

(19) **DANMARK**

(10) **DK/EP 2019183 T3**



Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

-
- (51) Int.Cl.: **E 06 B 9/06 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2017-10-23**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2017-07-19**
- (86) Europæisk ansøgning nr.: **08161124.6**
- (86) Europæisk indleveringsdag: **2008-07-24**
- (87) Den europæiske ansøgnings publiceringsdag: **2009-01-28**
- (30) Prioritet: **2007-07-25 IT BO20070514**
- (84) Designerede stater: **AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR**
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- (54) Benævnelse: **SKODDEENHED**
- (56) Fremdragne publikationer:
WO-A1-99/61742
US-A- 702 146
US-A1- 2004 221 968

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 housebreaking 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 adjacent 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 slidingly 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.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US2004221968A1 [0006]
- WO9961742A1 [0006]
- US702146A [0006]

P A T E N T K R A V

1. Skoddeenhed, som indbefatter flere næsten parallelle finner (2), der hver har mindst to forlængede langsgående sider, som ender i tilsvarende sideender (3), hvilke finner er reciprokt forbundet og bevægelige mellem sluttilstande af lukning og åbning af vinduet, døren eller passagen, med hvilken skoddeenheden (1) er tilknyttet, hvor forbindelsen mellem finnerne (2) er tilvejebragt ved forbudne stænger (4), som hver er roterende forbundet centralt til en mellemdel af en finne (2), og har de to modsatte ender respektive forbundet, på en roterende måde, til modstående dele af finnerne (2), som er tilstødende til finnen (2), der er centralt forbundet til armen (4), således at finner (2) og arme (4) udfører en reciprok pantograf forbindelse; hvor enheden (1) er kendt ved, at hver af sideenderne (3) består af et slutelement (16), der er fastgjort til finnen; hvor hver af sideenderne (3) har en sidebeskyttelse (17), der er roterende forbundet til slutelementet (16) i tilsvarende eller i nærhed af skydemidlet (14); hvor sidebeskyttelsen (17) har en forlænget triangulær facon med en længde tilnærmelsesvis svarende til bredden af finnen, der er vinkelret til den sidstnævnte, og er hængslet nær det skarpe toppunkt og oscillerer mellem en position, i hvilken den næsten er vendt mod sideenderne (3), og en position, i hvilken den rager frem for at beskytte spalten mellem finnen (2) og sideføringen (15) i den lukkede indstilling, hvor enheden (1) yderligere indbefatter et elastisk middel (18), der sammenpresseligt påvirkes mellem slutelementet (16) og sidebeskyttelsen (17) for elastisk at bevare den sidstnævnte imod den fremragende position.

2. Enhed ifølge krav 1, hvilken enhed er kendt ved, at forbindelsesarmene (4) af et første underaggregat forbindelsesarme (4) er tilknyttet sideenderne (3) af en side af finnerne (2), og de af et andet underaggregat er tilknyttet sideenderne (3) af den modsatte side af finnerne (2), som udfører to modsatte pantografforbindelser; hver arm (4) har et respektivt centralsæde (5) og to slutsæder (6, 7), hvor hver af sideenderne (3) af hver finne (2) har et respektivt centralhus (8) og to sluthuse (9, 10), der er nærliggende til de langsgående sider, sådanne sæder (5, 6, 7) og huse (8, 9, 10) passer til at modtage rotationsstifter (11, 12, 13), som er næsten parallelle med den langsgående dimension af finnen, og passer til pantografforbindelsen mellem finnerne og armene.

3. Enhed ifølge krav 2 kendt ved, at stifterne (13), der er tilstødende til samme langsgående side af finnerne, har et skydeemiddel (14), som rager frem og passer til at rulle langs sideføringer (15) af enheden (1).

4. Enhed ifølge krav 3, hvilken enhed er kendt ved mindst at være i forbindelse med et lodret aggregat af sideføringerne (15), hvor stifterne (13) af siden af skydemidlet (14) af den øvre finne (2) er blokeret eller fastgjort til de respektive føringer, og den nedre finne (2) er forbundet til åbningsmidlet (19); hvor åbningsmidlet (19) indbefatter to fleksible løftemidler (20), hvis nedre ende er fastgjort til respektive sider af den nedre finne (2), og hvis øvre ender er fastgjort til et respektivt tromlemiddel (21), der er

koaksialt med et snoet skaft (22), som er manuelt aktiveret eller motoriseret; hvor sidefø-
ringerne (15) har langsgående sæder til det fleksible løftemiddel (20).

5 5. Enhed ifølge krav 3, hvilken enhed er k e n d e t e g n e t ved, at stifterne (13)
af siden af skydemidlet (14) af en fastgjort slutstift (2) er blokeret eller fastgjort til de re-
spektive føringer og den modsatte slutfinne (2), der er bevægelig langs sideføringerne (15),
er forbundet til et åbningsmiddel (19); hvor åbningsmidlet (19) indbefatter mindst ét fleksi-
belt bevægelsesmiddel (30), der har enderne fastgjort til et respektivt snoningsmiddel (31)
og i indgreb med returtrissen (32) modsat til snoningsmidlet (31), hvor den bevægelige
slutfinne (2) er fastgjort til én af delene af det mindste ene fleksible bevægelsesmiddel (30),
10 der er indbefattet mellem snoningsmidlet (31) og returtrissen (32).

6. Enhed ifølge krav 5, hvilken enhed er k e n d e t e g n e t ved, at åbningsmidlet
(19) indbefatter to fleksible sidebevægelsesmidler (30), hvis dele er indbefattet mellem re-
spektive snoningsmidler (31), og hvor returtrissen (32) er huset i kanaler af sideføringerne
(15), hvor hver returtrisse (32) er roterende forbundet til den respektive sideføring (15).

