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(54) **Security shutter door systems for doors and windows**

(57) A shutter door security system for windows and doors refers to the usual or unusual reinforced shutter door (14) which secures the existing opening (13) or an opening under construction (13) used for a window/door opening of the masonry (10), as well as the frames which are placed or going to be placed there. The shutter door's (14) solid or non solid units (15-16) of any cross-section, bear internally reinforced units (18), which are extended in both sides or in one side off the sides of the units (15-16). The perimeter drivers (22) bear internally one of the following: either the right security projections grooves (24) or tongues (25) or embodied security hollows (26), which both move parallel or vertically to the equivalent units (15-16). They cover the reinforced units (18) or are entered in the cavities (20) of the shutter door (14) units (15-16), in order to secure the shutter door (14) at its place, according to the users commands or automatically, moving mechanically, electrically or electromagnetically. When the shutter door (14) is pulled down so as to be secured as it reaches its lower final position, where its initial unit (16) enters into the longitudinal socket (27) and it is secured by grooves (security projections) (24) inside it, traversing the initial unit (16) vertically. These move inside the other units, thus they secure perimeter and the entire shutter door (14) to its place. At any case, pulling up or down the shutter (14) or its securing/release as well as the hatch control (29) is done by the autonomous shutter control system (30).

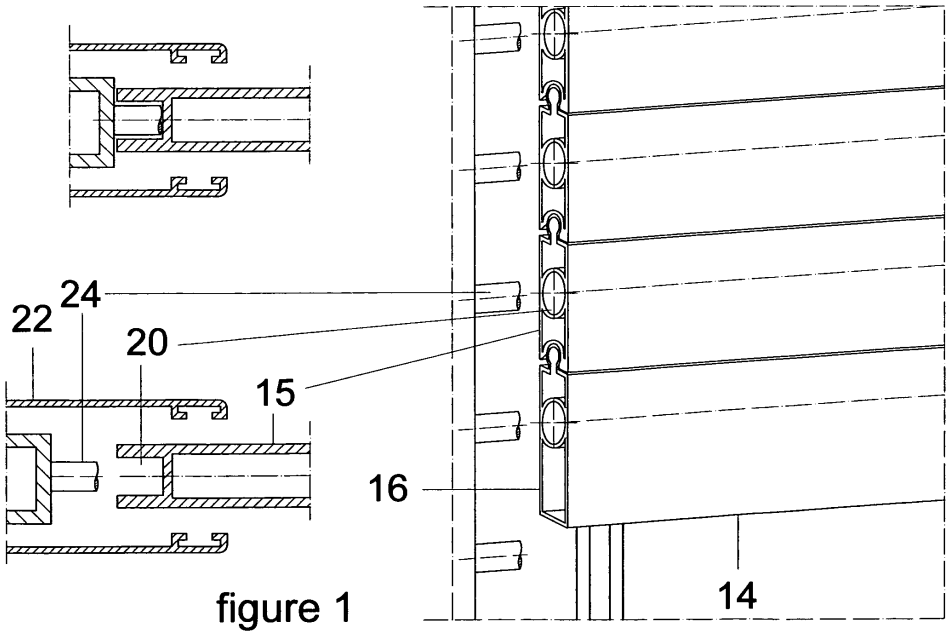

figure 1

EP 2 208 850 A2

Description

[0001] This invention is a security shutter door frame system for any door/window opening; it has been included in the masonry, securing the already existing or the future frames. The shutter door is composed of solid or not solid units which bear internally reinforced units extended outside the parts and which slide inside the perimeter drivers so as to be secured with proper security projections or cavities which move mechanically, electrically or electromagnetically.

[0002] Until today, various methods have been used for the door/window security. The front doors are secured with locks in at least one part of the frame, while the armoured doors in more. Windows and simple doors (balcony doors) are secured with door knobs and latches in at least two parts of the equivalent door leaf or frame, as well as perimeterly in selected parts of the frame of sliding, opening, folding, split, single and dived door leaves, as well as shutter doors. Minimal security is also offered by cast glass leaves in the opening of the door/window, as well as by alarms which use electric energy.

