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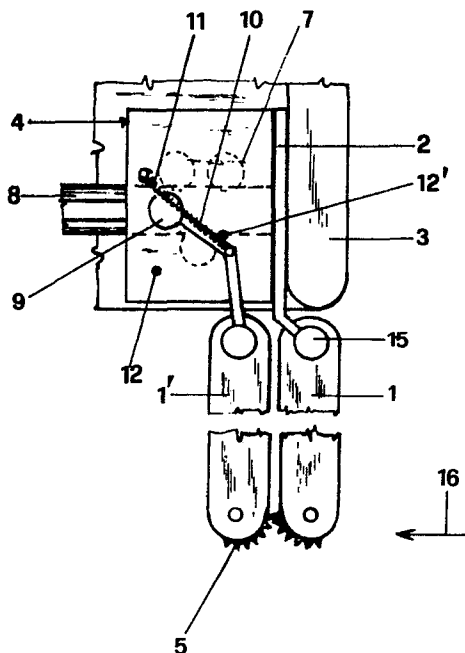
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Roller guide for suspended vertical panels.

The roller guide for suspended vertical panels (1, 1') comprises a frame (6), provided with sliding wheels (7) along a horizontal rail (8) placed on the upper of a wardrobe or the ceiling of a space, and a jointing bar (10) placed between the frame and the panel (1'). In the frame there are two stops (12, 12') against which the bar (10), moved by a spring (11) placed between the bar and the frame themselves, elastically leans near two symmetric extreme positions. In these positions the jointing axis bar (10) - panel (1') is alternatively advanced or backward with respect to the jointing axis bar (10) - frame (6).



The present invention relates to a roller guide for suspended vertical panels.

In the interior suspended vertical panels are well known, used as separations, partitions, facades and as doors for pieces of furnitures. These panels slide along horizontal rails and are provided with hinges near their adjacent vertical edges. The hinges allow panels to have a "rest position" when the panels are suspended in spaced, substantially parallel relation to each other, orthogonally to the sliding plane, and a "working position" when they are suspended coplanar to realize the "wall". It is also well known to realize the hinges provided with meshing gear wheels in order to make the movement of panels more exact and regular.

As a general rule two panels are jointed to each other: one of them, the so-called "fixed" panel, is jointed to the vertical wall of a piece of furniture or of a space along its free vertical edge, whereas the other, the so called moving panel, is jointed along one vertical edge to the fixed panel and along the other vertical edge to a roller guide sliding on a rail placed on the upper of the ceiling or of the space.

In order to carry out the closing of panels folded

as "an accordion", it is necessary to pull the free edge of the moving panel parallelly to the upper guide rail. Practically it often happens, being more instinctive, to push transversally the two panels near their adjacent vertical edge, that is to apply a parallel but not coplanar force to the upper guide rail. This action is not exact in that it causes the stumbling of the roller on the rail and, as time passes, a deformation of the rail and/or a damage to the roller itself.

10 In order to avoid this stumbling, it was suggested to place the joint between the panel and the roller in a position more advanced than the joint between the two panels with respect to the closing way, as well as when the panels are wholly folded. A drawback of this position is that in order to have the entire closing of the space, the length of the sliding rail must be longer than the total length of the coplanar doors and this is an obstacle when the panels should be placed in spaces defined by lateral walls or used with a wardrobe provided with opposite panels housed in a recess made specifically for this purpose.

20 To avoid the above mentioned stumbling it was also suggested to stop the opening of the panels before their whole folding, that is when they are suspended scantily

angled, but this position has the drawback of lowering the window of the space.

5 It was also suggested to use rollers which, when panels are in rest position, keep the panels themselves parallel to each other and back inclined as to closing way.

10 A drawback of this position is that these rollers don't allow the complete parallelism of folded panels and the alignment of the outer panel to lateral walls of the space to be closed, and also, as said before, they lower the window of the space.

