TO THE TOP CORNER OF WALL-FURNITURE**

VERBORGENE EINSTELLBARE MONTAGEVORRICHTUNG MIT EINEM VERBESSERTEN FIXIERUNGSSYSTEM FÜR DIE OBERE ECKE VON EINEM WANDMÖBEL

DISPOSITIF DE MONTAGE REGLABLE CACHE AVEC SYSTEME AMELIORE DE FIXATION AU COIN SUPERIEUR D'UN MEUBLE DE PAROI

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(73) Proprietor: **LEONARDO S.r.l.**
22060 Figino Serenza (Como) (IT)

(72) Inventor: **CATTANEO, Carlo**
I-22060 Figino Serenza (IT)

(74) Representative: **Martegani, Franco et al**
Patent Attorney
Via Carlo Alberto, 41
20052 Monza (Milano) (IT)

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Description

[0001] The present invention refers to a concealed and adjustable mounting device, with improved fixing system to the top corner of wall-furniture.

[0002] Mounting devices of this type (also commonly called concealed furniture attachments) are, for example, described in EP 555.924, EP 1.008.316 and DE 201 03 728, to which we refer should possible further clarification be necessary on the general structure of said devices, on their specific purpose and operation. In short, a mounting device of the type described in EP 1.008.316 and DE 201 03 728 is structurally formed from a metal plate, in a single elongated piece, having a plurality of attachment pins which extend from a side thereof. The mounting device described in EP 555.924 also has a plurality of holes for attachment screws on the opposite side to said pins.

[0003] The plate is intended to be fixed to the top corner of the furniture, and possibly also to the top wall (bonnet). From said plate an articulated arm extends upwards having, at its free end, a hooking element which is intended to engage freely with a rod, i.e. a dowel, fixed to the wall, or in any case to a bearer member suitable for such a purpose.

[0004] The position of said arm can be adjusted, both in depth and in height, with respect to the plate and, for such a purpose, kinematisms and manoeuvring screws accessible from the inside of the furniture, through one or more openings made in the rear lining.

[0005] In this way it is possible to adjust, both in depth and in height, obviously within certain limits, the position of the wall-furniture, after this has been fixed to the wall, engaging the hooking elements of the arms of the mounting devices with the bearer rod, or with another equivalent bearer element, fixed to the wall.

[0006] In the case of mounting devices equipped only with pins on one side of the attachment plate of the device to the top corner of the furniture, when the wall furniture is hung to the wall, the weight thereof generates a force on the articulated arm which tends to make the mounting device itself rotate in the direction of removal, or withdrawal, of the pins from the respective seats foreseen in the top corner.

[0007] For this reason it would be indispensable for mounting devices of this type to be equipped with positive attachment means (in addition to the pins), capable of keeping the mounting device in the correct position on the top corner of the furniture.

[0008] In EP 1.008.316 said positive attachment means consist of an eccentric dowel foreseen at the lower end of the plate of the mounting device.

[0009] Said dowel extends from the same side as the pins, substantially lying on the same plane, and is rotatable (substantially by 180°) between a non-operative position, of insertion thereof in a respective seat of the top corner of the furniture, and an operative position in which teeth, or attachment ridges thereof, engage stably in said seat, gripping the body of the furniture.

[0010] The rotation of the dowel is controlled manually through a lever which, in non-operative position, is contained inside the plate of the mounting device whereas, in operative position, it extends, for a certain portion, beyond the lower end of the plate itself.

[0011] Positive attachment means of the plate to the top corner of the furniture, of the type suggested in EP 1.008.316, whilst still ensuring a stable anchoring of the mounting device to the furniture, have the serious drawback of being able to be manoeuvred voluntarily, or even accidentally, taking the aforementioned lever which commands the rotation of the dowel from the operative position, back into the non-operative position, with the danger of withdrawal of the mounting device from the top corner of the furniture, with the clear possible serious consequences of the case.

[0012] The general purpose of the present invention is that of avoiding the drawbacks of the prior art, realising a concealed mounting device of the type mentioned above, equipped with positive attachment means (in addition to the pins), capable of ensuring stable and secure attachment through time of the mounting device to the furniture, where it is impossible to operate on said attachment means, voluntarily and accidentally, in the direction to cause a partial or total withdrawal of the plate of the mounting device from the top corner of the furniture.

[0013] The aforementioned purpose is accomplished by mounting devices having the characteristics outlined in the main claim and the attached sub-claims.

[0014] The structural and functional characteristics of the mounting device according to the invention, and its advantages compared to the prior art, shall clearly be understood from the following exemplifying description, referring to the attached drawings, in which:

- figure 1 is a top front view illustrating a non-limiting example of a concealed mounting device realised according to the invention;
- figure 2 is a section view taken according to the plane line II-II of figure 1;
- figure 3 is a top side view according to the arrow F of figure 1;
- figures 4 and 5 illustrate the mounting device of figures 1-3 fixed to wall-furniture, where said wall-furniture is only partially illustrated, and in figure 5 is hung on the wall;
- figures 6-8 are details in section illustrating the ways of positive attachment of the mounting device to the top corner of the furniture using the attachment means according to the present invention;
- figures 9-15 are details illustrating the stable mounting system on the plate of the mounting device of the positive attachment means according to the invention, where figure 14 is an enlarged section taken according to the plane line XIV-XIV of figure 1; and
- figure 16 is a figure, like figure 4, through which the purpose of the invention is better explained. First of all referring to figures 1-5 of the drawings, the mount-

ing device according to the invention is wholly indicated with 20, and is structurally formed from the combination of a plate 21, having a substantially elongated rectangular configuration, and an arm 22 fixed to said plate 21 in an articulated way.

