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(54) System to control the access of people

(57) System to control access of people, being of special application for its installation in access to banks, in such a way that the system comprises a motor-driven door (1) hinged with respect to a pair of lateral pivots (11) and (9) on its upper and lower side, the door (1) being provided with a vertical bar (2) on each of its sides, along with an electro-mechanical lock (3), presence detector means on both sides of the door (1), functioning means of the motor-driven door, anti-entrapment means, and electronic control means of the system, defined by a command console.

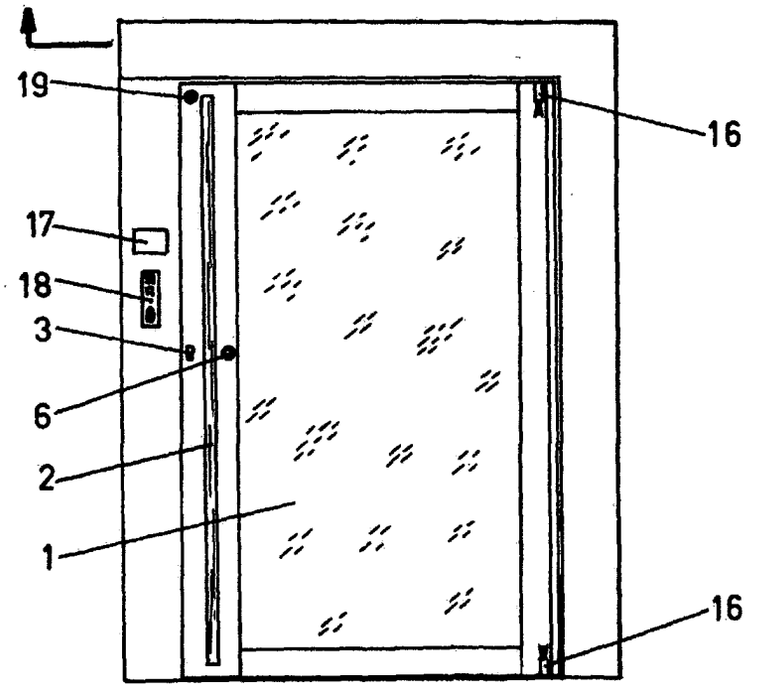

Fig. 2

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Description

OBJECT OF THE INVENTION

[0001] As stated in the heading of this descriptive specification, the following invention refers to a system to control access of people, which is of special utility for being installed in the access to banks, in such a way that the system comprises an access door provided with a series of function and control elements, along with a command console for the electronic control of the system, permitting its functioning to be adapted to the needs of the corresponding bank.

[0002] In this way, the system of control for access to the corresponding bank will be able to be adapted in line with the characteristics of that bank and in accordance with its opening hours, as well as in line with possible needs in accordance with the state of the system.

[0003] So, the system will be able to be adapted in accordance with the characteristics of the bank, and it will therefore be able to depend on whether or not it has an automatic cash dispenser, whether the bank is open or closed, and on the possible faults or needs of the bank.

[0004] Also, the control system permits the situation of the door to be known at all times and, if the bank has an automatic cash dispenser point and the branch is closed, it enables it to be known whether there is someone inside the cubicle of that system.

TECHNICAL FIELD OF THE INVENTION

[0005] The system to control access of people described in this specification is of special application for being installed in banks, independently of whether or not the bank has an automatic cash dispenser in a zone fitted out for that purpose.

BACKGROUND OF THE INVENTION

[0006] With the passage of time, the access of people both to banks and to certain other places is sought to be controlled by the rules of security in such a way that this control is done in a manner that has the least possible influence on the normal access for people, with the aim of creating the fewest possible problems.

[0007] So, it is becoming increasingly less frequent that one can access a bank without passing through some kind of security system, no matter how simple it might be, in other words, nowadays, virtually no bank has a free access system.

[0008] In this way, there exist on the market different means to control the access of people to banks, some being more sophisticated than others, and the means of control can thus vary from a simple electrical bell to antechambers provided with metal detection systems.

[0009] Therefore, in those banks with a simple electrical bell, in order to access them, it suffices for the user to ring the bell so that an employee, having seen the person who is ringing the bell, can perform the automatic opening of the door in order to permit access.

