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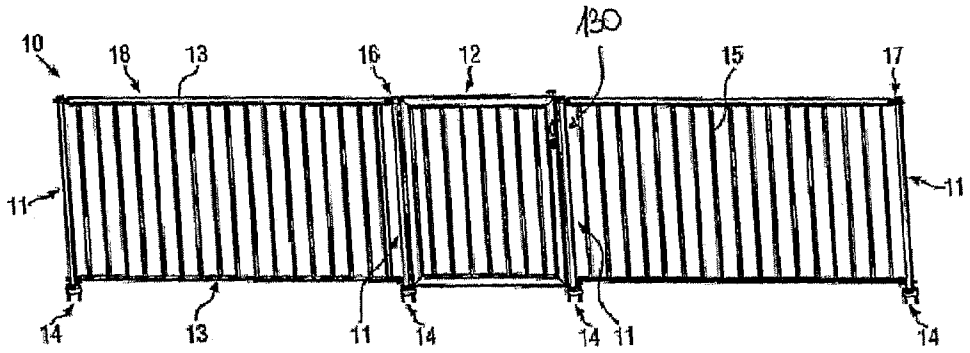

FIG. 1

(57) Abstract: A fencing system (10) for fencing a given space comprising pre-assembled modular elements provided with at least one upright (11) and with at least one bay (18) and one access element (12) carried rotatable by said at least one upright (11); a safety device (120) of said access element (12) being provided to prevent casual access to said given space.

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FENCING SYSTEM

The present invention relates to a fencing system. In particular, the present invention relates to a fencing system provided with an access control device. In more detail, the present invention relates to a fencing system provided with an access control device in such a way that it can be validly installed to delimit open spaces that may be unattended.

BACKGROUND TO THE INVENTION

Fencing systems are utilised to delimit spaces, and it is well known to delimit reserved areas with fencing systems that comprise barriers constructed to allow the controlled access of persons; such barriers are set up in combination with a base raised from the ground and normally made of masonry or concrete, in such a way as to provide stability to the barrier itself.

Furthermore, it is well known to construct fencing systems, which are installed directly on the edges of pre-existing and purpose-made pavements, as in the case of the barriers for balconies. Naturally, fencings must meet given conditions in order to assure users' safety, and hence they must present a given height and comprise an access area that is frequently provided with an access element comprising an opening system that can be operated only by authorised persons, and normally through a key.

Naturally, every type of space to be fenced has given characteristics, which the designer takes into account to optimise the functionality of the fencing system itself and to balance them with the constraints provided.

Recently, such needs have arisen that it is advisable to obtain fences of sporting facilities that combine the practicality of installation, the ability to inhibit access to minors essentially for safety and accident - prevention

reasons, as in the case of unattended swimming pools, so that it is evident that the fencing systems described above are poorly adequate and excessively costly. In these cases, the specific requirements are different from those described above, whereas if the installation is outdoors and it shall be conceived to be able to withstand atmospheric agents, it is also important for the fencing system to be easy and rapid to install, to be usable for any kind of perimeter and not to include unnecessary components, so as to enable to optimise the production process of the system and hence to reduce the production costs thereof. Even small changes to components of the fence can contribute considerably to the rationalisation of the productive process and hence to provide a competitive advantage on the market. In particular, many known fencing systems present opening systems with particularly complex kinetic mechanisms for the problem under consideration (ref. FR2836946). This also applies for the support and junction elements of the fence.

Furthermore, in general, part of the components of the fence is produced by moulding. This process presents the advantage of reducing the costs of production, but it presents the disadvantage that the moulded components can be made resistant against atmospheric agents only through the application of paints or coatings made of plastic material.

Therefore, in view of the above description it is readily apparent that there is a need for fencing systems that overcome the present disadvantages and that improve the quality of the system and the production process. In particular, there is a need for a fencing system that assures safety, that can be installed in an easy and rapid manner and that is particularly resistant to corrosion and to the consequent wear, caused by atmospheric agents.

Furthermore, it is necessary that the fencing system

adopts simple solutions, i.e. solutions that can be used in a simple manner and that are easy to implement in order to reduce the production costs and that make the fencing system accessible with no need for keys but only by persons able to perform more than one operation at a time. It should be kept in mind that in-depth studies have enabled to verify that this ability is associated with those who are provided with that minimum degree of awareness that enables knowingly to avoid potentially dangerous situations. In particular, there is a need for a durable, easy to construct fencing system, which is simple to install and able to be operated by adults or by minors able to understand the risks connected with the use of unattended public facilities.

SUMMARY OF THE PRESENT INVENTION

The present invention relates to a fencing system. In particular, the present invention relates to a fencing system provided with an access control device. In more detail, the present invention relates to a fencing system provided with an access control device in such a way that it can be validly installed to delimit open spaces that may be unattended.

In this regard, the present invention relates to a fencing system, for example, although without limitation, for swimming pools, comprising uprights, which support bays, and an access control device provided with a locking system, for locking and unlocking the entry gate, based on a fork shaped structure which can lock a pivot pin whereon is fastened a handle, so that operation of the handle is possible only after unlocking said pin by acting on said fork; thence, said gate can be opened only using both hands at the same time. The uprights and the other junction components used are obtained by extrusion and they can be subjected to an anodisation process to make them resistant to corrosion and to atmospheric agents.

According to an embodiment, the present invention relates to a system as claimed in the main claim 1, i.e. a system suitable to provide dividing walls, which comprises at least one upright and at least one bay to delimit spaces; connecting elements for connecting this at least one upright to this at least one bay; and one access control device provided with a rotatable element; wherein this rotatable element is provided with an opening system comprising a knob connected to a fork able to block a pin whereon a handle is fastened.

According to a further embodiment of the present invention as claimed in claim 5, at least one end of the connecting elements presents a fork shaped structure suitable to house a bracket element fastened to at least one upright.

According to a further embodiment of the present invention as claimed in claim 8, the system comprises an abutment, fastened to at least one upright, that blocks the travel of the rotatable element.

According to a further embodiment, the present invention relates to an opening system as claimed in claim 15, i.e. an opening system for a gate of a fence, which comprises one knob positioned on the upper margin of the gate; one rod connected at one end with the knob and terminating at the other end with a fork shaped structure; one handle fastened on one pivot pin with square cross section that is blocked by the tines of the fork.

According to a further embodiment, the present invention relates to a method as claimed in claim 18, i.e. a method for producing a fence, in which the uprights and the connecting elements are produced by extrusion.

BRIEF DESCRIPTION OF THE DRAWINGS

Further advantages, objects and characteristics of the present invention are defined in the appended claims and shall become more readily apparent from the detailed

description below, set forth with reference to drawings, in which identical or corresponding parts are identified by the same reference numbers, for the sake of convenience. In particular:

- figure 1 schematically shows an example of a dividing wall that can be obtained by means of the fencing system according to the present invention;
- figure 2 schematically shows an additional example of a dividing wall that can be obtained by means of the fencing system according to the present invention;
- figure 3 schematically shows another example of a dividing wall that can be obtained by means of the fencing system according to the present invention;
- figure 4 schematically shows a junction structure between a bay with parallel rods and the lower part of an upright according to the present invention;
- figure 5 is a perspective bottom view in enlarged scale of a base element of the fencing system according to the present invention extracted from figure 4;
- figure 5 bis is an exploded perspective elevation view in enlarged scale of a detail of figure 4 with some parts removed for the sake of clarity;
- figure 6 schematically shows the junction structure between a support element and the upper part of an upright of the fencing system according to the present invention;
- figure 6 bis is an exploded rotated view in enlarged scale of a part of figure 6, with some parts removed for the sake of clarity;
- figure 7 schematically shows the junction structure between a support element and the upper part of an upright of the fencing system according to the present invention in the case in which the bay is a pane of glass or of plastic material;
- figure 8 schematically shows the structure of a

junction between a support element and the lower part of an upright of the fencing system according to the present invention in the case in which the bay is a pane of glass or plastic material;

