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(54) **Shutter device**

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Description

[0001] The present invention concerns closures and refers to a shutter device specially fit for windows, passages and accesses.

[0002] Roller closures made of reciprocally articulated horizontal slats are known in order to be wound around a drum and to be unrolled for closing windows and similar.

[0003] A disadvantage of these known closures consists in requiring bulky external cased frames for housing the drum with the wound shutter.

[0004] Other disadvantage consists in that said known closures allow a passage of air and light proportional to their opening and excessively reduce the air passage when are partially closed. Additional disadvantage of said known closure consists in that could not be easily equipped with safety arrangements that avoid house-breaking by lifting the slats.

[0005] Slat shutters are also known in which each slat can be rotated around its longitudinal axis at least when the shutter closes the window. A disadvantage of this latter closures consists in that they are very complex and expensive, moreover sometimes are subjected to malfunctions and not much reliable.

[0006] Documents US 2004/221968 A1, WO99/61742 A1 and US 702 146 A disclose shutter devices having the features of the preamble of claim 1.

[0007] An object of this invention is to propose a shutter device which is compact and fit to be housed, also in the opening condition of the window, in the thickness of the wall.

[0008] Another object is to propose a shutter device which permits, in a condition of partial opening of the window, passage or access, to shadow the room delimited by the wall of the window allowing at the same time an air passage almost without obstacles in comparison with the passage of the complete opening.

[0009] Another purpose is to propose a shutter device equipped with safety means fit to prevent housebreakings.

[0010] Additional object is to propose a simple shutter device, relatively economical, sure and reliable.

[0011] The characteristics of the invention are in the followed evidenced with particular reference to the enclosed drawings in which:

- figure 1 illustrates an axonometric and schematic view of the shutter device object of the present invention in a condition of partial close-down;
- figure 2 illustrates an axonometric view of the device of figure 1 in an opening condition;
- figure 3 illustrates a front view of the device of figure 1 in a closing condition;
- figure 4 illustrates a view of a portion of the sectioned device according to the line IV - IV of figure 3;
- figure 5 illustrates an axonometric view of the portion of the device of figure 4;
- figure 6 illustrates a sectional view according to the

line VI - VI of figure 3;

- figure 7 illustrates a view of a portion of the sectioned device according to the line VII - VII of figure 6;
- figure 8 illustrates a front view of the device of figure 1;
- figure 9 illustrates a portion of the sectioned device according to the line IX - IX of figure 8;
- figure 10 illustrates the portion of the device of figure 9 sectioned according to the line X-X;
- figure 11 illustrates an axonometric view of the portion of figure 9;
- figure 11b illustrates an axonometric view of one of the connecting levers of the device of figure 1;
- figure 12 illustrates an axonometric view of one of the fins of the device of figure 1;
- figure 13 illustrates a side view of the fin of figure 12;
- figure 14 illustrates a front view of the fin of figure 12 from an angle on the same plane as the fin itself;
- figures 15 and 16 illustrate sectional views respectively according to the lines XV - XV and XVI - XVI of figure 14;
- figure 17 illustrates an axonometric view of one variant of the device of figure 1 in a condition of partial closedown;
- figure 18 illustrates a front view of the device of figure 17;
- figures 19 and 20 illustrate sectional views respectively according to the lines IXX - IXX and XX - XX of figure 18;
- figure 21 illustrates a sectional view according to the line XXI - XXI of figure 20;
- figure 22 illustrates an enlarged particular of figure 21;
- figure 23 illustrates an axonometric view of the portion of the device of figure 19;
- figure 24 illustrates a front view of the device of figure 17 in a condition of partial opening;
- figure 25 illustrates a section of the device according to the line XXV - XXV of figure 24;
- figure 26 illustrates a sectional view according to the line XXVI - XXVI of figure 25;
- figure 27 illustrates an axonometric view of the device portion of figure 25.

[0012] With reference to figures from 1 to 16, numeral 1 indicates the shutter device object of the present invention including a plurality of fins 2 reciprocally parallel, vertically superimposed and adjacent, for example made of metal, of wood, of wood derivatives, of synthetic materials, such as plastics or also reinforced resins, or of combination of these materials.

[0013] Such fins are shaped elongate rectangular, each with two elongate longitudinal sides that end in correspondence of the side ends 3.

[0014] The fins are reciprocally connected and moving between two extreme conditions of closing and opening of the window, door or passage to which the shutter device 1 is associated.

[0015] The connection between the fins 2 is realised by connecting side levers 4, for example made of rectilinear metal elements.

[0016] The connecting levers 4 are doubled with regard to fins; a number of such levers equal to the number of fins are associated to the ends 3 of a side of fins 2 and as many levers are associated to the ends 3 of the opposite side of fins 2. In this way, such fins 2 and levers 4 make two reciprocal pantograph connection, right and left, opposite and parallel.

[0017] In particular, each connecting lever 4 is centrally connected in revolving way to an intermediate portion of a side end 3 of a fin 2. The two opposite ends of such connecting lever 4 are respectively connected, in revolving way, to opposed portions of side ends 3 of contiguous fins 2, which are immediately upper and lower to the fin to which the lever 4 is centrally connected.

[0018] In other words, each side end 3 of a defined intermediate fin 2 has each hinged end at the end of a respective lever 4, one centrally hinged to the central portion of the side end of the immediately upper fin and the other centrally hinged to the central portion of the side end of the immediately lower fin. The central portion of such defined intermediate fin 2 is hinged to the central portion of a third lever 4. Each lever 4 has a respective central seat 5 and two end seats 6, 7.

[0019] Each side end 3 of each fin 2 has a respective central housing 8 and two end housings 9, 10, next to the longitudinal sides. Such seats 5, 6, 7 and housings 8, 9, 10 consist, for example in cylindrical holes housing rotation pins 11, 12, 13 almost parallel to the longitudinal dimension of fin and fit to the pantograph connection between fins and levers.

[0020] The pins 13 contiguous to a same longitudinal side of fins have sliding means 14, consistent for example in cylinder, bushes or protrusive bearings and fit for sliding long lateral guides 15 of the device 1 so constraining a same longitudinal side of all the fins 2.

[0021] Each side end 3 consists of an end element 16, for example carried out by forming or melting metal or plastic material, sideways fixed to the respective fin.

[0022] Each side end 3 has a side mobile protection 17, for example consisting of a metallic or plastic plate, perpendicular to the respective fin, and fit to protect the slit between fin 2 and side guide 15 in the closing condition and able to allow fins of flanking and completely lying over in the opening condition. For this purpose, each side protection 17 is rotably connected to end element 16 in correspondence or in proximity of the sliding means 14.

[0023] The side protection 17 has elongate triangular shape, with length approximately corresponding to the width of the fin and is hinged near the sharper top oscillating between a position in which is almost opposed to the side end 3 and one in which protrudes from it.

[0024] Each end element 16 is equipped with an elastic means 18, for example a spiral metallic spring, acting in compression between the end element 16 and the side protection 17 for elastically maintaining this latter towards

the protruding position in the closed condition and for allowing to rotate and flank to the end element 16 in the open condition

[0025] The pins 13 of the side of sliding means 14 of a fixed upper end fin 2 are blocked or fixed to the respective vertical guides and the opposite end fin 2, which is the lower and mobile along the lateral guides 15, is connected to opening means 19.

[0026] The opening means 19 include two flexible lifting means 20, for example two tapes or strings for roller blind, whose lower ends are fixed to respective sides of the lower end fin 2 and whose upper ends are fixed to respective drum means 21, fixed coaxially to a horizontal winding shaft 22, which is placed on the upper part of the vertical lateral guides 15 and which is manually actuated or powered thanks to an electromotor for roller closures.

[0027] The lateral guides 15 can be equipped with longitudinal seats for the tape or string lifting flexible means 20.

[0028] The operation of the device provides that, in the opening condition, the lifting flexible means are wound almost completely onto the respective drums and that all the fins are adjacent and almost horizontal.

[0029] The partial unwinding of the lifting flexible mean allows the fins to reciprocally space and to slightly tilting in order to shadow the window or door opening but leaving out almost unaltered the total light of the air passage. One additional unwinding of the lifting flexible means, thanks to the pantograph connection, carries the fins to dispose almost vertically and with reciprocal contact so completely closing down the door or window opening.

[0030] The variant of the device of figures from 17 to 27 can be installed also horizontally and provides that the pins 13 of the side of the sliding means 14 of a fixed end fin 2 are blocked or fixed to the respective horizontal or vertical guides and that the opposite end fin 2, movable along the lateral guides 15, is connected to opening means 19 of the bi-directional type.

[0031] The device 1 of this variant differs from the device of figures 1-16 because the opening means 19 include at least one movement flexible means 30, for example of the steel cable or synthetic fibre cable of the inextensible or high resistance type, having both ends fixed to a respective winding means 31 and having the medium section engaged in a return pulley 32 opposite to the winding means 31. The movable end fin 2 is fixed to one of the two sections, there and back, of the movement flexible means 30 included between the winding means 31 and the return pulley 32.

[0032] The invention preferably provides that the opening means 19 include two parallel and lateral movement flexible means 30 whose portions placed among the respective winding means 31 and return pulley 32 are housed in channels of lateral guides 15.

[0033] Each return pulley 32 is pivotally connected, for example by means of an idle pin, at the respective side guide 15. Each winding means 31 includes a reel means 33, for example cylindrical shaped, for winding, in adja-

cent turns, end portions of the movement flexible means 30 for a whole length of the respective wire equal at least with the run along the lateral guides 15 of the movable end fin 2.

[0034] The wire ends that is the ends of the movement flexible means 30 are blocked to the related reel means 33 to the opposite sides of the adjacent turn assembly. The end portions of the movement flexible means 30 are wound in these turns in opposite directions, one into anticlockwise direction and the other portion into clockwise direction, starting from the securing points of the wire end towards the portions of such flexible means outgoing from the turns and therefore from the reel means.

