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(54) **Device for motorization of sliding doors**

Motorantrieb für Schiebetüren

Dispositif de motorisation de portes coulissantes

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Description

[0001] The present invention relates to a device for motorization of sliding doors.

[0002] More specifically, the invention relates to an electro-mechanical device, permitting motorization of disappearing sliding doors, that usually are operated manually, and that can be applied in the same way to doors of already existing boxes, or to new boxes.

[0003] Large development of residential building during last years, has been characterized by a housing typology with always more reduced dimensions.

[0004] Apartments have average dimensions of 50 - 60 m². For this reason, it is always more frequent the use of disappearing sliding doors.

[0005] As it is well known, different solutions of sliding doors occur on the market, that are usually open and closed manually by the user.

[0006] As already said, almost all the products existing on the market are manually open - closed, although motorized products exist that can be installed on the already installed doors.

[0007] Solutions have been recently put on the market aiming to obtain motorization of opening and closure of the sliding door wing, being meant, at least in the present specification, by the "sliding door" term, the assembly comprised of counter frame, box and sliding wing.

[0008] EP-A-1 724 428 discloses all the features of the preamble of claim 1.

[0009] Motorization devices for sliding doors presently exist on the market that, to be installed, require reduction of height of doors of many centimeters.

[0010] Furthermore, said solutions require application of components from outside of the sliding door, such as for example blocking hooks, useful in case electric energy.

[0011] In any case, they are solutions requiring large modifications to the wall structure, in order to bring necessary electric connections to the door.

[0012] In view of the above, it is well evident the need of having a motorization device for a sliding door that can be fit both on existing sliding doors and in new sliding doors.

[0013] A further object of the present invention is that of suggesting a technically simple solution.

[0014] Another object of the present invention is that of realizing a motorization device not requiring relevant implant interventions.

[0015] Another object of the present invention is that of realizing a device for motorization of disappearing sliding doors which fully disappears within the counter frame.

[0016] It is therefore specific object of the present invention a device for the motorization of sliding doors, according to claim 1.

[0017] Preferably, said ratiomotor is a 24 V direct current ratiomotor.

[0018] Said belt can be comprised of polyurethane.

[0019] Furthermore, said control means comprise con-

trol units, for adjustment of speed, and a control button.

[0020] Said section bar is comprised of aluminum or iron, said section bar having such depth, height and length perfectly conforming to the measures of the counter frame.

[0021] The invention further relates to a method for mounting a device for motorization of sliding doors as described in the above, comprising the following steps:

- dismantling the door;
- introducing the ratiomotor within the sliding guide of the door, making it sliding for about 50 cm;
- introducing the two carriages for supporting and sliding the door, making it further sliding until when the device is in a position parallel to the door sliding guide;
- fixing the same by fixing means, e.g. a screw;
- making electric connections.

[0022] The present invention will be now described, for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

figure 1 is a perspective view of an embodiment of a device for motorization of sliding doors according to the invention;

figure 2 is an exploded view of device of figure 1;

figure 3 shows the step of installation of the device according to the invention; and

figure 4 shows operation of the door respectively with manual and motorized sliding.

[0023] Observing the figures of the enclosed drawings, and first observing figure 1, it can be observed a device according to the present invention, generically indicated by reference number 1, comprising a carriage 2, supporting the door (not shown), a ratiomotor 3, particularly a 24 V direct current ratiomotor, an encoder (not shown in the figure), a pair of pulleys 4, respectively a driven pulley and a pulley provided with friction, a belt 5, preferably comprised of polyurethane.

[0024] Furthermore, they are provided control units (not shown), for adjustment of speed, and a control button, the whole inserted within a section bar, said section bar being comprised of aluminum or iron, and having such depth, height and length perfectly conforming to the measures of the counter frame.

[0025] Observing the other figures enclosed, it can be observed that the mounting of this device is very simple.

[0026] After having dismantled the door 10, ratiomotor 3 is inserted within the sliding guide of the door, making it sliding for about 50 cm.

[0027] Then the two carriages are introduced for supporting and sliding the door 10, making it further sliding until when the device is in a position parallel to the door 10 sliding guide.

[0028] The whole is fixed by a single screw. Then low

tension electric connections are made, without requiring, unless wished, trace on the wall.

[0029] Obviously, in case electric power fails, it is possible opening manually the door.

[0030] As it can be observed, device 1 according to the invention perfectly conforms to the existing framework, completely disappearing from the view.

