

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 599 343 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
25.02.1998 Bulletin 1998/09

(51) Int Cl.⁶: **E06B 9/06**

(21) Application number: **93119117.5**

(22) Date of filing: **26.11.1993**

(54) **Grille**

Gitter

Grille

(84) Designated Contracting States:
DE FR IE

(30) Priority: **26.11.1992 GB 9224811**

(43) Date of publication of application:
01.06.1994 Bulletin 1994/22

(73) Proprietor: **Beare, Charles Augustine**
Wombourne, Nr Wolverhampton,
West Midlands (GB)

(72) Inventor: **Beare, Charles Augustine**
Wombourne, Nr Wolverhampton,
West Midlands (GB)

(74) Representative: **Lucking, David John et al**
FORRESTER & BOEHMERT
Franz-Joseph-Strasse 38
80801 München (DE)

(56) References cited:
AU-B- 596 065 **GB-A- 1 273 114**
GB-A- 2 224 073 **US-A- 3 417 805**

EP 0 599 343 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

Description of Invention

This invention relates to a screen for an opening and more particularly but not exclusively to a security screen for an opening.

In British Patent No. 2161197 there is described a security screen which comprises a plurality of elongate elements pivotally connected in a criss cross pattern to provide a generally rectangular assembly which is foldable and unfoldable between an extended condition in which the screen closes an opening and a folded condition in which access may be gained through the opening. The screen further has along each of two opposite sides, a side member, at least some of the elongate elements each being retained at one end relative to a respective side member and being movable axially of the respective side member during folding and unfolding of the screen. However the means whereby the elongate elements are retained relative to their respective side members provides no significant obstacle to a determined intruder. The side members are of channel configuration, there being slots in each limb and an opening in the respective elongate element, through which an axle passes, the axle being retained by means of end caps on the axle. Once the end caps are removed, the axle can easily be released from engagement with the side member and elongate element thereby facilitating forcing access through the opening.

In British Patent Application published under number GB 2224073 there is described another form of security screen of the same basic criss-cross kind. In this screen, the side members comprise inwardly facing channels with inwardly directed returns. The elongate elements are retained relative to the side members by means of axle and roller combinations, the rollers running on the inwardly directed returns when the screen is opened or closed.

The object of the invention is to provide a new or improved screen.

According to one aspect of the invention we provide a screen for an opening comprising a plurality of elongate elements pivotally connected together in a criss cross pattern to provide a generally rectangular assembly which is foldable and unfoldable between an extended condition in which the screen closes the opening, and a folded condition in which access may be gained through the opening, the screen further comprising along each of two opposite sides, a side member, at least some of the elongate elements each being retained at one end thereof relative to a respective side member and being movable axially of the respective side member during folding and unfolding of the screen, one of the side members being fixed relative to the opening and the other side member being slidable across the opening to effect folding and unfolding of the screen wherein each side member is, at least in the regions

where the one ends of the elongate elements are retained thereby, of re-entrant channel configuration and the retained ends of the respective elongate elements each carry a guide means which is entrapped in the re-entrant channel along the entire extent of axial movement of the one end of the respective elongate element, characterised in that the side members have a complex re-entrant configuration, and each side member comprises a base having a pair of limbs extending therefrom, the free ends of the limbs being in-turned to provide front wall parts, the front wall parts themselves each being in-turned to provide lips which extend inwardly of the channel.

Hence a more secure screen is provided.

The side members are preferably made by rolling.

The limbs, front wall parts and lips may each provide a track for a guide means whereby the guide means can be moved along the channel and be retained by the channel.

Preferably the guide means comprises a roller mechanism including at least one roller and an axle which passes through an opening in an end in a respective elongate element thereby to retain the end of the elongate element in the channel. The guide means comprises a pair of rollers carried on the axle, each of the rollers being rotatable relative to the axle, or fixed relative to the axle as desired. In each case, the end of the elongate element is pivotable relative to the axle.

Alternatively, the guide means may comprise a slider pivotally secured to the end of a respective elongate element, such as a slider made of a suitably strong plastics material such as nylon.

In a preferred arrangement, the security screen comprises a further side member which in use is fixed relative to an opposite side opening of the other fixed side member. The slidable side member and the further side member may each carry components of a locking mechanism whereby the slidable side member can be locked to the further side member with the screen in its extended condition.

The screen may further comprise top and bottom members which at least receive and conceal the ends of the pivotally connected elongate elements at the respective top and bottom of the rectangular assembly of elongate elements. Preferably, the top and/or bottom member comprises a re-entrant channel configuration, the ends of the elongate elements being received in the re-entrant channel and the slidable side member carrying a guide means at at least one end thereof, which moves along the channel and is trapped in the channel, thereby to facilitate sliding of the slidable side member, and to retain the side member relative to the top and/or bottom member.

The invention will now be described with reference to the accompanying drawings in which:

FIGURE 1 is a perspective illustrative view of a screen in accordance with the invention,

FIGURE 2 is a sectional view on the line 2-2 of Figure 1,

FIGURE 3 is an exploded illustrative view of a modification,

FIGURE 4 is a sectional view on the line 4-4 of Figure 1.

