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(54) **Screening system with movable sun louvers**

Sonnenschutzsystem mit beweglichen Lamellen

Système d'écran avec des lamelles mobiles

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(56) References cited:
EP-A2- 1 939 388 WO-A1-02/12648
DE-A1- 19 636 615 DE-U1-202005 008 622
FR-A1- 2 903 715

EP 2 336 479 B1

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Description

Field of application

[0001] In its most general aspect the present invention regards a solar radiation screening system having an improved structure and capable of being applied near windows of a building as well as comprising a plurality of movable sun louver elements supported in a parallel relation with a predetermined interval along horizontal axes and at a predetermined distance from said windows.

[0002] More particularly, the invention regards a movable sun louver element incorporated in the abovementioned screening system.

[0003] The invention substantially regards the field of "daylighting", i.e. the techniques that provide for maximum exploitation of natural light limiting the use of artificial light for daylighting public or residential buildings and the description that follows is provided with reference to this field of application with the sole aim of simplifying exposure thereof.

Prior art

[0004] As well known, in this specific technical field, natural lighting has beneficial effect on human health and it simultaneously allows reducing the use of artificial lighting, with the ensuing consequences in terms of consumption of electrical energy.

[0005] Over the last years, there has been an ever-growing need for reducing energy consumption and this has given rise to the so-called "daylighting" techniques which provide for maximum exploitation of natural light limiting the use of the artificial one. This leads to advantageous effects even in terms of lower costs required for heating or cooling a building to which such techniques are applied.

[0006] A correct application of the "daylighting" techniques however starts from the assumption that there suitably arises the need for direct solar radiation screening of the window surfaces of the buildings, whether simple windows or entire glass facades.

[0007] This allows regulating the amount and quality of daylight penetrating into the rooms of a building through the glass surfaces thereof.

[0008] This regulation, though desirable for all types of public or private buildings, would be particularly suitable especially in case of high buildings provided with entire glass facades.

[0009] Various solutions for solar radiation screening for these types of buildings are already known; for example, different types of fixed or movable sun louvers to be mounted near the windows are known.

[0010] There are various types of fixed sun louvers: they may be made up of a simple projection extended cantilevered above the glass surface or a plurality of elements arranged in a parallel relation with a regular interval. In the latter case, the sun louvers are made with

laminar sections, preferably wing-shaped, which are mounted horizontally at a predetermined distance from the glass surface. The number and spacing thereof are defined according to the application needs, depending on whether maximizing the screening effect or maximizing the external vision of the occupants of the building is required.

[0011] Though guaranteeing the passage of air and light, these sun louvers have the great disadvantage of being fixed and irremovable and not capable of efficiently regulating the solar radiation according to the variation of the hours of the day.

[0012] Sun louvers of the movable type which have become more and more common in public environments that are mainly used during the day such as hospitals, schools, offices, commercial and industrial buildings are also known.

[0013] These movable sun louvers are relatively complex structures in which a plurality of orientable blades are supported in a parallel relation on respective axes held by a metal frame structure. These blades rotate cohesively each around the support axis thereof and the most sophisticated systems are provided with a system for controlling the movement based on environmental sensors and connected to mechanisms actuated by electric or hydraulic cylinder gear motors. The rotation of the blades is regulated according to the environmental conditions, i.e. solar radiation, the force of the wind or presence of clouds. Regulation may also occur according to functions programmed through a time calendar.

[0014] Such a screening system is known from DE 202005008622U1.

[0015] Though advantageous from various points of view, and substantially meeting the purpose, these movable sun louvers systems are extremely complex and expensive and they do not always guarantee ideal visibility within the buildings on which they are installed.

[0016] Furthermore, the movement of the sun louver solely allows regulating the inclination thereof with respect to a vertical axis, but it does not allow performing other types of movements which could have an impact on the surface exposed to the incident solar radiation. Thus, this implies that several sun louver elements arranged in a parallel relation with a small interval to achieve the object of an efficient screening, are required. Alternatively, the use of a lesser number of sun louvers but having a considerable dimension with respective installation and management costs could be provided for.

[0017] The technical problem on which the present invention is based is that of providing a new solar radiation screening system by means of movable sun louvers having structural and functional characteristics such to allow regulating the amount and quality of light upon the variation of the hours of the day but reducing the number of sun louver elements required for the purpose, thus overcoming the drawbacks of the solutions currently proposed by the prior art.

[0018] Another object of the present invention is that

of providing a solar radiation screening system that is compatible with the architecture, and in particular with the facade, of the building for which it is intended.

[0019] A further object of the invention is that of providing a solar radiation screening system capable of always conferring a different aspect to the building on which it is installed as the hours of the day progress.

Summary of the invention

[0020] The solution idea on which the present invention is based is that of providing movable sun louvers having blades mounted on rotating axes which allow inclination thereof with respect to a horizontal plane but which can be extended width-wise from a minimum width to a maximum width. Thus, each sun louver is capable of telescopically increasing the screening surface.

[0021] Advantageously, the abovementioned blades are also partly traversed by the incident light radiation.

[0022] According to this solution idea, the technical drawback is overcome by a system of the previously indicated type and characterised in that at least one of said sun louver elements comprise a pair of blades parallel to each other and slidably mounted one on the other so as to achieve a greater or lesser extension of the exposed surface of the sun louver.

[0023] Advantageously, the sun louver elements comprise blades partly traversed by the incident light radiation.

[0024] Furthermore, the blades are obtained by means of a close-mesh grating or by means of a thick netting or even by means of a perforated plate.

[0025] The invention also regards a sun louver element for solar radiation screening systems and of the type intended to be mounted with other elements of the same type near windows of a building and rotatably supported on a horizontal axis parallel to the other elements and at a predetermined distance from said windows, characterised in that it comprises a pair of blades parallel to each other and slidably mounted one on the other so as to achieve a greater or lesser extension of the exposed surface of the sun louver.

[0026] Further characteristics and advantages of the system and of the sun louver according to the present invention shall be clear from the description, provided hereinafter, of a preferred embodiment provided by way of non-limiting example with reference to the attached drawings.

Brief description of the drawings

[0027]

- figure 1 represents a perspective and schematic view of a building provided with a solar radiation screening system obtained according to the present invention;
- figure 2 shows a perspective and schematic view of

a movable sun louver element incorporated in the screening system of figure 1;

- figure 2 A shows a perspective view of the sun louver element of figure 2 at an operative condition;
- figure 3 shows a side schematic view of the movable sun louver element of figure 2 in two different operative conditions;
- figure 4 shows a perspective view - with parts detached - of a detail of the sun louver element of figure 2;
- figure 5 shows a perspective view of the assembly of the parts illustrated in figure 4 assembled together;
- figures 6 and 7 are perspective and schematic views of a screening system according to the invention in two different operative conditions;
- figures 8 and 9 are vertical cross-section schematic views of a portion of the building of figure 1 provided with the system of the present invention and in two different operative conditions corresponding to two different hours of the day.

Detailed description

[0028] With reference to the attached figures, a solar radiation screening system 1 provided according to the present invention is indicated in its entirety with 1.

[0029] The system 1 is capable of being applied outside near windows 4 of a building 2 and comprises a plurality of movable sun louver elements 3 supported in a parallel relation along horizontal axes in predetermined relation spaced from each other and from said windows 4.

[0030] The system 1 is particularly indicated for tall and lean buildings such as flats or skyscrapers with facades 5 almost entirely enclosed by perimeter windows 4. However, the invention can also be applied on public and/or residential buildings of any type or size, even pre-existing ones provided with normal windows.

[0031] In the example provided herein by way of non-limiting example with reference to figure 1, the building 2 is a cylindrical or a polygonal base tower with a high number of sides, for example an octagon or a dodecagon, and comprises perimeter facades 5 enclosed by large windows 4 extended from the floor to the ceiling of each floor as shown for example in the section of figure 8.

