Jan. 20, 1959 J. HERTRICH 2,869,726

POWER-OPERATED CURB COVER FOR CENTRIFUGAL MACHINES

Filed July 6, 1954 3 Sheets-Sheet 1

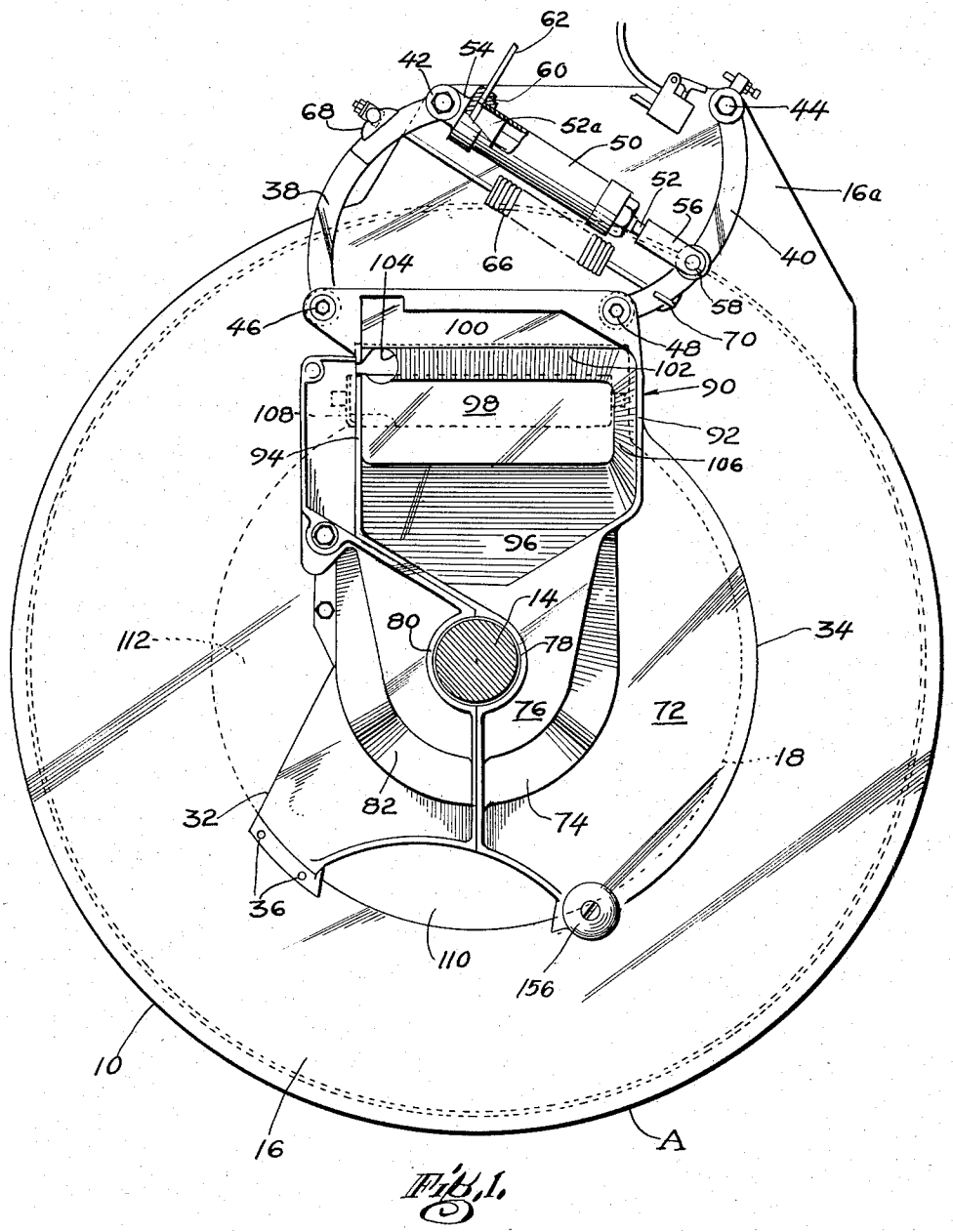


Fig. 1.