Referring to the drawings, there is shown in figure 1, a security screen 10 which comprises an assembly 12 being a plurality of elongate elements 12a to 12g pivotally connected together as shown for example at 13 in a criss cross pattern to provide a generally rectangular assembly which is foldable and unfoldable between an extended condition in which the screen 10 closes an opening 11 in which it is mounted, and a folded condition in which access can be gained through the opening. In the example shown, the opening 11 is arranged to be completely closed by the screen 11 when the screen is in its extended condition, the opening being of generally corresponding rectangular shape. In another arrangement, the opening 11 may not be completely closed by the security screen 10, e.g. the screen 10 may not extend for the full height of the opening 11.

The security screen 10 is shown in figure 1 in a partially extended condition and further comprises a pair of side members 14 and 15 one along each of two opposite sides of the assembly 12 of elongate elements.

Side member 14 is fixed relative to the opening 11, for example by fasteners (not shown) and the other side member 15 is slidable across the opening 11 to effect folding and unfolding of the screen 10 between its extended and folded conditions.

The security screen 10 further comprises top and bottom members 17,18, respectively, which bound the top and bottom of the opening 11, and a further side member 19 which is secured to an opposite side of the opening 11 to side member 14.

The one ends of a pair 12a and 12b of elongate elements are connected together and fixed relative to side member 14 as indicated at 20 whilst the one ends of a further pair 12c, 12d of elongate elements are connected together and to side member 15, as indicated at 21, the connections 20 and 21 permitting pivoting of the respective elongate elements, relative to each other and relative to the respective side members 14,15.

The one ends of another pair 12e, 12f of elongate elements are retained by fixed side member 14, but are free to move axially of side member 14 as hereinafter explained.

The one ends of yet another pair 12g, 12h, of elongate elements are retained by side member 15 but again are free to move axially of side member 15 as hereinafter explained.

It will be appreciated that as the side member 15 is slid across the opening 11, the elongate elements will relatively pivot and the overall height of the generally rectangular assembly 12 of elongate elements will vary. Thus the top and bottom members 17,18, are sufficiently

deep to receive and conceal the ends of the elongate elements at the top and bottom of the rectangular assembly 11, during the entire range of movement of the screen 10. Further, as the screen 10 is folded and unfolded, the axial positions of the ends of elongate elements 12e, 12f and 12g, 12h, relative to their respective side members 14,15, will vary.

Referring now to figure 2, there is shown a cross section through side member 14 along the line 2-2 of figure 1. The cross section of side member 15 is identical.

Side member 14 comprising a re-entrant channel configuration provided in this example by a base 24, a pair of generally parallel limbs 25,26, the free ends of the limbs 25,26, being in-turned to provide front wall parts 27,28, which are themselves in-turned to provide lips 29,30, which extend inwardly of the channel. An end 31 of elongate element 12e is shown received in the channel between the lips 29,30, the end 31 carrying a guide means 32 which in this example comprises a roller mechanism to facilitate movement of the end 31 of the elongate element 12e along the side member 14 during folding or unfolding the screen 10.

The roller mechanism comprises an axle 35 which has an integral head 36 at one end and carries a pair of rollers 37,38, which roll along the side member 14, in respective tracks 39,40 provided by the limbs 25,26, front wall parts 27,28, and lips 29,30, respectively. The axle 35 further carries a spacer 42 and passes through an opening provided in the end 31 of the elongate element 12e. In another example, where the height of the screen 10 is greater, the ends of a pair of elongate elements may be pivotally interconnected in the re-entrant channel side member 14 by the axle 35 of a guide means, in which case the space shown occupied by spacer 42 would be occupied by the end of the other of the pair of elongate elements. Thus the end 31 of the elongate element 12e, or the connected ends of the pair of elongate elements is or are captively retained by the re-entrant channel configuration of the side member 14, whilst being free axially to move relative to the side member 14 as the screen 10 is moved between its folded and unfolded conditions.

In this example, the end of the axle 35 remote from head 36 is splayed outwardly as indicated at 43, the head 36 and splayed end 43 being received in respective recesses 44,45, provided in the respective rollers 37,38. Thus the entire guide means 32 provides an assembly in which the axle 35 is not free to move along its own axis.

The ends of each of the elongate elements 12f, 12g and 12h are each retained captively by their respective side members 14,15, in the same manner as end 31 of elongate element 12e.

The fixings 20,21, can be achieved for example by a bolt or other fastener simply passing through the channels 14,15, from one side to the other.

Preferably though, the fixings 20,21, are such that

there is no access to the fixings from one side (e.g. outside) of the screen 10, for added security. In one example, there may be provided inside the channels 14, 15, a pair of rectangular plates which correspond in cross sectional configuration to the rollers 37,38, but at least one of the plates being fixed by rivets for example, or other fastenings to one wall 25 or 26 of the channel. The ends of the respective elongate elements 12a, 12b, or 12c, 12d, being received between the plates and connected thereto by an axle like axle 35 for example.

