Dec. 7, 1965 M. H. J. LAMBERT 3,221,803

HINGED DOORS FOR WALL-CUPBOARDS AND THE LIKE

Filed Oct. 29, 1962 2 Sheets-Sheet 1

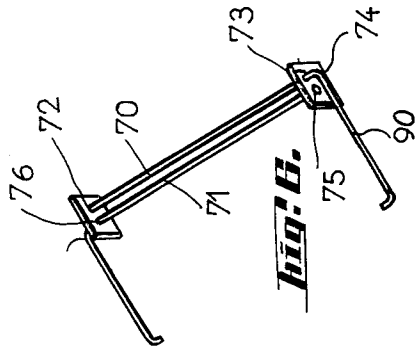

Fig: 6.

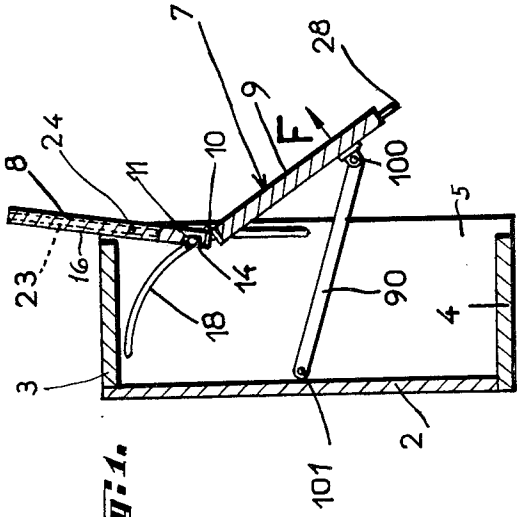

Fig: 1.

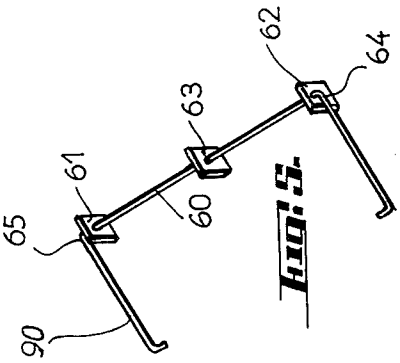

Fig: 5.

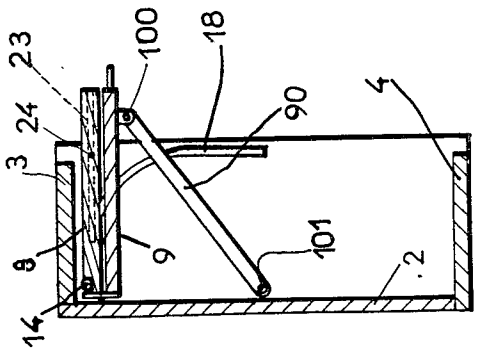

Fig: 2.

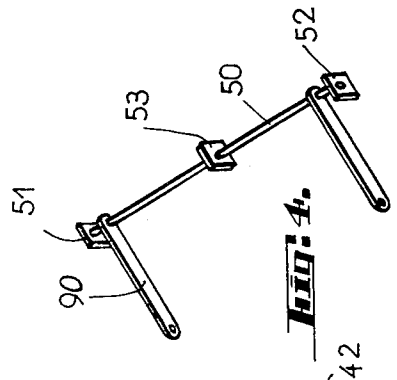

Fig: 4.

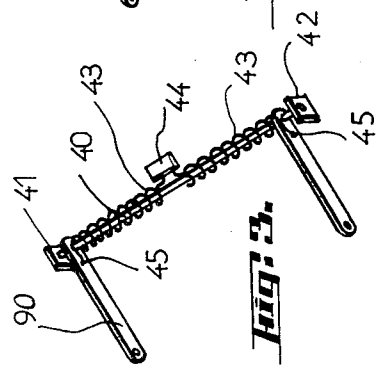

Fig: 3.

