

(19)



(11)

EP 1 935 286 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

05.04.2017 Bulletin 2017/14

(51) Int Cl.:

A47B 61/06 (2006.01)

E06B 3/80 (2006.01)

A47B 43/02 (2006.01)

A47B 96/20 (2006.01)

(21) Application number: **07106288.9**

(22) Date of filing: **17.04.2007**

(54) **Door with flexible opening**

Tür mit dehnbarer Öffnung

Porte à ouverture flexible

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE
SI SK TR**

(30) Priority: **22.12.2006 IT PD20060127 U**

(43) Date of publication of application:

25.06.2008 Bulletin 2008/26

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(56) References cited:

FR-A6- 2 208 469

US-B1- 6 585 333

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Description

[0001] The present patent relates to furnishing elements and in particular concerns doors for wardrobes or furniture in general.

[0002] The internal areas of wardrobes, like other furnishing elements, are frontally delimited by doors, shutters, sliding or tilting panels.

[0003] In general wardrobe doors are hinged to the vertical side walls of the compartment they close.

[0004] Some wardrobe compartments are closed by one single door, while other compartments are closed by two doors side by side, symmetrical or asymmetrical.

[0005] In this patent reference is made to pairs of doors that close a compartment of a wardrobe or furniture unit in general.

[0006] The closed position of the doors is sufficiently ensured by the hinges which connect the doors to the structure of the wardrobe.

[0007] In general the doors are opened by means of handles or push-pull mechanisms, or recesses on the adjacent edges of the two doors in which the user can insert his/her fingers and pull the door to open it.

[0008] An example of such a door can be found in US6,585,333.

[0009] The handles are elements of various shapes and sizes applied to the doors: the user grips the handle and pulls it towards him/her, thus opening the wardrobe door.

[0010] The handles are fixed to the doors by means of glue, screws etc. This involves drilling of at least one hole on the surface of the door. Said operation, in turn, requires accurate measurement of each point in which to make the hole, time to drill each of said holes and time to apply each handle.

[0011] Handles protruding beyond the surface of the door are known and are the most commonly used, and handles obtained inside the door itself or applied in recesses or seats purposely provided on the surface of the door are also known.

[0012] In any case, the handles, in addition to having an appreciable cost which contributes to increasing the total cost of the door and the wardrobe itself, constitute a constraint, in terms of appearance, on the part of the wardrobe exposed to view and on the whole wardrobe on which the doors are applied.

[0013] Devices are known, called push-pull or push-push, which comprise a hook, arrow or peg element with widened head, fixed and protruding on the inner surface of the door to be kept closed and a push-type hooking mechanism to be fixed, for example, to the body of the furniture unit or object closed by said door. With the door open, a simple pressure exerted on the door locates said hooking element inside the connection device of the hooking mechanism, while if the door is pressed and released again, the hooking mechanism opens, the hooking element is released from the door and the latter is pushed in the door opening direction.

[0014] Said push-pull mechanisms are positioned completely inside the compartment, therefore doors can be obtained without protrusions or interruptions of the surface.

5 **[0015]** On the other hand, said push-pull mechanisms are not cheap, they require accurate fitting using screws and precise adjustment in order to ensure both opening and closing. Recesses provided on the edge of the door avoid the application of handles or push-pull mechanisms but require special work to be carried out on the edge to produce said recesses and in any case modify the surface continuity of the wardrobe doors as it is necessary to provide a slot between the doors for insertion of the user's fingers.

10 **[0016]** To remedy said drawbacks, a new door with flexible opening has been studied and produced.

[0017] The object of the new door is to permit opening thereof without handles or locking mechanisms applied to the doors or to the structure of the furniture unit.

20 **[0018]** A further object of the new door is to eliminate protrusions, recesses or cavities from the exposed surface.

[0019] A further object of the new door is to eliminate the need for gripping elements or handles, push-pull mechanisms or other comparable elements for the opening thereof. A further object of the new door is to eliminate the need for extra work for application or adjustment of the opening means.

25 **[0020]** These and other objects, direct and complementary, are achieved by the new pair of doors with flexible opening according to claim 1. The doors consist of one, two or more adjacent panels.