The guide means 32 may be received by their respective side members 14,15, by sliding in from one end during assembly of the security screen 10, i.e. prior to the ends of the side members 14,15, becoming inaccessible. Alternatively if desired, at least the guide means 32 slidable in side member 14 can be assembled on site, for example, after the side member 14 has been secured relative to the opening 11 and after top and/or bottom members 17,18, have been secured relative to the side members 14,19, and/or relative to the opening 11. Assembly of the guide means 32 on site can be achieved because the side member 14 has in each limb 25,26, thereof, openings 46,47, which are axially displaced from the positions the guide means 32 will occupy when the screen 10 is in its fully extended condition closing the opening 11. Thus the rollers 37,38, spacer 42 and end 31, of the elongate element 12a can be located in their relative positions as seen in figure 2, and the axle 35 inserted through a respective opening 47 in limb 26, through each of the components. The ends of the axles 35 remote from the heads 36 can then be displaced using suitable tools which can access the ends of the axles 35 through the openings 46,47.

Other arrangements to facilitate assembling a guide means 32 from within the respective side member 14 are possible. For example, in the arrangement of figure 3, a roller 38a is provided rigidly and integrally with a spacer 42a and axle 35a, such that the spacer 42a and axle 35a will rotate with the roller 38a.

Roller 37a is secured relative to the axle by a headed fastener 34a, the head of which is received in a recess 45a of the roller 37a and the shaft of which is received in a threaded bore 50 within the axle part 35a.

The roller 37a may be rotatable relative to axle 35a or keyed thereto as in the example shown, but in each case, the rollers 37a,38a, spacer 42a and axle 35a, will rotate relative to the end of a respective elongate element as the end of the elongate element moves axially of the side member 14. The axle 35a is passed through an opening in a limb of the respective side member and passes through an opening in one end of the elongate element received in the respective re-entrant channel formation of the side member, and then the axle 35a and roller 37a are connected together as described.

Arrangements which permit assembly of a guide means from one side only of the side member 14 are possible, in the event that access cannot be gained to both sides of the side member 14.

If desired, the guide means for side member 15 may be arranged to be assembled on site, similarly to the guide means 32,32a described.

In another embodiment, the guide means, instead of comprising roller arrangements, may comprise sliders arranged to slide in their respective re-entrant channel configuration side members 14,15, the sliders being pivotally secured to the ends of their respective elongate elements 12a-12g.

In a preferred embodiment, the top and bottom members 17,18, each also comprise a re-entrant channel configuration which may be of a similar cross sectional configuration to the side member 14 shown in figure 2, or of an alternative re-entrant channel configuration. Preferably though the channels of the top and bottom members 17,18, are deeper than the channels of side members 14,15, as shown in figure 4, to permit up and down movement of the ends of the respective elongate elements 12d, 12k as the security screen 10 is folded and unfolded.

The slidable side member 15 carries at its lower end an insert 55 which has a part 56 which projects upwardly into the member 15, and a part 57 which projects downwardly into the channel of the bottom member 18. The downwardly projecting part 57 has a width W substantially the same as the thickness of a pair of elongate elements 12a-12g and thus substantially fills the space between a pair of inwardly extending lips 29b,30b of the channel member 18.

The upwardly extending part 56 is preferably of channel shape such that channel opening P of side member 15 is not obstructed throughout the full length of the member 15.

At the lower end of the downwardly extending part 57 there is an opening 58 through which passes an axle 59 for a pair of rollers 60.

Thus the side member 15 is guided during its sliding movement, in the channel bottom member 18 by the rollers 60 and is retained relative to bottom member 18.

At its upper end, the side member 15 carries another insert 61 which has a part 62 which projects downwardly into member 15, and a part 63 which projects upwardly into the channel of the top member 17 and substantially fills the space between a pair of inwardly extending lugs 29a,30a.

Again the downwardly extending part 62 is generally channel shaped such that channel opening P is not obstructed, and upwardly extending part has a slot 65 which receives an axle 66 which carries a pair of rollers 67. Thus the side member 15 is guided in the top channel member 17 during sliding, by rollers 67 and is retained relative to the top member 17. The slot 65 is provided so that in the event that the member 15 when moved across the opening 11, is not kept vertical, there is no risk of the rollers 67 jamming in the member 17.

The rollers 60,67 (and elongate elements 12a-12g) are preferably slid into their respective bottom and top members 18,17 from one end, e.g. prior to securing the

members 18,17 to fixed side member 19.

Further modifications may be made without departing from the scope of the invention. For example, the re-entrant channel configurations of at least the side members 14,15, and where appropriate the top and bottom members 17,18, need not comprise intumed lips such as indicated at 29 and 30 in figure 2. Any other suitable re-entrant channel configuration cross section may be provided so long as the respective guide means 32, 32a, 32b are retained in their channels whilst permitting axial movement of the guide means relative to the respective side/top/ or bottom member 14,15,17,18.