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Filed July 6, 1954 3 Sheets-Sheet 2

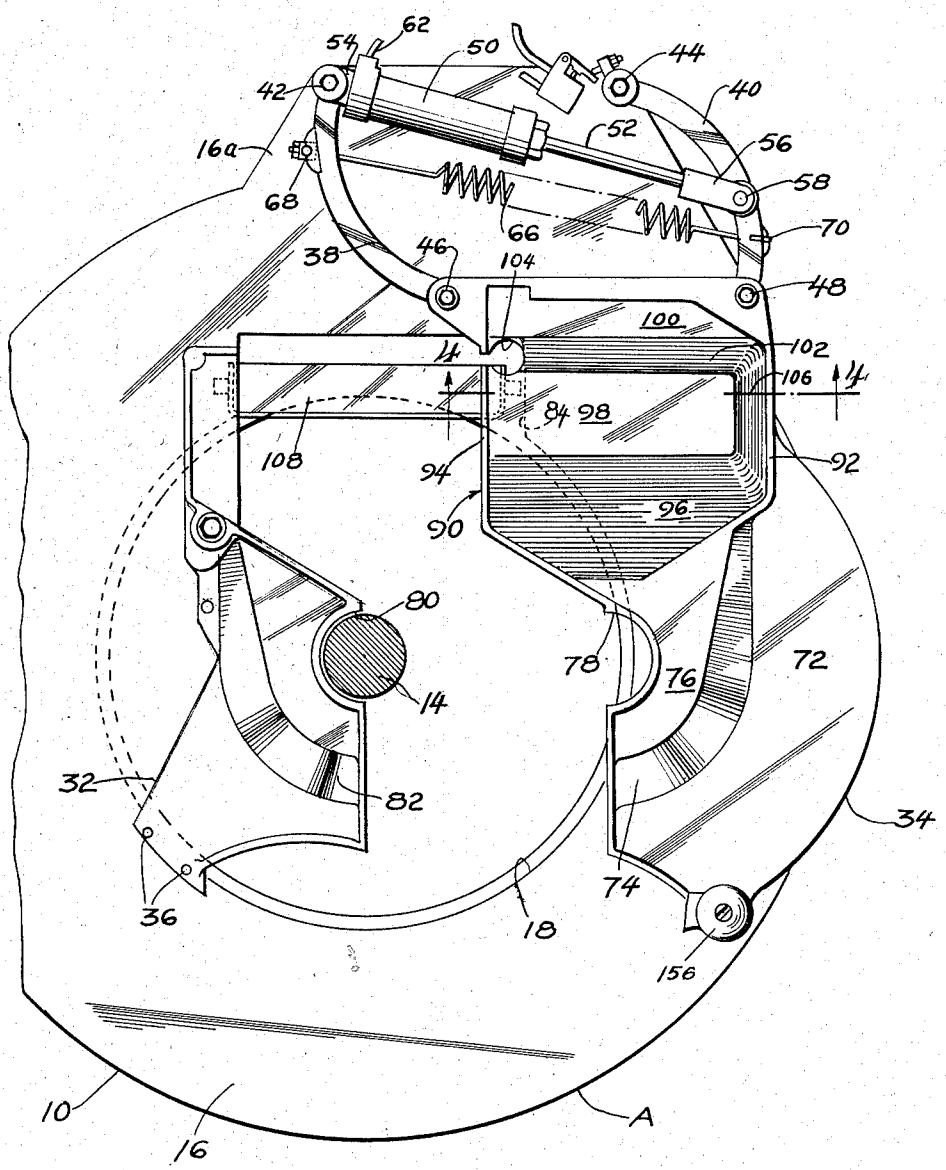


Fig. 2.