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Dec. 7, 1965 M. H. J. LAMBERT 3,221,803

HINGED DOORS FOR WALL-CUPBOARDS AND THE LIKE

Filed Oct. 29, 1962 2 Sheets-Sheet 2

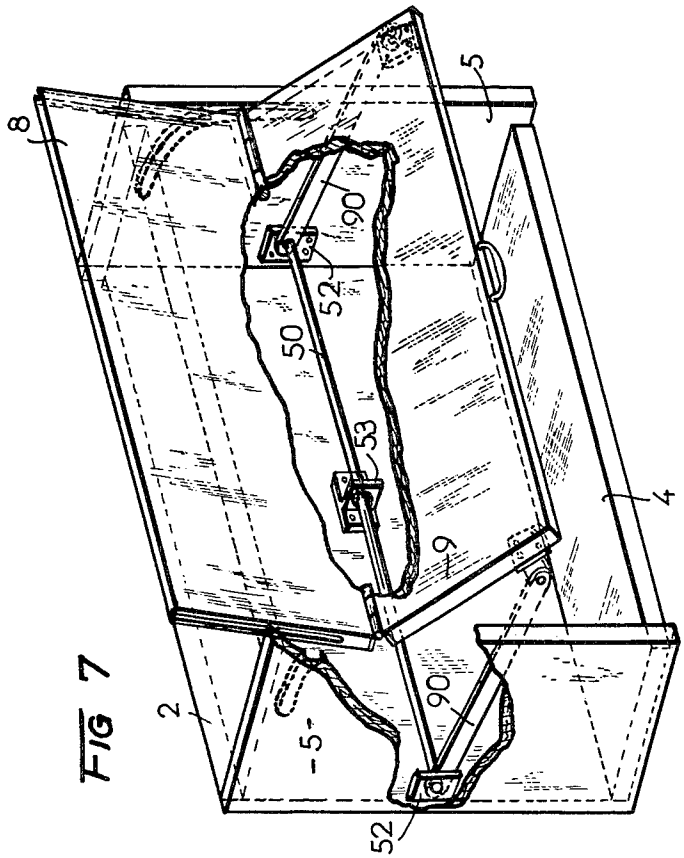

FIG 7

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HINGED DOORS FOR WALL-CUPBOARDS AND THE LIKE

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Claims priority, application France, Oct. 28, 1961, 877,350
5 Claims. (Cl. 160—206)

The present invention relates to doors in general and refers more particularly to doors for wall-cupboards which are of the type comprising two panels hingedly interconnected along their adjacent edges and adapted, in their open position, to be folded back completely and parallel to each other near one of the inner walls of the wall-cupboard, the first panel of the pair, that is the one nearest to the wall against which the panels are stowed, comprising along each one of its vertical edges a first guiding device co-acting with guide tracks formed in or carried by the corresponding parallel walls of the wall-cupboard, and a second guiding device movable in relation to a fixed point of said walls.

A door of this type has already been disclosed in U.S. Patent No. 3,075,819 in the name of Messrs. Bernard Louis Jean Liegeon and Marc Henri Jacques Lambert for "Hinged Doors for Wall-Cupboards and the Like."

The invention relates to an improvement in such doors and more particularly to a return and balance device for assisting the door opening movement. This return and balance device is characterized in that it comprises one and preferably two arms pivotally mounted at one end on said door, on the lower portion thereof, and at the other end about fixed points of said cupboard, said arms being biased in rotation and urging the panels towards their opening position against the force of gravity.

The aforesaid arm or arms are solid in rotation with a shaft journalled in bearings provided on the walls of said cupboard parallel to the plane of the cupboard openings. Said shaft is preferably a torsion bar attached at selected locations upon one of the walls of said cupboard.

Other features and advantages of this invention will appear as the following description proceeds with reference to the accompanying drawings illustrating diagrammatically by way of example a typical form of embodiment of the invention. In the drawings:

FIGURE 1 illustrates in cross sectional view a wall-cupboard or like structure equipped with a door constructed according to the teachings of this invention and shown in its semi open condition.

FIGURE 2 is a cross section similar to FIGURE 1 showing the door in its open condition.

FIGURES 3, 4, 5 and 6 show diagrammatically different embodiments of the return and balance device according to the invention.

FIGURE 7 is a partially broken away view of the wall cupboard, showing the location of the torsion bar illustrated in FIGURE 4.

In FIGURES 1 and 2 of the drawings, there is shown a parallepipedic wall-cupboard comprising a bottom **2**, a top or ceiling **3**, a bottom or floor **4**, and side walls **5**.

This wall-cupboard is closed by a door **7** comprising two panels **8**, **9** hingedly interconnected along their adjacent edges by one or more hinges **10**.

The first panel **8** comprises in the vicinity of the hinge **10** a guiding device **11** which comprises in the example illustrated, two pinions or shoes each mounted on a common shaft **14** journalled in bearings carried by the panel **8**.

These pinions project from each side of the panel **8** and engage guide-tracks **18** formed in the corresponding walls **5** of the cupboard.

The panel **8** is also provided along its edges **16** with another guiding device consisting of two slideways or grooves **23**, adapted to slide about pins **24**, secured on each wall **5**, of the wall-cupboard at the intersection of the two planes occupied by the panel **8** in the closed and open positions, respectively.

The return and balance means comprise an arm **90** pivoted at **100** on panel **9** at the lower end thereof and at **101** on the bottom **2** of the cupboard or (if desired) on the lateral wall **5**. In FIGURE 1, there is shown only one arm **90** but the return and balance means generally comprise two symmetrically disposed arms provided on panel **9** in the vicinity of each lateral side thereof. These two arms are solid with a common shaft and are solicited in rotation by biasing means urging them towards their upward position corresponding to the open condition of the door.

FIGURES 3, 4, 5 and 6 show different embodiments of the return and balance means.

In FIGURE 3 the arms **90** are secured on the ends of a shaft **40** journalled in bearings **41**, **42** provided on the lateral walls of the cupboard. Two helical springs **42** coiled in reverse directions about the shaft **40** are secured by one of their ends on the bottom wall **2** of the cupboard, at **44**; their opposite ends **45** engaging or being solid with the arms **90**.

It is evident for any person conversant with the art, that when the arms **90** are in their downward position (corresponding to the closed condition of the door), the two springs **43** are under tension to urge the arms **90** towards their upward position (corresponding to the open condition of the door, see FIGURE 2).

In the example of FIGURE 4, the shaft connecting the arms **90** is a torsion bar **50**, journalled at both ends in bearings **51**, **52** provided on the lateral walls **5** of the cupboard. The torsion bar **50** is solid at **53** with the bottom wall **2** of the cupboard, so that this bar **50** acts as a return means urging the arms **90** towards their upward position.

The example of FIGURE 5, differs from the one shown in FIGURE 4 in that the arms **90** consist of a portion of a torsion bar **60**. The torsion bar **60**, which is pivotally mounted in bearings **61**, **62**, is solid at **63** with the bottom wall **2**. The torsion bar **60** is bent at **64**, **65** and its free ends constitute the above mentioned arms **90**.

In the example of FIGURE 6, according to a modified embodiment, two torsion bars **70**, **71** are used; each of these bars is bent at one of its ends, respectively at **74** and **77**.

These two torsion bars are symmetrically located at each lateral side of the cupboard. By its end **72**, bar **70** is secured in a wall of the cupboard and said bar **70** is pivotally mounted in a bearing **73** near its bent portion **74**. The end **75** of bar **71** is secured on a wall of the cupboard and said bar **71** is pivotally mounted in a bearing **76** near the bent portion **77** thereof.

What I claim is:

1. A cupboard comprising two lateral parallel walls, an upper wall and a lower wall, a door for closing said cupboard, said door being formed of two panels hingedly interconnected along their adjacent edges and adapted, in their open position, to be folded back parallel to and against each other along said upper wall of said cupboard, the first of said panels, that is the one nearest to said upper wall against which it is to be stowed, comprising on each of its lateral edges perpendicular to said hinge means a first guiding device, said first guiding device co-acting with plain guide tracks provided on said lateral parallel walls, said first panel comprising also a second guiding device movable in relation to a fixed point on said parallel walls, said second panel comprising also a guiding, bal-

ancing and lifting device consisting of a torsion bar means fixedly secured by at least one point thereof to said cupboard, substantially parallel to the plane of the door opening, and having a pair of ends rotatably journalled in bearings provided at both lateral sides of said cupboard, and a pair of substantially symmetrically disposed arms pivotally mounted at one end on the lower part of said second panel and rigidly secured at their other end to said torsion bar means.

2. A cupboard as claimed in claim 1, wherein said torsion bar means consists of one single torsion bar secured by one point thereof to said cupboard.

3. A cupboard as claimed in claim 2, wherein said arms are respectively built and fixedly secured to said torsion bar.

4. A cupboard as claimed in claim 2, wherein said torsion bar is formed at each end with a bent portion forming one of said arms.

5. A cupboard as claimed in claim 1, wherein said torsion bar means consist of two torsion bars substantially

parallel to each other, rigidly secured at one of their ends to said cupboard and bent at their opposite ends to form an arm-like portion, the two arm-like portions constituting said pair of arms.

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