

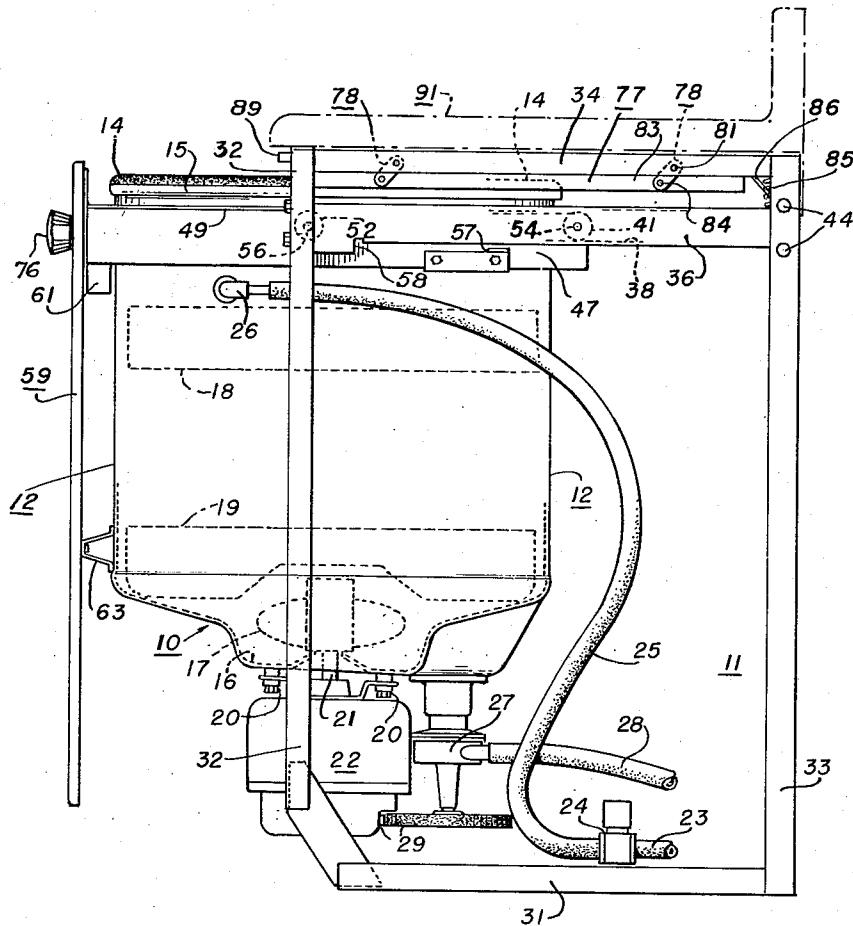
Feb. 2, 1954

E. K. CLARK
WASHING APPARATUS

2,668,091

Filed Sept. 30, 1949

3 Sheets-Sheet 1



WITNESSES:

R. J. Ridgely
D. J. McCarty

INVENTOR
EARL K. CLARK
BY *R. J. Small*
ATTORNEY

Feb. 2, 1954

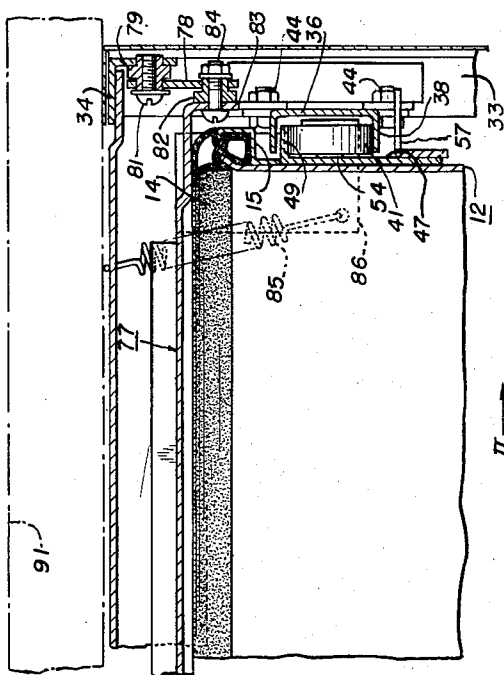
E. K. CLARK

2,668,091

WASHING APPARATUS

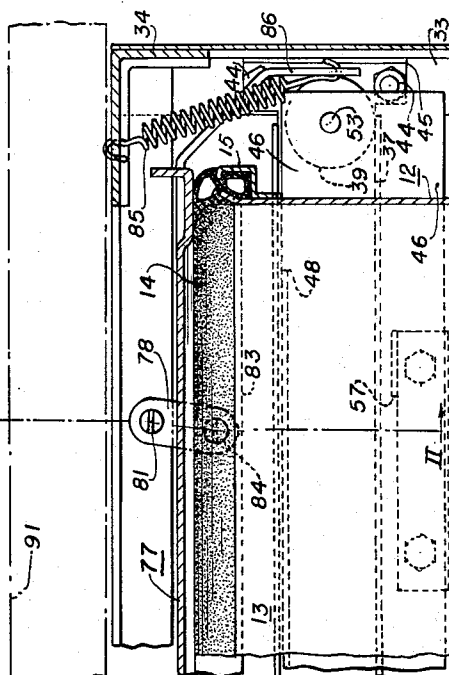
Filed Sept. 30, 1949

3 Sheets-Sheet 2



WITNESSES:

R. J. Ridge
D. J. McCarty



INVENTOR

EARL K. CLARK

BY *R. N. Ewall*

ATTORNEY

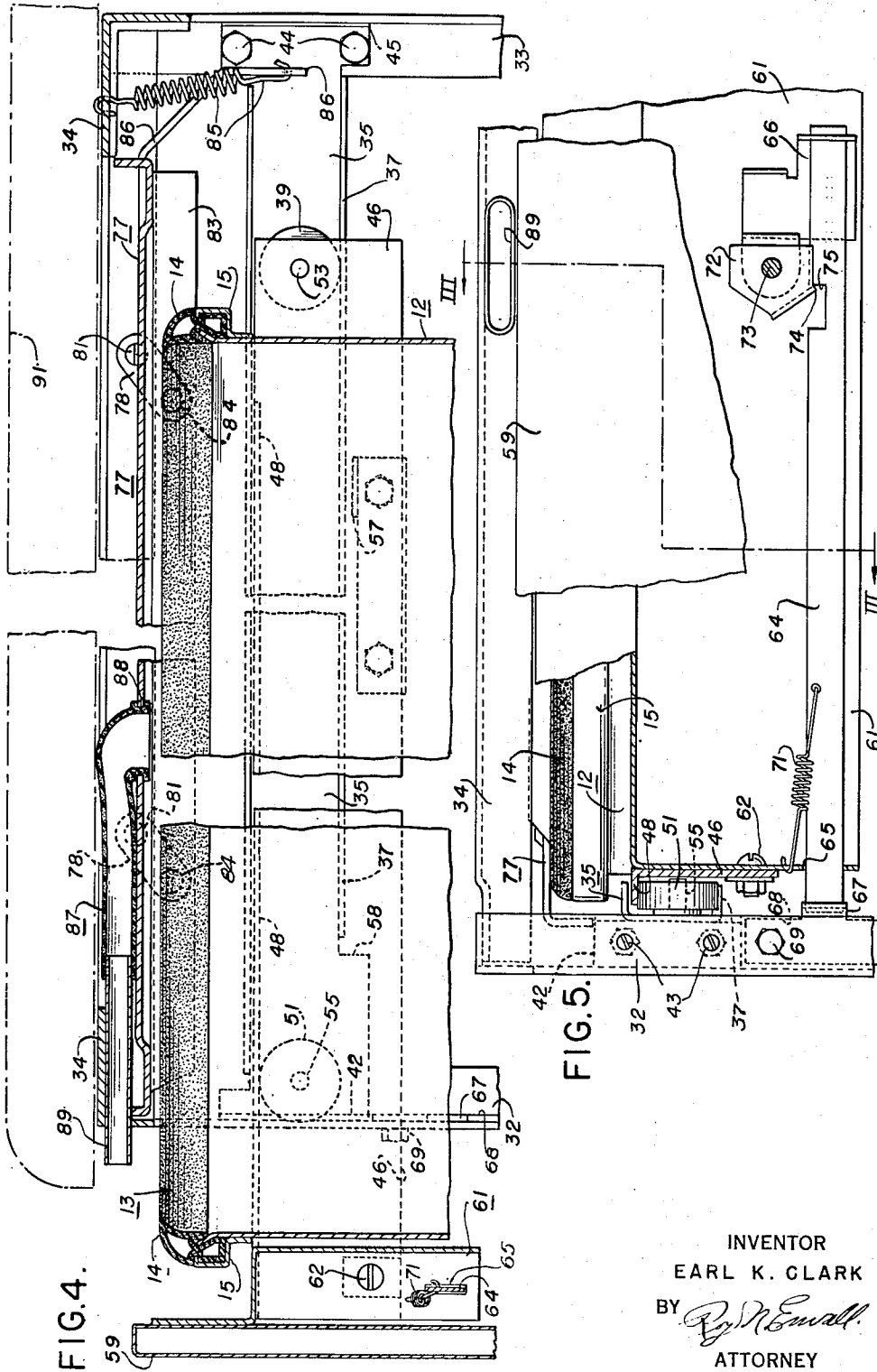
Feb. 2, 1954

E. K. CLARK
WASHING APPARATUS

2,668,091

Filed Sept. 30, 1949

3 Sheets-Sheet 3



INVENTOR
EARL K. CLARK
BY *Raymond E. Wall*
ATTORNEY

UNITED STATES PATENT OFFICE

2,668,091

WASHING APPARATUS

Earl K. Clark, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania

Application September 30, 1949, Serial No. 118,961

5 Claims. (Cl. 312-270)

1

My invention relates to washing apparatus and has for an object to provide improved apparatus of this kind.

My invention relates to washing apparatus and the open top type possess advantages over washers of the so-called open front type, one advantage being that they may be loaded and unloaded more conveniently than machines of the open front type. Another advantage is that open top machines are less susceptible to leaks and, furthermore, may be more economically produced. However, a disadvantage present in the open top type of machine, when installed beneath a work board or drain board of a sink, is that the board must be provided with a hinged lid to gain access to the washer and, therefore, this lid portion of the work board cannot be conveniently used for other operations when the washer is operated.

A further object of the present invention is to provide an improved open top dishwasher which may be installed beneath an unbroken top panel or work surface of a kitchen sink.

In practicing my invention, an open top type of dishwasher, which may be generally of conventional construction, is supported within a frame so that it may be readily moved into the frame for operation and retracted for loading and unloading. A cover is carried within the frame structure and means is provided for moving the cover downwardly into contact with the vat of the dishwasher for closing the top opening thereof when the washer is moved to its operating position within the frame. When the washer is retracted, the cover is moved upwardly clear of the washer structure during the early stage of the outward movement of the washer. Preferably, the vat is vented to the atmosphere exteriorly of the frame by a flexible conduit secured to the cover and the frame. A front panel carried by the washer structure closes the front opening in the frame in the operating position of the washer. The frame may be of open side construction when applied for operation within a cabinet type sink but is enclosed by panels when used in a cabinet type dishwasher. Flexible conduits are provided for connecting the washer structure to water supply and drain pipes.