[0003] Breaking into through a door or a window with the present means is not particularly difficult, as long as one assures that the actions are fast and one enters silently through a door or a window. Depending on the manufacturing and the security, the breaking into time and noise of the attempted effort is reduced or increased. Doors which have one locking point offer minimal security to the door, which can be easily broken into by using a pass key, a gad or even a screwdriver. The armoured doors secure in many points and they certainly offer great security, although they sometime prevent breaking into, they do not always protect, because they depend on a key which can be copied, whilst depending on their model, they can be opened using a drill on its functional parts. Alarms offer an important level of security as they have the advantage of adverting when a door/window is opened, but they depend on energy source which can be paused or intercept in various ways, for they function with an accumulator working in a frequency that can be defined. Windows and simple doors are easier to break into than a front door. The only minimal security they offer until nowadays is the internal safety windows leaves, which can also be broken into with a diamond cutter, a gad or a screwdriver. Mainly in case of big openings, but in usual openings for shade, cover from wandering eyes and minimal security, different types of shutter doors are used: plastic, metal, wooden, closed type, wired, perforated etc. The shutter doors are usually functional and good looking, but they do not prevent breaking into, as they are not secure enough; they are placed with simple methods and their material is soft and flexible. The use of an internal latch does not inhibit lifting them up, the vertical drivers can be removed from the frame with a gag and their units are easy to perforate and remove by using simple tools, which make no noise. Thus, they do not offer security, given the modem methods. At any case, the security of a door does not merely presuppose the function and the application of the means one will choose in order to secure a space. It is necessary that the material, the security method and preventing breaking into can live up to the security needs of the space which will be protected, while based on simple mechanical methods in accordance with the installation of the drivers in the masonry's openings and the securing by mechanical and electrical means of both the shutter's periphery and its body.

[0004] This invention aims to install a security shutter door system which can secure any door/window opening of the masonry and the frames which have been or will be installed, preventing any attempt to break into closed spaces, occupied or not. The security comes from the reinforced units bearing in their internal the solid or not solid elements which compose the common or uncommon reinforced shutter door which extend beyond their parts, so as to secure them in parallel or crosswise from the proper security projections or hollows while being in the perimeter drivers. The vertical perimeter drivers are either placed in the existing openings, or they are entered in vertical rails of any section and are "built" in the masonry. The initial unit enters the longitudinal socket so it is secured by security projections. The projections and the security cavities move automatically, mechanically, electrically or electromagnetically, or even automatically securing all or some of the units and the shutter door itself at its place. Thus a part of each unit of both sides remains in the gap between the masonry and the floor-sill, providing perimeter security to the entire shutter from the building materials which frame it.

[0005] The security shutter door system for doors and windows has important advantages and differences, compared to the existing security systems in door/window openings and generally in masonry frames, as it covers the existing weaknesses in security. The solid or not solid units which bear internally fortification units move parallel or vertically in perimeter drivers so as to be secured with projections or cavities which are moved mechanically, electrically or electromagnetically by the user, or even automatically securing all or some of the parts and the shutter door itself at its place. The vertical autonomous driver is either placed in the existing openings, or they enter in vertical rails of any section and are "built" in the masonry. In this case, the longitudinal socket is "sank" in the structural material, providing perimeter security for the entire shutter and its structure material around it. In this case, a part of the shutter remains armed in the gap between the masonry and the floor-sill, thus providing perimeter security to the entire shutter from the building materials which frame it. Thus, the time and the noise of an attempt to break into are multiplied; the shutter doors' parts cannot be lifted up, do not come apart from their drivers or the opening, whilst their perforation can be rendered really tiring. Any wireless or wired motion and release command to or from the autonomous control system of the shutter door is cancelled when the shutter

door is mechanically secured, so as to keep the residential space safe. In existing frames, the system is installed in any opening, replacing or securing them and the opening of the masonry. In new frames, it is installed before the opening at the masonry or embodying any frame.

[0006] Figure 1 presents a plan and elevation, of a shutter door part (14) with its units (15-16) secured/released depending on the case, by embodied proper security grooves projections (24) which move parallel to the perimeter driver (22) and are entered in the cavities (20) of the shutter door (14) units (15-16), in order to secure it.

[0007] Figure 2 presents a plan and elevation, of a shutter door part (14) with the units (15) which are secured/released depending on the case, by embodied security tongues projections (25) which move parallel to the perimeter driver (22) which is embodied in the frame (36) and cover the reinforced units (18) of the shutter (14) units (15), in order to secure it.

[0008] Figure 3 presents a vertical projection plane and an elevation, of a shutter door part (14) with its units (15) secured/released depending on the case, by embodied security grooves projections (24) which move vertical to the perimeter driver (22) and are entered in the units (15) of the shutter (14) units, in order to secure it.

[0009] Figure 4 presents a vertical projection plan and an elevation, shutter door part (14) with the units (15) which are secured/released depending on the case, by embodied security tongues projections (25) which are vertical to the perimeter driver (22) which cover the reinforcement units (18) of the shutter (14) units (15), in order to secure it.

[0010] Figure 5 presents a plan of a shutter part (14) with its units (15-16) secured/released depending on the case, by embodied security through cavities (26) which move parallel inside the perimeter driver (22) and cover the reinforcement units (18) of the shutter (14) units (15-16), in order to secure it.

