

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



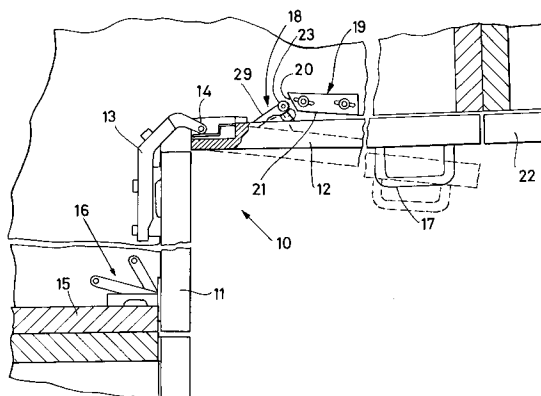
(11) Publication number:

0 592 047 A1

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **93202838.4**(51) Int. Cl.⁵: **E05F 7/00, E05D 15/26,
E06B 3/48**(22) Date of filing: **06.10.93**(30) Priority: **09.10.92 IT MI922335**(43) Date of publication of application:
13.04.94 Bulletin 94/15(84) Designated Contracting States:
AT DE ES FR GB GR IT PT SE(71) Applicant: **Ferrari, Franco**
Località Deviscio
I-22053 Lecco (Como)(IT)(72) Inventor: **Ferrari, Franco**
Località Deviscio
I-22053 Lecco(IT)
Inventor: **Migli, Carlo**
Via del Pozzo, 8
I-22053 Lecco(IT)(74) Representative: **Faraggiana, Vittorio, Dr. Ing.**
Ingg. Guzzi e Ravizza S.r.l.
Via Boccaccio, 24
I-20123 Milano (IT)(54) **Guide device for an angular door with two hinged wings, and door fitted with such device.**

(57) An angular door of a furniture unit comprises a first wing (11) and a second wing (12) disposed hinged together along a common edge, the first wing (11) being in turn hinged to the furniture unit. A guide device comprises sliding means (18) disposed on the second wing (12) which, during the initial opening of the door, run along a guide element (19), disposed in the furniture unit and comprising a first section (20) disposed so as to prevent the opening of the first wing (11), during a first pre-established angle of aperture of the second wing (12). The guide element (19) comprises moreover a second section (21) which, after having passed the first pre-established angle of aperture of the second wing (12), guides the sliding movement of the second wing (12) during a first pre-established angle of aperture of the first wing (11).

**Fig.1****EP 0 592 047 A1**

In all furniture systems, and especially kitchen furniture, which include several continuous fitted walls, there arises the problem of corner units which must offer the utmost accessibility in order to ensure that the internal space is utilized to the full.

The method most frequently used, precisely because it offers maximum accessibility, includes the use of corner units closed by a door consisting of two wings, one for each side of the corner, hinged together along a common edge. One of the two wings is hinged directly to the furniture unit by means of a normal articulated hinge while the other wing is fitted with a handle. When the second wing is opened it pulls the first wing open.

This solution optimizes access to the inside of the unit but has a serious drawback: the system composed of the two articulated wings has two degrees of freedom and this implies that the wing fitted with the handle may tend to move incorrectly. In particular, it may bump against the edge of adjacent wings if traction is exerted on the handle in such a way as to cause the door to rotate on the hinge secured to the furniture unit before the wing fitted with the handle is opened beyond a certain angle. During the closing phase, this problem is heightened by the fact that the single-pin hinge disposed between the two wings is normally provided with a spring-operated returning mechanism which tends to force the wings to form an angle of over 90°, so as to ensure that the door closes completely. If the system composed of the two wings is released starting from a position in which both wings are brought only partially close to the furniture unit, the combined action of the two spring-operated closing mechanisms of the hinges between the door and the unit and between the wings themselves is such that the wing fitted with the handle will definitely bump against an adjacent wing and the door will close completely only after the two adjacent wings have scraped extensively against each other, resulting in easily conceivable damage.