15 7. Enhed ifølge et hvilket som helst af krav 5 eller 6, hvilken enhed er k e n d e -
t e g n e t ved, at hvert snoningsmiddel (31) indbefatter et spolemiddel (33) til at sno ind i
tilstødende drejninger en længde af det fleksible bevægelsesmiddel (30), hvilken længde
mindst er lig med løbet langs sideføringerne (15) af den bevægelige slutfinne (2).

8. Enhed ifølge krav 7, hvilken enhed er k e n d e t e g n e t ved, at slutspidsen af
20 det fleksible bevægelsesmiddel (30) er spærret til det respektive spolemiddel (33) til den
modsatte side af tilstødende drejninger, hvor slutdelene af det fleksible bevægelsesmiddel
(30) bliver spundet i drejningerne i modsatte retninger, hvor hvert spolemiddel (33) er be-
grænset til at rotere omkring sin akse ved et rotationsskaft (34), der er manuelt aktiveret
eller ved en respektiv drevmotor (35).

25 9. Enhed ifølge krav 8, hvor enheden er k e n d e t e g n e t ved, at hvert spolemid-
del (33) er koaksialt med rotationsskaftet (34), som den er forbundet til ved hjælp af re-
spektive frie og roterende skydemidler (36).

10. Enhed ifølge krav 9, hvilken enhed er k e n d e t e g n e t ved, at de frie og
roterende skydemidler (36) indbefatter mindst en langsgående rille af det roterende skaft
30 (34), der er i forskydende indgreb med et skydeblokerende middel af hvert spolemiddel (33)
eller vice-versa.

11. Enhed ifølge krav 9 eller 10, hvilken enhed er k e n d e t e g n e t ved, at en
ende af hvert spolemiddel (33) har en gevinddel (37), som er i indgreb med et komplemen-
tært og koaksialt fastgjort gevind (38), hvilken gevinddel (37) og fastgjort gevind (38) har
35 et trin af skruegevindsprincip, hvilket trin er næsten det samme som trinnet af drejninger af
enderne af det fleksible bevægelsesmiddel (30), der er spundet omkring det respektive spo-
lemiddel (33), hvor skruegevindsretningen af disse gevinddele (37) og fastgjorte skruege-
vind (38) er således, at spolemidlet (33) forskydes i en retning modsat til forskydningen af
drejningerne, som udgår fra spolemidlet (33) af slutdelene af det fleksible bevægelsesmiddel

(30) til at fastholde den næsten fastgjorte position af disse udgangsdrejninger og af delene, der griber ind i returtrissen (32).

12. Enheden ifølge et hvilket som helst af kravene fra 5 til 11, hvilken enhed er k e n d e t e g n e t ved, at det fleksible bevægelsesmiddel (30) består af en wire af stål
5 eller et let forlængeligt tekstilmateriale.

13. Enhed ifølge krav 5, hvilken enhed er k e n d e t e g n e t ved, at åbningsmidlet (19) indbefatter mindst et fleksibelt ringmiddel, der griber ind med en motorkrone og med en gearkrone, hvor den bevægelige slutfinne er fastgjort til én af delene af det mindst ene fleksible ringmiddel, der er indbefattet mellem de to kroner.