[0032] Each movable element 3 incorporated in the system 1 is structured with a pair of elongated rectangular-shaped blades or panels 6, 7, i.e. blades or panels in which the longitudinal extension is considerably greater than the lateral one, for example by a ratio of at least 4:1, or greater.

[0033] Advantageously, the blades 6, 7 lie on planes parallel to each other and they are slidably mounted one on the other.

[0034] A sliding device 10, to be described in detail hereinafter, for adjusting the mutual moving away or approaching of the blades 6, 7, still with parallel planes, so as to achieve a greater or lesser extension of the exposed surface 8 of the sun louver 3 is provided for. Due to this

solution, the surface 8 of the sun louver 3 exposed to the incident light radiation varies in a substantially telescopic manner.

[0035] Advantageously, according to the present invention, the blades 6, 7 are not entirely opaque or, in other words, they are partly traversed by the incident light radiation.

[0036] More in particular, each blade is made by using a close-mesh grating or a thick netting. Alternatively, the blades 6, 7 may be obtained by means of a perforated plate, i.e. a plate provided with a plurality of small through holes distributed regularly. This solution allows reducing heat radiation and allows a greater amount of light energy.

[0037] A man skilled in the art can observe that any alternative embodiment may serve the purpose, such as for example an open-mesh fabric.

[0038] The components of the sun louver 3 are preferably made of metal material; however, other materials can be used for the blades 6, 7 or for parts of the sliding device 10.

[0039] In a preferred embodiment, each blade 6, 7 has a plate-like longitudinal edge 11, 12 extended perpendicularly to the laying plane of the respective blade 6, 7 and which confers a drawer-like configuration to each one of them.

[0040] Various transverse stiffening ribs 9 which are regularly distributed on the surface 8 and extended from one longitudinal edge to the other are also provided for.

[0041] When the sun louver element 3 is in the position of minimum extension with the blades 6, 7 overlapped with respect to each other, the resulting overall configuration is box-shaped, as shown for example in figure 2 A.

[0042] It should also be observed that the particular perforated structure of the blades 6, 7 makes the sun louver 3 capable of providing a screening filter having greater or lesser intensity depending on the overlapping percentage of the blades. Therefore, in the configuration of figure 2 A, in which the blades 6, 7 are completely overlapped, and which shall be referred to as "closed", allows obtaining an almost complete screening with considerable reduction of the lighting radiation passing through the sun louver.

[0043] In the other intermediate or "open" configurations, in which the blades 6, 7 are partly overlapped on each other, a mixed filtering effect with two longitudinal end strips partly traversed by the lighting radiation and a central strip which divides them wherein the filtering effect is greater due to the overlapping of the blades 6, 7 is obtained. This effect can be observed in the example of figure 6.

[0044] It should be observed that when the blades 6, 7 are in the configuration of maximum extension the width thereof substantially corresponds to the interval between the sun louvers 3.

[0045] All this has an impact not only in terms of the screening capacity of the system 1 according to the invention, but also in terms of the perception of the screen-

ing system by an observer outside the building 2 on which the system 1 is installed.

[0046] Actually, the building 2 is perceived differently depending on the relative position of the two blades of each sun louver and the arrangement thereof varies depending on the hours of the day and depending on the facades of the building, more or less hit by the incident light radiation. Thus, the building 2 in its entirety appears to an external observer always differently as the hours of the day progress, or upon variation of the climatic conditions which have an impact on the light radiation.

[0047] With reference to the example of figure 4, following is a detailed description of the sliding device 10 of the blades 6, 7 comprising slides 14, 18 integral with the respective blades 6, 7 and slidably mounted on a guide or rail 13.

[0048] The slides 14, 18 are C-shaped.

[0049] The rail 13 is formed by a pair of S-shaped sections 19, 19' and made integral with each other arranged facing each other in predetermined relation spaced so that there is a substantially T-shaped interstice 16 therebetween.

[0050] A respective slide 14 or 18 is integral with a corresponding smaller side of the blades 6, 7.

[0051] More in particular, with reference to the position of the blades 6, 7 illustrated in figure 2, guides 14 each associated to the opposite smaller sides of the blade 6 can be identified as upper guides, while the guides 18 associated to the opposite smaller sides of the blade 7 can be identified as lower guides.

[0052] The upper guides 14 are received in the upper part of the interstice 16 of the rail 13, substantially in the head part of the T-shaped interstice 16.

[0053] The lower guides instead slide outside the rail 13 surrounding the lower and narrower portion of the rail.

[0054] Wheels 20 for facilitating sliding are provided for inside the guides 14, 18.

[0055] A gear wheel 15 part of a rack gear is advantageously housed, internally and centrally with respect to the rail 13, in the interstice 16.

[0056] A tooth 21 conjugated to the wheel 15 of the rack gear is provided at the bottom of each guide 14, 18. The wheel 15 is integral with a sleeve or hub 23 projecting laterally and from opposite parts of the sun louver 3.

[0057] A rotation of the wheel 15 causes an equal and opposite kinematic action on the upper slides 14 and on the lower slides 18 which are actuated mutually moving away and approaching each other obtaining a translation of the respective blades 6, 7 in the direction of the arrow F of figure 3.

[0058] Motorised means for driving the angular excursion of the gear wheel 15 by rotatingly actuating the hub 23 integral therewith are provided. Such means are not represented in the drawing in that they are of the conventional type and they can be provided as an electric step motor mounted on board the sun louver 3 or housed laterally with respect thereto in a recess of the perimeter upright 24 of the building 2.

[0059] Further motorised means for adjusting the inclination of the sun louvers 3 with respect to a vertical axis are also provided.

[0060] Such further motorised means provide for an electric step motor which actuates a shaft 25 connected to output and control signals coming from an electronic device in which data and information regarding the ideal inclination according to the latitude and depending on the hour of the day of a given season of the year are memorised.

[0061] The shaft 25 traverses the hub 23 and it further passes with limited clearance through a hole 27 obtained centrally in the gear wheel 15.

[0062] The end of the shaft 25 is centrally made integral with the rail 13 so that a rotation of the shaft 25 causes a direct and corresponding angular excursion of the rail 13, and of the entire sun louver 3, with respect to vertical axis.

[0063] The shaft 25 essentially coincides with the axis for supporting the sun louver 3 which can thus be oriented around such axis.

[0064] Should the rotational movement of the sun louver 3 around the axis thereof require to be kept independent from the translation movement and mutual sliding of the blades 6, 7, then there arises the need of maintaining clearance between the shaft 25 and the hub 23 of the rotatable support.

[0065] On the contrary, should a simpler screening structure be sufficient, depending on the application needs, then the shaft 25 and the hub 23 can be made integral so that the rotation of the first causes an analogous rotation of the gear wheel 15 and a corresponding relative sliding of a blade 6 on the other blade 7.

[0066] The examples of figures 8 and 9 show in a section on a vertical plane how the interior spaces inside the building 2 appear near the perimeter windows provided with the screening system of the present invention.

[0067] An operative condition in which the solar radiation is minimum and the sun louvers 3 are extended in a parallel relation on a horizontal plane or with an inclination of only 10°, with the blades 6, 7 in closed position, is illustrated schematically in figure 8. This situation minimises the screening and maximises the amount of light which penetrates into the building.

[0068] An operative condition which occurs when the sun is on the southern side of the building 2 at about 70° on the zenith is illustrated in figure 9 instead; the sun louvers 3 are inclined in such a manner to be substantially perpendicular to the incident light radiation offering the maximum screening possible to the windows 4 of the building 2, with the blades 6, 7 totally open.

[0069] It can be observed how in this case the visibility towards outside is guaranteed in any case.