[0015] The plate 21 is intended to be fixed to the top corner 23 of wall-furniture 24, of which - for simplicity of illustration - only an upper end is illustrated, which is formed from the same top corner 23, from an upper bonnet 25 and from a rear lining 26.

[0016] The partial attachment of the plate 21 to the top corner 23 is carried out, in a known way, through a plurality of pins 27 extending from a side thereof and, as shall be explained later on, according to the invention, through further securing positive attachment means 28.

[0017] The arm 22 is hinged, or articulated, through side pins 29 to a mother screw 30 which screws into a screw 31 of the plate 21.

[0018] As can clearly be seen from the drawings, said screw 31 is axially fixed onto the plate 21, but with possibility of rotation, extending between two opposite walls 59, 60.

[0019] For such a purpose, the head of the screw 31 consists of a first gearing 32 coupled at 90° with a second gearing 33, which has, on the opposite side to the teeth, a seat 34 for a manoeuvring screwdriver.

[0020] It is thus clear how the rotation of the gearing 33 causes, through the gearing 32, a rotation of the screw 31 and, consequently, the translation in one of the two directions of the arrow F1 of the mother screw 30, thus the displacement of the arm 20.

[0021] This causes a vertical adjustment of the position of the arm 22 with respect to the plate 21.

[0022] The position of the arm 22 with respect to the plate 21 can also be adjusted horizontally, through a screw 35 which screws into a seat 36 of the plate 21 itself and is anchored through a head 37 to a vertical slot 38 of the arm 22. The head of the screw 37 has a cross-head 39 for a manoeuvring screwdriver.

[0023] Also in this case it is clear how, by acting on the adjustment screw 35, a variation is caused of the angle formed by the arm 22 with the plate 21 and, consequently, an adjustment in depth of the position of the wall-furniture 24 with respect to the wall 40.

[0024] The arm 22 is also equipped, at the free end, with a hooking element 41 intended to hook onto a support 42 fixed to the wall 40.

[0025] The height and depth adjustment kinematisms, described above as an example and not for limiting purposes, are of a type well known to men skilled in the art, and could also be different.

[0026] Concealed adjustable mounting devices of the type described above are fixed to the top corner 23 of the wall furniture (manually or even automatically), by inserting "with interference" the pins 27 in respective seats 43 of the top corner 23 (figures 4, 6-8 and 16). Just the pins 27, however, are not able to ensure the stable and secure attachment through time of the mounting device to the top corner of the furniture. Indeed, as better explained in figure 16, when the wall-furniture is hung on the wall, its weight generates a force 44 on the arm 22 which tends to make the mounting device rotate in the direction of the arrow 61 about the point P, generating a reaction force 45 which tends to pull the pins 27 out from the top corner 23 of the furniture.

[0027] To avoid the above, according to the invention, the plate 21 has, in addition to the pins 27, the aforementioned positive attachment means 28.

[0028] In the example shown, said positive attachment means 28 comprise a tubular dowel 46, for example made from plastic, or else metal, consisting of interspaced circumferential partitions 47, radially yielding in an elastic way, and having annular anchoring teeth 48 (figures 6-8).

[0029] Said dowel 46 also has an annular anchoring throat 49 in a corresponding cradle seat 50 of the plate 21 (figures 9-11), which is aligned with an opposite and interspaced hole 55 (oval or deformed in another way), of the plate 21 itself.

[0030] Still according to the invention, an actuator member, in the form of a metallic expansion pin 51, comprising two sections 52, 53 with a shorter and longer diameter respectively, cooperates with said tubular dowel 46, The diameter of the longer section 53 is substantially equal to the inner diameter of the tubular dowel 46.

[0031] As can clearly be seen from the drawings, the expansion pin 51 is inserted coaxially (passing through the hole 55) inside the tubular dowel 46 until the free end of its section 53, with a longer diameter, is brought into abutment against a breakable transversal diaphragm or partition 54 of the dowel 46 itself.

[0032] The section 52 with a shorter diameter of the pin 51 is, on the other hand, anchored to the hole 55 of the plate 21, with the possibility of axial translation.

[0033] The operation of the attachment system 28 according to the invention is clear from that which has been described above with reference to figures 6-8 of the drawings and, in brief, is the following.

[0034] At the time of insertion of the pins 27 in the seats 43 of the top corner 23 of the furniture, the elastically yielding partitions 47 of the dowel 46 are also introduced in a respective seat 56, with a diameter substantially equal to the outer diameter of the dowel 26, which is less than the outer diameter of the teeth 48.

[0035] Consequently, the elastically yielding partitions of the dowel 46 flex inwards, as shown in figure 7.

[0036] With the dowel 46 in this condition, for example manually through a hammer, or automatically through a thrusting element, the expansion pin 51 can be introduced (driven) inside the dowel 46 with consequent breaking of the partition 54, thus causing the expansion of the partitions 47 and the penetration of the annular teeth 48 in the solid body of the top corner 23, which leads to the stable and irremovable attachment of the mounting device.

[0037] Indeed, from figure 8 it is clear how the expansion pin 51 is completely inaccessible from the outside.

[0038] The purpose mentioned in the preamble of the description is thus achieved.

[0039] Figures 9-15 illustrate the possible assembly steps of the dowel 46 and of the relative expansion pin 51 on the plate 21.

[0040] As illustrated in the details of figures 9 and 10 and as already partly described above, the dowel 46 and the expansion pin 51 have a seat between two opposite parallel walls 57, 58 formed integrally from the plate 21, which respectively have the cradle 50 and the hole 55 for housing the dowel 46 and the section 52 of the expansion pin 51.

