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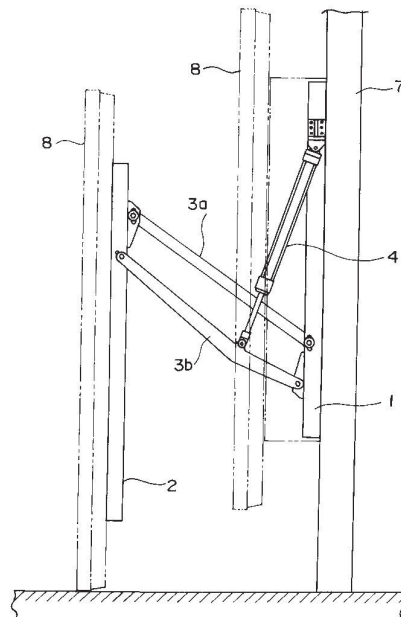
(54) [Name of invention] Supporting device for display

(57) [Summary]

[Problem] To provide a support device for a display that allows maintenance of the display to be easily performed and installation work to be easily performed by a small number of people.

[Solution means] The device is equipped with first frame 1 mounted to a vertical structure including a wall or pillar 7, a second frame 2 supporting the above mentioned display at the back of the display 8, a vertical pair of link arms 3a and 3b in which the ends of the top and bottom vertical points of the first frame are each supported in a rotatable fashion and, in the top and bottom vertical points of the second frame, the other ends are supported in a rotatable fashion, and a hydraulic cylinder driven to expand and contract by hydraulic pressure, and the contraction movement raises the second frame toward the first frame via each link arm, and the extension action lowers the second frame toward the front of the first frame via each link arm.

[Selection diagram] Fig. 4



[Scope of claims]

[Claim 1]

A display support device characterized by having a first frame attached to a vertical structure including a wall or pillar, etc.;

a second frame supporting the above mentioned display at a back of the display;

a pair of upper and lower link arms in which each end of the vertical upper and lower points of the above mentioned first frame is supported in a rotatable fashion and each end of the vertical upper and lower points of the above mentioned second frame are supported in a rotatable fashion;

and a fluid pressure driving means extending and contracting by fluid pressure and causing a second frame to be raised towards the above mentioned first frame side via the above mentioned respective link arms by contraction, and lowering the above mentioned second frame from the above mentioned first frame towards its front via the above mentioned respective link arms by the extension thereof.

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[Claim 2]

Support device for the display according to Claim 1, characterized in that the above mentioned upper and lower pair of link arms are axially aligned between one side of the above mentioned first frame and the second frame, and that the other upper and lower pair of link arms are axially aligned between the other side of the above mentioned first frame and the second frame, respectively.

[Claim 3]

Support device for the display according to Claim 1 or Claim 2, characterized in that one end of the above mentioned fluid pressure driving means is axially oriented to the above mentioned first frame and the other end is axially oriented to the rotational free end side of either of the above mentioned link arms away from the pivot support of the first frame.

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[Claim 4]

A support device for a display as claimed in any one of Claims 1 to 3, characterized in that the above mentioned fluid pressure driving means is a hydraulic cylinder that is hydraulically operated to extend and retract.

[Detailed description of invention]

[Technical field]

[0001]

The invention relates to a support device for a display for mounting a large screen flat screen television display against a vertical structure, such as a wall or column.

[Background technology]

[0002]

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For example, in displays such as television receivers, thin-type displays are popular, such as liquid crystal displays or plasma displays, and these are generally installed on the floor using a dedicated stand or on a rack (mounting table).

[0003]

In addition, in the above mentioned display, installation means such as mounting directly to the wall surface of the room utilizing the characteristics of the thin-type structure are also employed. For example, Patent Literature 1 shows a configuration in which a plurality of mounting holes are installed in a suitable position in the rear cabinet of the display, and the head of the mounting bolt pre-embedded in the wall surface is locked with a collar formed in the opening of the mounting hole, thereby attaching the display to the wall surface.