The general scope of this invention is to obviate the aforementioned problems by providing an innovative guided opening device for an angular double-wing door, so as to prevent undesirable opening movements.

This scope is achieved, according to the invention, by providing a guide device for a corner door of a furniture unit, said door comprising a first wing and a second wing disposed at an angle and hinged together along a common edge, the first wing being hinged in turn to the furniture unit along an edge parallel to said common edge between the wings, the device comprising sliding means disposed on the second wing in order to slide, during the initial phase of the opening of the door, on a

guide element disposed in the furniture unit, the guide element comprising at least a first section of the sliding surface for the sliding means disposed in order to substantially prevent the first wing from rotating open around the hinge securing it to the furniture unit during a first pre-established angle of aperture of the second wing.

The innovatory principles of this invention and its advantages with respect to the known technique will be more clearly evident from the following description of several possible exemplificative and non restrictive embodiments applying such principles, with reference to the accompanying drawings, in which:

- figure 1 shows a schematic partially cutaway plan view of a corner door with two wings hinged together, made according to the invention;
- figure 2 shows a view similar to that of figure 1 with the door in a partially open position;
- figure 3 shows an enlarged view of a detail of the door of figure 1.

With reference to the figures, a corner door for furniture units, indicated generically by reference 10, comprises two wings 11 and 12 hinged together along a common edge by means of hinges 13 of the type having one pin with axis of rotation 14. The door 10 is hinged to a side wall 15 of the furniture unit along an edge of the first wing parallel to the common edge between the wings.

The hinge may be obtained by means of articulated hinges 16, for example of the known type having seven pins.

The second wing or free wing 12 is provided with gripping means for opening the door, for example shown schematically in the figure in the form of a handle 17.

The hinges 11 and the hinges 16, which are both advantageously fitted with a spring-operated return mechanism, are of known technique, easily imaginable by any expert in the field, and therefore not further shown or described.

Innovatively, the door comprises a guide device comprising sliding means 18 disposed on the internal face of the free wing 12 which run on a guide element or sliding block 19 made from a block secured to the furniture unit close to a striking surface for the wing 12, for example on the upper internal surface of the furniture unit. The mutual position between the sliding means 18 and sliding block 19 is such as to reciprocally interfere during the initial opening of the door 10.

In particular, the guide element 19 comprises at least a first section 20 of the sliding surface for the sliding means 18, disposed so as to substantially prevent the first wing 11 from rotating around the hinge 16, during a first pre-established angle of aperture of the second wing 12 (as shown by the

broken line in figure 1). The guide element 19 also comprises a second section 21 of the sliding surface for the sliding means 18 disposed to guide the second wing 12, after having passed the first pre-established angle of aperture of the second wing 12, during a first pre-established angle of aperture of the first wing 11 (as shown in figure 2).

The first sliding section is advantageously made with a surface or area generically disposed crosswise to the wing 12 in the closed position, so that, during a first opening phase of the door corresponding to its initial arc of aperture, said wing can only rotate around the axis 14, while the wing 11 is prevented from rotating around the hinges 16.

Beyond the pre-established angle of aperture for the wing 11, the sliding means 18 abandon the surface 20 whereupon the wing 11 can also begin to open. The dimensions of the surface 20 are such that this occurs when the wing 12 is open by a sufficient angle of safety as to prevent interference with the surfaces of the furniture unit to the side of it, for example represented in the figure by a further independent wing 22.

The second sliding section of the element 19 is advantageously made with a second surface or area 21, generically disposed in a lengthwise direction to the wing 12 when in the closed position, and in particular, substantially parallel thereto when the latter has reached the non-interference angle of aperture. In this way, by running along the surface 21, the sliding means allow the aperture of the wing 11 while keeping the wing 12 at least with the safety angle of inclination reached during the first phase of aperture, and continuing to prevent it from coming into contact with the other areas of the furniture unit, as shown in figure 2.