[0070] To complete the description, it should be pointed out that the screening system of the present invention can be installed by providing aligned units of sun louvers 3, as shown in figures 6 and 7.

[0071] The overall movement of the sun louvers 3 can

be achieved by connecting the driving shafts 25 to each other by means of interconnection joints.

[0072] There is also the possibility of connecting the shafts 25 by means of constant velocity joints which allow connecting the sun louvers to each other according to a broken line to achieve a slightly curvilinear configuration which can also be applied on curved glass surfaces.

[0073] The various components of the system 1 or of the sun louver 3 can be made using different types of materials; for example metal materials such as aluminium or zinc-plated or painted steel or, more economically, synthetic plastic material such as PVC, which has the advantage of preventing overheating due to solar radiation.

[0074] The invention overcomes the technical drawback and achieves various advantages the first of which definitely lies in the fact that the screening system of the present invention requires a lesser number of sun louver elements with respect to the prior art solutions given that the slidable double blades of each sun louver can substantially double the extension of the exposed surface of the sun louver during the operative step.

[0075] Further advantages lie in the fact that the system of the present invention becomes an important component of the overall aesthetic properties of the building which, as previously indicated, can assume a different aspect from one facade to the other to an external observer.

[0076] The man skilled in the art shall observe how the system of the present invention can be subjected to modifications and variants.

[0077] For example, photovoltaic cells for generating electric energy sufficient for moving the screening system can be housed in the sun louver 3.

[0078] Furthermore, the shape and the profiles of the blades of the sun louvers can be selected according to their aesthetic properties or according to their capacity to support the action exerted by the wind.

[0079] The movement of the sun louver elements allows calibrating the orientation according to the current external conditions. This allows optimising the entry of the solar radiation so as to intercept the high rays of the summer sun but allow the penetration of the low winter radiation.

[0080] Lastly, the system of the present invention facilitates the regulation of the microclimate inside the building, improving the heat comfort of the occupants thereof.

Claims

1. Solar radiation screening system (1) with movable sun louver elements (3), of the type capable of being applied at windows (4) of a building (2) and comprising a plurality of said movable sun louver elements (3) supported in a parallel relation with a predetermined interval along horizontal axes and at a prede-

- terminated distance from said windows (4), **characterised in that** at least one of said sun louver elements comprises a pair of blades (6, 7) parallel to each other and slidably mounted one (6) on the other (7) so as to achieve a greater or lesser extension of the exposed surface (8) of the sun louver element (3).
2. Screening system according to claim 1, **characterised in that** said sun louver elements (3) comprise blades (6, 7) partly traversed by the incident light radiation.
 3. Screening system according to claim 2, **characterised in that** said blades (6, 7) are obtained by means of a close-mesh grating or by means of a thick netting or even by means of a perforated plate.
 4. Screening system according to claim 1, **characterised in that** each blade (6, 7) is mounted on corresponding slides (14, 18) slidable on a rail (13) integral with the respective support axis of the sun louver element (3), gearing means (15, 21) being provided for adjusting the mutual sliding of the slides (14, 18) and of the corresponding blades (6, 7).
 5. Screening system according to claim 1, **characterised in that** the maximum extension of the blades (6, 7) corresponds to the interval between the sun louvers elements (3).
 6. Screening system according to claim 4, **characterised in that** it comprises motorised means for independently rotating the sun louver element (3) about the horizontal axis and rotating said gearing means.
 7. Screening system according to claim 4, **characterised in that** it comprises a motor shaft (25) integral with said rail (13) and coaxial with said support axis; multiple units of sun louver elements (3) being connected aligned with respect to each other by means of interconnection joints of the motor shafts.
 8. Sun louver element (3) for solar radiation screening systems and of the type intended to be mounted with other elements (3) of the same type at windows (4) of a building (2) and rotatably supported on a horizontal axis parallel to the other elements (3) and at a predetermined distance from said windows (4), **characterised in that** it comprises a pair of blades (6, 7) parallel to each other and slidably mounted one (6) on the other (7) so as to achieve a greater or lesser extension of the exposed surface (8) of the sun louver element (3).
 9. Sun louver element according to claim 8, **characterised in that** said blades (6, 7) are obtained by means of a close-mesh grating or by means of a thick netting or even by means of a perforated plate.

10. Sun louver element according to claim 8, **characterised in that** each blade (6, 7) is mounted on corresponding slides (14, 18) slidable on a rail (13) integral with the respective axis for supporting the sun louver element (3), gearing means (15, 21) being provided for adjusting the mutual sliding of the slides (14, 18) and of the corresponding blades (6, 7).

10 Patentansprüche

1. Sonnenstrahlungsabschirmungssystem (1) mit beweglichen Sonnenlamellenelementen (3) des Typs, der geeignet ist, an Fenstern (4) eines Gebäudes (2) angebracht zu werden und eine Vielzahl der beweglichen Sonnenlamellenelemente (3) umfasst, die in paralleler Relation mit einem vorbestimmten Abstand entlang horizontaler Achsen und im einem vorbestimmten Abstand von den Fenstern (4) gelagert sind, **dadurch gekennzeichnet, dass** mindestens eines der Sonnenlamellenelemente ein Paar von Lamellen (6, 7) umfasst, die parallel zueinander angeordnet sind und von denen eines (6) auf dem anderen (7) verschiebbar angeordnet ist, um eine größere oder kleinere Ausdehnung der exponierten Oberfläche (8) des Sonnenlamellenelements (3) zu erreichen.
2. Abschirmungssystem nach Anspruch 1, **dadurch gekennzeichnet, dass** die Sonnenlamellenelemente (3) Lamellen (6, 7) umfassen, die teilweise von der einfallenden Lichtstrahlung passiert werden.
3. Abschirmungssystem nach Anspruch 2, **dadurch gekennzeichnet, dass** die Lamellen (6, 7) mittels eines engmaschigen Gitters oder mittels eines dichten Netzes oder sogar mittels einer perforierten Platte erhalten werden.
4. Abschirmungssystem nach Anspruch 1, **dadurch gekennzeichnet, dass** jede Lamelle (6, 7) auf zugehörigen Schlitten (14, 18) angeordnet ist, die auf einer Schiene (13) verschiebbar sind, die einteilig mit der jeweiligen Tragachse des Sonnenlamellenelements (3) ausgebildet ist, wobei Zahnradgetriebemittel (15, 21) zum Einstellen des gegenseitigen Verschiebens der Schlitten (14, 18) und der zugehörigen Lamellen (6, 7) vorgesehen sind.
5. Abschirmungssystem nach Anspruch 1, **dadurch gekennzeichnet, dass** die maximale Ausdehnung der Lamellen (6, 7) dem Abstand zwischen den Sonnenlamellenelementen (3) entspricht.
6. Abschirmungssystem nach Anspruch 4, **dadurch gekennzeichnet, dass** es motorisierte Mittel zum unabhängigen Drehen des Sonnenlamellenelementes (3) um die horizontale Achse und zum Drehen

der Zahnradgetriebemittel umfasst.

