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(54) **Retractable security grate**

Einziehbares Sicherheitsgitter

Grille de sécurité rétractable

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Description

[0001] The present invention relates to a retractable security grate provided with a bar winding and packing system, which allows a dimension reduction of the casing needed to house the grate when it is completely lifted.

BACKGROUND OF THE INVENTION

[0002] At the state of the art, there are known various embodiments of retractable security grates to be applied to windows, French doors and main doors, made up of a series of bars constrained with respect to each other and connected to lifting systems which allow the bars to be arranged inside a casing when the grate is completely lifted.

[0003] An example of such systems is described in the Patent US2032461 in which it is described a retractable security grate comprising a series of bars constrained with respect to each other by means of a chain, configured so that they can be lifted by means of a shaped wheel and "folded" packed on guides arranged horizontally or vertically. At the state of the art there are known many other examples, as the Italian application BA2009U000052 or the Italian Patents n° 1327560, n° 1388391 and n° 1394469.

[0004] Another example of such system is the Italian Patent application BA2009A000034 filed by the inventors of the present Patent application, in which there was described a retractable security grate comprising a series of parallel bars transversal with respect to each other articulated by means of rectangular little plates, comprising a winding system for said bars by means of shaped discs.

[0005] Other documents are the international Patent application WO2012/120483 and the US Patent application US4013113.

[0006] All the cited documents and many others known at the state of the art describe packing systems for the bars of retractable security grates.

[0007] However, none of the documents known at the state of the art describes winding systems for the bars of retractable security grates which allow the simple structure to be optimized and, above all, the space taken by the bars when these ones are completely packed to be optimized. This last aspect is particularly important since when the grate is completely up, the packed bars are contained inside a casing positioned in the outer walls of the building. In many cases, the casing has to contain also a rolling gate. Moreover, to the space taken by the packed bars, in many cases it is to be added the space taken by a suitable heat insulating layer, intended to correct the heat bridge provided by the casing.

[0008] It is to be highlighted also that the retractable security grates are installed in case of renewal of yet existing buildings. In these cases, the maximum thickness of the casing is limited to the existing structure of the building, and a very large casing could cause the

technical impossibility to install the retractable security grate.

[0009] Therefore, it is clear that in all the cited situations, it is needed a packing system for retractable security grates which allows to reduce at minimum the space taken by the bars when these are packed inside the casing.

[0010] Therefore, aim of the present invention is to provide a retractable security grate provided with a system of guides installed in the casing and with a lifting system which allow to reduce at minimum the space taken by the bars as a whole. It is to be précised that it will be used indifferently the words security grate or grate.

[0011] The object of the present invention reaches the prefixed aims since it is a retractable security grate provided with a bar winding and packing system which allows to optimize the dimensions of the casing needed to house the grate bars when the same is completely lifted. Conveniently the winding system of the grate object of the present invention allows to pack the bars by exploiting also the horizontal dimension of the casing in addition to the space available in vertical direction. So, it is clear that it is possible to pack the same number of bars of equal thickness in a casing of smaller dimension with respect to what needed in the devices known at the state of the art, or, alternately, it is possible to pack a greater number of bars (which allow to provide grates for casing of greater height) in casings of equal dimensions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Six views of a preferred embodiment of the object are appended to the present invention.

Figure 1 shows a panoramic view of the assembled system;

Figure 2 shows a side view of the system;

Figure 3 shows a perspective view of the sole guides of the system;

Figure 4 shows a perspective view of the guides and of the shaped wheel;

Figures 5 and 6 show the front view and the side view of the guides of the packing system according to the invention, respectively;

Figure 7 shows a side view of the guides;

Figure 8 shows an embodiment of the pins which constrain the various elements of the system.

DETAILED DESCRIPTION OF THE INVENTION

[0013] With reference to figure 1, a preferred embodiment of the grate, object of the present invention, comprises a plurality of bars (1), each one integral to a respective little plate (21). The bars are constrained with respect to each other by means of connecting rods (22). Each connecting rod is in fact hinged to two little plates (21) corresponding to a couple of consecutive bars (1).

