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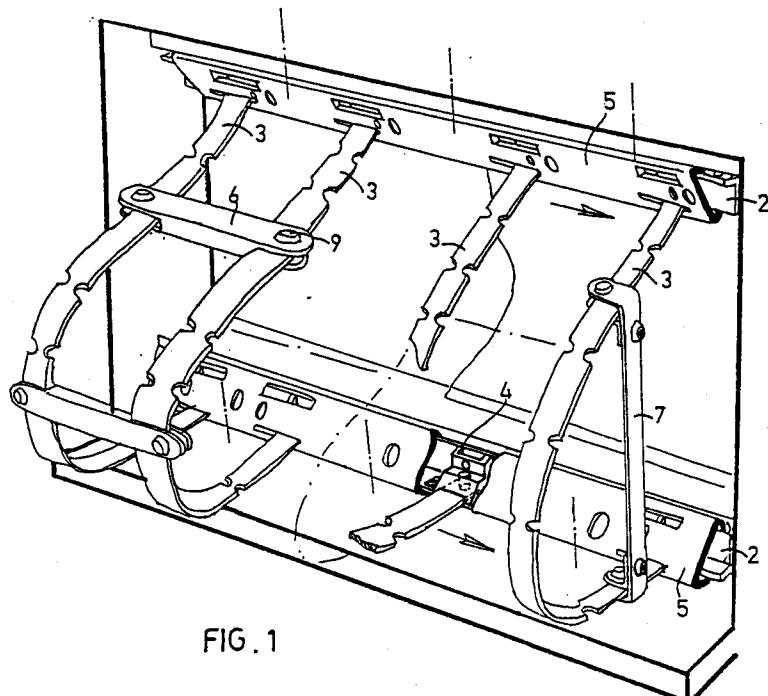
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㉓ Assembly kit for assembling protective window grills.

㉔ An assembly kit for assembling a protective grill over a window in a wall includes a pair of base strips (2) to be anchored to the wall on opposite sides of the window, a plurality of spring metal strips (3) to be applied across the window opening and to be secured at their opposite ends to the base strips (2),

a pair of cover strips (5) covering the base strips and having openings for receiving the ends of the spring metal strips (3) secured to the base strips (2), and a plurality of locking blocks, one for each end of each spring metal strip, for locking the spring metal strips to the base strips.



The present invention relates to protective window grills, and particularly to an assembly kit for assembling a protective grill over a window in order to provide a barrier against a forceful entry through the window.

At the present time, protective grills applied over a window are specially-designed for each window. This requires the grill manufacturer to design the protective grill according to the specific size and configuration of the window and, after the grill has been produced, to anchor the grill to the wall over the window. Such specially-designed protective grills are therefore expensive to produce and time-consuming to install.

An object of the present invention is to provide an assembly kit including preformed elements of a modular design enabling grills to be applied over windows at substantially lower costs and in substantially less time than permitted by the specially-designed grills presently used.

According to the present invention, there is provided an assembly kit for assembling a protective grill over a window in a wall, comprising: a pair of base strips to be anchored to the wall on opposite sides of the window; and a plurality of spring metal strips to be applied across the window opening and to be secured at their opposite ends to the base strips.

According to additional features of the preferred embodiment of the invention described below, the assembly kit further includes a pair of cover strips covering the base strips and having openings for receiving the ends of the spring metal strips secured to the base strips. The assembly kit further includes a plurality of locking blocks, one for each end of each of the spring metal strips, for locking the spring metal strips to the base strips.

According to still further features in the described preferred embodiment, both the spring metal strips and the locking bars are of complementary L-shaped profile. In addition, the locking bars are formed with a groove along the outer face of one of their legs, which groove is of a width to receive the respective end of the spring metal strip secured thereby. The locking bars are also formed with an opening through the one leg for receiving a fastener to secure the respective end of the spring metal strip.

According to still further features in the described preferred embodiment, the locking bars are formed with one of the grooves along the outer face of each of its legs, and with one of the openings through each of its legs for receiving a fastener to secure the respective end of the spring metal strip. The thickness of one of the grooves is larger than that of the other to enable one groove to receive a single spring metal strip, and the other to receive two spring metal strips in stacked rela-

tion to each other.