[0011] Figure 6 presents a floor plan of the perimeter driver (22) and its embodied vertical base (23) which is framed by the masonry (10) while being armed, as well as a part of the shutter door (14) unit (15) which remains in the masonry (11) gap and the rest of it in the opening (13).

[0012] Figure 7 presents an elevation, of a shutter part (14) consisted by units of vertical chains (17), joined by horizontal bars (19) which move on roller bearings (21) and serves as fortification items (18) which secure the units (17).

[0013] Figure 8 presents the vertical version of the longitudinal socket (27) which is "sank" in the material of the floor-sill (12) so it remains armed. Furthermore, it presents a part of the shutter door's (14) initial part (16) being secured/released depending on the case, by the appropriate security grooves projection (24) which moves vertical in the longitudinal socket (27) and traverses the initial part (16) in order to secure it. In addition, this initial part (16) is secured/released, depending on the case, by a security locking plate (28) of the right section which moves vertical and turns into the socket (27), it also comes out from one side of the initial part (16) and is hooked on the longitudinal socket (27) so as to secure the shutter door (14). Depending on the presence or the lack of the initial part (16) the gate (29) covers or reveals the longitudinal socket (27).

[0014] The shutter door system for windows and doors refers to the usual or the unusual reinforced shutter (14) which is installed in an existing opening or an opening under construction (13) used for a window/door opening of the masonry (10). It protects the masonry and any frames from any attempt to break into areas at times when is prohibited, for instance in factories beyond working hours, installations, shops, store houses, closed parking spaces, residential areas, unoccupied houses as well as any area in need of securing.

[0015] The security for the opening (13) of the door/window of the masonry (10) comes initially from the reinforced units (18) which internally bear any fortification units, solid or not (15) as well as from the initial unit (16) which compose the shutter door (14). Note that their vertical section comes in various shapes and forms. These fortifications (18) are bars, leaf blades or tubes, as well as horizontal bars (19) which connect chain parts. The fortification of every element (15-16) stretches on either both or on one side and beyond its limits so as to be the point where the shutter door (14) will be secured, where all or some of its units (15-16) are different when it comes to their ends or when they are not solid. The shutter door's (14) units (15-16) slide into vertical perimeter drivers (22) allowing the shutter door's (14) pulling up so that the opening (13) is released of its pulling down so that the opening (13) is closed and secured. The perimeter drivers (22) of any opening (13) and place they are installed bear internally the right security projections (24-25) or security hollows (26) which move: either parallel, by entering each unit (15-16) covering the reinforced units (18), entering into the gap (20) of the shutter's (14) hollow units (15-16), or vertically, covering or traversing the units (15-16), this securing the shutter at its place, under the command of the user or automatically.

The embodied security projections (24-25) and the security hollows (26) have different sections, according to the section of the solid and the non solid units (15-16) they secure. When the security projections are grooves (24), they operate parallel, entering in the gap (20) of the hollow pane of the units (15-16) or in the right sockets which the units (15-16) or their reinforced units (18) bear. Moreover, they act vertically, covering in this way the proper creations of the reinforced units (18) of each unit (15-16) or they traverse them from the right holes according to the place and size of each projection (24) thus securing the shutter (14) from every position. The preferred security tongues projection (25), operate parallel, covering the fortification units (18) of each unit (15-16) or the units themselves (15-16) if their ends have the same section with the security tongues projection (25) which secures it, as well as moving vertically, covering

the right parts of the fortification units (18) of each units (15-16). The selected security -through or bling- hollows (26) move parallel, covering the right sizes of the fortification parts (18) of each reinforced unit (15-16). The order for securing the selected units (15-16) of the shutter door (14) is performed by mechanical, electrical or electromagnetic movement which all the selected right security projections (24-25) and security hollows (26) receive, operating in the right sections.

