

(19)



(11)

**EP 4 505 912 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**12.02.2025 Bulletin 2025/07**

(51) International Patent Classification (IPC):  
**A47G 29/10 (2006.01) E05B 19/00 (2006.01)**  
**G07C 9/00 (2020.01) G07F 17/00 (2006.01)**

(21) Application number: **24171839.4**

(52) Cooperative Patent Classification (CPC):  
**A47G 29/10; E05B 19/0005; G07C 9/00;**  
**G07F 17/0042; G07C 2009/00936**

(22) Date of filing: **23.04.2024**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA**  
Designated Validation States:  
**GE KH MA MD TN**

(71) Applicant: **Sintesi Srl**  
**35012 Camposampiero (PD) (IT)**

(72) Inventor: **FERRO, Silvano**  
**35010 Borgoricco PD (IT)**

(74) Representative: **De Sandre, Emanuele et al**  
**Società Italiana Brevetti S.p.A**  
**Stradone San Fermo 21 sc B**  
**37121 Verona (IT)**

(30) Priority: **10.08.2023 IT 202300017094**

(54) **SAFETY CASE PARTICULARLY FOR THE MANAGEMENT OF KEYCHAINS AND OBJECT-HOLDERS**

(57) The present invention relates to a security locker (10) particularly for the management of keychains and object-holder, comprising:

- a cabinet (11);
- a load-bearing wall (12) located inside the cabinet (11);
- a matrix of storage slots (13, 13a, 13b) defined on the load-bearing wall (12),
- a plurality of object-holder inserts (14, 14a, 14b), each positioned in a corresponding storage slot (13, 13a, 13b);
- a storage compartment (15) containing the load-bearing wall (12),
- a pick-up and return chamber (16) comprising a pick-up and return panel (21) having a plurality of pick-up and return slots (17, 17a, 17b) each configured to accommodate a said object-holder insert (14, 14a, 14b);
- gripping means (18) configured to grip and to extract a said object holder insert (14, 14a, 14b) from a said corresponding storage slot (13, 13a, 13b), and for introducing said object-holder insert (14, 14a, 14b) into a said pick-up and return slot (17, 17a, 17b);
- handling means (19) configured to move said gripping means (18) from a pick-up operating set-up in correspondence with a said storage slot (13, 13a, 13b) to a release operating set-up at a said pick-up and return slot (17, 17a, 17b).

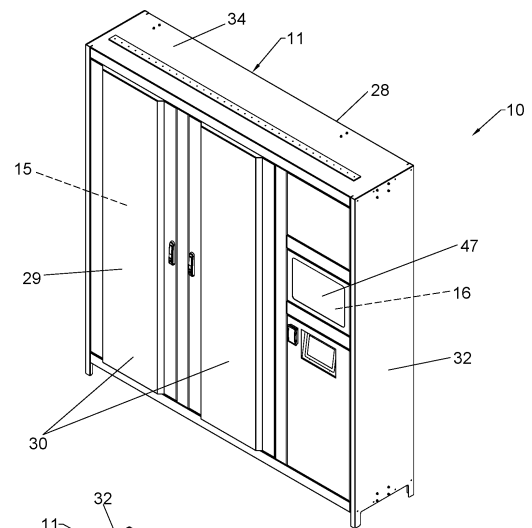


Fig.1

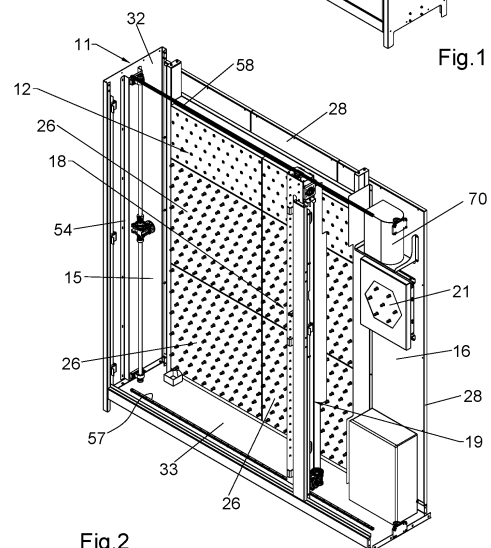


Fig.2

**EP 4 505 912 A1**

**Description**

## TECHNICAL FIELD

**[0001]** The present finding refers to a security locker, particularly for the management of keychains and object-holder.

## PRIOR ART

**[0002]** It is now well known that traditional mechanical keys are still widely used and employed, even in realities with computerised access control, for a variety of uses such as telematics cabinets, lockers, padlocks, company vehicles, forklifts, meeting rooms, archives, equipment, switchboards, gyms and many other similar applications and uses.

**[0003]** When a mechanical key can be used by several users, its management could be problematic as it becomes essential to keep track of who is in possession of a certain mechanical key in a certain place at a certain time.

**[0004]** To date, special security lockers configured to manage the pick-up and return of keys have been developed to overcome these problems.

**[0005]** In such security lockers, each key is locked by an electromechanical device that allows it to be withdrawn only by authorised persons after they have identified themselves and been recognised by the system via an integrated identification device, such as a proximity, magnetic, code, biometric and similar reader.

**[0006]** In this way, each user is made responsible for using a key, as it is well known and recorded which user has withdrawn a key and at what time they did so. Such a system allows complete monitoring by recording withdrawals, returns and enables remote verification of available keys.

**[0007]** Such a security locker also requires that the keys are locked mechanically and that only authorised and identified persons are allowed to pick up them.

**[0008]** In a preferred form of implementation of such a security locker, in the event that the level of security is to be increased, the security locker is enclosed in a cabinet that is in turn only accessible via a digitally authorised opening system, e.g. by means of a badge.

**[0009]** Such a security locker, while appreciated, has some aspects that can be improved.

**[0010]** A first aspect is related to the fact that, although mechanically locked to the casket, all keys are available to a user approaching the casket; a possible attacker therefore has the complete set of keys at his disposal on which to take inappropriate possession.

**[0011]** This is also the case if the locker is locked inside a cabinet, the door of which, when opened, makes all the keys locked to the locker available to an attacker. In addition, the known type of security lockers provide for an object-holder insert that is inserted into a corresponding storage slot of a plurality of defined storage slots on a load-bearing wall of the locker.

**[0012]** A key, or alternatively a remote control, or any other object, which is different from the keys, or remote controls or other objects that are hung from the other object-holder inserts, is usually hung by a ring or lanyard.

**[0013]** Therefore, it is essential for the correct functioning of the system that the user places the object-holder insert in the specific position indicated by the system itself, e.g. by a light signal next to the storage slot.

**[0014]** However, the luminous indications emitted by the system to guide the user in placing the object-holder insert from his hand to the storage slot indicated by the key management system, do not give certainty that the user is actually behaving correctly.

**[0015]** In particular, lockers of the known type make it possible to unlock, and make available to a user, even three or more object-holder insert at a time, with the consequent risk that, when returning, the same user does not place each of the three object-holder inserts in the corresponding storage slots; what results is that a subsequent user risks unknowingly taking, from a slot correctly indicated to him by the system, a wrong object-holder insert that should not have been placed in that slot by the previous user.

## SUMMARY OF THE INVENTION

**[0016]** The main task of the present invention is, therefore, to develop a security locker particularly for the management of keychains and object-holders, capable of overcoming the limitations and drawbacks of known type lockers.

**[0017]** As part of this task, an important aim of the invention is to develop a security locker capable of providing improved anti-break-in characteristics compared to known types of lockers.

**[0018]** Another aim of the invention is to develop a security locker capable of limiting possible errors in use by a user called upon to take from it or place in it a key or other objects.

**[0019]** It is still an aim of the present invention to develop a security locker that is simple and intuitive to use, even for a user without any special training.

**[0020]** This task, as well as these and other aims, which will appear more clearly below, are achieved by a security locker, particularly for the management of keychains and object-holders, according to claim 1.

**[0021]** Detailed features of the security locker according to the invention are given in the dependent claims.

**[0022]** Further features and advantages of the invention will result more from the description of a preferred, but not exclusive, form of execution of the security locker according to the invention, supported by the drawings proposed by way of illustration and not limitation in the accompanying tables and listed below.

## BRIEF DESCRIPTION OF THE DESIGNS

**[0023]**

- Figure 1 represents a perspective view of a security locker according to the invention;
- Figure 2 represents a perspective view of the security locker according to the invention;
- Figure 3 represents a frontal sectional view of the security locker according to the invention;
- Figure 4 represents a perspective view of a first portion of the security locker according to the invention;
- Figure 5 represents a perspective view of a security locker element according to the invention;
- Figure 6 represents a perspective view of a portion of the gripping means of an automated security locker according to the invention;
- Figure 7 represents a frontal view of the Figure 6 gripping means portion in an initial operating set-up;
- Figure 8 represents the same view as figure 7 in a second operating set-up;
- Figure 9 represents a perspective view of the gripping means on board the handling means;
- Figure 10 represents a perspective view of the handling means of the security locker according to the invention;
- Figure 11 represents another perspective view of the handling means in Figure 10;
- Figure 12 represents a perspective view of the pick-up and return housing of the security locker according to the invention;
- Figure 13 represents a cross-sectional view of the pick-up and return housing in Figure 12;
- Figure 14 represents a detail of figure 13;
- Figure 15 represents another perspective view of the security locker according to the invention;
- Figure 16 represents a first sectional view, according to a substantially horizontal plane of section, of a detail of the pick-up and return housing of a security locker according to the invention;
- Figure 17 represents a second sectional view, according to a substantially vertical cross-sectional plan, of a detail of the pick-up and return housing of the security locker according to the invention;
- Figure 18 represents a perspective view of a security locker object-holder insert according to the invention;
- Figure 19 represents a longitudinal sectional view of the object-holder insert in figure 18,
- Figure 20 represents another perspective view of the pick-up and return housing;
- Figure 21 represents a further perspective view of the pick-up and return housing,
- Figures 22 and 23 represent two respective side views of a part in Figures 20 and 21.

#### DETAILED DESCRIPTION

**[0024]** With particular reference to the above-mentioned figures, a security locker, particularly for the management of keychains and object-holder, is, according to

the invention, designated as a whole with the number 10.

**[0025]** This security locker 10 comprises:

- a cabinet 11;
- a load-bearing wall 12 located inside the cabinet 11;
- a matrix of storage slots, clearly visible in Figures 3 and 4, indicated as examples by the numbers 13, 13a, 13b, which storage slots 13, 13a, 13b are defined on the load-bearing wall 12; each storage slot 13 develops in a transverse direction with respect to a development plane P of said load-bearing wall 12; this plane P is shown, as an example, in Figure 4;
- a plurality of object-holder inserts, clearly visible in Figures 4, 5 and 16 to 19, and indicated by the numbers 14, 14a and 14b, each of which is positioned in a corresponding storage slot 13, 13a, 13b.