In practice, it will be appreciated that the side member 15 will carry one part of a lock L which interengages with a keeper secured relative to side member 19 such that the security screen 10 can be locked in its extended condition.

It will be appreciated that the security screen 10 described provides a significant deterrent and real degree of security against forced entry through the opening 11, where the opening 11 comprises a door or window for example.

However, when the security screen is folded open, the screen does not provide any significant obstacle to access through the opening 11.

The features disclosed in the foregoing description or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, or a class or group of substances or compositions, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

Claims

1. A screen (10) for an opening (11) comprising a plurality of elongate elements (12a-12g) pivotally connected together in a criss cross pattern to provide a generally rectangular assembly (12) which is foldable and unfoldable between an extended condition in which the screen (10) closes the opening (11), and a folded condition in which access may be gained through the opening (11), the screen (10) further comprising along each of two opposite sides, a side member (14,15), at least some of the elongate elements (12a-12g) each being retained at one end thereof relative to a respective side member and being movable axially of the respective side member (14,15) during folding and unfolding of the screen (10), one of the side members (14) being fixed relative to the opening (10) and the other side member (15) being slidable across the opening to effect folding and unfolding of the screen characterised in that each side member (14,15) is, at least in the regions where the one ends of the elongate elements (12a-12g) are retained thereby, of re-en-

trant channel configuration and the retained ends of the respective elongate elements (12a-12g) each carry a guide means (32) which is entrapped in the re-entrant channel (14,15) along the entire extent of axial movement of the one end of the respective elongate element (12a-12g), characterised in that the side members (14,15) have a complex re-entrant configuration, and each side member (14,15) comprises a base (24) having a pair of limbs (25,26) extending therefrom, the free ends of the limbs (25,26) being in-turned to provide front wall parts (27,28), the front wall parts (27,28) themselves each being in-turned to provide lips (29,30) which extend inwardly of the channel.

2. A screen according to claim 1 characterised in that the side members (14,15) are made by rolling.
3. A screen according to claim 1 or 2 characterised in that the limbs (27,28), front wall parts (27,28), and lips (29,30) each provide a track for the respective guide means (32) whereby the guide means (32) can move along the channel and be retained by the channel.
4. A screen according to any one of the preceding claims characterised in that each of the guide means (32) comprises a roller mechanism including at least one roller (37,38; 37a,38a) and an axle (35,35a) which passes through an opening in an end in a respective elongate element (12a-12g) thereby to retain the end of the elongate element (12a-12g) in the channel.
5. A screen according to claim 4 characterised in that the guide means (32) comprises a pair of rollers (37,38) carried on the axle (35), each of the rollers (37,38) being rotatable relative to the axle (35), or fixed relative to the axle (35), the end of the elongate element (12a-12g) being pivotable relative to the axle (35).
6. A screen according to any one of the preceding claims, characterised in that the security screen (10) comprises a further side member (19) which in use is fixed relative to an opposite side of the opening (11) to the fixed side member (14).
7. A screen according to claim 6 characterised in that the slidable side member (15) and the further side member (19) each carry components of a locking mechanism (L) whereby the slidable side member (15) can be locked to the further side member (19) with the screen (10) in its extended condition.
8. A screen according to any one of the preceding claims characterised in that the screen (10) comprises top and bottom members (17,18) which at

least receive and conceal the ends of the pivotally connected elongate elements (12a-12g) at the respective top and bottom of the generally rectangular assembly (10) of elongate elements.

9. A screen according to claim 8 characterised in that the top and/or bottom member (17, 18) comprises a re-entrant channel configuration, the ends of the elongate elements (12a-12g) being received in the re-entrant channel and the slidable side member (15) carrying a guide means (58-60) at at least one end thereof, which moves along the channel (18) and is trapped in the channel, thereby to facilitate sliding of the slidable side member (15), and to retain the movable side member (15) relative to the top (17) and/or bottom members (18).