[Patent Literature 1] Unexamined patent application JP 5-11707 publication

[0004]

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On the other hand, as another means of attaching the above mentioned thin display along the wall, etc., Patent Literature 2 shows a configuration in which two pipe-shaped members are vertically mounted along the wall along the wall to be parallel to each other, and the rear surface of the display is mounted via an L-shaped fitting that is screwed to each of the pipe-shaped members.

[Patent Literature 2] Unexamined patent application JP10-292898 publication

[Disclosure of invention]

[Problems that the invention will attempt to solve]

[0005]

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Incidentally, in this type of display in recent years, there has been an increasing demand for larger screens in commercial applications, etc., so plasma displays are also provided that have a screen size of more than 100 inches. In such a plasma display, the weight of such a display is greater than 100 kg, so it is extremely difficult for a limited number of people to install such a display in a predetermined height position such as on a wall, etc., in the mounting means for the display as shown in the above mentioned Patent Literature 1 and 2.

[0006]

In addition, in the above mentioned plasma display, it is necessary to open the back surface of the display during maintenance, etc., so it is necessary to ensure that there is enough space between the wall surface and the back surface of the display to allow people to enter. Therefore, it is desirable that the support device supporting the display be configured to be able to meet the above mentioned requirements during maintenance of the display.

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[0007]

The problem of the invention is the provision of a support device for a display that is capable of mounting a large and heavy display as described above against a wall surface including pillars, etc., easily with a limited number of people, and that allows for a predetermined space between said mounting position and the back surface of the display, such as during maintenance.

[Method for solving the problem]

[0008]

The support device for the display according to the present invention, which is made to solve the above mentioned problem, is characterized by a first frame mounted to a vertical structure including a wall or column, a second frame supporting the above mentioned display at the back of the display, a vertical pair of link arms in which the ends of the top and bottom vertical points of the above mentioned first frame are each supported in a rotatable fashion and, in the top and bottom vertical points of the above mentioned second frame, the other ends are supported in a rotatable fashion, and a hydraulic drive driven to expand and contract by hydraulic pressure, and the contraction movement raises the second frame toward the first frame via each above mentioned link arm, and the extension action lowers the second frame toward the front of the first frame via each above mentioned link arm.

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[0009]

In this case, it is desirable that the upper and lower pair of link arms are axially aligned between one side of the above mentioned first frame and the second frame, and that the other upper and lower pair of link arms are axially aligned between the other side of the above mentioned first frame and the second frame, respectively.

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[0010]

And, in a preferred embodiment, one end of the above mentioned fluid pressure driving means is axially aligned to the above mentioned first frame and the other end is axially aligned to a rotational free end side in either of the above mentioned link arms away from the pivot support of the above mentioned first frame. In addition, in the support device according to the present invention, a hydraulic cylinder that is hydraulically telescopically operated is preferably used as the fluid pressure driving means.

[Effect of Invention]

[0011]

By the support device of the display according to the above mentioned configuration, when the above mentioned hydraulic cylinder as a fluid pressure driving means is driven and extended, a second frame supporting the back of the display can be lowered towards the front of the first frame attached to the vertical structure via the above mentioned link arms. This allows for a predetermined spacing between the vertical structure and the display, making it easy to perform maintenance, etc. of the display.

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[0012]

Also, after the end of the maintenance, etc. of the display, the above mentioned hydraulic cylinder may be contracted to raise the second frame supporting the display towards the above mentioned first frame side via each of the above mentioned link arms, thereby allowing the display to be placed in a predetermined position along the vertical structure.

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[0013]

Further, by the support device of the display according to the above mentioned configuration, the abovementioned hydraulic cylinder can be contracted to bring the first and second frames closer together, and the first frame can be raised while maintaining a generally vertical position by attaching a rear face of the display to the second frame and extending and driving the above mentioned hydraulic cylinder.

[0014]

Thus, the first frame can be easily opposed to a predetermined position of the vertical structure by mounting it on a caster or other transport means with the rear of the display attached to the second frame and extending and driving the hydraulic cylinder as described above. This makes it easier for a small number of people to install the support device and display.