The angle between the two wings can thus vary without any danger until reaching the angle at which the spring of the hinges 13 comes into action. The sliding means 18 thus abandon the element 19, the wing 12 begins to close on the wing 11 and the door continues to open until it is wide open, as shown schematically by the broken line in figure 2.

As can be clearly seen in the figures, the first surface 20 can also be advantageously made to slope in the opposite direction to the common hinge between the wings, so as to facilitate the opening movement of the entire door and ensure a smoother transition between surface 20 and surface 21.

During the subsequent closing movement of the door 10, the movements described above will obviously be carried out in reverse sequence and consequently the wing 12 will not approach its completely closed position until the wing 11 is completely closed, thereby preventing any risk of undesirable contact and scraping.

At this point it will be clear that the intended scopes have been achieved, by providing an angular door with two hinged wings which is guided during the critical phases of opening and closing.

As can be seen in figures 1 and 2, the sliding means can comprise a support 29 secured to the wing 12 and bearing a small roller 23 freely pivoted to run over the element 19. Figure 3 shows an alternative embodiment in which the sliding means are in the form of a metal wire 24, with its free ends 25 and 26 forced into holes made in the wing and suitably bent so as to provide, between the ends, an area that slides on the guide element.

In both the embodiment of figures 1, 2 and in the embodiment of figure 3, the detail 19 can be provided with oval slots to enable it to be adjustably secured to the furniture unit by means of screws 27, 28.

The sliding element 18 can likewise be adjustably secured by screws, as can be easily conceived by any expert in the field, thereby enabling the reciprocal fine positioning of the guide elements 18, 19.

The foregoing description of an embodiment applying the innovatory principles of this invention is obviously given by way of example in order to illustrate such innovatory principles and should not therefore be understood as a limitation to the sphere of the invention claimed herein.

For example, the shapes and proportions of the wings and hinges may differ according to particular practical requirements, just as the shapes and positions of the guide means may differ.

Instead of having sliding surfaces consisting of two completely different elements, the guide element can have two sliding sections composed of a single sliding surface with a variable continuous curvature in order to form the two differently sloping sections.