[0010] On the other hand, other banks have more sophisticated means of control, in such a way that access to the bank consists of an antechamber in which one passes through two independent doors, in such a way that when a user approaches it, first the outer door opens, permitting access to the antechamber, then, once that door is closed, the inner door will opened so that the user can enter the bank. When it comes to leaving, the operation is the opposite to that described above.

[0011] We can likewise cite Utility Model U9502723, which describes and claims a "security passage cabin to control the access to premises", the cabin of which consists of an entrance passage and another exit passage, with a central cubicle in which the pairs of doors on the outer and inner side of the entrance and exist passages converge, with a detector arc for ferromagnetic materials being provided solely in the entrance passage.

[0012] Equally, we can cite Invention Patent P9800192, which describes and claims a "cabin for access control", this cabin consisting of a pair of profiles with the general shape of an inverted "U" on their front sides, and in one of their sides there is defined an enclosed cubicle, accessible by a glazed internal wall which acts as a door and means of fingerprint detection of the persons accessing the interior of the premises, these means of fingerprint detection being defined by a print detector integral with the door.

[0013] Similarly, in the closed side cubicle, a camera and a monitor have been installed, with the monitor being oriented towards the glazed access door in order to record the image of people accessing the cabin from outside the premises, the image being displayed on the monitor and recorded for filing.

DESCRIPTION OF THE INVENTION

[0014] The present specification describes a system to control access of people, being of special application for installation in the access to banks, in such a way that the system comprises a motor-driven door hinged with respect to a pair of lateral pivots and on its upper and lower side, the door being provided with a vertical bar on each of its sides, along with an electro-mechanical lock, presence detector means on both sides of the door, functioning means of the motor-driven door, anti-entrapment means, and electronic control means of the system, defined by a command console, accessible to the personnel in charge.

[0015] So, the door is actuated by means of a motor provided with the corresponding reducer and encoder, which transmits movement by means of a chain to a pinion integral with the upper pivot for rotation of the door.

[0016] The presence detection means are defined by some sensors arranged in relation to both sides of the door and with respect to the opposite side of rotation, in such a way that the opening of the door, at a predetermined speed, will start at the moment in which the corresponding presence sensor detects the approach of the hand of a user, also permitting the direction of rotation of the door to be known.

[0017] The functioning means of the motor-driven door are defined by a key which can be set in three positions (day, night and total disconnection), provided on its outer side.

[0018] Moreover, the motor-driven door, which is hinged with respect to one of its sides, is controlled by means of the command console of the electronic control system, having the corresponding connections between the door and the control console, in such a way that the rotation of the door starts when any of the presence detectors becomes actuated, the door moving with a predetermined and that speed of rotation being adapted, in both directions, to the speed of passage of the users.

[0019] The functioning means, defined by a three-way key (day, night and total disconnection) will, together with the electro-mechanical lock and the presence sensors provided in one door and the other, be adapted in line with the functioning which the motor-drive has to have, by means of duly acting on the commands of the control console.

[0020] The anti-entrapment means are defined by at least one cell, vertically positioned, in each of the sides of the motor-driven door, with respect to the side of rotation.

[0021] So, in a preferred embodiment, the anti-entrapment means are defined by a pair of cells in each of the sides of the door, one provided in the upper part and the other in the lower part, and facing each other, thereby preventing possible entrapments of users between the side of rotation of the door and the frame for it, with respect to both sides of the door.

[0022] Also, the outer part of the frame of the motor-driven door incorporates some passage control signals, a loud-speaker system for communication with the command console, as well as a push-button for operating a sound element in the actual command console.

[0023] Furthermore, in relation to the zone of the automatic cash dispenser, the control system incorporates a presence detector, a video recording system and an oral communication system from the control console.

[0024] The electro-mechanical lock is provided with a manual unlocking key, permitting the lock to be unlocked in case of need.

[0025] In order to complete the description that is going to be made, and with the aim of aiding a better understanding of the characteristics of the invention, this descriptive specification is accompanied by a set of drawings in which the most characteristic details of the invention are represented in a manner that is to be regarded as illustrative rather than limiting.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

Figure 1. Shows a plan view of an access to a bank provided with an automatic cash dispenser, in which can be seen the access door from the outside to the zone of the automatic cash dispenser, along with the access door to the inside of the bank.