10

DRAWINGS

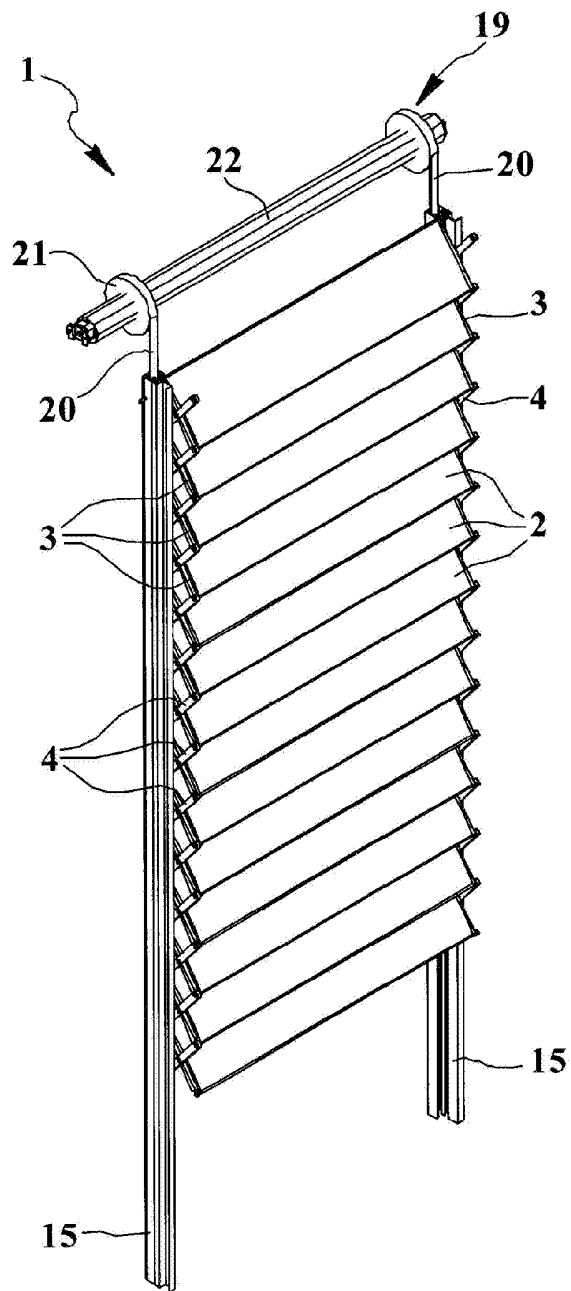


FIG.1

FIG. 2

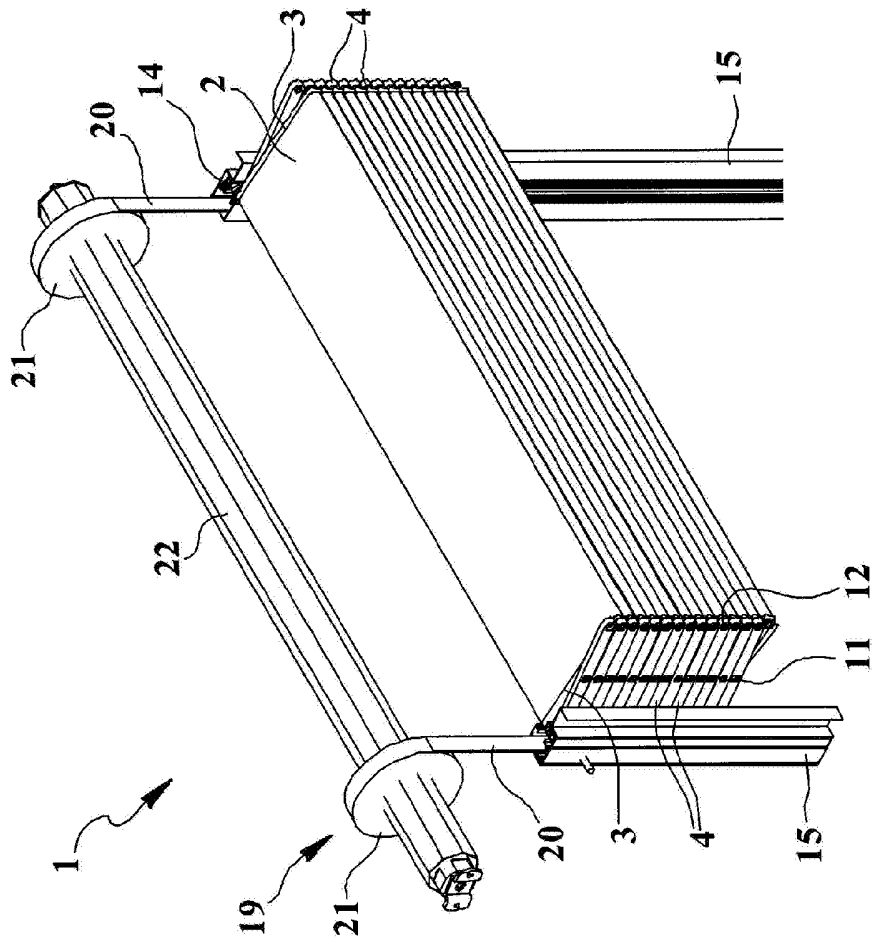