- figure 9 schematically shows the pincer-like structure of the junction element between the upper part of an upright and a pane of glass or other plastic material of the fencing system according to the present invention;
- figure 10 schematically shows the pincer-like structure of the junction element between the lower part of an upright and a pane of glass or other plastic material of the fencing system according to the present invention;
- figure 11 schematically shows the hinge element between the access element and one upright of the fencing system according to the present invention;
- figure 12 shows a schematic top view of the hinge element between the access element and one upright of the fencing system according to the present invention;
- figure 13 schematically shows the structure of the opening system of the fencing system according to the present invention;
- figure 13 bis is an exploded rotated view in enlarged scale of a part of figure 13, with some parts removed for the sake of clarity;
- figure 14 schematically shows a section of the opening system of the fencing system according to the present invention;
- figure 15 schematically shows a top view of the structure of the opening system of the fencing system according to the present invention;
- figure 15 bis is an enlarged view of a portion of figure 15, with some parts removed for the sake of clarity;
- figure 16 is a section view according to the line XVI-XVI of figure 12 in enlarged scale and with some parts removed for the sake of clarity;

- figure 17 schematically shows a cross section of one upright of the fencing system according to the present invention.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

Figure 1 shows a segment of a dividing wall that can be obtained by means of the fencing system 10 according to the present invention, in which the support uprights 11 are produced by cutting of bars obtained by extrusion and are fastened on feet 14 suitable to be made integral with the ground. As will be better described below, nearly all components adapted to be assembled to the uprights 11 is obtained by cutting of extruded bars and is subsequently subjected to anodisation treatment before being installed.

Extrusion is an industrial production process that is carried out by plastic deformation of a material made paste-like and subsequently forced to pass through a die to produce a bar, whose cross section reproduces in negative form the shape of the die.

It should be noted that the extruded aluminium is easy to anodise, unlike aluminium obtained by moulding, and this makes the aluminium extrusion process particularly interesting to produce bars resistant to the corrosion of atmospheric agents at very low cost. Otherwise, it would be necessary to coat these products with paint or with layers of plastic material, which are easily degradable and could compromise the aesthetics of the used components, with higher costs. Furthermore, the components obtained by extrusion present a smooth, uniform surface, free of discontinuity lines that instead can be present on elements obtained by moulding or welding.

With particular reference to figure 17, it should be noted that each upright 11 has cross section which presents one central portion 200 substantially H-shaped, closed at the top and at the bottom in figure 17 by two substantially elliptical segments 202. It should be noted that, between

the two segments 202, each upright 11 presents two housings 204, which produce, in the upright 11, mutually opposite longitudinal grooves 45, each of which is delimited by longitudinal seats 206, which are V-shaped in cross section at the side of the two substantially elliptical segments 202, as it is shown in figure 17 again. The aim of the longitudinal seats 206 is to block in position spacers 46 and / or longitudinal lids 46', or, as it will be better described hereunder, each of which presents a cross section shaped in such a way as to shape couple with the seats 206.

Therefore, each upright 11 is particularly rigid and light, presenting a hollow structure delimited by segments with thin thickness of the substantially membrane type.

Again with reference to figure 1, the uprights 11 are suitable to support one or more bays 18, each bay comprising two support elements 13 substantially parallel to the ground, between which a plurality of rods 15 is interposed. The support elements 13 can have elongated shape and they cover all the distance between two uprights 11. The bays 18 are connected to the uprights 11 by means of connecting elements 17 made of anodised metallic material. The rods 15 are positioned at such a distance as to prevent the passage of persons.

The fencing system 10 further comprises an access element 12 or rotatable gate, positioned between two given uprights 11 and connected by means of a hinge system 16 to one of these uprights 11 in such a way as to be rotatable relative to the respective upright 11, as it will be shown in greater detail hereafter.

The rotation of the access element 12 is limited by an abutment 138, shown in figure 15, which is housed within the respective upright 11 at one of the two corresponding longitudinal grooves 45, better shown in figures 12 and 15, which face each other and are obtained during the extrusion production process whereby each upright 11 is manufactured.

In particular, each abutment 138 is provided with a head 138' that extends longitudinally as far as the abutment 138 itself, as shown in figures 13 and 14, prismatically to engage in shape the respective groove 45 in order to be placed in longitudinal contact with one spacer, and is connected transversely to the groove 45 in a rigid manner through a threaded connection, known and therefore not shown, suitable to exert a very high contact pressure, e.g. by means of a dowel 154 transverse to the longitudinal axis of the upright 11 and able to cooperate with one bottom of the groove 45. Furthermore, each abutment 138 is positioned longitudinally along the upright 11 and presents a projection 138'' shaped in such a way as to act as end stop for the access element 12, in such a position as to allow the alignment of this access element 12 with the adjacent bays 18. It should be noted that each head 138' of each abutment 138 presents, at the opposite side to the groove 45, a central portion 152 provided with a transverse seat, known and therefore not shown, designed to house a body, which can move transversely to the uprights 11 and can be interpreted as a spring latch or a transverse latch, and that each spacer 46 can be produced by extrusion and presents a constant cross section, which reproduces the shape of one cross section of the central portion 152. Furthermore, each segment of the groove 45 free from segment of spacers 46, is snap closed by a lid 46' suitable laterally to join continuously the substantially elliptical segments 202.

According to particular embodiments of the present invention, the rods 15 can be made of aluminium. The structure of each foot 14 and of the connecting elements 17 is shown in detail in figures 4 and 6. Each upright 11 is rigidly connected to the corresponding foot 14. Each upright 11 prismatically houses a bracket element 43 in a respective groove 45 through a respective head 430. Each

bracket 43 presents one projection 43', which is used to connect with the upright 11 itself a support element 13 for supporting each bay 18, and which is better visible in figure 6 bis. It is easily understood that each head 430 is coupled to the respective groove 45 in a conjugate manner, and that the rigid fastening to the groove 45 is achieved through a transverse dowel, similarly to what is described for the head 138'.

Each support element 13 is provided at the ends with a fork shaped structure 44, which is able to house the bracket element 43. The bracket element 43 is provided with a hole 42 that allows to fasten the fork shaped structure 44 to the bracket element 43 by means of a pivot pin or dowel. According to an embodiment of the present invention, the pivot pin inserted in the hole 42 disappears entirely, being included in the holes of the fork 44 and of the bracket element 43.

The structure of the foot 14 shown in figure 4 is shown in greater detail in figures 5 and 5bis, in which it is clearly visible that the foot 14 comprises a substantially prismatic base 51 provided with two holes 53 in which are inserted two pivot pins or lag bolts 52 that fasten the base to the pavement, thereby assuring the stability of the fencing structure. In a particular embodiment, the base 51 is also provided with four further holes 54. The holes 54 can house supports 55, which serve the purpose of adjusting the inclination of the foot 14 and thus of the upright 11 relative to the pavement. According to other embodiments of the present invention, the number of holes 54 and respective feet 55 could be three or a number higher than four. The base 51 is further provided with an insertion structure 58, suitable to be housed in the lower end of the upright 11 by interference. Each foot 14 further comprises lateral protective elements 56 for covering the head of the lag bolts and to give greater

aesthetic pleasantness to the foot 14. In other particular embodiments of the present invention, the number of lag bolts 52 can be higher than two.