[0014] The constraints between the bars and the little

plates can be carried out according to modes known at the state of the art, all comprised in the aims of the present invention.

[0015] According to a preferred embodiment there can be used washers (23) in Teflon or other self-lubricating material interposed in the couplings between the little plates and the connecting rods, so that the need to use lubricants is avoided.

[0016] In addition, the pins used to constrain the little plates and the connecting rods are alternately of different thickness (51, 52) so that they project outwardly at different depth, as it is shown in figure 8, where the casing and the guides are not shown for clarity.

[0017] The security grate comprises also vertical guides (not shown in the drawings) of type known at the state of the art, inside which the little plates (21) and the connecting rods (22) slide when the grate is lowered or lifted.

[0018] The lifting and lowering of the bars (1) is controlled by a shaped wheel (3) and by a couple of guides (41, 42). As it is shown in figure 4, the shaped wheel (3) is configured so that it is provided peripherally with a series of grooves (31, 32, 33) of such shape that they can house the bars (1). The grooves are at suitable distance the one with respect to the other so that they can engage, by rotating, following bars of the grate.

[0019] The number and the shape of the grooves shown in figure 4 are to be intended example of a preferred embodiment of the invention and not limiting the aim of the same. Wheels with three, four or more grooves can be used without departing from the aims of the present invention. The wheel (3) is constrained to the side wall of the casing (5) so that it can rotate. On the rotation axis of the wheel an electric motor can be conveniently installed (not shown in figure) for the actuation of the grate. Even if in the figures it is shown, for simplicity, only a side of the grate, it is clear that a similar wheel can be arranged at the opposed end of the casing, preferably keyed on the same rotation axis and moved by means of the same electric motor. As it is shown in the figures 4 and 7, the two guides (41, 42) define an obliged path for the bars and the connecting rods. The shape of the two guides is such that these define a first portion of substantially vertical path, installed in continuity with the vertical guides (not shown) in which the little plates and the connecting rods slide when the grate is lowered, and a second portion which defines a portion of substantially circular path. This portion will be of greater width than the width defined by the vertical portion so that it is possible the correct passage of the little plates and connecting rods. The system is configured so that the wheel (3), in whose groove (31) a bar (1) is engaged, forces, by rotating, such bar to follow the section of path defined by the guides (41, 42) and engages the next bar with the next groove (32).

[0020] Conveniently, the outer guide (42) ends almost at the upper end of the circumference defined by the same, so that it is allowed the movement of the little plates

and connecting rods shown in figures and explained in detail in the following.

[0021] The inner guide (41) comprises instead, after the vertical section (411) a second horizontal section (412) and a last vertical section (413), the three sections being jointed with suitable bending radii.

[0022] The system comprises also a third guide (43), arranged in diagonal and jointed to the vertical section (413) almost at the connection with the horizontal section, as it is shown in figure 6.

[0023] The side view of figure 6 allows to observe that the thickness of the guide (43), measured by the wall of the casing, is lower than the thickness of the guide (41). In this way, the inclined guide (43) is engaged only by the pins (52) projecting mainly outwards, thus allowing an ordered folded packing following a vertical arrangement, as it is shown in the images. The presence of the inclined guide is useful in fact to guide the end of each little plate which has to be positioned outwards, thus avoiding sticking of the system.

[0024] Moreover, advantageously the inner guide is provided on the horizontal section (41) with a relief (44) of lower thickness than the thickness of the inclined guide (43). In this way, the relief cannot be engaged by the pins (51, 52) which constrain the adjacent little plates.

[0025] A sole little plate is provided with a pin (53) of such dimensions that it engages the relief (44). This little plate is the little plate which constrains the first bar (11) whose dimensions would exceed the vertical height available for packing. By engaging the relief (44) the pin (53) lifts the end of the bar. In addition, conveniently the first bar (11) which has to be packed in vertical position is provided with a relief (12) arranged on the surface which will be packed on the adjacent bar (14). The relief (12) can be welded to the bar, screwed or constrained by other suitable means, and it has such a thickness that the bar (11) is prevented from being positioned in horizontal position. The angle formed by the bar (11) with respect to the horizontal when the relief rests on the previous bar is such that, when the wheel (3) is lifting the grate, the force exerted by the connecting rod constrained to the next bar is directed in the direction of lifting the bar (11). The next bars (15, 16) continue to be packed in horizontal direction, as it is shown in figure.

