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(54) A bellows-type door having sliding wings.

(57) A bellows-type door having sliding wings, comprising a set of folding wings (1) mounted between a pair of opposite guideways (9, 10). Each wing (1) is mounted by means of hinge elements (16, 22) an rollers (6) running along an overhead guideway (9), and by means of hinge elements (17, 22) on a carriage (7) running along a bottom guideway (10).

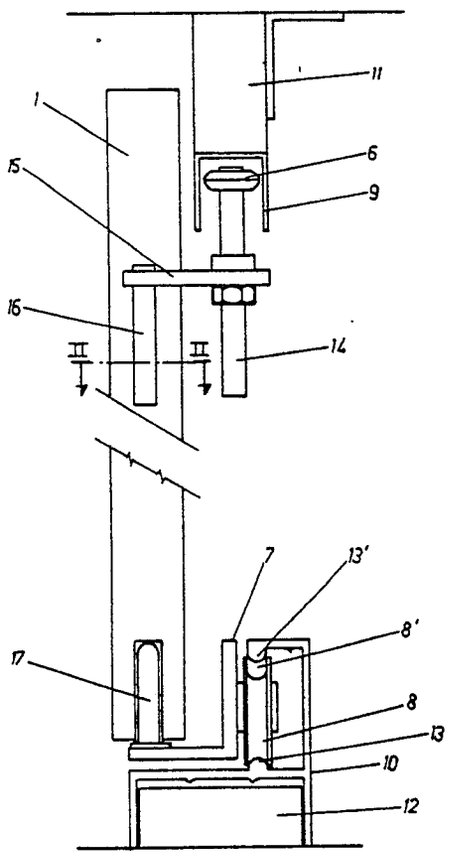

FIG. 1

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A BELLOWS-TYPE DOOR HAVING SLIDING WINGS

This invention relates to a bellows-type door having sliding wings, particularly for closing an opening into a room.

It is an object of the invention to provide a door means of the above type which can be easily operated and in which the wings can be indifferently moved to one side or the other of the door opening.

It is another object of the invention to permit easy mounting of the door wings and particularly of the hinge means enabling them to slide.

A door means according to the invention has a set of wing elements which can fold flat one against each other, these wings being mounted between a pair of oppositely arranged slideways by means of hinge means designed to move along said guideways.

Preferably, the running hinges can move along an overhead guide-way by means of rollers and along a bottom guideway by means of carriages provided with wheels having grooved profiles which are offset with respect to one another.

According to another aspect of the invention, the side edges of the door wings have metal shapes mounted thereon which provide inside recesses for receiving blocks of rigid plastics material, these blocks being designed to receive in turn hinge pins for the hinge means.

Further features of the invention will be best understood when reading the following detailed description made in relation to one embodiment thereof shown, by way of example only, in the accompanying drawing, wherein

Figure 1 is a schematic vertical sectional view of a wing for a door means according to the invention, showing the running hinges and their guideways;

Figure 2 is a sectional view taken along the line II-II in figure 1;

Figure 3 is a schematic perspective view showing the upper hinge arrangement of a door wing, as seen from the inside of the wing;

Figure 4 is like figure 3 but shows, in a fantom view, as seen from the outside, the bottom hinge arrangement of a wing;

Figure 5 is a perspective view of a carriage for running of a wing on a bottom guideway; and

Figure 6 is a schematic view of a door means according to the invention.

Referring now to figure 6, there is shown a door means according to the invention having a set, for example, of two-by-two-folding door wings 1 connected by hinges 2 to one another and mounted at their free ends on hinge means designed to run along overhead and bottom guideways, or rails, as will be explained further.

Figure 6 shows a frame unit enclosing the door means which comprises side cover members 4 and horizontal crosspieces 3 in which respective guideways for the running hinges of the wings are mounted.

Provided adjacent to the wing edges carrying the hinges 2, are suitable handles 5 (figure 6) in order to facilitate folding of the door wings.

Referring now to figures 1 to 4, the hinge running system for the wings 1 will be described.

Secured to a side edge of each wing 1, at upper and lower portions thereof, are guide rollers 6 of vertical axes and a carriage 7 respectively, this carriage 7 being provided with wheels 8, 8′ having grooved profiles and horizontal axes, which are offset with respect to one another in a direction of height.

The rollers 6 and carriages 7 run in associated guide ways 9 and 10 fastened to the ceiling and the floor respectively.

The overhead guideway 9 is a channel member providing a running track for the rollers 6 and secured to a crosspiece 11 fixed to the ceiling.

On the other hand, the bottom guideway 10 consists of a profile member, preferably of metal material, secured to a crosspiece 12 fixed to the floor.

The profile member 10 is shaped so as to provide a bearing and running track 13 for the wheels 8 of the carriages 7 and an opposite running track 13′ for the carriage wheels 8′ (figure 5).

The upper rollers 6 are rotatably mounted at the top of associated cylindrical threaded spindles 14 that are screwed into one branch of an L-shaped strap 15 so as to permit them to be easily mounted and adjusted in height. Provided at the end of the other branch of L-shaped strap 15 is a pin 16 of vertical axis which serves as a hinge means and is secured to the side edge of door wing 1, as will further explained hereinafter.

The bottom carriage 7 consists of a plate means of L-shaped cross-section on a face of which the wheels 8, 8′ of horizontal axis are mounted, while on another face of said plate means there is arranged a pin 17 of vertical axis which serves as a hinge element and which is secured in turn, like the pin 16, to the side edge of wing 1.

The wings 1 have rounded-off side edges which are obtained by fastening an appropriate shape 18, preferably of metal material, to the wing 1. This shape 18 has an inner chamber 20 and is formed with a front opening 19 having a recess 21 formed to the rear thereof for receiving a sealing

strip (see figure 2).

Fitted and secured in proper positions in chamber 20 of the shape 18 forming the edge of wing 1, are blocks 22 of rigid plastics material, such as nylon for example, which blocks are provided with a vertically directed, circular bore 23 designed to receive the hinge pin 16 or 17.

Fastening of blocks 22 to the shape 18 and of this latter to the wing 1 is achieved by means of screws which are horizontally passed through the block 22, the bottom wall 24 of shape 18 and engaged into wing 1, as schematically indicated by dashed line 25 in figure 2.

Thus, the block 22 provides a hinge element which is fixed to the lower end of wing 1 when it is coupled with carriage 7, and which is fixed to, but at a distance from, the upper end of that wing when it is coupled with the upper pin 16 (figure 3) so that the upper portion of wing 1 will be disposed in front of crosspiece 11. In this latter case, an inner portion of shape 18, which extends from the upper edge of wing 1 down to the top of the associated block 22, is cut away in order to permit fitting of hinge pin 16 into block hole 23 and to enable the wing 1 to rotate 90° on opening thereof.

Although a specific embodiment of the invention has been described herein above and illustrated in the drawings, it is intended that many changes as to the details of construction may be made thereto without departing from the spirit and scope of the invention as defined in the annexed claims

Claims

1. A bellows-type door having sliding wings, comprising a set of folding wings (1) mounted between a pair of opposite guideways (9, 10), characterized in that each wing (1) is mounted by means of hinge elements (16, 22) on rollers (6) running along an overhead guideway (9), and by means of hinge elements (17, 22) on a carriage (7) running along a bottom guideway (10).

2. The bellows-type door according to claim 1, wherein the carriage (7) is provided with wheels (8, 8′) having grooved profiles and horizontal axes, the wheels (8, 8′) being offset with respect to one another in a direction of height and being designed to run on opposite tracks (13, 13′) respectively, of the lower guideway (10).

3. The bellows-type door according to claim 1 or 2, wherein said rollers (6) have vertical axes and run in a channel member (9) secured to a ceiling by means of a crosspiece (11).

4. The bellows-type door according to claim 3, wherein said rollers (6) are rotatably mounted to the top of respective threaded spindles (14) screwed into one branch of an L-shaped strap(15).

5. The bellows-type door according to any of preceding claims 1 to 4, wherein each wing (1) has its side edges covered by a shape (18) formed with an inner chamber (20) and a front opening (19).

6. The bellows-type door according to claim 5, wherein said hinge elements (16,22) and (17,22) comprise hinge pins (16, 17) of vertical axes, carried by the L-shaped strap (15) and the carriage (7) respectively, and a block (22) provided with a circular bore (23) which is received and fixed in place in the inner chamber (20) of said shape (18).

7. The bellows-type door according to claim 6, wherein said block (22) is fastened inside the shape (18) by means of at least one screw which is engaged in a horizontal direction through the block (22), a bottom wall (24) of shape (18) and into a wing (1) thereby to fasten at the same time the shape (18) to the wing (1).

8. The bellows-type door according to any claims 5 to 7, wherein a recess (21) is formed just to the rear of front opening (19) in shape (18) and is designed to receive a sealing strip.

9. The bellows-type door according to any preceding claims, wherein the lower hinge (17,22) is arranged at the lower end of wing (1) while the upper hinge (16,22) is arranged at a distance to the top edge of wing (1).

10. The bellows-type door according to claim 9, wherein the wings are arranged so that their upper portion is in front of said crosspiece (11) supporting the overhead guideway (9).

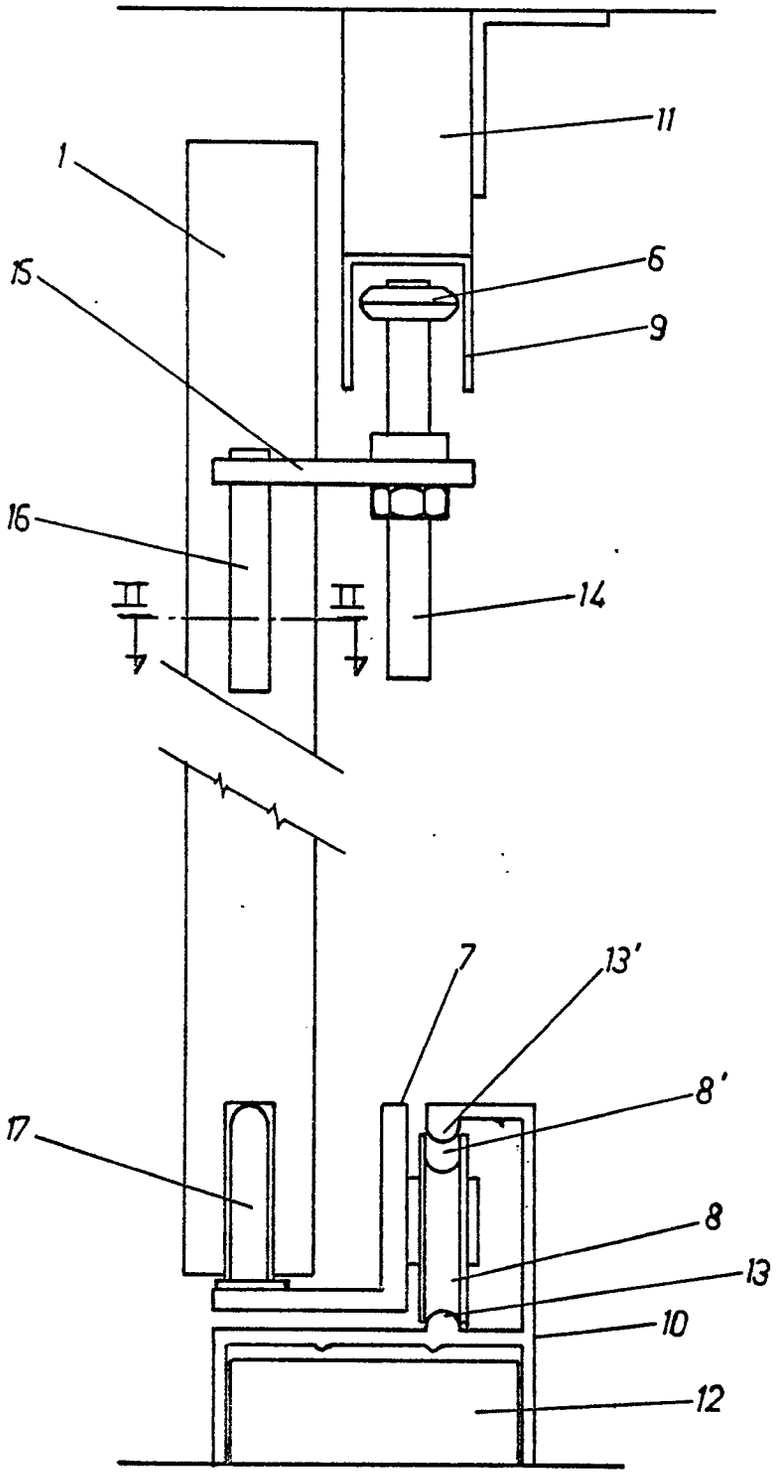

FIG. 1

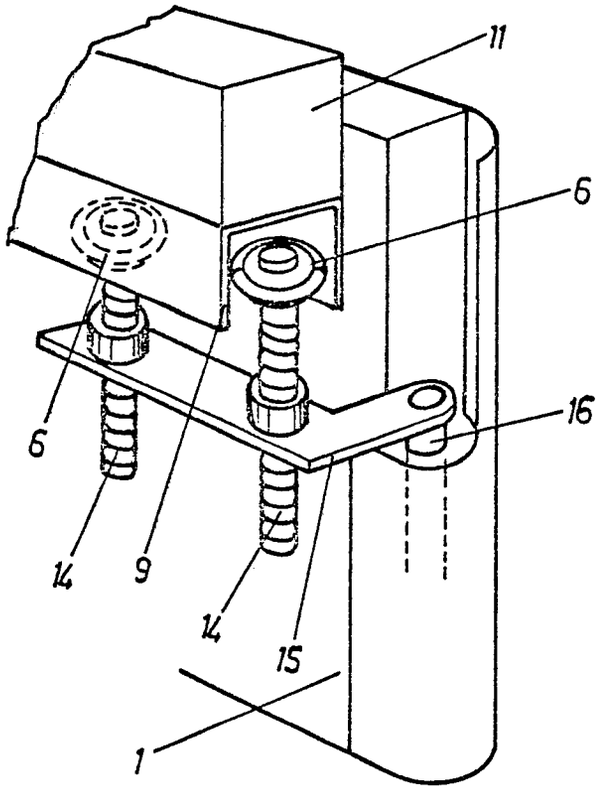

FIG. 3

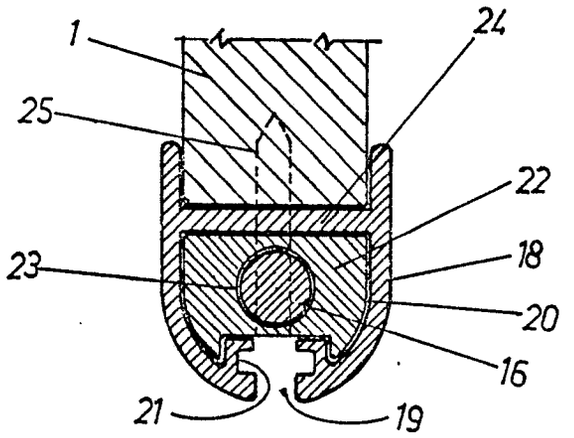

FIG. 2

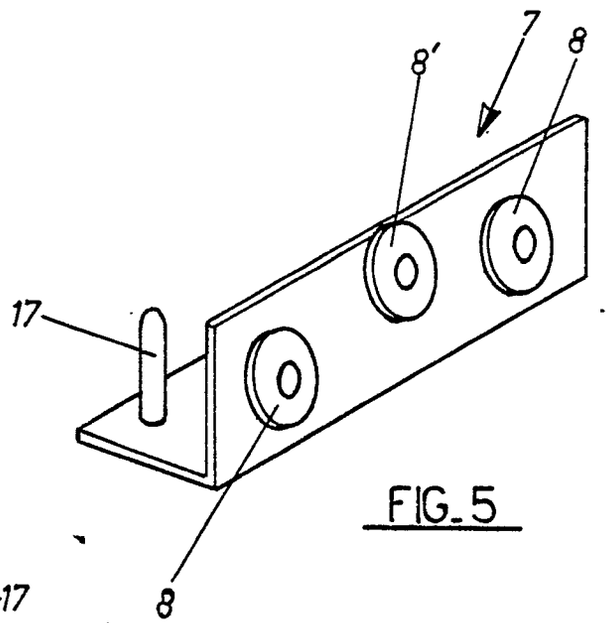

FIG. 5

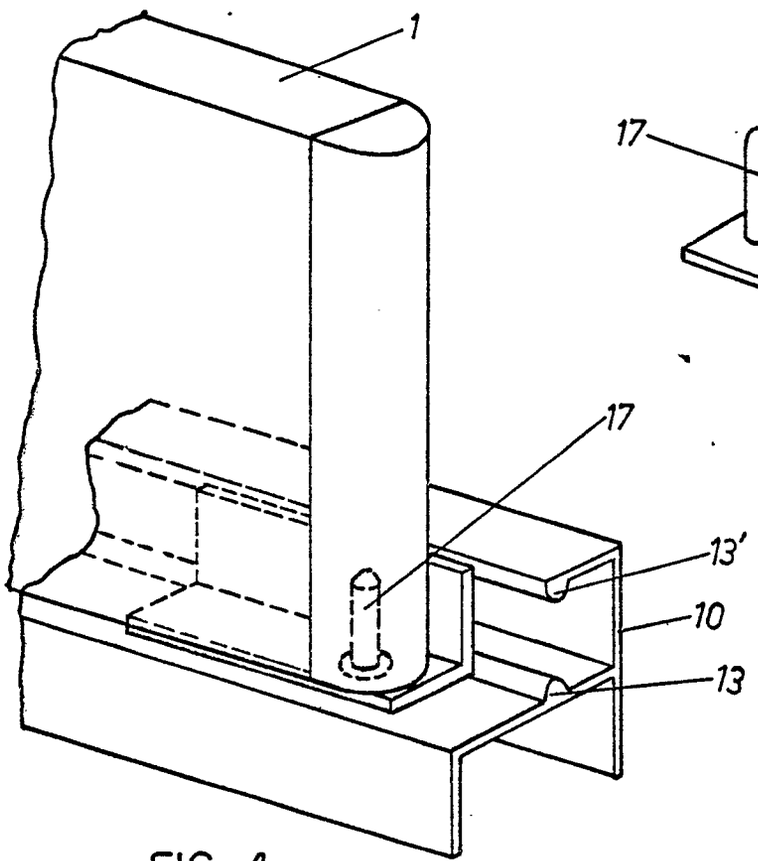

FIG. 4

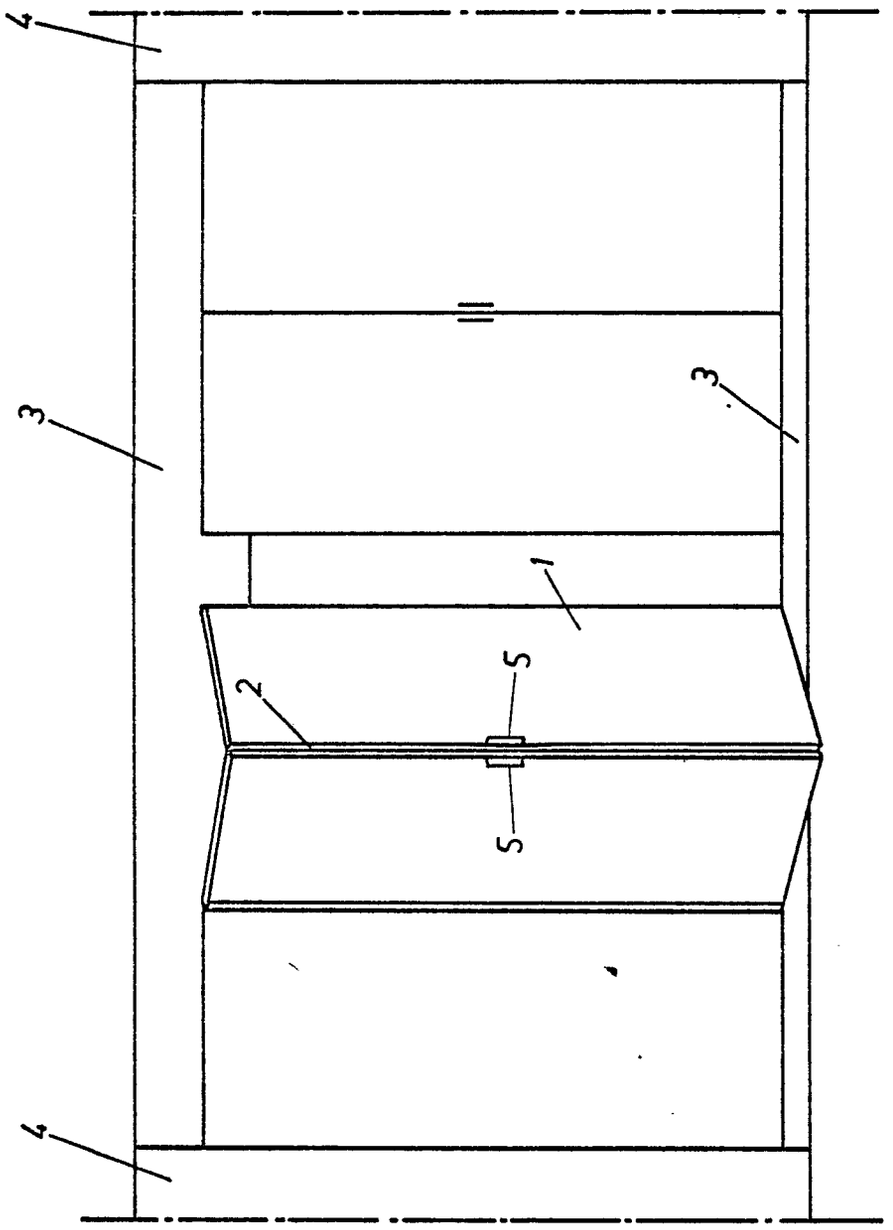

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number

EP 89 10 3771

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.4)
X	EP-A-0 134 759 (MOVI S.n.c. DI LINO VIGANO & CO.) * Whole document *	1-3	E 06 B 3/48 E 05 D 15/26
Y		4,5,9	
Y	CH-A- 160 690 (BIANCHETTI) * Figures 5,6; page 1, column 1, line 14 - page 2, column 1, line 6 *	4,9	
A		6	
Y	FR-A-2 336 526 (MILANT EFFE-ELLE S.n.c.) * Figures 4-6; page 2, line 13 - page 4, line 17 *	5	
A		6,8	
A	US-A-2 210 652 (DENNET) * Figure 4; page 2, lines 9-44 *	7,8	
A	FR-A-2 185 202 (BESSE) * Figure 2; page 2, line 29 - page 3, line 15 *	10	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

E 06 B
E 05 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19-07-1989	KISING A.J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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