**[0026]** The peculiarity of security locker 10 according to the invention lies in the fact that in the cabinet 11 are defined:

- a storage compartment 15 containing the load-bearing wall 12,
- a pick-up and return chamber 16 comprising a pick-up and return panel 21 having a plurality of pick-up and return slots 17, 17a, 17b each configured to accommodate a object-holder insert 14, 14a, 14b.

**[0027]** The security locker 10 also includes:

- gripping means 18 configured to grip and to extract a storage insert 14, 14a, 14b from one of said corresponding storage slots 13, 13a, 13b, and for introducing the same object-holder insert 14, 14a, 14b into one of the pick-up and return slot 17, 17a, 17b;
- handling means 19 configured to move said gripping means 18 from a pick-up operating set-up at one of said storage slot 13, 13a, 13b to a release operating set-up at one of said pick-up and return slot 17, 17a, 17b;
- presence detection means 20 configured to detect the presence of one or more object-holder inserts 14, 14a, 14b within said pick-up and return chamber 16.

**[0028]** The gripping means 18 are also to be understood as being configured for gripping and extracting an object-holder insert 14, 14a, 14b from a pick-up and return slot 17, 17a, 17b and for introducing the same object-holder insert 14, 14a, 14b into one of said corresponding storage slot 13, 13a, 13b.

**[0029]** The handling means 19 are also configured to move said gripping means 18 from a gripping operational arrangement in correspondence with one of said pick-up and return slots 17, 17a, 17b to a release operating set-up in correspondence with one of said storage slot 13, 13a, 13b.

**[0030]** The handling means 19 are then configured to move an object-holder insert 14, 14a, 14b from any of the

storage slots 13, 13a, 13b to any of the pick-up and return slot 17, 17a, 17b and vice versa.

**[0031]** Each of the object-holder inserts 14, 14a, 14b comprises a body having a polygonal cross-section, having a coupling shape for an intermediate object object-holder element 25.

**[0032]** An object-holder insert 14 is well illustrated, as an example, in Figures 16, 17, 18 and 19.

**[0033]** The object-holder inserts numbered 14a and 14b are intended to be equal or substantially equal to the object-holder insert 14.

**[0034]** In particular, in the present embodiment of the invention, the object-holder insert 14 has a body having a hexagonal cross-section; this hexagonal cross-section is understood to be transverse to a longitudinal axis of development of its body.

**[0035]** Each object-holder insert 14, 14a, 14b is intended it could have a cross-section of another shape, e.g. triangular, or quadrilateral, or polygonal in general, or circular, or oval, as well as other shapes not illustrated for simplicity and brevity. Each object-holder insert 14, 14a, 14b has, preferably, a centring shape 22. The centring shape 22 corresponds to a centring counter-shape 23 defined in the pick-up and return slots 17, 17a, 17b.

**[0036]** The centring shape 22 is configured to slideably couple reversibly with the centring counter-shape 23.

**[0037]** In the present example embodiment, which is of course to be understood as not limiting the invention, the centring shape 22 comprises at least one longitudinal recess defined on the outer surface of the object-holder insert 14, 14a, 14b. Correspondingly, the centring counter-shape 23 is given by a defined relief on the inner surface of the pick-up and return slots 17, 17a, 17b.

**[0038]** The coupling shape is, for example and not exclusively, a transverse hole 24. Such a transverse hole 24 is preferably a through hole.

**[0039]** To this transverse hole 24 is generally attached an intermediate object-holder element 25, exemplified in figure 18, which may be a key ring, or a key lanyard, or alternatively a object-holding drawer 50 as exemplified in figure 5. object-holding drawer 50 is configured to engage in the transverse hole 24. The object-holding drawer 50 is configured to support an object that does not have a through-hole that can be coupled with a key ring or key lanyard, such as a card, or a remote door opener, or other similar object without a hole. Object-holder insert 14, 14a, 14b has a seat 51 for an electronic component 80. Such a seat 51 is clearly visible in Figures 16 and 17.

**[0040]** Such an electronic component is, for example, an electronic component for interaction with a control and management system of the security locker 10.

**[0041]** In the present embodiment of the invention, the seat 51 is defined by a rear blind hole.

**[0042]** The term 'rear' is understood to be realised in the portion of the object-holder insert 14, 14a, 14b that faces a rear wall 28 of the cabinet 11.

**[0043]** The cabinet 11, in particular, is intended to

comprise a rear wall 28, a front wall 29 with at least one door 30 for access and loading, two sides 32, a bottom 33 and a top 34.

**[0044]** The object-holder insert 14, 14a, 14b also has a transverse recess 31 for engagement with locking means 45 better described and schematised below in figure 17.

**[0045]** In particular, the security locker 10 according to the present invention is also characterised by the fact that said pick-up and return slots 17, 17a, 17b each comprise locking means 45 configured to prevent an unwanted extraction of a corresponding object-holder insert 14, 14a, 14b from said pick-up and return slots 17, 17a, 17b.

**[0046]** For example, but not exclusively, such locking means 45 comprise an electro-driven actuator 35 with an engagement tooth 36.

**[0047]** The locking means 45 are configured in such a way that when an operator, or the handling means, inserts an object-holder insert 14 into a pick-up and return slot 17, the rear portion of the same object-holder insert 14 pushes the engagement tooth 36 to retract at least in part into the body of the electro-driven actuator 35 and then to snap in an engagement position, e.g. pushed by an elastic pushing element, in the transverse recess 31.

**[0048]** The locking means 45 are also configured so that, following a signal from an electronic control and management unit, the engagement tooth 36 is moved by the electro-driven actuator 35 so as to exit the transverse recess 31; in this way, the object-holder insert 14 is free from the locking means 45 and is available to be extracted from the pick-up and return slot 17 by the hand of a user. Alternatively, the locking means 45 comprise a bi-directional actuator configured to move the engagement tooth 36 either away from the transverse recess 31 or towards and into engagement with the transverse recess 31.

**[0049]** The signal for activating the approach and coupling movement of the electro-driven actuator 35 is given by a position sensor 39 located on an electronic board 38 at the rear of each pick-up and return slot 17, 17a, 17b.

**[0050]** Each of the said object-holder inserts 14, 14a, 14b is made of transparent or semi-transparent material.

**[0051]** In addition, the pick-up and return slots 17, 17a, 17b comprise illumination means 37 configured to transmit light signals through said object-holder inserts 14, 14a, 14b when these are made of transparent or semi-transparent material.

**[0052]** Such illumination means 37 comprise, for example, a plurality of LEDs supported by the electronic board 38 arranged at the rear of each pick-up and return slot 17, 17a, 17b.

**[0053]** In particular, the object-holder insert 14, 14a, 14b is preferably made of transparent plastic.

**[0054]** The illumination means 37 are governed by the electronic control and management unit of the security locker 10 in such a way that, for example, they are switched on to signal in which pick-up and return slot 17, 17a, 17b a user has to return an object-holder insert 14, 14a, 14b at the end of a use.

**[0055]** The illumination means 37 can, of course, also be managed in another way, for example to indicate to a user which object-holder insert 14, 14a, 14b to pick up, for example by switching on a green light to indicate a situation in which the object-holder insert 14 which is illuminated green is in the correct position for picking up. Similarly, a red light is used to indicate the incorrect positioning of a object-holder insert 14 in a pick-up and return slot 17 which is not the correct one. The illumination means 37 may also be used purely for aesthetic reasons or to illuminate the surroundings.

**[0056]** The load-bearing wall 12 comprises at least one load-bearing panel 26 bearing an ordered matrix of storage slots 13, 13a, 13b.

**[0057]** For example, the load-bearing wall 12 is defined by a plurality of load-bearing panels 26 arranged side-by-side and co-planar.

**[0058]** Each load-bearing panel 26 is supported by one or more fixing brackets 27 to a rear wall 28 of said cabinet 11.

**[0059]** Each storage slot 13, 13a, 13b is defined by a through-hole of substantially counter-shaped cross-section to the cross-section of said object-holder insert 14, 14a, 14b.

**[0060]** Behind the load-bearing wall 12, at each storage slot 13, 13a, 13b, there is advantageously provided a retaining tab, not shown for simplicity in the figures, configured to interact with an object-holder insert 14, 14a, 14b inserted into the storage slot 13, 13a, 13b so as to hold it reversibly within the same storage slot 13, 13a, 13b, preventing it from accidentally slipping out.

**[0061]** Correspondingly, the pick-up and return slots 17, 17a, 17b are also each defined by a through-hole with a cross-section substantially counter-shaped to the cross-section of said object-holder insert 14, 14a, 14b.

**[0062]** The storage compartment 15, containing the load-bearing wall 12, and the pick-up and return chamber 16 comprising a pick-up and return panel 21, are divided by an intermediate bulkhead 46.

**[0063]** The pick-up and return chamber 16 is closed at the front by a movable barrier 47. Such a movable barrier 47 is defined, for example, by a door hinged to the front wall 29 of the cabinet 11.

**[0064]** The movable barrier 47 preferably consists of a door made of transparent or semi-transparent material.

**[0065]** Alternatively, the movable barrier 47 can be a sliding damper.

**[0066]** Such a sash or damper may also consist of a grille or panel with no openings or through-holes.

**[0067]** The pick-up and return chamber 16 also advantageously comprises a security bulkhead 90 configured to be moved between two setups:

- a lowered trim when the gripping means 18 are in motion,
- a raised, essentially horizontal trim when the movable barrier 47 is open. This security bulkhead 90 has an anti-piracy function, so that when the movable

barrier 47 is opened by a user for the removal of an object-holder insert 14 from the pick-up and return chamber 16, a possible attacker cannot introduce his hands or other burglary tools into the cabinet 11.

**[0068]** The security bulkhead 90 also has an anti-fall function, because if a freshly retrieved object-holder insert 14 slips out of the hands of a careless user, the freshly retrieved object-holder insert 14 falls onto the security bulkhead 90, in a raised position, instead of plummeting to the bottom of the cabinet in a position unreachable by the user.

**[0069]** In the depicted realisation example, the security bulkhead 90 comprises an anti-extraction plate 91 and two lower articulated arms 92 moved by motorisation means.

**[0070]** Motorisation means include, for example and not exclusively, an electric actuator 93 for each lower articulated arm 92.