[0035] Such portions of the flexible means outgoing from the reel means are directed towards the return pulley and are adjacent and separated from a distance almost corresponding to the diameter of the reel means 33.

[0036] Each reel means 33 is constrained to rotate around the own axis by a rotation shaft 34 manually actuated or, preferably, by a respective driving motor 35.

[0037] Each reel means 33 is coaxial to the rotation shaft 34 with which is connected by means of respective free and rotation sliding means 36 comprising at least a longitudinal groove of the rotation shaft 34 slidably engaged by a sliding-block means of each reel means 33 or vice-versa.

[0038] An end of each reel means 33 has a threaded portion 37 engaged with a complementary and coaxial fixed thread 38.

[0039] Such threaded portion 37 and fixed threading 38 have a step of screw thread principles almost equal with the turn step of the ends of the movement flexible means 30 that are wound around the respective reel means 33.

[0040] The screw thread direction of these threaded portion 37 and fixed screw thread 38 is such as to translate the reel means 33 into direction opposite to the translation of the turns outgoing from the reel means 33 of the end portions of the movement flexible means 30.

[0041] In this way it is possible to maintain almost fixed the position of these exit turns and of the engaged portions in the return pulley 32.

[0042] The operation of the variant of the device of figures 17-27 provides that both movements for opening and closing of the movable end fin are actuated by the opening means 19 in order to prevent housebreakings and to allow the operation of the device with any orientation of guides also lying horizontal on a horizontal or vertical plane.

[0043] It is important to observe that the fixing of the wire ends to the reel precludes each sliding of the wire itself so defining with precision the position of fins depending on the rotation of the reel.

[0044] A further variant whose simplicity allows the understanding without the help of specific figures, provides that the opening means 19 include at least one flexible annular means, for example a chain or a cog belt, engaged with a motor toothed-crown wheel and with a transmission crown where the movable end fin is fixed to one

of the portions of the at least a flexible annular means included between the two crowns.

[0045] An advantage of this invention is to supply a shutter device which is compact and fit to be housed, also in the opening condition of the window, in the thickness of the wall.

[0046] Another advantage is to supply a shutter device which permits, in a condition of partial opening of the window, passage or access, to shadow the room delimited by the wall of the window allowing at the same time an air passage almost without obstacles in comparison with the passage of the complete opening.

[0047] Another advantage is to supply a shutter device equipped with safety means fit to prevent housebreakings.

[0048] Additional advantage is to supply a shutter device which is easily to be installed also in traditional closure and pre-existing passages for substituting the traditional doors and window frames.

[0049] Other advantage is to supply a device fit to use guides, shafts and engines for commercial doors and window frames.

[0050] Additional advantage is to supply a simple shutter device, relatively economical, sure and reliable.

Claims

1. Shutter device including a plurality of fins (2) almost parallel, each having at least two elongate longitudinal sides ending in correspondence of the side ends (3), such fins are reciprocally connected and movable between end conditions of closing and opening of the window, door or passage to which the shutter device (1) is associated, the connection between the fins (2) is made by connecting levers (4) each rotatably centrally connected to a middle portion of a fin (2) and having the two opposite ends respectively connected, in rotating way, to opposed portions of the fins (2) contiguous to the fin (2) to which the lever (4) is centrally connected, such fins (2) and levers (4) carrying out a reciprocal pantograph connection; said device (1) being **characterised in that** each side end (3) consists of an end element (16) fixed to the fin; each side end (3) has a side protection (17) rotatably connected to the end element (16) in correspondence or in proximity of the sliding means (14); said side protection (17) is elongate triangular shaped, with length approximately corresponding to the width of the fin, perpendicular to this latter and it is hinged near the sharper vertex oscillating between a position in which is almost faced to the side ends (3) and a position in which protrudes from it for protecting the slit between fin (2) and side guide (15) in the closing condition, said device (1) further includes an elastic means (18) acting in compression between the end element (16) and the side protection (17) for elastically maintain-

ing the latter towards the protruding position.

2. Device according to claim 1 **characterised in that** the connecting levers (4) of a first sub-assembly connecting levers (4) are associated to the side ends (3) of a side of fins (2) and those of a second sub-assembly are associated to the side ends (3) of the opposite side of fins (2) carrying out two opposite pantograph connections; each lever (4) has a respective central seat (5) and two end seats (6, 7) where each side ends (3) of each fin (2) has a respective central housing (8) and two end housings (9, 10), next to the longitudinal sides, such seats (5, 6, 7) and housings (8, 9, 10) being fit for housing rotation pins (11, 12, 13) almost parallel to the longitudinal dimension of the fin and fit to the pantograph connection between fins and levers.
3. Device according to claim 2 **characterised in that** the pins (13) contiguous to a same longitudinal side of fins have sliding means (14) protruding and fit for scrolling along lateral guides (15) of the device (1).
4. Device according to claim 3 **characterised in that**, at least in correspondence of a vertical assembly of the lateral guides (15), the pins (13) of the side of the sliding means (14) of the upper fin (2) are blocked or fixed to the respective guides and the lower fin (2) is connected to opening means (19); the opening means (19) include two lifting flexible means (20) whose lower end are fixed to respective sides of the lower fin (2) and whose upper ends are fixed to respective drum means (21) coaxial to a winding shaft (22) manually actuated or motorized; the lateral guides (15) have longitudinal seats for the lifting flexible means (20).
5. Device according to claim 3 **characterised in that** the pins (13) of the side of the sliding means (14) of a fixed end fin (2) are blocked or fixed to the respective guides and the opposite end fin (2), mobile along the lateral guides (15), is connected to opening means (19); the opening means (19) include at least one movement flexible means (30) having the ends fixed to a respective winding means (31) and engaged in a return pulley (32) opposite to the winding means (31), the movable end fin (2) being fixed to one of the portions of the at least a movement flexible means (30) included between the winding means (31) and the return pulley (32).
6. Device according to claim 5 **characterised in that** the opening means (19) include two side flexible movement means (30) whose portions included among the respective winding means (31) and the return pulley (32) are housed in channels of the lateral guides (15) where each return pulley (32) is rotatably connected to the respective side guide (15).
7. Device according to any one of claims 5 or 6 **characterised in that** each winding means (31) includes a reel means (33) for winding into adjacent turns of a length of movement flexible means (30) equal at least with the run along the lateral guides (15) of the end mobile fin (2).
8. Device according to claim 7 **characterised in that** the end tips of the movement flexible means (30) are blocked to the respective reel means (33) to the opposite sides of adjacent turns, the end portions of the movement flexible means (30) being wound in the turns in opposite directions where each reel means (33) is constrained to rotate around its axis by a rotation shaft (34) manually actuated or by a respective driving motor (35).
9. Device according to claim 8 **characterised in that** each reel means (33) is coaxial to the rotation shaft (34) with which is connected by means of respective free and rotation sliding means (36).
10. Device according to claim 9 **characterised in that** the free and rotation sliding means (36) include at least a longitudinal groove of the rotation shaft (34) slidably engaged by a sliding-block means of each reel means (33) or vice-versa.
11. Device according to claim 9 or 10 **characterised in that** an end of each reel means (33) has a threaded portion (37) engaged in a complementary and coaxial fixed threading (38), such threaded portion (37) and fixed threading (38) having a step of screw thread principles almost the same as the step of turns of the ends of the movement flexible means (30) wound around the respective reel means (33), the screw thread direction of these threaded portion (37) and fixed screw thread (38) such as to translate the reel means (33) into direction opposite to the translation of the turns outgoing from the reel means (33) of the end portions of the movement flexible means (30) for maintaining almost fixed the position of these exit turns and of the portions engaged in the return pulley (32).
12. Device according to any one of claims from 5 to 11 **characterised in that** the movement flexible means (30) consists of a wire of steel or light lengthening textile material.
13. Device according to claim 5 **characterised in that** the opening means (19) include at least a flexible annular means engaged with a motor crown and with a transmission crown, the movable end fin being fixed to one of the portions of the at least a flexible annular means included between the two crowns.