[0041] The assembly steps are the following.

[0042] The dowel 46 is housed with its anchoring throat 49 in the cradle 50 (figures 9, 10), after which the pin 51 is inserted as shown in figures 11-13.

[0043] The pin 51 is held in position, with the possibility of axial sliding, through deformation (in the direction of the arrow) of the hole 55, as shown in figures 12-15.

[0044] It should be noted that (figure 12), in the assembled position, the section 53 of the pin 51 rests upon the base 62 of its seat, so as to ensure a correct translational movement into the position of figure 8. Thanks to this particular assembly procedure of the dowel 46 and of the pin 51, the positive attachment system 28 according to the invention, as already mentioned above, when operative, is practically inaccessible, thus being extremely secure.

[0045] As already stated, the horizontal and vertical adjustment systems of the mounting device according to the invention have been illustrated as a non-limiting example, with them being able to be of a different type, provided they can be combined with the attachment system 28, which is the essence of the invention itself.

[0046] Therefore, the scope of protection of the invention is defined by the following claims.

Claims

1. Concealed adjustable mounting device of the type comprising, in combination: a plate (21) having a hooking element, further positive attachment means of said plate (21) and a plurality of pins (27), which extend from a side thereof, for attachment to the top corner (23) of wall- furniture (24) through insertion of said pins (27) in respective holes (43), and said hooking element of said plate (21) to a bearer member (42) fixed to a wall (40), between said plate (21) and said hooking element being foreseen depth and height adjustment kinematisms, horizontally and vertically, of the hooking element with respect to the plate (21), said further positive attachment means of the plate (21) to said top corner (23) extending from the same side of said plate (21) as said pins (27) and also cooperating with the aforementioned pins (27), **characterised in that** said further positive attachment means (28) consist of at least one dowel (46) suitable for being inserted in a respective seat (56) of said top corner (23), with said dowel (46) also being associated an actuator member being an expansion pin (51) that is mobile between a first non-operative position in which said dowel (46) can be inserted in said seat (56), and a second operative position in which said dowel (46) is stressed so as to stably anchor in said seat (56).

2. Mounting device according to claim 1, **characterised in that** said expansion pin (51) in said second operative position is partially contained inside said dowel (46) and partially inside said plate (21).

3. Mounting device according to claim 1, **characterised in that** said dowel (46) is tubular and comprises interspaced circumferential partitions (47), radially yielding in an elastic manner, having annular anchoring teeth (48) to said seat (56).

4. Mounting device according to claim 1, **characterised in that** said expansion pin (51) comprises two sections (52,53), with a longer and shorter diameter respectively, the diameter of the section (53) being substantially equal to the inner diameter of the tubular dowel (46) where said section (53) houses slidably, whereas the section (52) with a shorter diameter passes through a deformed hole (55) of the plate (21), with the possibility of axial translation.

5. Mounting device according to claim 4, **characterised in that** said section (53) abuts against a breakable diaphragm (54) of the dowel (46).

6. Mounting device according to claim 1, **characterised in that** said dowel (46) also has an annular throat (49) for anchoring in a corresponding cradle seat (50) of the plate (21), which is aligned with an opposite and interspaced hole (55) of the plate (21) itself, said hole (55) being crossed by said expansion pin (51), said cradle seat (50) and said hole (55) being respectively formed on two opposite and interspaced walls (57,58) of the plate (21).

7. Mounting device according to claim 4, **characterised in that** the section (53) of the pin (51) rests upon a base (62) of its seat, so as to ensure a correct translational movement of the pin (51) itself.

Patentansprüche

1. Verborgene einstellbare Montagevorrichtung von dem Typ, die umfasst, in Kombination: eine Platte (21), die ein Hakenelement, weitere formschlüssige Anbringungsmittel der Platte (21) und eine Vielzahl

von Stiften (27) aufweist, die sich von einer Seite davon erstrecken, zur Anbringung an der oberen Ekke (23) eines Wandmöbels (24) durch Einsetzen der Stifte (27) in jeweilige Löcher (43) und des Hakenelements der Platte (21) an einem Trägerelement (42), das an einer Wand (40) befestigt ist, wobei zwischen der Platte (21) und dem Hakenelement Tiefen- und Höheneinstellungs-Kinematikelemente, horizontal und vertikal, des Hakenelements mit Bezug auf die Platte (21) vorgesehen sind, wobei die weiteren formschlüssigen Anbringungsmittel der Platte (21) an der oberen Ecke (23) sich von der gleichen Seite der Platte (21) wie die Stifte (27) erstrecken und auch mit den vorstehend erwähnten Stiften (27) zusammenarbeiten, **dadurch gekennzeichnet, dass** die weiteren formschlüssigen Anbringungsmittel (28) aus zumindest einem Dübel (46) bestehen, der geeignet ist, in einen entsprechenden Sitz (56) der oberen Ecke (23) eingesetzt zu werden, wobei dem Dübel (46) auch ein Aktorelement zugeordnet ist, das ein Spreizstift (51) ist, der beweglich ist zwischen einer ersten nichtfunktionalen Stellung, in der der Dübel (46) in den Sitz (56) eingesetzt werden kann, und einer zweiten funktionalen Stellung, in der der Dübel (46) gespannt ist, um sich stabil in dem Sitz (56) zu verankern.

2. Montagevorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Spreizstift (51) in der zweiten funktionalen Stellung teilweise innerhalb des Dübels (46) und teilweise innerhalb der Platte (21) enthalten ist.

3. Montagevorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Dübel (46) rohrförmig ist und voneinander beabstandete Umfangsunterteilungen (47) umfasst, die auf eine elastische Weise radial nachgiebig sind und ringförmige Verankerungszähne (48) an dem Sitz (56) aufweisen.

4. Montagevorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Spreizstift (51) zwei Teilstücke (52, 53) mit einem längeren bzw. kürzeren Durchmesser umfasst, wobei der Durchmesser des Teilstücks (53) im Wesentlichen gleich dem Innendurchmesser des röhrförmigen Dübels (46) ist, wo das Teilstück (53) verschiebbar untergebracht ist, wobei das Teilstück (52) mit einem kleineren Durchmesser durch ein eingeformtes Loch (55) der Platte (21) mit der Möglichkeit einer axialen Verschiebung verläuft.

5. Montagevorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** das Teilstück (53) gegen eine zerbrechliche Membran (54) des Dübels (46) anschlägt.

6. Montagevorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Dübel (46) auch eine ringförmige Verengung (49) zur Verankerung in einem entsprechenden Gabelsitz (50) der Platte (21) aufweist, die mit einem entgegengesetzten und beabstandeten Loch (55) der Platte (21) selbst ausgerichtet ist, wobei das Loch (55) durch den Spreizstift (51) durchquert wird, wobei der Gabelsitz (50) und das Loch (55) jeweils an zwei entgegengesetzten und voneinander beabstandeten Wänden (57, 58) der Platte (21) gebildet sind.

7. Montagevorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** das Teilstück (53) des Stiftes (51) auf einer Basis (62) seines Sitzes derart aufliegt, dass eine richtige Verschiebebewegung des Stiftes (51) selbst sichergestellt ist.

Revendications

1. Dispositif de montage réglable caché du type comprenant, en combinaison : une plaque (21) comportant un élément d'accrochage, un autre moyen de fixation positive de ladite plaque (21) et une pluralité d'ergots (27), qui s'étendent depuis un côté de celleci, pour la fixation à l'angle supérieur (23) d'un meuble suspendu (24) par insertion desdits ergots (27) dans des trous respectifs (43), et ledit élément d'accrochage de la plaque (21) à un élément de support (42) fixé sur un mur (40), entre ladite plaque (21) et ledit élément d'accrochage étant prévue une cinématique de réglage en profondeur et en hauteur, horizontalement et verticalement, de l'élément d'accrochage par rapport à la plaque (21), ledit autre moyen de fixation positive de la plaque (21) audit angle supérieur (23) s'étendant depuis le même côté de la plaque (21) que lesdits ergots (27) et coopérant aussi avec les ergots susmentionnés (27), **caractérisé en ce que** ledit autre moyen de fixation positive (28) est constitué d'au moins une goupille (46) adaptée pour être insérée dans un siège respectif (56) dudit angle supérieur (23), ladite goupille (46) étant aussi associée à un élément d'actionnement qui est un axe expansible (51) qui est mobile entre une première position non fonctionnelle dans laquelle ladite goupille (46) peut être insérée dans ledit siège (56), et une deuxième position, fonctionnelle, dans laquelle ladite goupille (46) est contrainte afin de s'ancrer de façon stable dans ledit siège (56).

2. Dispositif de montage selon la revendication 1, **caractérisé en ce que** ledit axe expansible (51) dans la deuxième position, ou position fonctionnelle, est partiellement contenu à l'intérieur de ladite goupille (46) et partiellement à l'intérieur de ladite plaque (21).

3. Dispositif de montage selon la revendication 1, **caractérisé en ce que** ladite goupille (46) est tubulaire et comprend des cloisons circonférentielles espacées (47), cédant radialement de manière élastique, comportant des dents d'ancrage annulaires (48) avec ledit siège (56).

4. Dispositif de montage selon la revendication 1, **caractérisé en ce que** ledit axe expansible (51) comprend deux sections (52, 53), respectivement avec un diamètre long et un diamètre court, le diamètre de la section (53) étant substantiellement égal au diamètre intérieur de la goupille tubulaire (46) où ladite section (53) se loge de façon coulissante, tandis que la section (52) ayant un plus petit diamètre passe dans un trou déformé (55) de la plaque (21), avec la possibilité de suivre une translation axiale.

5. Dispositif de montage selon la revendication 4, **caractérisé en ce que** ladite section (53) bute contre une membrane cassable (54) de la goupille (46).

6. Dispositif de montage selon la revendication 1, **caractérisé en ce que** ladite goupille (46) comporte en outre une gorge annulaire (49) pour permettre l'ancrage dans un siège de berceau correspondant (50) de la plaque (21), qui est annulée avec un trou opposé et espacé (55) de la plaque (21) elle-même, ledit trou (55) étant traversé par ledit axe expansible (51), ledit siège de berceau (50) et ledit trou (55) étant formés respectivement sur deux parois opposées et espacées (57, 58) de la plaque (21).

7. Dispositif de montage selon la revendication 4, **caractérisé en ce que** la section (53) de l'axe (51) repose sur une base (62) de son siège, afin d'assurer un mouvement de translation correct de l'axe (51) lui-même.