FIG.3

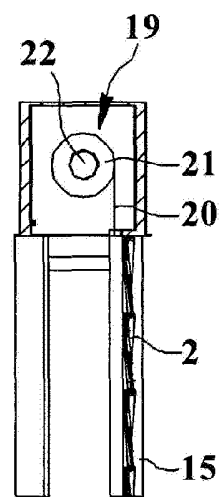
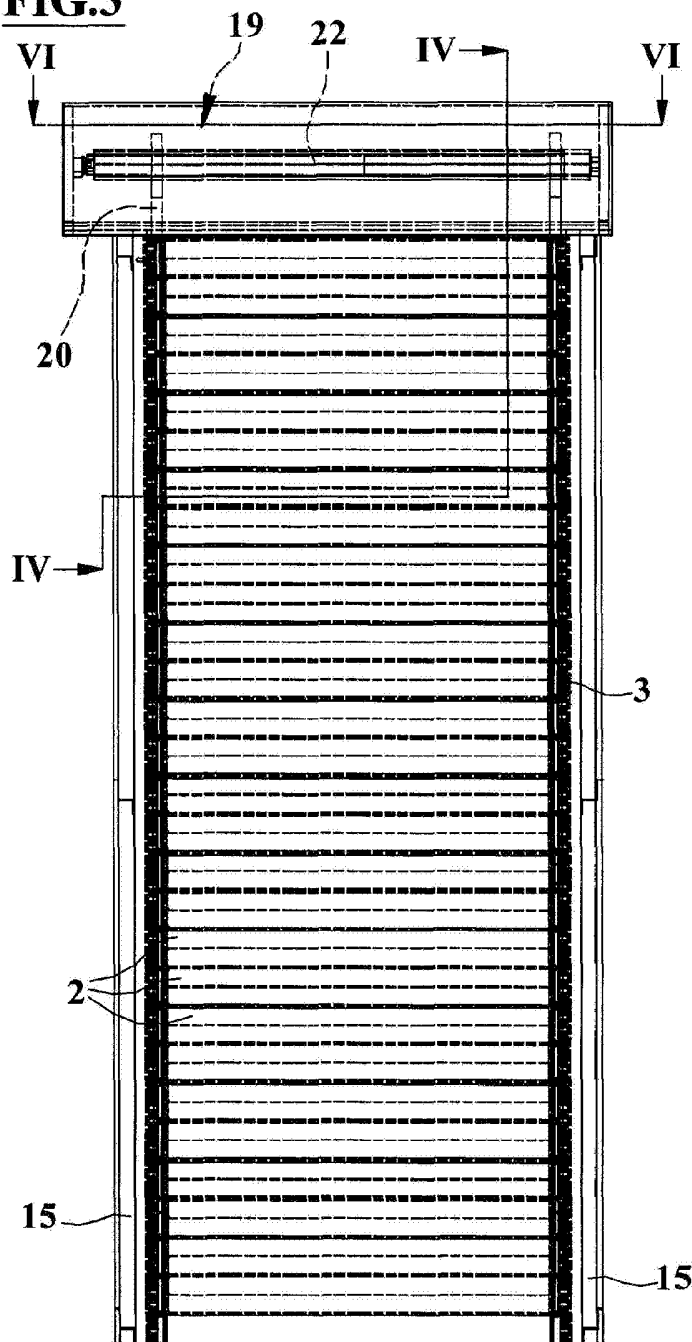