**[0071]** The electric actuator 93 is, for example, a linear actuator.

**[0072]** In particular, the security bulkhead 90 comprises an anti-extraction plate 91 extending from a hinge bracket 94, at the rear, attached to a rear structural panel 95, to a front striker profile 96 attached to a front retaining panel 97.

**[0073]** The hinge bracket 94 is positioned below the pick-up and return panel 21.

**[0074]** The front striker profile 96 is positioned below the movable barrier 47.

**[0075]** Figure 22 shows the security bulkhead 90 in raised trim, figure 23 shows the security bulkhead 90 in lowered trim.

**[0076]** The security bulkhead 90 is rotated from the lowered to the raised trim when the movable barrier 47 is opened; normally, when the movable barrier 47 is closed, the security bulkhead 90 is lowered so as not to impede the transit of the gripping means 18.

**[0077]** The electronic control unit of the security locker 10 is then configured to detect the opening of the movable barrier 47 and to actuate the electric actuators 93 to rotate the security bulkhead 90 from the lowered to the raised position.

**[0078]** The gripping means 18, configured for gripping and extracting an object-holder insert 14, 14a, 14b from one of said corresponding storage slot 13, 13a, 13b, and for introducing the same object-holder insert 14, 14a, 14b into a pick-up and return slot 17, 17a, 17b, are well depicted in Figures 6, 7, 8 and 9.

**[0079]** Such gripping means 18 comprise a gripper device 48 configured to grip and release an object-holder insert 14, 14a, 14b.

**[0080]** The handling means 19, configured to move said gripping means 18 from a pick-up operating set-up at one of said storage slots 13, 13a, 13b to a release operating set-up at one of said pick-up and return slots 17, 17a, 17b, comprise:

- a horizontal slide 49 supporting the clamping device 48,
- a vertical slide 50 supporting a horizontal guide 52 for the horizontal slide 49,
- a vertical guide 53 for the vertical slide 50,
- translation means 54 for the vertical guide 53, such means of translation 54 being configured to determine the horizontal translation of the vertical guide 53 in a plane substantially parallel to the lying of load-bearing wall 12,
- first actuator means 55 configured to move the horizontal slide 49 relative to the horizontal guide 52 in a receding - approaching direction relative to the load-bearing wall 12;
- second actuator means 56 configured to substantially vertically move the vertical slide 50 on the vertical guide 53.

**[0081]** The first actuator means 55 consist of a linear actuator, e.g. a double-acting cylinder, or alternatively an electric actuator.

**[0082]** The second actuator means 56 are, again by way of example and not limitation, of the belt type.

**[0083]** In the embodiment of the invention described herein, described by way of example and not limitation of the invention, the translation means 54 for the vertical guide 53 comprise:

- a bottom rail 57 arranged at the bottom of cabinet 11,
- an upper rail 58 arranged at the top of cabinet 11,
- a lower runner 59 placed below the vertical guide 53 and configured to slide on the bottom rail 57,
- an upper runner 60 placed above the vertical guide 53 and configured to slide on the upper rail 58,
- pulling means 61 configured to drag the vertical guide 53 sliding on the bottom rail 57 and on the upper 58 rail.

**[0084]** The vertical guide 53 basically consists of a sheet metal column.

**[0085]** The intermediate bulkhead 46 can be mounted on board the vertical guide 53.

**[0086]** When the vertical guide 53 is positioned at the pick-up and return panel 21, the intermediate bulkhead 46 prevents an attacker from reaching, with a hand or other burglary tools, into the interior of the storage compartment 15 through the pick-up and return chamber 16.

**[0087]** The pulling means 61 are, for example, belt-driven, e.g. driven by an electric motor.

**[0088]** Such handling means 19 permit the handling of the gripping means 18 from any of the storage slots 13, 13a, 13b to any of the pick-up and return slots 17, 17a, 17b.

**[0089]** The presence detection means 20, configured to detect the presence of one or more of the object-holder inserts 14, 14a, 14b within said pick-up and return chamber 16, comprise at least one load cell 65 interposed between the pick-up and return panel 21 and a support

frame 66.

**[0090]** The presence detection means 20 also comprise an electronic component 80, located inside each key-holder insert 14, 14a, 14b, and configured to emit a presence signal; the presence signal is detected by a corresponding presence sensor, which sensor is located behind the pick-up and return panel 21, and is mounted on a corresponding electronic board 38.

**[0091]** The electronic component 80 is for example an RFID chip.

**[0092]** The electronic component 80 and the respective presence sensor enable the detection of the simple presence of the insert holder 14, 14a, 14b in the pick-up and return slot 17, 17a, 17b.

**[0093]** The pick-up and return panel 21 is attached, for example, to two upper load cells 65 and two lower load cells 65b.

**[0094]** The load cells 65 and 65b transmit load signals to the electronic control and management unit of the security locker 10 according to the invention.

**[0095]** The presence detection means 20 enable the electronic control unit of the security locker 10 to detect the presence or absence of an object-holder insert 14, 14a, 14b, as well as the object attached to the object-holder insert, in the pick-up and return chamber 16, and also to detect whether the object originally hung on the object-holder insert 14, 14a, 14b is still correctly hung, or whether it has been removed, or whether it has been replaced by another object of a different weight, by means of the detection of the weighing of the pick-up and return panel 21 performed by means of the load cells 65 and/or 65b.

**[0096]** The electronic control and management unit is therefore able to understand:

- whether an object-holder insert 14, 14a, 14b has been placed in the security locker 10 with the brought object still correctly attached,
- or if the object-holder insert 14, 14a, 14b is devoid of the object that should be attached to it, and therefore weighs less overall than the expected weight, which should be the same as when the storage insert was taken out.

**[0097]** The security locker 10 thus comprises an electronic control unit and a smartcard or badge reader connected to said electronic control unit.

**[0098]** The electronic control unit is configured to manage the movement of these object-holder inserts according to the information and authorisations transmitted by an operator's badge, or via any other identification system, such as a biometric system, PIN code, or an app on a smartphone.

**[0099]** For example, a first operator is in possession of a first badge loaded with information such that, once interfaced with a smart-card reader, it activates the electronic control and management unit of the security locker 10 in such a way that a specific object-holder insert 14,

carrying for example a key to a specific room to which only said first operator has access, is picked up from its corresponding storage slot 13 in the storage compartment 15 and is inserted into a corresponding pick-up and return slot 17 in the pick-up and return chamber 16; only thereafter is the movable barrier 47, which closes the pick-up and return chamber 16, unlocked by the electronic control and management unit and the first operator can open the pick-up and return chamber 16 and remove the specific object-holder insert 14 with the predetermined key attached thereto.

**[0100]** The security locker 10 may include an event display screen.

**[0101]** The electronic control unit of the security locker can be configured to display on the display screen a synoptic mapping of the doors to which the keys stored in security locker 10 are destined, thus making interaction with users more intuitive. The safety locker 10 according to the invention may advantageously also comprise sanitising means 70 configured and positioned to act on said object-holder inserts when they are housed in said storage compartment 15; the sanitising means 70 may be of a type known per se, for example air purifiers, UV light sanitisers, ionisers and other similar devices.

**[0102]** An object of the invention is also to be understood to include an object-holder insert 14, particularly for keys and the like.

**[0103]** The object-holder insert 14, as described above, is characterised in that it comprises a body having a polygonal cross-section, having a coupling shape for an intermediate object-holding element, said object-holder insert 14, 14a, 14b having a seat 51 for an electronic component 80 for interaction with a control and management system of a security locker 10.

**[0104]** In particular, the object-holder insert 14 is characterised by the fact that it is made of transparent or semi-transparent material.

**[0105]** Also an object of the invention is an object-holder insert as described above in use with a security locker 10 also as described above.

**[0106]** It is therefore understood how a security locker according to the present invention achieves the intended task and purpose.

**[0107]** In particular, the present invention has developed a security locker capable of ensuring improved anti-intrusion characteristics compared to known types of cases, thanks to the differentiation between a storage compartment, inaccessible to a user, and a pick-up and return chamber, accessible only to an authorised user by means of an identification system.

**[0108]** In addition, the invention developed a security locker capable of limiting possible errors in use by a user called upon to take a key or other object from it or put it back into it, in particular thanks to the automatic gripping means and the automatic handling means, which, being configured to move an object-holder insert from the storage compartment to the pick-up and return chamber and vice versa, prevents human errors during pick-up or

return.

**[0109]** Furthermore, with the present invention, a security locker has been developed that is simple and intuitive to use, even for a user without any special training.

**[0110]** Furthermore, the invention developed a security locker capable of creating a particularly pleasing visual impact thanks to the backlighting system of the object-holder inserts, where these are made of transparent or semi-transparent material. In summary, among the advantages of the present invention is the fact that the security locker 10 never allows a user to have direct access to the keys hanging from the object-holder inserts 14.

**[0111]** The locks on door for access and loading 30 are configured in such a way that they can only be opened by means of dedicated keys whose possession is restricted to a single 'master' user.

**[0112]** Access to storage compartment 15 is only allowed to a very select few people, with high security locks.

**[0113]** The invention thus conceived is susceptible to numerous modifications and variations, all of which fall within the scope of protection of the appended claims. Furthermore, all details may be replaced by other technically equivalent elements.

**[0114]** Where the mentioned operational characteristics and techniques are followed by signs or reference numbers, those signs or reference numbers have been affixed for the sole purpose of increasing the intelligibility of the description and claims themselves and, consequently, they do not constitute in any way a limitation on the interpretation of each element identified, by way of example only, by those signs or reference numbers.

## Claims

1. Security locker (10) particularly for the management of keychains and object-holder, comprising:

- a cabinet (11);
- a load-bearing wall (12) located inside said cabinet (11);
- a matrix of storage slots (13, 13a, 13b) defined on said load-bearing wall (12), each storage slot (13) developing in a transverse direction to a development plane (P) of said load-bearing wall (12);
- a plurality of object-holder inserts (14, 14a, 14b), each positioned in a corresponding storage slot (13, 13a, 13b);

**characterised in that** in said cabinet (11) are defined:

- a storage compartment (15) containing said load-bearing wall (12),

- a pick-up and return chamber (16) comprising a pick-up and return panel (21) having a plurality of pick-up and return slots (17, 17a, 17b) each configured to accommodate one of said object-holder insert (14, 14a, 14b);

said security locker (10) comprising:

- gripping means (18) configured to grip and to extract one of said object-holder insert (14, 14a, 14b) from one of said corresponding storage slot (13, 13a, 13b), and for introducing said object-holder insert (14, 14a, 14b) into one of said pick-up and return slot (17, 17a, 17b);

- handling means (19) configured to move said gripping means (18) from a pick-up operating set-up at one of said storage slot (13, 13a, 13b) to a release operating set-up at one of said pick-up and return slot (17, 17a, 17b);

- presence detection means (20) configured to detect the presence of one or more object-holder inserts (14, 14a, 14b) within said pick-up and return chamber (16).