Patentansprüche

1. Jalousievorrichtung umfassend eine Mehrzahl an Lamellen (2), die nahezu parallel angeordnet sind, wobei jede mindestens zwei längliche Längsseiten aufweist, die in Verbindung mit den Seitenenden (3) enden, wobei
 5 solche Lamellen sind wechselweise verbunden und bewegbar zwischen Endzuständen des Schließens und Öffnens des Fensters, der Tür oder des Durchgangs zu dem die Jalousievorrichtung (1) zugehörig ist, und
 10 die Verbindung zwischen den Lamellen (2) ist hergestellt durch Verbindungshebel (4), die jeweils mittig drehend verbunden sind mit einem mittleren Bereich einer Lamelle (2) und die zwei entgegengesetzte Enden sind entsprechend in drehender Weise verbunden mit entgegengesetzten Bereichen der Lamelle (2), die benachbart zu der Lamelle (2) angeordnet ist, mit der der Hebel (4) mittig verbunden ist, wobei
 15 solche Lamellen (2) und Hebel (4) eine wechselweise Scherenverbindung ausführen, und die Vorrichtung (1) ist **dadurch gekennzeichnet, dass**
 20 jedes Seitenende (3) aus einem Endelement (16) besteht, das an der Lamelle befestigt ist, wobei jedes Seitenende (3) einen Seitenschutz (17) aufweist, der drehend verbunden ist mit dem Endelement (16) in Verbindung oder in Nachbarschaft zum Schiebemittel (14), und
 25 der Seitenschutz (17) weist die Form eines länglichen Dreiecks auf, wobei die Länge ungefähr der Breite der Lamelle entspricht, ist rechtwinklig zu dem Letzteren und ist nahe der spitzeren Ecke angelenkt, die zwischen einer Position schwingt, in der er nahezu den Seitenenden (3) zugewandt ist, und einer Position, in der er davon vorsteht, um den Schlitz zwischen Lamelle (2) und Seitenführung (15) im Schließzustand zu schützen, wobei die Vorrichtung (1) weiterhin ein elastisches Mittel (18) umfasst, das in Kompression zwischen dem Endelement (16) und dem Seitenschutz (17) agiert, um das Letztere elastisch in Richtung der vorstehenden Position zu halten.
 30
2. Vorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Verbindungshebel (4) einer ersten Unteranordnung an Verbindungshebeln (4) den Seitenenden (3) einer Seite der Lamellen (2) zugeordnet sind und die Verbindungshebel (4) einer zweiten Unteranordnung sind den Seitenenden (3) der entgegengesetzten Seite der Lamellen (2) zugeordnet, die zwei entgegengesetzte Scherenverbindungen ausführen, wobei
 35 jeder Hebel (4) einen entsprechenden mittigen Sitz (5) sowie zwei End-Sitze (6, 7) aufweist, wobei jedes Seitenende (3) jeder Lamelle (2) ein entsprechendes mittiges Gehäuse (8) und zwei Endgehäuse (9, 10) aufweist, neben den Längsseiten, wobei solche Sitze (5, 6, 7) und Gehäuse (8, 9, 10) angepasst sind, um Drehstifte (11, 12, 13) nahezu parallel zu den Längsabmessungen der Lamelle und passend zur Scheren-Verbindung zwischen Lamellen und Hebeln aufzunehmen.
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3. Vorrichtung gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Stifte (13), die benachbart zur gleichen Lamellen-Längsseite angeordnet sind, Schiebemittel (14) aufweisen, die vorstehen und passend sind, um entlang der lateralen Führungen (15) der Vorrichtung (1) verschoben zu werden.
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4. Vorrichtung gemäß Anspruch 3, **dadurch gekennzeichnet, dass**, mindestens in Verbindung mit einer vertikalen Anordnung der seitlichen Führungen (15), die Stifte (13) der Seiten der Schiebemittel (14) der oberen Lamelle (2) blockiert oder fixiert sind an den entsprechenden Führungen und die untere Lamelle (2) ist mit Öffnungsmitteln (19) verbunden, wobei die Öffnungsmittel (19) zwei flexible Hebemittel (20) aufweisen, deren unteres Ende an entsprechenden Seiten der unteren Lamelle (2) befestigt ist und deren obere Enden an entsprechenden Trommelmitteln (21) befestigt sind, die koaxial zu einem manuell betätigten oder motorisierten Wickel-Schaft (22) angeordnet sind, wobei
 50 die lateralen Führungen (15) Längssitze für das flexible Hebemittel (20) aufweisen.
5. Vorrichtung gemäß Anspruch 3, **dadurch gekennzeichnet, dass** die Stifte (13) der Seite des Schiebemittels (14) einer befestigten Endlamelle (2) blockiert oder fixiert sind an den entsprechenden Führungen und die entgegengesetzte Endlamelle (2), die entlang der lateralen Führungen (15) bewegbar ist, ist mit Öffnungsmitteln (19) verbunden, wobei die Öffnungsmittel (19) mindestens ein flexibles Bewegungsmittel (30) umfassen, das die Enden befestigt an entsprechenden Wickelmitteln (31) und in Eingriff in einer Rückkehrrolle (32) entgegengesetzt zum Wickelmittel (31) aufweist, wobei
 55 die bewegbare Endlamelle (2) an einem der Bereiche des mindestens einen flexiblen Bewegungsmittels (30) befestigt ist, der zwischen dem Wickelmittel (31) und der Rückkehrrolle (32) angeordnet ist.
6. Vorrichtung gemäß Anspruch 5, **dadurch gekennzeichnet, dass** das Öffnungsmittel (19) zwei seitliche flexible Bewegungsmittel (30) umfasst, deren Bereiche, die zwischen den entsprechenden Wickelmitteln (31) und der Rückkehrrolle (32) angeordnet sind, in Kanälen der lateralen Führungen (15) angeordnet sind, wobei jede Rückkehrrolle (32) drehend mit der entsprechenden Seitenführung (15) verbunden ist.

7. Vorrichtung gemäß einem der Ansprüche 5 oder 6, **dadurch gekennzeichnet, dass** jedes Wickelmittel (31) ein Spulenmittel (33) zum Wickeln in benachbarte Windungen einer Länge an flexiblen Bewegungsmitteln (30) gleich zu zumindest des Laufs entlang der lateralen Führungen (15) der mobilen Endlamellen (2) aufweist.
8. Vorrichtung gemäß Anspruch 7, **dadurch gekennzeichnet, dass** die Endspitzen der flexiblen Bewegungsmittel (30) an den entsprechenden Spulenmitteln (33) blockiert sind an den entgegengesetzten Seiten von benachbarten Windungen, wobei die Endbereiche der flexiblen Bewegungsmittel (30) in die Windungen in entgegengesetzte Richtungen gewickelt sind, wobei jedes Spulenmittel (33) beschränkt ist, um um seine Achse durch eine Drehwelle (34) zu drehen, die manuell oder durch einen entsprechenden Antriebsmotor (35) betätigt wird.
9. Vorrichtung gemäß Anspruch 8, **dadurch gekennzeichnet, dass** jedes Spulenmittel (33) koaxial mit der Drehwelle (34) ist, mit der es mittels entsprechender freier und drehender Schiebemittel (36) verbunden ist.
10. Vorrichtung gemäß Anspruch 9, **dadurch gekennzeichnet, dass** die freien und drehenden Schiebemittel (36) mindestens eine Längsrille der Drehwelle (34) umfassen, die gleitend in Eingriff steht mit einem Schiebe-Block-Mittel von jedem Spulenmittel (33) oder umgekehrt.
11. Vorrichtung gemäß Anspruch 9 oder 10, **dadurch gekennzeichnet, dass** ein Ende von jedem Spulenmittel (33) einen mit Gewinde versehenen Bereich (37) aufweist, der mit einem komplementären und koaxial festen Gewinde (38) in Eingriff steht, wobei der mit Gewinde versehene Bereich (37) und das feste Gewinde (38) einen Schritt an Schrauben-Gewinde-Prinzip nahezu gleich wie der Schritt an Windungen der Enden des flexiblen Bewegungsmittels (30) aufweist, das um die entsprechenden Spulenmittel (33) gewickelt ist, wobei die Gangrichtung des Schraubengewindes dieses mit Gewinde versehenen Bereichs (37) und die des festen Schraubengewindes (38) so ist, um das Spulenmittel (33) in eine Richtung entgegengesetzt zur Bewegung der Windungen ausgehend von dem Spulenmittel (33) der Endbereiche des flexiblen Bewegungsmittels (30) zu bewegen, um nahezu fest die Position dieser End-Windungen und der Bereiche zu halten, die in der Rückkehrrolle (32) in Eingriff stehen.
12. Vorrichtung gemäß einem der Ansprüche 5-11, **dadurch gekennzeichnet, dass** das flexible Bewegungsmittel (30) aus einem Stahldraht oder sich

leicht verlängernden Textilmaterial besteht.

13. Vorrichtung gemäß Anspruch 5, **dadurch gekennzeichnet, dass** das Öffnungsmittel (19) mindestens ein flexibles ringförmiges Mittel aufweist, das mit einem Motorkranz und mit einem Getriebekranz in Eingriff steht, wobei die bewegbare Endlamelle an einem der Bereiche des mindestens einen flexiblen ringförmigen Mittels befestigt ist, der zwischen den zwei Kränzen angeordnet ist.

Revendications

1. Dispositif obturateur comprenant une pluralité de lames (2) presque parallèles, ayant chacune au moins deux côtés longitudinaux allongés se terminant en correspondance des extrémités latérales (3), ces lames étant reliées de manière réciproque et mobiles entre des états extrêmes de fermeture et d'ouverture de la fenêtre, porte ou passage auquel le dispositif obturateur (1) est associé, la liaison entre les lames (2) étant réalisée par des leviers de liaison (4) reliés de manière rotative et centrale à une partie médiane d'une lame (2) et ayant les deux extrémités opposées reliées respectivement, de manière rotative, à des parties opposées des lames (2) contiguës à la lame (2) à laquelle le levier (4) est relié de manière centrale, ces lames (2) et leviers (4) réalisant une liaison à pantographe réciproque ; ledit dispositif (1) étant **caractérisé par le fait que** chaque extrémité latérale (3) consiste en un élément d'extrémité (16) fixé à la lame ; chaque extrémité latérale (3) a une protection latérale (17) reliée de manière rotative à l'élément d'extrémité (16) en correspondance ou à proximité des moyens de coulissement (14) ; ladite protection latérale (17) a une forme triangulaire allongée, avec une longueur correspondant approximativement à la largeur de la lame, perpendiculaire à cette dernière, et elle est articulée près du sommet plus étroit oscillant entre une position dans laquelle elle fait presque face aux extrémités latérales (3) et une position dans laquelle elle fait saillie à partir celle-ci pour protéger la fente entre la lame (2) et un guide latéral (15) dans l'état de fermeture, ledit dispositif (1) comprend en outre des moyens élastiques (18) agissant en compression entre l'élément d'extrémité (16) et la protection latérale (17) pour maintenir élastiquement cette dernière vers la position de saillie.
2. Dispositif selon la revendication 1, **caractérisé par le fait que** les leviers de liaison (4) d'un premier sous-ensemble de leviers de liaison (4) sont associés aux extrémités latérales (3) d'un côté des lames (2) et ceux dans un second sous-ensemble sont associés aux extrémités latérales (3) du côté opposé des lames (2) réalisant deux liaisons à pantographe