7. Abschirmungssystem nach Anspruch 4, **dadurch gekennzeichnet, dass** es eine Motorwelle (25) umfasst, die einteilig mit der Schiene (13) und koaxial mit den Tragachsen ausgebildet ist, wobei mehrere Einheiten von Sonnenlamellenelementen (3) zueinander ausgerichtet miteinander mittels Verbindungsgelenken der Motorwellen verbunden sind. 5
8. Sonnenlamellenelement (3) für Sonnenstrahlungabschirmungssysteme des Typs, der vorgesehen ist, um mit anderen Elementen (3) desselben Typs an Fenstern (4) eines Gebäudes (2) befestigt und drehbar auf einer horizontalen Achse gelagert zu werden, die parallel zu den anderen Elementen (3) und in einem vorbestimmten Abstand von den Fenstern (4) angeordnet ist, **dadurch gekennzeichnet, dass** es ein Paar von Lamellen (6, 7) umfasst, die parallel zueinander angeordnet sind und von denen eines (6) auf dem anderen (7) verschiebbar angeordnet ist, um eine größere oder geringere Ausdehnung der exponierten Oberfläche (8) des Sonnenlamellenelements (3) zu erreichen. 10
9. Sonnenlamellenelement nach Anspruch 8, **dadurch gekennzeichnet, dass** die Lamellen (6, 7) mittels eines engmaschigen Gitters oder mittels eines dichten Netzes oder sogar mittels einer perforierten Platte erhalten werden. 15
10. Sonnenlamellenelement nach Anspruch 8, **dadurch gekennzeichnet, dass** jede Lamelle (6, 7) auf zugehörigen Schlitten (14, 18) angeordnet ist, die auf einer Schiene (13) verschiebbar sind, die einteilig mit der jeweiligen Achse zum Tragen des Sonnenlamellenelements (3) ausgebildet sind, wobei Zahnradgetriebemittel (15, 21) zum Einstellen des gegenseitigen Verschiebens der Schlitten (14, 18) und der zugehörigen Lamellen (6, 7) vorgesehen sind. 20

Revendications

1. Système d'écran (1) contre le rayonnement solaire comprenant des éléments de lamelle pare-soleil mobiles (3), du type capable d'être appliqués à des fenêtres (4) d'un bâtiment (2), et comprenant une pluralité desdits éléments de lamelle pare-soleil mobiles (3) supportés dans une relation parallèle avec un intervalle prédéterminé le long d'axes horizontaux et à une distance prédéterminée desdites fenêtres (4), **caractérisé en ce qu'**au moins un desdits éléments de lamelle pare-soleil comprend une paire de lames (6, 7) qui sont parallèles l'une à l'autre et qui sont montées de façon coulissante l'une (6) sur l'autre (7) de manière à obtenir une extension plus grande ou plus petite de la surface exposée (8) de 45

l'élément de lamelle pare-soleil (3).

2. Système d'écran selon la revendication 1, **caractérisé en ce que** lesdits éléments de lamelle pare-soleil (3) comprennent des lames (6, 7) qui sont partiellement traversées par le rayonnement lumineux incident. 5
3. Système d'écran selon la revendication 2, **caractérisé en ce que** lesdites lames (6, 7) sont obtenues au moyen d'une grille à fines mailles ou au moyen d'un treillis épais, voire même au moyen d'une plaque perforée. 10
4. Système d'écran selon la revendication 1, **caractérisé en ce que** chaque lame (6, 7) est montée sur des glissières correspondantes (14, 18) qui peuvent coulisser sur un rail (13) qui est intégré à l'axe de support respectif de l'élément de lamelle pare-soleil (3), des moyens d'engrenage (15, 21) étant prévus pour régler le coulisement mutuel des glissières (14, 18) ainsi que des lames correspondantes (6, 7). 15
5. Système d'écran selon la revendication 1, **caractérisé en ce que** l'extension maximum des lames (6, 7) correspond à l'intervalle entre les éléments de lamelle pare-soleil (3). 20
6. Système d'écran selon la revendication 4, **caractérisé en ce qu'**il comprend des moyens motorisés pour faire tourner de façon indépendante les uns des autres les éléments de lamelle pare-soleil (3) autour de l'axe horizontal et pour faire tourner lesdits moyens d'engrenage. 25
7. Système d'écran selon la revendication 4, **caractérisé en ce qu'**il comprend un arbre de moteur (25) qui est intégré audit rail (13) et qui est coaxial audit axe de support; de multiples unités d'éléments de lamelle pare-soleil (3) étant connectées en alignement les unes par rapport aux autres au moyen de joints d'interconnexion des arbres de moteur. 30
8. Élément de lamelle pare-soleil (3) pour des systèmes d'écran contre le rayonnement solaire et du type destiné à être monté avec d'autres éléments (3) du même type à des fenêtres (4) d'un bâtiment (2) et supporté de façon rotative sur un axe horizontal qui est parallèle aux autres éléments (3) et à une distance prédéterminée desdites fenêtres (4), **caractérisé en ce qu'**il comprend une paire de lames (6, 7) qui sont parallèles l'une à l'autre et qui sont montées de façon coulissante l'une (6) sur l'autre (7) de manière à obtenir une extension plus grande ou plus petite de la surface exposée (8) de l'élément de lamelle pare-soleil (3). 35
9. Élément de lamelle pare-soleil selon la revendication 45

8, **caractérisé en ce que** lesdites lames (6, 7) sont obtenues au moyen d'une grille à fines mailles ou au moyen d'un treillis épais, voire même au moyen d'une plaque perforée.

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10. Elément de lamelle pare-soleil selon la revendication 8, **caractérisé en ce que** chaque lame (6, 7) est montée sur des glissières correspondantes (14, 18) qui peuvent coulisser sur un rail (13) qui est intégré à l'axe respectif pour supporter les éléments de lamelle pare-soleil (3), des moyens d'engrenage (15, 21) étant prévus pour régler le coulissement mutuel des glissières (14, 18) ainsi que des lames correspondantes (6, 7).