[0026] In this way, in addition to the space available in vertical direction, it is possible to exploit the horizontal dimension of the casing to pack the bars.

[0027] Therefore it is clear that it is possible to pack the same number of bars of equal thickness in a casing of smaller dimensions with respect to what needed in the devices known at the state of the art, or, in the same way, it is possible to pack a greater number of bars (which allow to realize grate for casings of greater height) in casings of equal dimensions.

Claims

1. Retractable security grate, comprising:

- a plurality of bars (1), each one rigidly joined to a small plate (21), each small plate (21) being hinged to two connecting rods (22) by means of pins (51,52) having alternately different thickness, said small plates being configured to slide into guides;
- an internal guide (41) and an external guide (42) integral with a side wall of a casing defining an obligatory path for the connecting rods (22);
- a shaped wheel (3) configured to move said bars (1);

characterized in that

said security grate comprises a further guide (43) integral with the side wall of the casing having a thickness such as to be engaged exclusively by the pins (52) with a greater thickness, said guide (43) being arranged so as to allow an ordered accordion packing of the bars (1) according a vertical arrangement and in that

the first bar (11) whose size would exceed available vertical packaging height is provided with a protrusion (12) to prevent said first bar (11) from leaning on the preceding bar (14), said protrusion (12) being configured so that the minimum angle allowed between said first bar (11) and the horizontal line, is such that direction of the force exerted by the next connecting rod (13) is directed to raise said bar (11), allowing successive bars (15, 16) to pack in the horizontal direction.

2. Retractable security grate according to claim 1 wherein said internal guide (41) comprises a relief (44), whose thickness is such that it can not be engaged by pins (52) of greater thickness, and in that at least one of the small plates (21), is bounded to the adjacent connecting rod (22) by means of a pin (53) having a thickness suitable to engage said relief (44).

3. Retractable security grate according to claim 1 or 2, wherein the shaped wheel (3) comprises, at its edge, a plurality of grooves (31, 32, 33) whose shape is configured to accommodate bars (1), said grooves being arranged at a suitable distance from each other such as to engage, when shaped-wheel is turning, successive bars.

4. Retractable security grate according to claim 3 wherein said shaped wheel (3), engaging a bar (17) in a groove (31), is configured to force said bar (17) to follow the path defined by the guides (41, 42) and to engage with the adjacent groove (32) the next bar (18).

5. Retractable security grate according to one of the preceding claims, wherein the shaped wheel (3) is rotatably constrained to the lateral wall of the casing (5).

6. Retractable security grate according to one of claims 1 and 3, wherein said guides (41, 42) define a first and a second path part, said first part being vertical and said second part being circular and wherein the width of the circular part is greater than the width of the vertical part.

7. Retractable security grate according to one of the preceding claims, wherein into coupling between said small plates and said connecting rods are interposed Teflon, or other self-lubricating material, washers (23).

8. Retractable security grate according to one of the preceding claims, further comprising lateral vertical guides within which said plates (21) and said connecting rods (22) slide when the security grate is moved down or raised.

Patentansprüche

1. Einziehbares Sicherheitsgitter, umfassend:

- eine Vielzahl von Stangen (1), von denen jede fest mit einer kleinen Platte (21) und jede kleine Platte (21) mittels Stiften (51, 52) mit abwechselnd unterschiedlichen Stärken klappbar mit zwei Verbindungsstangen (22) verbunden ist, wobei die genannten kleinen Platten für das Gleiten in Schienen ausgelegt sind;
- eine innere Schiene (41) und eine äußere Schiene (42), die fest mit einer Seitenwand eines Gehäuses verbunden sind und so eine obligatorische Bahn für die Verbindungsstangen (22) festlegen;
- ein zum Bewegen der genannten Stangen (1) ausgelegtes profiliertes Rad (3);