- opposées ; chaque levier (4) a un siège central respectif (5) et deux sièges d'extrémité (6, 7), chaque extrémité latérale (3) de chaque lame (2) ayant un logement central respectif (8) et deux logements d'extrémité (9, 10), à proximité des côtés longitudinaux, ces sièges (5, 6, 7) et logements (8, 9, 10) étant adaptés pour recevoir des axes de rotation (11, 12, 13) presque parallèles à la dimension longitudinale de la lame et adaptés à la liaison à pantographe entre les lames et les leviers.
3. Dispositif selon la revendication 2, **caractérisé par le fait que** les axes (13) contigus à un même côté longitudinal de lames ont des moyens de coulissement (14) faisant saillie et adaptés pour défiler le long de guides latéraux (15) du dispositif (1).
 4. Dispositif selon la revendication 3, **caractérisé par le fait que**, au moins en correspondance d'un ensemble vertical des guides latéraux (15), les axes (13) du côté des moyens de coulissement (14) de la lame supérieure (2) sont bloqués ou fixés aux guides respectifs et la lame inférieure (2) est reliée à des moyens d'ouverture (19) ; les moyens d'ouverture (19) comprennent deux moyens flexibles de levage (20) dont les extrémités inférieures sont fixées à des côtés respectifs de la lame inférieure (2) et dont les extrémités supérieures sont fixées à des moyens de tambour respectifs (21) coaxiaux à un arbre d'enroulement (22) actionné manuellement ou motorisé ; les guides latéraux (15) ont des sièges longitudinaux pour les moyens flexibles de levage (20).
 5. Dispositif selon la revendication 3, **caractérisé par le fait que** les axes (13) du côté des moyens de coulissement (14) d'une lame d'extrémité fixe (2) sont bloqués ou fixés aux guides respectifs et la lame d'extrémité opposée (2), mobile le long des guides latéraux (15), est reliée aux moyens d'ouverture (19) ; les moyens d'ouverture (19) comprennent au moins un moyen flexible de mouvement (30) ayant les extrémités fixées à un moyen d'enroulement respectif (31) et en engagement dans une poulie de rappel (32) opposée au moyen d'enroulement (31), la lame d'extrémité mobile (2) étant fixée à l'une des parties de l'au moins un moyen flexible de mouvement (30) comprise entre le moyen d'enroulement (31) et la poulie de rappel (32).
 6. Dispositif selon la revendication 5, **caractérisé par le fait que** les moyens d'ouverture (19) comprennent deux moyens de mouvement flexibles latéraux (30) dont des parties comprises entre le moyen d'enroulement respectif (31) et la poulie de rappel (32) sont reçues dans des canaux des guides latéraux (15), chaque poulie de rappel (32) étant reliée de manière rotative au guide latéral respectif (15).
 7. Dispositif selon l'une quelconque des revendications 5 ou 6, **caractérisé par le fait que** chaque moyen d'enroulement (31) comprend un moyen de bobine (33) pour l'enroulement, en spires adjacentes, d'une longueur de moyen flexible de mouvement (30) égale au moins à la trajectoire le long des guides latéraux (15) de la lame mobile d'extrémité (2).
 8. Dispositif selon la revendication 7, **caractérisé par le fait que** les pointes d'extrémité du moyen flexible de mouvement (30) sont bloquées aux moyens de bobine respectifs (33) sur les côtés opposés de spires adjacentes, les parties d'extrémité du moyen flexible de mouvement (30) étant enroulées en les spires dans des directions opposées, chaque moyen de bobine (33) étant contraint de tourner autour de son axe par un arbre de rotation (34) actionné manuellement ou par un moteur d'entraînement respectif (35).
 9. Dispositif selon la revendication 8, **caractérisé par le fait que** chaque moyen de bobine (33) est coaxial à l'arbre de rotation (34) auquel il est relié à l'aide de moyens de coulissement à rotation et libre respectifs (36).
 10. Dispositif selon la revendication 9, **caractérisé par le fait que** les moyens de coulissement à rotation et libre (36) comprennent au moins une rainure longitudinale de l'arbre de rotation (34) en engagement coulissant par un moyen de bloc coulissant de chaque moyen de bobine (33), ou inversement.
 11. Dispositif selon la revendication 9 ou 10, **caractérisé par le fait qu'une** extrémité de chaque moyen de bobine (33) comprend une partie filetée (37) en engagement dans un filetage fixe complémentaire et coaxial (38), cette partie filetée (37) et ce filetage fixe (38) ayant un pas de principes de filetage presque identique au pas de spires des extrémités du moyen flexible de mouvement (30) enroulées autour du moyen de bobine respectif (33), la direction de filetage de cette partie filetée (37) et de ce filetage fixe (38) étant de telle façon à déplacer en translation le moyen de bobine (33) dans une direction opposée à la translation des spires quittant le moyen de bobine (33) des parties d'extrémité du moyen flexible de mouvement (30) pour maintenir presque fixe la position de ces spires de sortie et des parties en engagement dans la poulie de rappel (32).
 12. Dispositif selon l'une quelconque des revendications 5 à 11, **caractérisé par le fait que** le moyen flexible de mouvement (30) consiste en un fil d'acier ou de matière textile à allongement léger.
 13. Dispositif selon la revendication 5, **caractérisé par le fait que** les moyens d'ouverture (19) comprennent

au moins un moyen annulaire flexible en engagement avec une couronne de moteur et avec une couronne de transmission, la lame d'extrémité mobile étant fixée à l'une des parties de l'au moins un moyen annulaire flexible comprise entre les deux couronnes.

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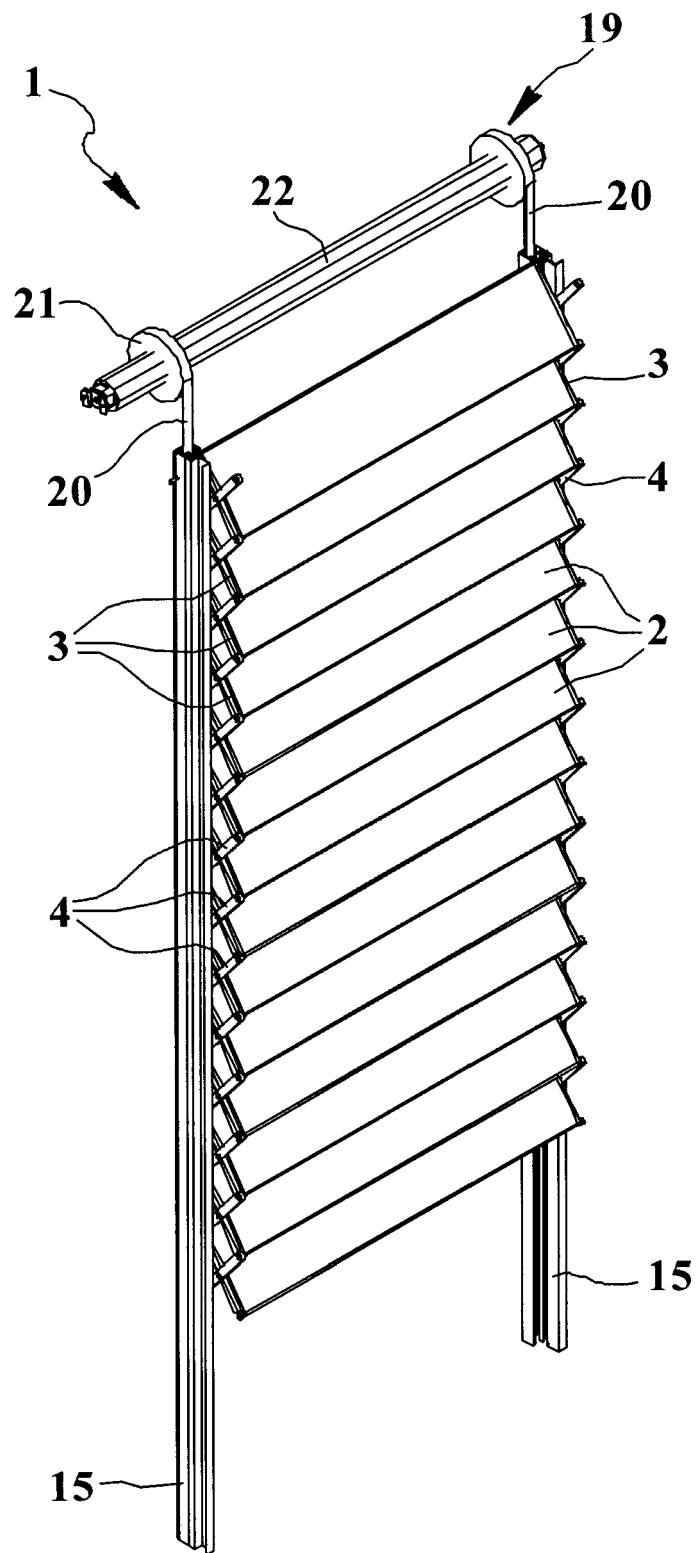