[0016] When the shutter door (14) is pulled down so as to be secured, it reaches its lower final position, where its initial part (16) enters into the longitudinal socket (27) which bears a hatch (29) moving automatically by mechanical, electrical or electromagnetic motion. This hatch (29) is revealed while the shutter door (14) is being pulled down the particular longitudinal socket (27), but when the shutter is pulled up (14) it covers it. The longitudinal socket (27) bears internally security grooves/projections (24), which move vertically in relation with the initial unit (16) of the shutter door (14) and traverse it from right holes, securing the shutter door (14) to its place, under the orders of the user or automatically, mechanically, electrically or electromagnetically. This initial unit (16) is secured/released thanks to rolled plates of the right section (28) which moves vertically and turns into the socket (27), it also comes out from both sides or from the one side of the initial unit (16) and is hooked on the longitudinal socket (27), so as to secure the shutter door (14) to its place, under the order of the user by mechanical motion from the internal part of the area. The unusual reinforced shutter (14) is also formed by chain units (17), where its unit (17) composes vertical chains of any section, jointed together with horizontal bars (19). The joints of the chains (17) bear roller bearings (21) which smooth them and render their movements silent; for aesthetical reasons the chains (17) are lined at least on one side. The solid or non solid units (15-16) of any side which are the common usual or unusual reinforced shutter door (14), jointed outline in at least one of the shutter door's (14) sides a design, formed by all or some of the selected units, which bear in all of their surface or in part of it embossing sockets, projections or colored designs, so as to make a beautiful entity. The perimeter vertical drivers (22) of the shutter door (14) remain autonomous or are embodied in vertical rails (23) of any size and the longitudinal socket (27) are "built" in the masonry (10) and "foundered" in the structural material of the floor/sill (13) so that both are armed, before the completion of the opening (13) of the frame or they may be installed after its completion, the securing of the units (15-17) is provided parallel or vertically by the right tongues or grooves security projections (24-25) or the security hollows (26), in the way which was described above. Moreover, the perimeter vertical drivers (22) of the shutter (14) are embodied in a frame of any size (36), which is jointed with an equivalent frame (36) at the sill which bears the embodied driver (22)-same size and form- so it is used as a logtitudal socket (27). Thus the frame (36) supports the door/window leaves while at the same time it serves as the perimeter driver (22) of the shutter's (14) units (15-17) and the longitudinal socket (27) of the initial unit (16), thus the frame is one piece and it includes in one frame (36) the door/window leaves and the shutter (14) together. At the same time, the perimeter drivers (22) which are installed in a masonry opening (13) of the front door, embodied in a frame or being autonomous, are "built" within the masonry (10) in order to prevent the door's opening from any side of the area. As far as the security of the units (15-17) is concerned, it is ensured by the use of the right security tongues/grooves (24-25) projections or the security hollows, as it is described above.

[0017] All the upward and downward motions of the shutter (14), the periodical motions of the hatch (29) as well as the securing/releasing of the shutter (14) are performed with mechanical, electrical or electromagnetic motion, which controls the autonomous control system (30) from the internal or the external part of the area, which is composed by an electronic control unit (31), electromechanical means, an accumulator (32) and some sensors for: motion direction and shutter position (33), securing/releasing report of the manual mechanical means (34), vibration and thermal sensors of the units (35). The electronic control unit (31) communicates wireless or wired by two-way information exchange and central control systems, controlled access systems or with simple switches. The electronic control unit (31) defines all the functions and the system situation thanks to a series of actions: it processes all the data it receives, publishes the system's functional status, as well as any malfunctions, alarm reports due to temperature increase of vibration the units(15-16) receive, via a series of sensors (34). Furthermore, it controls at all times the motion conditions and shutter (14) positions, as well as the smooth pulling up and down function through the direction motion sensors and the shutter's position (33). In addition, it controls the electrometrical means according to the users commands or automatically so as the shutter (14) is secured or released, while receiving confirmation reports for these actions. Finally, the mechanical securing of the shutter (14) cancels any command for pulling up and releasing, given by the autonomous shutter control system (30).

Claims

1. Shutter door securing frame system, a usual shutter door (14), units (15-16) which are joint together and move into perimeter drivers (22), when the units are pulled up, they enter the drivers (22), releasing the opening (13), when they are pulled down they move in the perimeter drivers (22) closing the opening (13), that is composed of solid and non solid units (15-16) of any cross-section. However, the ends of some or all parts (15-16) are non solid, it is such a security system, which bears internally perimeter drivers (22)

and security grooves/projections (24), of relevant cavities (20) of hollow parts (15-16), which security projections (24) move in parallel in relation with each unit (15-16) of the shutter (14) and enter in the hollow parts (15-16), securing the shutter door (14) to its place, under the orders of the user or automatically, mechanically, electrically or electromagnetically. The projections' (24) number can be the same or smaller than the hollow parts (15-16) of the shutter door (14).

2. Shutter door securing frame system, as mentioned in Claims 1 and 2, a non usual reinforced shutter door (14), consisted of solid or not units (15-16), where a fortification unit (18), solid or not, of any cross-section and of proper length comes out of the unit (15-16), from both sides or from the one side, for all the units (15-16) or for some of them. It is such a security system which bears internally perimeter drivers (22) and embodied security tongues/projections (25) corresponding to that of the units (15-16), which move parallel to each unit (15-16) and cover the fortification units (18) of each one of the reinforced units (15-16), of the shutter door (14) in a suitable length securing its place, under the orders of the user or automatically, mechanically, electrically or electromagnetically.

3. Shutter door securing frame system, as mentioned in Claims 1 and 2, a non usual reinforced shutter door (14), consisted of units (15-16), where a fortification unit (18) of proper length comes out of the units (15-16). It is such a security system which bears internally perimeter drivers (22) bilaterally embodied proper security projections (26), through, or blind, of the right size for each fortification unit (18) of the units themselves (15-16). The security hollows (26) which move in parallel of the unit (15-16), cover the fortification units (18) of each reinforced part (15-16) of the shutter door (14), in a suitable length securing its place.