Fig. 1

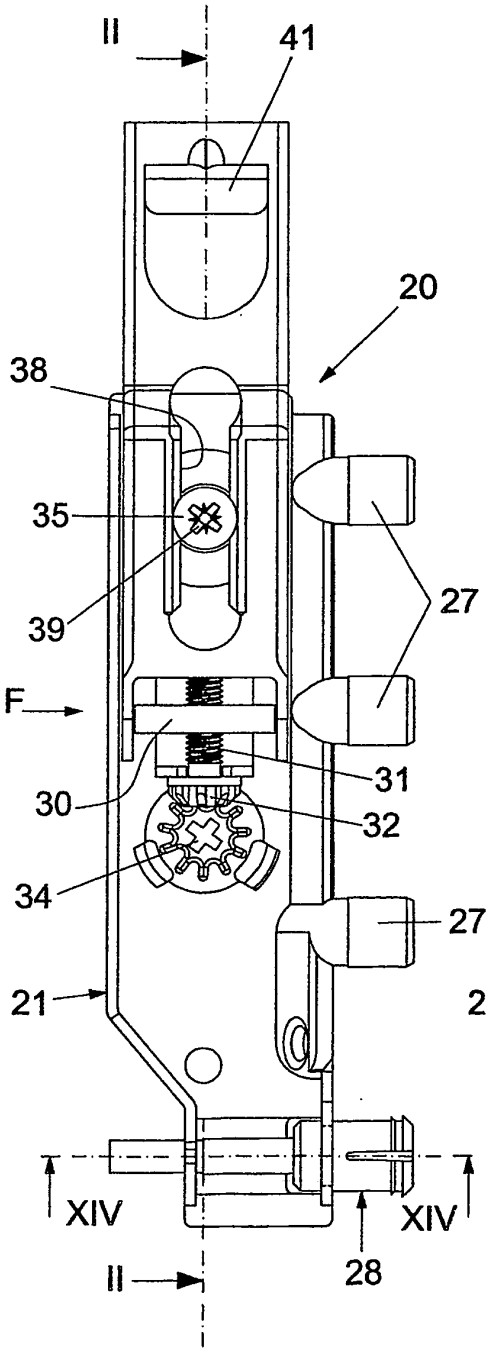


Fig. 2

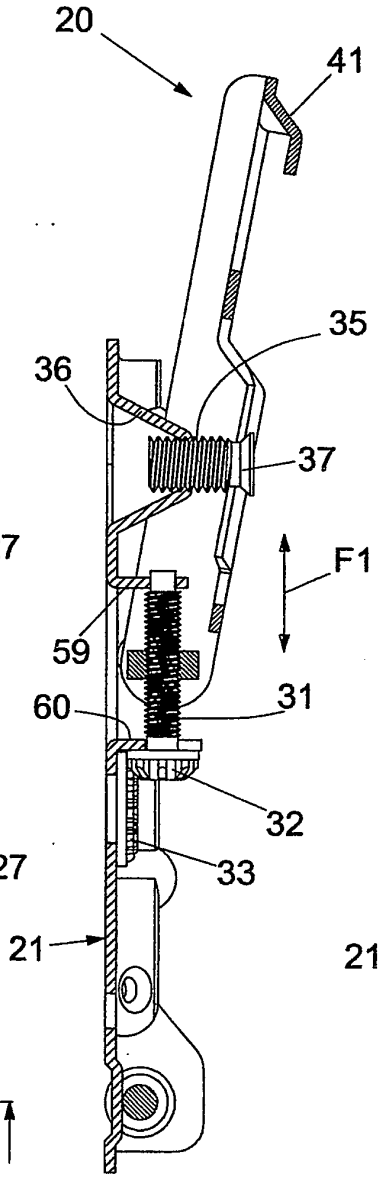


Fig. 3

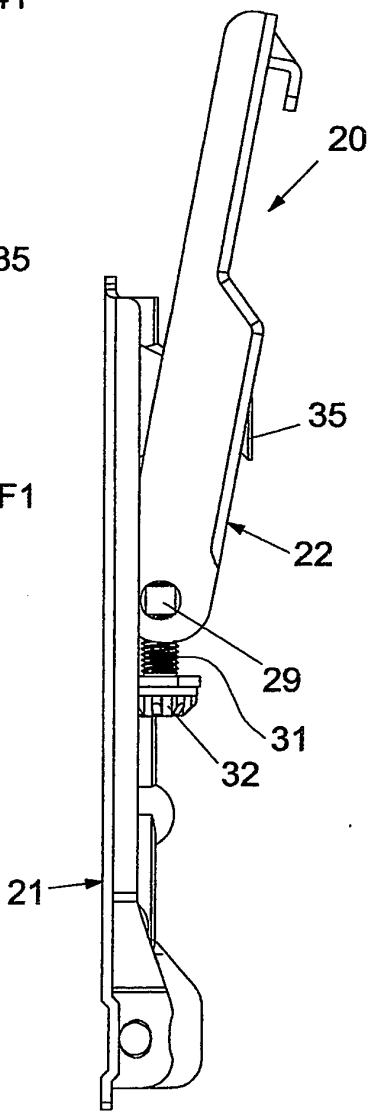


Fig. 4

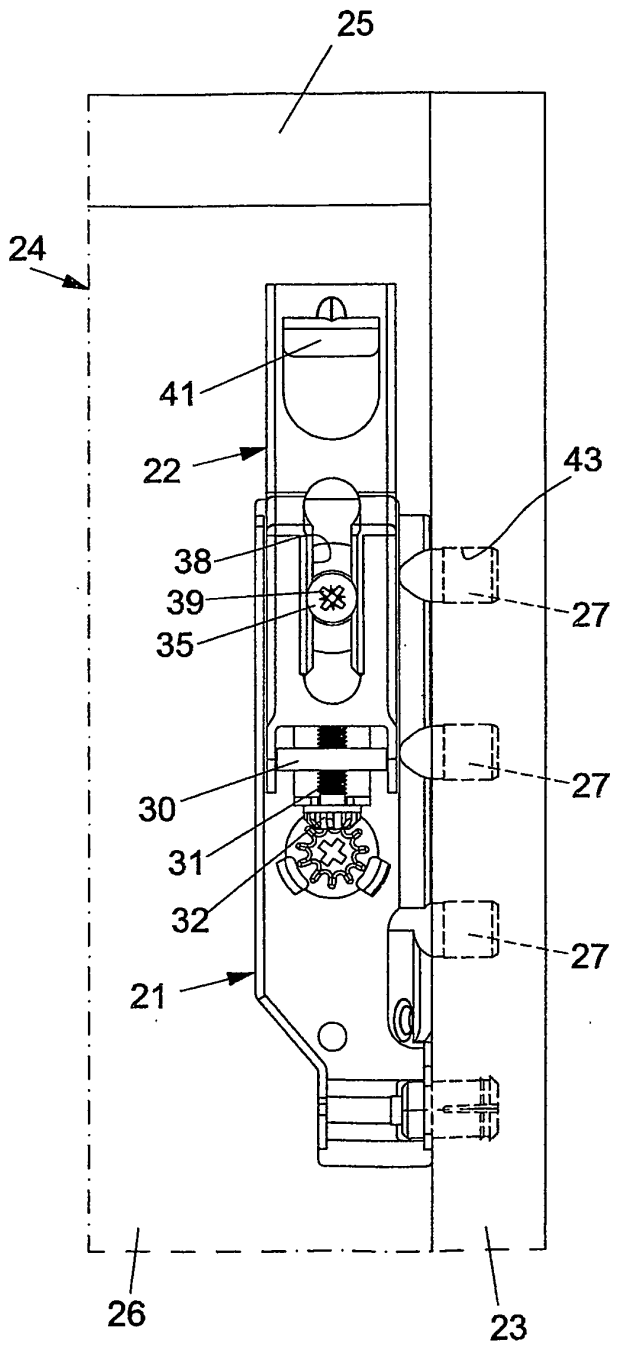