According to still further features in the described preferred embodiment, the assembly kit also includes a plurality of bracing bars each securable by fasteners transversely across a pair of spring metal strips. In the described preferred embodiment, the bracing bars are formed with recesses at their opposite ends for receiving the spring metal strips. In addition, some of the bracing bars are formed with recesses of a width substantially equal to the thickness of the spring metal strips to receive the end of a single spring metal strip, and others of the bracing bars are formed with recesses of a width substantially twice the thickness of the spring metal strips to receive the ends of two stacked spring metal strips.

As will be described more particularly below, an assembly kit constructed in accordance with the present invention permits protective grills to be produced and applied over windows at substantially lower cost, and in substantially less time, than the specially-designed protective grills now applied over window openings to provide a barrier against a forceful entry through the window opening.

Further features and advantages of the invention will be apparent from the description below.

The invention is herein described, by way of example only, with reference to the accompanying drawings, wherin:

Fig. 1 illustrates one form of protective grill constructed with the elements of an assembly kit in accordance with the present invention;

Fig. 2 is a transverse sectional view more particularly illustrating the assembled grill in place over the window to be protected;

Fig. 3 is an exploded view illustrating the main elements included in the assembly kit for making the protective grill illustrated in Figs. 1 and 2;

Fig. 3a illustrates the manner in which the elements of the assembly kit may be used for producing a protective grill of increased strength if such is desired for any particular application; and

Figs. 4a, 4b and 4c diagrammatically illustrate three types of protective grills which may be produced by the use of the elements of the assembly kit illustrated in Figs. 1-3.

The basic concept involved in the protective grill illustrated in Figs. 1 and 2 is that it utilizes the elements of an assembly kit, which elements are more particularly illustrated in the exploded view of Fig. 3, enabling protective grills of substantially any size and configuration to be installed at the site with a minimum of cost and time. Thus, the assembly kit can include the basic elements in modular form permitting an unskilled person, even the purchaser himself or herself, to assemble the grill over

the window to be protected by utilizing only common tools.

The assembly kit for producing the protective grill illustrated in Figs. 1-3 would include the following basic elements: a pair of base strips, generally designated 2, to be anchored to the wall on opposite sides of the window; a plurality of spring metal strips, generally designated 3, to be applied across the window opening and to be secured at their opposite ends to the base strips 2; a pair of cover strips, generally designated 4, to cover the base strips 2, which cover strips have openings for receiving the ends of the spring metal strips 3 secured to the base strips; a plurality of locking blocks, each generally designated 5, one for each end of the spring metal strip for locking it to the base strips 2; a plurality of bracing bars 6, each securable to extend transversely across a pair of the spring metal strips 3; and one or more vertical bracing bars 7, to be secured to the spring metal strip 3 at one or both ends of the assembled protective grill in order to further brace the protective grill.

The base strips 2, spring metal strips 3, and/or the cover strips 4, could be supplied in the form of continuous strips to be cut to the required length according to the size and configuration of the window to receive the protective grill; alternatively, such elements could be precut to the required size according to the dimensions and configuration of a window opening particularly where the window openings are of standard sizes and configurations.

The only other elements needed for assembling a protective grill to a window are fasteners, such as shown at 8, 9 and 10 in Figs. 1-3. Such fasteners could also be supplied in the assembly kit, or commonly available fasteners could be used for this purpose.

The base strips 2 are of L-shaped profile, including two perpendicular legs 21, 22. Each of the legs 21, 22 is formed with a plurality of openings 23 for receiving the fasteners 8 in order to anchor two of the base strips to the wall WLL on opposite sides of the window WND to be protected by the assembled grill. The legs 21, 22 of the base strip are further formed with a circular array of projections 24 around each fastening opening 23 on the side of the base strip facing the wall WLL to which the base strip is to be anchored, so as to provide water-drainage spaces between the base strip and the wall to which it is anchored.

Each leg 21, 22 of the base strips 2 is further formed with a plurality of elongated openings or slots for receiving the ends of the spring metal strips 3. As shown particularly in Fig. 3, leg 22 of each base strip 2 is formed with a slot 25a of a length and width substantially corresponding to the width and thickness, respectively, of the spring

metal strips 3. The other leg 22, however, is formed with a slot 25b of the same configuration but of double width in order to receive two stacked spring metal strips 3, should it be desired to produce a reinforced grill of double thickness, as will be described more particularly below.