FIG.1

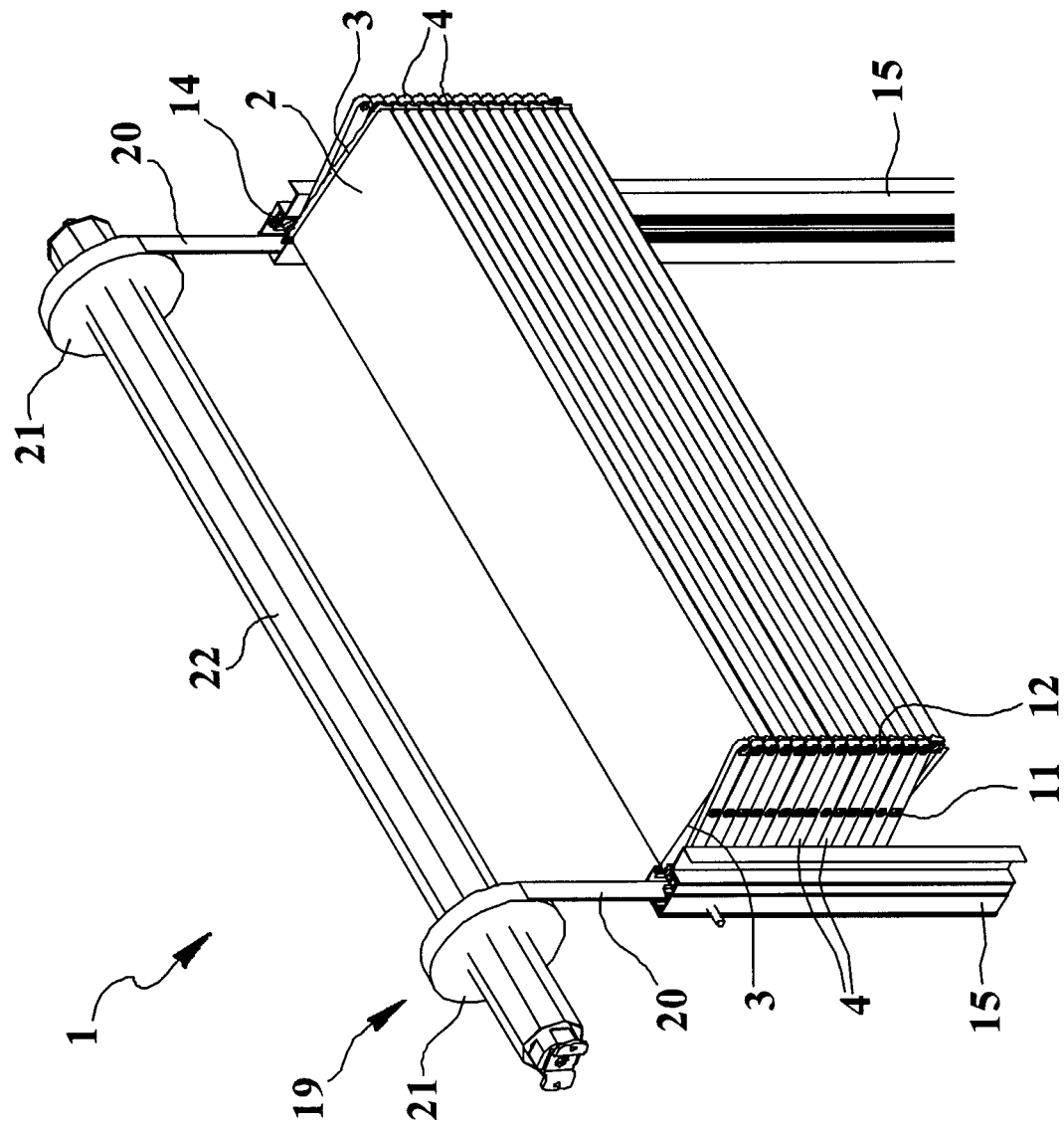


FIG.2

FIG.3

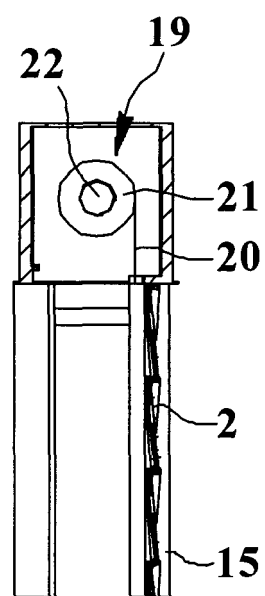
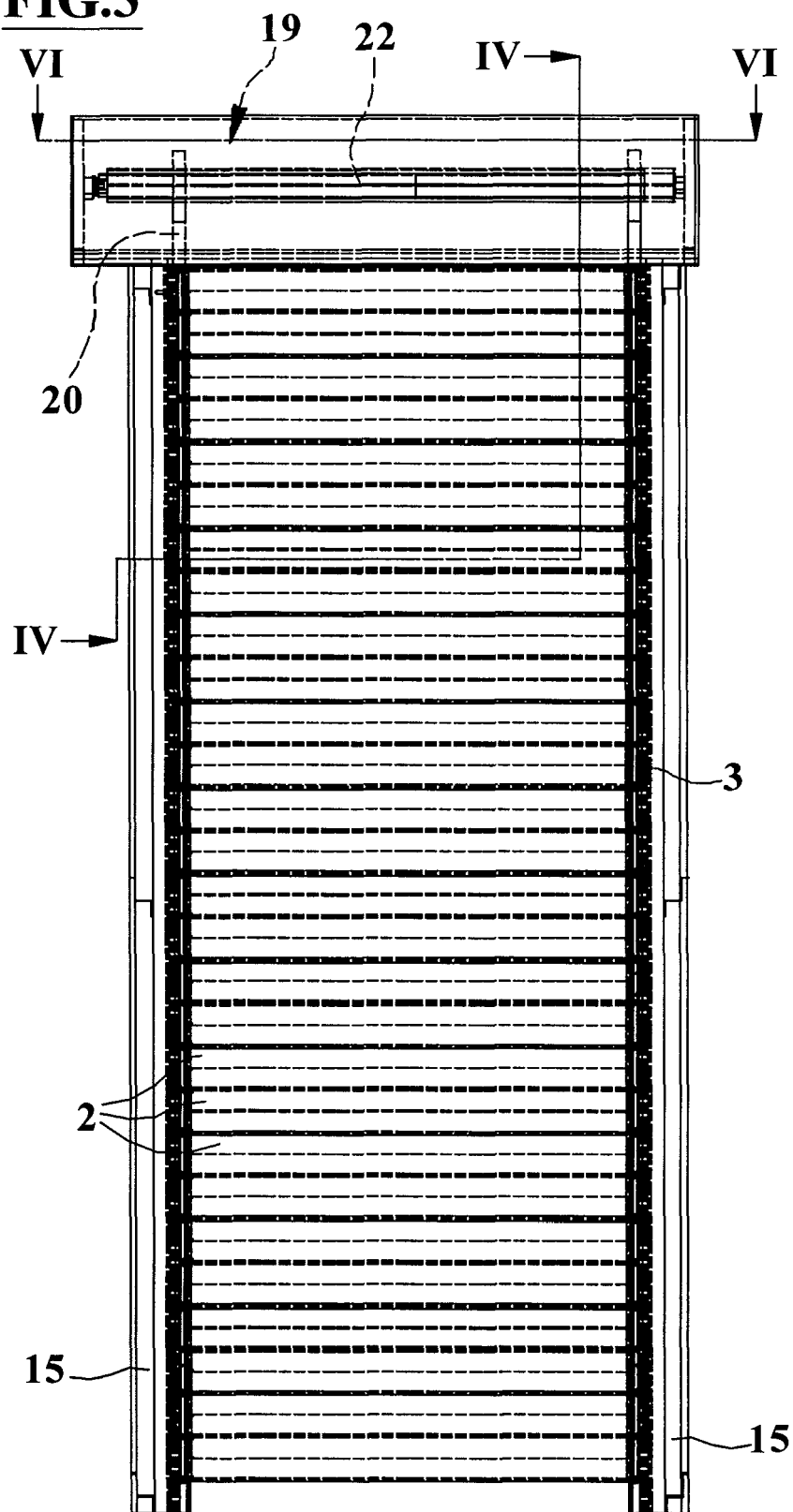


FIG.4

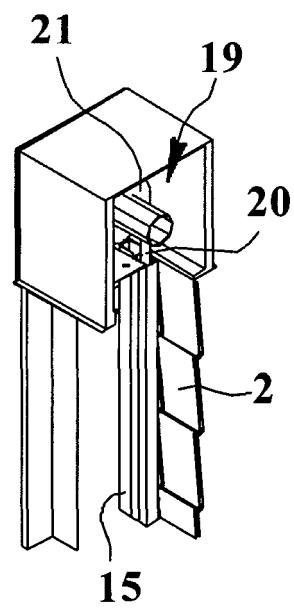


FIG.5

FIG.7

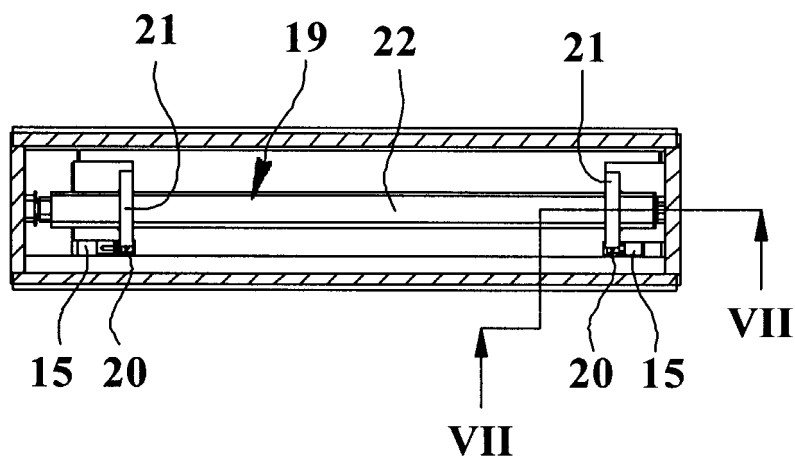
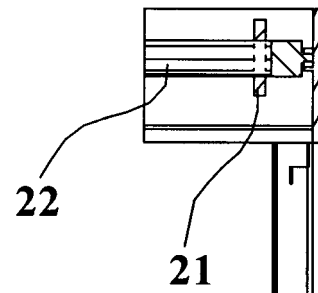
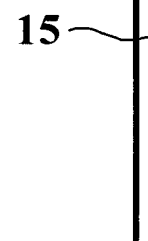