Claims

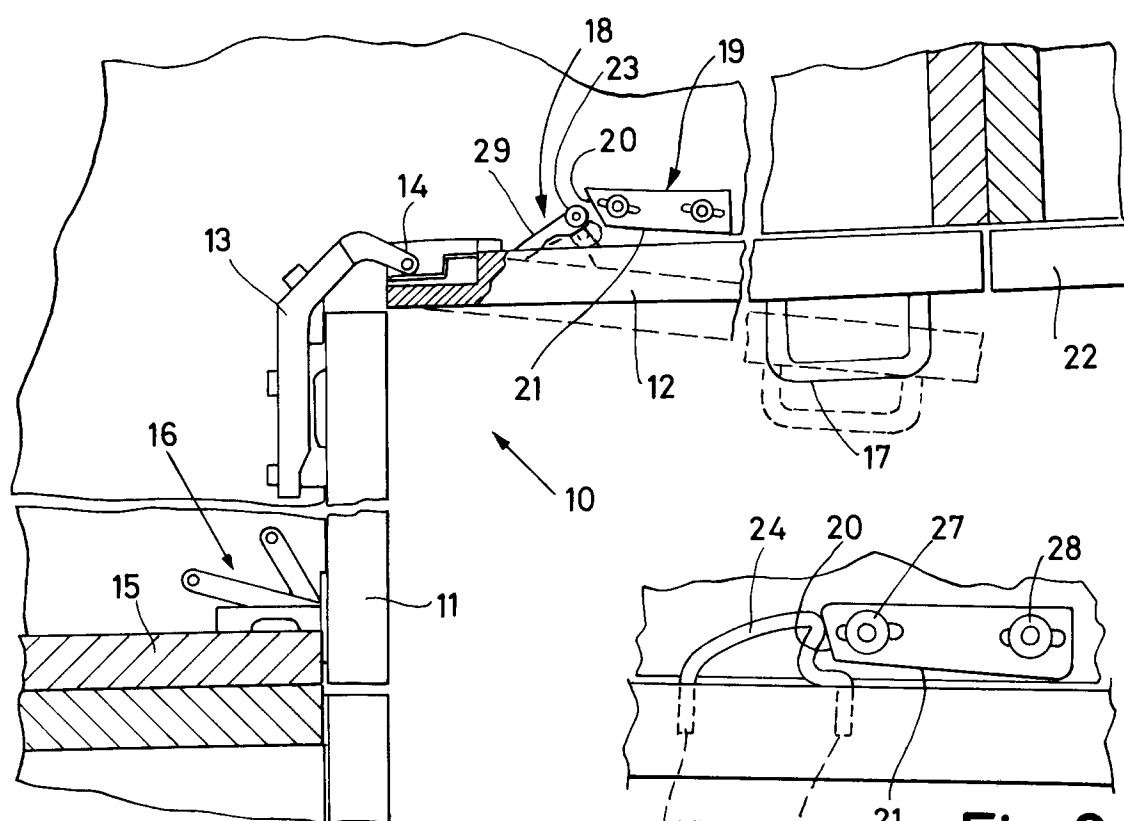
1. Guide device for an angular door of a furniture unit, said door comprising a first wing (11) and a second wing (12) disposed at an angle and hinged together along a common edge, the first wing (11) being hinged in turn to the furniture unit along an edge parallel to said common edge between the wings, the device comprising sliding means (18) disposed on the second wing (12) in order to slide, during the initial phase of the opening of the door, on a guide element (19) disposed in the furniture unit, the guide element (19) comprising at least a first section (20) of the sliding surface for the sliding means (18) disposed in order to substantially prevent the first wing (11) from rotating open around the hinge securing it to the

furniture unit during a first pre-established angle of aperture of the second wing (12).

2. Guide device as claimed in claim 1, characterized by the fact that the guide element (19) comprises a second section (21) of the sliding surface for the sliding means (18) disposed so as to guide the second wing (12), after having passed the first pre-established angle of aperture of the second wing (12), during a first pre-established angle of aperture of the first wing (11). 5
10
3. Guide device as claimed in claim 1, characterized by the fact that the first section (20) of the sliding surface is substantially in the form of a surface (20) generically directed crosswise to the extension of the second wing (12) when in the closed position. 15
20
4. Guide device as claimed in claim 2, characterized by the fact that the second section (21) of the guide surface is substantially in the form of a surface (21) generically disposed lengthwise to the extension of the second wing (12) in the closed position. 25
5. Guide device as claimed in claim 3, characterized by the fact that the surface (20) slopes in the opposite direction to the common hinge between the wings. 30
6. Guide device as claimed in claim 4, characterized by the fact that the surface (21) slopes in order to be substantially parallel to the second wing (12) when open by said first pre-established angle of aperture. 35
7. Guide device as claimed in claim 1, characterized by the fact that the guide element (19) is made in the form of a block secured to an internal surface of the furniture unit close to a striking surface of the second wing (12). 40
8. Guide device as claimed in claim 1, characterized by the fact that the sliding means (18) comprise a supporting element (29) secured to the second wing and bearing a roller (23) which runs on the guide element (19). 45
50
9. Guide device as claimed in claim 1, characterized by the fact that the sliding means (18) comprise a filiform element (24) shaped in order to have two free ends (25, 26) inserted into holes in the internal surface of the second wing (12) and a section between the ends forming an area which slides on the guide element (19). 55

10. Guide device as claimed in claim 1, characterized by the fact that at least the guide element is secured to the furniture unit in such a way as to be adjustable in position.

11. Corner door (10) for furniture comprising a first wing (11) and a second wing (12) disposed angularly and hinged together along a common edge, the first wing (11) being in turn hinged to the furniture unit along an edge parallel to said common edge between the wings, characterized by the fact of comprising a guide device as claimed in any of the previous claims.