Each leg 21, 22 of the base strips 2 is further formed with a plurality of additional openings 26 flanked on its opposite sides by a slit formation defining a pair of lugs 27, 28. These lugs may be pressed outwardly of the respective leg, for positioning the locking blocks 4 on the base strips 2, before the locking blocks are actually fixed to the base strips, as will also be described more particularly below.

The spring metal strips 3 may be of spring steel of high strength but sufficiently elastic to permit them to be bent into a curve, as shown particularly in Fig. 1. Each is formed with an opening 31, 32 at its opposite ends for receiving the pins of the locking blocks 4 for anchoring the strips 3 to the base strips 2. In addition, the opposite edges of the spring metal strips 3 are formed with semi-circular notches 33 along their lengths for locating and receiving the bracing bars 6.

The locking blocks 4 are also of L-shaped profile, including two legs 41, 42. Blocks 4 may be made of hard plastic or of metal. Each leg 41, 42, is formed with a throughgoing opening 43, 44 for receiving a locking pin 45. In addition, the outer face of each leg 41, 42 is formed with a groove 46a, 46b, of a width substantially equal to that of the spring metal strips 3 in order to receive the end of the spring metal strip to be secured thereto and to the respective base strip 2.

As shown particularly in Fig. 3, the thickness of groove 46a formed in leg 41 is indicated as "x", whereas the thickness of groove 46b located in leg 42 is indicated as "y". The thickness "x" of groove 46a is substantially the thickness of the spring metal strips 3 so as to accommodate a single one of such strips; whereas thickness "y" of groove 46b is twice that of "x", so as to accommodate the ends of two spring metal strips 3, should it be desired to assemble a stronger grill having double thickness.

The cover strips 5 cover the base strips 2 and also the locking blocks 4 after the spring metal strips 3 have been secured to the base strips by means of the locking blocks. Thus, each cover strip 5 is of C-configuration, being formed with a pair of inwardly-directed ends 51, 52 along its opposite edges for slidably receiving the edges of the two legs 21, 22 of the base strips 2.

In addition, each cover strip is formed with a plurality of slots 53a along one edge, and another plurality of slots 53b along its opposite edge. Slots 53a are of a height "x", corresponding to the

height "x" of the slots 25a formed in leg 21 of the base strip 2 for receiving a single-thickness spring metal strip 3, whereas slots 53b are of the height "y" of slot 25b in leg 22 of the base strip 2 for receiving double-thickness strips 3. The length of each slot 53a, 53b, is about twice the length of the slots 25a, 25b in the base strips 2. This enables each cover strip 5, after the spring metal strips 3 have been fixed to the base strips 2 by means of the locking blocks 4, to be slid over the base strips and thereby to cover them as well as the locking blocks.

The cover strips 5 are further formed with openings 56 for receiving pins 45 used for fastening the ends of the spring metal strips 3 via locking block 4 to the base strips 2. Openings 56 are preferably of oblong configuration to accommodate pins 45 in either position of the cover strip 5, i.e., with its large-width slot 53b oriented upwardly or downwardly.

Each cover strip 5 is further formed with a slit formation defining lugs 54, 55 which may be pressed inwardly after the cover strips have been moved to their final position covering the locking blocks 4, in order to fix the cover strips in this final position.

The bracing bars 6 are securable by the fasteners 9 transversely across a pair of the spring metal strips 3 after the latter strips have been fixed to the base strips 2. They are formed, at each of their opposite ends, with a recess 61 for receiving the respective spring metal strip 3, and with an opening 62 for receiving the fastener 9 fixing the bracing bar to the respective spring metal strip 3.

The assembly kit would include a plurality of bracing bars, as indicated at 6 in Fig. 3, in which the end recesses 61 are of a depth "x", and another plurality of bracing bars, as shown at 6' in Fig. 3a, in which the end recesses 61' are of a depth "y". Thus, when the grill is to include single-thickness strips 3, the bracing bars 6 would be used, and when it is to include the double-thickness strips, shown at 3' in Fig. 3a, the bracing bars 6" would be used.