2. Security locker according to claim 1, **characterised in that** said gripping means (18) are configured for gripping and extracting an object-holder insert (14, 14a, 14b) from a pick-up and return slot (17, 17a, 17b) and for introducing the same object-holder insert (14, 14a, 14b) into one of said corresponding storage slot (13, 13a, 13b).
3. Security locker according to claim 1 or 2, **characterised in that** said handling means (19) are also configured to move said gripping means (18) from a gripping operational arrangement in correspondence with one of said pick-up and return slots (17, 17a, 17b) to a release operating set-up in correspondence with one of said storage slots (13, 13a, 13b), said handling means (19) are thus configured to move a object-holder insert (14, 14a, 14b) from any of said storage slot (13, 13a, 13b) to any of said pick-up and return slot (17, 17a, 17b) and vice versa.
4. Security locker according to one or more of the preceding claims, **characterised in that** each of said object-holder inserts (14, 14a, 14b) comprises a body having a polygonal cross-section, having a coupling shape for an intermediate object-holding element (25).
5. Security locker according to one or more of the preceding claims, **characterised in that** each object-holder insert (14, 14a, 14b) has a centring shape (22), said centring shape (22) corresponding to a centring counter-shape (23) defined in the pick up and return slots (17, 17a, 17b), said centring shape (22) being configured to slideably couple reversibly

with the centring counter-shape (23).

6. Security locker according to one or more of the preceding claims, **characterised in that** said object-holder insert (14, 14a, 14b) has a seat (51) for an electronic component (80) for interaction with a control and management system of said security locker (10).
7. Security locker according to one or more of the preceding claims, **characterised in that** said object-holder insert (14, 14a, 14b) also has a transverse recess (31) for engagement with locking means (45), said locking means (45) being configured to prevent an unwanted extraction of a corresponding object-holder insert (14, 14a, 14b) from one of said pick-up and return slot (17, 17a, 17b).
8. Security locker according to one or more of the preceding claims, **characterised in that** each of said object-holder inserts (14, 14a, 14b) is made of transparent or semi-transparent material, said pick-up and return slots (17, 17a, 17b) comprising illumination means (37) configured to transmit light signals through said object-holder inserts (14, 14a, 14b) when said object-holder inserts are made of transparent or semi-transparent material.
9. Security locker according to one or more of the preceding claims, **characterised in that** said pick-up and return chamber (16) is closed at the front by a movable barrier (47).
10. Security locker according to one or more of the preceding claims, **characterised in that** said gripping means (18) comprise a gripper device (48) configured to grip and release an object-holder insert (14, 14a, 14b).
11. Security locker according to one or more of the preceding claims, **characterised in that** said handling means (19) comprises:
  - a horizontal slide (49) supporting said gripper device (48),
  - a vertical slide (50) supporting a horizontal guide (52) for the horizontal slide (49),
  - a vertical guide (53) for the vertical slide (50),
  - translation means (54) for the vertical guide (53), such translation means (54) being configured to determine the horizontal translation of the vertical guide (53) in a plane substantially parallel to the load-bearing wall (12) plane;
  - first actuator means (55) configured to translate the horizontal slide (49) with respect to the horizontal guide (52) in an away from-towards direction with respect to the load-bearing wall (12);

- second actuator means (56) configured to substantially vertically move the vertical slide (50) on the vertical guide (53).

12. Security locker according to one or more of the preceding claims, **characterised in that** said presence detection means (20) comprise at least one load cell (65) interposed between the pick-up and return panel (21) and a support frame (66). 5  
10
13. Security locker according to one or more of the preceding claims, **characterised in that** it comprises sanitising means (70) configured and positioned to act on said object-holder inserts when said inserts are housed in said storage compartment (15). 15
14. Object-holder insert (14), particularly for keys and the like, **characterised by** comprising a body having a polygonal cross-section, having a coupling shape for an intermediate object-holding element, said object-holder insert (14, 14a, 14b) having a seat (51) for an electronic component (80) for interaction with a control and management system of a security locker (10). 20  
25
15. Object-holder insert (14) according to the preceding claim, **characterised by** being made of transparent or semi-transparent material. 30  
35  
40  
45  
50  
55