30 **[0021]** Two of said adjacent panels are connected to each other, on the vertical side, generally the longest, by a laminar strip element, subsequently called, for the sake of convenience, flexible connection blade, inserted partially inside one panel and partially inside the other adjacent panel thus keeping said panels connected at a minimum distance from each other.

35 **[0022]** It is possible for the door to consist of three or more panels with connection to the other panels of the door being obtained by any means or device not visible from the outer side of the door.

40 **[0023]** Said flexible connection blade preferably extends throughout almost the whole height of the two panels.

[0024] Said flexible connection blade is made of flexible material, typically spring steel.

45 **[0025]** The outer edge of one of said panels is fixed to the structure or side of the wardrobe by means of the known hinges.

[0026] When a pair of doors fitted on the wardrobe is in the closed position, the surface of all the panels of the two doors is substantially continuous.

50 **[0027]** The preferred version provides for a wardrobe or furniture unit in general with two doors, at least one of which comprises two panels connected to each other by a flexible element, preferably a spring steel blade.

[0028] In the subsequent part of the description, for the sake of convenience, a door having preferably two panels joined by said flexible element is called flexible door, and a door with one or more panels not joined by any flexible element is called rigid door.

[0029] To access the inner compartment of the wardrobe, simply push the flexible door at a point (generically halfway up the door) in an easily accessible position normally corresponding to the standard height of a handle, and at the edge of the flexible door adjacent to the corresponding edge of the rigid door.

[0030] The pressure exerted causes partial flexion towards the inside of the edge of the flexible door opposite the hinged edge, so that the space immediately behind the edge of the rigid door can be accessed in order to pull said door in the opening direction.

[0031] As mentioned, in said slot thus created it is possible to insert a hand, preferably the same hand that pushed the flexible door, behind the edge of the rigid door and then pull it in the opening direction.

[0032] Flexion of the edge of the flexible door is in the order of a few millimetres, but in any case sufficient for the passage at least of the fingers of one hand to hook or grip the edge of the adjacent rigid door and open it.

[0033] Said flexion, furthermore, is reversible due both to the constitution of the door panel and to the flexible characteristics of the flexible connection blade.

[0034] To facilitate insertion of the hand and gripping of the edge of the door to be opened, the same can be chamfered.

[0035] It is possible for both doors to be of the flexible type.

[0036] It is possible for the flexible door and/or the adjacent door to be of the sliding type.

[0037] The characteristics of the new flexible door will be better clarified by the following description with reference to the drawing attached by way of non-limiting example.

[0038] In figure 1 a horizontal section of two doors (A, B) closing the compartment of a wardrobe or furniture unit in general is schematised, while figure 2 illustrates the significant details in horizontal section.

[0039] The figures clearly show the two panels (A1, A2, B1, B2) that make up each door (A, B) fixed to the side walls (L) of the wardrobe by means of the known hinges (C).

[0040] At least the panels (A1, A2) of one door (A) are connected to each other by a flexible connection blade (E), inserted partially inside one panel (A1) and partially inside the other adjacent panel (A2) thus keeping said panels (A1, A2) connected at a minimum distance from each other.

[0041] The panels (B1, B2) of the other door (B) can be joined identically by a flexible blade or a non-flexible blade (N), made of aluminium for example.

[0042] Figure 2 clearly shows the movement of the central area of the edge (Alb) of the panel (A1) of the door (A) with flexible blade (E), and any recess or seat

(B1i) in the rear part of the edge (B1b) of the door to be opened (B) facing towards the door (A) with flexible blade (E) thus facilitating insertion of the user's hand and gripping of the edge (B1b) of the door (B) to be opened.

[0043] The new flexible door offers considerable advantages.

[0044] With the new door, the outer surface is smooth and without protuberances or recesses. With the new door, any outer surface finish can be applied or obtained, in any material without said finish being modified or damaged by the application of a handle.

[0045] With the new door, glass or mirror sheets of any type with any patterning, applied in the production or delivery phase, can be used as outer surface finish without having to make holes in or modify said glass or mirror sheets.

[0046] The new door permits the production of complete doors regardless of the side, right or left, or position, top or bottom, since each door can be mounted in any position and direction.

[0047] The new door does not require any extra work or adaptations or fitting of accessory parts for opening, such as handles for example.

[0048] The new door does not require modifications of the inner surfaces of the compartment for the application of opening and/or closing mechanisms, such as push-pull mechanisms, for example.