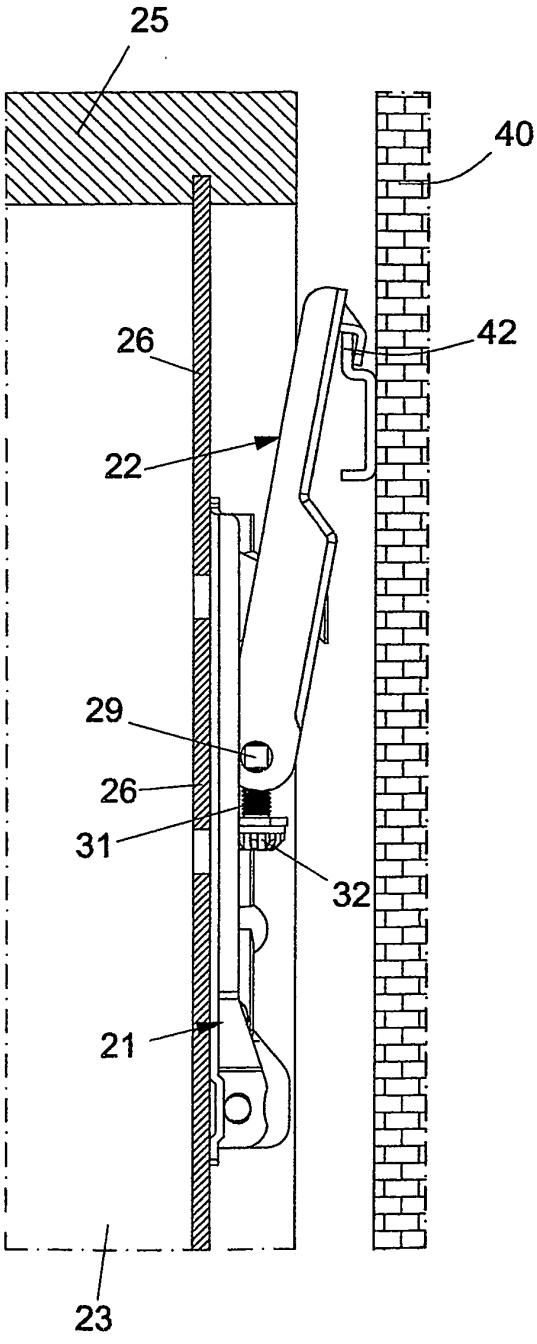

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Fig. 5


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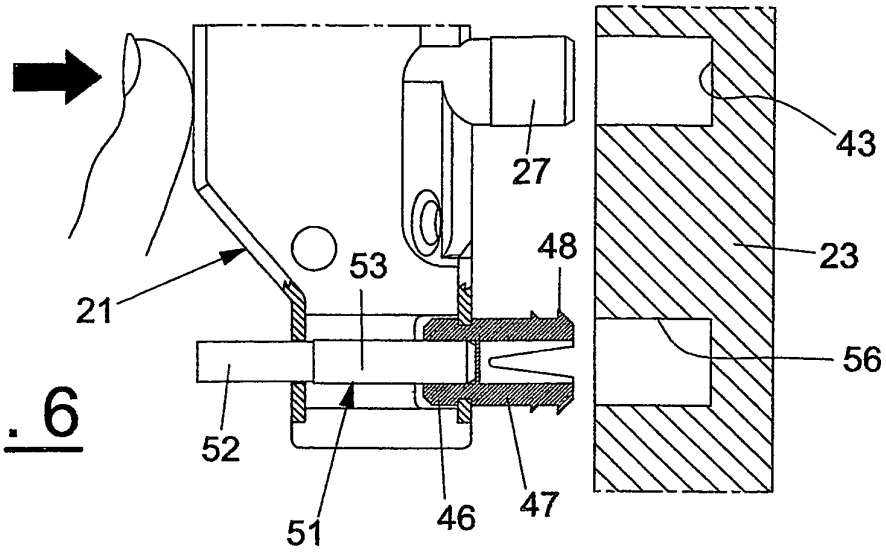