In view of the above description, each foot 14 can be obtained through swarf removal from a longitudinal portion obtained by cross cutting of an extrusion bar.

Figure 6 shows in detail the connection of the upper part of the upright 11 to the support element 13 of the corresponding bay 18. As shown also in figure 4 for the lower part of the fencing system 10, the support element 13 ends with a fork shaped structure 44 comprising a slit 67 into which is inserted a bracket element 43 provided with a hole 42. The connection of the bracket element 43 to the fork shaped element 44 is assured by a pivot pin or dowel inserted in the hole 42 and in the corresponding hole in the fork element. A hat element 65 is mounted on the upper end of the upright 11, and is rigidly connected to this latter through a bracket element 43, in a manner known and therefore not shown, as it is more clear in figure 13 bis.

According to other embodiments of the present invention, in the bays 18 the rods 15 shown in figure 1 can be replaced by panels 25 or by panes 25 made of glass or any other material suitable for the needs of the case. Such an alternative embodiment of the fencing system 10 is shown in figure 3, where it is designated with the reference number 30 for the sake of convenience. In this case, glass panes 25 are supported by uprights 11 similar to those shown previously in figure 1. The panes 25 are fastened to the uprights 11 by means of pincer-like elements 37, visible also in figures 9 and 10, in which they are positioned at the four vertices of the pane 25.

The uprights 11 are mounted on feet 14. The fencing system 30 also comprises an opening 22 obtained by means of a glass pane 35 framed in a frame element; this frame element being in turn fastened in a rotatable manner to the

upright 11 by means of a hinge 16 or the like.

According to a particular embodiment of the present invention, the hinge system for the opening can be obtained by means of connecting elements of the type shown in figures 4 and 6; in this case, the upper support elements shall be rotatable around the respective pivot pins received or housed in the holes of the fork shaped structures 44 of the bracket elements 43, as it will be better explained hereunder.

Figures 9 and 10 show in detail a pincer-like element 37, which connects the glass pane 25 to the upright 11. Each pincer-like element 37, made of anodised metallic material, in figure 10 comprises two jaws 96 and 106, which are coupled to each other, thereby forming a shape housing / a slit for an angular portion of the respective pane 25 whereto the pane 25 itself can be fastened. Each jaw 96 presents one head completely similar to the head 430 already described to couple prismatically with a groove 45, and therefore indicated by the same reference number.

Furthermore, each jaw 96 is designed to be press connected through a dowel similarly to the abutment 138 and comprises one planar end able to match with the pane 25 and one end 92 having a fork shaped structure able to be mounted on the bracket element 43 of the upright 11. The pane 25 is held between the corresponding jaws 96 and 106 by means of threaded members 97, normally screws. In a particular embodiment of the present invention, as shown in figure 9, the screws 97 can be two. In this case as well, the pincer-like elements 37 can thus serve as hinge elements for a pane or bay fastened to the upright in a rotatable manner and hence acting as a door. The upper end of the upright 11 is closed / covered by means of a hat element 65.

A further example of a dividing wall obtainable through the fencing system according to the present

invention will be illustrated hereafter with reference to figure 2, in which it is designated with the reference number 20. According to this embodiment, as in the one described with reference to figure 2, the bays 18 comprise a panel 25, a glass pane 25 or a panel produced with any other material suitable for the needs of the case.

With reference, for the sake of convenience, to a glass pane 25, this pane is framed by means of support elements 23 that in turn are supported by the uprights 11, which are fastened in turn to the ground by means of feet 14, similarly to what is shown for the previous embodiments.

Figure 7 shows in detail the frame of the pane 25 and the junction between the upper support element 23 and the upright 11. The pane 25 is inserted in a longitudinal groove present on the lower part of the support element 23 and it is maintained in its position by a gasket element 76. Each supporting element 23 is provided with a fork shaped end 44 having a slit 67 in which can be inserted the bracket element 43 which is fastened on the upright 11 similarly to what is shown for the previous embodiments.

If it is desired to provide the fencing system 20 with a particular aesthetic value, one could couple the panes 25 with an elongated element 68 for lateral illumination, e.g. a neon tube with thin section or any other light source with elongated shape and thin section, shown only in figure 7. In this way, it is possible to illuminate each pane 25 in a diffused manner in order to make it able to signal a danger even in darkness.

Figure 8 shows the lower part of the corresponding bay 18 according to the same embodiment illustrated with reference to figure 7.

Also the lower support element 23 is provided with a longitudinal groove and with a gasket element able stably to house the pane 25. The junction between the support

element 23 and the upright 11 takes place similarly to what is described with reference to figure 7.

Figure 11 shows an example of an access element 12 of the fencing system according to the present invention. The access element 12 comprises a frame element 116 that is fastened to an upright 11 by means of a hinge element 16, which comprises a central portion 162 able to be coupled to the access element 12 and two reference portions 163 able to be coupled in a conjugate manner to a longitudinal groove 45 of the respective upright 11 through respective heads, similarly to each abutment 138, as shown in figure 12. The central portions 162 and the reference portions 163 are also produced by cross cut of the same metal bar obtained by extrusion and simply inverted by 180° to be able to be coupled in shape to the mutually facing longitudinal grooves 45 of the upright 11 and of the access element 12. The frame element 116 can contain both parallel rods 15 as shown in figure 11 or glass panes 25 or panels made of any other plastic material, as described above. The access element 12 can comprise two or more hinge elements 16 positioned along the upright 11.

Figure 12 shows the access element 12 seen from the top. The hinge element 16 contains an elastic device 121 to impose, in use, to the access element 12 to close again once it is free of exterior thrusts. With reference to figure 16 only, the elastic device 121 comprises a pivot pin 123 provided with a plurality of longitudinal abutments obtainable by means of at least four planar faces 124 parallel to the axis of the pivot pin 123 to act as an abutment for the conical end of a dowel 125 that engages a hole obtained transversely to the pivot pin 123 in the central portion 162. In view of the above description, each dowel 125 enables rigidly to connect the pivot pin 123 to the respective central portion 162. Again with reference to figure 16, the elastic device 121 comprises a torsion

spring 126 that is able to connect elastically the central portion 162 to at least one of the reference portions 163.

To this end, the pin 123 presents at a respective end thereof at least one seat 127 for a terminal 1260 of the spring 126, and the reference portion 163 facing this seat 127 carries integrally a lid 164, which presents a plurality of seats 165, each of which is selectively engageable by the remaining terminal 1261 of the spring 126 itself. The pivot pin 123 presents, in the respective free end 1230 at opposite side to the spring 126, a manoeuvring seat 1231 for operation of the recessed hexagonal head for an Allen wrench. The operation of the elastic device 121 is easily understood and it allows the access element 12 to return in contact with the respective abutment 138 every time it is left free as a result of a rotation. In particular, in use, the rotation of the access element 12 causes the detachment of the access element 12 from the abutment 138, the terminal 1260 is rotated around its own longitudinal axis with the result that the spring 126 is subjected to an increased torsion load relative to the terminal 1261 carried rigidly by the pin 123 and hence by the central portion 162. The pre-loading of the spring 126 can easily be adjusted with the access element 12 in contact with the abutment 138 once the dowel 125 is loosened until making the respective conical end return inside the central portion 162; at this point, with an Allen wrench engaged within the seat 1231, the pin 123 can be rotated until bringing a different face 124 to face the dowel 125 which, once it is rotated until establishing contact with this new face 124, will again produce the rigid connection of the pin 123 to the central portion 162 and hence to the access element 12, and a different value of the pre-loading of the spring 126.

The upright 11 is supported by a respective foot 14. In the profile of the upright 11 is inserted a bracket

element 43 which enables to engage the support element 13 with the upright 11.