FIG.6



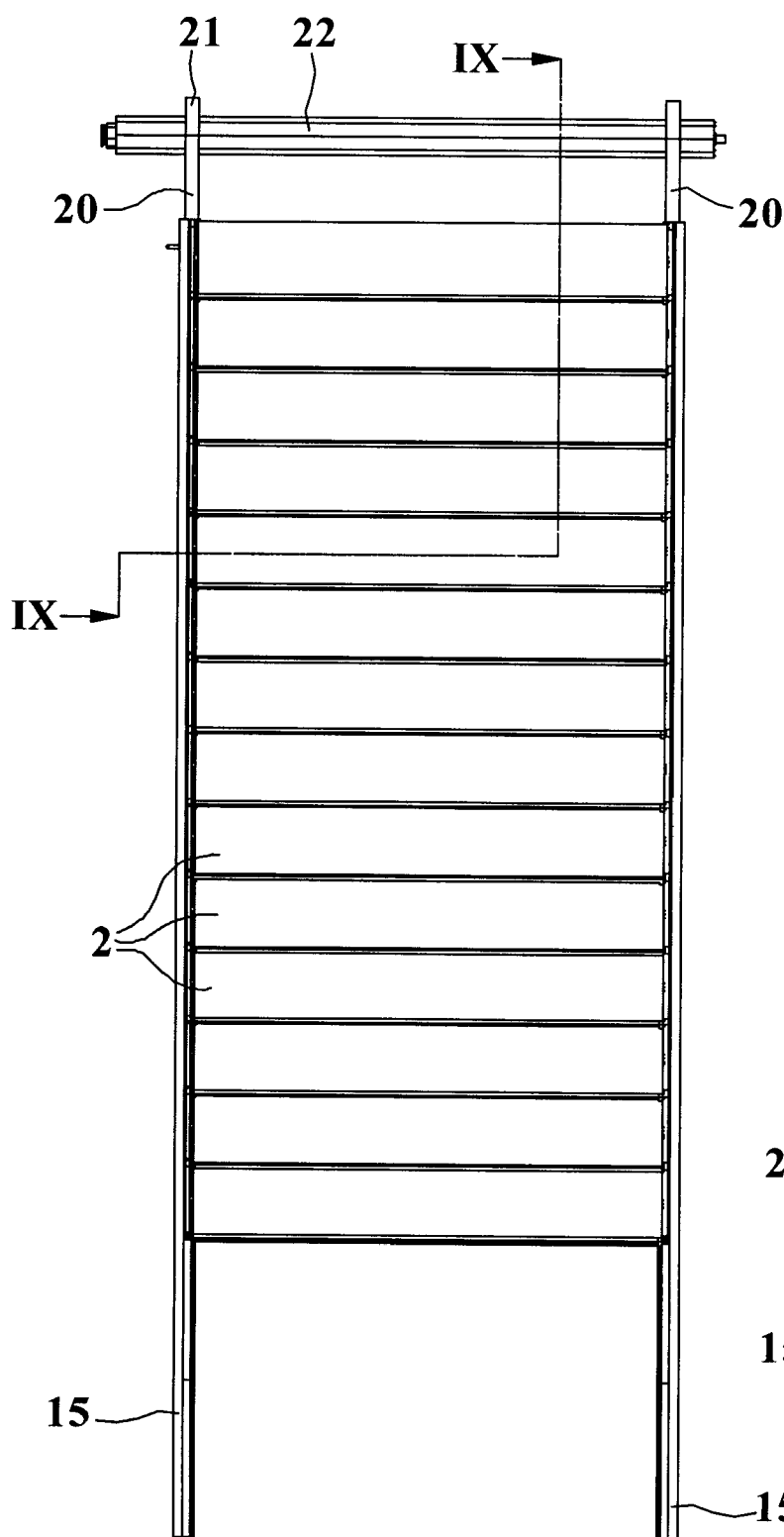


FIG. 8

FIG. 9

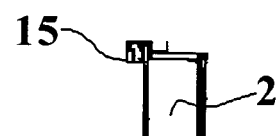
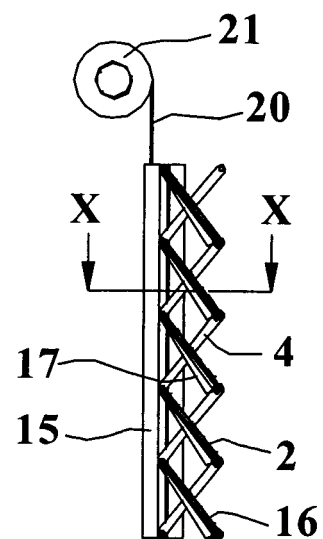


FIG. 10

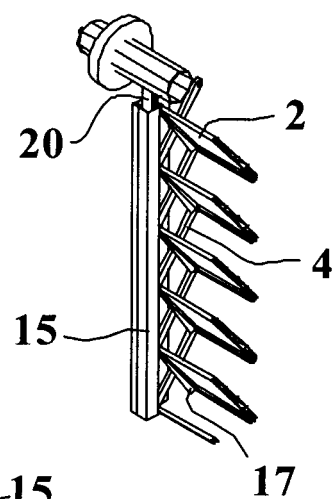
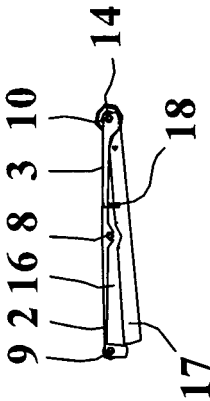
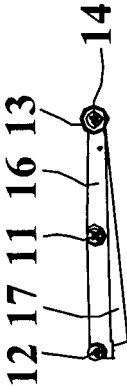
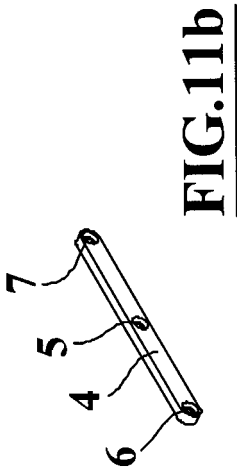
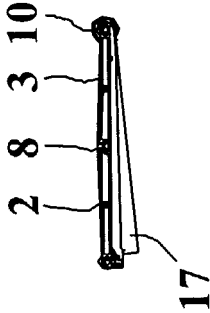
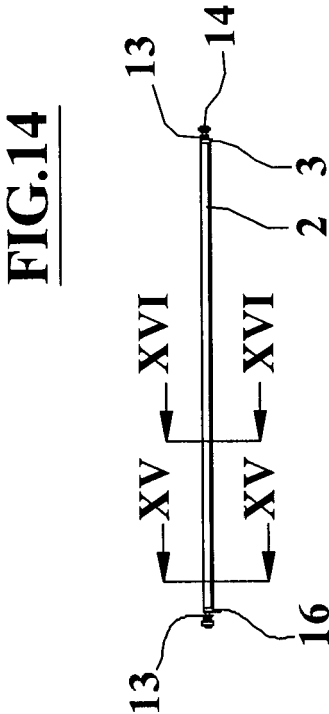
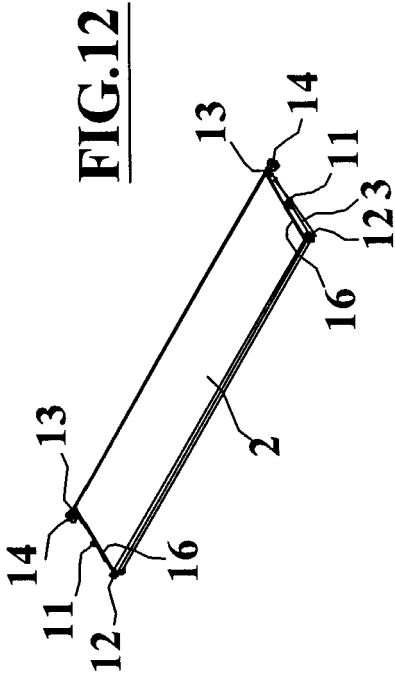


