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**E1J JGT J810**

(56) Documents Cited:  
**GB 2332922 A** **GB 2318818 A**

(58) Field of Search:  
UK CL (Edition X ) **E1J**  
INT CL **E06B**  
Other: **Online: EPODOC, WPI**

(54) Abstract Title: **Collapsible Security Grille**

(57) A collapsible security grille comprises a frame consisting of a top rail (1) and a bottom rail (2) and two side members (3). At least one collapsible gate assembly extends between sets of upper and lower runners respectively engaged with and movable along the top and bottom rails. The gate assembly comprising a lattice formed of a plurality of pairs of arms (7), each pair of arms being pivotally connected together at the centres thereof, and the pairs being pivotally linked together with sliding members (8) slidably located in upright channel members (9). The channel member or members (9) at one side of the gate assembly are connected to upper and lower anchor members (18), while the remaining channel members (9) are each secured to a respective upper and lower runner. The anchor members (18) are adjustably attachable to one of the side members and to a respective one of the upper and lower rails, thereby connecting the rails to the side member and anchoring the said side of the gate assembly to the frame.

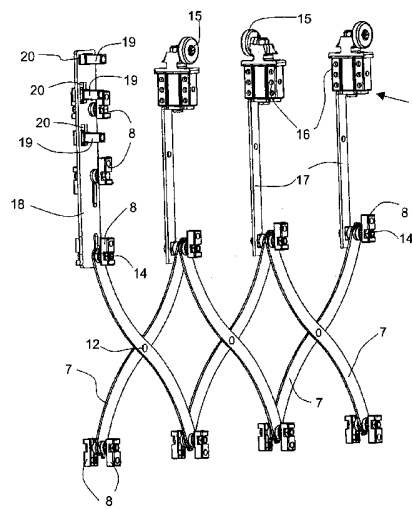
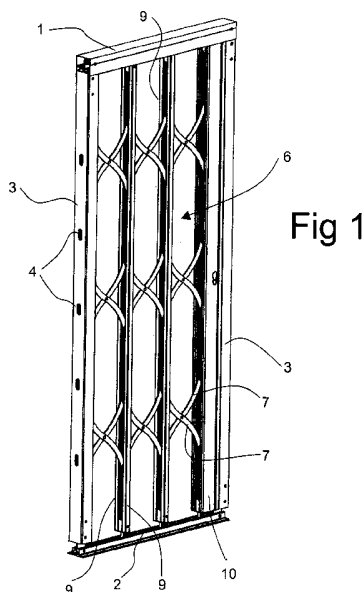