Patentansprüche

1. Ein Gitter (10) für eine Öffnung (11) mit mehreren länglichen Elementen (12a-12g), die in einem Kreuzmuster drehbar miteinander verbunden sind, um einen im allgemeinen rechteckigen Aufbau (12) bereitzustellen, der zwischen einem auseinandergezogenen Zustand, in dem das Gitter (10) die Öffnung verschließt, und einem gefalteten Zustand, in dem Zugang durch die Öffnung (11) möglich ist, faltbar und entfaltbar ist, wobei das Gitter (10) außerdem entlang jeder von zwei gegenüberliegenden Seiten ein Seitenteil (14, 15) umfaßt, wobei wenigstens einige der länglichen Elemente (12a-12g) jeweils an einem Ende desselben an einem jeweiligen Seitenteil festgehalten werden und während des Faltens und Entfaltens des Gitters (10) axial von dem jeweiligen Seitenteil (14, 15) beweglich sind, wobei eines der Seitenteile (14) an der Öffnung (10) befestigt ist und das andere Seitenteil (15) quer über die Öffnung verschiebbar ist, um ein Falten und Entfalten des Gitters zu bewirken, dadurch gekennzeichnet, daß jedes Seitenteil (14, 15) wenigstens in den Gebieten, in denen die einen Enden der länglichen Elemente (12a-12g) dadurch gehalten werden, eine wiedereinspringende Kanal-konfiguration aufweist und jedes festgehaltene Ende der jeweiligen länglichen Elemente (12a-12g) eine Führungseinrichtung (32) hält, die in dem wiedereinspringenden Kanal (14, 15) entlang des gesamten Ausmaßes der axialen Bewegung des einen Endes des jeweiligen länglichen Elements (12a-12g) eingeschlossen ist, dadurch gekennzeichnet, daß die Seitenteile (14, 15) eine komplexe wiedereinspringende Konfiguration aufweisen und jedes Seitenteil (14, 15) eine Basis (24) mit einem Paar sich davon erstreckenden Schenkeln (25, 26) umfaßt, wobei die freien Enden der Schenkel (25, 26) nach innen gedreht sind, um Vorderwandteile (27, 28) bereitzustellen, wobei die Vorderwandteile

(27, 28) selbst jeweils nach innen gedreht sind, um Lippen (29, 30) bereitzustellen, die sich innerhalb des Kanals erstrecken.

2. Ein Gitter nach Anspruch 1, dadurch gekennzeichnet, daß die Seitenteile (14, 15) durch Walzen hergestellt sind.
3. Ein Gitter nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Schenkel (27, 28), Vorderwandteile (27, 28) und Lippen (29, 30) jeweils eine Schiene für die jeweilige Führungseinrichtung (32) bereitzustellen, wodurch die Führungseinrichtung (32) sich entlang des Kanals bewegen kann und von dem Kanal festgehalten werden kann.
4. Ein Gitter nach irgendeinem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß jede Führungseinrichtung (32) einen Rollmechanismus umfaßt, der wenigstens eine Rolle (37, 38; 37a, 38a) und eine Achse (35, 35a) einschließt, die durch eine Öffnung in einem Ende in einem jeweiligen länglichen Element (12a-12g) hindurchtritt, um dadurch das Ende des länglichen Elements (12a-12g) in dem Kanal festzuhalten.
5. Ein Gitter nach Anspruch 4, dadurch gekennzeichnet, daß die Führungseinrichtung (32) ein Paar Rollen (37, 38) umfaßt, die auf der Achse (35) getragen werden, wobei jede Rolle (37, 38) relativ zu der Achse (35) drehbar oder an der Achse (35) befestigt ist, wobei das Ende des länglichen Elements (12a-12g) relativ zu der Achse (35) drehbar ist.
6. Ein Gitter nach irgendeinem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß das Sicherheitsgitter (10) ein weiteres Seitenteil (19) umfaßt, das im Gebrauch an einer gegenüberliegenden Seite der Öffnung (11) an dem befestigten Seitenteil (14) befestigt ist.
7. Ein Gitter nach Anspruch 6, dadurch gekennzeichnet, daß das gleitfähige Seitenteil (15) und das weitere Seitenteil (19) jeweils Komponenten eines Verriegelungsmechanismus (L) tragen, wodurch das gleitfähige Seitenteil (15) im auseinandergezogenen Zustand des Gitters (10) an dem weiteren Seitenteil (19) verriegelt werden kann.
8. Ein Gitter nach irgendeinem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß das Gitter (10) obere und untere Teile (17, 18) umfaßt, die zumindest die Enden der drehbar verbundenen länglichen Elemente (12a-12g) an der jeweiligen Oberseite und Unterseite des im allgemeinen rechteckigen Aufbaus (10) aus länglichen Elementen aufnehmen und verbergen.

9. Ein Gitter nach Anspruch 8, dadurch gekennzeichnet, daß das obere und/oder untere Teil (17, 18) eine wiedereinspringende Kanalkonfiguration aufweist/aufweisen, wobei die Enden der länglichen Elemente (12a-12q) in dem wiedereinspringenden Kanal aufgenommen werden und das gleitfähige Seitenteil (15) eine Führungseinrichtung (58-60) an wenigstens einem Ende desselben trägt, die sich entlang des Kanals (18) bewegt und in dem Kanal gefangen ist, um dadurch ein Gleiten des gleitfähigen Seitenteils (15) zu erleichtern und das bewegliche Seitenteil (15) an den oberen (17) und/oder unteren Teilen (18) festzuhalten.