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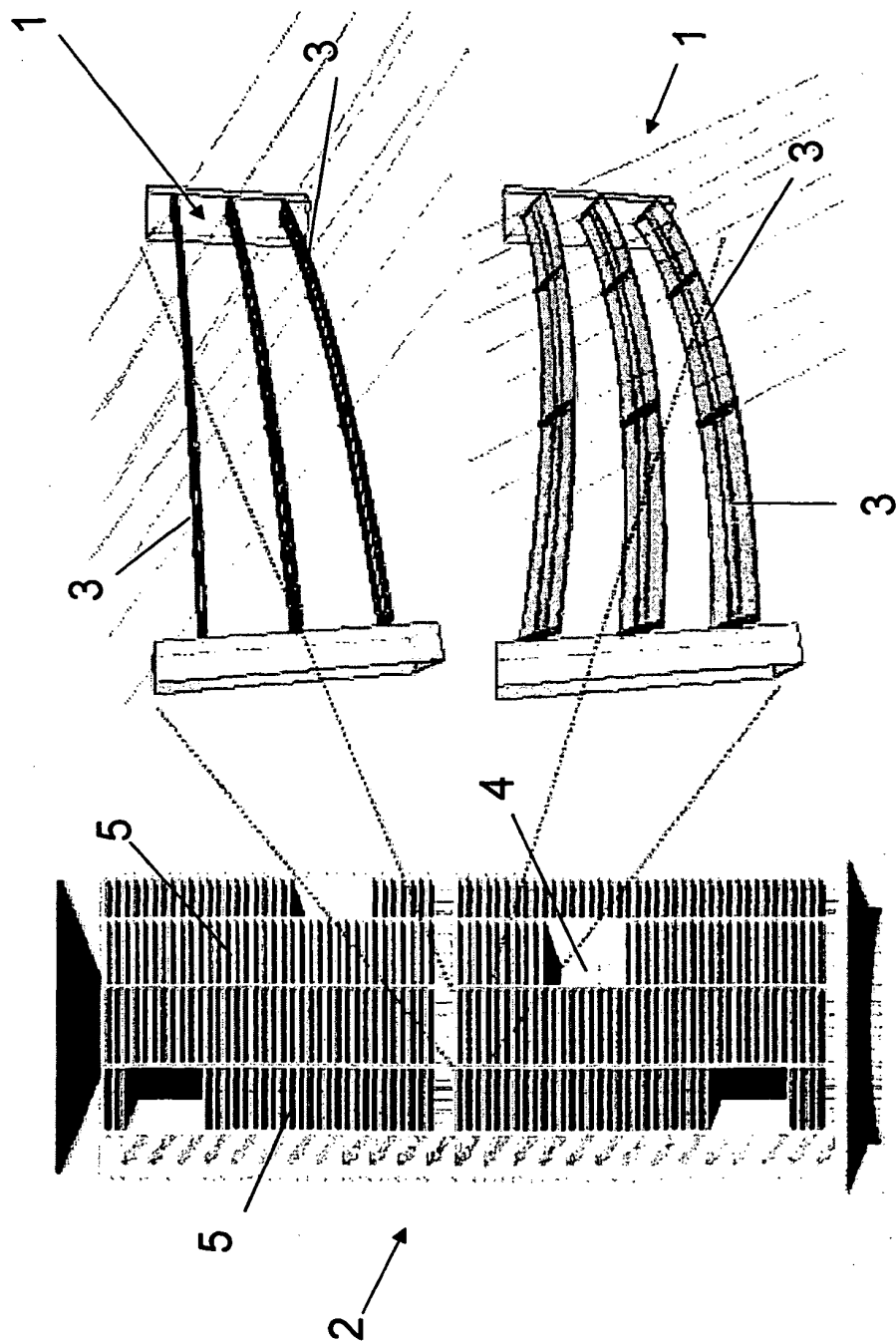
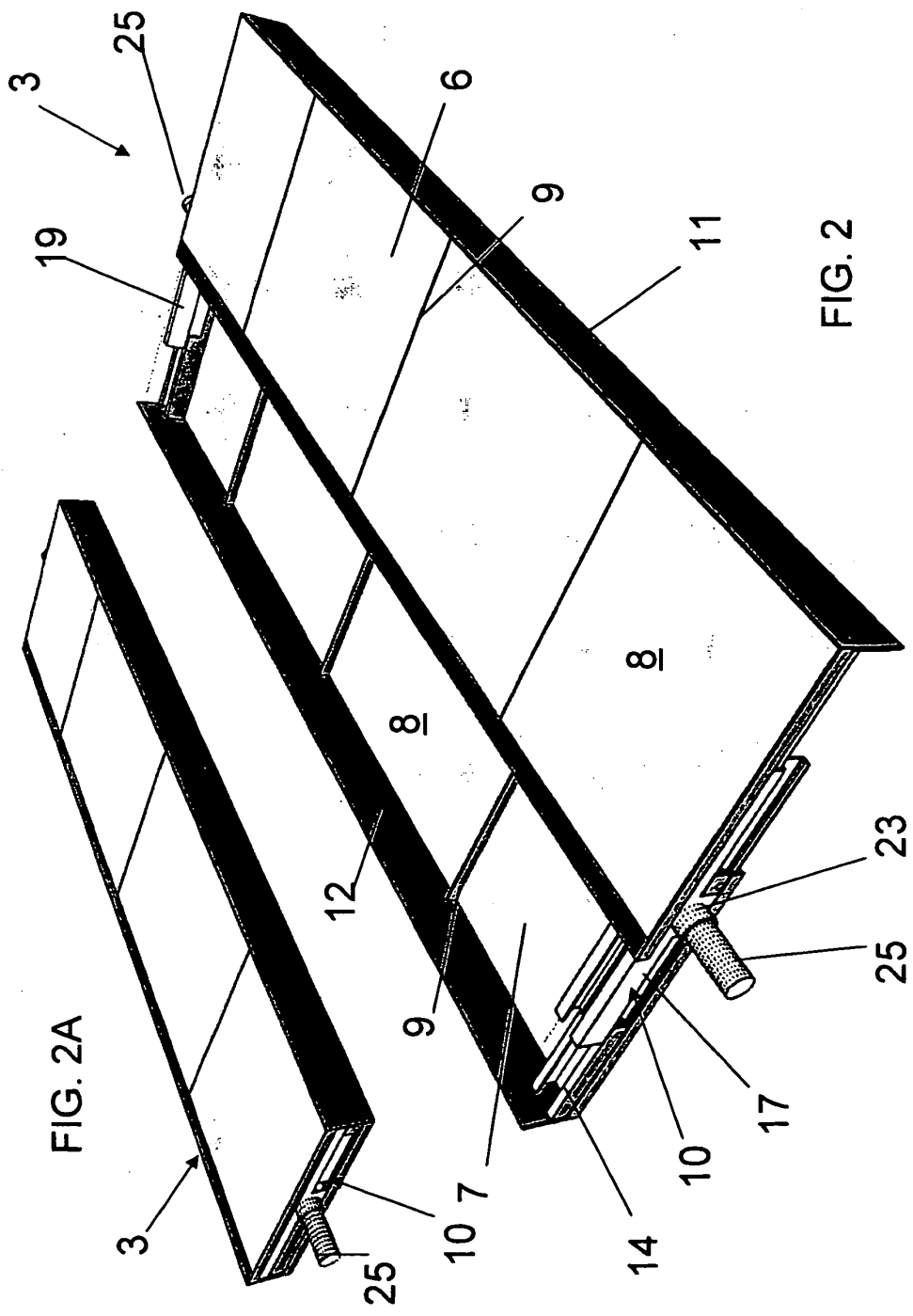