[0031] Ratiomotor can be provided on the right side or on the left side, on the basis of the structure of the sliding door on which it must be mounted.

[0032] The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

Claims

1. Device (1) for the motorization of sliding doors comprising a door support carriage (2), a ratiomotor (3), an encoder, a pair of pulleys (4), respectively a driven pulley and a pulley provided with friction, a belt (5) between said two pulleys, means for controlling the motion of the sliding door, and a section bar (6) containing said elements,
characterized in that said device (1) further comprises a sliding element provided with two rollers, said sliding element being fixed at one extremity of said section bar (6) and being adapted to carry said driven pulley (4) and said ratiomotor (3).
2. Device (1) according to claim 1, **characterized in that** said ratiomotor (3) is a 24 V direct current ratiomotor.
3. Device (1) according to claim 1 or 2, **characterized in that** said belt (5) is comprised of polyurethane.
4. Device (1) according to one of the preceding claims, **characterized in that** said control means comprise control units, for adjustment of speed, and a control button.
5. Device (1) according to one of the preceding claims, **characterized in that** said section bar (6) is comprised of aluminum or iron, said section bar having such depth, height and length perfectly conforming to the measures of the counter frame.
6. Method for mounting a device for motorization of sliding doors according to one of the claims 1 - 5, **characterized in that** it comprises the following steps:
 - dismantling the door;
 - introducing the sliding element with the ratiomotor (3) within a sliding guide of the door, mak-

ing the extremity of said section bar (6), to which said ratiomotor (3) is fixed, sliding for about 50 cm;

- introducing the two carriages for supporting and sliding the door in the door sliding guide making the extremity of said section bar (6), to which said ratiomotor (3) is fixed, further sliding until when the device is in a position parallel to the door sliding guide;
- fixing the other extremity of said section bar (6) by fixing means, e.g. a screw;
- making electric connections.

15 Patentansprüche

1. Einrichtung (1) für die Motorisierung von Schiebetüren, umfassend ein Tür-Trägerfahrwerk (2), einen Getriebemotor (3), einen Encoder, ein Paar von Umlenkrollen (4), entsprechend eine getriebene Umlenkrolle und eine Umlenkrolle, die mit Reibung versehen ist, einen Gurt (5) zwischen den zwei Umlenkrollen, Mittel zur Steuerung der Bewegung der Schiebetür, und ein Profilstab (6), der diese Elemente enthält,
dadurch gekennzeichnet, dass die Einrichtung (1) ferner ein gleitendes Element umfasst, das mit zwei Rollen versehen ist, wobei das gleitende Element an einem Endpunkt des Profilstabs (6) fixiert und angepasst ist, die getriebene Umlenkrolle (4) und den Getriebemotor (3) zu tragen.
2. Einrichtung (1) gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der Getriebemotor (3) ein 24V-Gleichstrom-Getriebemotor ist.
3. Einrichtung (1) gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Gurt (5) Polyurethan umfasst.
4. Einrichtung (1) gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Steuermittel Steuereinheiten zur Einstellung einer Geschwindigkeit, und einen Steuerknopf umfassen.
5. Einrichtung (1) gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Profilstab (6) Aluminium oder Eisen umfasst, wobei der Profilstab eine derartige Tiefe, Höhe und Länge aufweist, um perfekt den Maßen des Gegenrahmens zu entsprechen.
6. Verfahren zum Montieren einer Einrichtung zur Motorisierung von Schiebetüren gemäß einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** es die folgenden Schritte umfasst:
 - Demontage der Tür;

- Einführung des gleitenden Elements mit dem Getriebemotor (3) in eine gleitende Führung der Tür, wobei das Ende des Profilstabs (6), an dem der Getriebemotor (3) fixiert ist, für ungefähr 50 cm gleitend gemacht wird;
- Einführung der zwei Fahrwerke zum Tragen und Gleiten der Tür in der Tür-gleitenden Führung, wobei das Ende des Profilstabs (6), an dem der Getriebemotor (3) fixiert ist, weiter gleitend gemacht wird, bis die Einrichtung in einer Position parallel zu der Tür-gleitenden Führung ist;
- Fixierung des anderen Endes des Profilstabs (6) durch Fixiermittel, zum Beispiel eine Schraube;
- Herstellung elektrischer Verbindungen.