dadurch gekennzeichnet, dass

das genannte Sicherheitsgitter eine weitere mit der Seitenwand des Gehäuses fest verbundene Schiene (43) mit einer Stärke aufweist, die geeignet ist, ausschließlich in die Stifte (52) mit einer größeren Stärke einzurasten, wobei die genannte Schiene (43) so angeordnet ist, dass eine geordnetes Faltpaket der Stangen (1) mit einer vertikalen Anordnung ermöglicht wird

und dadurch, dass

die erste Stange (11), deren Größe die Höhe des verfügbaren Faltpakets überschreiten würde, mit einem Überstand (12) versehen ist, um zu vermeiden, dass die erste Stange (11) auf der Stange davor (14)

auffliegt, wobei der genannte Überstand (12) so ausgelegt ist, dass der zulässige Mindestwinkel zwischen der genannten ersten Stange (11) und der horizontalen Linie geeignet ist, die Richtung der von der nächsten Verbindungsstange (13) ausgeübten Kraft so verlaufen zu lassen, dass die genannte Stange (11) angehoben wird und so die nachfolgenden Stangen (15, 16) in horizontaler Richtung zusammengelegt werden können.

2. Einziehbares Sicherheitsgitter nach Anspruch 1, bei dem die genannte innere Schiene (41) ein Relief (44) mit einer Stärke umfasst, durch die es nicht in Stifte (52) größerer Stärke einrasten kann und bei dem mindestens eine der kleinen Platten (21) mit einem Stift (53) mit der angrenzenden Verbindungsstange (22) verbunden ist, dessen Stärke geeignet ist, in das genannte Relief (44) einzugreifen.
3. Einziehbares Sicherheitsgitter nach Anspruch 1 oder 2, bei dem das profilierte Rad (3) an seinem Rand eine Vielzahl von Nuten (31, 32, 33) umfasst, deren Form darauf ausgelegt ist, Stangen (1) aufzunehmen, wobei die genannten Nuten in einem entsprechenden Abstand voneinander angeordnet sind, so dass sie, wenn das profilierte Rad dreht, in die nachfolgenden Stangen eingreifen.
4. Einziehbares Sicherheitsgitter nach Anspruch 3, bei dem das genannte, eine Stange (17) in eine Nut (31) einsetzende profilierte Rad (3) so ausgelegt ist, dass die genannte Stange (17) in eine Nut (31) gedrückt wird, um der von den Schienen (41, 42) definierten Bahn zu folgen und die nächste Stange (18) in die angrenzende Nut (32) einzusetzen.
5. Einziehbares Sicherheitsgitter nach einem der voranstehenden Ansprüche, bei dem das profilierte Rad (3) drehbar an der Seitenwand des Gehäuses (5) angebracht ist.
6. Einziehbares Sicherheitsgitter nach einem der Ansprüche 1 bis 3, bei dem die genannten Schienen (41, 42) einen ersten und zweiten Bahnteil definieren, wobei der genannte erste Teil vertikal und der genannte zweite Teil kreisförmig ist und bei dem die Breite des kreisförmigen Teils größer als die Breite des vertikalen Teils ist.
7. Einziehbares Sicherheitsgitter nach einem der vorangegangenen Ansprüche, bei dem sich in der Kupplung zwischen den genannten kleinen Platten und den genannten Verbindungsstangen Unterlegscheiben (23) aus Teflon oder anderem selbstschmierenden Werkstoff befinden.
8. Einziehbares Sicherheitsgitter nach einem der vorangegangenen Ansprüche, das außerdem seitliche

vertikale Schienen umfasst, in denen die genannten Platten (21) und die genannten Verbindungsstangen (22) gleiten, wenn das Sicherheitsgitter gesenkt oder angehoben wird.

