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Supporting and running device for sliding doors, particularly for furniture.

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Description

The invention relates to a supporting and running device for sliding doors, particularly for furniture.

Well-known are supporting and running devices for sliding doors, particularly for furniture, provided with rollers applied to the upper edge of the doors and sliding along guides applied to the furniture frame.

With the aim of allowing opening of the doors and therefore their total or partial superimposition, they have to run on parallel planes: this implies, in the closed position, the formation of openings for entry of dust inside of the furniture and a not very agreeable outlook.

US-A-3 510 983 discloses flush closing sliding doors, of which a first door remains in the same plane when the doors are in the open position, that it occupies when the doors are in the closed flush position, and a second door is in the front plane when the doors are in the closed position and is moved into a rearward plane in back of the first door, when the door are in the open position. However this doors assembly:

doesn't completely cover the furniture frame, but keeps in view the upper guide rails and the overstanding structure strip, to which they unavoidably must be connected,

has a door which is movable inwardly, thus reducing the usable volume inside the furniture,

requires the obliged position of the doors in close condition.

Aim of the invention is to realize a supporting and running device for sliding doors, which allows the doors themselves to be placed parallelly facing when open and coplanarly aligned when closed, and which overcomes all the draw-backs above referred to.

According to the invention such an aim is attained with a supporting and running device for sliding doors, particularly for furniture, as described in claim 1.

The invention is hereinafter further clarified with reference to the enclosed drawings in which:

Figure 1 shows in vertical section the supporting and running device for sliding doors according to the invention applied to a wardrobe with the doors coplanar (closed wardrobe),

Figure 2 shows it in the same view as Figure 1 with the doors superimposed (opened wardrobe), Figure 3 shows it in partially sectioned view from above,

Figures 4 and 5 show it in schematic view from above and below respectively and in a smaller scale two doors during partial superimposition step,

Figures 6 to 8 show schematically in partial schematic view from above a furniture with three doors in three subsequent steps of opening of the middle door, and

Figures 9 and 10 show it in the same view in two

subsequent steps of opening of a side door.

As can be seen from the figures, the device according to the invention can be used, for example, for wardrobes with sliding doors.

In the illustrated embodiment the doors are three and are indicated by the numerals 1, 2 and 3.

Both side doors 1 and 3 are provided near the horizontal edges with pairs of longitudinal carriages 4, 5.

Each upper longitudinal carriage 4 comprises a metal supporting plate 6 for a horizontal axis roller 7 sliding on a longitudinal guide 8 externally applied on the horizontal upper edge of the wardrobe 9.

Each lower longitudinal carriage 5 comprises a small supporting plate 10 of a vertical axis roller 11 sliding in a guide 12 applied near the lower edge of the wardrobe 9.

The middle door 2 is also provide, near its horizontal edges, with a pair of longitudinal carriages 13, 14. Each upper longitudinal carriage 13 comprises a supporting bracket 15 for a roller 16 sliding along a longitudinal guide 17. In particular, to allow transversal displacements of the door 2 with respect to the guide 17, the bracket 15 is provided with two horizontal axis rollers 18 and 19 and a vertical axis roller 20, which support and drive a rod 21 connected to the longitudinal carriage 13.

Between the bracket 15 and a projection 22 connected to the rod 21 a solenoidal spring 23 is placed, having the role of elastically keeping the door 2 coplanar to the doors 1 and 3, when they are in closed position.

Each lower longitudinal carriage 14 comprises a bracket 24 which at its end is provided with a pin 25 having a spring 26, to which a supporting lever 27 of a roller 28 is connected, the roller sliding on a guide 29 applied to the wardrobe and parallel to the guide 12.

Furthermore, the doors 1, 2 and 3 are provided on the upper part with a guide section 30 having rounded ends which help, as it will be better clarified, the transversal displacement of the door 2 with respect to doors 1 and 3 during their reciprocal movement.

Whereas, to the brackets 24 of the lower longitudinal carriage 14 a guide section 31 is applied, against which the vertical axis rollers 32, applied to the supporting plate 10 of the longitudinal carriages 5, leans. Analogously to the guide sections 30, the guide section 31 is also provided with rounded ends.