[0049] Therefore with reference to the preceding description and the accompanying drawing, the following claims are made.

Claims

1. A pair of doors, for wardrobes or furniture units, comprising a first door (A) and an adjacent second door (B), wherein said door (A) is flexible, at least at the edge adjacent to the second door (B) to permit the positioning of fingers between the edge of said flexible door (A) and the adjacent door (B) so as to permit the opening of said adjacent second door (B), **characterised in that** the second door (B) is provided with a recess or seat (B1i) in the non-exposed part of the edge (B1b) of the second door (B) facing the first door (A).
2. A pair of doors according to claim 1, **characterised in that** said first door (A) consists of two or more panels (A1, A2) positioned side by side on the longest side, and wherein at least two of said panels (A1, A2) are connected to each other, on said longest side, by one or more connection elements (E) integral with said two panels (A1, A2), and wherein one of the panels (A2) is suitable for being connected to the side of the compartment of the wardrobe or furniture unit by means of hinges (C).
3. A pair of doors according to claim 2, **characterised**

in that said connection element (E) is flexible.

4. A pair of doors according to claims 2 or 3, **characterised in that** said flexible element (E) consists of a flexible blade (E) inserted partially inside one panel (A1) and partially inside the other adjacent panel (A2).
5. A pair of doors according to claim 2,3 or 4, **characterised in that** said two panels (A1, A2) with flexible blade (E) positioned in-between are connected to at least one further panel in turn hinged, on the opposite side, to the wardrobe wall.
6. A pair of doors according to any of the proceeding claims, whereby said second door (B) can be connected to the side of the compartment of the wardrobe or furniture unit by means of hinges (C), **characterised in that** said second door (B) consists of at least two panels (B1, B2) positioned side by side on the longest side, and wherein said panels (B1, B2) are interconnected, on the longest side, by a non-flexible laminar strip element (N) or non-flexible connection blade (N) inserted partially inside a panel (B1) and partially inside the other adjacent panel (B2), and wherein said door (B) is such as to be fitted together with a door (A) with flexible blade (E) as per the preceding claimsto close the compartment of a wardrobe or furniture unit.
7. A pair of doors according to the preceding claims, **characterised in that** said first door (A), is of the sliding type.
8. A pair of doors according to any of the proceeding claims, **characterised in that** said first door (A) is combined with said adjacent door (B) which is of the sliding type.

Patentansprüche

1. Paar von Türen für Kleiderschränke oder Möbelemente, umfassend eine erste Tür (A) und eine benachbart angeordnete zweite Tür (B), wobei die Tür (A) wenigstens an der benachbart zur zweiten Tür (B) angeordneten Kante dehnbar ist, um das Positionieren von Zapfen zwischen der Kante der dehnbaren Tür (A) und der benachbart angeordneten Tür (B) zu ermöglichen, um das Öffnen der benachbart angeordneten zweiten Tür (B) zu ermöglichen, **dadurch gekennzeichnet, dass** die zweite Tür (B) mit einer Aussparung oder einem Sitz (B1i) im nicht freiliegenden Teil der Kante (B1b) der zweiten Tür (B) versehen ist, die der ersten Tür (A) zugewandt ist.
2. Paar von Türen nach Anspruch 1, **dadurch gekennzeichnet, dass** die erste Tür (A) aus zwei oder meh-

ren Platten (A1, A2) besteht, die nebeneinander auf der längsten Seite angeordnet sind, und wobei wenigstens zwei der Platten (A1, A2) auf der längsten Seite durch ein oder mehrere einstückig mit den beiden Platten (A1, A2) ausgebildeten Verbindungselementen (E) miteinander verbunden sind, und wobei eine der Platten (A2) dazu geeignet ist, mit der Seite des Schrankfaches oder des Möbelements mittels Scharnieren (C) verbunden zu werden.