Figure 13 shows the part of the access element 12 opposite to the one in which the hinge element 16 shown in figure 11 is located, and figure 14 shows a safety device 120 comprising a first clamping group 130 and a second clamping group 150 provided with one spring latch 151 and with one handle 153 carried rotatable by the access element 12 and mechanically coupled to the spring latch 151 for the respective operation of the abutment element 138 from and to a central portion 152. This second clamping group 150 further comprises a locking device 140 provided with a rod 140, which will be better described below. The first clamping group 130 comprises, on the upper margin of the frame element 116, one knob 131, which allows to unlock the handle 153, enabling the opening by rotation of the access element 12 at the opposite side to the abutment 138. The knob 131 is connected to the rod 140, and this latter ends with a fork shaped structure 141, therefore the rod 140 and the fork 141 move in a manner integral with the knob 131.

The handle 153 is keyed on a pivot pin 142 with square cross section. The fork 141 presents two tines that laterally delimit a slit of such a width as to enable the entry of the pivot pin 142 without play, in order to prevent the pin 142 itself from rotating if housed inside the slit of the fork 141, and hence the slit presents width which approximates by excess the side of the section of the pivot pin 142. Therefore, under normal conditions, the handle 153 cannot turn and hence the access element 12 cannot be rotated, and it must therefore remain closed. By moving the knob 131 upwards, the fork 141 is moved upwards, thereby freeing the square pivot pin 142 and thus enabling the operation of the handle 153 and the opening of the gate 12, which cannot be involuntary or casual. Therefore, in order to open the access element 12 it is necessary to use

both the hands, since the knob 131 must be lifted with one hand and simultaneously the handle 153 must be turned with the other hand. Furthermore, the upright 11 presents a bracket element 43 to fasten the support element 13 of the bay 18 to the upright 11.

With particular reference to figure 15, the first clamping group 130 is illustrated from the top. The abutment element 138, which enables to stop the access element 12, comprises a part positioned on the line of closure of the access element 12.

The abutment element 138 is positioned longitudinally along the upright 11. In the profile of the upright 11 is inserted a bracket element 139 which enables to engage the support element 13 through the fork 43.

It should be noted that, as shown in particular in figures 12 and 15, but also in figures 4, 6, 7, 8, 9, 10, and 11, the free portions of the grooves 45 house in shape longitudinal spacers 46 and / or longitudinal lids 46', whose task is to close these grooves 45 and also longitudinally to support each bracket element 43, each abutment 138 and every other element coupled longitudinally by shape to the uprights 11 and, in the final analysis, to unload the weight of the bays 18 on the feet 14.

Therefore, the only operations to carry out to produce barriers by means of the fencing systems 10/20/30 described above consist of cutting extruded bars of given shape to measure, and, if these bars have already been anodised previously, of assembling them together to pre-assemble the barriers in the factory, and of adding standard hardware, like the hardware to support the bays 18, or to produce them in detail, hence without performing complex machining work of swarf removing, but only to obtain threaded holes for housing fastening dowels.

Naturally, these bars will have the cross section shaped as shown in figures 5, 12, and 15. With reference to

the safety device 120, it should be specified that it is an access control device for controlling passages through the access element / the gate 12. This safety device 120 allows the opening of the access element / gate 12 only following the simultaneous operation of two distinct clamping groups 130 and 150 through the first user interface of the rotatable type, the handle 153, and the second user interface, the knob 131, which is movable along the axis of the upright 11.

In view of the above description, it is easily understood that the opening system 130 described to embody the present invention is particularly simple and easy to manufacture, thereby allowing a reduction in the production costs of the fencing system relative to the prior art known systems.

Use of the fencing system 10/20/30 is readily apparent from the description above and requires no further explanations; nonetheless, it may be appropriate to specify that each fencing system 10/20/30 described with reference to figure 1/2/3 is particularly advantageous also when installing the corresponding fencing system, for the installation work is minimised. Thanks to the type of junction adopted between each upright 11 and the respective bays 18 it is possible to rotate each bay 18 relative to the other by an angle ranging between 0° and 360°. This allows a great flexibility of use of the fencing system 10/20/30 and allows to delimit spaces which can be delimited by every type of perimeter that can be constructed in segments.

Adding that, when the installations are outdoors, the dimensional constraints are considerably looser than those encountered indoors, the features described above make the fencing systems 10/20/30 particularly suitable for the production of modular elements with standard length to be supplied pre-assembled and comprising the uprights 11 and

the respective bay 18 already in axis. In this way, the installation steps are greatly simplified and it becomes necessary only to drill holes in the pavement and to fix the pre-assembled elements in such a way that they are plumb. Therefore, the simple availability of an electric screwdriver enables even installers with minimal expertise, and hence with quite limited hourly cost, to perform excellent installations of effective, aesthetically pleasing safety barriers.

Lastly, it is apparent that modifications and variants can be made to the fencing system 10/20/30 described and illustrated herein without however departing from the protective scope of the present invention.

The present invention relates also to a method for producing fencing systems for swimming pools, in which the elements are obtained by extrusion. The elements can be obtained entirely by extrusion, but it is also possible to obtain by extrusion semi-finished elements which can then be subjected to mechanical swarf removal machining work to obtain the desired components.

In view of the above description, it is readily apparent that the teachings provided above to implement the present invention enable to reach the technical objects described above and in particular they enable to produce a durable, easily manufactured fencing system that is simple to be installed and operated by adult persons or by minors able to understand the risks connected with the use of unattended public structures.

CLAIMS

1. A fencing system (10, 20, 30) comprising at least one upright (11), at least one bay (18) rigidly coupled to said upright (11) to delimit a given space, and at least one access element (12) coupled to said upright (11) in a rotatable manner through at least one hinge (16); a safety device (130) being provided to control accesses through said access element (12); characterised in that said safety device (120) comprises a first clamping group (130) and a second clamping group (150) respectively provided with a first user interface (131) movable along one axis of said upright (11) and with a second interface (153) of the rotatable type; said first interface (131) being normally coupled to said second interface (153) in order to prevent an involuntary operation thereof.

2. A system according to claim 1, characterised in that said second clamping device (150) comprises a pivot pin (142) rigidly connected to said handle (153) and in that locking means (140) are provided, which are movable parallel to said upright (11) and shaped so as to couple transversely to said pivot pin (142) in such a way as to block it selectively in rotation.

3. A system according to claim 2, characterised in that said first clamping device (130) comprises one knob (131) coupled to said locking means (140) and in that said second clamping device (150) comprises one handle (153) carried by said access element (12), one spring latch (151) carried movable relative to said access element (12) and mechanically coupled to said handle (153) to co-operate, in use, transversely with said upright (11) and to allow selectively an opening of said access element (12).

4. A system according to claim 2 or 3, characterised in that said locking means (140) are a part of said first clamping group (130) and comprise a rod (140) parallel to said upright (11) which terminates with a fork shaped

structure (141), shaped in such a way as to fork-couple transversely to said pivot pin (142) in such a way as to block it selectively in rotation.

5. A fencing system (10, 20, 30) comprising a plurality of uprights (11), at least one bay (18) positioned between two said uprights (11) to delimit a space; at least one access element (12) being positioned between two said uprights (11) and coupled to one of two said uprights (11) in a rotatable manner through at least one hinge (16); characterised in that each said upright (11) can be produced by assembling components which can be produced through cutting of extruded bars to measure and prismatical / shape assembling.

6. A system according to claim 5, characterised in that each said upright (11) is prismatically coupled to one foot (14) through one respective insertion structure (58) of said foot (14); said insertion structure (58) being able to engage a lower end of said upright (11); each said foot (14) comprising a base (51) provided with at least three supports (55) suitable to adjust an inclination of respective said upright (11) relative to the pavement.