4. Shutter door securing frame system, as mentioned in Claim 1, a non usual reinforced shutter (14), consisted of solid or not units (15-16), where a fortification unit (18) or not of any cross-section and of proper length comes out of the unit (15-16), from both sides or from the one side, for all the units (15-16) or for some of them. It is such a security system which bears internally perimeter drivers (22) and bilaterally embodied security grooves/projections (24) or tongues (25), equal to the fortification units (18) of each unit (15-16) which projections (24-25) move vertically to each unit (15-16) of the shutter and inside the peripheral guides (22), covering in this way the fortification units (18) of each one of the units (15-16) of the shutter (14), or traversing them, and thus securing it in the right place.

5. Shutter door securing frame system, as mentioned in Claims 1 and 4, a usual or non usual reinforced shutter door (14), when during its pulling down in the lower final position, its initial unit (16) enters in a longitudinal socket (27), which bears a hatch (29). Depending on the presence/absence of the initial unit (16) in the socket (27), it is covered/revealed automatically, mechanically, electrically or electromagnetically. It is such a security system which bears in the longitudinal socket (27) embodied security grooves/projections (24), which move vertically on the initial unit (16) of the shutter door (14) and inside the longitudinal socket (27), traverse the initial unit (16) of the shutter door (14) securing the shutter (14) to its place, under the orders of the user or automatically, mechanically, electrically or electromagnetically. Furthermore, this initial unit (16) is secured/released, depending on the case, by a security rolled plate (28) of the right section which rolled plates (28) move rotary and crosswise into the socket (27), it also comes out from one side of the initial unit (16), single-sided or two-sided, and is hooked on the longitudinal socket (27) so as to secure the shutter door (14) from the internal side of the area, under the commands of the user, moving mechanically.

6. Shutter door securing frame system, as mentioned in Claims 1 to 5, referring to a non usual or not reinforced shutter (14), consisting of units (15-16), solid or not, of any cross-section; these units jointed compose a design in at least one of the parts of the shutter door (14). It is such a security system with some or all of its units (15-16) have in their surface or in a part of it embossing sockets, projections or form or colored designs.

7. Shutter door securing frame system, as mentioned in Claims 1 to 5, referring to a non usual reinforced shutter door (14), consisting of units with vertical chains (17) of various cross-sections, jointed by horizontal bars (19). The bars have unit joints with roller bearings (21) and they are totally or partially lined.

8. Shutter door securing frame system, as mentioned in Claims 1 to 5, referring to a usual or non usual reinforced shutter (14). Its perimeter drivers (22) embodied or not in vertical rails (23) of any size and the longitudinal socket (27) are "built" in the masonry (10) and "sank" in the structural material of the floor/sill (12) so that both are armed. It is such a security system which allows a part of the units (15-17) to move in two directions inside the perimeter drivers (22) in the void part of the masonry (11). The initial unit (16) enters in the floor/sill (12) through a socket (27).

9. Shutter door securing frame system, as mentioned in Claims 1 to 5 and 8, referring to a usual or non

usual reinforced shutter (14). Its perimeter drivers (22) are embodied in frames of any size and shape, and they jointed in an equivalent frame (36) at the floor/sill (12) which bears the embodied driver (22) of the same section and shape, used as a longitudinal socket (27). It is such a security system which allows a part of the shutter door's (14) units (15-16) to move in two directions in the perimeter drivers (22) which are embodied in the frame (36) of any kind of recess.

10. Shutter door securing frame system, as mentioned in Claims 1 to 5, 8 and 9, referring to a usual or non usual reinforced shutter (14). Its perimeter drivers (22) are installed in a masonry opening (13) of the front door; the shutter door (14) is secured in front of or behind the recess. It is such a security system whose drivers (22) allows the move of the units (15-16) and secure the shutter door (14) at its place as well as in every part of the front door opening, preventing its opening from all sides.

11. Shutter door securing frame system, as mentioned in Claims 1 to 5, and 8 to 10, referring to a usual or non usual reinforced shutter (14), when during its pulling up/down, the hatch control (29) as well as the securing/release of the shutter door (14), is done by an autonomous shutter control system (30), which is composed by an electronic control unit (31), an accumulator (32), electromechanical means, and some sensors for: motion direction and shutter position (33), securing/releasing report of the manual mechanical means (34), vibration and thermal sensors of the units (35). It is such a security system the electronic control unit (31) communicates wireless or wired by two-way information exchange and central control systems, controlled access systems or with simple switches. The electronic control unit (31) defines all the functions and the system situation thanks to a series of actions: it processes all the data it receives, publishes the system's functional status, as well as any malfunctions, alarm reports due to temperature increase of vibration the units(15-16) receive, via a series of sensors (34). Furthermore, it controls at all times the motion conditions and shutter door (14) positions as well as the smooth pulling up and down function through the direction motion sensors and the shutter's position (33). In addition, it controls the electromechanical means according to the users commands or automatically so as the shutter door (14) is secured or released, while receiving confirmation reports for these actions. Finally, the mechanical securing of the shutter door (14) cancels any command for pulling up and releasing, given by the autonomous shutter control system (30).