3. Paar von Türen nach Anspruch 2, **dadurch gekennzeichnet, dass** das Verbindungselement (E) dehnbar ist.
4. Paar von Türen nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** das dehnbare Element (E) aus einer dehnbaren Lamelle (E) besteht, die teilweise in eine Platte (A1) und teilweise in die andere, benachbart angeordnete Platte (A2) eingefügt ist.
5. Paar von Türen nach Anspruch 2, 3 oder 4, **dadurch gekennzeichnet, dass** die beiden Platten (A1, A2) mit dazwischen angeordneter, dehnbarer Lamelle (E) mit wenigstens einer weiteren Platte verbunden sind, die ihrerseits auf der gegenüberliegenden Seite an der Schrankwand angelenkt ist.
6. Paar von Türen nach einem der vorstehenden Ansprüche, wobei die zweite Tür (B) an der Seite des Schrankfaches oder des Möbelements mittels Scharnieren (C) verbunden werden kann, **dadurch gekennzeichnet, dass** die zweite Tür (B) aus wenigstens zwei Platten (B1, B2) besteht, die nebeneinander auf der längsten Seite angeordnet sind und wobei die Platten (B1, B2) auf der längsten Seite durch ein nicht-dehnbares, lamellenförmiges Bandelement (N) oder eine nicht-dehnbare Verbindungslamelle (N) miteinander verbunden sind, die teilweise in eine Platte (B1) und teilweise in die andere, benachbart angeordnete Platte (B2) eingefügt ist, und wobei die Tür (B) derart ist, dass sie mit einer Tür (A) mit dehnbarer Lamelle (E) gemäß den vorstehenden Ansprüchen zusammengefügt werden kann, um das Schrankfach oder Möbelement zu verschließen.
7. Paar von Türen nach den vorstehenden Ansprüchen, **dadurch gekennzeichnet, dass** die erste Tür (A) vom Schiebetyp ist.
8. Paar von Türen nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Tür (A) mit der benachbart angeordneten Tür (B) kombiniert ist, die vom Schiebetyp ist.

Revendications

1. Paire de portes, pour des garde-robes ou des unités de meubles, comprenant une première porte (A) et une deuxième porte adjacente (B), dans laquelle ladite porte (A) est flexible, au moins au niveau d'un bord adjacent à la deuxième porte (B) pour permettre le positionnement de doigts entre le bord de ladite porte flexible (A) et la porte adjacente (B) de manière à permettre l'ouverture de ladite deuxième porte adjacente (B), **caractérisée en ce que** la deuxième porte (B) est munie d'un évidement ou siège (B1i) dans la partie non exposée du bord (B1b) de la deuxième porte (B) faisant face à la première porte (A). 5
2. Paire de portes, selon la revendication 1, **caractérisée en ce que** ladite première porte (A) comprend au moins deux panneaux (A1, A2) positionnés côte à côte sur le côté le plus long, et dans laquelle au moins deux desdits panneaux (A1, A2) sont connectés l'un à l'autre, sur ledit côté le plus long, par un ou plusieurs éléments de connexion (E) solidaire avec lesdits deux panneaux (A1, A2), et dans laquelle un des panneaux (A2) est adapté pour être connecté au côté du compartiment de la garde-robe ou de l'unité de meuble au moyen de charnières (C). 10 20 25
3. Paire de portes, selon la revendication 2, **caractérisée en ce que** ledit élément de connexion (E) est flexible. 30
4. Paire de portes, selon la revendication 2 ou 3, **caractérisée en ce que** ledit élément flexible (E) comprend une lame flexible (E) insérée partiellement à l'intérieur d'un panneau (A1) et partiellement à l'intérieur de l'autre panneau adjacent (A2). 35
5. Paire de portes selon la revendication 2, 3 ou 4, **caractérisée en ce que** lesdits deux panneaux (A1, A2) avec la lame flexible (E) positionnée entre eux sont connectés à au moins un autre panneau articulé par charnière à son tour, du côté opposé, à la paroi de la garde-robe. 40 45
6. Paire de portes selon l'une quelconque des revendications précédentes, dans laquelle ladite deuxième porte (B) peut être connectée au côté du compartiment de la garde-robe ou de l'unité de meuble au moyen de charnières (C), **caractérisée en ce que** ladite deuxième porte (B) comprend au moins deux panneaux (B1, B2) positionnés côte à côte sur le côté le plus long, et dans laquelle lesdits panneaux (B1, B2) sont interconnectés, sur le côté le plus long, par un élément de bande laminaire non-flexible (N) ou une lame de connexion non-flexible (N) insérée partiellement à l'intérieur d'un panneau (B1) et partiellement à l'intérieur de l'autre panneau adjacent (B2), et dans laquelle ladite porte (B) est telle qu'elle peut être rendue solidaire d'une porte (A) avec une lame flexible (E) comme selon les revendications précédentes pour fermer le compartiment d'une garde-robe ou d'une unité de meuble. 50 55
7. Paire de portes selon les revendications précédentes, **caractérisée en ce que** ladite première porte (A) est du type coulissant.
8. Paire de portes selon l'une quelconque des revendications précédentes, **caractérisée en ce que** ladite première porte (A) est combinée avec ladite porte adjacente (B) qui est du type coulissant.