15 The object of the invention is to eliminate the drawbacks jointly and disjunctly arising from these well known roller guides and to realize a roller guide which allows panels to be suspended in spaced, parallel relation to each other and to the wall of the space when they are opened, and which allows an easy and correct working in closing and opening operation.

20 This object is achieved according to the invention by a roller guide for suspended vertical panels, sliding on a horizontal rail and provided with hinges with meshing gear wheels near the adjacent vertical edges, characterized in that it comprises a frame provided with sliding wheels along the rail and a jointing bar placed between the frame and the

corresponding panel and moving between two steady extreme symmetric positions, in one position the jointing axis between the bar and the panel being further back, with respect to the closing way, than the jointing axis between the frame and the bar, in the other position said jointing axis being more advanced than the jointing axis between the frame and the bar.

The invention is further clarified here below in a preferred embodiment with references to the enclosed drawings in which:

figure 1 shows, in frontal fore view, a four doors wardrobe with two pairs of panels provided with a roller guide according to the invention,
figure 2 shows, in fragmentary enlarged and dissected perspective view, the roller guide according to the invention applied to a vertical suspended panel,
figure 3 shows, in a plan schematic view, the roller guide applied to a panel in rest position, and
figure 4 shows the same roller guide in the same view of figure 3, applied to a panel in working position.

As shown in figures, the roller guide, object of the invention, is used in vertical suspended panels, in particular in panels jointed near their vertical adjacent

edges thus they have a "working" position, when they are suspended coplanar to each other to realize the doors of a wardrobe or the partition wall of the space, or a "rest" position when, pivoted at 90° and folded as an "accordion", they are suspended in spaced parallel relation to each other.

In the embodiment shown (cf. fig. 1) there are four panels and they are jointed two by two to realize the doors of a wardrobe. Every pair comprises a first panel 1 jointed, near a vertical edge, to pins 2 connected to the frame of the wardrobe 3, and a second panel 1', jointed to the other vertical edge of the first panel, and near its opposite vertical edge to a roller guide, generically indicated with 4.

The joint between the two panels 1,1' is obtained by well-known meshing gear wheels hinges, which assure a high precision and evenness of the jointing movement.

The number of these hinges 5 is variable and depends on the total height of panels 1,1'.

Basically the roller guide 4 comprises a metallic frame 6 which is provided with wheels 7 with vertical axis and concav outline, engaging themselves with a rail 8 having a complementary outline, applied to the upper horizontal

edge of the wardrobe.

Furthermore a vertical pin is applied to the metallic frame 6, this pin being jointed to one end of a metallic bar 10.

5 The other end of the bar 10 is jointed to the panel 1' near the vertical free edge.

 A solenoidal spring 9 is interposed amidst the bar 10 and the frame 6. This spring is used as a traction one in order to keep elastically the bar 10 in one of the two
10 extreme positions, where it leans against two stops 12,12' provided in the frame 6.

 The stopping position of the two stops 12,12' is such that, near to the two extreme positions of bar 10, the free vertical edge of the panel 1' is adherent to the upper
15 and lower horizontal edges of the wardrobe, and the jointing axis of the bar 10 to the panel 1' is symmetrically placed with respect to the vertical orthogonal plane of the front of the wardrobe, said plane passing, through the jointing axis of the bar itself to the metallic frame 6.

20 In each intermediate position between the two above mentioned extreme positions the bar 10 sticks out of the frame 6 and comes out of the box-shaped section 13, wrapping the guide rail 8, through a longitudinal slit 14

housed along said section 13.

In order to obtain the whole camouflage of the box-shaped section when panels 1,1' are coplanar (working position), the section is placed to a level lower than the upper edge of panels, and the jointed engagement between the bar 10 and the panel 1' takes place near a recess obtained in the upper edge of the panel 1'.

The roller guide, according to the invention, operates as follows:

- when the wardrobe is completely opened (cf. fig. 3), the panel 1' is parallelly related to the panel 1 which is jointed to pins 2 connected to the frame of the wardrobe. In order to close the wardrobe it is necessary to push the two panels 1,1' in the way indicated by the arrow 16 represented in figure 3, pressing them where their vertical edges are jointed to each other.

The point at which this thrust acts, which is certainly incorrect, being the farthest from the sliding plane of the roller guide, but which is the most instinctive being the nearest to the user, allows a correct closing of the wardrobe, due to the position of the jointing axis bar 10-frame 5 more advanced than the jointing axis bar 10-panel 1'.

The sizes of panels 1,1' and of the rail 8 are such that, when the roller is at the end of its running movement, the two panels are not suspended vertically to each other; this position is reached afterward by inertia or thrust owing to the rotation of the bar 10 around its pin 9 jointed to the frame 6.

This rotation takes the bar 10 to the other extreme position with the jointing axis to the panel 1 more "advanced" than the jointing axis to the frame 6 (cf. fig. 4).

In this other extreme position the two panels 1,1' are suspended coplanar to each other: in particular the panel 1' can engage itself below, by a swallow-tailed groove 18, with a complementar relief 19 placed in the low plane of the wardrobe. This relief 5 is fitted so to avoid pendular movements of panels 1,1' in working position.

In order to open the wardrobe, it's only required a traction, according to the arrow 17, near their jointed vertical edges; this can be made by a suitable handle 20 or grip.

Essentially owing to the bar 10, the jointing axis to the panel 1' is backward with respect to the jointing axis to the frame 10 when the closing movement begins, on

the contrary it is advanced at the end of this movement.

In the first configuration it is avoided the stumbling of the roller 4 over the rail 8 even with an incorrect closing movement, whereas in the second one the roller and its rail do not exceed the encumbrance of the coplanar panels and it is possible to use them also in wardrobes provided with opposite panels and/or wholly housed in a recess, or with partitions placed from one wall to the other of a room.

Moreover one must observe that the spring 11, which keeps elastically the bar 10 in the two extreme positions, also is an effectual shock absorber: in fact casual rough opening and/or closing movements or strokes given to the panels 1,1' during these movements, are partly absorbed from the elastic displacement of the bar 10, and so are notably lightened before reaching the roller guide.

Moreover when wardrobes are very high a series of rails and rollers, placed at various lengths, may preferably be used thus making the frame stronger and the opening and closing operations more free.

C L A I M S

1. Roller guide for suspended vertical panels,
sliding on a horizontal rail and provided with hinges with
meshing gear wheels near the adjacent vertical edges,
5 characterized in that it comprises a frame (6) provided with
sliding wheels (7) along the rail (8) and a jointing bar
(10) placed between the frame (6) and the corresponding
panel (1') and moving between two steady extreme symmetric
positions, in one position the jointing axis between the bar
10 (10) and the panel (1') being further back, with respect to
the closing way, than the jointing axis between the frame
(6) and the bar (10), in the other extreme position said
jointing axis being more advanced than the jointing axis
between the frame (6) and the bar (10).
- 15 2. Roller guide according to claim 1 characterized in
that it comprises two stops (12,12') which delimitate the
two extreme positions, where the bar (10) is elastically
kept by a spring (11) placed between the bar (10) and the
frame (6).
- 20 3. Roller guide according to claims 1 and 2 charac-
terized in that the two stops (12,12') are constituted by
two pins applied to the frame (6) and interferring with the
jointing movement of said bar (10) with respect to said

frame (6).

4. Roller guide according to claim 1 characterized in that the rail (8) is housed in a box-shaped section provided with a longitudinal slit (14) from which the bar (10) comes out partly.

5. Roller guide according to claim 1 characterized in that the bar (10) is jointed to the panel (1') near a recess (15), the upper edge of this panel (1') being placed at upper level with respect to the rail (8).

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