May 23, 1967 D. N. TOMA 3,321,100

REVERSIBLE OPENING DOOR

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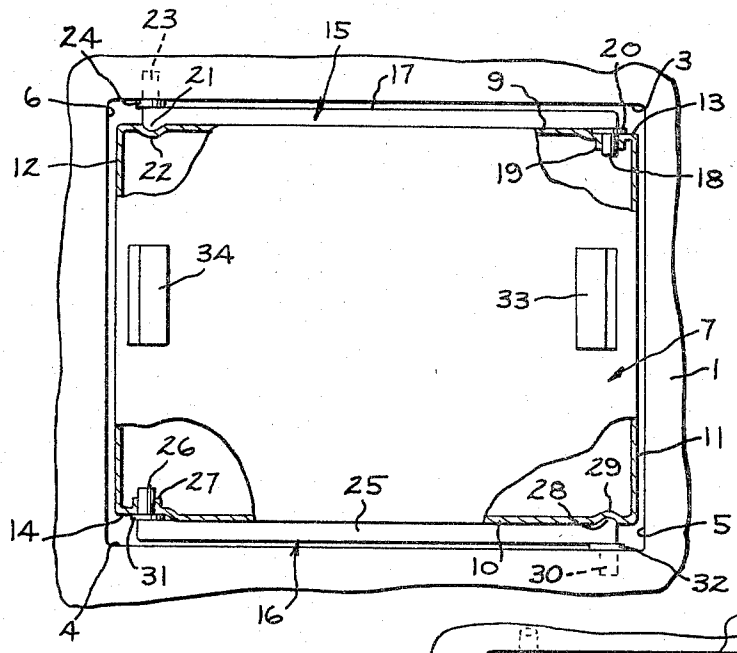


FIG. 1

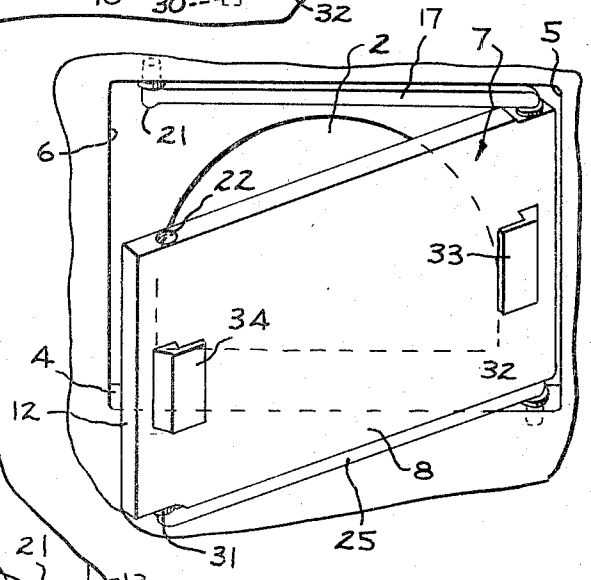


FIG. 2

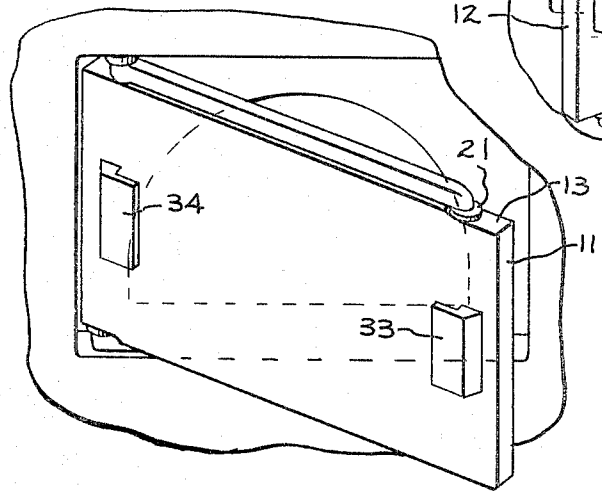


FIG. 3

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REVERSIBLE OPENING DOOR

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This invention relates to doors and other closure members, and more particularly, to a new and improved mechanism whereby a door may be opened selectively from either side.

With many appliances it is advantageous for the access door to be operable selectively from either side. For instance, many housewives place an automatic clothes washer and a clothes dryer in a side-by-side relationship. In such installations, it greatly facilitates transfer of fabrics from the washer to the dryer if the dryer door may be opened away from the washer. For this reason some housewives may desire a right hand door while others desire a left hand door. The cost to the customer is substantially increased if the manufacturer must make both right and left hand door versions of each model of his machines.

Modern kitchens include large work areas surrounded by various storage cabinets. It is desirable if the housewife may open the cabinet doors away from her, regardless of the portion of the work area she is using. This requires reversible opening doors for the cabinets.

It is an object of this invention to provide a new and improved mechanism for opening doors and other closure members selectively from either side.

It is another object of this invention to provide such a mechanism which is easy and reliable in operation and economical to manufacture and install.

It is a further object of this invention to provide a simple and reliable mechanism which allows the door or closure member selectively to be opened from either side while preventing inadvertent complete removal of the door.

In carrying out this invention, in one form thereof, there is provided a support structure including a pair of spaced walls. A closure member and a pair of mounting members are received between the walls with each of the mounting members being received between one wall and a corresponding side of the closure member. Each mounting member is rotatably connected to the closure member adjacent a corner diagonally opposite the other mounting member and extends along its corresponding side of the closure member. Each mounting member is provided with a projection that is releasably received in a detent provided adjacent the other end of the corresponding side of the closure. member Additionally, each closure member is rotatably connected to a corresponding wall in alignment with its projection and detent.

The subject matter which I regard as my invention is particularly pointed out and distinctly claimed in the concluding portion of the specification. My invention, both as to organization and method of operation, together with further objects and advantages thereof may best be understood by reference to the following description taken in conjunction with the accompanying drawing. In the drawing:

FIGURE 1 is a fragmentary front elevational view of a clothes dryer including my invention and showing the door in its closed position, the view being partly broken away and partially in section to illustrate details;

FIGURE 2 is a fragmentary perspective view of the mechanism of FIGURE 1 showing the door partially opened from one side; and

FIGURE 3 is a view similar to FIGURE 2 showing the door partially opened from the other side.

Referring to the drawing, there is shown one form of my new and improved reversible opening door and mounting mechanism utilized in a clothes dryer. A surface member 1, in this instance being the front panel of a dryer, includes a recessed opening 2. In order to provide the recessed opening, the surface member 1 is bent inwardly so as to form parallel top and bottom walls 3 and 4 spaced above and below the opening 2 respectively and spaced end walls 5 and 6, spaced outwardly from the sides of the opening 2.

The surface member, including one of the pairs of spaced walls projecting outwardly from the opening 2 forms a support structure for the access door or closure member 7 which is received in the recess formed by the walls around the opening 2. The door has an outer wall or surface 8 and sides including a top 9, bottom 10 and ends 11 and 12. Diagonally opposite corners of the top 9, and bottom 10 are indented, as shown at 13 and 14 respectively.

A pair of elongated mounting members 15 and 16 are received between the door 7 and the walls 3 and 4 respectively. Mounting member 15 includes an elongated body portion 17 extending lengthwise between top 9 and top wall 3. One end 18 of mounting member 15 is bent inwardly and is rotatably received in an opening 19 formed in indentation 13. A small wear-resistant washer 20 is provided between indentation 13 and body portion 17. Adjacent its other end mounting member 15 is provided with a projection 21 that is releasably received in a detent 22 provided in the top 9 adjacent its end opposite indentation 13. The end 23 of mounting member 15 is bent outwardly so as to be rotatably received in a cooperating opening provided in top wall 3. A small wear-resistant washer 24 is mounted around the end 23 between body portion 17 of mounting member 15 and top wall 3.

In a similar manner, mounting member 16 includes an elongated body portion 25 and an inwardly bent end 26 which is received in an opening 27 formed in indentation 14. Adjacent its other end, mounting member 16 includes a projection 28 which is received in a detent 29 formed in the end of bottom wall 10 opposite indentation 14. End 30 of mounting member 16 is bent outwardly and is received in an opening provided in the bottom wall 4. Washers 31 and 32 are received between mounting member 16 and the bottom 10 of door 7 and the bottom wall 4 respectively in a manner similar to washers 21 and 24, which are associated with the upper mounting member 15.

With this construction it will be noted that each of the mounting members is received between one of the projecting walls and a cooperating one of the sides of the door, mounting member 15 being received between top wall 3 and top 9 while mounting member 16 is received between bottom wall 4 and bottom 10. The mounting members are rotatably received in openings provided adjacent diagonally opposite corners of the door. Additionally, each mounting member is provided with a projection that is reelasably received in a detent formed adjacent the other end of the cooperating side of the door and is rotatably received in an opening in the cooperating projecting wall in alignment with the projection and detent. Thus, the rotatable connection between one mounting member and the support structure, the projection and detent connection between that mounting member and the door and the rotatable connection between the other mounting member and the door are all in substantial alignment.

In order to open and close the door a pair of handles 33 and 34 are provided on the outer wall 8. The handle 33 is mounted substantially in alignment with opening

19 and detent 29 while handle 34 is mounted substantially in alignment with opening 27 in detent 22.

When it is desired to open the door from its left hand edge, as shown in FIGURE 2, the user merely grasps handle 34 and pulls outwardly. This force causes projection 21 to be released from detent 22 and the door pivots at the top about the rotatable connection between end 18 of mounting member 15 and opening 19 and pivots at the bottom about the rotatable connection formed by end 30 of mounting member 16 being received in an opening in the bottom wall 4. In this instance, projection 28 remains in detent 29. When the door is closed, it merely swings inwardly on the same axis until projection 21 is engaged in detent 22.

When it is desired to open the door on the right hand edge, as shown in FIGURE 3, the user merely grasps handle 33 and pulls outwardly. In this instance, projection 28 is released from detent 29 and the door pivots about its opposite end. In this case, end 23 of mounting member 15 rotates in the opening in the top wall 3 and end 26 of mounting member 16 rotates in the opening 27 of bottom 10. In closing, the door rotates in the opposite direction until projection 28 is engaged in detent 29.

It will be understood that, while projections 21 and 28 are shown as being formed integrally with mounting members 15 and 16 respectively, they may be formed in any suitable manner such as, for instance, small plastic tabs attached to the mounting members. Also, it will be understood that while door 7 is shown mounted in a recess around opening 2 such a construction is not necessary and has been shown only for the sake of convenience, since clothes dryers normally have the access opening recessed in order that the front of the dryer, including the access door, will be generally planar in form. If the opening is provided in a substantially flat surface, my new and improved reversible opening door and mounting mechanism can be utilized merely by providing a pair of small projections disposed adjacent diagonally opposite corners of the opening and provided with suitable recesses or openings to receive the ends of the mounting members.

While, in accordance with the patent statutes, I have described what at present is considered to be the preferred embodiment of my invention, it will be obvious to those skilled in the art that various changes and modifications may be made thereto without departing from the invention, and I therefore aim in the appended claims to cover such changes and modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A support structure including a pair of spaced walls, a closure member receivable between said walls, a pair of elongated mounting members, each of said mounting members being reecived between one of said walls and a corresponding side of said closure member, said mounting members being rotatably connected to said closure member adjacent first diagonally opposite corners of said closure member, said mounting members including projections releasably received in detents provided adjacent second diagonally opposite corners of said closure member, and each of said mounting members being rotatably connected to a corresponding one of said walls at a position in alignment with its projection.

2. A support structure including a pair of spaced walls, a closure member receivable between said walls, a pair of elongated mounting members, each of said mounting members being received between one of said walls and a corresponding side of said closure member, each of said sides of said closure member including an opening to rotatably receive one end of a corresponding one of said mounting members, said openings being adjacent diagonally opposite corners of said closure member, each of said sides further including a detent substantially directly opposite the opening in the other of said sides, each of said mounting members including a projection releasably received in a cooperating one of said detents, each of said mounting members being rotatably connected to a cooperating wall at a position in alignment with said detent in said corresponding one of said sides and said opening in the other of said sides.

3. A surface member having an opening therein, a closure member receivable over said opening, a pair of elongated mounting members extending along opposite sides of said closure member, said mounting members being rotatably connected to said closure member adjacent first diagonally opposite corners of said closure member, said mounting members including projections releasably received in detents provided adjacent second diagonally opposite corners of said closure member, and each of said closure members being rotatably connected to said surface member at a position in alignment with a corresponding one of said projections.

4. A surface member having a recessed opening therein, said surface member being formed with generally parallel walls projecting outwardly on opposite sides of said opening, a closure member receivable between said walls to close said opening, a pair of elongated mounting members, each of said mounting members being received between one of said walls and a corresponding side of said closure member, said mounting members being rotatably connected to said closure member adjacent first diagonally opposite corners of said closure members, said mounting members including projections releasably received in detents provided adjacent second diagonally opposite corners of said closure members, and each of said mounting members being rotatably connected to a corresponding wall at a position in alignment with its projection.

5. A surface member having a recessed opening therein, said surface member being formed with generally parallel walls projecting outwardly on opposite sides of said opening, a closure member receivable between said walls to close said opening, a pair of elongated mounting members, each of said mounting members being received between one of said walls and a corresponding side of said closure member, said mounting members being rotatably connected to a corresponding one of said walls adjacent first diagonally opposite corners of said closure member, said mounting members including projections releasably received in detents provided adjacent said first diagonally opposite corners of said closure members, said corresponding sides of said closure member being offset inwardly adjacent second diagonally opposite corners of said closure member, and each of said mounting members being rotatably connected to said closure member in the offset portion of the corresponding one of said sides.

References Cited by the Examiner

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