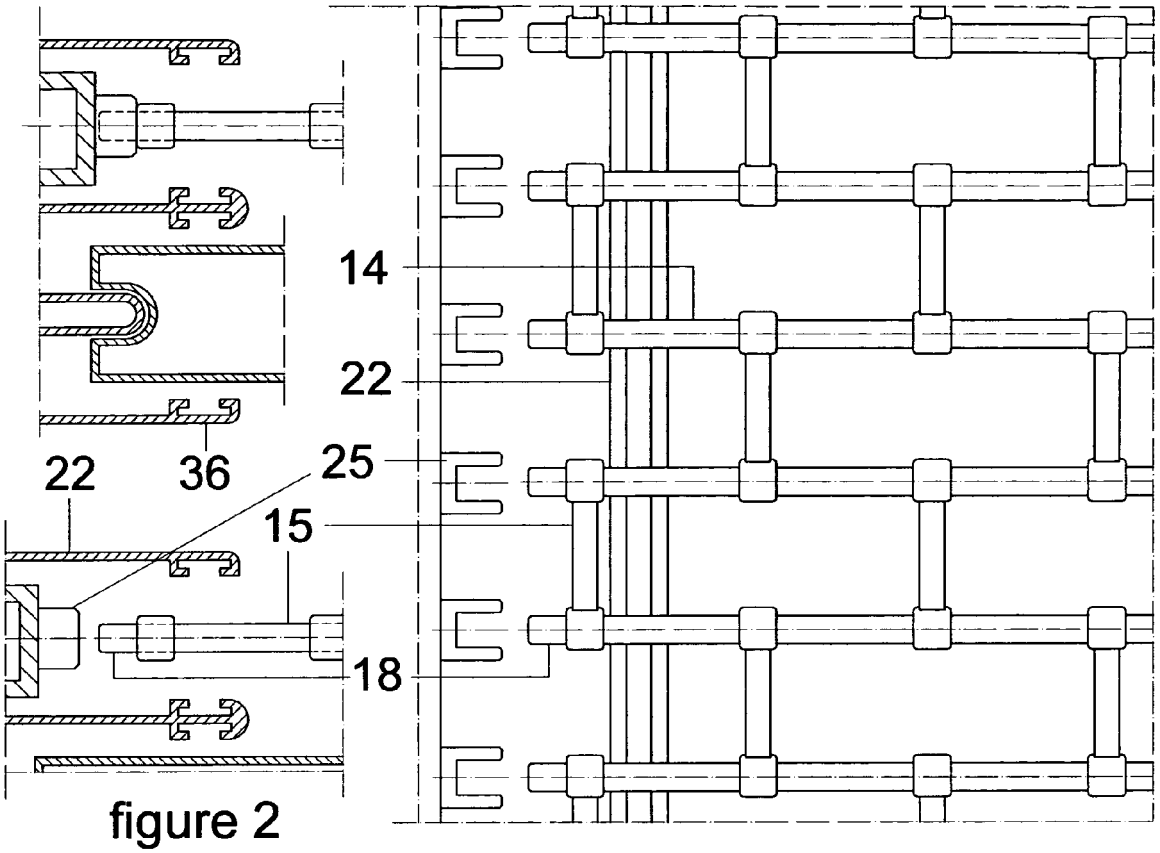

figure 2

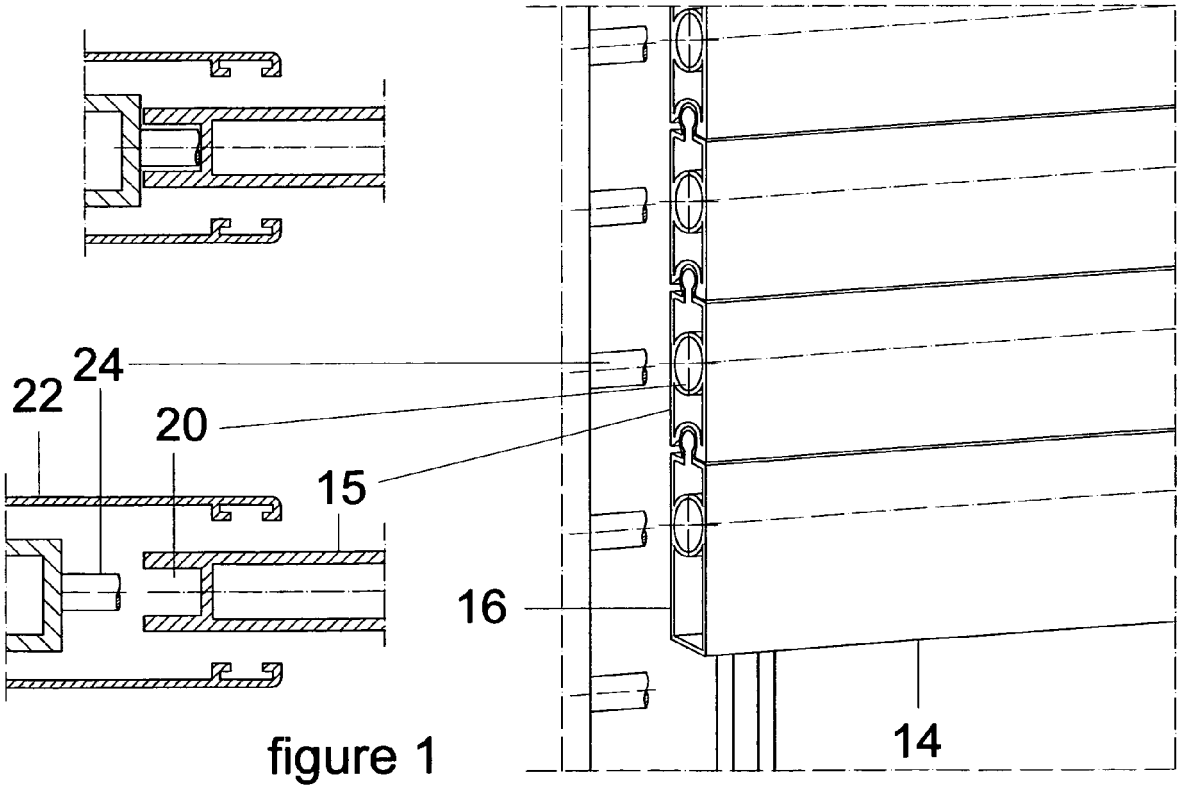