FIG. 11



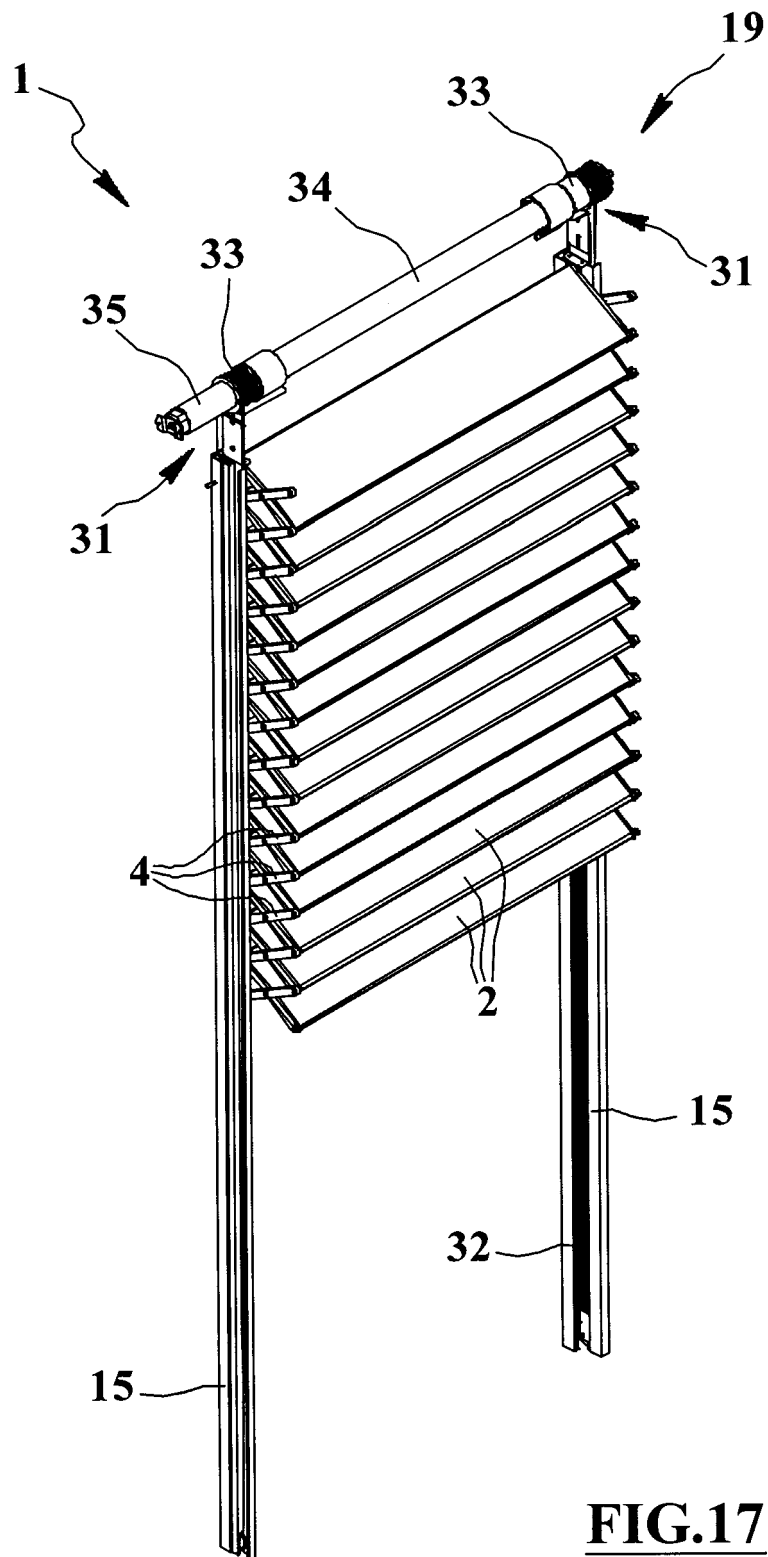


FIG.17

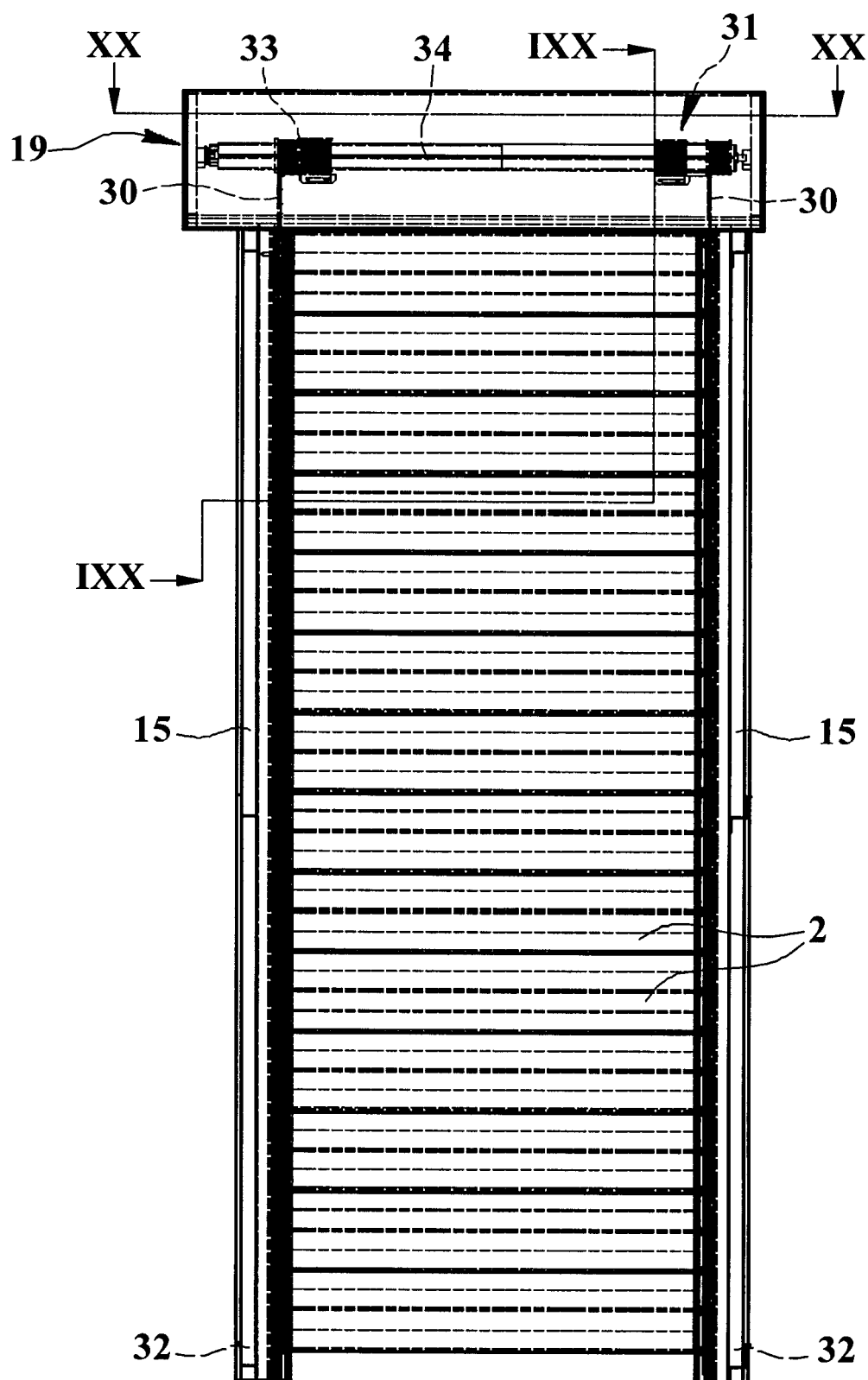


FIG.18

FIG.19

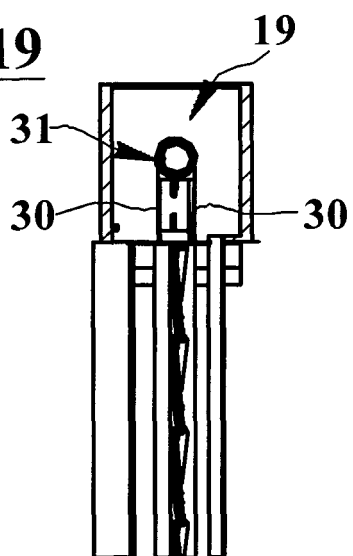


FIG.21

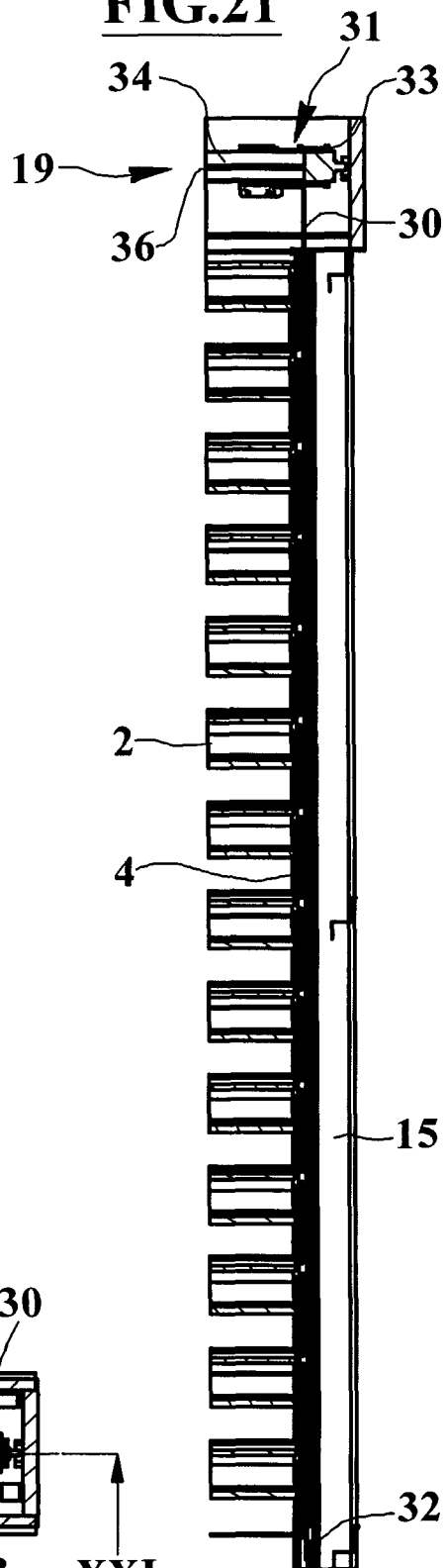


FIG.23

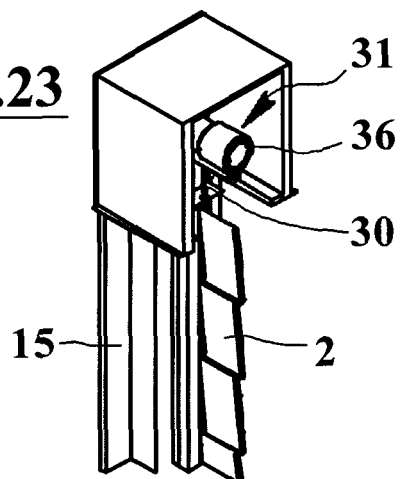
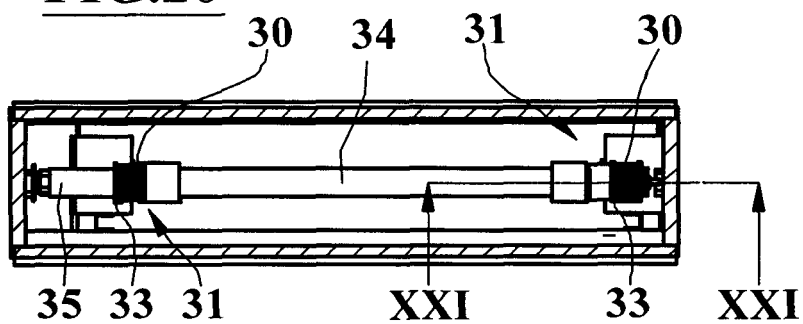