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Filed July 6, 1954 3 Sheets-Sheet 3

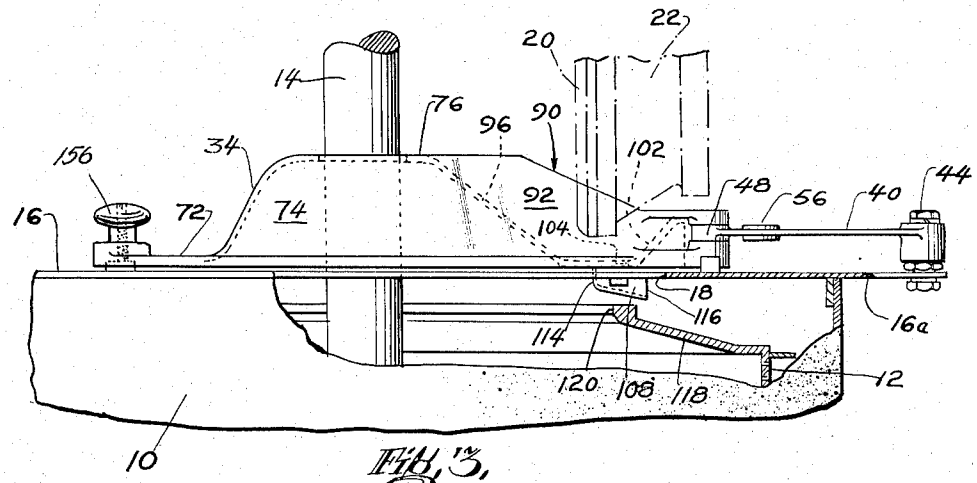


Fig. 3.

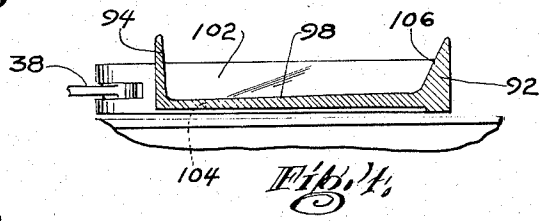


Fig. 4.

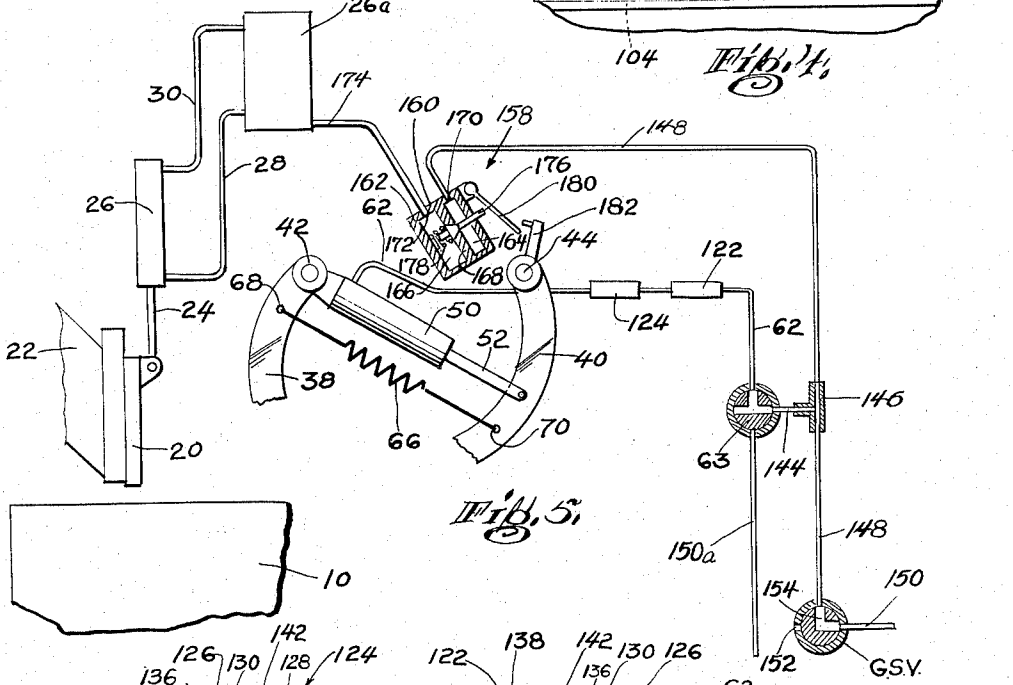


Fig. 5.