figure 1

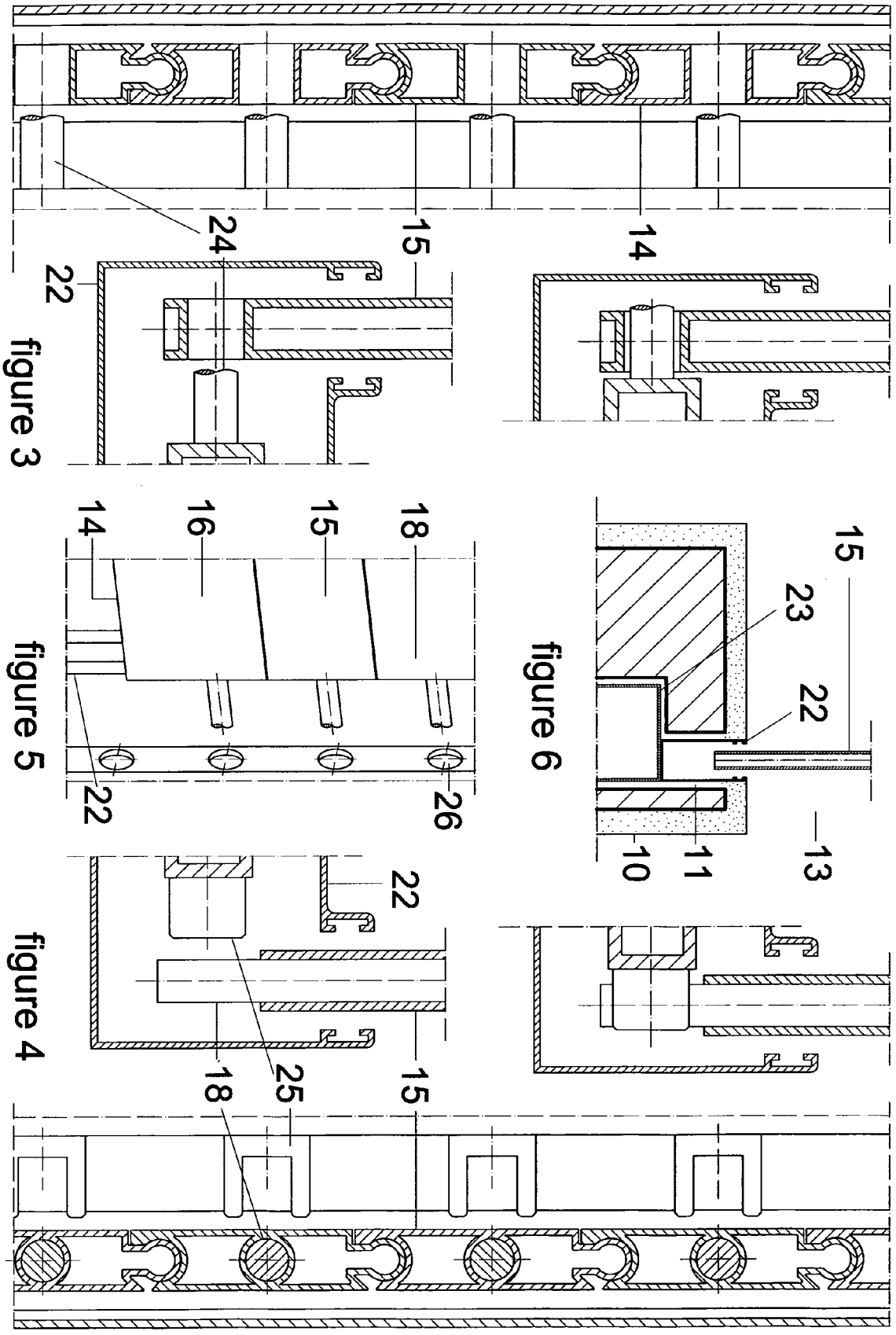

figure 3

figure 5