FIG.4

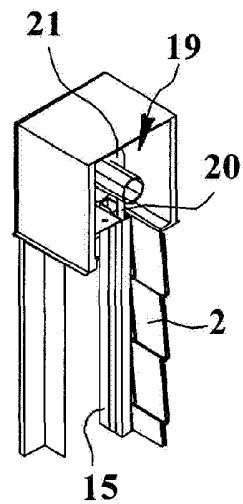


FIG.5

FIG.7

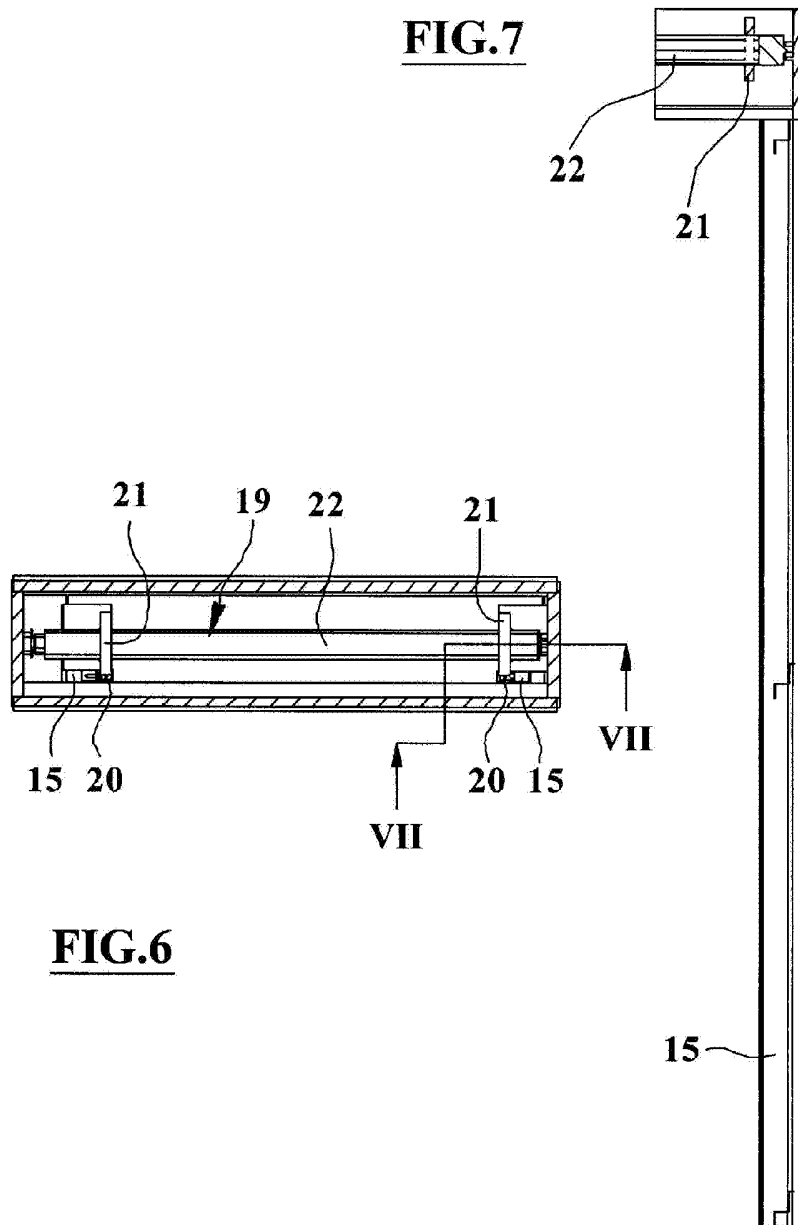


FIG.6

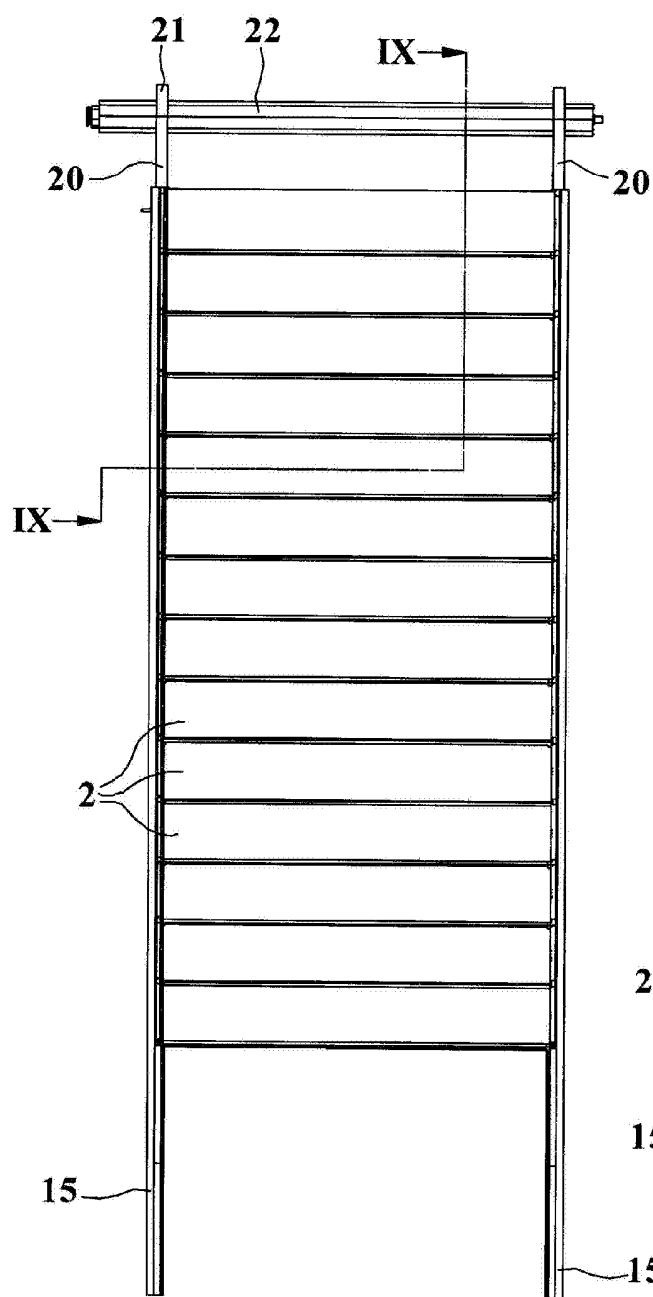


FIG. 8

FIG. 9

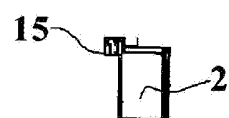
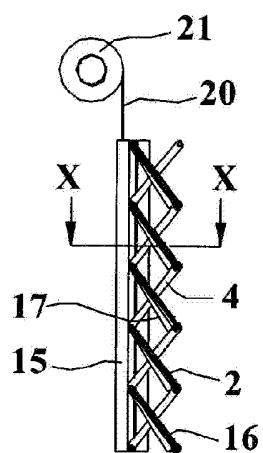