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[Best form for implementing the invention]

[0015]

The support device for the display according to the present invention will be described below based on the embodiment shown in the figures. Fig. 1 shows the basic configuration of the support device in the deployed state (with the second frame lowered relative to the first frame), and Fig. 2 shows the support device in the closed state (with the second frame approaching upward toward the first frame). In Figs. 1 and 2, the scale of the figures is different, but the same parts are shown with the same signs.

[0016]

In Figs. 1 and 2, sign 1 shows a first frame, which is attached to a vertical structure including a wall or pillar, etc., as will be described based on Fig. 4, which will be described below. This first frame 1 includes a right column 1a made of a square pipe and a left column 1b made of a square pipe, which are connected such that each above mentioned column 1a, 1b is in a parallel state by means of an upper connecting member 1c made of a channel fitting and a central connecting member 1d made of a square pipe, and is formed in a planar fashion as a whole.

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[0017]

In the embodiment shown in the figure, a substrate 1e, 1f are attached between the above mentioned upper connecting member 1c and the central connecting member 1d, and on the substrate 1e, 1f, a hydraulic pump that expands and contracts the hydraulic cylinder described below as necessary, and a power supply device, etc., of the same pump are arranged.

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[0018]

On the other hand, sign 2 shows the second frame, which is mounted to support the above mentioned display at the back of the display, as will be described based on Fig. 4 below. This second frame 2 includes a right column 2a made of a square pipe and a left column 2b made of a square pipe as well, and is connected such that each above mentioned column 2a, 2b is in a parallel state and is formed in a planar fashion as a whole by an upper connecting member 2c made of a channel fitting and a central connecting member 2d made of a channel fitting.

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[0019]

At two upper and lower points near the lower end of the above mentioned right column 1a that constitutes the first frame 1, one end each of the upper link arm 3a and the lower link arm 3b is rotatably axially supported, and each other end of the upper and lower pair of link arms 3a, 3b is rotatably axially supported at two upper and lower points near the upper end of right column 2a that constitutes the above mentioned second frame 2.

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[0020]

Further, at two upper and lower points near the lower end of the left column 1b constituting the above mentioned first frame 1, one end each of the upper link arm 3c and the lower link arm 3d constituting the other pair of link arms is rotatably axially supported, and each other end of the upper and lower pair of link arms 3c, 3d is rotatably axially supported at two upper and lower points near the upper end of the left column 2b constituting the above mentioned second frame 2.

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[0021]

This causes a pair of upper and lower link arms to be axially aligned between one side of the above mentioned first frame and the second frame, and another pair of upper and lower link arms to be axially aligned between the other side of the above mentioned first frame and the second frame, respectively. Note that in the embodiment shown in the figure, the attachment spacing of the upper and lower two points of the pair of link arms 3a, 3b passed between the right columns 1a, 2a constituting the first frame 1 and the second frame 2 is set to be greater than the attachment spacing of the upper and lower two points of the pair of link arms 3c, 3d passed between the left columns 1b, 2b.

[0022]

On the other hand, one end of the hydraulic cylinder 4 as a fluid pressure driving means is axially supported at the upper end of the right column 1a that constitutes the above mentioned first frame 1. The other end of the hydraulic cylinder 4 is also axially supported on the rotational free end side away from the axial support point of the right column 1a in the above mentioned lower link arm 3b. That is, in the embodiment shown in the figure, the other end of the hydraulic cylinder 4 is axially supported at a location slightly closer to the first frame 1 than about the center or center of the lower link arm 3b.

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[0023]

Thus, if the hydraulic cylinder 4 is driven to extend, the support device can be in a deployed state in which the second frame 2 is lowered relative to the first frame 1, as shown in Fig. 1. Also, if the hydraulic cylinder 4 is driven to contract, the support device can make the second frame approach upward and close towards the first frame, as shown in Fig. 2.

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[0024]

Fig. 3 shows the said support device in a closed state, that is, in the state shown in Fig. 2, its top, bottom, left, and right are covered with a cover member 5. In Fig. 3, representative parts of each part described based on Fig. 1 and Fig. 2 are shown with the same sign respectively. The cover member 5 covers each frame 1, 2, and link arms 3a to 3d, etc. when the support device is mounted on a wall surface, etc., and this cover member 5, used to improve the appearance, is not essential to the support device according to the invention.