Revendications

1. Dispositif (1) pour la motorisation de portes coulissantes, comprenant un chariot de support de porte (2), un motoréducteur (3), un codeur, une paire de poulies (4), respectivement une poulie entraînée et une poulie comportant un frottement, une courroie (5) entre lesdites deux poulies, des moyens pour commander le mouvement de la porte coulissante, et une barre de section (6) contenant lesdits éléments, **caractérisé en ce que** ledit dispositif (1) comprend de plus un élément de coulissement muni de deux rouleaux, ledit élément de coulissement étant fixé à une extrémité de ladite barre de section (6) et étant adapté de façon à porter ladite poulie entraînée (4) et ledit motoréducteur (3).
2. Dispositif (1) selon la revendication 1, **caractérisé en ce que** ledit motoréducteur (3) est un motoréducteur à courant continu 24 V.
3. Dispositif (1) selon la revendication 1 ou 2, **caractérisé en ce que** ladite courroie (5) se compose de polyuréthane.
4. Dispositif (1) selon l'une des revendications précédentes, **caractérisé en ce que** lesdits moyens de commande comprennent des unités de commande, pour le réglage de la vitesse, et un bouton de commande.
5. Dispositif (1) selon l'une des revendications précédentes, **caractérisé en ce que** ladite barre de section (6) se compose d'aluminium ou de fer, ladite barre de section ayant une profondeur, une hauteur et une longueur se conformant parfaitement aux mesures du contre-cadre.
6. Procédé pour monter un dispositif pour la motorisa-

tion de portes coulissantes selon l'une des revendications 1 à 5, **caractérisé en ce qu'il** comprend les étapes suivantes :

- le démontage de la porte ;
- l'introduction de l'élément de coulissement avec le motoréducteur (3) à l'intérieur d'un guide de coulissement de la porte, en faisant coulisser l'extrémité de ladite barre de section (6), à laquelle est fixé ledit motoréducteur (3), d'environ 50 cm ;
- l'introduction des deux chariots pour supporter et faire coulisser la porte dans le guide de coulissement de porte, en faisant encore davantage coulisser l'extrémité de ladite barre de section (6), à laquelle est fixé ledit motoréducteur (3), jusqu'à ce que le dispositif soit dans une position parallèle au guide de coulissement de porte ;
- la fixation de l'autre extrémité de ladite barre de section (6) par des moyens de fixation, par exemple une vis ;
- la réalisation de connexions électriques.