FIG. 10

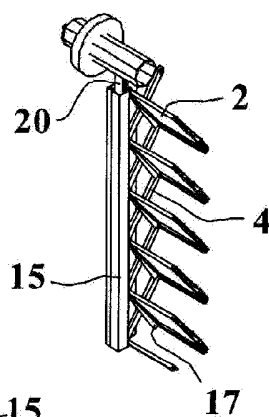


FIG. 11

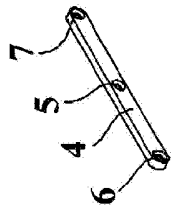


FIG.11b

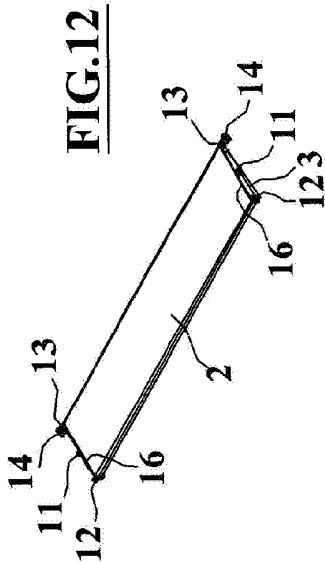


FIG.12

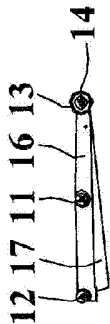


FIG.13

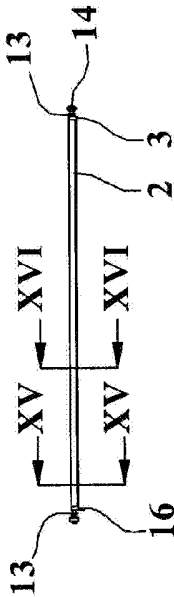


FIG.14

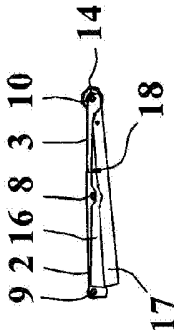


FIG.15