The operating of the device according to the invention is as follows: when in closed position, the doors 1, 2 and 3 are placed coplanar among themselves (cfr. Fig. 6) and completely close the wardrobe 9. This position is kept elastically stable by the action of the springs 23.

To open the middle area of the wardrobe, the middle door 2 is pushed from one side or the other (to the left in the embodiment, cfr. Fig. 7). Following such a push, the middle door 2 moves sideways by means of

its rollers 16 sliding along the guide 17 and the same time starts to move transversally so partially superimposing the lateral door 1.

Such superimposition is due to the fact that:

on the upper part the rounded ends of the guide sections 30 foreseen on the doors 1 and 2 and faced in the opposite direction interact between themselves causing the elastic lengthening of the spring 23 and the consequent transversal displacement of the door 2,

on the lower part the rounded portion of the guide section 31 near the door 1, interacts with the rollers 32 and, overcoming the reaction of the springs 26, allows the door 2 to elastically displace to the outside.

Continuing this push, the door 2 superimposes itself on the door 1 until it is parallelly facing to this (cfr. Fig. 8).

To close the wardrobe, the door 2 is pushed towards the right: continuing this displacement, the elastic reaction of the springs 23 and 26, that drawing back the bracket 15 and the bracket 24 respectively, prevails, these springs bring back the door 2, which is no longer engaged to the guide sections 30 and 31, in a coplanar position with the doors 1 and 3.

In the case that one needs to open one of the side areas of the wardrobe (the left in the embodiment), the side door 1 is pushed in the direction shown by arrow 33 in Figure 9. Also in this case the reciprocal engagement between the upper guide sections 30 and between the lower guide section 31 and the roller 32 causes displacement of the middle door 2 until the side door 1 is placed parallelly facing to it (cfr. Fig. 10).

In such a way the device according to the invention allows an easy and quick operating of sliding doors, which, when in close position, remain coplanar among themselves, eliminating any opening for entry of dust and at the same time ensuring a pleasant aspect to the closed wardrobe.

Claims

1. Supporting and running device for sliding doors, particularly for furniture, having a first (1, 3) and a second type (2) of door, which are coplanar when closed and superimposed when open, carriages connected to said doors and running on guide rails, and means allowing the resilient displacement of each second type of door (2) out of its position coplanar with the others, characterized in that it comprises:

a least at first pair of longitudinal carriages (4, 5) connected to the upper part, resp. to the lower part, of each first type of door (1, 3) and guided by means of rollers (7, 11) along corresponding guide rails (8, 12) parallelly placed out of the plane containing said door (1, 3) near to the closure sur-

face of the furniture,

at least a second pair of longitudinal carriages (13, 14) guided by means of rollers (16, 28) along corresponding guide rails (17, 29) place out of the plane containing each second type of door (2), parallelly to the first ones but more distant from the closure surface of the furniture, and connected to the upper part, resp. to the lower part, of said second type of door (2), said second longitudinal carriages (13, 14) comprising an overall bridge-shaped support extending over said first type of door (1, 3) and/or its longitudinal carriages (4, 5), during their mutual movements, and

at least an upper transverse carriage applied to each upper longitudinal carriage of said second type of door to allow the resilient displacement of the door outwardly of the furniture, said transverse carriage comprising at least a bracket (15), applied to the door (2) and transversely extending over the guide rails (8, 17), at least a transversal rod (21) cooperating with rolling supports (18, 19) having a horizontal rotation axes located at different distances from the plane of the door (2) to transfer the weight of the door on said rod (21) and to produce a moment opposing the moment due to said transfer of weight, as well as at least one spring (23) interposed between said bracket (15) and said roller (16), and at least a member (24, 27) interposed between each second type of door (2) and the respective lower guide rail (29) and supporting a roller (28) elastically keeping said second type of door (2) coplanar with said first type of door (1,3).