The foregoing and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a side elevation of a dishwasher constructed and arranged in accordance with my

2

invention, the washer structure being shown partly retracted from the supporting frame;

Fig. 2 is a transverse sectional view of the upper portion of the washer vat and frame and is taken along the line II--II of Fig. 3;

Fig. 3 is a vertical longitudinal section of the upper portion of the washer vat and frame and is taken along the line III--III of Fig. 5, the washer structure in Fig. 3 being shown in its operating position within the frame;

Fig. 4 is a view similar to Fig. 3, showing the washer structure partly retracted from the frame; and

Fig. 5 is a front view of the upper portion of the apparatus with certain elements broken away for clearness.

Reference will now be had to the drawings, in Fig. 1 of which, I have shown an open top type of dishwasher, generally indicated at 10, supported by a frame structure 11 in such manner that it may be moved within the frame structure 11 for operation and retracted to a position exteriorly of the frame for loading and unloading. The dishwasher 10, which may be generally of conventional construction, includes a vat 12 having a relatively large access opening at the top side thereof and indicated at 13 in Figs. 2 to 4, inclusive. A resilient gasket structure 14 is carried by the vat peripherally of the access opening 13. As shown, a flanged ring 15 welded or otherwise secured to the vat structure clamps the gasket 14 in position. The vat 12 is suitably formed at the lower side thereof to define a sump 16 for a body of washing water and a rotatable impeller 17 is employed for projecting the water upwardly through the vat and into contact with the dishes (not shown) stored therein. Suitable racks indicated at 18 and 19 and of any well-understood construction are supported within the vat 12 for holding the dishes. The impeller 17 is driven by a shaft 21 of a vertical motor 22, the latter being carried by the vat 12 by means of bolts 20.

Hot water is delivered to the vat 12 through a fixed conduit 23 having a valve 24 connected thereto, which valve may be of any suitable type and shown, by way of example, as a solenoid-operated valve. A flexible hose or conduit 25 provides communication between the valve 24 and a nozzle 26 carried by the vat and arranged for the discharge of the hot water into the vat 12. Vitiated water is discharged from the vat by a pump 27 through a flexible conduit 28 which leads to a suitable point of discharge not shown. Pump 27 as disclosed is driven by the motor 22

3

through a pair of friction wheels 29. Flow of water from the vat to the pump 27 may be controlled in any suitable manner which has not been disclosed for the sake of brevity and as it forms no part of the present invention.

The frame structure 11 includes a base 31, a pair of vertically extending corner members 32 arranged at the front end of the base and a pair of vertically extending corner members 33 secured to the rear end of the base. The upper ends of the corner members 32 and 33 are tied together by a generally rectangular upper frame member 34 and preferably formed of angle iron as shown.

The dishwasher structure 10 is supported from the frame 11 by a roller and track construction in order to facilitate the inward and outward movement of the dishwasher relative the frame which construction will now be described. As best shown in Figs. 2 to 5, inclusive, a pair of channeled members 35 and 36 extend lengthwise of the frame 11 on opposite sides of the vat 12, the lower flanges 37 and 38 of which define tracks upon which rollers 39 and 41 run. As described hereinafter, the rollers 39 and 41 are journaled on the dishwasher structure 10. The channeled member 35 is provided at its forward end with a laterally directed flange 42 which is secured by means of bolts 43 to the front left-hand corner member 32 as best shown in Figs. 3 and 5. The rear end of the channeled member 35 is secured by means of bolts 44 to a bracket 45 welded or otherwise secured to the left-hand rear corner member 33 of the frame. The opposite channeled member 36 is secured to the right-hand front and rear corner members 32 and 33, respectively, in exactly the same manner as described in connection with the channeled member 35 and, therefore, no further description will be given of the channeled member 36 or its support.

Arranged on opposite sides of the vat structure 12 and suitably secured thereto are a pair of plates 46 and 47 having respective outwardly projecting rails 48 and 49 formed thereon, which rails 48 and 49 rest upon rollers 51 and 52 which are journaled upon the frame. As best shown in Figs. 2 and 3, the left rear roller 39 is journaled on a pin 53 which is suitably secured to the rear end of the plate 46. The opposite rear roller 41 is journaled upon a pin 54 which is secured to the plate 47 in exactly the same manner as described in connection with the pin 53 and plate 46. (See Figs. 1 and 2.)