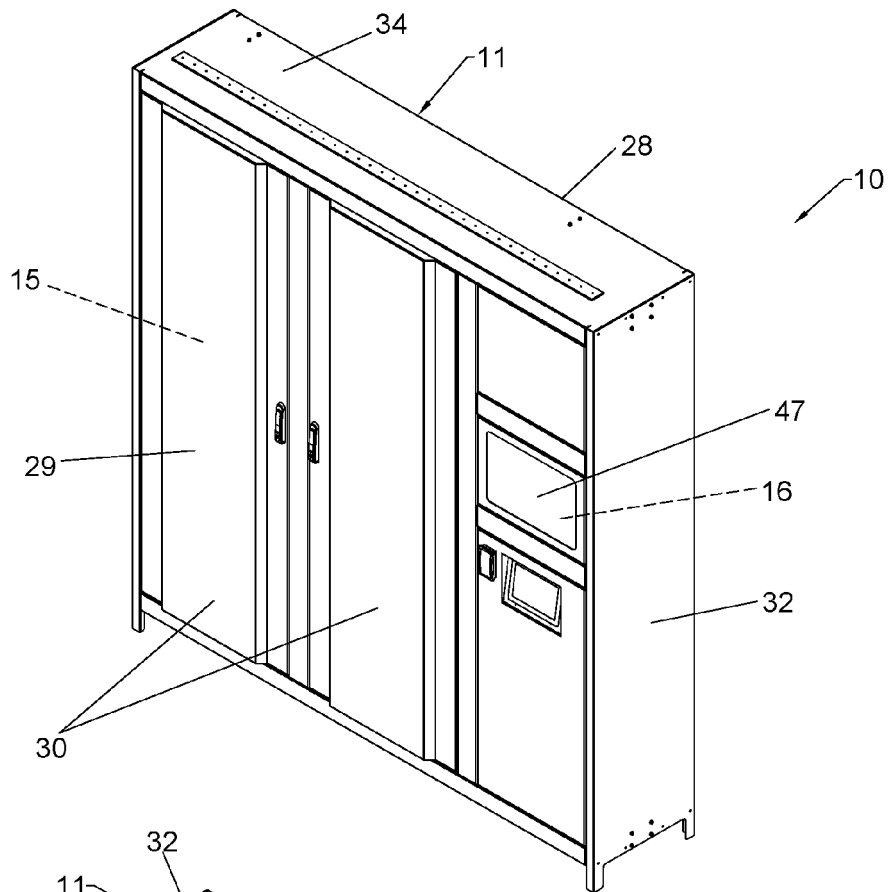


Fig.1

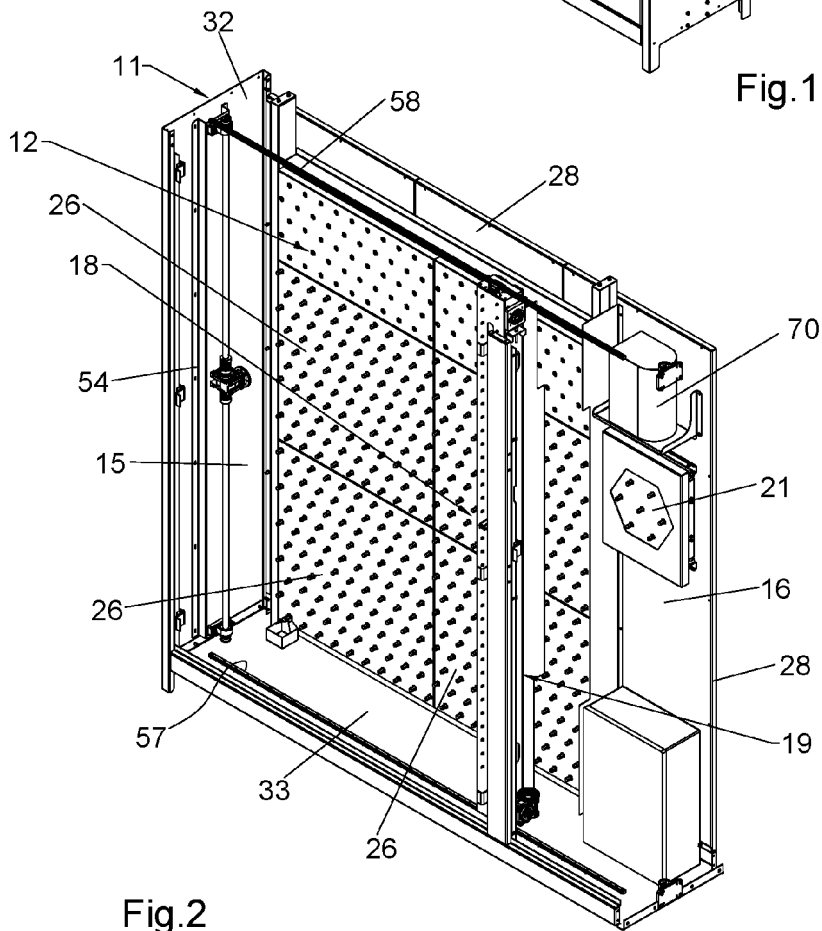


Fig.2



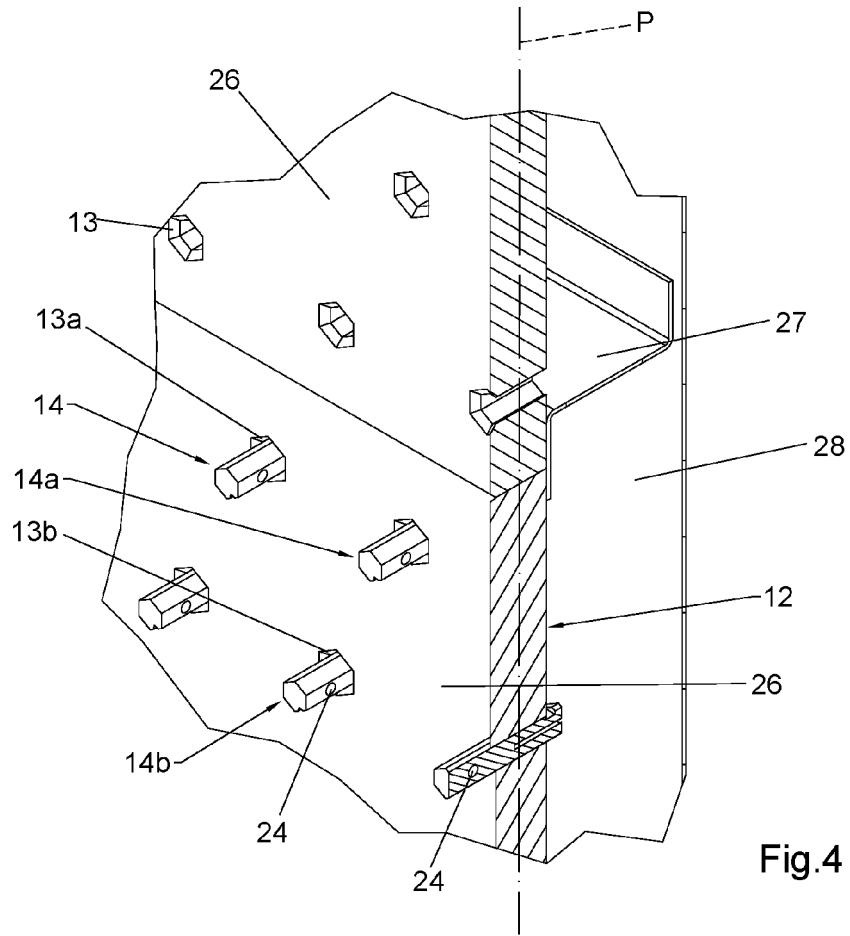


Fig.4

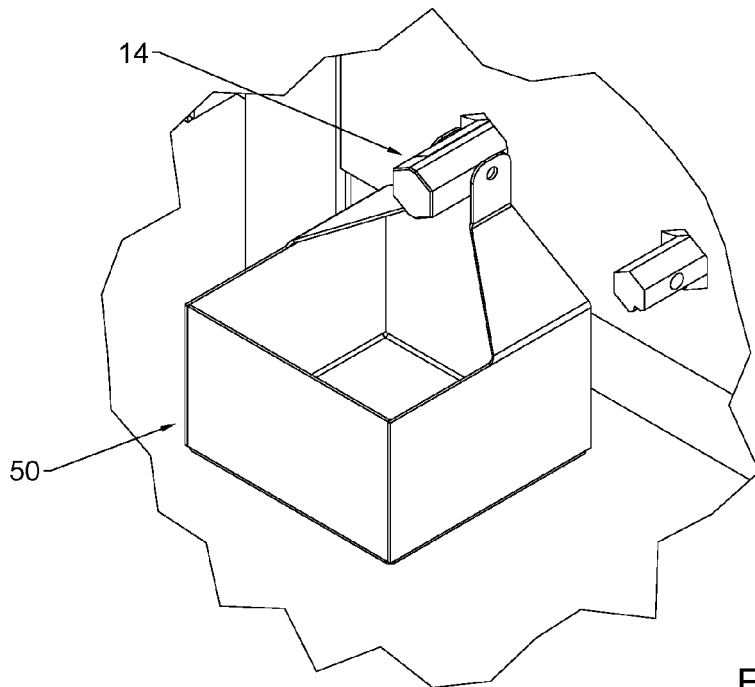


Fig.5

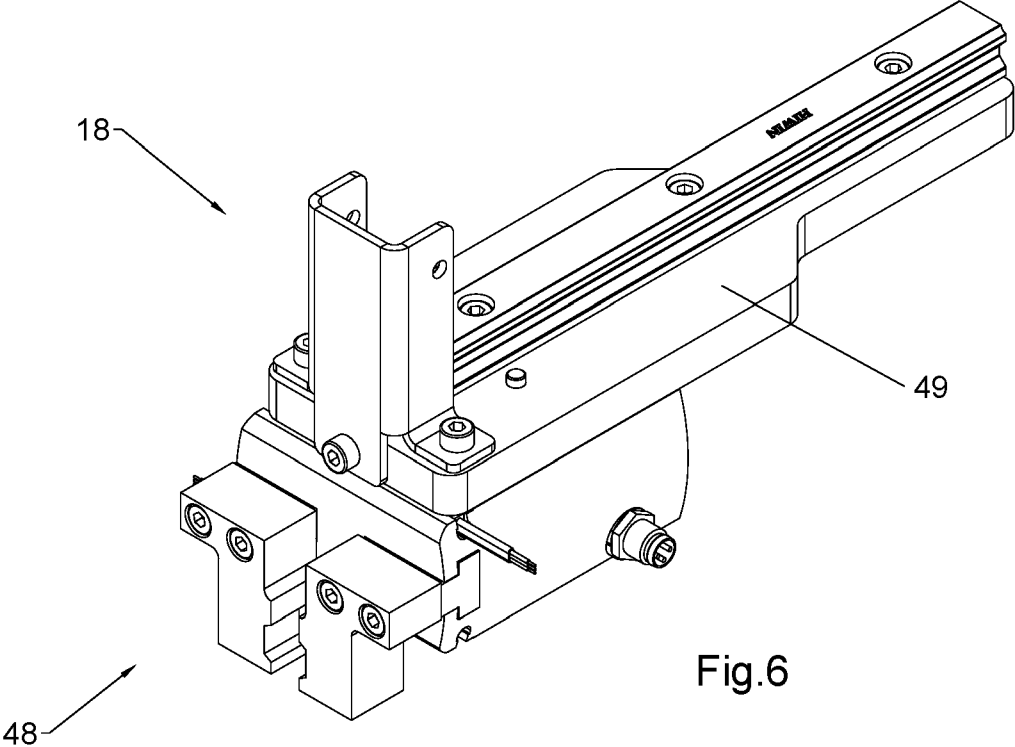


Fig.6

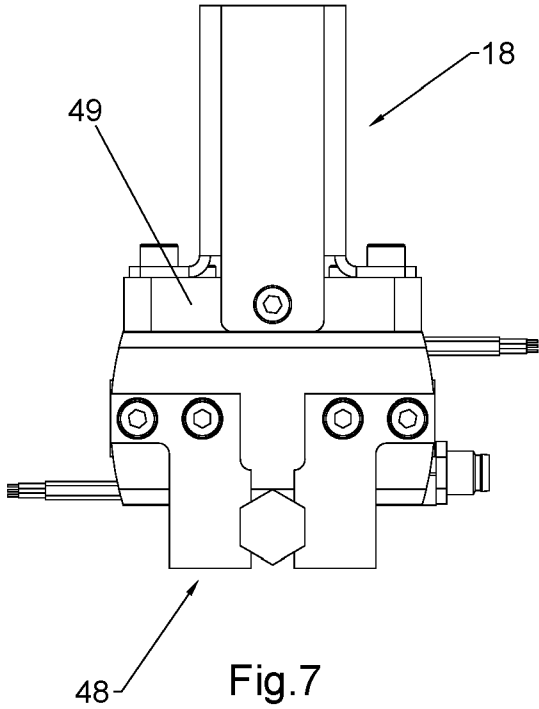


Fig.7