FIG. 1



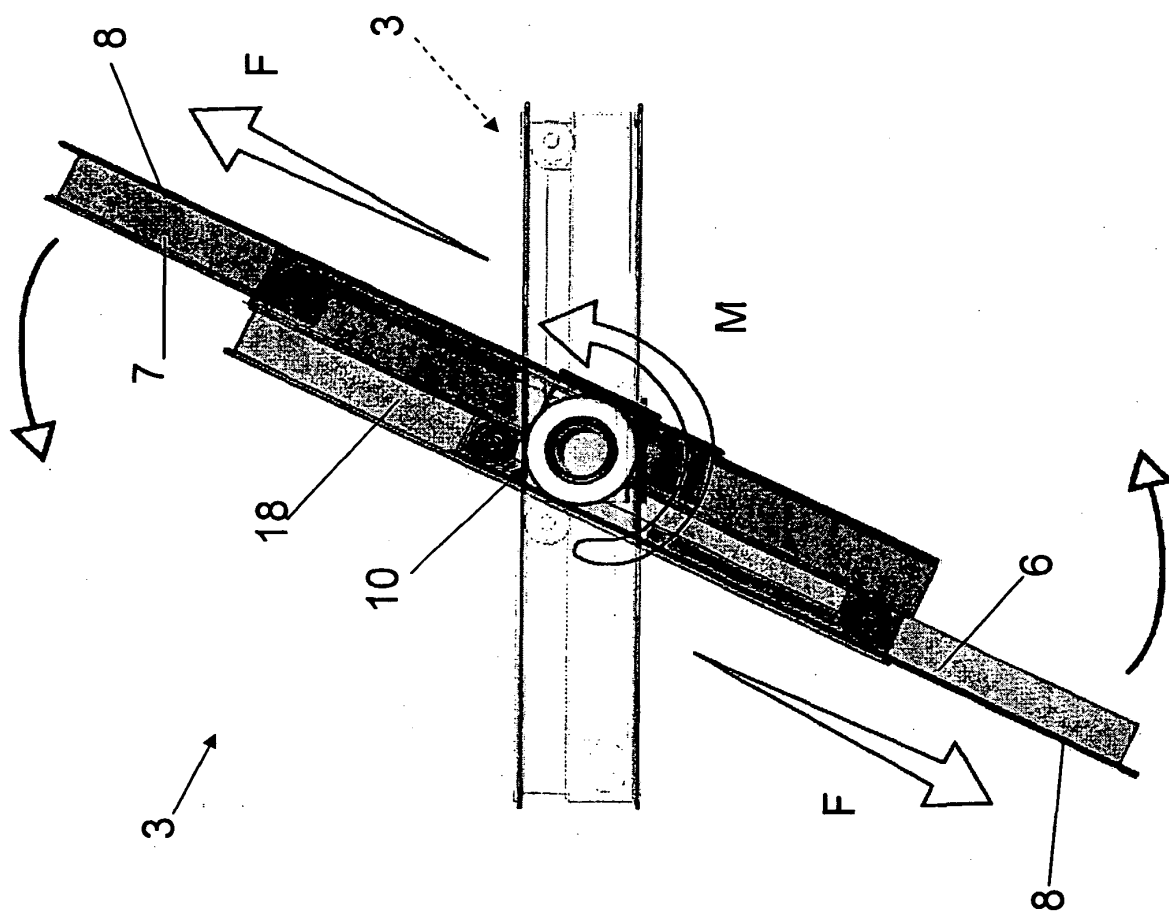
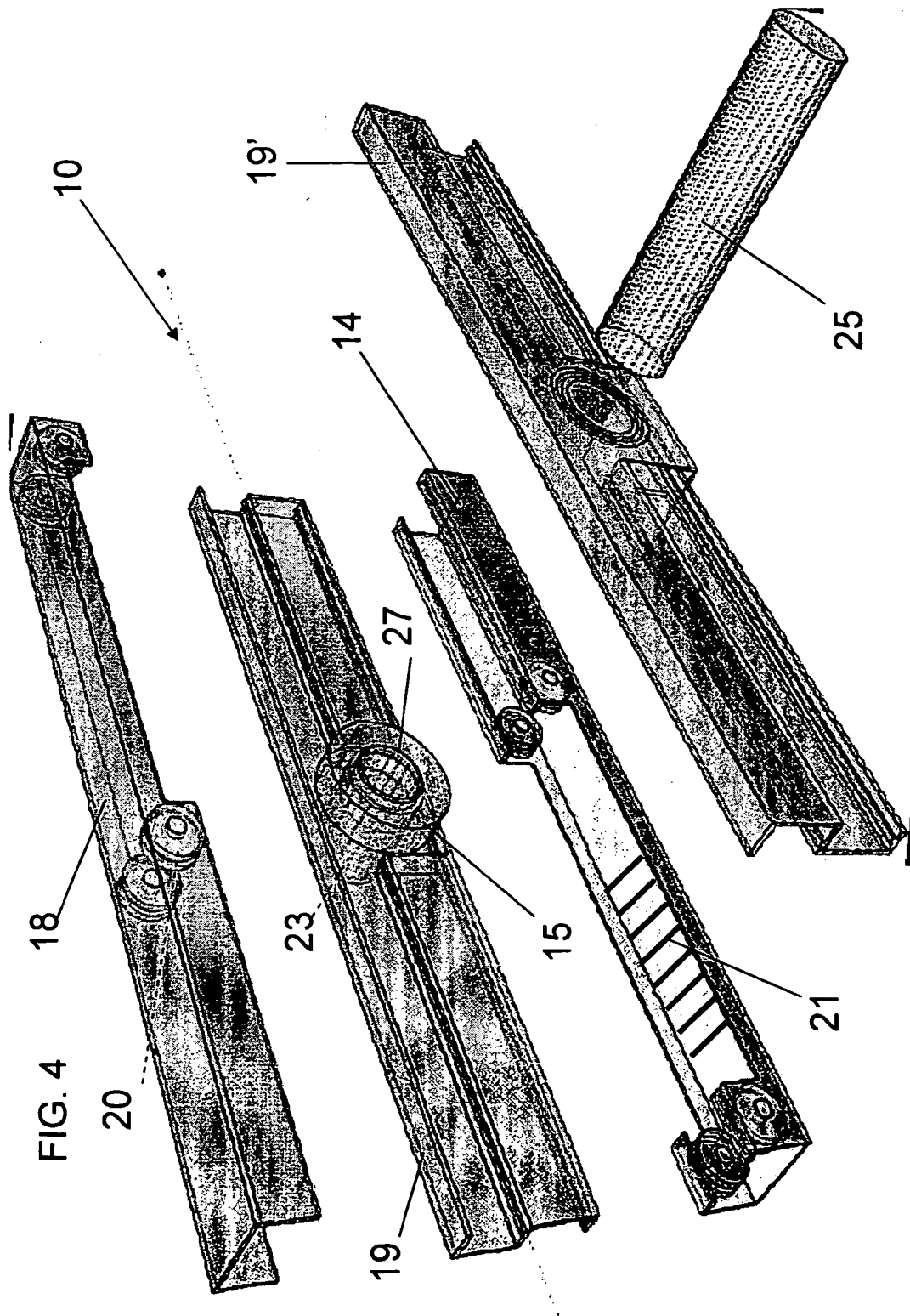