The vertical bracing bars 7 are applied to one or both ends of the assembled grill, particularly where the spring metal strips 3 are assembled with an outwardly-extending bulge, as shown in Fig. 1. Such bulges are commonly provided in window grills in order to accommodate bedding or the like to be placed before an open window for airing. When such a bulge is provided in the grill, the vertical bracing strips 7 are applied to one or both end strips 3 on opposite sides of the bulge, as shown in Fig. 1. The bracing bar 7 includes, at each of its opposite ends, a pair of spaced lugs 71, 72 formed with openings 73, 74, for receiving the fasteners 10 securing the bracing bars to the end

spring metal strip 3.

As indicated earlier, fasteners 8, 9 and 10 may be any suitable commonly-available fastener. Thus, fastener 8, used for anchoring the base strips 2 to the wall on opposite sides of the window, is of the type which includes an expandable sleeve 81 anchored in the wall, and a bolt 82 threaded via opening 23 in base strip 2 into the expandable sleeve 81. The head of bolt 82 is covered by the cover strip 5 so that it would not be accessible from the outside.

Fastener 8 is used as the main fastener for anchoring the base strip 2 to the wall via opening 23 in one leg of the base strip. A second fastener 83 is provided to be passed through opening 23 in the other leg of the base strip 2 for further anchoring the base strip to the wall.

Fasteners 9 for securing the bracing bars 6 transversely across pairs of spring metal strips 3 are shown as being of the type which includes a bolt 91 having a detachable head 92, receivable within a nut 93. Thus, when the bolt 91 has been fastened via the nut 93, head 92 may be broken off in order to prevent removable of the fastener.

Fasteners 10 for securing the vertical bracing bar 7 to the grill assembly may be of a similar type as fastener 9, including a bolt 101 having a breakable head 102, and receivable within a nut 103. It will be appreciated that other fasteners may be used, e.g., rivets or the like.

The protective grill is assembled in the following manner:

First, the user decides whether the grill to be assembled is to include single-thickness spring metal strips 3, as shown in Figs. 1, 2 and 3, or double-thickness spring metal strips 3, as shown at 3' in Fig. 3a. In addition, the user decides which of the three grill configurations, as illustrated in Figs. 4a, 4b, and 4c, is to be assembled. Thus, Fig. 4a illustrates a protective grill including double-thickness spring metal strips 3 with no bulge formed in the protective grill; Fig. 4b illustrates a grill of single-thickness spring metal strip 3 recessed within the wall and containing a bulge; and Fig. 4c illustrates a grill of single-strip thickness with a bulge but applied over a non-recessed window.

If the grill configuration illustrated in Fig. 4a is to be assembled, the two base strips 2 are secured to the opposite sides of the window with their legs 22 containing the wider slots 25b occupying the horizontal position. Blocks 4 are then applied with their enlarged-thickness grooves 46b assuming the vertical positions so as to receive the double-thickness strips 3. Each block 4 is located, by lugs 27, 28 of base strips 2, with opening 43 of the locking block in alignment with opening 26 of the base strip.

The cover strips 5 are then applied over the

base strips 2 and over the locking blocks 4, with the larger-width slots 53b in alignment with the larger-width slots 25b in the base strip 2.

The ends of spring metal strips 3, in stacked relationship as shown at 3' in Fig. 3a, are then passed through slots 53b in the cover strip 5, through grooves 46 in the locking blocks 4, and through slots 25b in the base strip 2; and pins 45 are then inserted through the openings 56 in the cover strips 5, openings 43 in the locking blocks 4, openings 26 in the base strips 2, and openings 31 (or 32) in the double spring metal strips 3', thereby locking the spring metal strips to the base strips. The cover 5 is then slid laterally, this being permitted by the double-length of its slots 53b (and also 53a), so as thereby to cover the pins 45 securing the above parts together; and lugs 54, 55 are then pressed inwardly to straddle the opposite sides of the locking blocks 4, and thereby to fix the cover strips 5 in position.