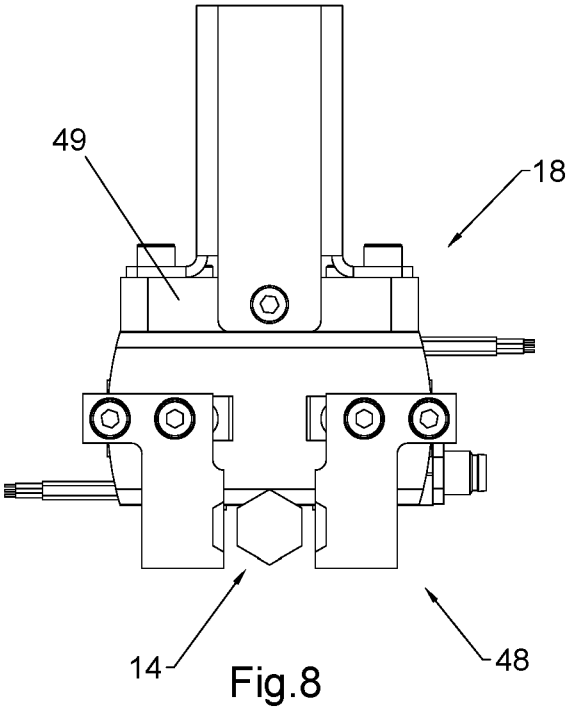


Fig.8

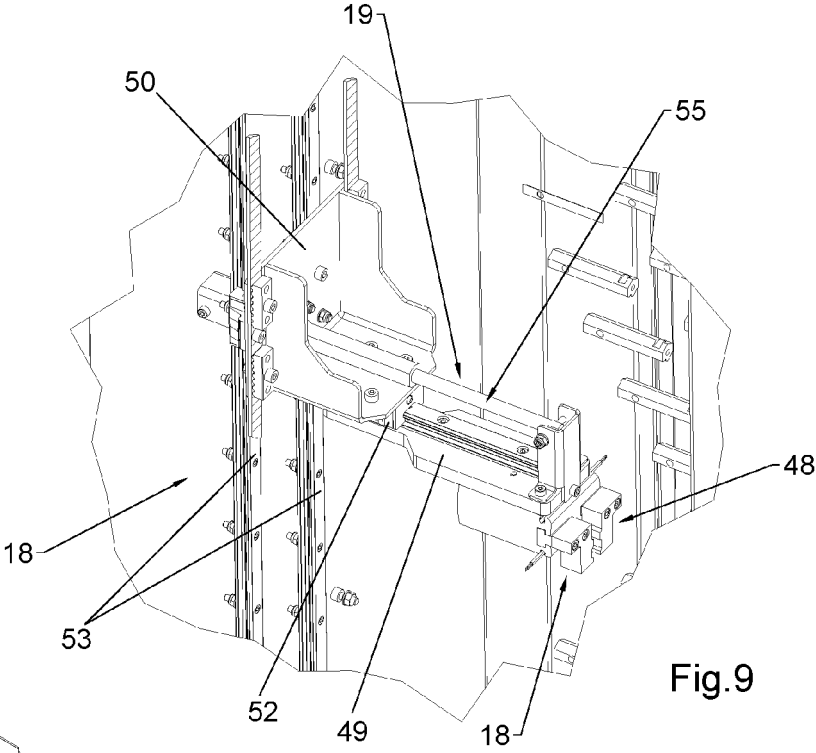


Fig.9

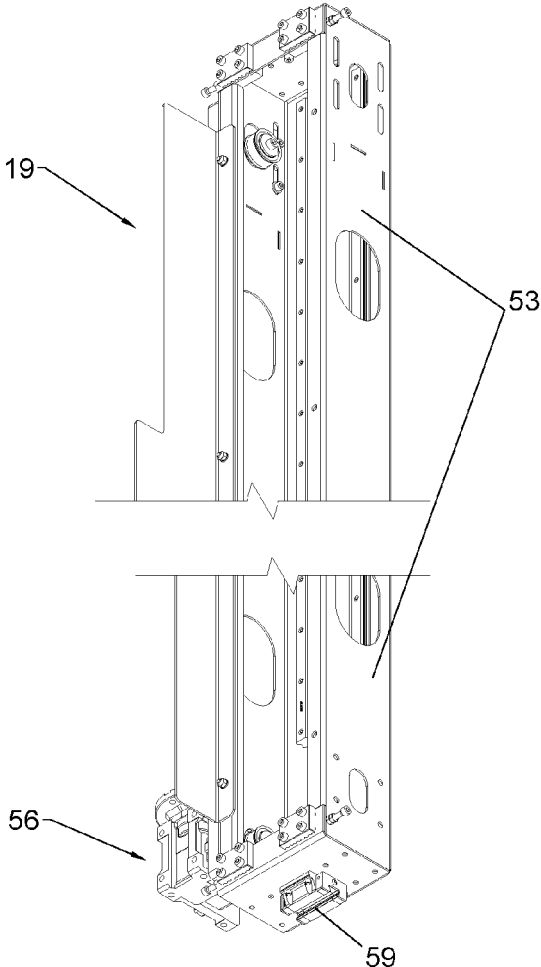


Fig.10

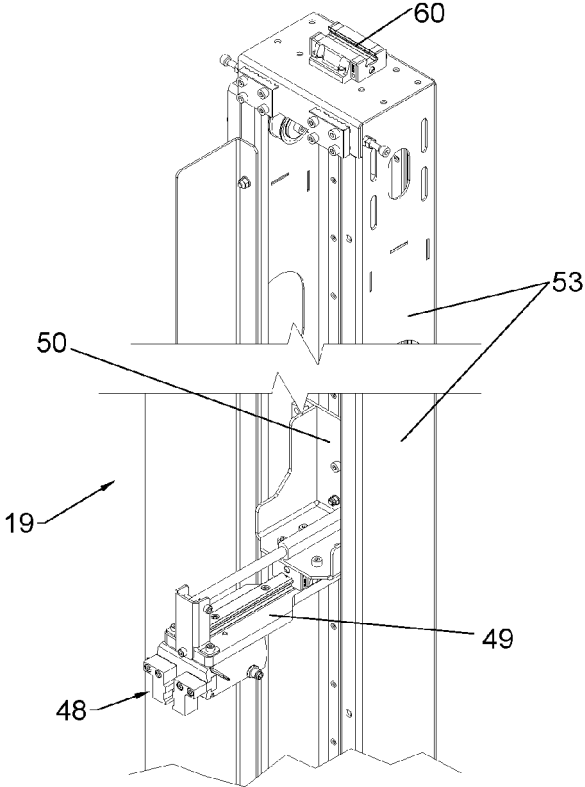


Fig.11

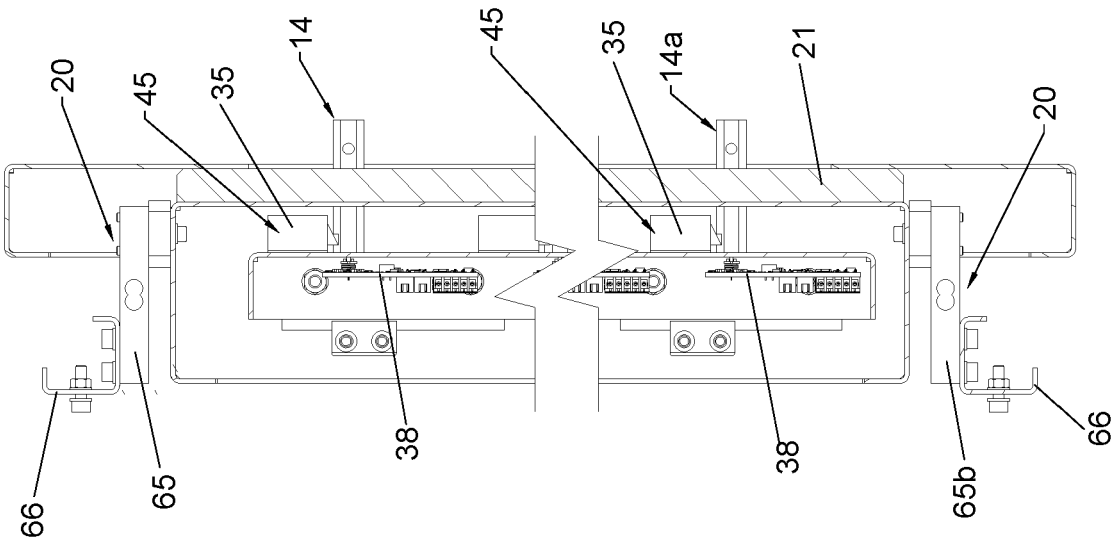


Fig.13

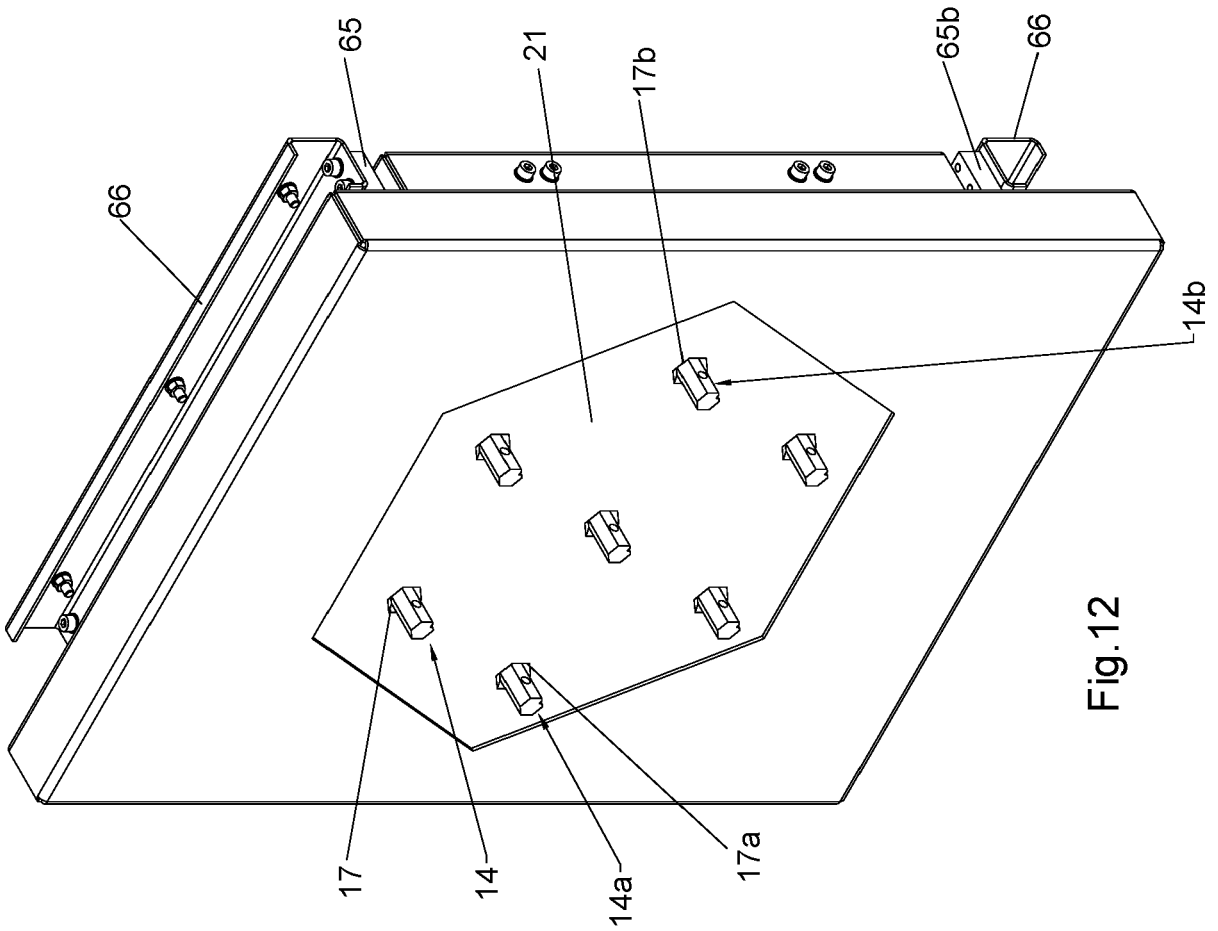
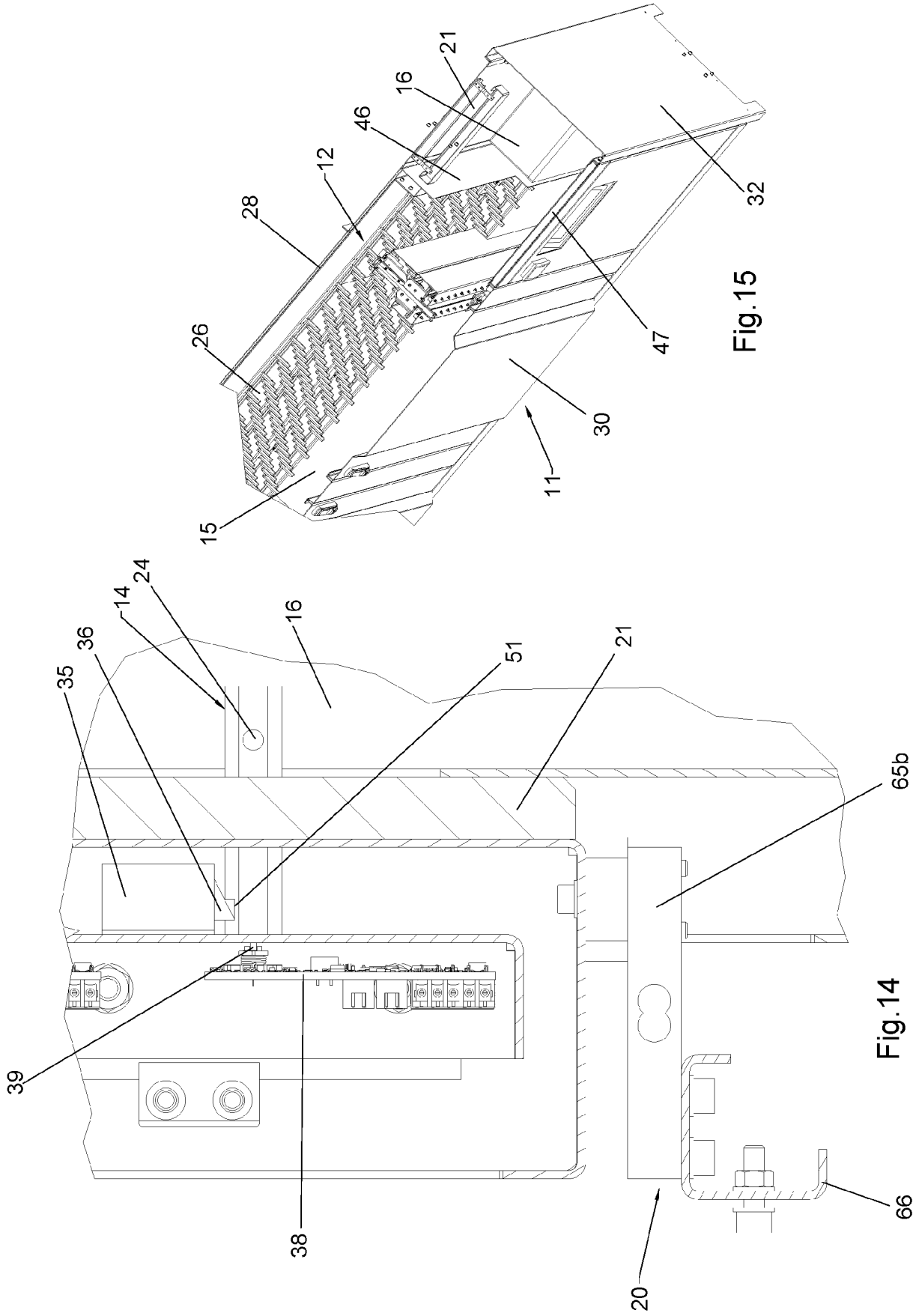