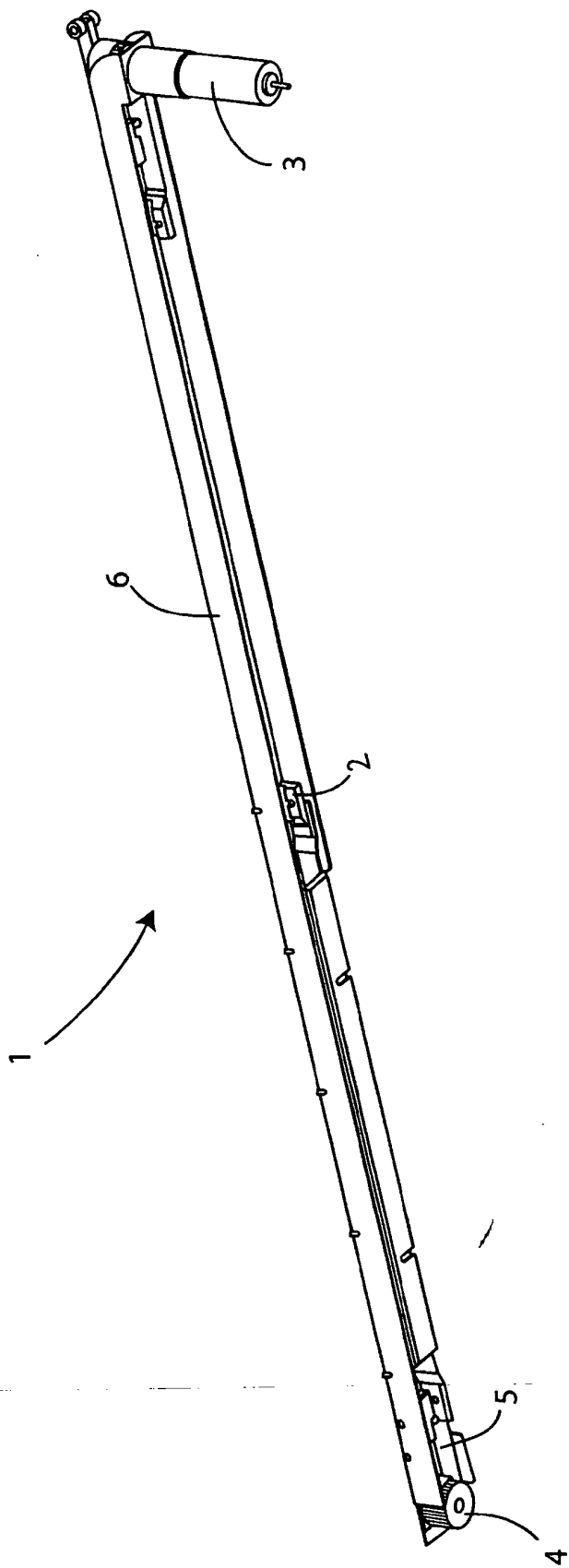


Fig. 1

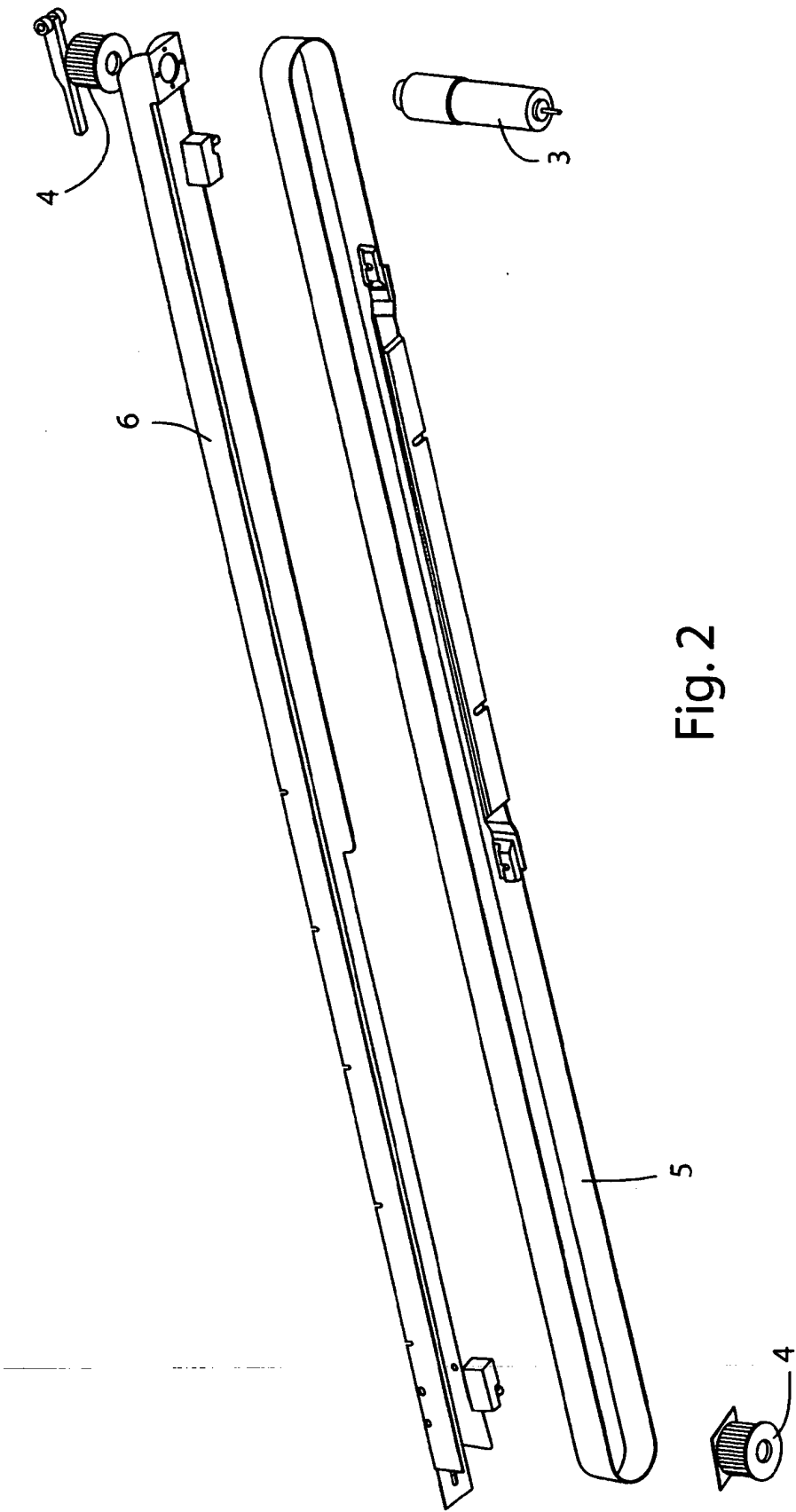


Fig. 2