Fig. 6

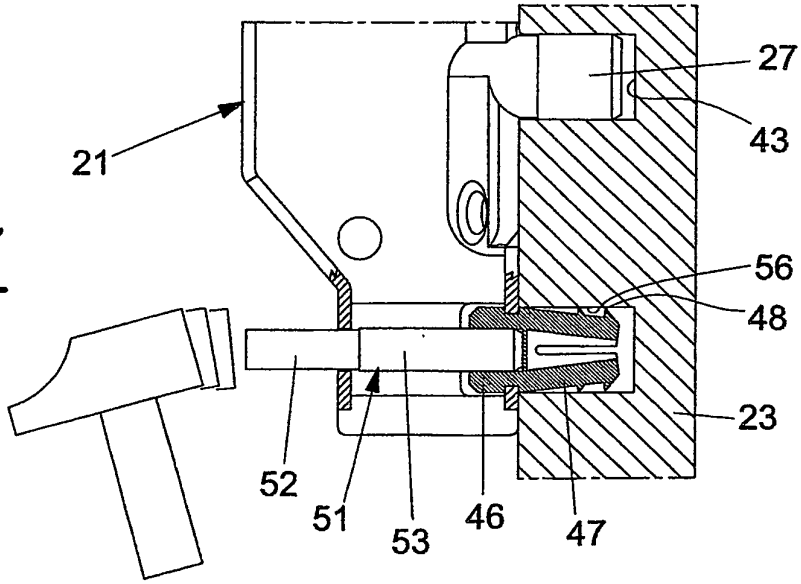


Fig. 7

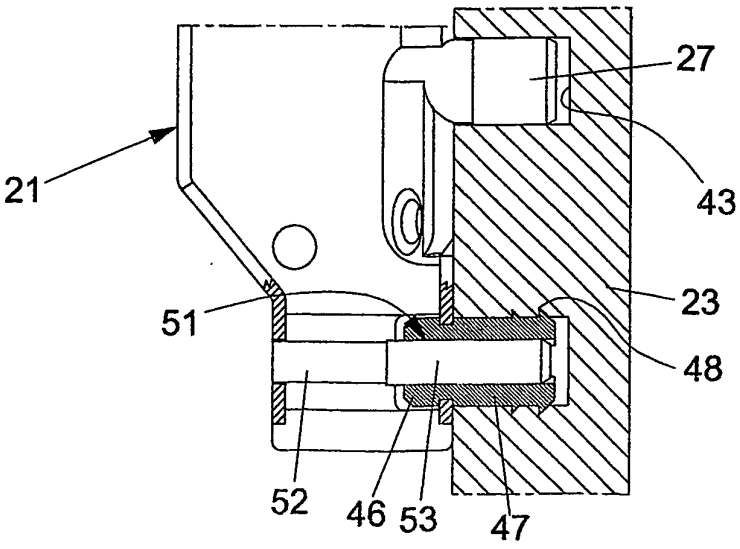


Fig. 8

Fig. 9

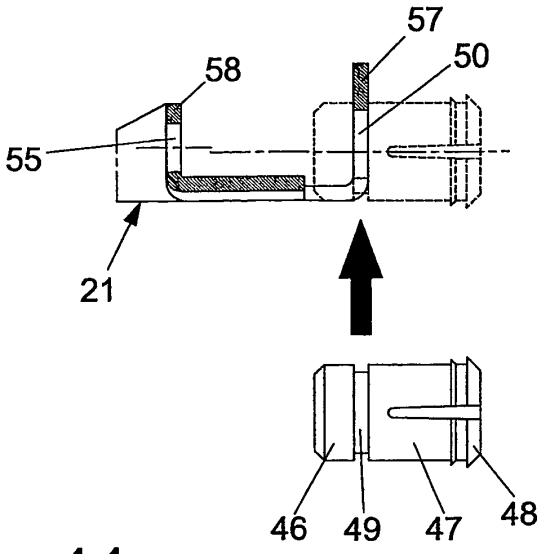


Fig. 10

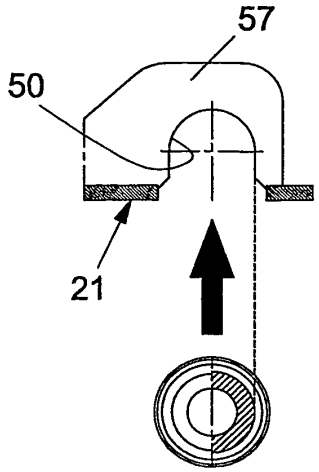


Fig. 11

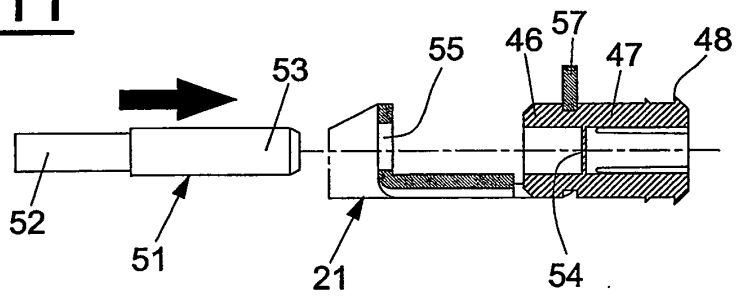


Fig. 12

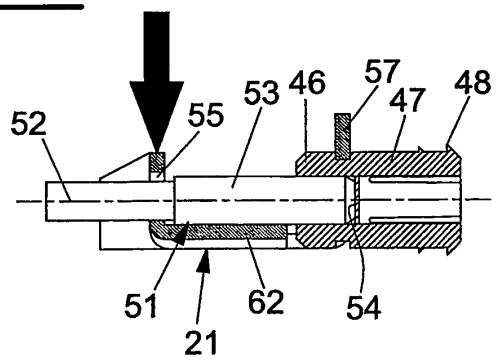