FIG. 3



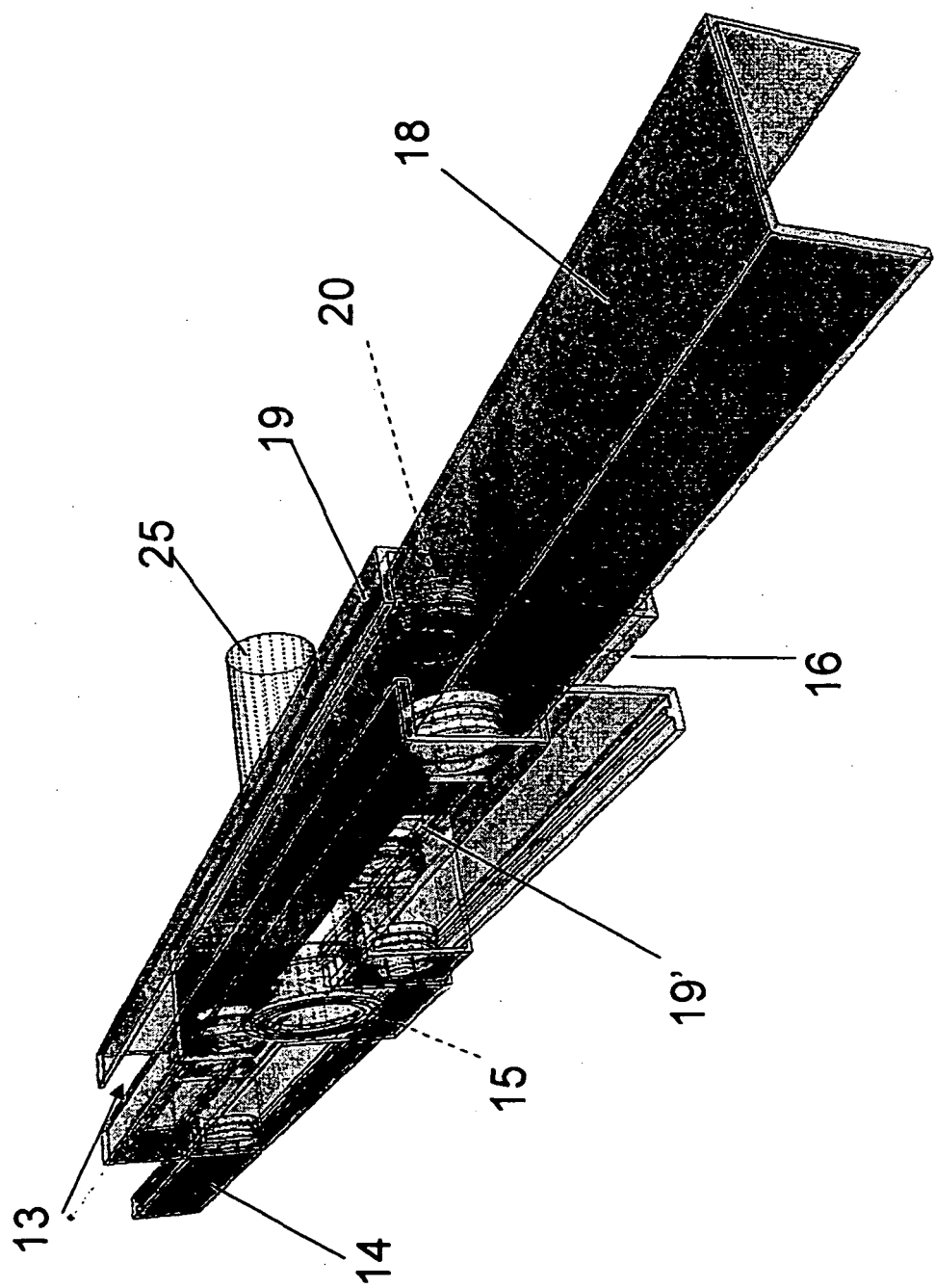


FIG. 5

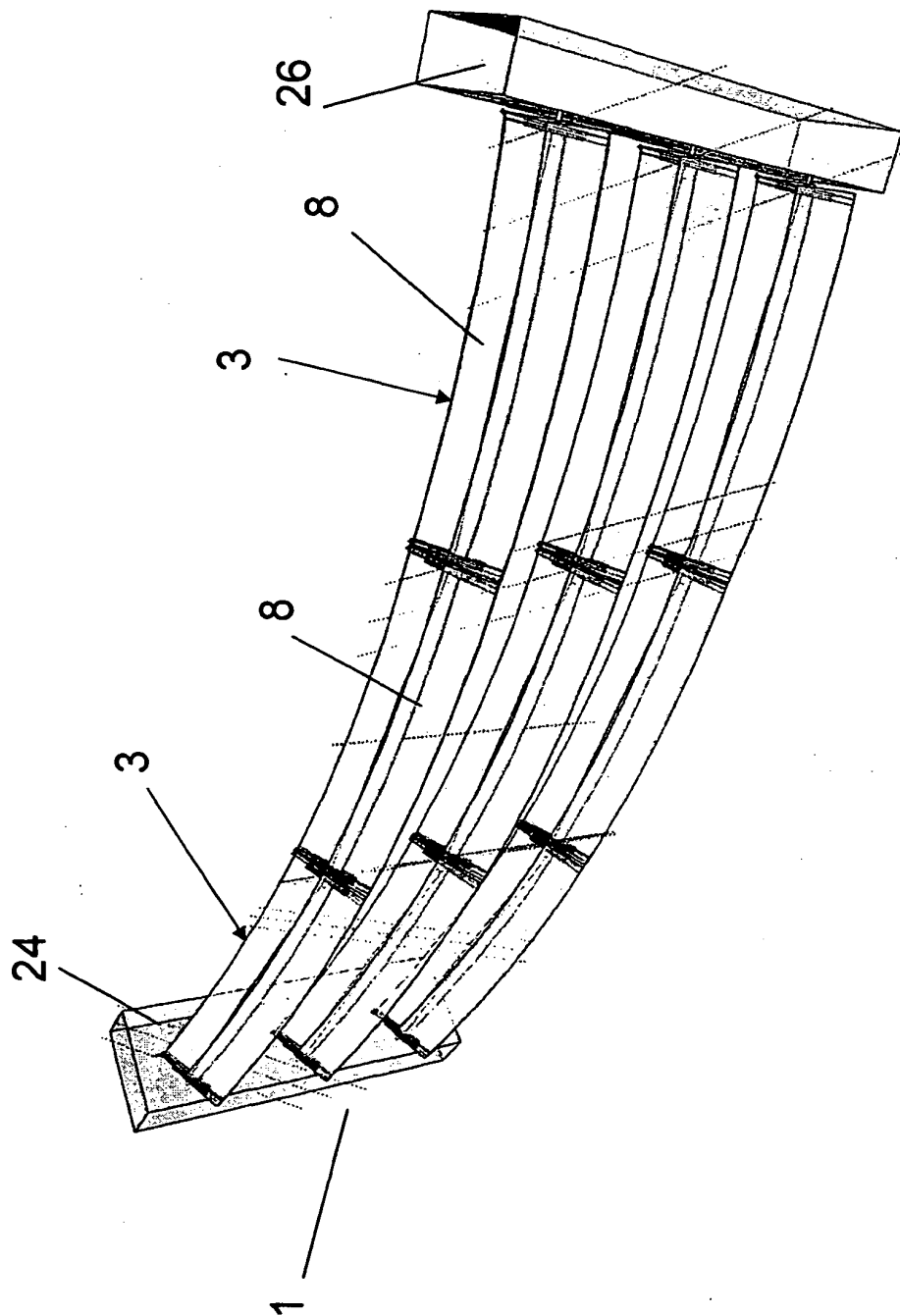


FIG. 6

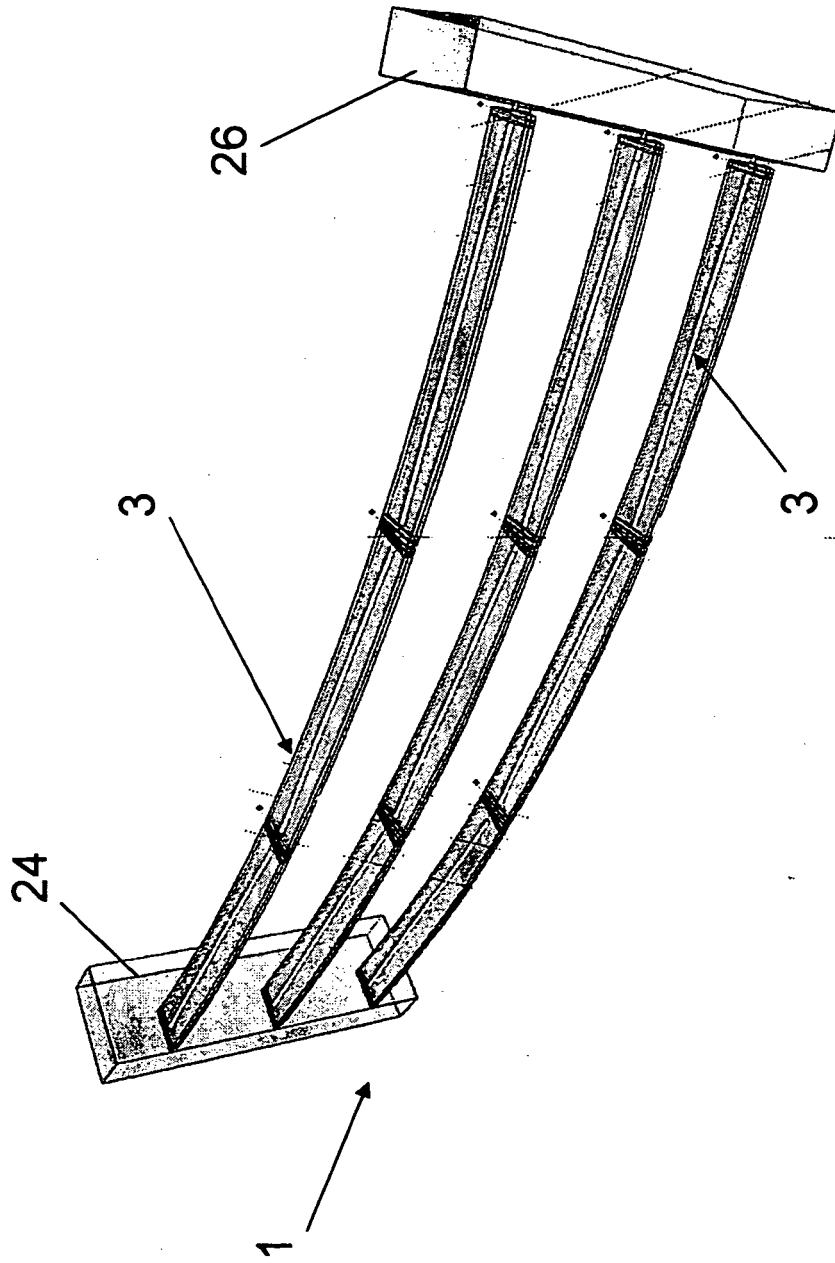


FIG. 7