7. A system according to claim 6, characterised in that each said foot (14) comprises lateral protective elements (56).

8. A system according to any one of claims 1 to 7, characterised in that each said upright (11) presents cross section which is shaped in a given manner and provided with a central portion (200), closed by two convex segments (202) delimiting two housings (204) producing in said upright (11) mutually opposite longitudinal grooves (45).

9. A system according to claim 8, characterised in that each of said longitudinal grooves (45) is delimited by longitudinal seats (206) V-shaped in cross section from the side of two said substantially elliptical segments (202); each said groove (45) being suitable to house longitudinal

lids (46') of given extension, each of which presenting at least one retaining member (208) shaped in section to couple in shape to said longitudinal seat (206) in order to close a respective said groove (45) and / or axially to support hardware to couple to said bays (18).

10. A system according to claim 8 or 9, characterised in that said central portion (200) is H - shaped and in that the two said segments (202) are of a substantially membrane type to make said upright (11) hollow inside and particularly rigid and light.

11. A system according to any one of claims 5 to 10, characterised by comprising at least one abutment member (138) provided with a central portion (152) presenting one respective head (138'), shaped in such a way as prismatically to couple to one of the respective grooves (45) of one said upright (11) laterally facing said access element at opposite side to said hinge (16), and with a projection (138'') shaped in such a way as to act as stop for said access element (12).

12. A system according to claim 11, characterised in that each said abutment member (138) presents a seat for a dowel (154) transverse to said upright (11) suitable to cooperate with one bottom of said groove (45) to couple rigidly said abutment member (138) to said upright (11); a spacer (46) being housed prismatically in the corresponding groove (45) to support said abutment member longitudinally at opposite side to said respective head (138').

13. A system according to claim 12, characterised in that each said spacer (46) presents cross section shaped in such a way as to couple in shape to one said groove (45) and is designed to be connected transversally to the same said groove (45) in a rigid manner through a threaded connection (154).

14. A system according to claim 13, characterised by comprising at least one bracket element (43) provided with

one respective head (430) suitable to couple prismatically to one respective said groove (45) of each said upright (11) and designed in such a way as to be maintained at a given height by means of a lid / spacer (46) coupled to the same said groove (45); each said bracket element (43) presenting a projection (43') provided with one hole engageable by a fastening pivot pin for connecting one said bay (18) to the corresponding said upright (11).

15. A system according to any one of claims 1 to 14, characterised in that at least one said bay (18) comprises a pane (25); at least a pincer-like element (37) being provided in order to connect said pane (25) to one said upright (11) and comprising, in this regard, one head (430) designed in such a way as to couple prismatically to one said groove (45) and to be supported by one said lid / spacer (46); each said pincer-like element (37) comprising one first jaw (96) and one second jaw (106) coupled to each other by means of threaded members (97), in such a way as to clamp the corresponding said pane (25).

16. A system according to any one of the previous claims, characterised in that each said upright (11) is delimited axially by one lid (65).

17. A system according to any one of the previous claims, characterised in that at least one said pain (25) is produced with glass or plastic material presenting substantially equivalent physical characteristics.

18. A system according to claim 17, characterised by comprising a lighting elongated device (68) which can be associated laterally with one said pane (25) to light it internally by reflection in a diffuse manner and to make it visible in the dark.

19. A system according to any one of the previous claims, characterised in that the pivot pin (142) presents square cross section and in that one distance between tines of said fork (141) approximates by excess one width of said

pivot pin (142).

20. A system according to any one of the previous claims, characterised in that said at least one bay (18) comprises rods (15).

21. A system according to claim 20, characterised in that said rods (15) are made of anodised aluminium.

22. A system according to any one of the previous claims 16 to 21, characterised in that said at least one upright (11), one respective said foot (14), one said spacer (46) and each said pincer-like element (37) are made of anodised metallic material.

23. A system according to any one of the previous claims 16 to 22, characterised in that said at least one upright (11), said at least one foot (14), said at least one spacer (46) and each said pincer-like element (37) are produced by extrusion.

24. A method for opening an access element (12) of an opening system according to any one of the previous claims, characterised in that said access element (12) can be open by lifting in succession said knob (131) and simultaneously turning said handle (153).