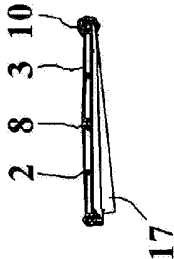


FIG.16

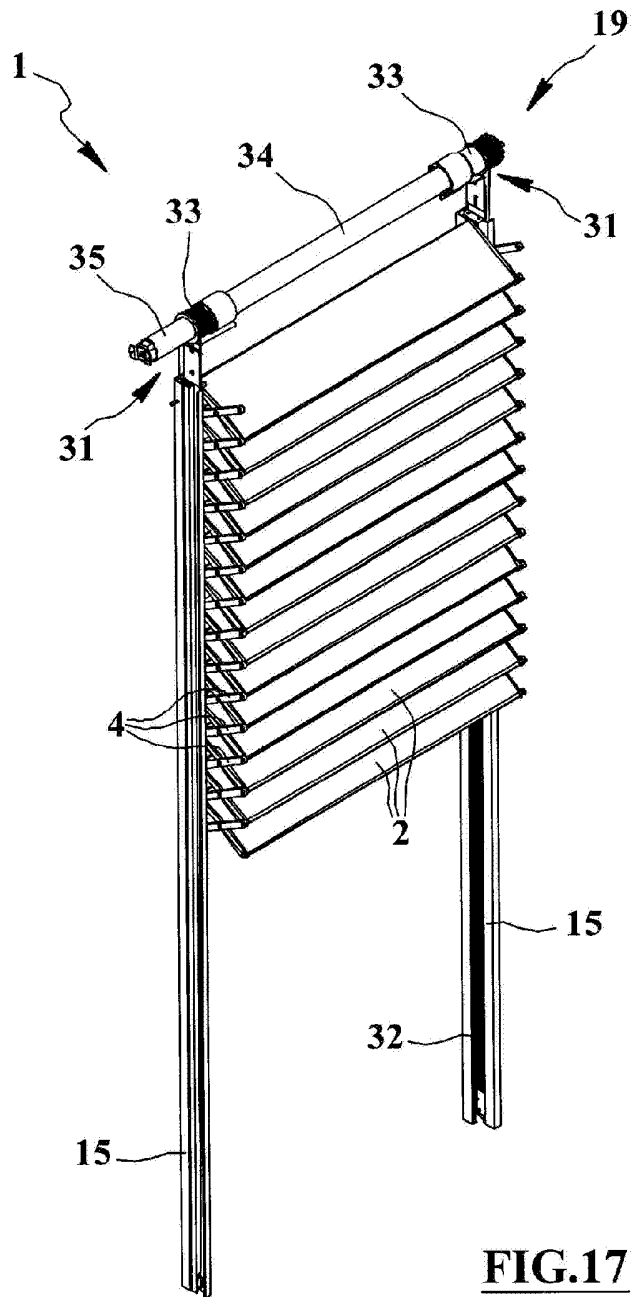


FIG.17

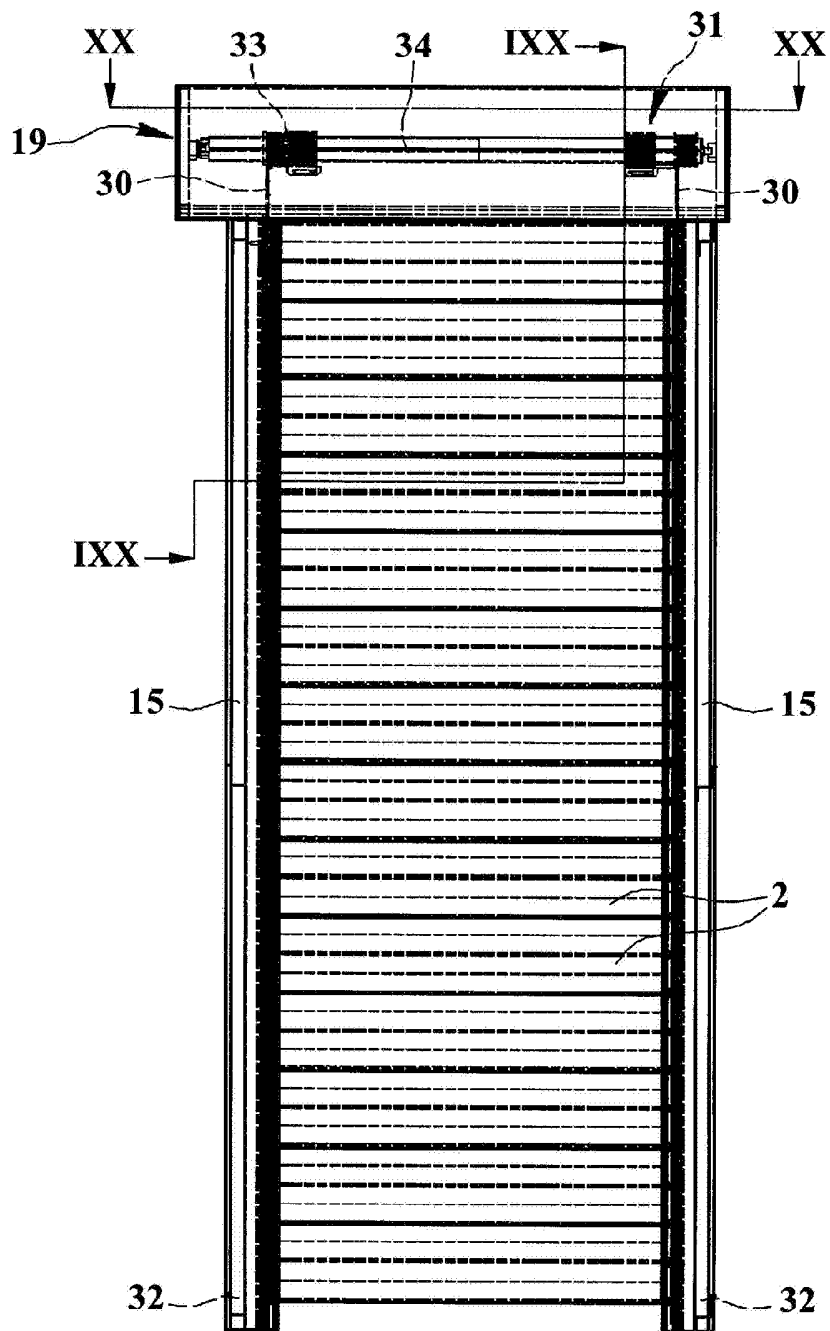


FIG.18

FIG.19

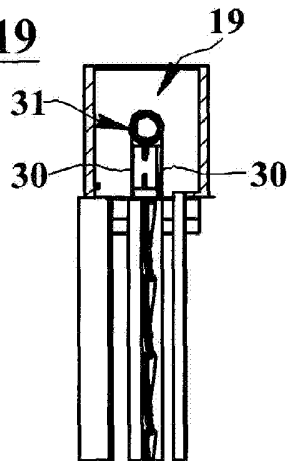


FIG.21

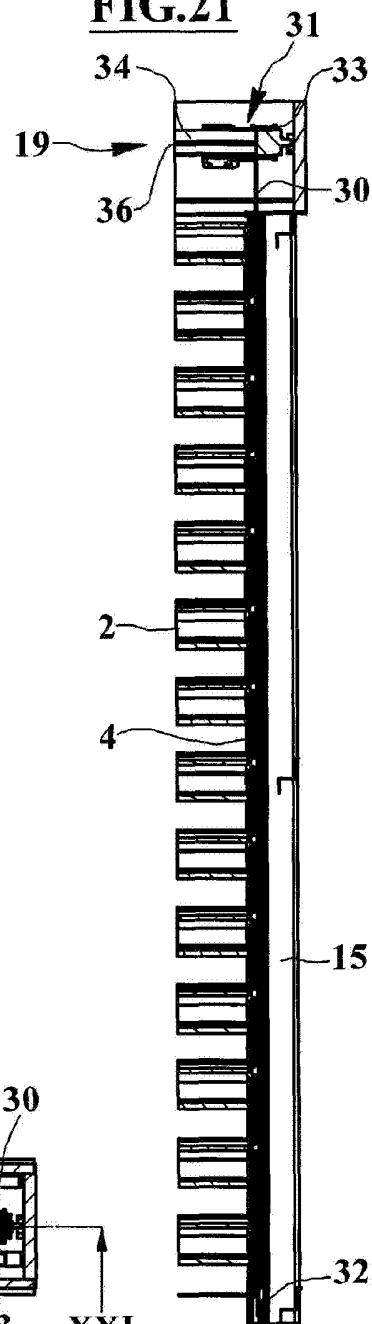


FIG.23

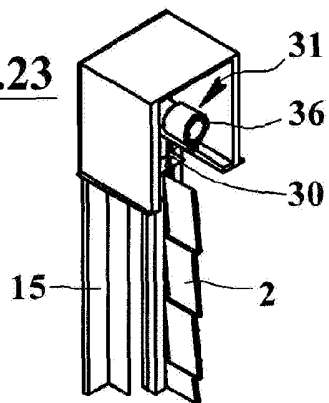
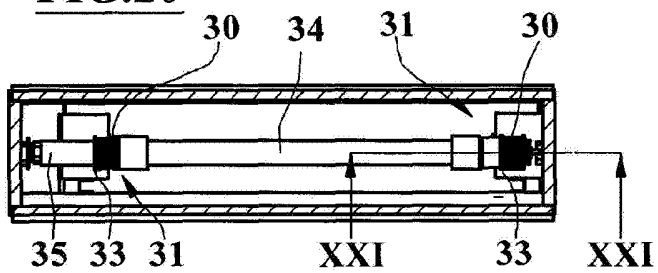