The bracing bars 6 may then be applied transversely across pairs of the spring metal strips 3, as desired, by using fasteners 9; and finally the vertical bracing bar 7 may be applied to one or both ends of the assembled grill by the use of the fasteners 10.

It will be appreciated that the grill assemblies illustrated in Fig. 4b or 4c may be assembled in a similar manner, by properly orienting the various parts according to the specific configuration to be assembled, which will be readily apparent from Figs. 4b and 4c.

While the invention has been described with respect to one preferred embodiment, it will be appreciated that many variations, modifications and other applications of the invention may be made. Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. An assembly kit for assembling a protective grill over a window in a wall, comprising:
a pair of base strips to be anchored to the wall on opposite sides of the window;
and a plurality of spring metal strips to be applied across the window opening and to be secured at their opposite ends to said base strips.
2. The assembly kit according to Claim 1, further including a pair of cover strips covering said base strips and having openings for receiving

the ends of the spring metal strips secured to the base strips.

3. The assembly kit according to Claim 2, further including a plurality of locking blocks, one for each end of each of said spring metal strips, for locking the spring metal strips to the base strips.
4. The assembly kit according to Claim 3, wherein both of said spring metal strips and said locking bars are of complementary L-shaped profile.
5. The assembly kit according to Claim 4, wherein said locking bars are formed with a groove along the outer face of one of its legs, which groove is of a width to receive the respective end of the spring metal strip secured thereby, and with an opening through the one leg for receiving a fastener to secure the respective end of the spring metal strip.
6. The assembly kit according to Claim 5, wherein said locking bars are formed with one of said grooves along the outer face of each of its legs, and with one of said openings through each of its legs for receiving a fastener to secure the respective end of the spring metal strip.
7. The assembly kit according to Claim 6, wherein the thickness of one of said grooves is larger than that of the other to enable one groove to receive a single spring metal strip, and the other to receive two spring metal strips in stacked relation to each other.
8. The assembly kit according to any one of Claims 2-7, wherein said openings in the cover strips are of larger width than the width of the spring metal strips permitting the cover strips, after the spring metal strips have been fastened by said locking blocks to the base strips, to be slid over the base strips and to cover the locking blocks.
9. The assembly kit according to any one of Claims 1-8, further including a plurality of bracing bars each securable by fasteners transversely across a pair of spring metal strips.
10. The assembly kit according to Claim 9, wherein said bracing bars are formed with recesses at their opposite ends for receiving the spring metal strips.

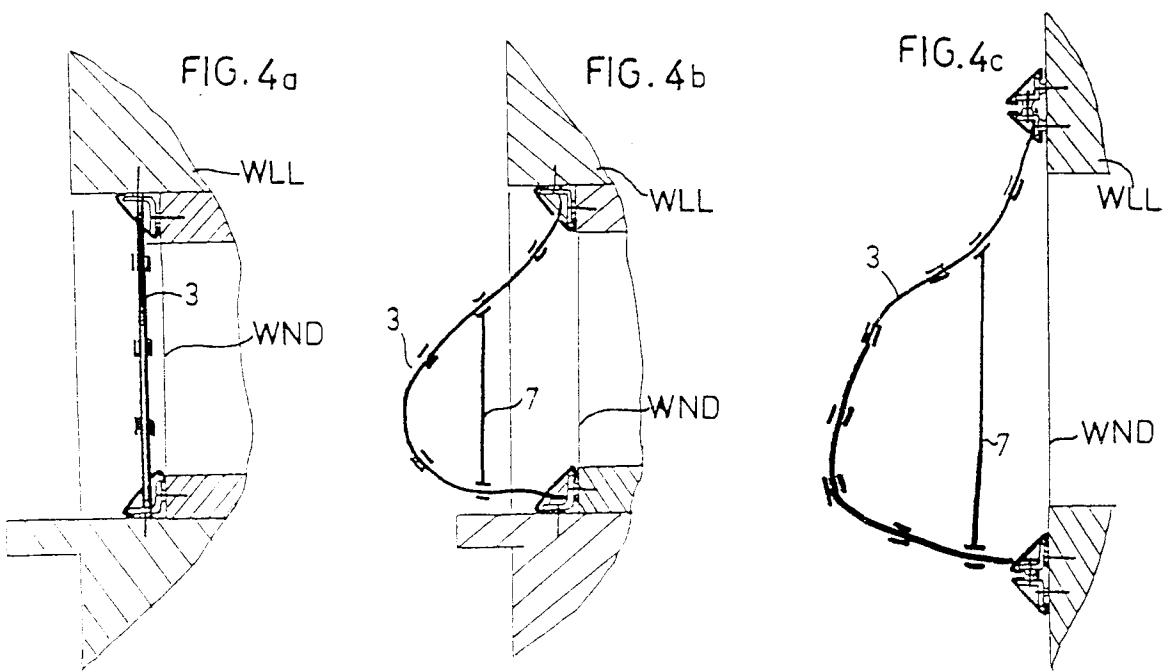
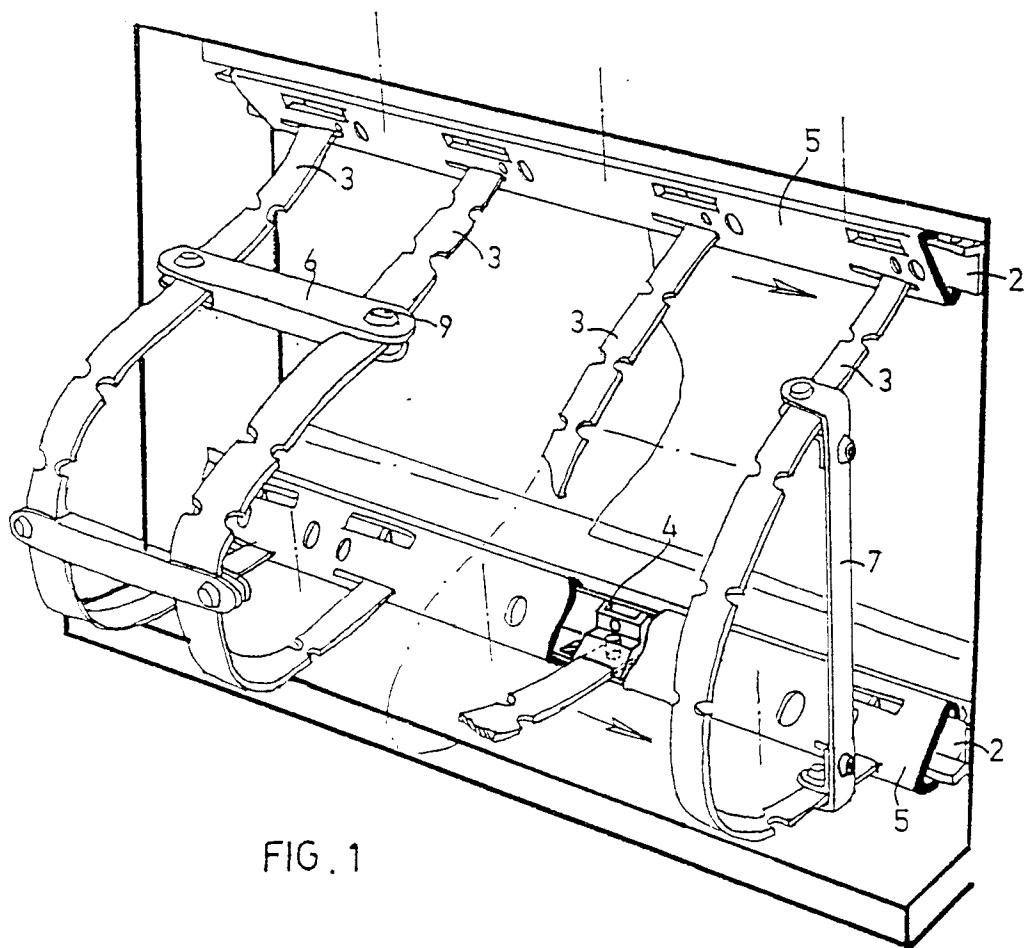
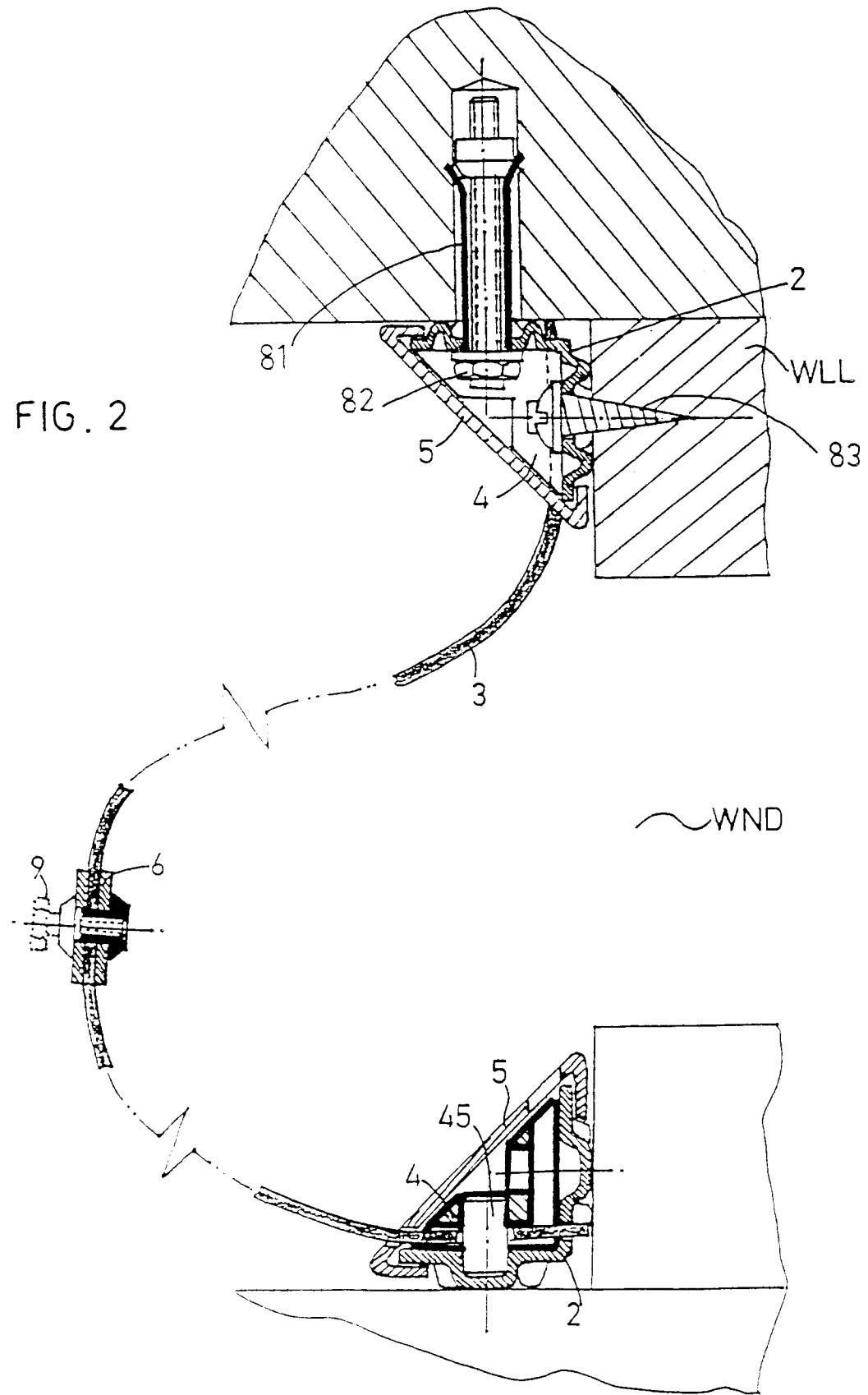
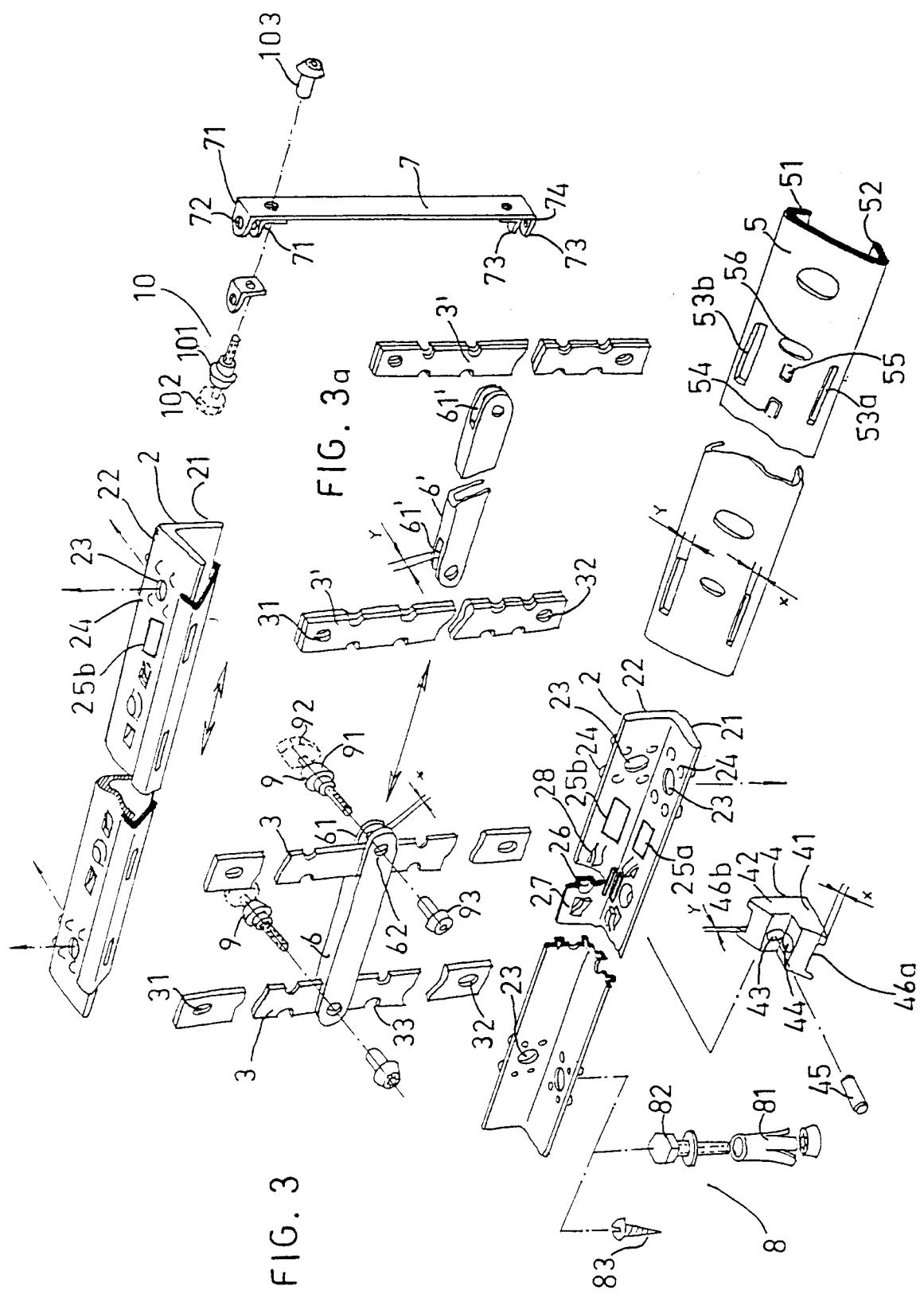


FIG. 2







**European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 91 12 1153

DOCUMENTS CONSIDERED TO BE RELEVANT

DOCUMENTS CONSIDERED TO BE RELEVANT					
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)		
Y	DE-U-8 910 321 (STIELS) * page 4, last paragraph - page 5, paragraph 1; figures *	1,2,9	E0689/01		
A	---	8			
Y	FR-A-2 330 826 (BEVERSDORF) * the whole document *	1,2,9			
A	---	8,10			
A	EP-A-0 119 971 (MECCANICA INVICTA SRL) * page 3, line 17 - line 28; figures *	3,4			
A	DE-U-8 622 301 (LOEVEN) ---				
A	US-A-1 962 569 (MILLER) -----				
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)		
			E06B		
The present search report has been drawn up for all claims					
Place of search	Date of completion of the search	Examiner			
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