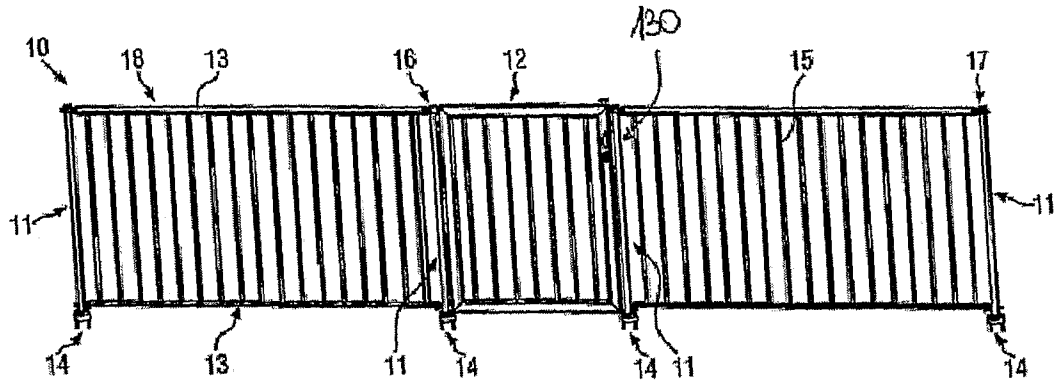

FIG. 1

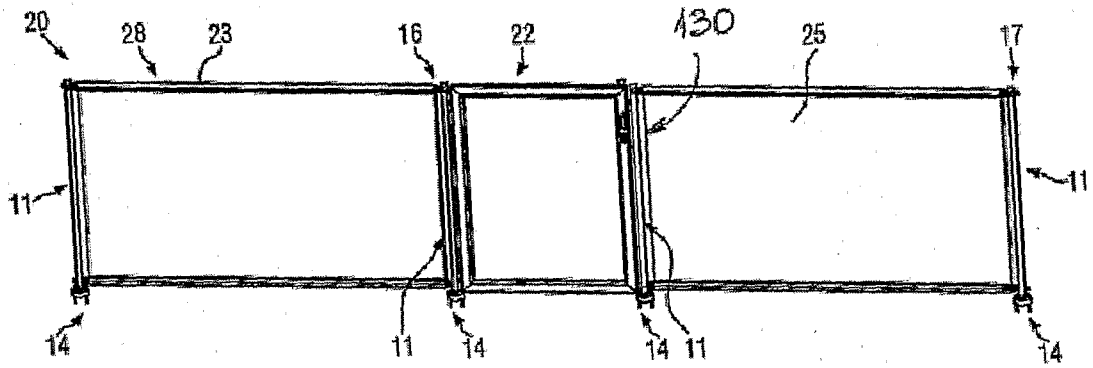

FIG. 2

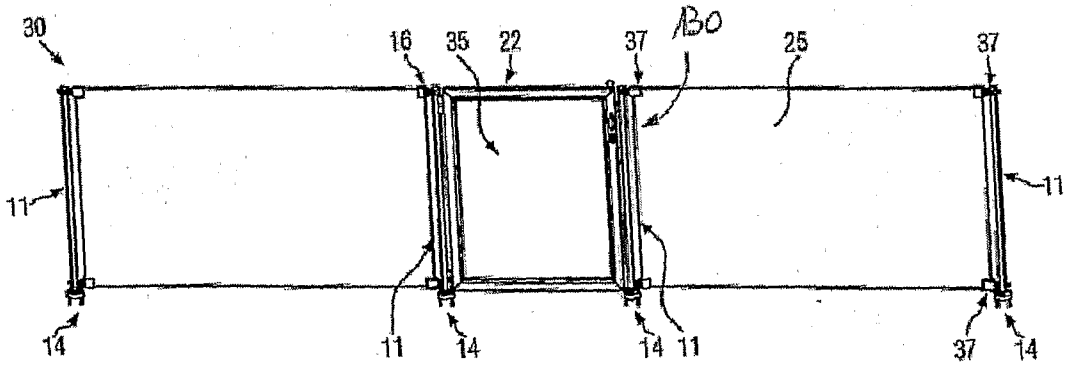

FIG. 3

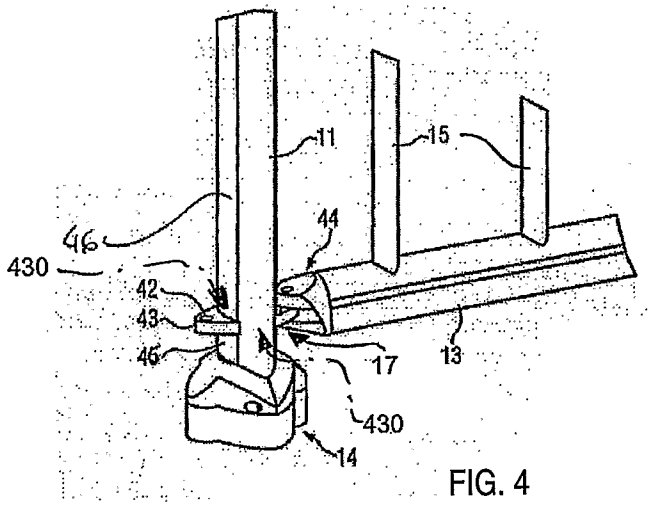

FIG. 4

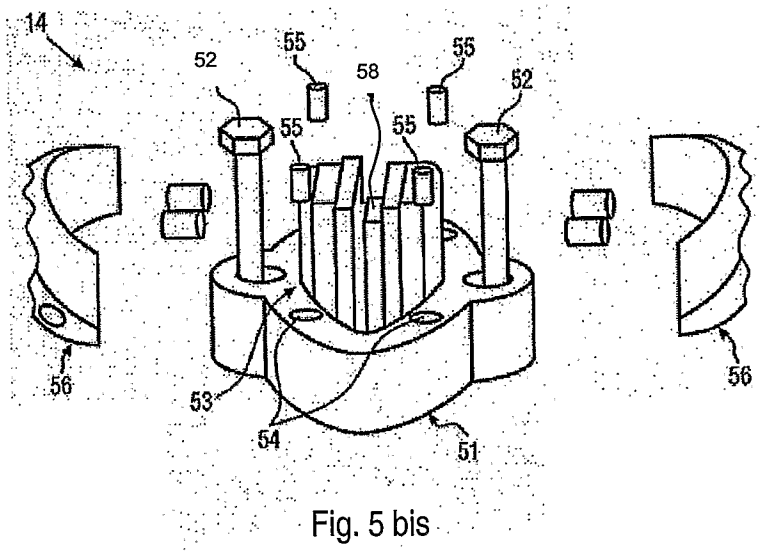

Fig. 5 bis

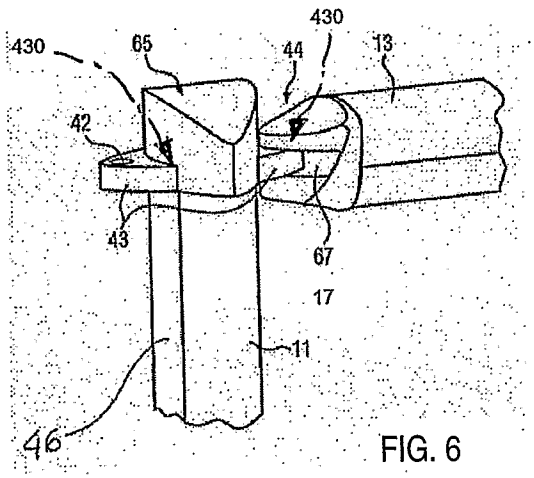

FIG. 6

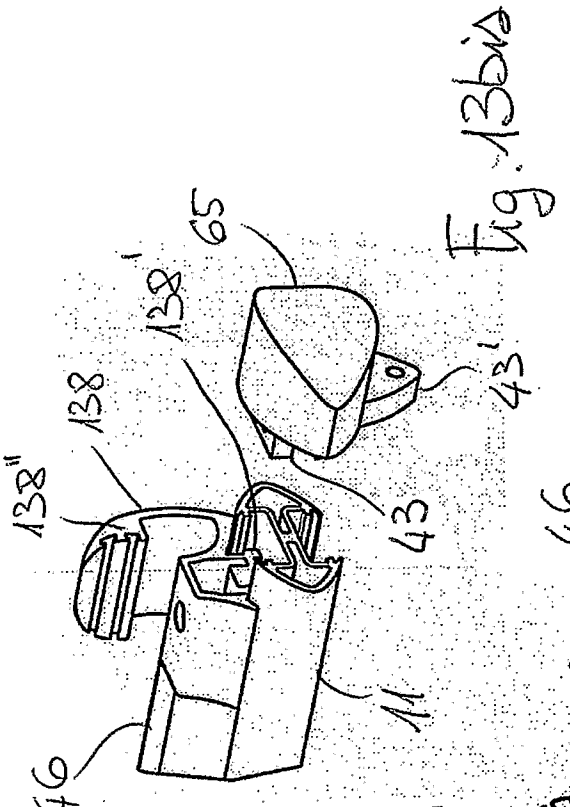

Fig. 13bis