[0025]

It should be noted that in order to effectively dissipate heat emitted from the back surface of the display supported in the above mentioned support device, it is desirable to use perforated metal with holes throughout, or expanded metal, etc. in the form of a knitted extension of a large number of slits.

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[0026]

Fig. 4 shows an example of mounting a display on a wall, etc., using a support device of the above mentioned configuration, with the display being viewed from the side, and Fig. 4 shows the deployed state (corresponding to Fig. 1) in which the second frame 2 is lowered relative to the first frame 1. In Fig. 4, the corresponding parts of the parts already described are shown with the same signs.

[0027]

In order to attach the display 8 to a wall, etc., using the support device described above, reinforcement pillars 7 are installed as necessary within the wall. Thus, in the example shown in Fig. 4, the left side surface of said column 7 can be said to be a wall surface.

[0028]

The above mentioned reinforcing column 7 is mounted with a bolt 12 for mounting the back of the first frame 1 as shown in Fig. 5. On the other hand, a plurality of mounting holes are provided on the back of the right column 1a and the left column 1b, which make up the above mentioned first frame 1, at appropriate locations along their longitudinal direction. In Fig. 5, the mounting holes installed on the back of the right column 1a are shown with sign 11.

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[0029]

The mounting holes 11 are formed in communication between a large diameter through which the head of said bolt 12 is inserted and a small diameter through which the head of said bolt 12 is locked. Therefore, by matching the large diameter of the above mentioned mounting hole 11 formed in the first frame with respect to the bolt 12 pre-attached to the wall surface, etc., and relatively inserting the head of the bolt 12 and lowering the position of the first frame slightly, the small diameter of the mounting hole 11 is locked to the head of the bolt 12, and the first frame 1 can be attached to the wall surface, etc., including the column 7 in this state.

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[0030]

On the other hand, Fig. 6 shows an example of mounting the back surface of the display 8 on the front surface of the second frame 2, and the front surface of the right and left columns 2a, 2b, respectively, constituting the second frame 2 are fitted with a plurality of mounting holes at appropriate locations along their longitudinal direction as shown in Figs. 1-3. In Fig. 6, the mounting holes that have been installed on the front surface of the right column 2a are shown with a sign 13. The back of the above mentioned display 8 supported by the second frame 2 is also fitted with a bolt 14 in a position corresponding to the mounting hole 13.

[0031]

The above mentioned mounting holes 13 are formed in communication with a large diameter through which the head of the above mentioned bolt 14 mounted on the back of the above mentioned display 8 is inserted and a small diameter through which the head of bolt 14 is locked. Thus, by matching the large diameter of the above mentioned mounting hole 13 formed in the second frame 2 with respect to the bolt 14 pre-mounted at the back of the display 8 and relatively inserting the head of the bolt 14 and slightly raising the position of the second frame, the small diameter of the mounting hole 13 in the head of the bolt 12 can be locked and the display 8 can be mounted in this state on the front face of the second frame 2.

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[0032]

With the configuration shown in Figs. 5 and 6, when the hydraulic cylinder 4 attached to the support device is driven to contract as described above with the above mentioned support device and the display 8 connected to a wall surface, etc., the support device raises and approaches the second frame 2 towards the first frame 1, which enables mounting of the above mentioned display 8 attached to the front surface of the second frame 2 along a wall or the like, as shown in Fig. 2.

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[0033]

With the support device of the above mentioned configuration according to the invention, by telescopically driving the hydraulic cylinder 4, the display 8 can be set to a lowered state and a support state along the wall surface as shown in Fig. 4. In addition, if maintenance, etc. of the display 8 is required, by extending and driving the hydraulic cylinder 4 as described in the Invention Effect section and lowering the display 8, a predetermined spacing can be provided between the back surface of the display 8 and the wall surface, etc. as shown in Fig. 4, and maintenance, etc. of the display 8 can thereby be easily performed.