2. Device according to claim 1 characterized in that the longitudinal carriages (4, 5, 13, 14) of the adjacent doors are guided along two parallel guide rails (8, 12, 17, 29).
3. Device according to claim 1 characterized in that the upper transverse carriage comprises guide rollers mounted on said bracket (15) to guide the rod (21) connected to the respective upper longitudinal carriage (13), and at least one spring (23) interposed between said bracket (15) and said rod (21).
4. Device according to claim 1 characterized in that at least one elastically articulated lever (27) is interposed between each second type of door (2) and the respective guide rail (29), said lever being connected at one end to the door (2) and being provided at the other end with a roller (28) engaged with the guide rail (29).
5. Device according to claim 1 characterized in that each second type of door (2) is provided with a pair of horizontal guide sections (30) cooperating

with guide sections (30) foreseen in the adjacent first type of door (1, 3) to cause the transversal mutual displacement.

6. Device according to claim 5 characterized in that the guide sections (30) have the ends rounded. 5
7. Device according to claim 1 characterized in that it comprises horizontal guide sections (31) applied to the second type of door (2) and cooperating with guide rollers (32) applied to the adjacent first type of door (1, 3) to cause the mutual transversal displacement. 10

Patentansprüche

1. Trag- und Laufvorrichtung für Schiebetüren, insbesondere für Möbel, mit einer ersten (1,3) und einer zweiten Art (2) von Tür, welche sich in einer Ebene befinden, wenn sie geschlossen sind, und hintereinander angeordnet, wenn sie offen sind, welche Schlitten, welche mit diesen Türen verbunden sind und in Führungsschienen laufen, und Mittel aufweist, die das erschütterungsfreie Verschieben von jeder zweiten Art von Tür (2) aus ihrer mit den anderen koplanaren Position erlauben, dadurch gekennzeichnet, daß sie aufweist:
- mindestens ein erstes Paar Längsschlitten (4,5) welche mit dem oberen Teil bzw. dem unteren Teil jeder ersten Art von Tür (1,3) verbunden sind und mittels Rollen (7,11) entlang korrespondierender Führungsschienen (8,12) geführt sind, welche parallel außerhalb der Ebene, welche diese Tür (1,3) enthält, nahe der Verschußfläche des Möbelstückes angeordnet sind, 20
 - mindestens ein zweites Paar Längsschlitten (13,14), die mittels Rollen (16,28) entlang korrespondierender Führungsschienen (17,29), welche außerhalb der Ebene, welche jede zweite Art von Tür (2) enthält, parallel zu den ersten, aber in einem größeren Abstand von der Verschußfläche des Möbelstückes, angeordnet sind, geführt sind und die mit dem oberen Teil bzw. mit dem unteren Teil von dieser zweiten Art von Tür (2) verbunden sind, wobei diese zweiten Längsschlitten (13,14) einen insgesamt brückenförmigen Träger aufweisen, welcher sich über diese erste Art von Tür (1,3) und/oder über ihre Längsschlitten (4,5) während ihrer Gegeneinanderbewegung erstreckt, und 25
 - mindestens einen oberen Querschlitten, welcher an jedem Längsschlitten dieser zweiten Art von Tür (2) angebracht ist, um das erschütterungsfreie Verschieben der Tür vom Möbelstück weg zu erlauben, wobei dieser 30

Querschlitten mindestens eine Konsole (15), die an der Tür (2) angebracht ist und sich quer über die Führungsschienen (8,17) erstreckt, mindestens eine Querstange (21), welche mit rollenden Tragvorrichtungen (18,19), die horizontale Rotationsachsen aufweisen und die in verschiedenen Abständen von der Ebene der Tür (2) angeordnet sind, zusammenwirkt, um das Gewicht der Tür auf die Querstange (21) zu versetzen und ein Moment entgegengesetzt dem Moment, das sich aus dieser Versetzung des Gewichts der Tür (2) ergibt, zu bewirken, sowie mindestens eine Feder (23), welche zwischen der Konsole (15) und der Rolle (16) zwischengeschaltet ist, aufweist, und mindestens ein Element (24,27), das zwischen einer zweiten Art (2) von Tür und der jeweiligen unteren Führungsprofile (29) liegt und eine Rolle (28) trägt, die die zweite Art (2) von Tür mit den ersten Art (1,3) von Tür koplanar elastisch hält. 15