Fig 3

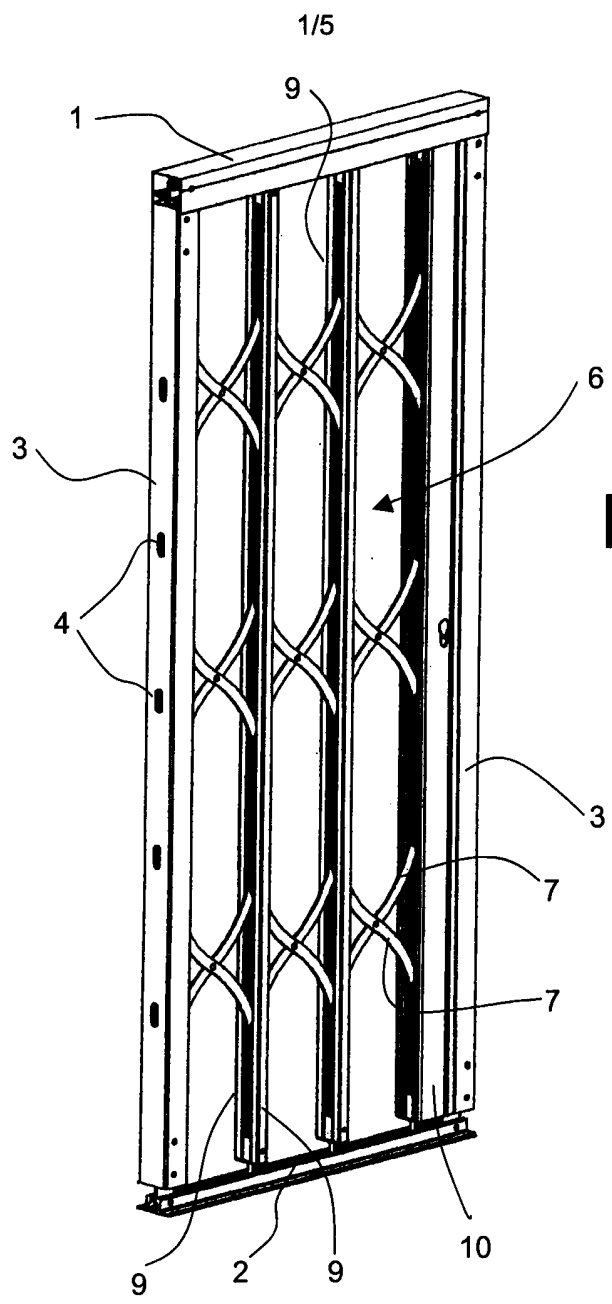


Fig 1

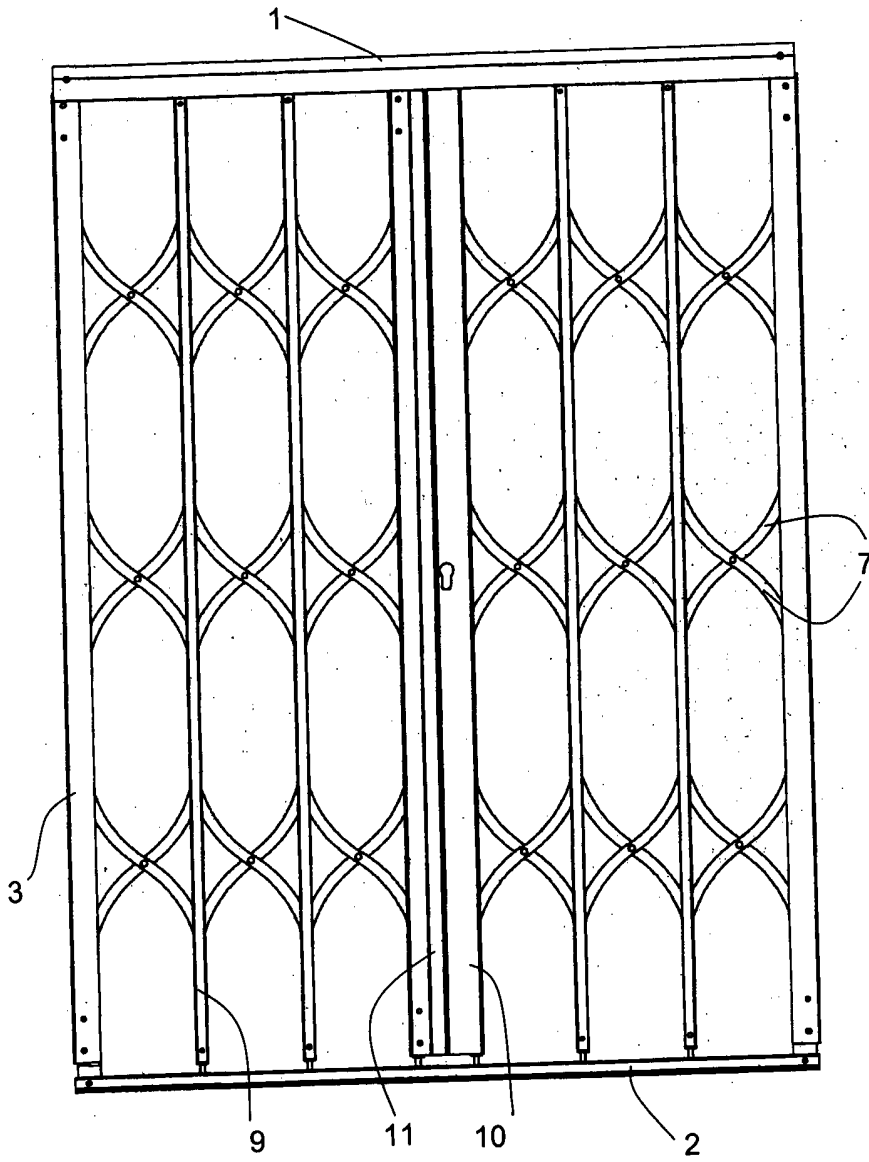


Fig 2a

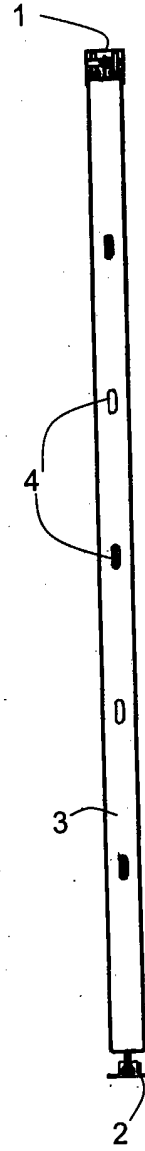


Fig 2b

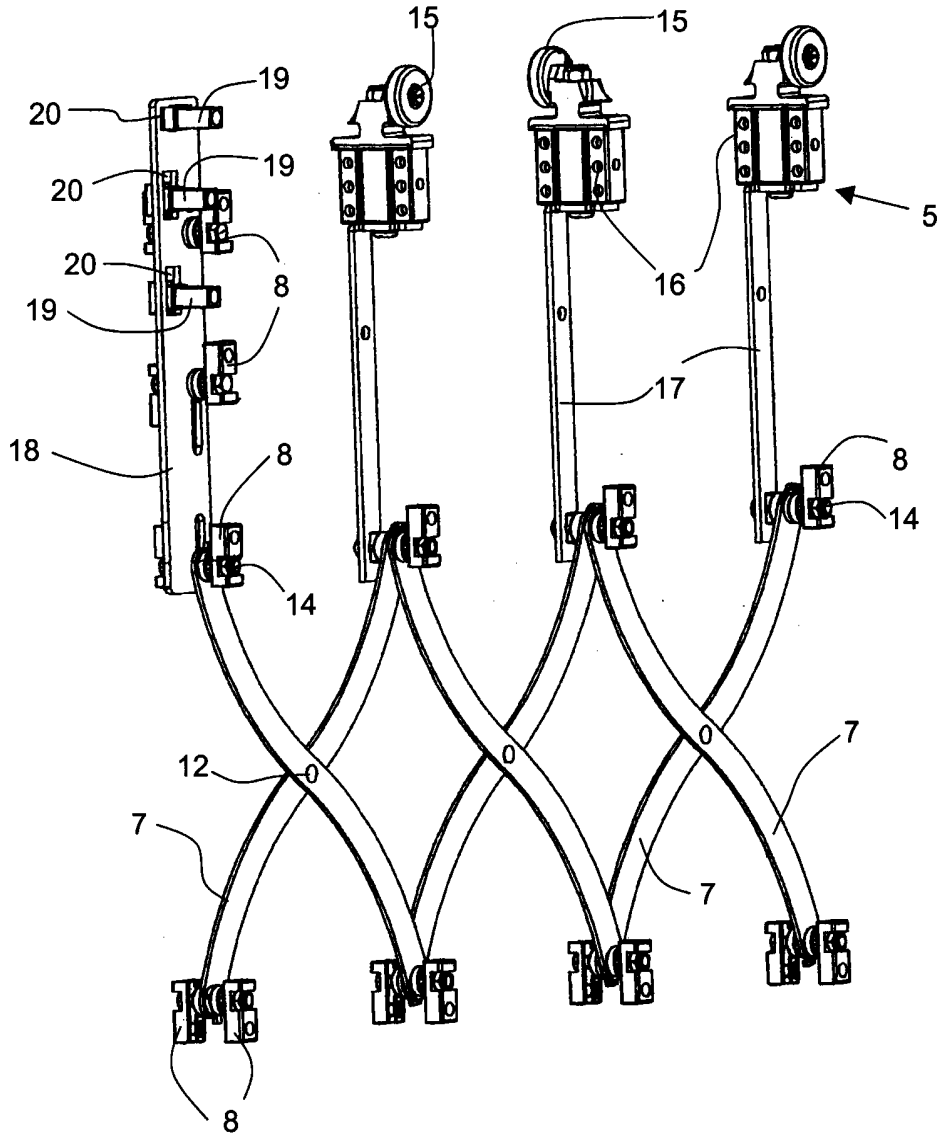


Fig 3

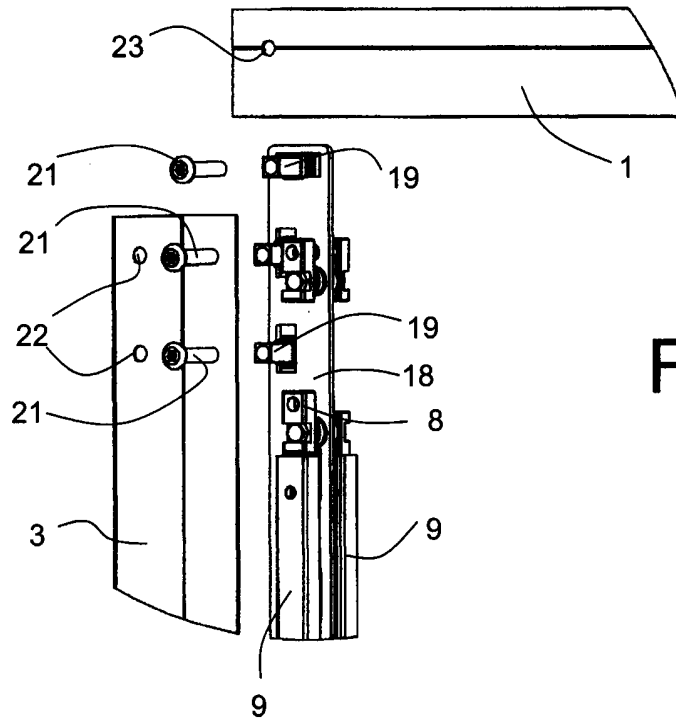


Fig 4

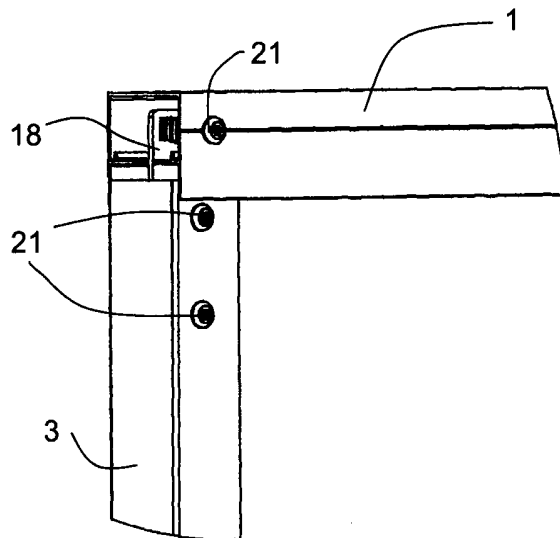


Fig 5

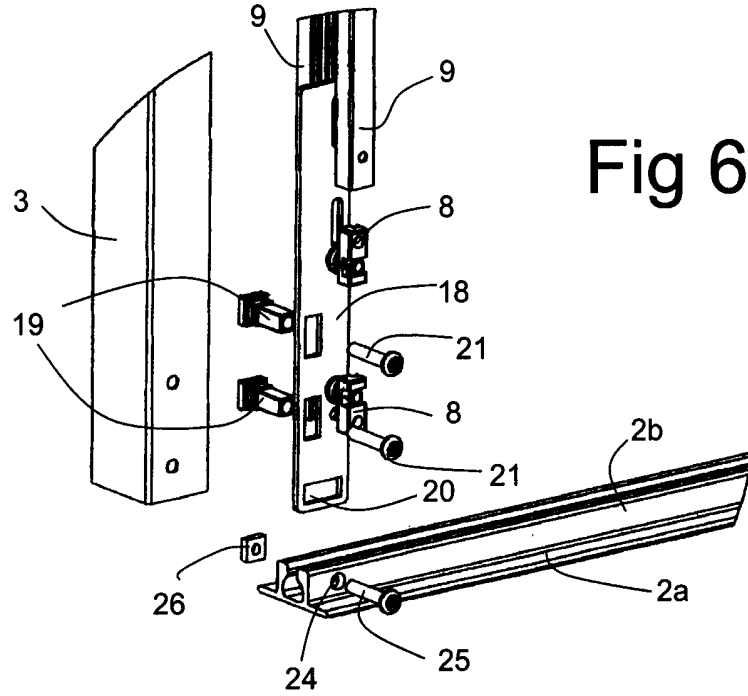


Fig 6

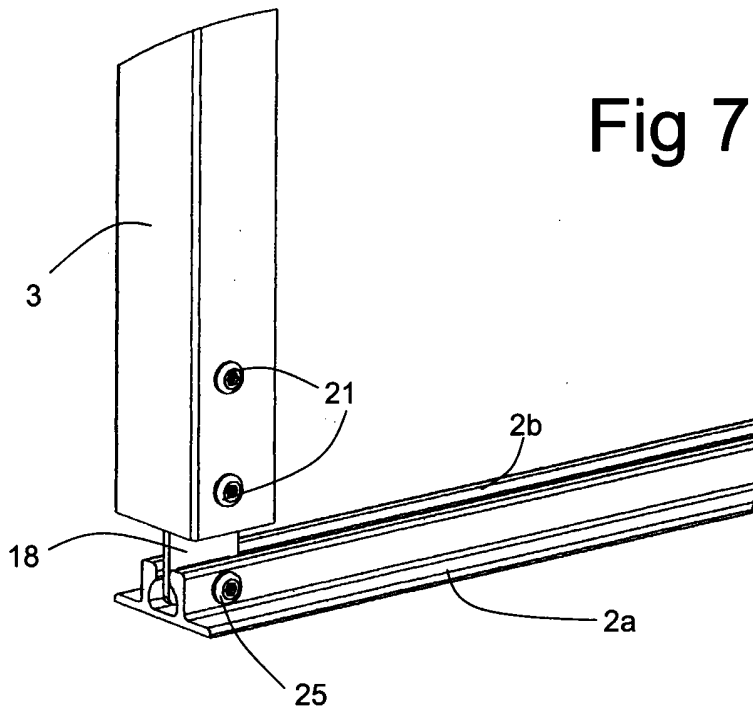


Fig 7

## COLLAPSIBLE SECURITY GRILLE

### Field of the Invention

This invention relates to a collapsible security grille, and to the installation thereof.

### 5 Background to the Invention

Collapsible security grilles are typically fitted in a doorway or window opening to provide additional security. Examples of this type of grille are disclosed in our earlier Patents Nos GB2318818 and GB2333313.

Conveniently, a grille of this general type will consist of a rigid frame in  
10 which a collapsible grille is slidably mounted.