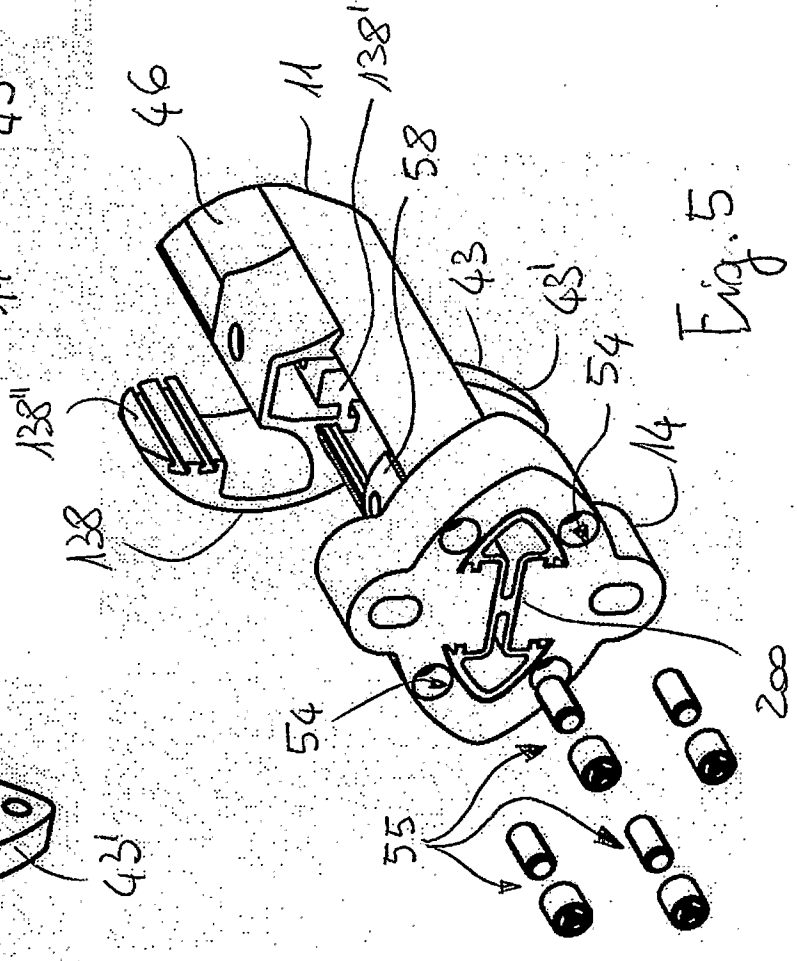

Fig. 5

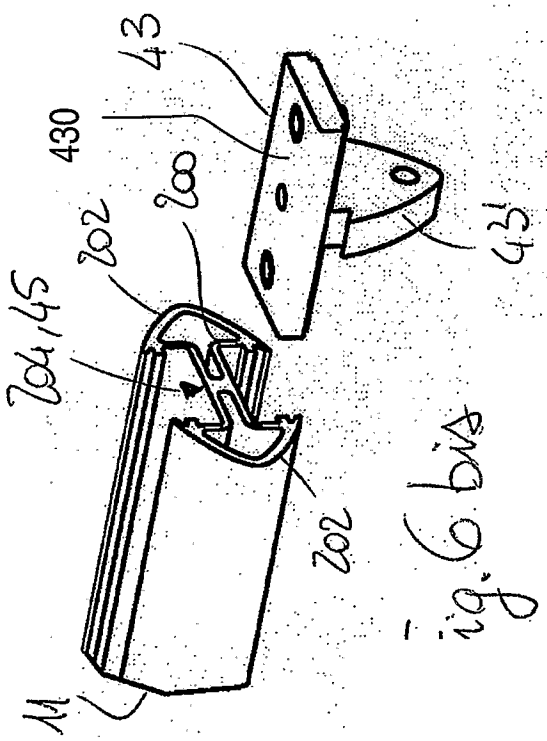

Fig. 6 bis

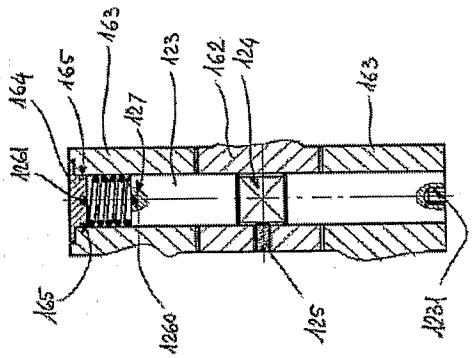

FIG. 16

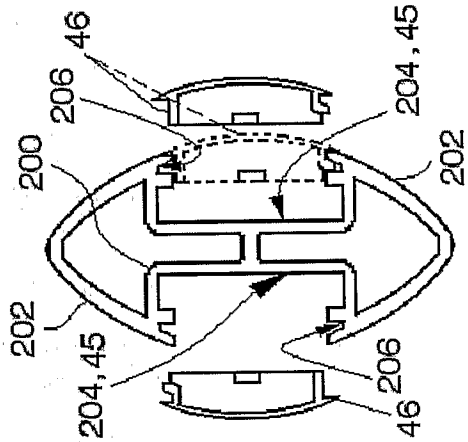

Fig. 17

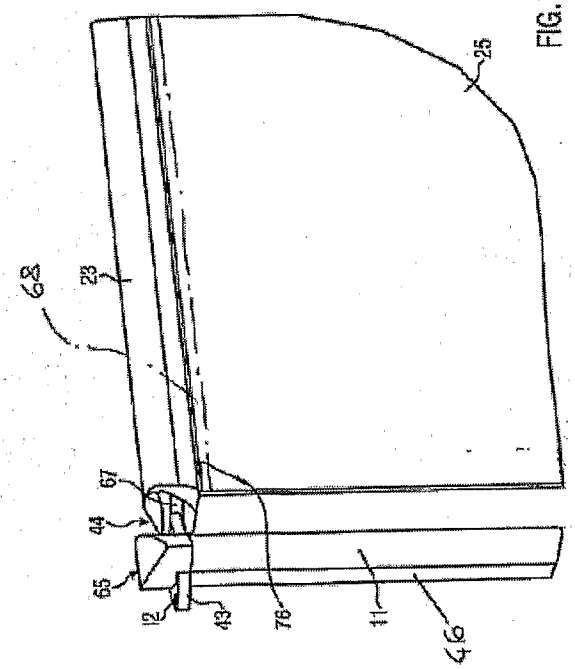

FIG. 7

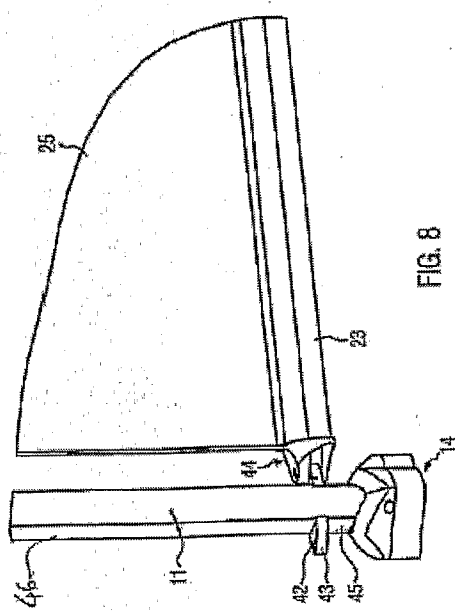

FIG. 8

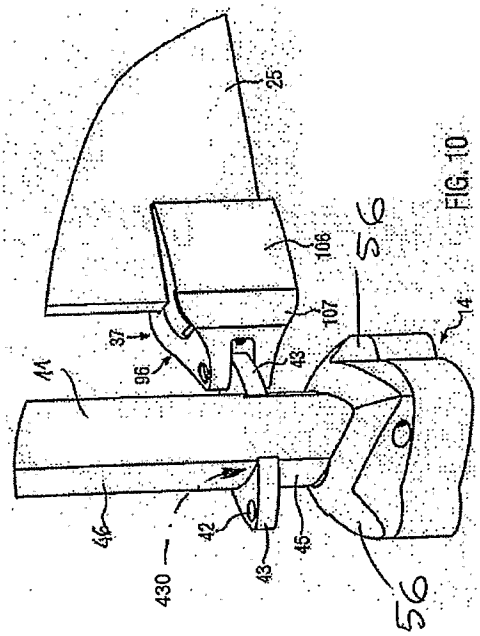

FIG. 10