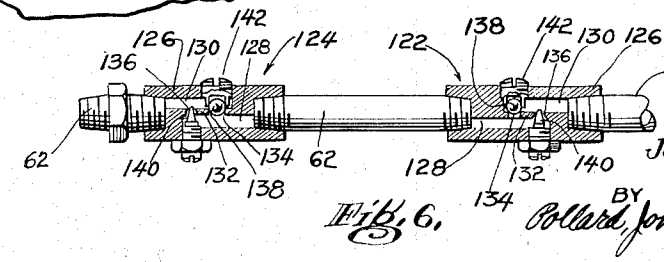


Fig. 6.

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United States Patent Office 2,869,726 Patented Jan. 20, 1959

2,869,726

POWER-OPERATED CURB COVER FOR CENTRIFUGAL MACHINES

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Application July 6, 1954, Serial No. 441,369

8 Claims. (Cl. 210—142)

This invention relates to improvements in centrifugal apparatus of the type employed in the manufacture and refining of sugar and, more particularly, to new centrifugal curb top covers and new combinations thereof with power-operated driving mechanisms and with loading control mechanisms.

In the manufacturing and refining of sugar in the usual open top centrifugal, a supply tank, or "centrifugal mixer," is provided adjacent the centrifugal to hold a comparatively large quantity of sugar massecuite or magma to be purged. Such tanks have a loading spout extending therefrom to gate-controlled outlets from which charge material can flow from the tank into the centrifugal. Such centrifugals are usually provided with a curb having a top opening that is normally closed by a movable cover so as to exclude foreign matter and the outside atmosphere from the environs of the centrifugal basket when a charge is being processed. At the time of each loading operation, the curb top cover is opened before the loading gate on the supply tank spout is opened, and it is closed after the loading gate has been closed. In addition, a charge-guiding drip pan is usually provided for directing the material flowing from the tank into the centrifugal basket when the loading gate is opened and for catching drippings from the loading gate when the latter is closed. This drip pan is generally scraped by the attendant at the completion of each loading operation to deposit the collected drippings into the basket.

Although automatic controls have been provided for governing the operation of loading gates which serve sugar centrifugals, the laborious and time consuming steps of opening and closing the curb cover and scraping the drip pan are still performed manually for lack of a reliable and efficient means of performing them otherwise.

One of the objects of this invention is to provide an improved organization of a centrifugal machine having an automatic cycle control including a sliding curb cover that is controlled automatically at the time of each loading operation yet can be opened and closed as desired under manual control at any time either in or out of the automatic cycle.

A further object is to provide such an organization having control means that prevent in a positive manner opening of the loading gate in the automatic cycle when the curb cover is closed but permit free movement of the curb cover to and from open position under the desired manual control of the centrifugal operator without interfering with the normal cyclical operation of the loading gate operating mechanism.

Another object of this invention is to provide for sugar centrifugals an improved curb cover construction which can be used in conjunction with automatic control mechanisms for the provision of a completely automatic cyclical sugar centrifugal.

According to an important feature of this invention, a curb cover element is mounted on a curb top for swinging movement over otherwise unused portions of the curb top from a normal closed position covering the curb top opening to an open position exposing the opening by a pair of links that are each pivotally secured to the cover at one end and swiveled on the curb top at the other end. The links are so arranged that displacement of the cover to and from open position is effected by movement of the cover through a relatively small arcuate path throughout which the cover remains parallel to its closed position.

According to another feature of this invention, movement of the cover to open position is effected by power-operated means or by manually operable means that can be operated independently of the power-operated means. Movement of the cover to closed position is effected by yieldable means that are arranged to act continuously to urge the cover to closed position with a limited force that is overbalanced by the force of the power-operated means, or by a force applied manually by the centrifugal attendant, which moves the cover to open position. Thus, inactivation of the power-operated means or release of the manually operated means results in movement of the cover to closed position by the yieldable means.

The power-operated means employed in the new arrangment is preferably a fluid pressure operated motor that is combined with adjustable control means that regulate the rate of flow of fluid to and from the fluid pressure operated motor so that the respective movement of the cover to and from open position may be effected at predetermined rates.

The invention further provides control means for the loading gate opening motor, together with acutating means for such control means which respond to movements of the cover for moving the control means to a position in which the gate opening means are rendered inoperable when the cover is closed and to a position in which the gate opening means are rendered operable when the cover is opened. In this way the loading gate cannot be opened until the curb top cover has been so moved away from its closed position that the path of flow of charge material from the supply tank to the centrifugal basket is not obstructed. This assures an efficient and thoroughly reliable automatic loading operation, for it mechanically determines the proper time at which the loading operation should begin and it avoids the detrimental effects that might otherwise result if the automatic controls effected opening of the gate in a cycle in which the cover failed to open.

Another feature of the invention lies in the improved curb cover construction whereby the movable curb cover element is provided with an integrally formed trough that serves to catch drippings that fall from the loading gate when the cover is closed and to continuously dispose of such drippings by draining them into a receptacle that underlies an outlet in the trough throughout the path of its movement with the trough and cover. With a curb cover of this character, the trough is displaced from below the loading gate when the cover element is moved to its open position and the loading gate is advantageously positioned directly over the curb top opening so that charge material flowing from the gate in each loading operation falls directly into the basket and does not require the use of the usual charge-guiding drip pan. And the continuous disposal of the drippings that fall into the trough eliminates the loss of time and physical burden involved in scraping out a conventional drip pan at the end of each loading operation. The elimination of the scraping operation renders the improved cover arrangement especially suitable for automatic cyclical operation.

Other objects, features and advantages of this invention will become apparent from the following detailed

description and the accompanying drawings showing an illustrative embodiment of the invention.

In the drawings:

Figure 1 is a plan view of a centrifugal curb top provided with an improved sliding cover element in accordance with my invention, the cover element being shown in closed position;

Figure 2 is a plan view similar to Figure 1, with the curb top cover element in open position;

Figure 3 is a fragmentary side elevation of the centrifugal curb and the curb top cover element, the curb being partially broken away to show the drippings receiver within the curb. The phantom lines in this figure indicate the position of the usual loading chute and control gate overlying the curb;

Figure 4 is a vertical transverse section through the drippings catching trough formed on the sliding cover element, taken on lines 4—4 of Figure 2;

Figure 5 is a diagrammatic view of a flow circuit and of motor and control elements for controlling operation of the movable curb top cover element, together with means for rendering the loading gate inoperable when the curb cover is in closed position; and

Figure 6 is a diagrammatic longitudinal cross-section through part of the control mechanism of Figure 5.

The drawings show a form of curb top cover provided in accordance with this invention in operative association with the curb top of a suspended centrifugal and a loading gate. The curb **10** surrounds a perforate centrifugal basket **12**, which is suspended on a vertical spindle **14** and adapted to be revolved at high speed to effect separation of liquid and solid materials introduced into the basket. The curb has a top wall **16** with a central opening **18** therein permitting access to the basket. Sugar massecuite or magma is delivered for centrifugal treatment from a mixer tank (not shown) through a loading spout **22** and thence into the basket when a loading gate **20** of any suitable construction is moved away from its position closing the spout outlet. Gate **20** is connected with the reciprocatory plunger **24** (see Figure 5) of a double acting air cylinder **26** which serves as a motor both for opening and closing the loading gate. It will be evident that when the gate motor control device **26***a* is operated to pass air under suitable pressure into the lower part of cylinder **26** through conduit **28** and to vent conduit **30**, the gate **20** will be lifted to an open position in which charge material in the mixer tank will flow freely into basket **12**. When the gate motor control device **26***a* is actuated to pass air under pressure through line **30** to the upper part of cylinder **26** and to vent line **28**, the gate **20** will be moved downward to a closed position.

All of this is well known in the art. It is also well-known to provide a cover for normally closing the curb top opening so that objectionable air currents and foreign matter are prevented from entering the basket and having harmful effects on the contents of the basket. Such cover must be opened at the time of each loading operation before opening of the loading gate takes place to expose the curb top opening and permit free access to the basket so that a charge may be introduced into the basket.

In accordance with this invention, a new and improved curb top cover unit is provided that embodies several important new features of construction and operation. In the preferred form shown in the drawings, the cover unit comprises a movable cover element **34** that is adapted in closed position to fit together with a stationary cover element **32** and substantially cover the opening **18** in the curb top and is adapted to move freely to an open position exposing the opening. Stationary cover element **32** is fixed on the curb top by bolts **36**.

The movable cover element **34** is pivotally mounted to swing horizontally to and from closed position in an arcuate path on unused portions of the curb top with the cover element remaining parallel to its closed position throughout such movement. In the preferred form shown, the mounting means include a pair of links **38** and **40**, which are swivelled at their one ends to an integral, backward extension **16***a* of the curb top by pivots **42** and **44** pivotally connected at their other ends to opposite sides of the movable cover element **34** at **46** and **48**, respectively. The pivots **42**, **44**, **46** and **48** of links **38** and **40** define substantially a parallelogram so that a line passing through movable pivots **46** and **48** on the movable cover element **34** remains parallel to a line passing through the fixed pivots **42** and **44** throughout the path of movement of such cover element. The opening and closing movements of the cover may be brought about either by manual means or by power-operated means.

The swinging movements of the cover to and from closed position under power-operated means are carried out and limited in the following manner. A single-acting fluid pressure motor comprising an air cylinder **50** having a plunger **52** is supported in a horizontal position between the links **38** and **40** by brackets **54** and **56**, which are secured at one end to the cylinder and plunger, respectively, and swivelled at the other ends to pivot **42** on the curb top and pivot **58** on link **40**, respectively. The plunger carries a piston **52***a* within the cylinder and the stroke of the plunger **52** is fixed so that when the plunger lies at the inner limit of its movement in cylinder **50**, the cover will be disposed in closed position, as shown in Figure 1, while at the outer limit of plunger movement the cover will be held in open position, as shown in Figure 2. The cylinder has an air inlet **60** connected with an air conduit **62** through which air under pressure may be either admitted into the cylinder for moving the cover to open position or expelled from the cylinder during closing movement of the cover.

It will be seen, therefore, that the admission of air pressure into the cylinder **50** forces the piston **52***a* to the right as viewed in Figure 1 to move the plunger **52** outwardly and swing link **40** counterclockwise about pivot **44**. As link **40** is so moved, the cover is moved to open position in a horizontal arcuate path with the cover being constrained to remain parallel to its closed position by the coordinating action of the link **38** which is simultaneously swung in a counterclockwise direction about pivot **42** in an arc corresponding to that through which link **40** moves.

On the other hand, when the pressure in cylinder **50** is released by venting line **62**, the piston **52***a* is free to slide to the left as viewed in Figure 1. When this happens, the cover is swung back to its closed position by the action of a tension spring **66** upon links **38** and **40**. The tension spring has its ends fixed to the links at unequal distances from the fixed pivot axes of the links; the connection **68** of the spring with link **38** is closer to the pivot **42** than the connection **70** of the spring with link **40** is to pivot **44**. By this arrangement, when the cover is moved to open position, the counterclockwise movement of the links stresses the spring and causes it to exert a moment in a clockwise direction upon link **40** that is greater than the counterclockwise moment exerted upon link **38**. Thus, it will be seen that the spring continuously exerts a force urging the links to their original positions so that when the pressure in cylinder **50** is released, the links swing clockwise under the action of the spring and move the cover to closed position.

For admitting fluid pressure into the cover motor cylinder **50**, the air conduit **62** leads to a manually operable three-way valve **63** which is normally positioned, as shown in Figure 5, to connect conduit **62** through duct **144**, T connection **146** and duct **148** to a solenoid valve GSV that is movable between a normal position venting duct **148** through port **152** and an energized position con-

necting duct 148 with a header 150 that leads to a source of fluid under pressure. It results that actuation of the valve GSV to move it to its energized position, which may be brought about automatically at the desired time in the automatic cycle of operation of the centrifugal, and to admit compressed air into duct 62 through valve 63, duct 144, T 146 and duct 148, brings into cover motor chamber 50 fluid pressure which forces piston 52*a* and plunger 52 to the right as viewed in Figure 1 to effect opening of the cover element 34. In order to bring about closing of the cover, the solenoid valve GSV is deenergized to return it to its normal position in which conduit 62 is vented through valve 63, duct 144, T 146, duct 148 and port 152. It results that the force of the fluid pressure acting on piston 52*a* is released and the cover element 34 is free to slide back to its closed position under the action of tension spring 66 as described above.

Alternatively, the curb cover element 34 may be operated under selective manual remote control. To accomplish this, three-way manually operated valve 63, which may be located at any suitable location accessible to the centrifugal attendant, has a direct connection with a branch 150*a* of the header 150. It will be evident from Figure 5 that rotation of the valve 63 to disconnect air conduit 62 and duct 144 and to connect air conduit 62 and branch 150*a* of the header results in the admission of air under pressure into the cover motor cylinder 50 and in the opening of the curb cover element 34. In order to close the cover element 34, the air pressure in cover motor cylinder 50 is released by rotating the valve 63 back to its normal position in which the air conduit 62 is disconnected from the header branch 150*a* and is again vented through duct 144, T 146, duct 148 and solenoid valve GSV whose internal passage 154 is open to port 152 when the valve is deenergized.

It is desirable to be able to open and close the curb cover by hand independently of the power mechanism in case of an emergency or for any other purpose. To this end it will be observed that the power mechanism for returning and holding the cover element 34 in closed position is the yieldable tension spring 66. This spring is the only means resisting opening movement of the cover, since the air cylinder 50 is a one-way cylinder allowing free movement of its piston 52*a* in the direction of the cover opening movement of link 40. Accordingly, it will be seen that the cover element 34 may be swung open manually at any time by grasping and moving handle 156, whether during or out of the automatic cycle of the centrifugal machine.

In combination with the elements just described, Figure 5 also shows a loading control mechanism which prevents opening of the loading gate 20 until the cover element 34 has been opened. The mechanism, indicated generally at 158, comprises an air valve 160 having a valve body 162 formed with chambers 164 and 166 on opposite sides of a transverse partition 168, the chambers 164 and 166, respectively, having ports 170 and 172 for connection with air line 148 leading to the solenoid valve GSV and with air line 174 leading to the gate motor control device 26*a*. The chambers 164 and 166 are interconnected through partition 168 by an opening therein which is controlled by a valve element 176, the valve being biased to a closed, gate motor deenergizing position by a compression spring 178 acting upon one end of the element 176. The other end of the valve element 176 extends through the end wall of valve body 162 and is positioned to be engaged to be moved axially against the action of spring 178 to an open, gate motor energizing position by a lever arm 180 pivotally mounted on an end wall of the valve body. The free end of the lever arm 180 is positioned in the path of movement of an actuator arm 182 mounted on link 40 for movement therewith about pivot 44.