To install the grille, the frame is first assembled with the grille therein and then located in the opening where it is to be installed. The side members of the frame are then attached to the opening by screws engaging suitable anchors. If the grille is a single side-locking grille, the attachment operation on the locking  
15 side is relatively straightforward, as the grille can simply be slid aside to give access for the fixing operation. However, at the opposite side of the grille, being permanently attached to the frame or, in the case of a double centre-locking grille, on both sides, attachment is a difficult and time-consuming operation, because access is restricted by the presence of the grille.

20 In addition, adjustment of the frame to compensate for irregularities of the opening is difficult or impossible when the frame is positioned in the opening, because the frame is preassembled in such a manner that the connections between the frame members are inaccessible when the frame is in position in the opening.

25 The present invention seeks to overcome these difficulties.

### Summary of the Invention

According to the invention, there is provided a collapsible grille comprising a frame consisting of a top rail and a bottom rail and two side members, and at least one collapsible gate assembly extending between sets of upper and  
30 lower runners respectively engaged with and movable along the top and bottom rails, the gate assembly comprising a lattice formed of a plurality of pairs of arms, each pair of arms being pivotally connected together at the centres

thereof, and the pairs being pivotally linked together with sliding members slidably located in upright channel members, the channel member or members at one side of the gate assembly being connected to upper and lower anchor members, while the remaining channel members are each secured to a respective upper and lower runner, the anchor members being adjustably attachable to one of the side members and to a respective one of the upper and lower rails, thereby connecting the rails to the side member and anchoring the said side of the gate assembly to the frame.

Where a single gate assembly is used, the opposite side member of the frame may be attached to the upper and lower rails by adjustable connectors, which may be the same as the anchor members, but without being attached to the gate assembly. Instead, the movable side of the gate may be provided with a stile member engageable with and lockable to the said opposite side member.

Where double, centre-locking, gate assemblies are used, one side of each assembly is anchored to the frame, while the other side is linked to one of a mating pair of stile members which are lockable together.

Preferably, the anchor members are received in the lower rail and are secured therein by a screw passing through the rail and the anchor member. The anchor member may have an elongate slot through which the screw passes to provide adjustability. The screw may engage a square nut held in position by engagement of one side of the nut with the rail to prevent its turning.