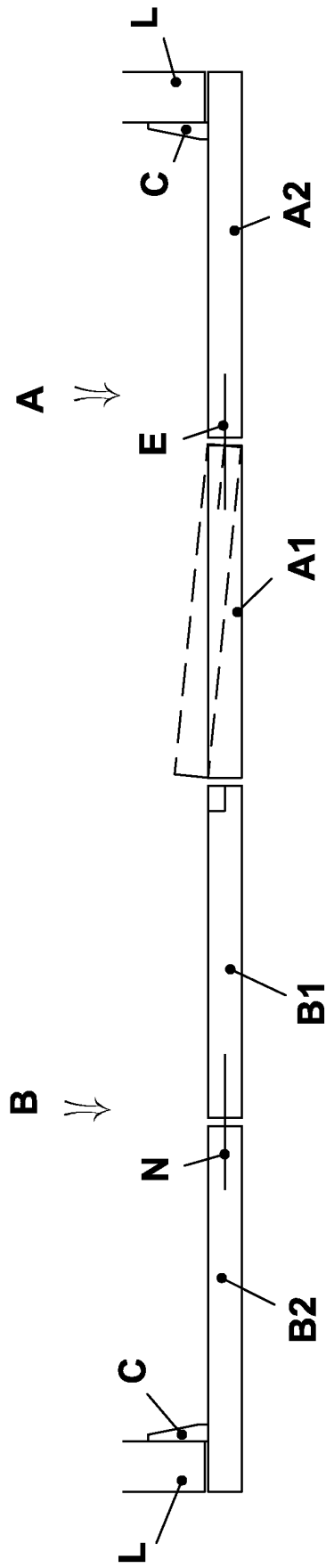


Fig. 1

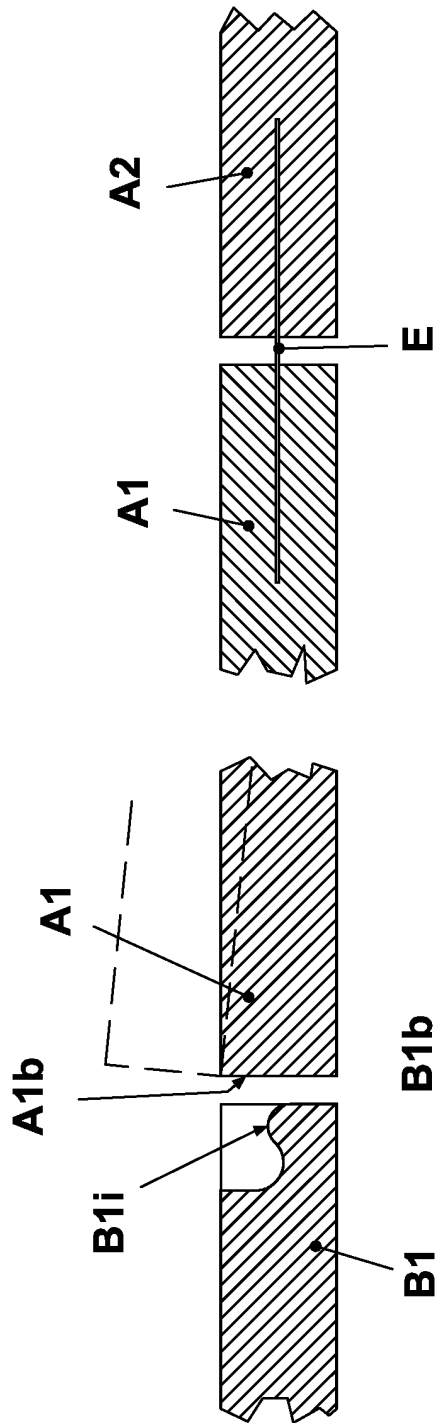


Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6585333 B [0008]