figure 6

figure 4

figure 7

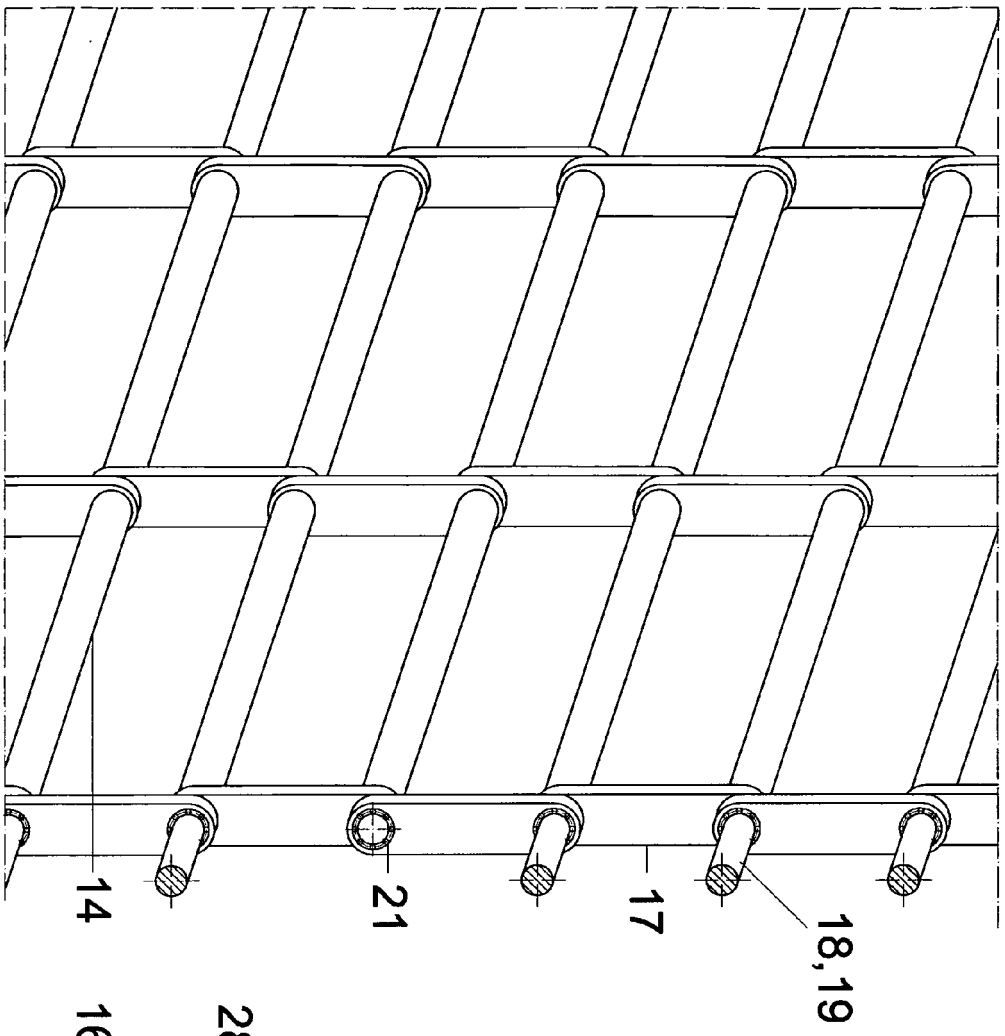

figure 8