[0034]

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In addition, as also described in the Invention Effect section, the first frame can be easily placed in opposition in the designated position of the vertical structure by mounting it on a transport means such as a caster that is not illustrated with the rear surface of the display 8 attached to the second frame 2, and by extending and driving the hydraulic cylinder 4. This makes it easier for a limited number of people to install the support device and display.

[0035]

Note that in the above mentioned embodiment, the other end of the hydraulic cylinder 4 with one end axially aligned to the first frame side is axially aligned at a location slightly closer to the first frame 1 than the approximately central or central portion of the lower link arm 3b, but the other end of the above mentioned hydraulic cylinder 4 may be configured axially aligned to any portion of the second frame 2.

[0036]

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In addition, the above mentioned hydraulic cylinder 4 may also employ fluid pressure driving means that are telescopically operated by other fluids, other than those that are hydraulically telescopically driven.

[0037]

In the case where a hydraulic cylinder is used as mentioned above as a fluid pressure driving means and a structure is made to inject and aspirate oil from the hydraulic pump to this hydraulic cylinder, the hydraulic cylinder 4 can be telescopically operated by forward and reverse rotation of the motor driving the above mentioned hydraulic pump. According to this configuration, the configuration can be simplified because there is no longer a need to include a switching valve, etc. on the hydraulic cylinder side or in the hydraulic control system.

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[0038]

Furthermore, although described in the above mentioned embodiment based on a support device supporting a plasma display, the support device according to the present invention can also suitably be employed to support various displays other than the above mentioned plasma display such as heavy electroluminescent displays including signs, signage, or neon signs.

[Short description of drawings]

[0039]

[Fig. 1] A perspective view shown with the support device according to this invention deployed.

[Fig. 2] A perspective view shown in the same closed state.

[Fig. 3] A perspective view showing the state of the cover member attached to the support device in the state shown in Fig. 2. 10

[Fig. 4] A side view showing the display mounted on a wall, etc. using the support device described above.

[Fig. 5] A schematic diagram illustrating one means of attaching the above mentioned support device to a wall, etc.

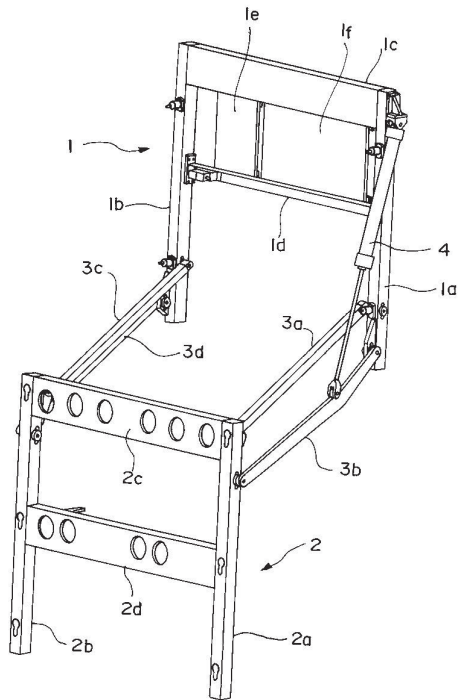
[Fig. 6] A schematic diagram illustrating one means of attaching a display to a frame on the front side of the support device.

[Explanation of signs]

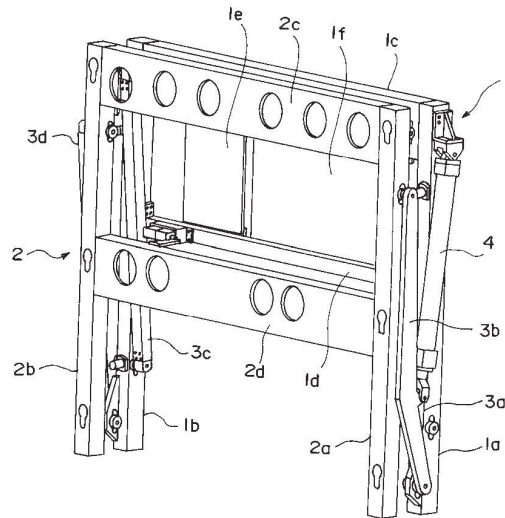
[0040]