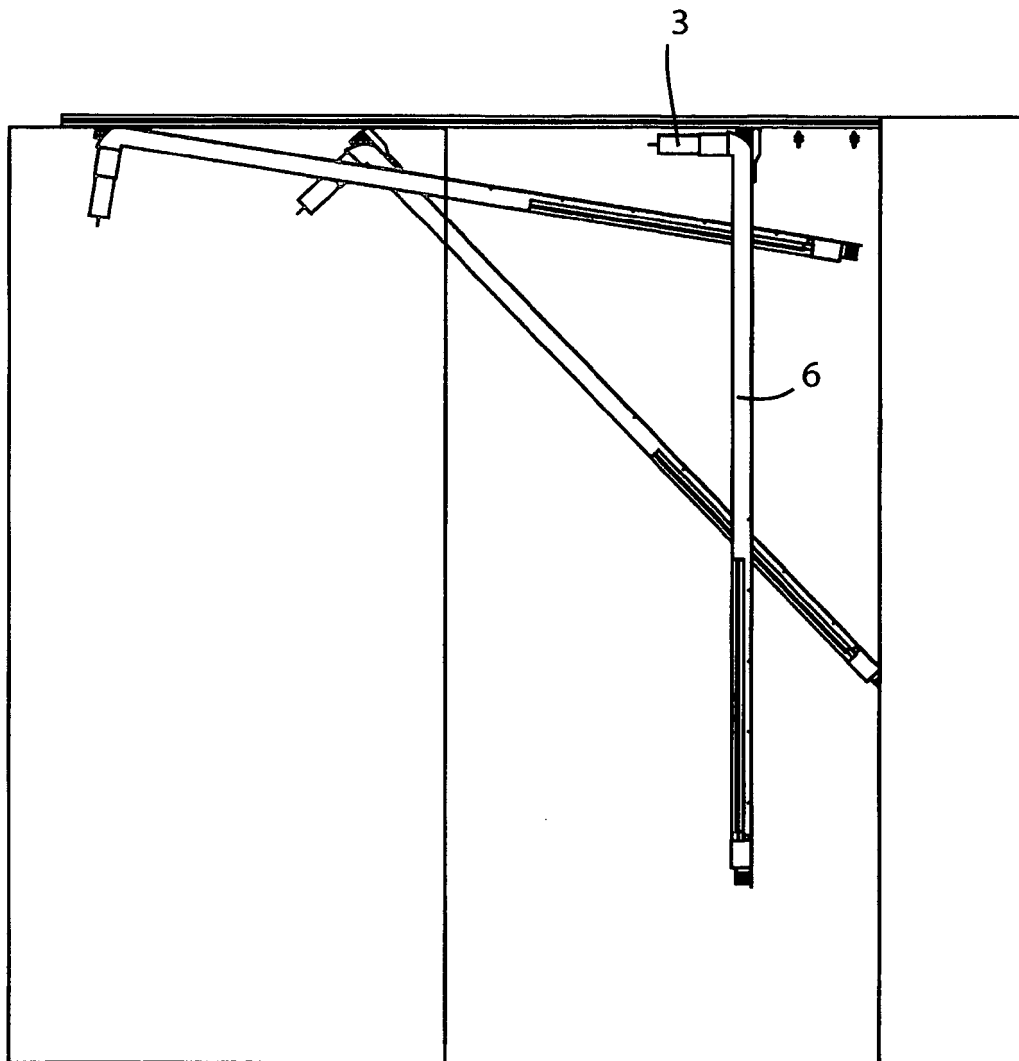


Fig. 3

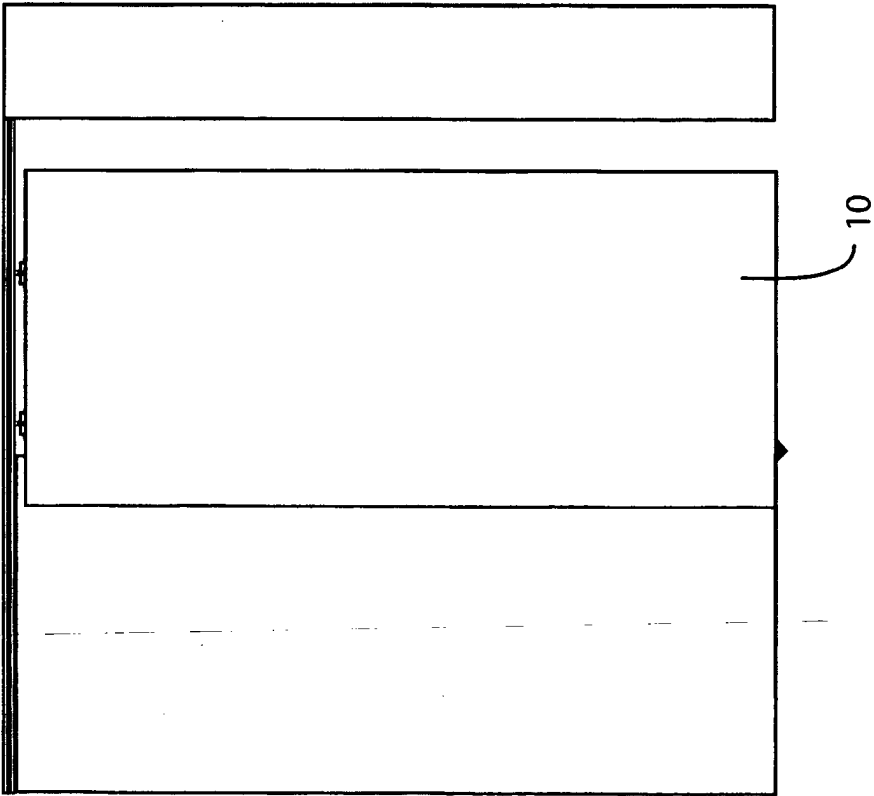
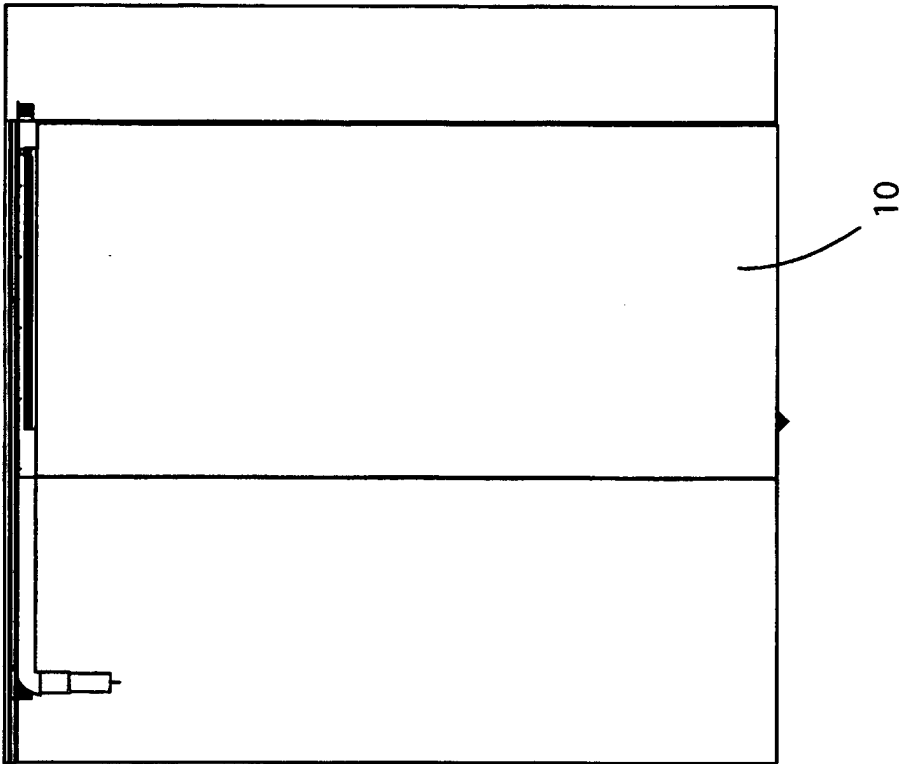


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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