FIG.20



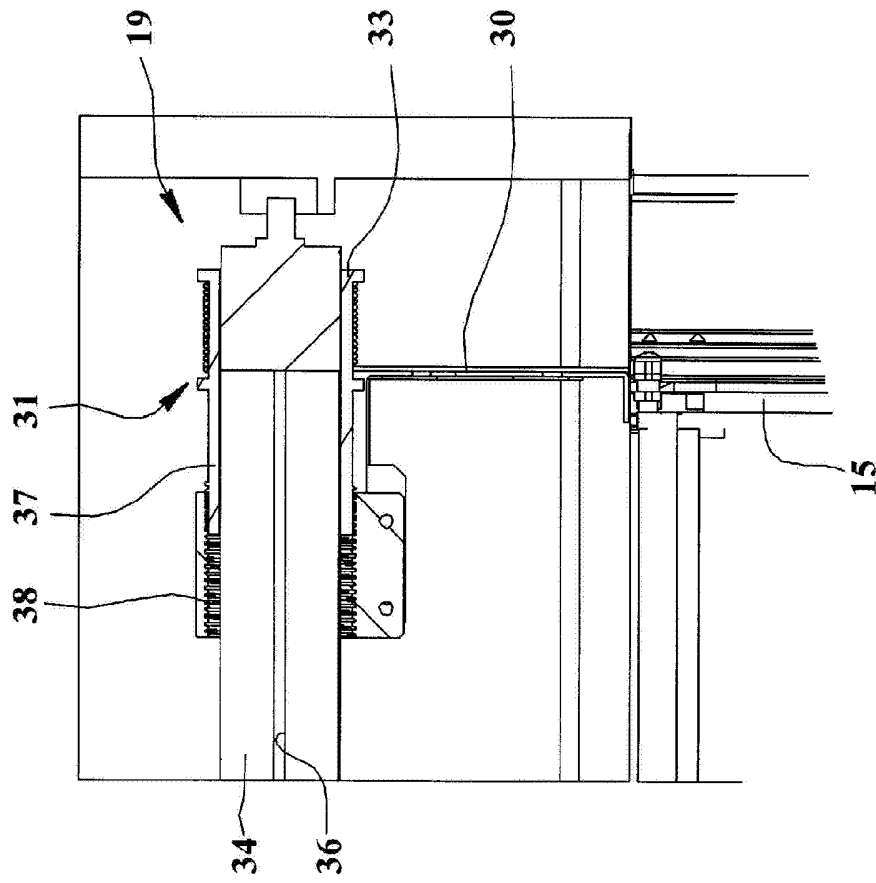
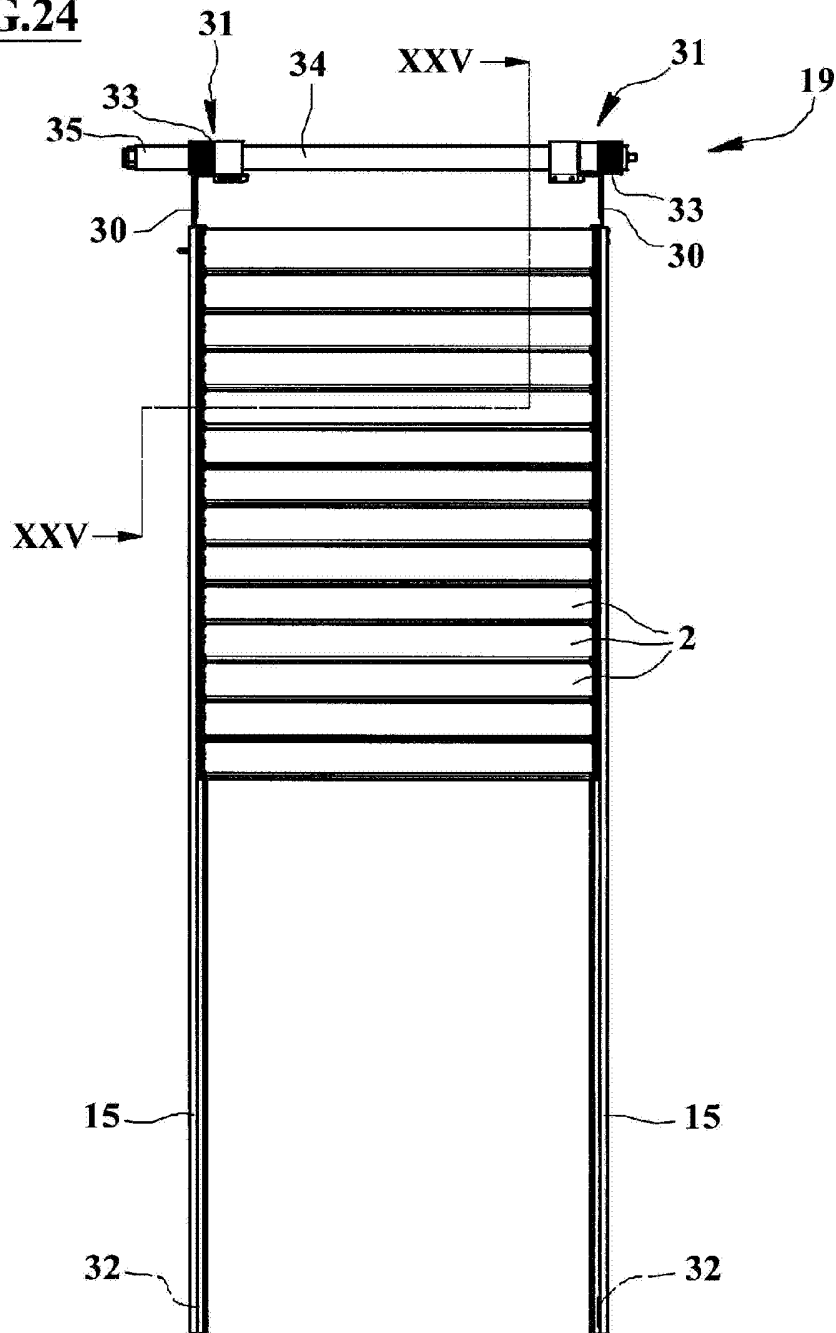


FIG.22

FIG.24

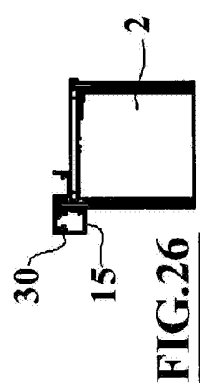
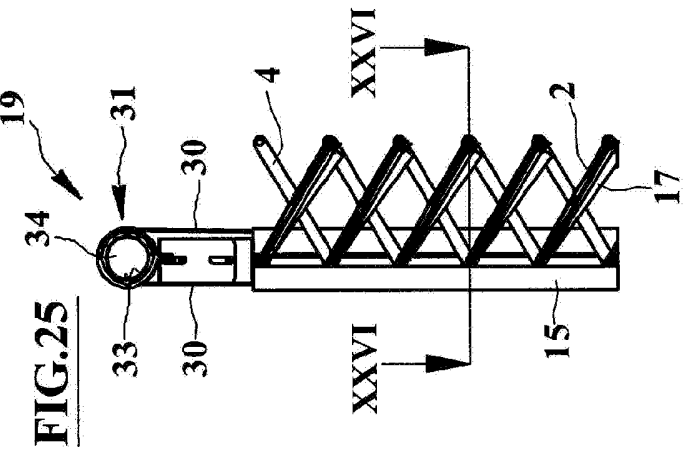
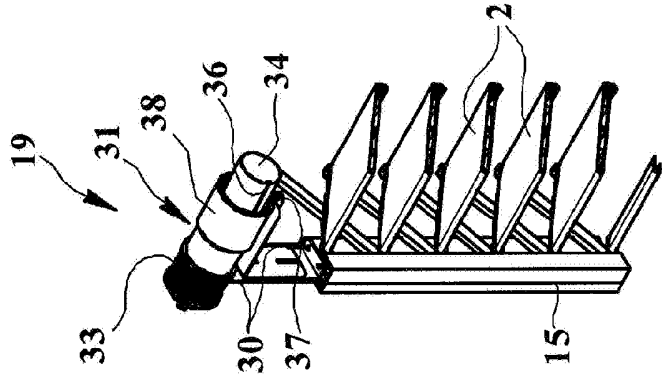


FIG.25

FIG.26

FIG.27