1	first frame	
1a and 1b	columns	
1c, 1d	connecting members	20
2	second frame	
2a and 2b	columns	
2c, 2d	connecting members	
3a to 3d	link arms	
4	hydraulic cylinders (body pressure driving means)	
5	cover member	
7	pillars (wall)	
8	display	
11 and 13	mounting holes	
12, 14	bolts	

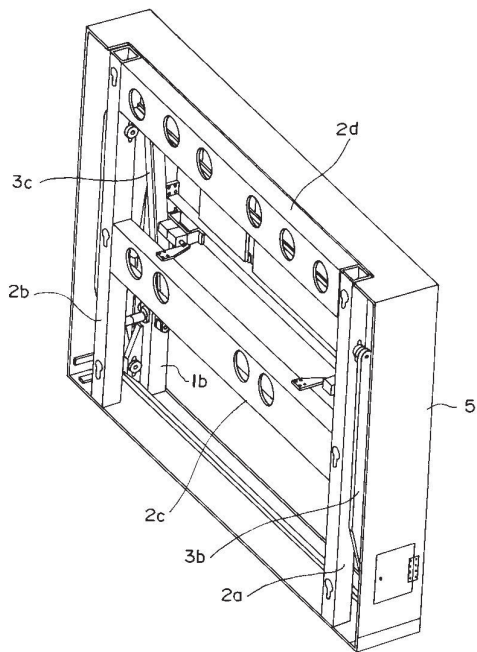
[Fig. 1]



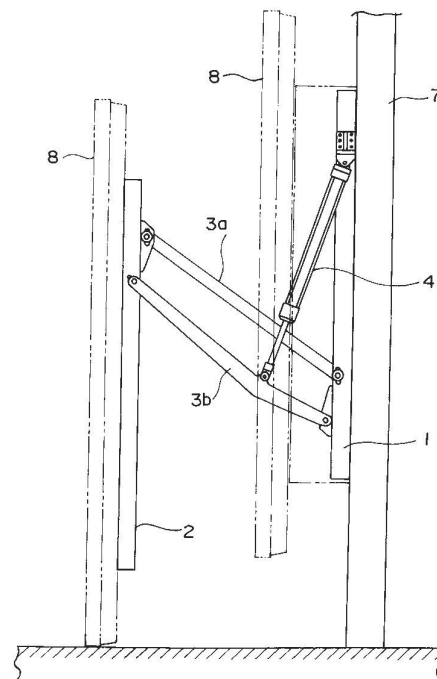
[Fig. 2]



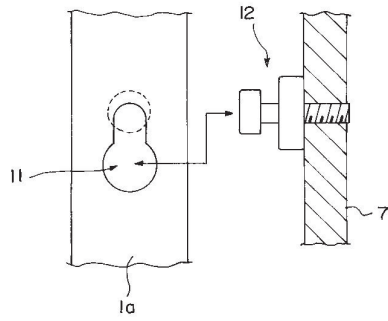
[Fig. 3]



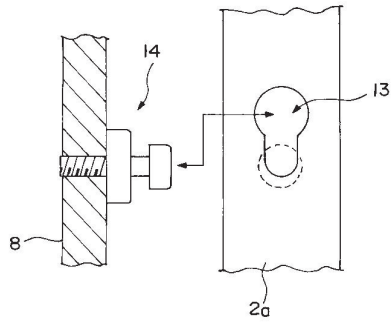
[Fig. 4]



[Fig. 5]



[Fig. 6]



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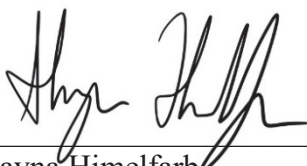
1-11-1 Suwa, Takatsu Ward, Kawasaki, Kanagawa Prefecture

F term (reference) 5G435 AA19 EE13 EE19 EE50

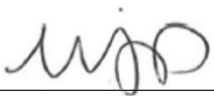


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I, Shayna Himelfarb, hereby certify that the document “**JP2009014047A**” is, to the best of my knowledge and belief, a true and accurate translation from Japanese into English.


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