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Längsschlitten (4,5,13,14) der aneinanderliegenden Türen entlang zweier paralleler Führungsschienen (8,12,17,29) geführt sind. 20
3. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der obere Querschlitten Führungsrollen, welche auf der Konsole (15) gelagert sind, um die Stange (21), welche mit dem entsprechenden oberen Längsschlitten (13) verbunden ist, zu führen, und mindestens eine Feder (23), welche zwischen der Konsole (15) und der Stange (21) zwischengeschaltet ist, aufweist. 25
4. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß mindestens ein elastisch gelagerter Tragbügel (27) zwischen jeder zweiten Art von Tür (2) und der entsprechenden Führungsschiene (29) dazwischengesetzt ist, wobei der Bügel an einem Ende mit dem Tür (2) verbunden ist und an dem anderen Ende mit einer Rolle (28) versehen ist, welche in die Führungsschiene (29) eingreift. 30
5. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß jede zweite Art von Tür (2) mit einem Paar von horizontalen Führungsprofilen (30) versehen ist, welche mit Führungsprofilen (30) zusammenwirken, welche an der anliegenden ersten Art von Tür (1,3) vorgesehen sind, um das transversale Gegeneinanderverschieben herbeizuführen. 35
6. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Führungsprofile (30) abgerun-

dete Enden aufweisen.

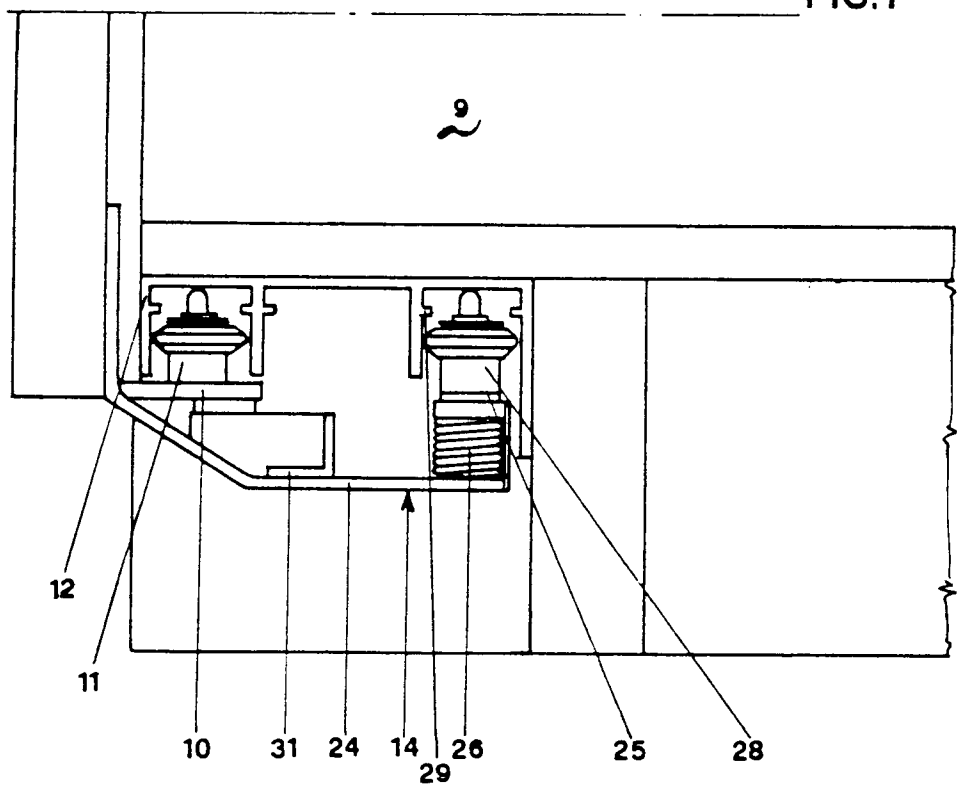
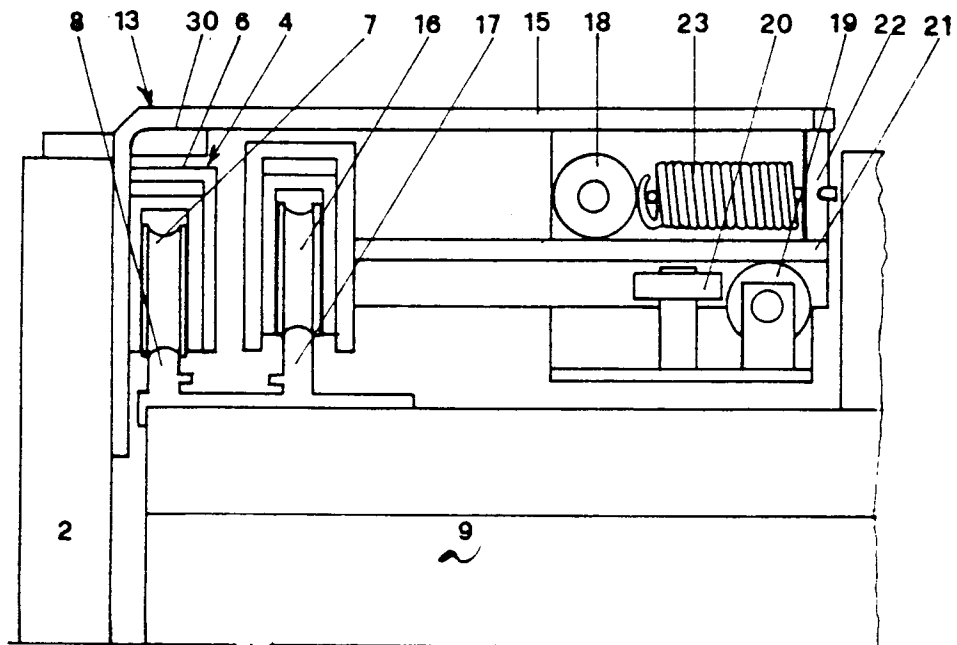
7. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß sie horizontale Führungsprofile (31) aufweist, welche an der zweiten Art von Tür (2) angebracht sind und mit Führungsrollen (32) zusammenwirken, welche an der anliegenden ersten Art von Tür (1,3) angeordnet sind, um das transversale Gegeneinanderverschieben herbeizuführen.

Revendications

1. Dispositif de support et de course pour portes coulissantes, notamment pour meubles, ayant des premiers (1,3) et seconds types (2) de portes, qui sont coplanaires lorsqu'ils sont fermés et superposés lorsqu'ils sont ouverts, des chariots fixés auxdites portes et se déplaçant sur des rails de guidage, et des moyens permettant le déplacement élastique de chaque second type de porte (2) de sa position coplanaire aux autres, caractérisé en ce qu'il comprend:
- au moins une première paire de chariots longitudinaux (4,5) fixés à la partie supérieure, respectivement à la partie inférieure, de chaque premier type de porte (1,3) et guidés au moyens de roulettes (7,11) le long des rails de guidage correspondants (8,12) disposés parallèlement à l'extérieur du plan contenant ladite porte (1,3), à proximité de la surface fermant le meuble,
 - au moins une seconde paire de chariots longitudinaux (13,14) guidés au moyen de roulettes (16,28) le long de rails de guidage correspondants (17,29) disposés à l'extérieur du plan contenant chaque second type de porte (2), parallèlement aux premiers types mais à distance plus importante de la surface fermant le meuble, et fixés à la partie supérieure, respectivement à la partie inférieure dudit second type de porte (2), lesdits seconds chariots longitudinaux comprenant un support général en forme de pont s'étendant par dessus ledit second type de porte (1,3) et/ou ses chariots longitudinaux (4,5) lors de leurs mouvements mutuels, et
 - au moins un chariot transversal supérieur fixé à chaque chariot longitudinal du dit second type de porte afin d'autoriser le déplacement élastique de la porte extérieurement au meuble, ledit chariot transversal comprenant au moins une console (15), fixée à la porte (2) et se prolongeant transversalement par dessus les rails de guidage (8,17), au moins une tringle transversale (21) coopérant avec des supports roulants (18,19) ayant des axes de

rotation horizontaux disposés à différentes distances du plan de la porte (2) afin de transférer le poids de la porte sur ledite tringle (21) et de produire un moment s'opposant au moment dû audit transfert du poids, et aussi au moins un ressort (23) disposé entre ladite console (15) et ladite roulette (16) et au moins un membre (24,27) disposée entre chaque second type de porte (2) et le rail de guidage inférieur respectif (29) et supportant une roulette (28) qui tient élastiquement ledit second type de porte (2) coplanaire avec ledit premier type de porte (1,3).

2. Dispositif conforme à la revendication 1, caractérisé en ce que les chariots longitudinaux (4,5,13,14) des portes adjacentes sont guidés le long de deux rails de guidage parallèles (8,12,17,29).
3. Dispositif conforme à la revendication 1, caractérisé en ce que le chariot transversal supérieur comprend des roulettes de guidage montées sur ladite console (15) afin de guider la tringle (21) fixée au chariot longitudinal supérieur respectif (13), et au moins un ressort (23) disposé entre ladite console (15) et ladite tringle (21).
4. Dispositif conforme à la revendication 1, caractérisé en ce qu'au moins un levier articulé élastiquement (27) est disposé entre chaque second type de porte (2) et le rail de guidage respectif (29), ledit levier étant fixé à une extrémité de la porte (2) et étant pourvu à l'autre extrémité d'une roulette (18) engagée dans le rail de guidage (29).
5. Dispositif conforme à la revendication 1, caractérisé en ce que chaque second type de porte (2) est équipé d'une paire d'éléments de guidage horizontaux (30) coopérant avec des éléments de guidage (30) prévus dans le premier type de porte adjacent (1,3) afin de produire le déplacement mutuel transversal.
6. Dispositif conforme à la revendication 1, caractérisé en ce que les éléments de guidage (30) ont des extrémités arrondies.
7. Dispositif conforme à la revendication 1, caractérisé en ce qu'il comprend des éléments de guidage horizontaux (31) fixés au second type de porte (2) et coopérant avec des roulettes de guidage (32) solidaires du premier type de porte adjacent (1,3) afin de produire le déplacement transversal mutuel.



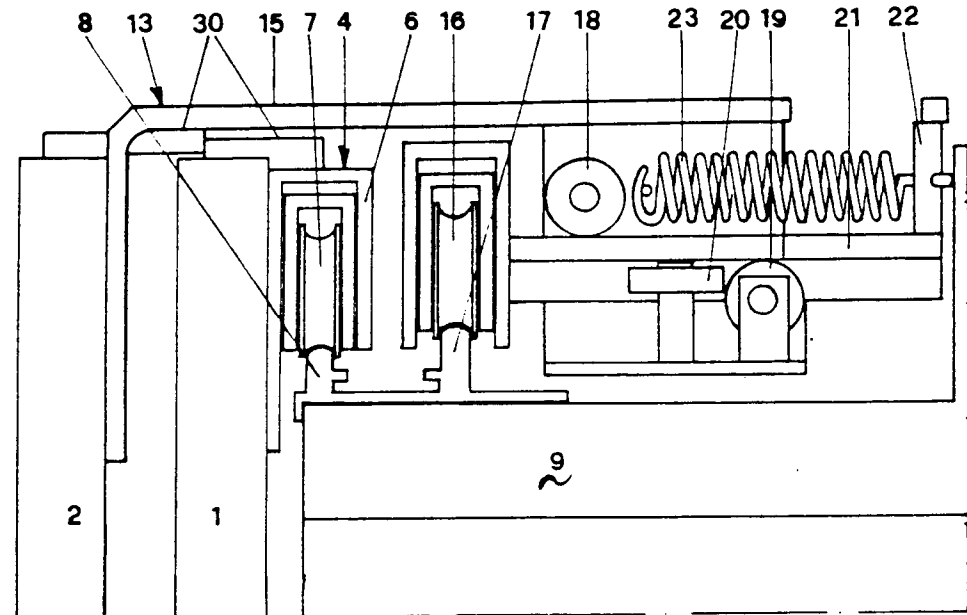


FIG. 2