Revendications

1. Grille de sécurité rétractable, comprenant:

- une pluralité de barres (1), chacune reliée rigidement à une petite plaque (21), chaque petite plaque (21) étant articulée sur deux bielles (22) au moyen de broches (51, 52) ayant alternativement une épaisseur différente, lesdites petites plaques étant configurées pour glisser dans des guides;
- un guide interne (41) et un guide externe (42) solidaire d'une paroi latérale d'un carter définissant un chemin obligatoire pour les bielles (22);
- une roue profilée (3) configurée pour déplacer lesdites barres (1);

caractérisée en ce que

ladite grille de sécurité comprend un autre guide (43) solidaire de la paroi latérale du carter ayant une épaisseur telle qu'elle est engendrée exclusivement par les broches (52) avec une épaisseur plus grande, ledit guide (43) étant agencé de façon à permettre un arrangement ordonné en accordéon des barres (1) selon une disposition verticale et que la première barre (11) dont la taille dépasserait la hauteur d'arrangement verticale disponible est munie d'une saillie (12) pour empêcher ladite première barre (11) de s'appuyer sur la barre précédente (14), ladite saillie (12) étant configurée de sorte que l'angle minimum permis entre ladite première barre (11) et la ligne horizontale, est tel que la direction de la force exercée par la tige de liaison suivante (13) est dirigée pour soulever ladite barre (11), en permettant à des barres successives (15, 16) de s'arranger dans la direction horizontale.

2. Grille de sécurité rétractable selon la revendication 1, dans laquelle ledit guide interne (41) comprend un relief (44), dont l'épaisseur est telle qu'elle ne peut pas être engagée par des broches (52) de plus grande épaisseur, et qu'au moins une des petites plaques (21) est unie à la tige de liaison (22) adjacente au moyen d'une broche (53) ayant une épaisseur appropriée pour engager ledit relief (44).
3. Grille de sécurité rétractable selon la revendication 1 ou 2, dans laquelle la roue profilée (3) comprend, sur son bord, une pluralité de rainures (31, 32, 33) dont la forme est configurée pour recevoir des barres (1), lesdites rainures étant agencées à une distance

appropriée l'une de l'autre de manière à s'engager, lorsque la roue profilée tourne, dans des barres successives.

4. Grille de sécurité rétractable selon la revendication 3, dans laquelle ladite roue profilée (3) engagée avec une barre (17) dans une rainure (31), est configurée pour forcer ladite barre (17) à suivre le chemin défini par les guides (41, 42) et à s'engager par la rainure adjacente (32) avec la barre suivante (18). 5
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5. Grille de sécurité rétractable selon l'une quelconque des revendications précédentes, dans laquelle la roue profilée (3) est forcée en rotation avec la paroi latérale du carter (5). 15
6. Grille de sécurité rétractable selon l'une des revendications 1 et 3, dans laquelle lesdits guides (41, 42) définissent une première et une deuxième partie de déplacement, ladite première partie étant verticale et ladite deuxième partie étant circulaire et dans laquelle la largeur de la partie circulaire est supérieure à la largeur de la partie verticale. 20
7. Grille de sécurité rétractable selon l'une quelconque des revendications précédentes, dans laquelle des rondelles (23) en téflon ou un autre matériau auto-lubrifiant sont intercalées en accouplement entre lesdites petites plaques et lesdites tiges de liaison. 25
30
8. Grille de sécurité rétractable selon l'une quelconque des revendications précédentes, comprenant en outre des guides verticaux latéraux à l'intérieur desquels lesdites plaques (21) et lesdites tiges de liaison (22) glissent lorsque la grille de sécurité est déplacée vers le bas ou surélevée. 35

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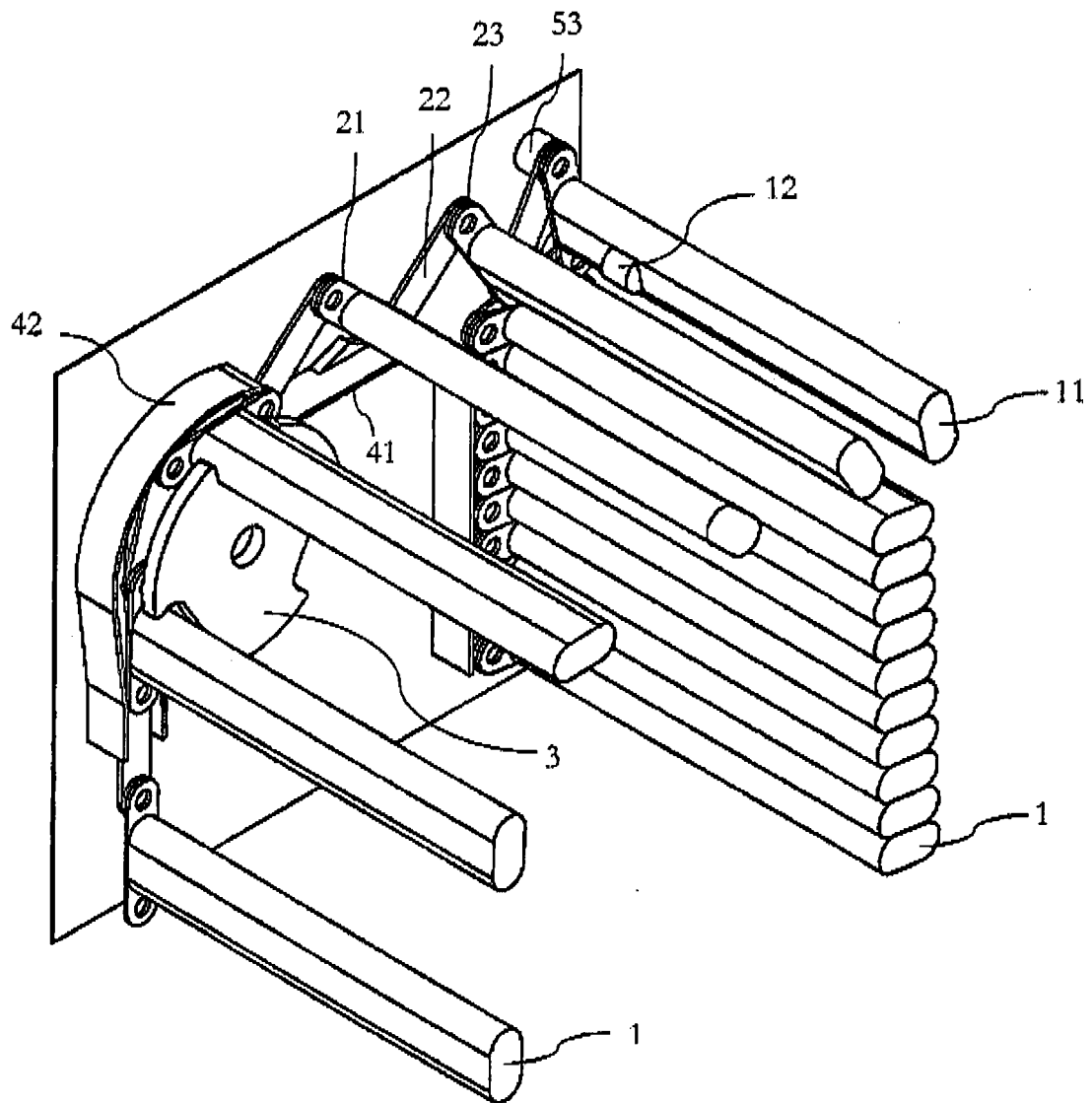