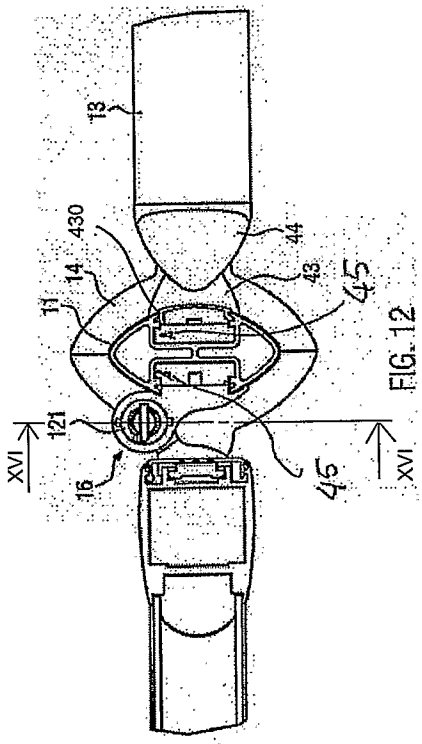

FIG. 12

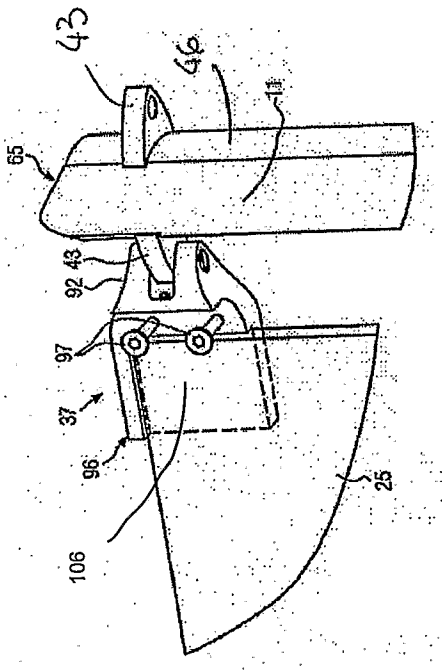

FIG. 9

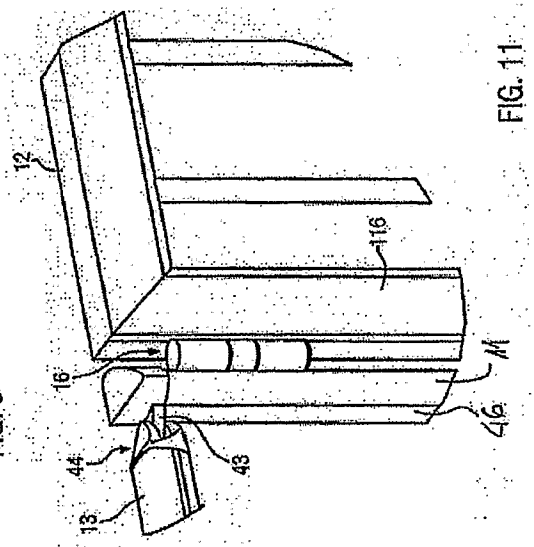

FIG. 11

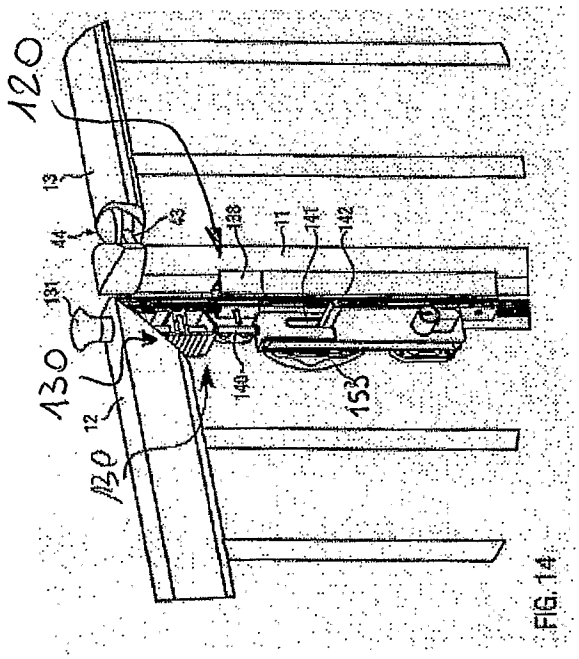

FIG. 14

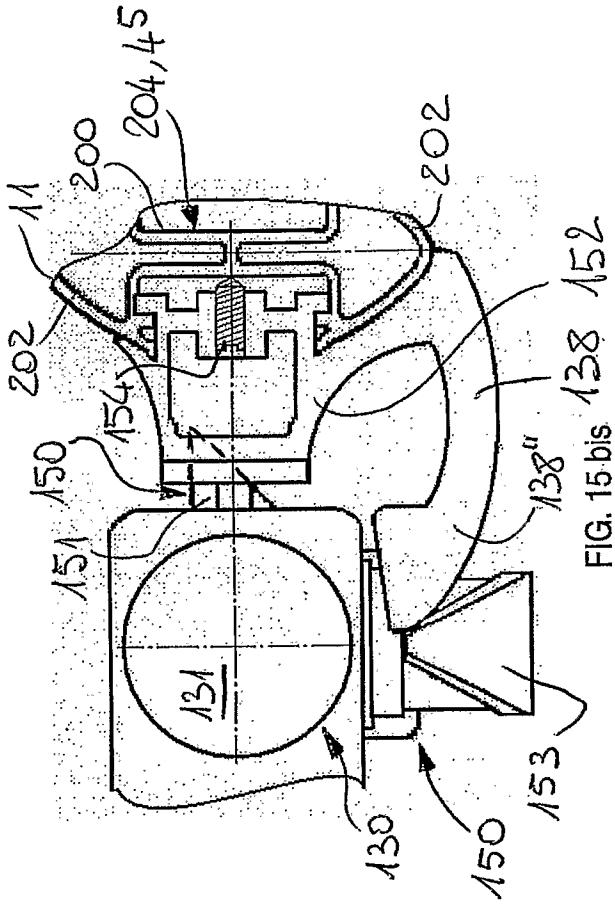

FIG. 15 bis

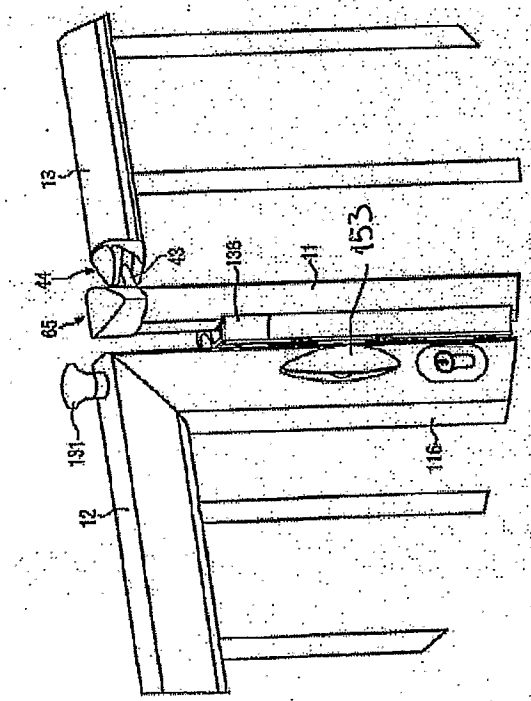

FIG. 13

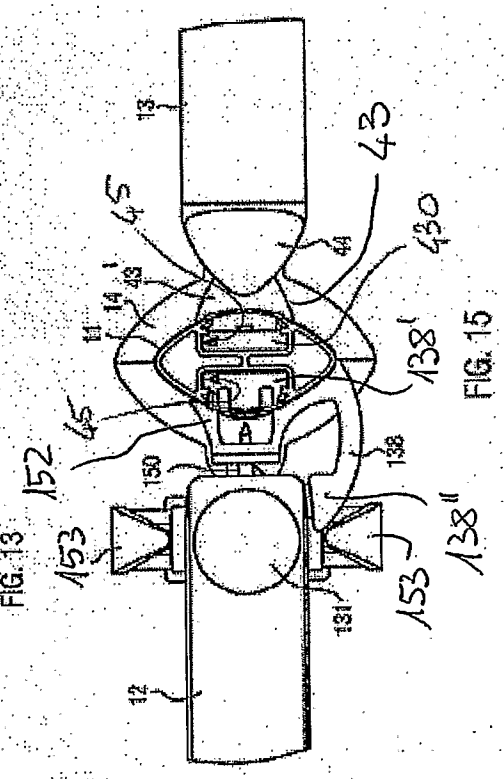

FIG. 15