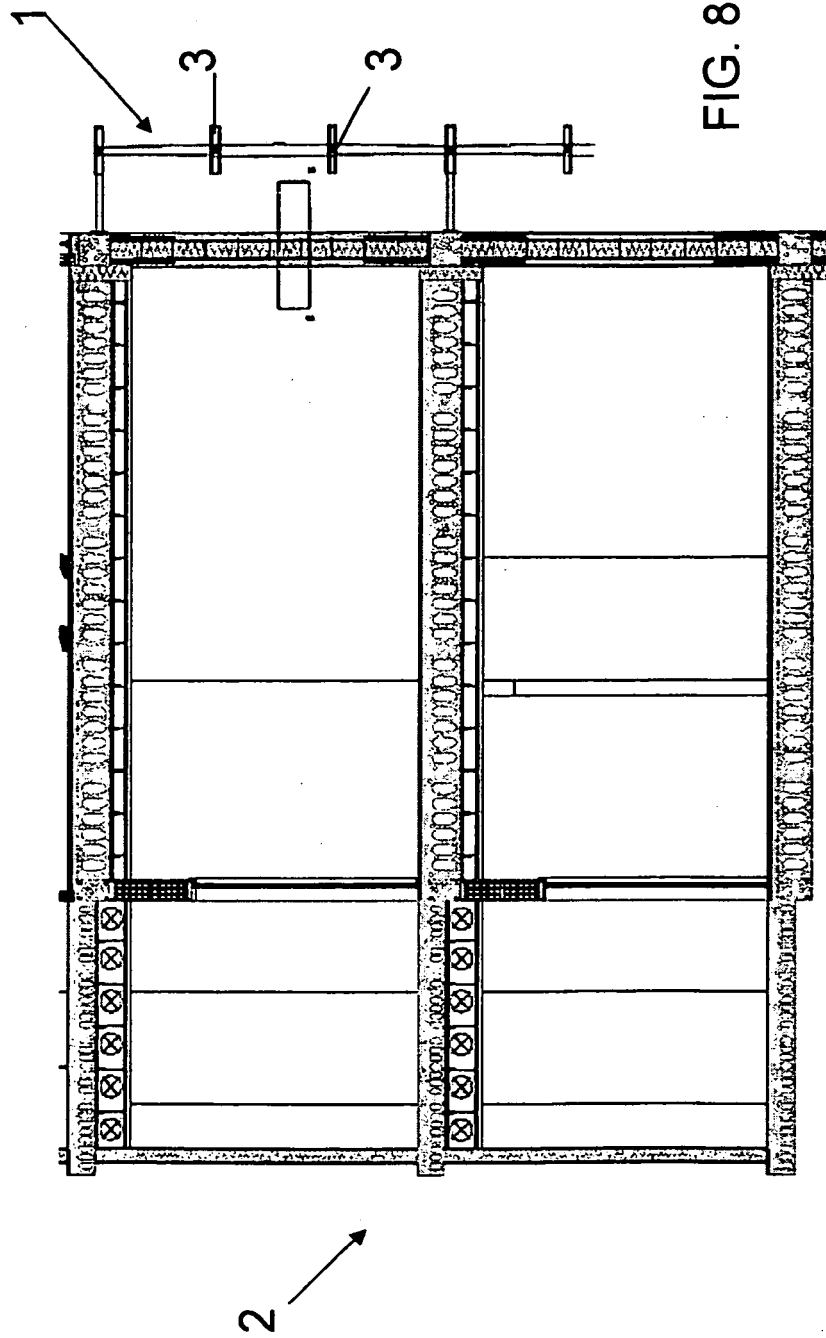
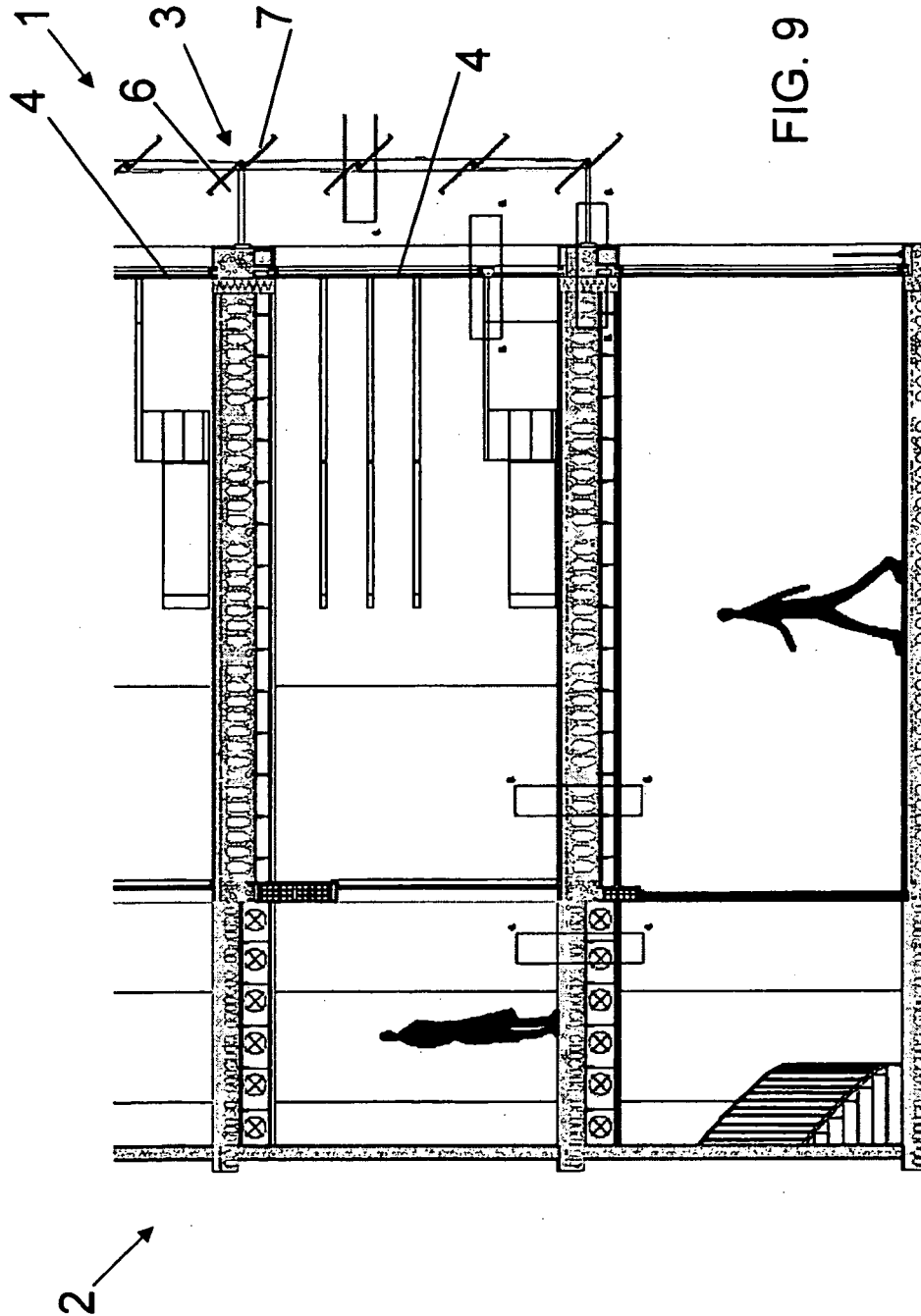


FIG. 8



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 202005008622 U1 [0014]