The front roller 51 is journaled on a pin 55 which is secured to the channeled member 35 adjacent the front end thereof and the opposite front roller 52 is journaled on a pin 56, the latter being secured to the channeled member 36 adjacent the front end thereof.

It will be apparent from the foregoing description that, as the dishwasher structure is moved from its operating position as shown in Fig. 3 outwardly of the frame, the rails 48 and 49 which are fixed to the vat 12 ride upon the rotating rollers 51 and 52 and that the rollers 39 and 41 roll upon the fixed tracks 37 and 38. Outward movement of the dishwashing machine relative the frame 11 is limited by stops 57 fixed in any well-understood manner to the sides of the vat 12 and which are engageable with fixed projecting portions 58 formed on the channeled members 35 and 36.

In order to close the relatively large opening intervening between the two front corner members 32 in the operating position of the appara-

4

tus, a panel 59 is provided, which panel 59 is substantially coextensive with said intervening space. The panel 59 is shown in Fig. 1 and in part in Figs. 3, 4 and 5. The panel 59 is secured adjacent its upper end to a box 61 in any well-understood manner, as by welding, and the box 61 is secured, as by means of screws 62, to the front ends of the plates 46 and 47. (See Figs. 3, 4 and 5.) The panel 59 may also be supported by a bracket structure 63 to the lower portion of the vat 12 as shown in Fig. 1.

In order to maintain the dishwasher structure 10 in its operating position within the frame 11, a latch structure shown in Figs. 4 and 5 is provided. The latch structure includes a slidable bar 64, one end of which projects through an opening 65 in the box structure 61 and the opposite end of which is slidably supported by a bracket 66 secured in any well-understood manner within the box structure 61. The bar 64 in the latched position of the apparatus is disposed behind a projection 67 formed on a catch plate 68, the latter being secured to the corner member 32 by one or more bolts 69. A spring 71 attached to a portion of the box structure 61 and the latch bar 64 biases the latter at all times toward its latched position. Unlatching of the mechanism is effected by a cam 72 fixed to a shaft 73 and having a camming portion 74 which is engageable with a surface 75 formed on the latch bar 64. The shaft 73 extends through the panel 59 and has a handle 76 on the outer or front end for rotating the shaft. From Fig. 5, it will be apparent that counterclockwise movement of the camming portion 74 about the axis of the shaft 73 will force the bar 64 to the right, as viewed in Fig. 5, and out of engagement with projection 67, whereupon the dishwasher structure may be withdrawn from the frame 11 as described heretofore.

Arranged within the frame structure 11 adjacent the upper end thereof is a cover 77 which is engageable with the gasket 14 in the operating position of the apparatus for preventing leakage of water through the access opening of the vat during operation of the impeller. The cover 77 is supported within the frame structure by a plurality of links 78, the upper ends of which are pivotally supported by respective studs 79, the latter being fixed within openings in the rectangular upper frame member 34. The heads of screws 81 prevent displacement of the links 78 from the studs 79. The lower ends of the links 78 pivotally support laterally projecting studs 82 which are fixed by means of bolts 84 to spaced, downwardly extending flanges 83 formed on the cover 77. The cover 77 is biased upwardly with respect to the frame to a position, as shown in Fig. 4, at all times by a pair of tension springs 85 secured at their upper ends to the frame member 34 and at their lower ends to a pair of respective arms 86 which project downwardly from the cover 77 into the paths of movement of the rollers 39 and 41.

In the operating position of the apparatus, as shown in Fig. 3, the rollers 39 and 41 engage the arms 86. During movement of the dishwasher structure to the position shown in Fig. 3, the rollers 39 and 41 engage the arms 86 and effect rearward and downward movement thereof as the cover 77 swings downwardly from the position shown in Fig. 4 to the position shown in Fig. 3. During this downward swinging movement, the cover 77 engages the gasket 14 and the final stage of movement of the washer structure effects compression of the gasket 14. The arrangement of

5

6

the pivots 70 and 82 for the various links 78 is such that, during this compressing operation, the horizontal lineal movement of the gasket 14 and the horizontal component of the swinging movement of the cover 77 are substantially equal, so that there is no sliding movement of the cover 77 relative to the gasket 14.

Upon unlatching of the washer structure as described, the dishwasher and its gasket 14 move to the left from the position shown in Fig. 3. The tension springs 25 maintain contact between the arms 85 and the rollers 39 and 41 during the early stage of outward movement of the washer. During this stage of movement, the cover 77 rides on the gasket 14 for a short distance and then moves upwardly clear of the gasket to the position of the apparatus shown in Fig. 4. Following the separation of the cover 77 and the gasket 14, the washer structure moves to its outermost position, as described heretofore, for loading or unloading.

It will thus be seen that the cover is mounted to move in a path which is inclined downwardly toward the rear, and that the cover is caused to be moved rearwardly along with the vat during the latter part of its rearward travel. At the same time, it is also caused to move downwardly to compress the gasket. Likewise, upon forward movement, the cover moves upwardly and forwardly along said inclined path, moving forwardly along with the vat during the initial portion of its forward movement from its operating position and at the same time upwardly to a position in which it clears the vat, so as to permit continued forward movement of the vat.

It is desirable in apparatus of this kind that the vat 12 be vented to the ambient atmosphere. Accordingly, a resilient conduit, shown at 87, and projecting through the cover 77 is provided. The inner end of the conduit 87 may be provided with a groove 88 for receiving the margin of an opening in the cover 77, as best shown in Fig. 3. The outer end of the conduit 87 is flattened for attachment to an oval-shaped conduit 89 fixed to and projecting through the upper frame 34, as best shown in Figs. 3 and 5. The resiliency of the conduit 87, of course, permits movement of the cover 77 relative to the frame 11, as described.

I have shown in broken lines, at 91 a work board of a conventional cabinet type kitchen sink and, when the dishwashing apparatus is applied for service beneath a work board of this kind, the frame 11 may be of open sided construction, it being understood that the frame is concealed by the walls of the sink cabinet. When supplied for use as a cabinet type dishwasher which may be mounted in any location within the kitchen, the two sides and the rear as well as the top of the framework are provided with suitable panels, not shown, in order to completely enclose the framework. The front side of the dishwasher is, of course, closed in either application in the operating position of the apparatus by the front panel 59. In both applications of the apparatus referred to, the top panel or sink board may be continuous or unbroken and, therefore, may be utilized as a work surface at all times.

From the foregoing description, it will be apparent that I have provided an improved dishwasher construction which, while retaining desirable features of an open top type of machine, may operate beneath a continuous top wall or work surface. The construction is such that the

washer may be unlatched and withdrawn from beneath the top work surface without stooping and loading and unloading is conveniently carried out with the open top washer in position at the front side of the work surface. The door for closing the access opening of the washer moves automatically into closed and open positions in response to movement of the washer structure. While my invention is particularly adaptable to dishwashing machines, it will be apparent that it may be applied to other forms of washing apparatus, such as domestic clothes washing machines.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof.

What I claim is:

1. In combination, a frame having an opening in the front side thereof, a vat having an access opening in its top side, a resilient gasket carried by the vat peripherally of the access opening, means for supporting said vat from the frame and providing for lineal movement of the vat inwardly and outwardly of the frame, a front panel carried by the vat and substantially closing the front opening in the frame when said vat is moved to its position within the frame, a latch for retaining the vat within the frame, handle means extending through said panel for operating the latch, a cover for closing said access opening, means supporting the cover from the frame and providing for upward and downward movement of the cover relative to the frame, means responsive to movement of the vat inwardly of the frame for actuating said cover downwardly into engagement with said gasket and means effecting upward movement of the cover when said vat is withdrawn from the frame.