Figure 2. Shows a front view of an access door from the outside to a zone of the automatic cash dispenser, in which certain functional elements can be seen in the front frame along with a pair of anti-entrapment sensors.

Figure 3. Shows a plan view of the door of the previous figure, in which can seen the pair of vertical bars, one on each side of the door, on which the presence detectors are mounted.

Figure 4. Shows a side elevation view of the door relative to figure 2, in which the positioning of the presence sensors can be seen, along with the anti-entrapment sensors.

Figure 5. Shows a front view of an access door to a bank provided with an automatic cash dispenser zone, with certain mounting details of the hinging pivots of the door having been represented, along with the transmission of the motor for driving the door.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0027] In view of the figures commented upon and in accordance with the numbering adopted, we can see how the system includes a motor-driven hinged door 1, provided with a vertical bar 2 in each of its sides, this door 1 having an electro-mechanical lock 3, means of operating the motor-driven door, presence detector means on both sides of the door, and anti-entrapment means, along with electronic means of control of the system for the functioning of the door, defined by a command console, accessible to the personnel in charge.

[0028] The motor-driven hinged door 1 is preferably of utility for being installed in controlling the access of people to banks provided with a zone 4 for the installation of at least one automatic cash dispenser 5, in such a way that for the functioning of the system, the door 1 remains connected with the control console by means of a connection 21, due to the control console being located inside the bank.

[0029] So, zone 4 for the location of at least one automatic cash dispenser 5 remains separated from the interior zone 8 of the bank by a door 7, which will be open or closed depending on the working activity of the bank.

[0030] Moreover, the motor-driven door 1, which is hinged around one of its sides, presents in the vicinity of the side opposed to that of rotation and on both sides, a vertical bar 2, along with some presence sensors 6, in such a way that the said presence sensors 6 have an approximate range of thirty-five centimetres, their mounting being carried out in such a manner that at the moment in which one of them detects the approach of a user's hand to operate the door 1, in order to effect any manoeuvre, the automatic actuation system for the motor-driven door 1 becomes activated.

[0031] So, the motor-driven door 1, hinged in both directions with respect to one of its sides, is controlled by means of a command console of the electronic control system, so that this console will initiate the rotation at a predetermined speed and that speed of rotation will be automatically adapted in both directions to the speed of passage of the users.

[0032] In other words, the users must not exert any force on the motor-driven door 1 since it is the motor itself for the door 1 which transmits the movement without the users having to act on the door.

[0033] Similarly, the direction of rotation of the motor-driven door 1 will vary at the moment in which the presence is detected of a user accessing in the direction opposite to that of the rotation, and it will adapt itself to the user and reverse its direction of rotation.

[0034] In this way, for the hinging of the door 1 with respect to one of its sides, the door is mounted with respect to a lower pivot integral with the structure of the door 1, provided with the corresponding bearings 10, and an upper pivot 11, to which movement is transmitted by means of the motor 12.

[0035] To achieve this, secured to the upper pivot 11 integral with the structure of the door 1, and mounted with respect to the corresponding bearings 13, is a pinion 14 to which the motor 12 transmits movement by means of the chain 15, said motor 12 being provided with the respective reducer and encoder.

[0036] As this concerns a motor-driven door, it incorporates certain security measures, and so the door has a monitoring system for the consumption of the drive motor, in such a way that, by knowing the consumption of the motor at each moment by means of mathematical algorithms, we know the force being exerted and we can therefore determine if any trapping has occurred, in which case the direction of rotation of the door would be put into reverse in order to release the trapped person.

[0037] As we have stated, the presence detector means are defined by some sensors 6 provided in the structure of the door 1 in relation to the side opposite to that of rotation, permitting the direction of rotation of the hinged door 1 to be known at any moment. Moreover, given that the door 1 can rotate in both directions, this permits a more fluent flow of traffic.

[0038] Furthermore, in accordance with the functioning which the door 1 has to have, both the electro-mechanical lock 3 and the presence sensors 6 provided in one and the other side of the door with respect to the side opposite to that of rotation will be activated or not, this activation being carried out by means of the corresponding commands in the control console.

[0039] Likewise, the system to control access of people presents certain anti-entrapment means, which are defined by at least one cell 16, vertically positioned, in each side of the motor-driven door 1, with respect to the side of rotation, in such a way that the system preferably incorporates one cell 16 in its upper part and the other in its lower part.

[0040] These anti-entrapment cells 16 protect users from possible entrapments between the side of rotation of the door 1 and the frame for it, so that the vertical positioning of the sensors or cells 16 provide protection over the entire height of the door 1 and, if those cells detect any presence, the system acts and causes the movement of the door to go into reverse.

[0041] Of course, depending on the needs or preferences of the customer, the motor-driven door 1 can lack any of the listed elements. So, in practical embodiments of the motor-driven door 1, both the presence detectors 6 and the anti-entrapment cells 16 will be optional, and they do not modify the essence of the invention.

[0042] Equally, the control system incorporates an access control device 17, a card reader, which is of use for controlling access to the zone 4 for the location of the automatic cash dispenser 5, preferably being of use when the bank is not open to the public.

[0043] Similarly, the control system incorporates a unit 18 in which have been installed an entrance push-button, passage signals and an intercom, permitting communication with the command console.

[0044] Equally, in relation to the outer part of the motor-driven door 1 there is a key 19 which cam be set in three different positions (day, night and total disconnection) in order to adapt the functioning of the door 1 to the different modes required, in other words, depending on, for example, whether or not the bank is open to the public or in accordance with any specific mode of functioning.

[0045] In relation to the inner part of the motor-driven door 1, the control system incorporates an exit push-button as well as a video recording system.

[0046] Furthermore, in relation to the zone 4 for the location of the automatic cash dispenser 5, the system incorporates a presence detector 20 and a communication system, by means of which the presence of users in that zone 4 of the dispenser 5 can be controlled, and it is possible to communicate with those present there, this means of control and communication being of special application when the bank is closed to the public and that zone 4 is accessed by a person with the intention of remaining there for a longer period of time than is considered usual for the operation that can be performed in the zone.

[0047] In this way, once that situation has been determined, the person inside will be able to be communicated with from the control console in order to inform them that if they do not leave the zone then the appropriate measures will be taken.

[0048] By way of example, we can make a description of the different ways of functioning of the motor-driven door 1 and so, in accordance with the positioning of the key 19, and with the activation or otherwise of the electro-mechanical lock 3 and activation or otherwise of the presence sensors 6 on the basis of the positioning of the corresponding function commands of the control console, different actions are obtained for the door, such as might be:

+ "Day"; "on"; "automatic", "entrance-exit"

[0049] This is the normal working position for the door system, so that when it is at rest the door remains in the closed position, the electro-mechanical lock 3 is activated and the presence sensors for both sides of the doors will be activated.

[0050] So, both for entering and for leaving, one merely has to bring the hand up to the vertical bar 2, of the corresponding side of the door 1, and it will react by opening in the desired direction when the presence sensors 6 detect that situation.

+ "Day"; "on"; "automatic", "entrance"

[0051] At rest, the door remains in the closed position, the electro-mechanical lock 3 is active and just the presence sensor located on the outer side of the door 1 is active.

[0052] So, the door system will merely allow entrances.

[0053] When the hand is brought up to the active presence sensor, the first thing the system does is to open the electro-mechanical lock 3 and then the normal opening manoeuvre takes place.

+ "Day"; "on"; "automatic", "exit"

[0054] At rest, the door remains in the closed position, the electro-mechanical lock 3 is active and just the presence sensor located on the inner side of the door 1 is active.

[0055] So, the door system will merely allow exits.

[0056] When the hand is brought up to the active presence sensor, the first thing the system does is to open the electro-mechanical lock 3 and then the normal opening manoeuvre takes place.

+ "Day"; "on"; "closed"

[0057] At rest, the door remains in the closed position, the electro-mechanical lock 3 is not active and the door can be programmed so that in this position it is open 90° towards the inside or open 90° towards the outside.

+ "Day"; "on"; "open"

[0058] At rest, the door remains in the open position and the electro-mechanical lock 3 is not active.

[0059] The door 1 can be programmed so that in this position it is open 90° towards the inside or open 90° towards the outside.

+ "Day"; "off"

[0060] This position is useful when there exists a cash dispenser and the office is closed. At rest, the door remains in the closed position, the electro-mechanical lock 3 is active and the interior presence sensor is active, while the exterior presence sensor is not active.

[0061] So, in order to enter, this can only be done by means of the card reader 17, while to leave, the presence sensor relating to the inner side of the door will become actuated.

+ "Night"

[0062] At rest, the door 1 remains in the closed position, the electro-mechanical lock 3 is active and the presence sensors for both sides of the door 1 are inactive.

[0063] In this position, the door system is fully closed and it is not possible to enter or leave. This position is useful when the bank is closed and it has no cash dispenser or it has one but it is wished to render it unusable.

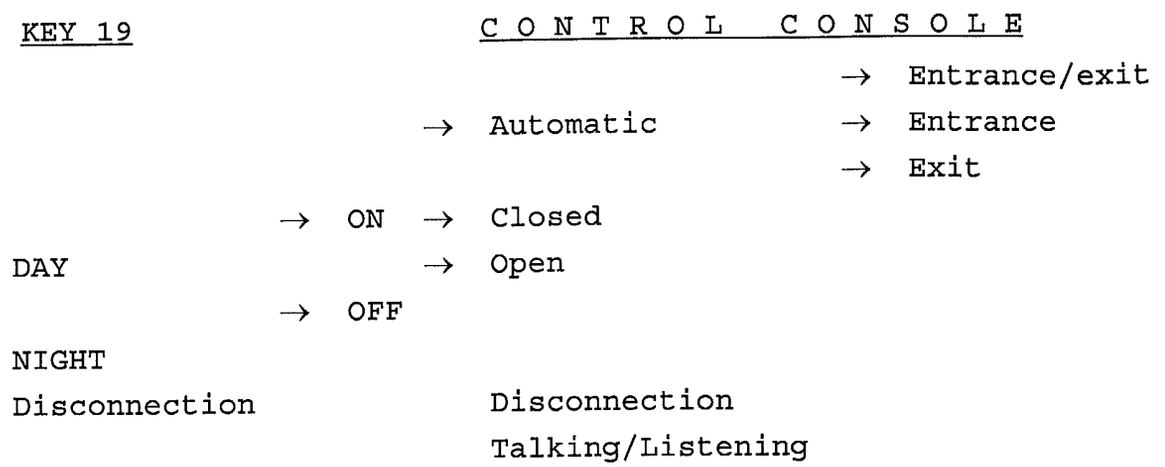
+ "Total disconnection"

[0064] This position is just one of security, since if we set the key to the totally off position the system becomes disconnected and the door remains free without any control. This function can be obtained both with the key 19 when it is turned to that position and from the control console since it also has that function available.

+ "Talking listening"

[0065] With this option, communication can be set up between the command console and the exterior signal, in such a way that while we keep the push-button in the unit 18 pressed down, we can talk from the command console and listen in the exterior signal, and when the push-button is released for a period of time from the command console, one can hear what is being said in the exterior signal.

[0066] Finally, for a better understanding, the following diagram is included of the relation between the key 19 and the control console for the functioning of the door.



Claims

1. System to control access of people, being of special application for its installation in the access to banks, **characterised in that** the system comprises a motor-driven door (1) hinged with respect to a pair of lateral pivots (11) and (9) on its upper and lower side, the door (1) being provided with a vertical bar (2) on each of its sides, along with an electro-mechanical lock (3), presence detector means on both sides of the door (1), functioning means of the motor-driven door, anti-entrapment means, and electronic control means of the system, defined by a command console.

2. System to control access of people, according to claim 1, **characterised in that** the door (1) is driven by means of a motor (12) provided with the corresponding reducer and encoder, which transmits movement by means of a chain (15) to a pinion (14) integral with the upper pivot (11) for rotation of the door (1).

3. System to control access of people, according to claim 1, **characterised in that** the presence detector means are defined by a plurality of sensors (6) provided in both sides of the motor-driven door (1), in relation to the side opposite to the rotating side of the door, permitting to know its rotating direction.

4. System to control access of people, according to claim 1, **characterised in that** the functioning means of the motor-driven door (1) are defined by a key (19) able to be set to two function positions, and a third disconnection position, provided on its outer side.

5. System to control access of people, according to claims 1, 3 and 4, **characterised in that** the motor-driven door (1), hinged with respect to one of its sides, is controlled, in combination with the function key (19), by means of the command console of the electronic control system, the rotation starting at a predefined speed, by any of the presence detectors (6) being activated, and said rotating speed being adapted in both directions to the crossing speed of the users.

6. System to control access of people, according to claims 1, 3 and 4, **characterised in that** the functioning means defined by a key (19) able to be set to different positions, together with the electro-mechanical lock (3) and the presence sensors (6) provided in one and the other side of the door (1), are adapted by means of the corresponding control commands, in accordance with the functioning required to the motor-driven door (1).

7. System to control access of people, according to claim 1, **characterised in that** the anti-entrapment means comprises at least one cell (16), vertically positioned, in each of the sides of the motor-driven door (1), with respect to the side of rotation thereof.

8. System to control access of people, according to claims 1 and 7, **characterised in that** in a preferred embodiment, the anti-entrapment means comprises a pair of cells (16) in each of the sides of the motor-driven door (1), in relation to their side of rotation, one being provided in the upper part and the other in the lower part, facing each other.

9. System to control access of people, according to claim 1, **characterised in that** the outer part of the frame for the motor-driven door (1) incorporates a unit comprising passage control signals, a loudspeaker system for communicating with the command console, and a push-button for activating a sound element in the command console.

10. System to control access of people, according to claim 1, **characterised in that** in relation to the zone (4) of the automatic cash dispenser (5), the control system incorporates a presence detector (20) and an oral communication system from the control console.

11. System to control access of people, according to claim 1, **characterised in that** the electro-mechanical lock (3) is provided with a manual unlocking key.