Fig.12



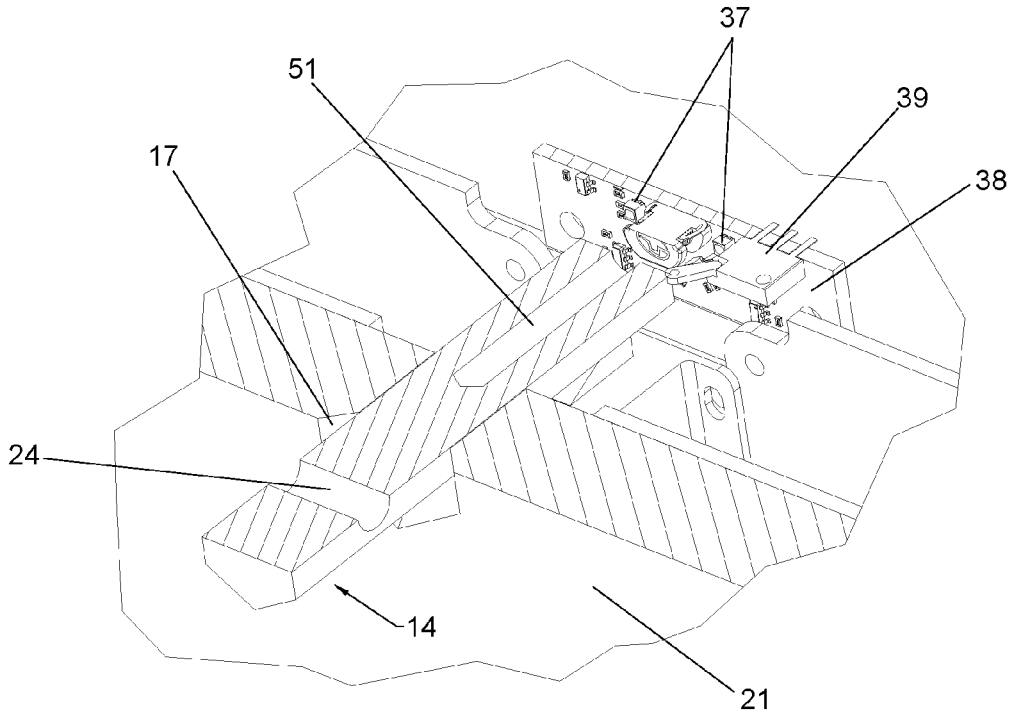


Fig.16

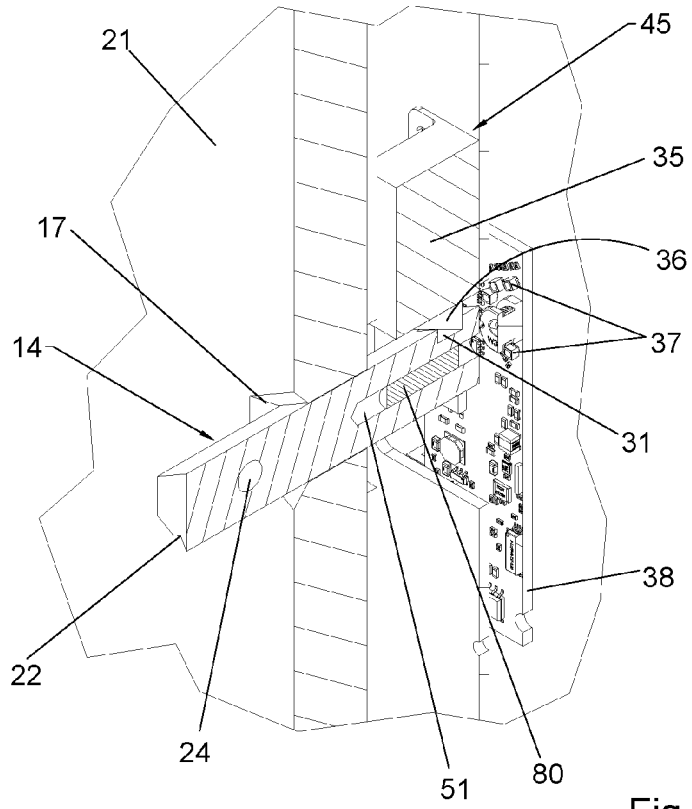


Fig.17

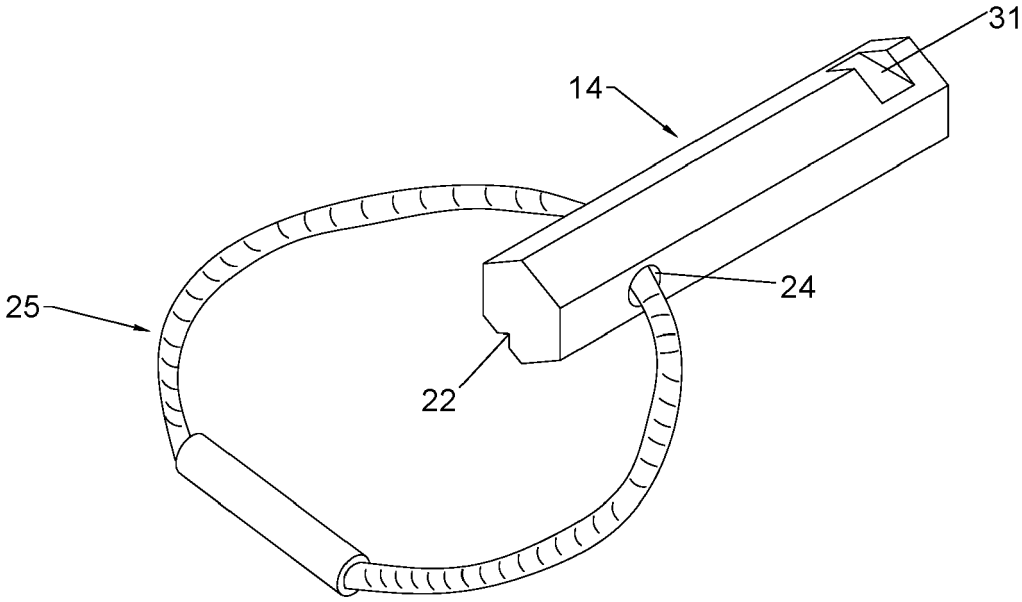


Fig. 18

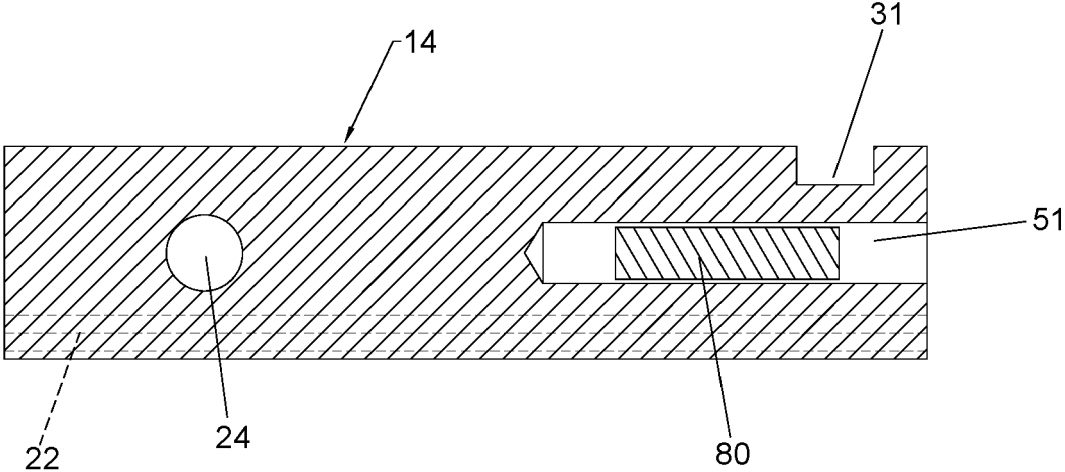


Fig. 19

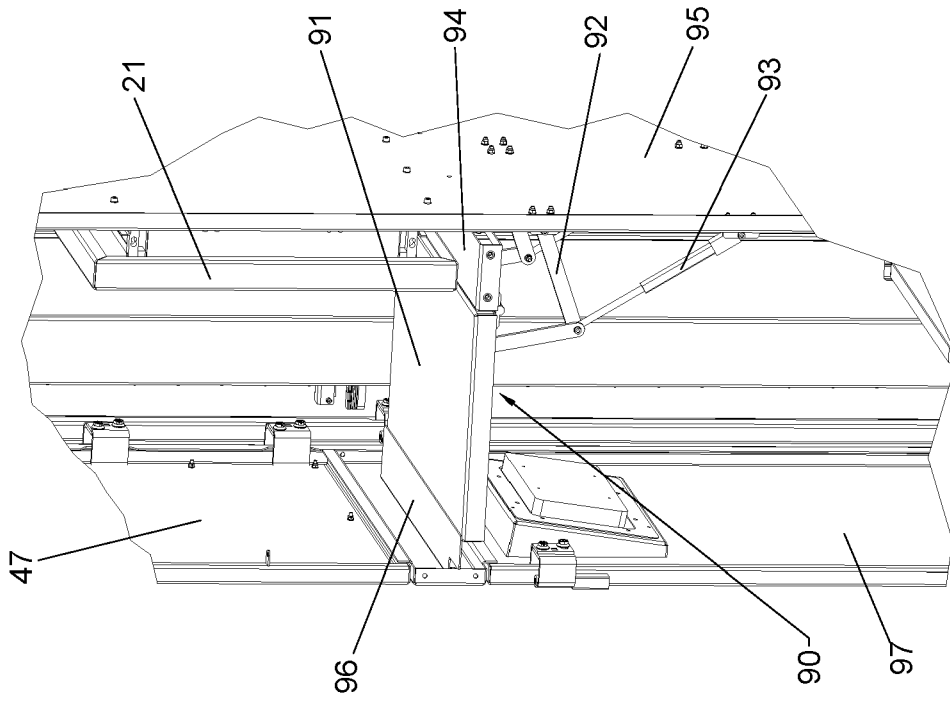


Fig.21

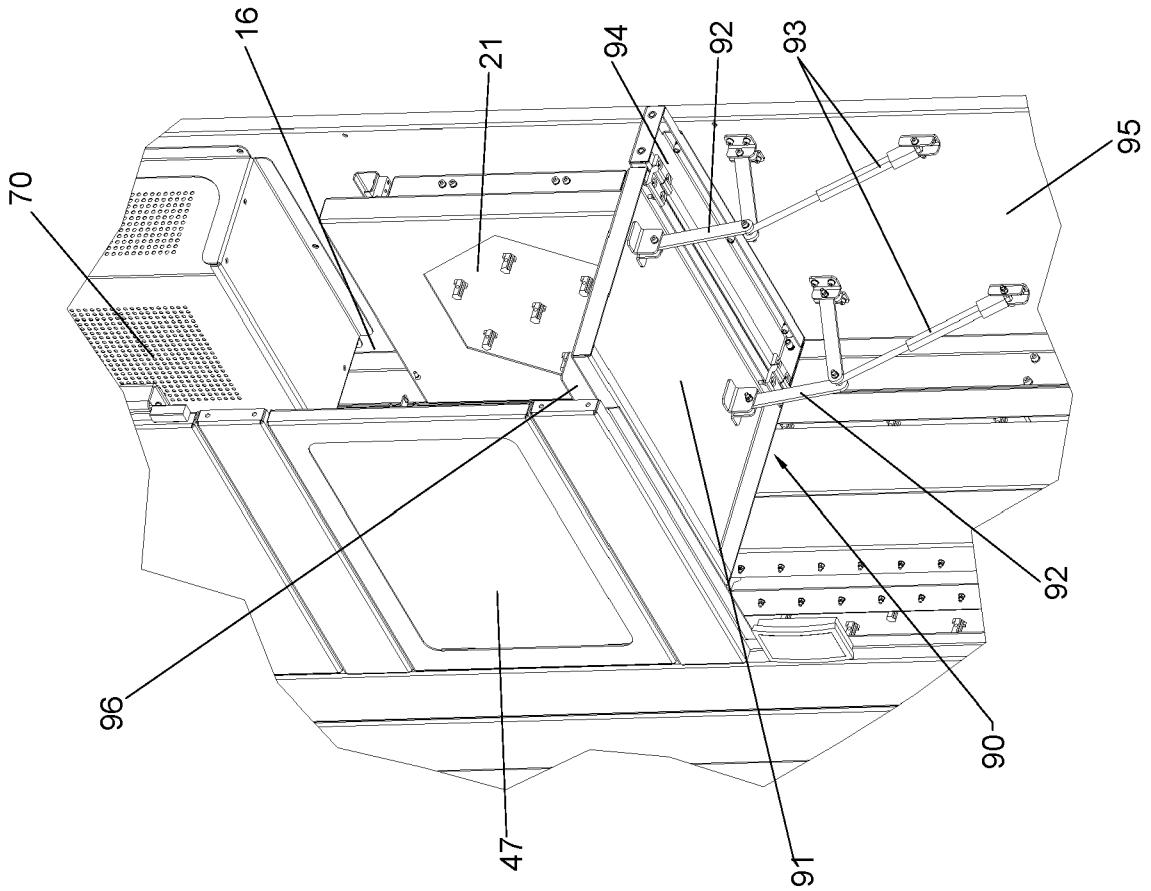


Fig.20

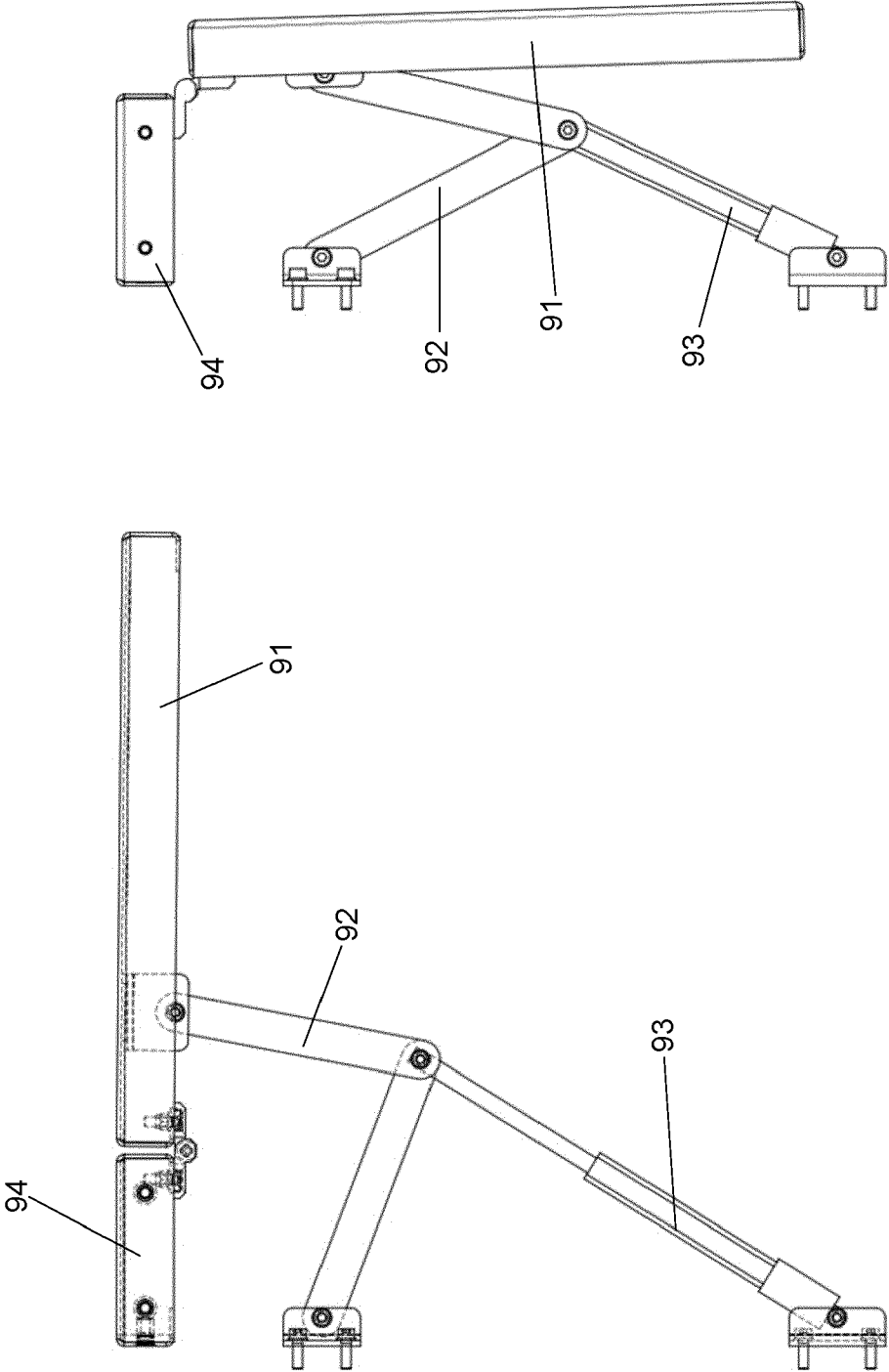


Fig.23

Fig.22



EUROPEAN SEARCH REPORT

Application Number  
EP 24 17 1839

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 3 819 881 A1 (META MUSTAFA [DE]) 12 May 2021 (2021-05-12) * paragraphs [0001], [0005], [0022], [0023], [0030]; figure 2 *	1,14	INV. A47G29/10 E05B19/00 G07C9/00 G07F17/00
A	EP 4 002 310 A1 (METALLBAU NITZBON GBR [DE]) 25 May 2022 (2022-05-25) * paragraphs [0003], [0007], [0010], [0034], [0096], [0097], [0098]; figures 2,3 *	1,14	
A	WO 2019/180115 A1 (FRANKA EMIKA GMBH [DE]) 26 September 2019 (2019-09-26) * page 8, lines 34-37 - page 9, lines 1-20; claim 7; figures 2-3 *	1,14	
X	US 2008/258869 A1 (OGNJENOVIC MIODRAG [US]) 23 October 2008 (2008-10-23) * paragraphs [0018], [0023]; claim 7; figure 2 *	14,15	
A		1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47G G07C E05C G07G E05B G07F
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>7 October 2024</b>	Examiner <b>Longo dit Operti, T</b>
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 24 17 1839

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07 - 10 - 2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3819881	A1	12 - 05 - 2021	NONE
-----			
EP 4002310	A1	25 - 05 - 2022	DE 102020130579 A1
		EP 4002310 A1	19 - 05 - 2022
			25 - 05 - 2022
-----			
WO 2019180115	A1	26 - 09 - 2019	DE 202018101663 U1
		WO 2019180115 A1	17 - 04 - 2018
			26 - 09 - 2019
-----			
US 2008258869	A1	23 - 10 - 2008	NONE
-----			

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82