Revendications

1. Grille (10) pour une ouverture (11) comprenant plusieurs éléments allongés (12a à 12q) reliés entre eux de façon pivotante suivant une disposition entrecroisée pour fournir un ensemble (12) généralement rectangulaire qui peut se plier et se déplier entre un état déployé dans lequel la grille (10) ferme l'ouverture (11) et un état plié dans lequel on a accès par l'ouverture (11), la grille (10) comprenant en outre, le long de chacun des deux côtés opposés, un élément latéral (14, 15), au moins certains des éléments allongés (12a à 12q) étant retenus, chacun à une de ses extrémités, par rapport à un élément latéral respectif, et étant mobiles axialement par rapport à l'élément latéral respectif (14, 15) pendant le processus de pliage et de dépliage de la grille (10), un des éléments latéraux (14) étant fixe par rapport à l'ouverture (11), l'autre élément latéral (15) pouvant coulisser à travers l'ouverture pour effectuer le pliage et le dépliage de la grille,

caractérisée en ce que :

- chaque élément latéral (14, 15) a, au moins dans les zones où les extrémités des éléments allongés (12a à 12q) sont retenues de cette façon, une configuration ayant la forme d'un profilé rentrant en U, les extrémités retenues des éléments allongés respectifs (12a à 12q) portant chacune des moyens de guidage (32) qui sont pris dans le profilé rentrant en U (14, 15) sur la totalité du déplacement axial de l'extrémité de l'élément allongé respectif (12a à 12q),
- les éléments latéraux (14, 15) ont une configuration rentrante complexe, chaque élément latéral (14, 15) se composant d'une base (24) ayant une paire de branches (25, 26) s'étendant depuis la base, les extrémités libres des branches (25, 26) étant tournées vers l'intérieur pour fournir des parties (27, 28) formant des parois frontales, les parties (27, 28) formant des parois frontales étant elles-mêmes tournées vers l'intérieur pour fournir des lèvres (29, 30)

qui se prolongent à l'intérieur du profilé en U.

2. Grille selon la revendication 1, caractérisée en ce que les éléments latéraux (14, 15) sont constitués par laminage.
3. Grille selon la revendication 1 ou 2, caractérisée en ce que les branches (25, 26), les parties (27, 28) formant des parois frontales et les lèvres (29, 30) fournissent chacune une piste pour les moyens de guidage respectifs (32), grâce à quoi les moyens de guidage (32) peuvent se déplacer le long du profilé en U et être retenus par le profilé en U.
4. Grille selon l'une quelconque des revendications précédentes, caractérisée en ce que chacun des moyens de guidage (32) se compose d'un mécanisme à rouleaux comprenant au moins un rouleau (37, 38 ; 37a, 38a) et un axe (35, 35a) qui traverse une ouverture au niveau d'une extrémité d'un élément allongé respectif (12a à 12q), retenant ainsi, dans le profilé en U, l'extrémité de l'élément allongé (12a à 12q).
5. Grille selon la revendication 4, caractérisée en ce que les moyens de guidage (32) se composent d'une paire de rouleaux (37, 38) portés sur l'axe (35), chacun des rouleaux (37, 38) étant rotatif par rapport à l'axe (35) ou fixe par rapport à l'axe (35), l'extrémité de l'élément allongé (12a à 12q) pouvant pivoter par rapport à l'axe (35).
6. Grille selon l'une quelconque des revendications précédentes, caractérisée en ce que la grille de sécurité (10) se compose en outre d'un élément latéral (19) qui, en cours d'utilisation, est fixe par rapport à un côté de l'ouverture (11) opposé à l'élément latéral fixe (14).
7. Grille selon la revendication 6, caractérisée en ce que l'élément latéral coulissant (15) et l'autre élément latéral (19) portent chacun des composants d'un mécanisme de verrouillage (L), grâce à quoi l'élément latéral coulissant (15) peut être verrouillé par rapport à l'autre élément latéral (19), la grille (10) étant déployée.
8. Grille selon l'une quelconque des revendications précédentes, caractérisée en ce que la grille (10) se compose d'éléments (17, 18) du haut et du bas qui au moins reçoivent et cachent les extrémités des éléments allongés (12a à 12q) reliés de façon pivotante, respectivement au niveau du haut et du bas de l'ensemble (12) généralement rectangulaire d'éléments allongés.
9. Grille selon la revendication 8, caractérisée en ce que la configuration de l'élément (17, 18) du haut

et/ou du bas a la forme d'un profilé rentrant en U, les extrémités des éléments allongés (12a à 12q) étant logées dans le profilé rentrant en U, l'élément latéral coulissant (15) portant au moins au niveau d'une de ses extrémités, des moyens de guidage (58 à 60) qui se déplacent le long du profilé en U (18) et qui sont pris dans le profilé en U, facilitant ainsi le coulissement de l'élément latéral coulissant (15) et permettant de retenir l'élément latéral coulissant (15) par rapport aux éléments du haut (17) et/ou du bas (18). 5 10

15

20

25

30

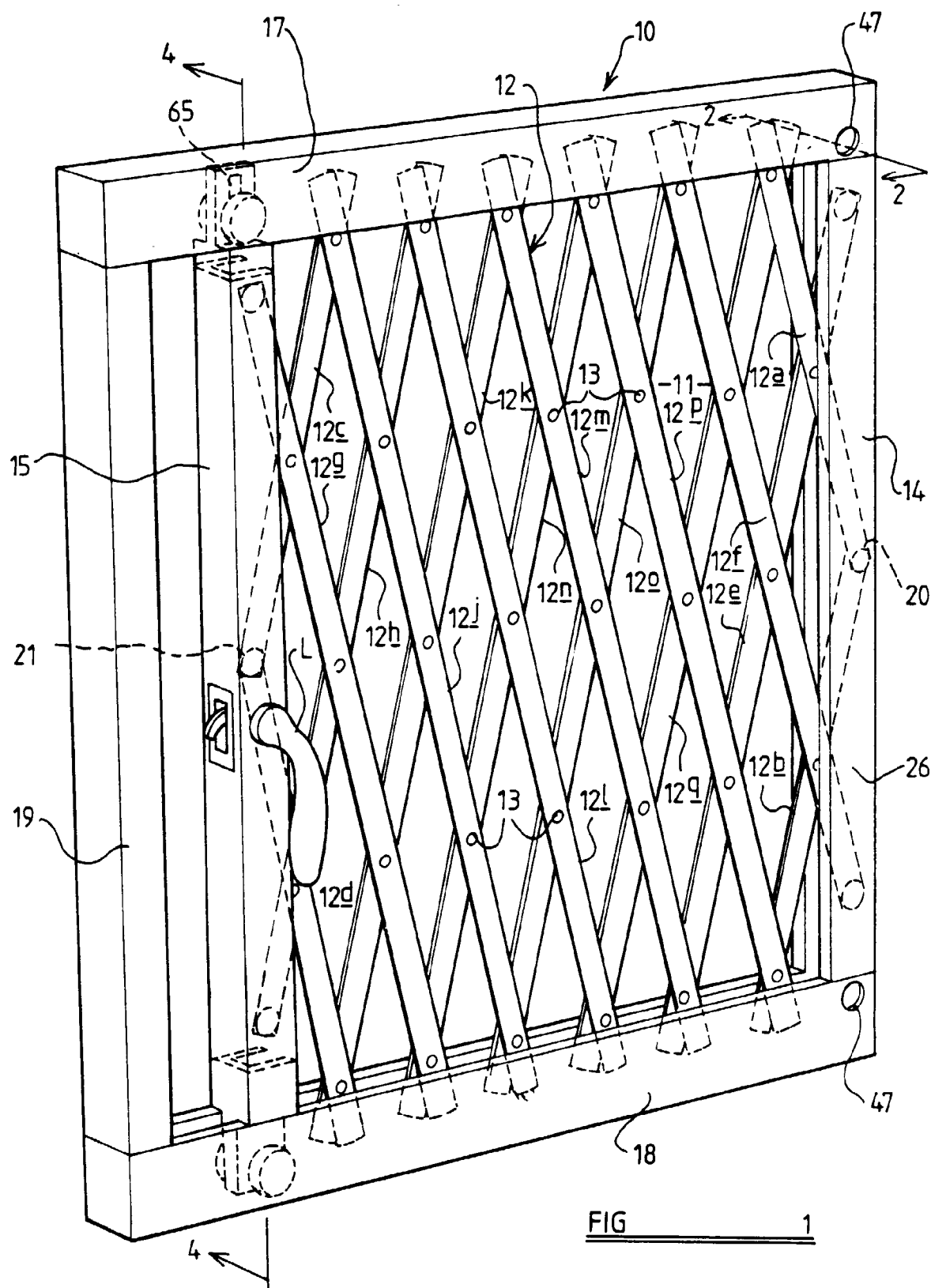
35

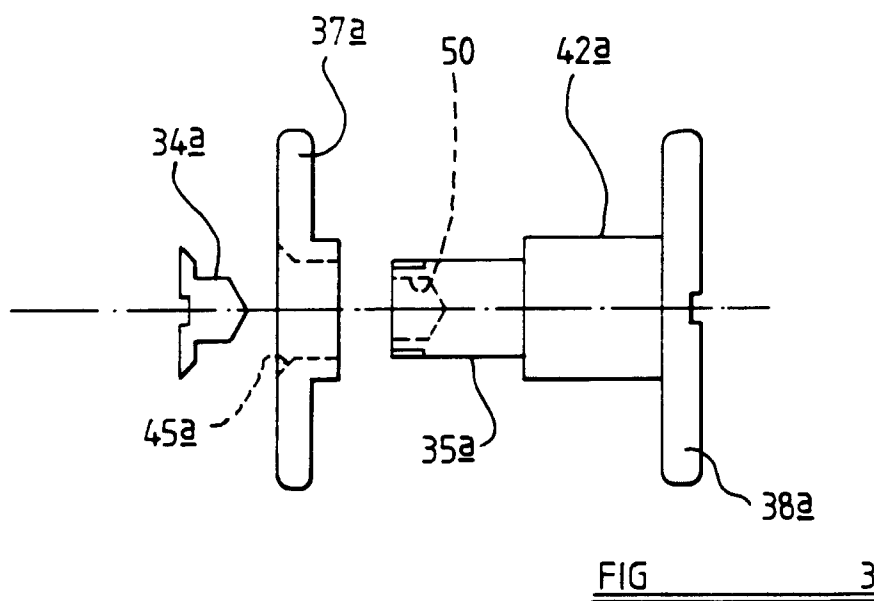
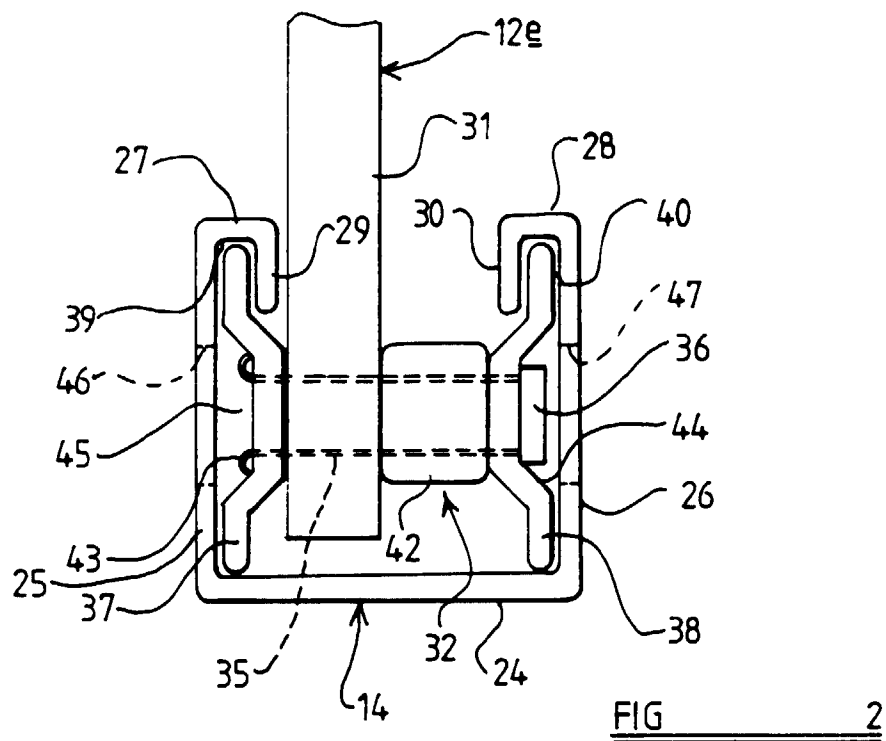
40

45

50

55





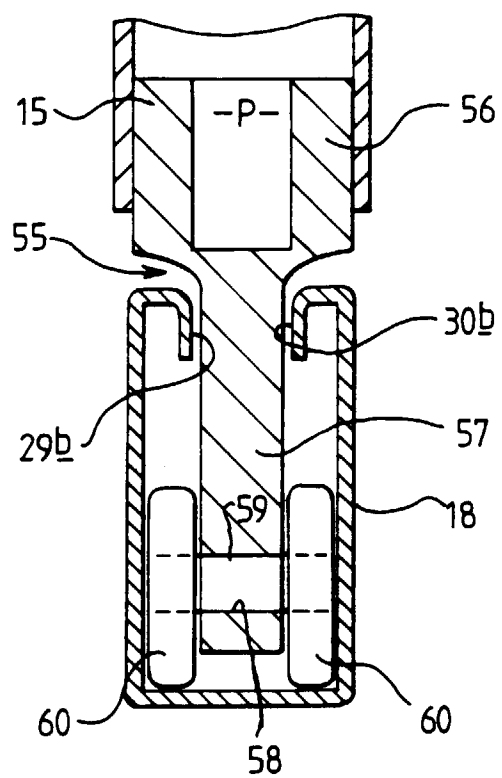
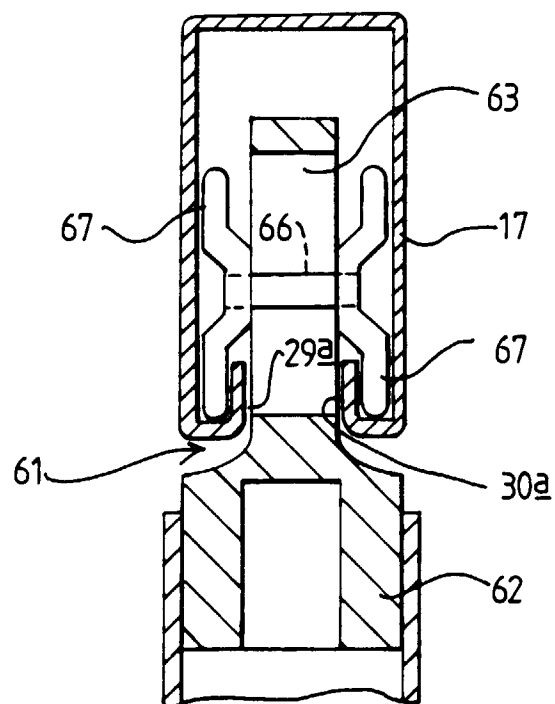


FIG 4