Fig. 1

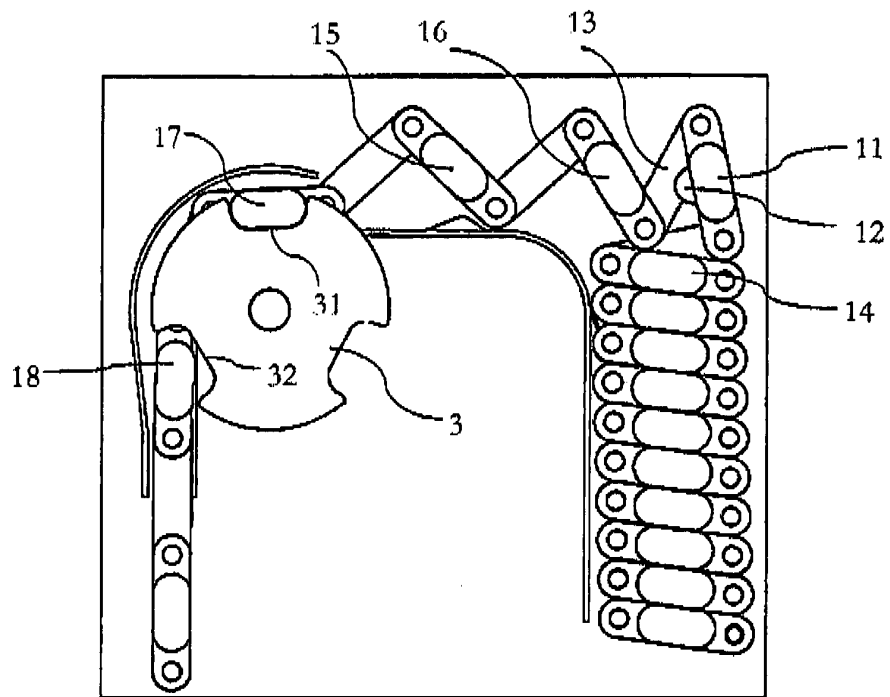


Fig. 2

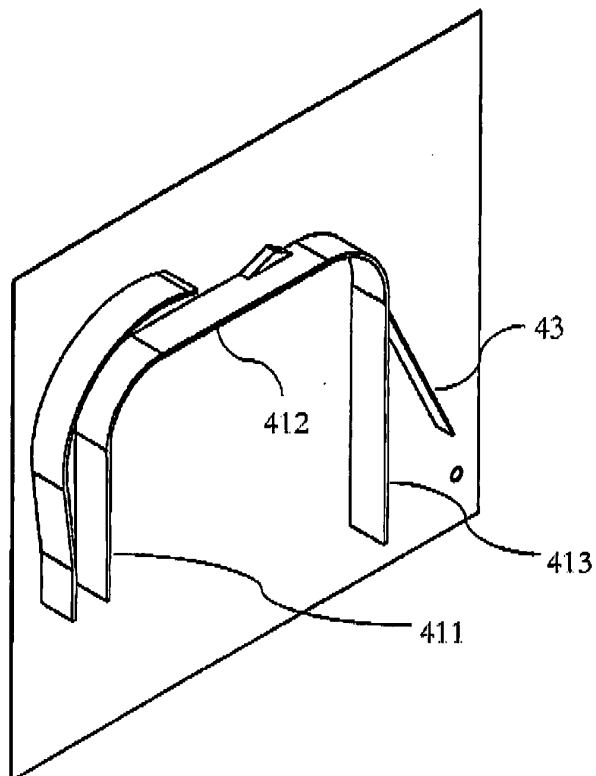


Fig. 3

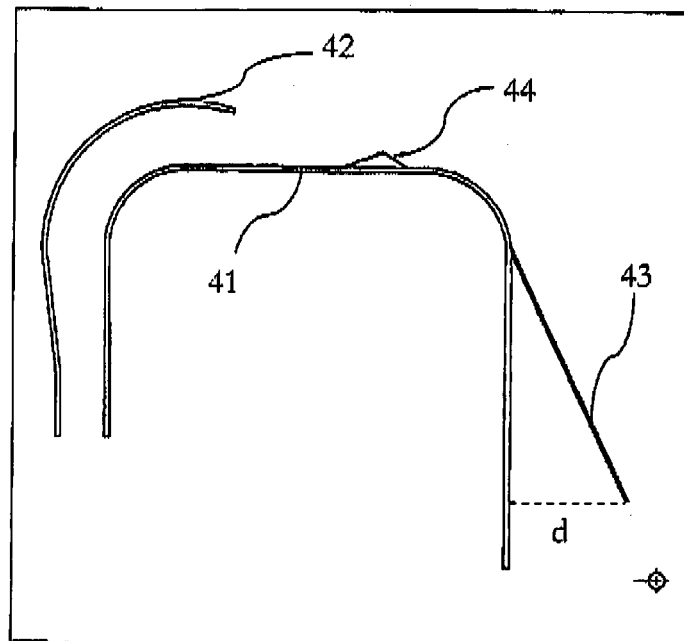


Fig. 5

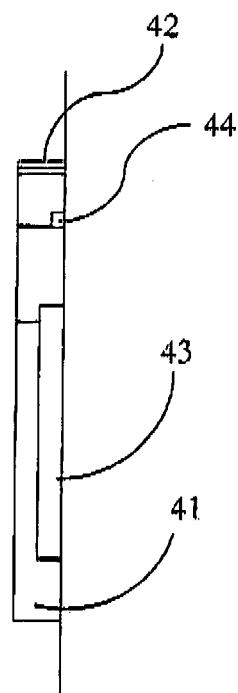


Fig. 6

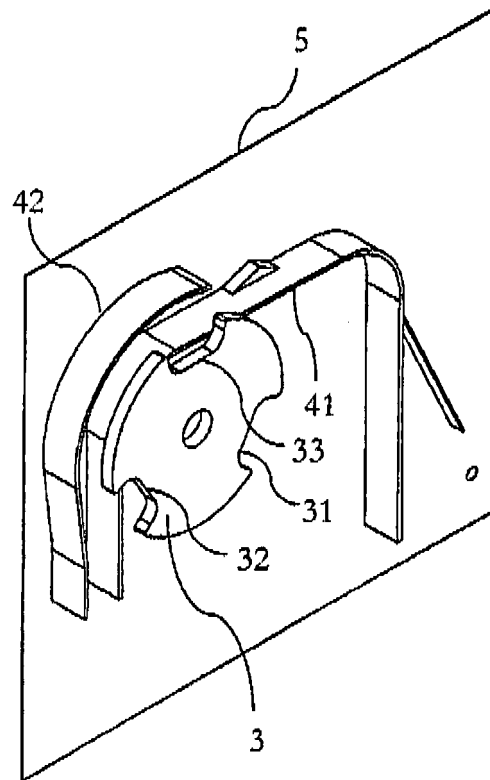


Fig. 4

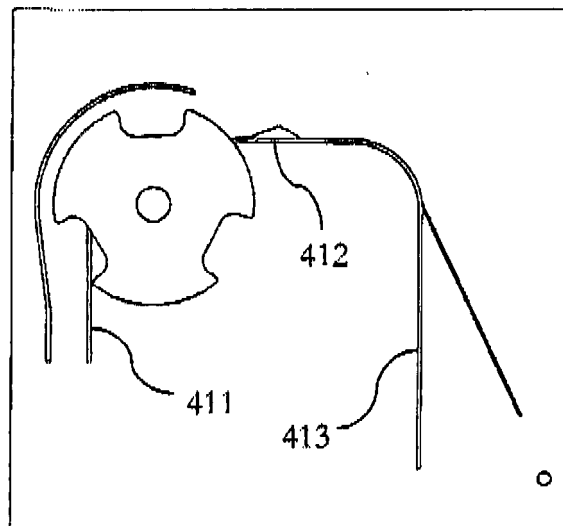


Fig. 7

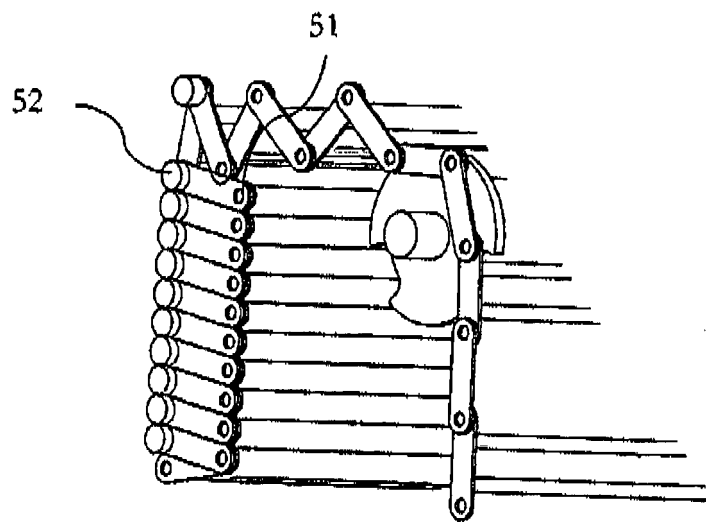


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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