Fig. 13

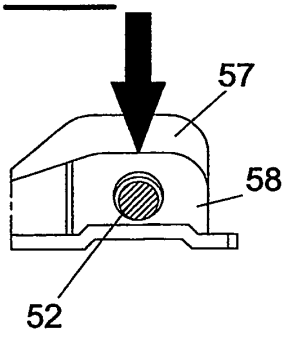


Fig. 14

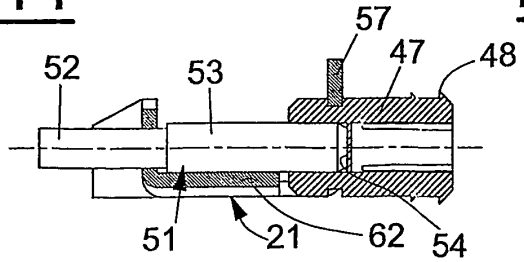


Fig. 15

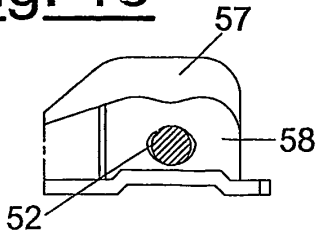
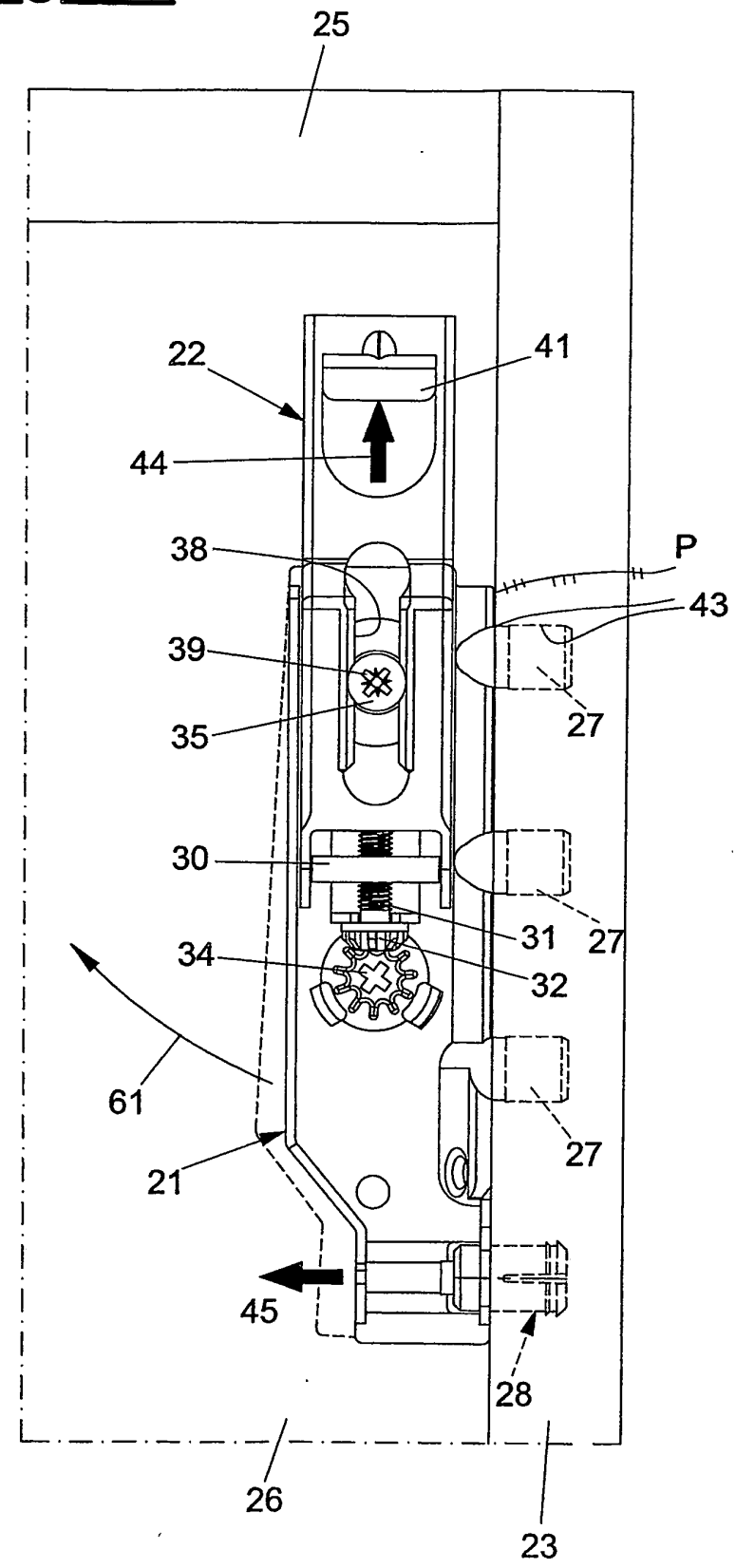


Fig. 16



REFERENCES CITED IN THE DESCRIPTION

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