FIG.20



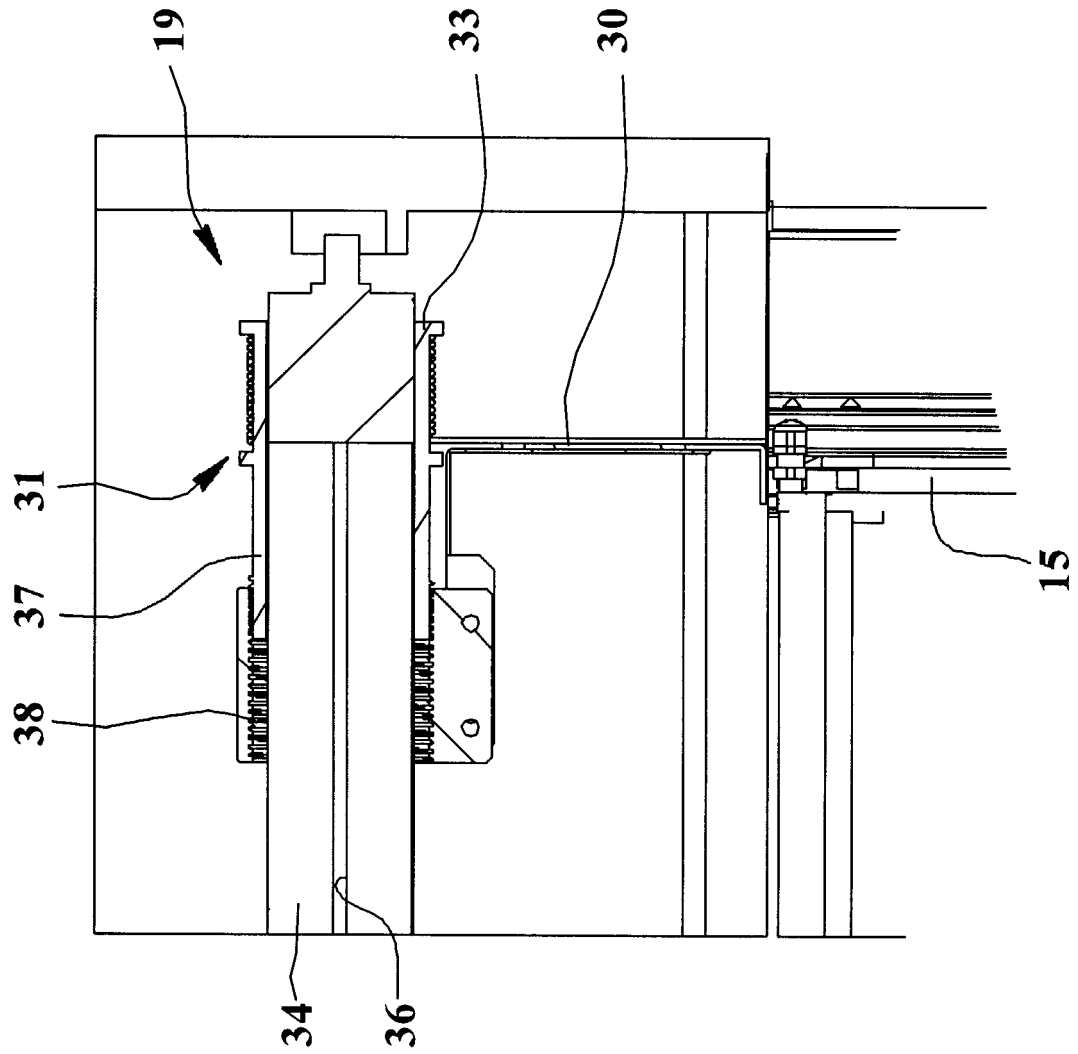
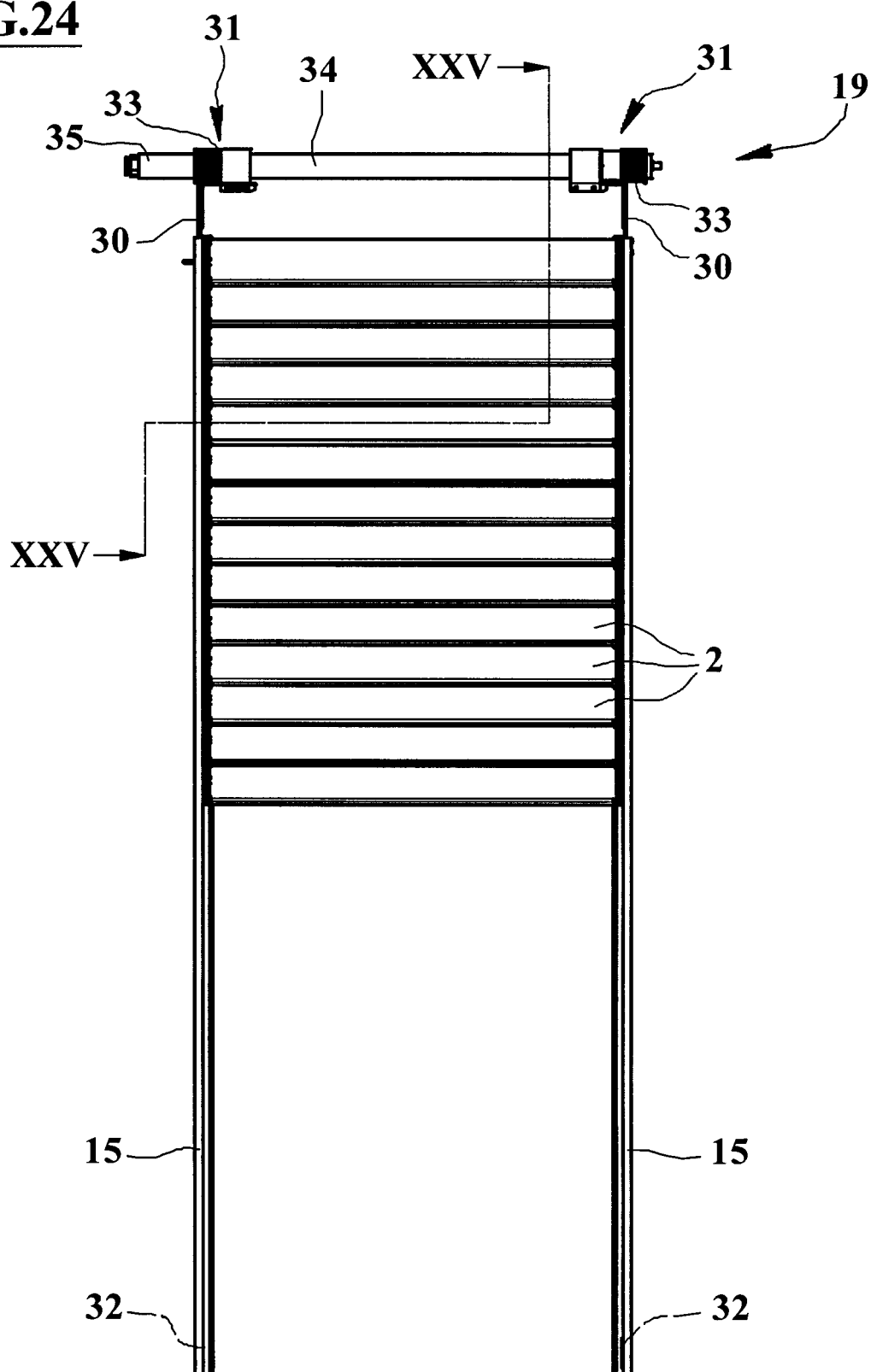


FIG.22

FIG.24



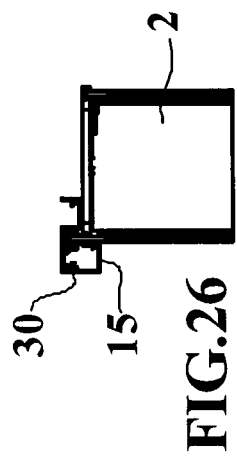
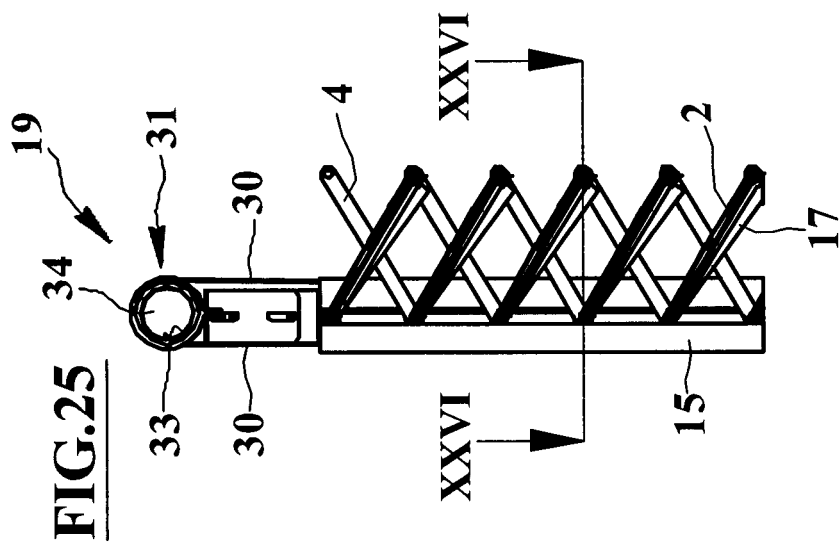
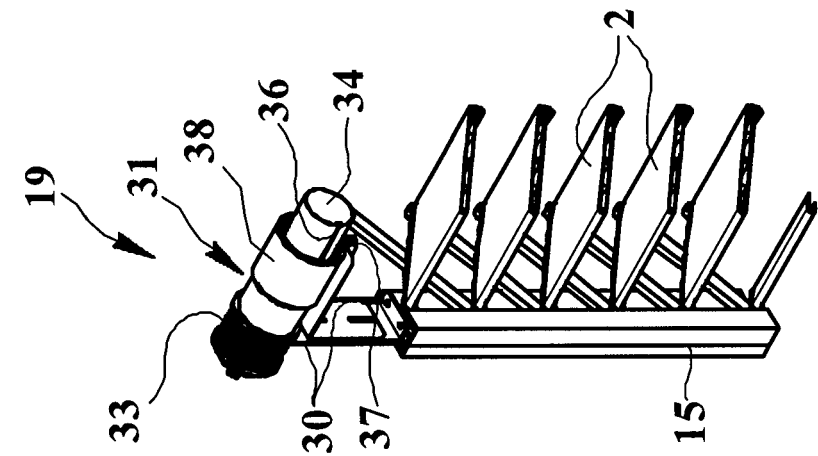


FIG.27

FIG.26

REFERENCES CITED IN THE DESCRIPTION

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