2. In combination, a frame having an opening in the front side thereof, a vat having an access opening in its top side, a resilient gasket carried by the vat peripherally of the access opening, means for supporting said vat from the frame and providing for lineal movement of the vat inwardly and outwardly of the frame, latching means for retaining the vat within the frame, a cover for closing said access opening, a plurality of links supporting said cover, said links being pivoted to the frame and to spaced portions of the cover for providing swinging up and down movement of the cover and an arm fixed to the cover and extending into the path of movement of the vat, said arm being engaged by the vat during movement thereof to its position inwardly of the frame for first swinging the cover inwardly of the frame downwardly into engagement with said gasket and then compressing the gasket.

3. In combination, a frame having an opening in the front side thereof, a vat having an access opening in its top side, means for supporting the vat from the frame and providing for horizontal movement of the vat through said front opening between an operating position within the frame and a position at least partly outside the frame, a cover for closing said access opening, means for supporting said cover in substantially horizontal position in said frame and providing for movement of said cover relative to the frame along, and constraining such movement to, a path inclined downwardly toward the rear, said vat and said cover having cooperating means adapted to engage during the latter part of the rearward movement of the vat, whereby

7

said cover moves rearwardly concurrently with the vat and at the same time is forced downwardly against said vat to close said access opening, and means for moving said cover, upon the initial forward movement of said vat from its position within the frame, forwardly and upwardly along said inclined path to a position in which it clears the vat, to permit continued forward movement of the vat while the cover remains within the frame, whereby there is no horizontal sliding movement between said cover and said vat.

4. In combination, a frame, a vat having an opening in the top wall thereof, means supporting the vat from the frame for movement into and out of the frame, a cover for closing the opening in the vat, a plurality of links pivoted to the frame and the cover, one or more of said links supporting the forward end of the cover, one or more of said links supporting the rear of the cover, said links providing for upward and downward movement of the cover along a path inclined downwardly to the rear and restraining movement of said cover to within said frame, means for raising said cover and holding the same in its upper position, substantially parallel to the top wall of the vat, when said vat is moved out of said frame, and means responsive to movement of the vat to its position within the frame for moving the cover rearwardly and thereby forcing the same downwardly into engagement with the vat for closing said opening.

5. In combination, a frame, a vat having an opening in the top wall thereof, means supporting the vat from the frame and providing for movement of the vat rearwardly into and forwardly out of the frame, a cover for closing the

8

opening in the vat, a plurality of links pivoted to the frame and to the cover for the support of the latter, at least one of said links being disposed toward the front of the cover and another of said links being disposed toward the rear of said cover, said links providing for upward movement of the cover upon forward movement thereof and downward movement of the cover upon rearward movement thereof, means biasing the cover to its upper position, and means responsive to movement of the vat rearwardly to its position within the frame for moving the cover rearwardly with the vat and thereby forcing the cover downwardly into engagement with the vat for closing said opening, said biasing means serving to move the cover to its upper position during the initial portion of the forward movement of the vat from its position within the frame, the vat being movable relative to the cover during the remainder of said forward movement.

EARL K. CLARK.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
631,836	Welsh	Aug. 29, 1899
740,677	Monsen et al.	Oct. 6, 1903
812,343	Horner	Feb. 13, 1906
1,172,711	Hunter	Feb. 22, 1916
1,825,033	Walker	Sept. 29, 1931
2,106,619	Merrill	Jan. 25, 1938
2,347,760	Wulstein	May 2, 1944
2,429,090	Burt-Wells	Oct. 14, 1947
2,430,141	Reeves	Nov. 4, 1947
2,455,182	La Vallee	Nov. 30, 1948