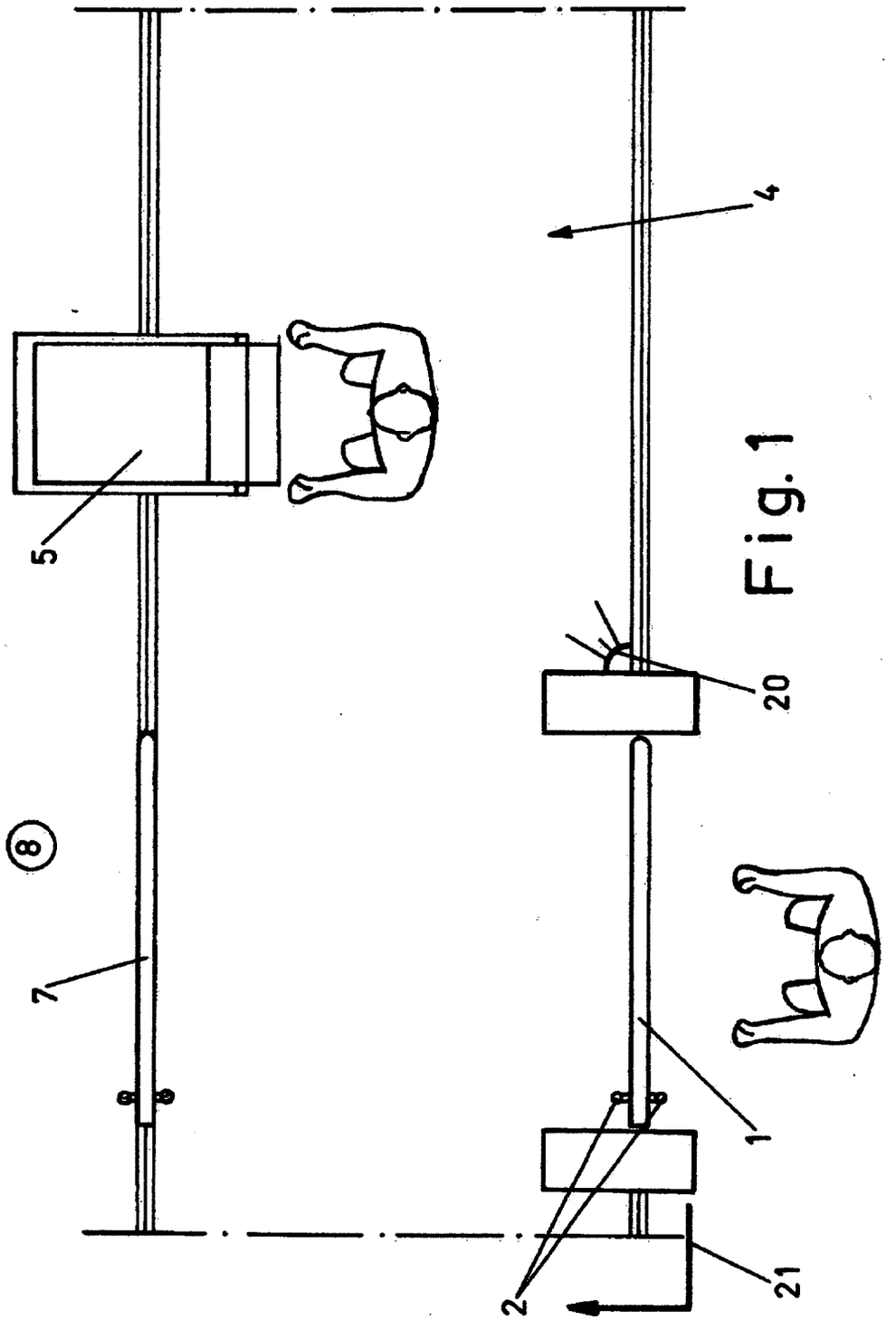


Fig. 1

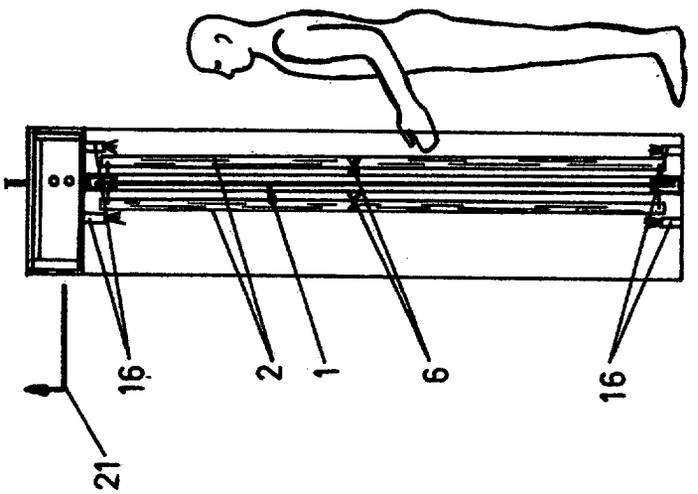


Fig. 4

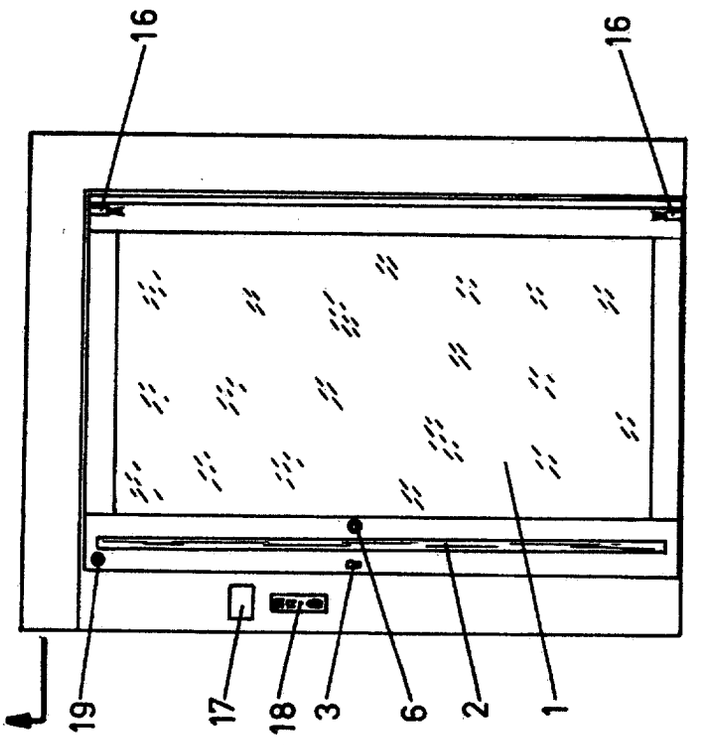