The interconnection between the anchor members and the side member of the frame may be by way of internally-threaded bush members passing through non-circular holes in the anchor member and engaged by threaded screws passing through holes in the side member of the frame, on the side thereof facing inwardly of the door or window opening so as to be inaccessible from the outside of the grille.

The grille of the invention is easier to install than conventional grilles, and may be readily adjusted to compensate for variations in the window or door opening. Security is maintained because all fixings can be made inaccessible from the exposed face of the grille.



### **Brief Description of the Drawings**

In the drawings, which illustrate exemplary embodiments of the invention:

Figure 1 is a perspective view of a single gate collapsible security grille;

Figures 2a and 2b are respectively front and side elevational view of a  
5 double gate collapsible security grille;

Figure 3 is a perspective view of a lattice assembly forming a part of a  
gate assembly;

Figure 4 is a perspective view from one side of the connection between  
an anchor member, the top rail and the side frame member, before assembly;

10 Figure 5 is a perspective view from the opposite side of the components  
of Figure 4 after assembly;

Figure 6 is a view corresponding to Figure 4 of the lower rail connection;  
and

Figure 7 is a view of the components shown in Figure 6, after assembly.

### **15 Detailed Description of the Illustrated Embodiments**

Figure 1 illustrates a single gate collapsible grille having a frame formed  
from a top rail 1, a bottom rail 2, and two side members 3, in the form of metal  
channels having fixing holes 4 therethrough to facilitate attachment to the win-  
dow or door opening into which the grille is to be installed. The top rail 1 is in  
20 the form of a channel-shaped aluminium extrusion in which wheeled upper run-  
ners 5 (Figure 3) can be guided, while the bottom rail 2 is an extrusion having  
an elongate slot to guide a lower slide runner/retainer (not shown). The gate 6  
is formed of a plurality of pairs of curved arms 7, each pair being pivotally con-  
nected together at the midpoints thereof, while the ends of the arms are each  
25 pivotally joined to a spaced pair of slide members 8 (Figure 3) serving also to  
link adjacent pairs at each side of the gate. The slide members are slidably  
mounted and retained within channel members 9 on opposed faces of the gate  
so that the connections between the arms are enclosed. On one side, the gate  
is connected to the side member 3, while on the other side it is connected to a  
30 stile member 10 which fits into and is lockable to the opposite side member 3.  
As the gate is slid to one side, the arms pivot and slide in known manner to col-  
lapse the grille against the opposite side.

Figures 2a and 2b illustrate a grille having a pair of opposed gates, each essentially the same as the single gate in Figure 1 and each being anchored at one side to the side member 3 of the frame. The movable ends of the gates are provided with mating stiles 10 and 11 which may be locked together.

5           Figure 3 illustrates the upper section of the lattice assembly forming part of a gate as illustrated in Figure 1 or 2. Each arm 7 has a double curve and is connected together with another to form a pair by means of a central pivot pin 12. The free end of each arm 7 is linked to a plastics slide member 8 through a connecting pin 14 and spacing washers. The intermediate connecting pins 14a  
10       serve to link together the arms of the adjacent pairs. The upper connecting pins 14 each carry a single slide member 8 and a link to an upper runner 5, with the exception of that at the side of the gate which is to connect to the side member 3 of the frame. The upper runners 5 have a supporting wheel 15 which locates in and runs along the upper rail 1, and plastics guide blocks 16 locating in the  
15       lower part of the upper rail to hold the runners square in the rail. The link 17 suspends the lattice at the desired height in the frame. The lower connecting pins 14 each carry a pair of the slide members 8, fitting into the opposed channel members 9 (Figures 1 and 2).

          The pin 14 at the side of the lattice assembly that is to connect to the  
20       side member of the frame carries, as well as the slide member 8, an anchor plate 18, which carries two further slide members 8 pivotally mounted thereon, and three internally threaded plastics bush members 19, each having a square section engageable in a corresponding square or rectangular (allowing sliding adjustment) aperture 20 in the anchor plate 18.