Fig_1

Fig. 3

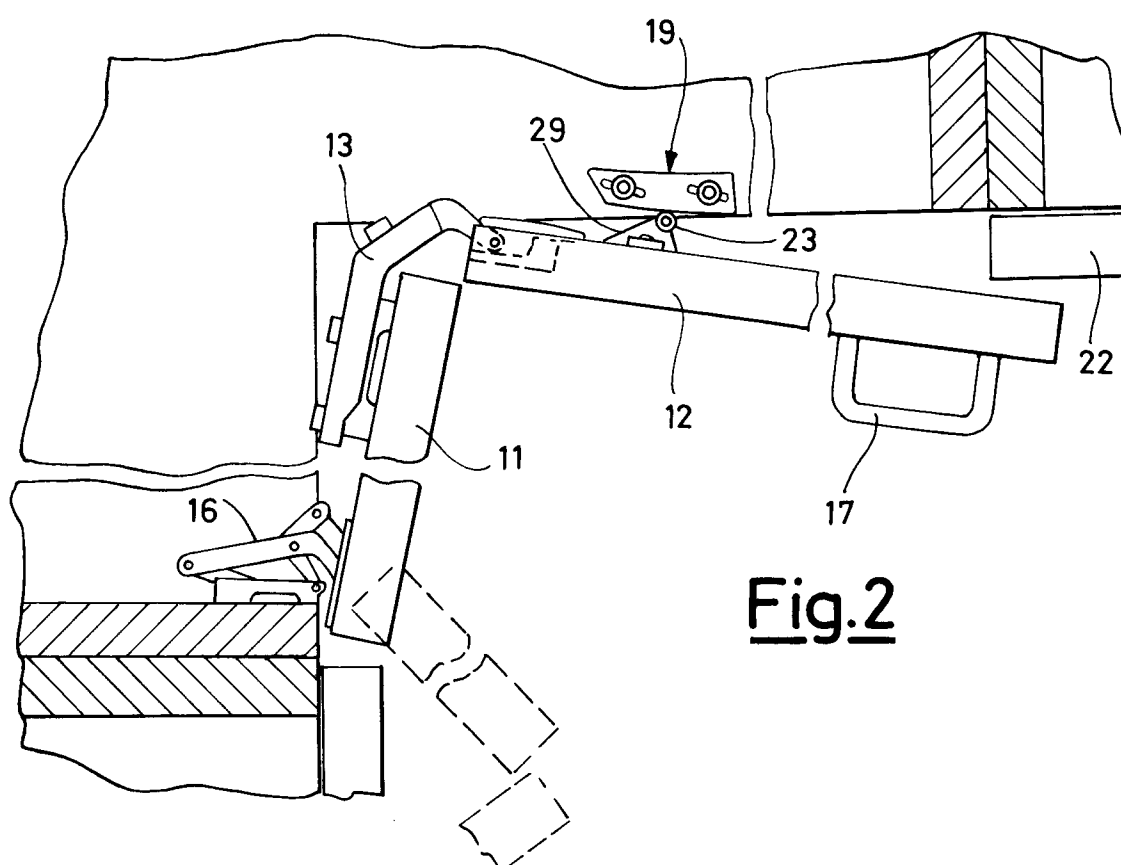


Fig.2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 20 2838

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)
A	DE-U-92 03 048 (PAUL HETTICH) * page 3, line 31 - page 4, line 10 * * page 6, line 13 - line 25; figure 1 * ---	1	E05F7/00 E05D15/26 E06B3/48
A	DE-U-91 01 701 (LAPRELL, MARTINI, ALTHAUS) * page 3, line 24 - page 4, line 15; figures 1-5 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			E05F E05D E06B
The present search report has been drawn up for all claims			f
Place of search THE HAGUE		Date of completion of the search 19 January 1994	Examiner Guillaume, G
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure F : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			