Fig. 2

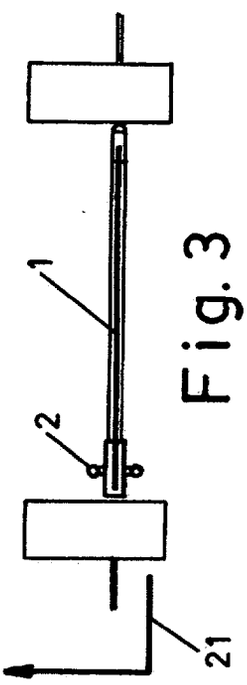


Fig. 3

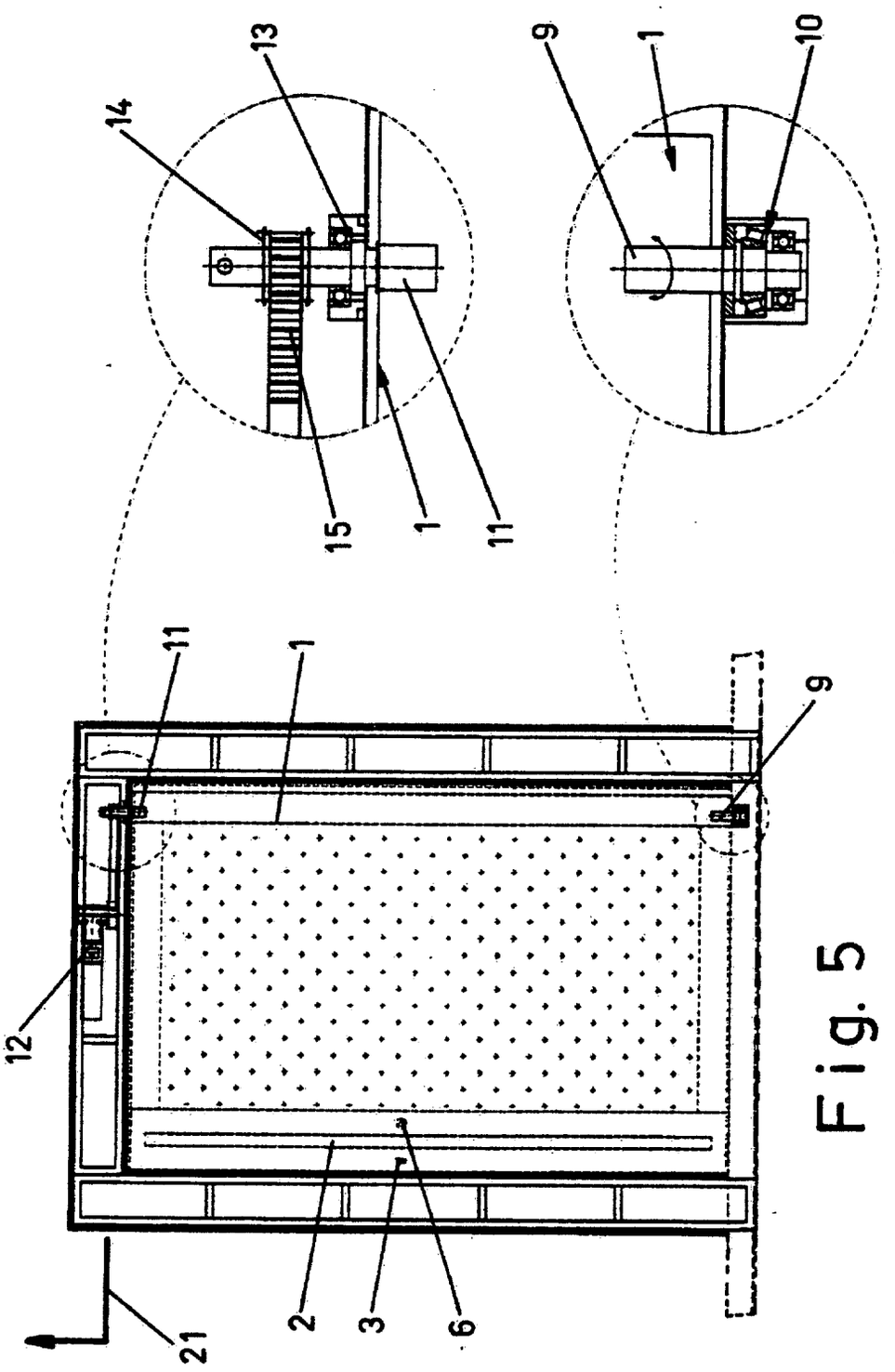


Fig. 5