25           The attachment of the anchor plate 18 to the side member 3 and top rail 1 of the frame will be described with reference to Figures 4 and 5. Figure 4 shows the anchor plate 18 connected to the lattice assembly of the gate assembly, although only the channel members 9 are shown for clarity. The bush members 19 are pushed into position in the holes 20, and the anchor plate 18 is  
30       then inserted into the side member 3 of the frame, which has first been attached to the side of the opening while the gate assembly has been slid clear to allow full access for the fixing operation. Fixing screws 21 are then inserted into

holes 22 in the face of the side member 3 which will be inaccessible when the door/window and grille are closed and engaged with the bushes 19 to secure the plate 18. Similarly, a third screw 21 passed through a hole 23 in the top rail 1 to engage the upper bush 19, thereby securing the top rail to the side member of the frame at the same time as anchoring the side of the gate assembly to the frame. Figure 5 shows the complete connection.

Figures 6 and 7 illustrate the fixing of the lower anchor plate 18 to the bottom rail 2 and the lower part of the side member 3. In this case, only two bushes 19 are used, instead of three. The bottom rail 2 is an extrusion, for example of aluminium or aluminium alloy, with a flat strip 2a with a pair of walls 2b upstanding therefrom, shaped so as to provide an elongate slot having a narrow entrance and a wider space within so as to allow the lower runners (not shown) on the gate assembly or assemblies to be guided by and retained in the rail 2. The anchor plate 18 has a rectangular aperture 20 adjacent one end. In the upper fixing this is used to retain the upper bush 19. As may be seen in Figures 6 and 7, the anchor plate 18 is a sliding fit into the entrance of the slot between the walls 2b. Aligned holes 24 are provided through the walls 2b, adjacent to the end of the rail 2, and a screw 25 can pass through these holes and through the aperture 20, to be engaged with a square nut 26, which is prevented from rotation by resting with one side against the strip 2a. The plate 18 is secured to the side member 3 in the same manner as at the top of the frame, and then the screw 25 is tightened to fix the bottom rail 2 to the side member 3, the square aperture 20 allowing for any variation in position due to irregularities in the sides of the opening in the building for the door or window. The resultant joint may be seen from Figure 7. It will again be noted that the screw heads are directed inwardly of the building, and are therefore not accessible from outside.

## CLAIMS

1. A collapsible security grille, comprising a frame consisting of a top rail and a bottom rail and two side members, and at least one collapsible gate assembly extending between sets of upper and lower runners respectively engaged with and movable along the top and bottom rails, the gate assembly comprising a lattice formed of a plurality of pairs of arms, each pair of arms being pivotally connected together at the centres thereof, and the pairs being pivotally linked together with sliding members slidably located in upright channel members, the channel member or members at one side of the gate assembly being connected to upper and lower anchor members, while the remaining channel members are each secured to a respective upper and lower runner, the anchor members being adjustably attachable to one of the side members and to a respective one of the upper and lower rails, thereby connecting the rails to the side member and anchoring the said side of the gate assembly to the frame.

2. A collapsible grille according to Claim 1, having a single gate assembly, and wherein the opposite side member of the frame is attached to the upper and lower rails by adjustable connectors.

3. A collapsible grille according to Claim 2, wherein the adjustable connectors are the same as the anchor members, but without being attached to the gate assembly.

4. A collapsible grille according to Claim 1, 2 or 3, wherein the movable side of the gate assembly is provided with a stile member engageable with the opposite side member or with a corresponding stile member on the other gate assembly, where two gate assemblies are provided.

5. A collapsible grille according to any preceding claim, wherein the anchor members are received in the lower rail and are secured therein by a screw passing through the rail and the anchor member.

6. A collapsible grille according to Claim 5, wherein the anchor member has an elongate slot through which the screw passes to provide adjustability.

7. A collapsible grille according to any preceding claim, wherein the interconnection between the anchor members and the side member of the

frame is by way of internally-threaded bush members passing through non-circular holes in the anchor member and engaged by threaded screws passing through holes in the side member of the frame.

8. A collapsible security grille, substantially as described with reference to, and/or as shown in, the drawings.

Application No: GB0524942.0

Examiner: Mr Philip Lawrence

Claims searched: 1-8

Date of search: 3 April 2006

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A	1	GB2332922 A (BEARE), see whole document.
X	1-7	GB2318818 A (BRADBURY), see esp. Figures 9-11 and related description on page 13 line 6 - page 14 line 10.

**Categories:**

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

E1J

Worldwide search of patent documents classified in the following areas of the IPC

E06B

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI