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(11) **EP 0 822 312 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**04.02.1998 Bulletin 1998/06**

(51) Int. Cl.<sup>6</sup>: **E06B 9/15, E05D 1/04**

(21) Application number: **97202308.9**

(22) Date of filing: **24.07.1997**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC  
NL PT SE**  
Designated Extension States:  
**AL LT LV RO SI**

(72) Inventor:  
**Van Hout, Peter William  
1121 GE Landsmeer (NL)**

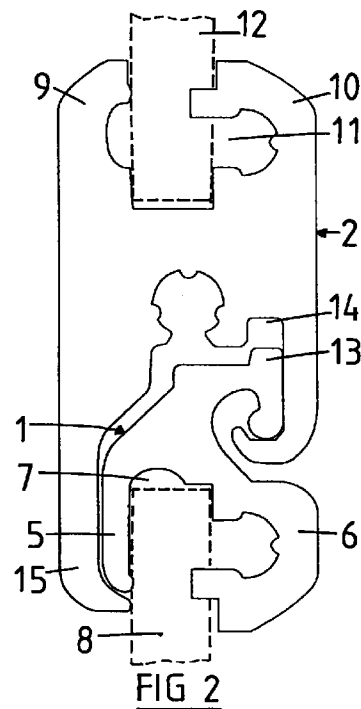
(30) Priority: **30.07.1996 NL 1003707**

(74) Representative:  
**Voncken, Bartholomeus Maria Christiaan  
Octrooibureau Los en Stigter B.V.  
Weteringschans 96  
1017 XS Amsterdam (NL)**

(71) Applicant: **Megasec B.V.  
1013 GM Amsterdam (NL)**

(54) **Hinge**

(57) The invention relates to a hinge for connecting two panel-shaped elements, comprising two hinge parts pivotable with respect to each other and which each at one side are provided with a projection and recess, respectively, for cooperation with the other hinge part and which at the opposite side are provided with a receiving opening for an edge of a panel-shaped element. At its one side one of said hinge parts is provided with an extension which in an extreme hinge position may engage a side face of the panel-shaped element that is received in the other hinge part.



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## Description

The invention relates to a hinge for connecting two panel-shaped elements, comprising two hinge parts pivotable with respect to each other and which each at one side are provided with a projection and recess, respectively, for cooperation with the other hinge part and which at the opposite side are provided with a receiving opening for an edge of a panel-shaped element.

Such a hinge is already known from Dutch patent application 89.00592. Among others, hinges of this type are applied in collapsible roller shutters for protecting shop-premises. The hinge parts ensure the collapsibility of the roller shutter around the central axis. In the collapsed position of the roller shutter the hinge parts generally enclose an angle, whereas in the extended position the hinge parts generally are aligned.

In the extended position it often appears, that the roller shutter provides a certain degree of movability; often, for example under influence of wind, this movability goes along with disturbing noises.

It is an object of the invention to provide a hinge of the type mentioned before, using which this disadvantage can be avoided in a simple, but nevertheless effective way.

Thus the hinge according to the invention is characterised in that at its one side one of said hinge parts is provided with an extension which in an extreme hinge position may engage a side face of the panel-shaped element that is received in the other hinge part.

When applied in a roller shutter the extension engages the side face of the respective panel-shaped element when the roller shutter is in its extended position. As a result a firm coherence is obtained between the elements defining the roller shutter, such that the movability of the roller shutter is dramatically decreased and, for example under influence of wind, hardly any or no disturbing noises are created.

In this aspect the extension may be dimensioned such that the hinge is optimally adapted to collapsing the roller shutter; then said extension in the collapsed position also provides a support for a hinge of the adjacent winding layer.

Preferably the extension is dimensioned such that it will engage the panel-shaped element without contacting the other hinge part. Like this the advantage is obtained that the engagement of the extension with the panel-shaped element is guaranteed, also in case of small dimensional defects (as a result of fabrication or as a result of assembling). For, it should be avoided that the extension already engages the other hinge part before contacting the panel-shaped element. If this would be the case the engagement between the extension and the other hinge part would obstruct a continued pivoting of the hinge parts relative to each other, such that the extension would not engage the panel shaped element.

Further an embodiment of the hinge according to the invention is mentioned, in which the extension is part of the hinge part that is provided with the recess. Although this embodiment offers constructive advantages, it should not be excluded that the extension may be part of the hinge part that is provided with the projection.

Finally it is advantageous, if the extension is an oppositely directed continuation of one of the legs of the hinge part. With this embodiment a proper operation is combined with a high degree of simplicity, whereas moreover the possibility is created to give a planar contour to the respective side of the hinge part which extends from the outer end of the extension towards the outer end of the respective leg. Consequently a hinge is obtained having a planar appearance without disturbing steps, recesses or alike.

Hereinafter the invention will be elucidated referring to the drawing, in which an embodiment of the hinge according to the invention is illustrated. Herein:

fig. 1 shows an embodiment of the hinge according to the invention in a first position;

fig. 2 shows the hinge of fig. 1 in a second position;

fig. 3 shows the hinge of fig. 1 in a third position, and

fig. 4 shows a largely collapsed roller shutter provided with hinges according to fig. 1.

The position of the hinge according to the invention illustrated in fig. 1 corresponds with the position of the hinges in a collapsed position of the roller shutter in correspondence with fig. 4. The illustrated hinge comprises a first hinge part 1 and a second hinge part 2 connected thereto. At one of its sides the first hinge part 1 is provided with a projection 3 which, in order to pivotably interconnect the hinge parts 1 and 2, cooperates with a recess 4 at one side of the second hinge part 2.

At the side facing away from the projection 3 the first hinge part 1 is provided with two legs 5 and 6 between which a receiving opening 7 is defined for receiving the edge of a panel-shaped element 8. The manner in which both legs 5 and 6 cooperate with a panel-shaped element 8 is known per se and thus does not need any further explanation.

In a corresponding way the second hinge part 2 comprises at its side facing away from the recess 4 two legs 9 and 10 and therebetween a receiving opening 11 for receiving a panel-shaped element 12.

Of course the shape of the projection 3, the recess 4 and the legs 5, 6 and 9, 10, respectively, may be varied in many ways. This also applies to the configuration of the remaining parts of the hinge parts 1 and 2. Thus it is possible that, as illustrated, the first hinge part 1 comprises a lip 13 shaped on the projection 3 which, in the position of the hinge illustrated in fig. 3, may cooperate with a slot 14 defined in the other hinge part 2 for locking the hinge parts. For a detailed description refer-

ence is made to Dutch patent application 89.00592.

At its side facing away from the legs 9 and 10 the second hinge part 2 comprises an extension 15. In the illustrated embodiment this extension is an oppositely directed continuation of leg 9. As a result a smooth appearance is obtained at said side of the hinge part 2.

In an extreme hinge position of the hinge parts 1 and 2 the extension 15, as is visible in fig. 2, engages with its free end a side face of the panel-shaped element 8 received in hinge part 1. In this aspect the extension is dimensioned such, that it may engage the panel shaped element 8 without touching the hinge part 1, especially its leg 5. Consequently the extension 15 defines an obstruction for uncontrolled movements of the panel-shaped element 8 (together with the first hinge part 1) relative to the panel-shaped element 12 (together with the second hinge part 2). As a result it can be avoided in the position shown in correspondence with fig. 2 or fig. 3, that a roller shutter provided with hinges according to the invention will rattle, for example under influence of wind, and will create undesired noises.

Needless to say, that in the position illustrated in fig. 3 the extension 15 engages the panel-shaped element 8 in a corresponding manner, however in this position, as noted before, the lip 13 engages the slot 14 for creating an additional latching between the hinge parts 1 and 2 of the hinge.

The roller shutter, which is illustrated in a largely collapsed position in fig. 4, is provided with a large amount of panel-shaped elements 16 which are interconnected by means of hinges according to the invention. From this figure it appears that in the collapsed position of such a roller shutter the extension 15 provides an additional function. As appears, such an extension 15 supports both hinge parts 1 and 2 of a hinge of an adjacent winding layer. Through dimensioning the extension 15 in an appropriate manner it is possible like this to obtain an extremely controlled and stabilised winding of the roller shutter onto a central axis 17.

The invention is not limited to the embodiment described before, which can be varied widely within the scope of the invention as described by the claims.

#### Claims

1. Hinge for connecting two panel-shaped elements, comprising two hinge parts pivotable with respect to each other and which each at one side are provided with a projection and recess, respectively, for cooperation with the other hinge part and which at the opposite side are provided with a receiving opening for an edge of a panel-shaped element, **characterised**, in that at its one side one of said hinge parts is provided with an extension which in an extreme hinge position may engage a side face of the panel-shaped element that is received in the other hinge part.

2. Hinge according to claim 1, **characterised** in that the extension is dimensioned such that it will engage the panel-shaped element without contacting the other hinge part.

3. Hinge according to claim 1 or 2, **characterised** in that the extension is part of the hinge part that is provided with the recess.

4. Hinge according to one of the previous claims, **characterised** in that the extension is an oppositely directed continuation of one of the legs of the hinge part.

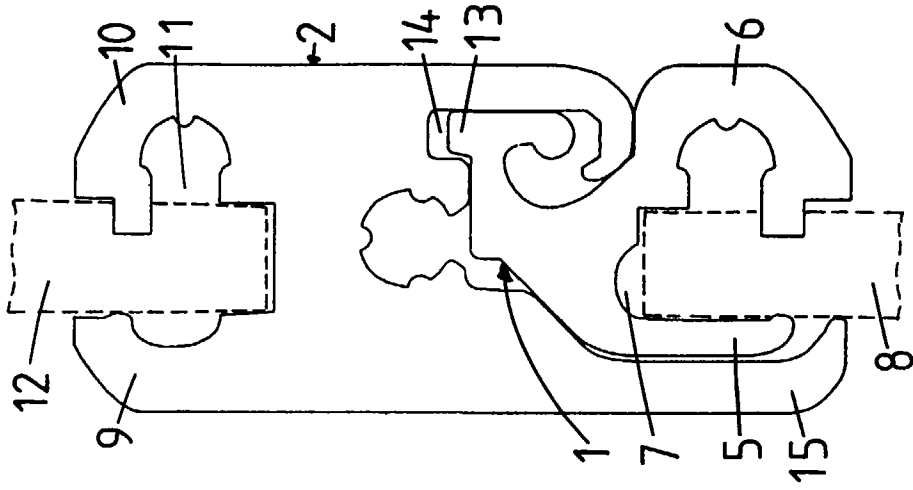


FIG 3

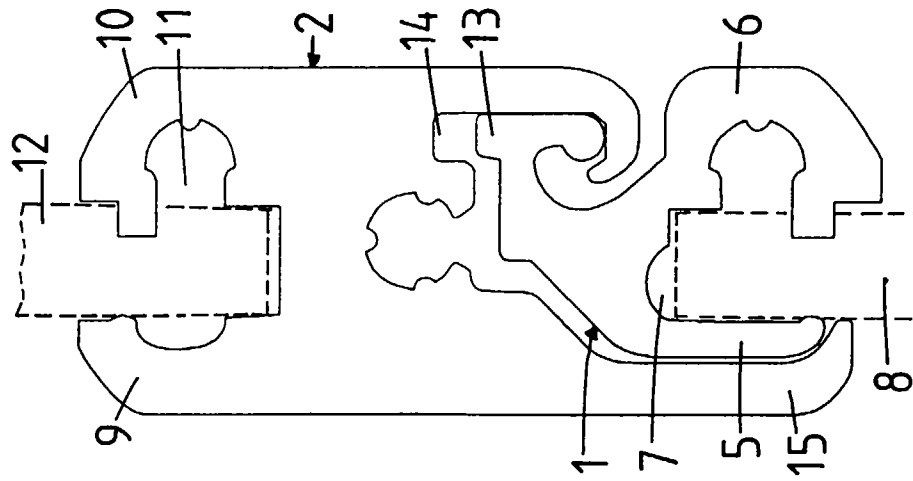


FIG 2

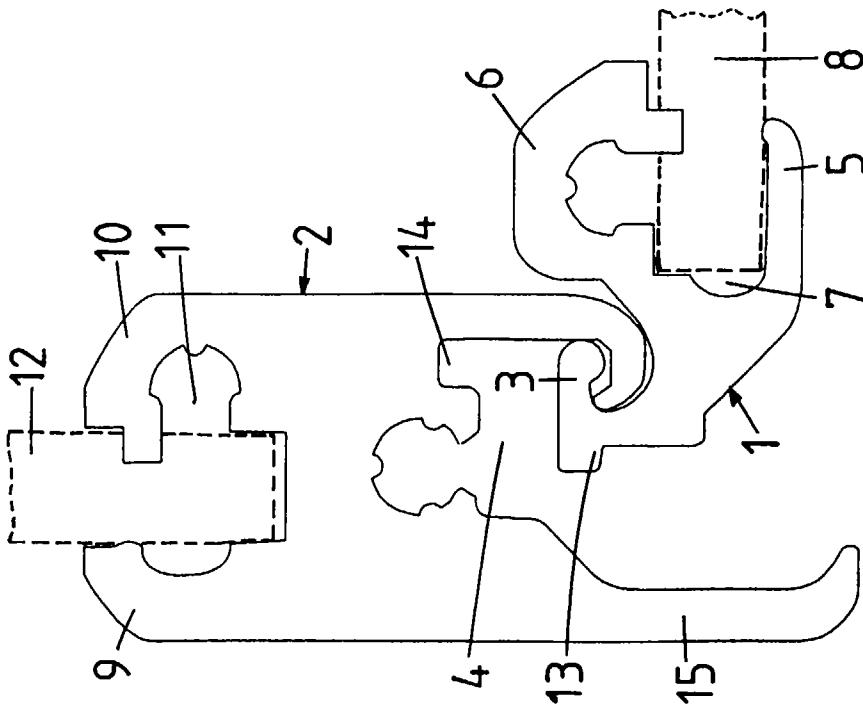


FIG 1

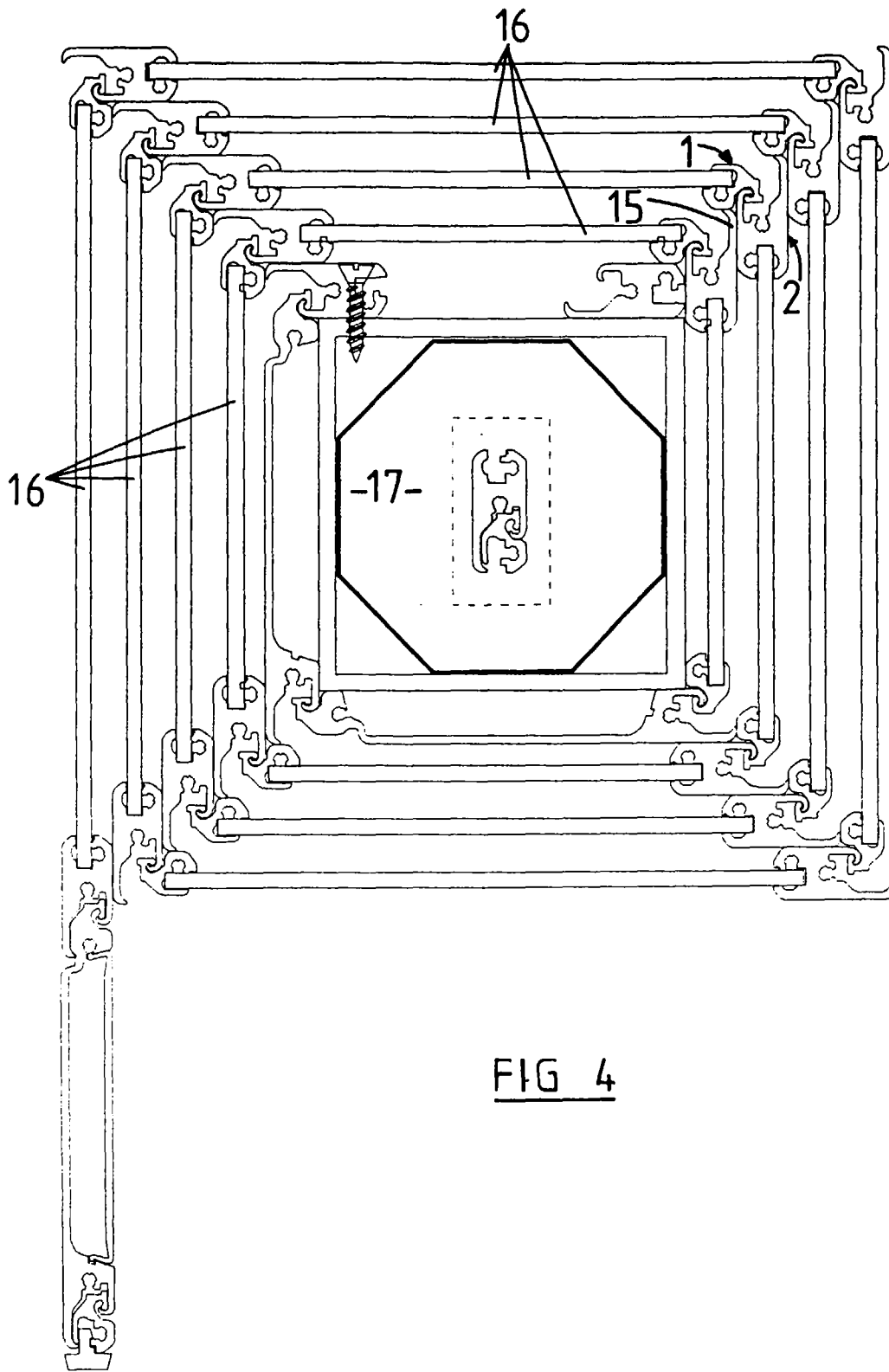


FIG 4



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EUROPEAN SEARCH REPORT

Application Number  
EP 97 20 2308

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.6)
Y	EP 0 037 448 A (BOSTWICK DOORS (UK) LTD) 14 October 1981 * page 3, line 29 - page 8, line 31; figures 1,3 *	1,3,4	E06B9/15 E05D1/04
Y	WO 96 07801 A (INMAN, B. ET AL) 14 March 1996 * page 10, paragraph 2 - page 11, paragraph 2; figures 5-7 *	1,3,4	
A	WO 95 13450 A (BJORØY, M.) 18 May 1995 * the whole document *		
A	US 4 930 561 A (WHITING ROLL-UP DOOR MFG. CORP.) 5 June 1990 * the whole document *		
A	EP 0 538 924 A (FLOOR VOUWHEK B.V.) 28 April 1993 * the whole document *	1	
X	DE 38 28 631 A (HÜPPE GMBH & CO) 15 March 1990 * column 2, line 35 - column 3, line 48 *	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E06B E05D A47K
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
MUNICH		24 October 1997	Knerr, G
CATEGORY OF CITED DOCUMENTS			
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