The functions embodied in the loading control mechanism may be described as follows:

Actuation of solenoid valve GSV to its energized position establishes a connection between duct 148 and header 150 and results in the admission of air under pressure into the cover operating motor cylinder 50 and at the same time in the admission of air into chamber 164 of the control valve 160. As long as the cover element 34 is in closed position, the valve element 176 remains in its gate motor deenergizing position under the action of spring 178 so as to prevent flow of pressure fluid to the gate motor control device 26*a*. However, when the cover element is moved to a predetermined open position, the actuator arm 182 swings lever arm 180 about its pivot in a direction to move the valve element 176 to its open, gate motor energizing position so as to allow fluid pressure to pass from chamber 164 to chamber 166 and thence to the gate motor control device 26*a* through duct 174.

It will be seen by the present arrangement, that energization of the gate motor 26 in the automatic cycle of operation is prevented when the curb opening 18 is covered by the cover element 34. However, it will also be seen that the curb cover element 34 can be moved freely to and from open position under the desired manual control of the centrifugal operator without interfering with the normal cyclical operation of the loading gate operating mechanism, for neither manual manipulation of the gate nor actuation of the valve 63 will result in the admission of fluid pressure into chamber 164 of the loading control mechanism 158. Accordingly, the valve element 176 may be moved to and from its open, gate motor energizing position with no effect on the operation of the gate motor 26.

The air flow through conduit 62 is retarded to a selected rate in each direction to give the desired rate of curb cover movement between its open and closed positions. For this purpose, air flow controls 122 and 124 are placed in series in conduit 62. Both air flow controls are identical in construction, which is shown in detail in Figure 6. As seen therein, control 122 is placed in normal position to restrict flow to the motor 50 to control the rate of opening movement, and control 124 is in reversed position to restrict flow from the motor 50 to control the rate of closing movement. Each has a cylindrical body 126 formed with an axial bore 128 extending partially therethrough and open at one end of the body 126 for communicating with the conduit 62 and a laterally displaced axial bore 130 extending partially through the body open at the opposite end of body 126 for communicating with the conduit 62, the inner ends of the bores 128 and 130 being in overlapping relation and having a common wall 132 therebetween in which are disposed small orifices 134 and 136 that interconnect the bores 128 and 130 to complete the air passageway through the control. The effective size of orifice 136 in each flow control is regulated by an adjustable needle 140 and the orifice 134 is controlled by a one-way ball valve 138 that permits flow therethrough in one direction and prevents flow therethrough in the opposite direction.

The valve 140 controlling the orifice 136 in flow control 122 is arranged to provide a controlled rate of flow of the compressed air passing through conduit 62 to the cover motor cylinder 50 so as to regulate the rate of opening movement of the cover element 34, and valve 138 controlling orifice 134 provides free by-pass around the needle valve 136 for back flow of compressed air passing through conduit 62 from the cover motor cylinder 50. Valves 140 and 138 in flow control 124 are in reverse arrangement to those in flow control 122 so that the rate of back flow of the compressed air passing through conduit 62 from the cover motor cylinder 50 is regulated by the needle valve 140 so as to control the rate of closing movement of the cover element 34, while

compressed air flowing to the motor cylinder 50 is bypassed around needle valve 140 by the ball valve 138.

The movable cover element 34 has an arcuate horizontal outline with a flat outer portion 72 that adapts it to overlie the curb top 16 in close relation thereto and a raised inner portion 74 that slopes upwardly and inwardly from the plane of the outer portion, having a relative level crest 76 formed with a peripheral recess 78 that, when the movable element 34 lies in closed position, forms with a corresponding recess 80 in a similarly raised portion 82 of the stationary element 32 a central aperture through which the spindle 14 extends. The aperture so constituted by recesses 78 and 80 is formed to permit gyratory movement of the spindle. In the embodiment illustrated, the back part of curb top 16 is provided with a recessed portion 84 (see Fig. 2) that extends rearwardly away from the spindle 14 to a location behind the loading gate 20 and opens forwardly into and forms a part of the curb top opening 18. The length of the recess 84 corresponds to the stroke of the movable cover element 34. The edges of the curb bordering recess 84 form rearwardly extended side margins of the opening 18 which otherwise would be circular. By this construction the loading gate 20 can be positioned directly over the rear portion curb top opening 18 formed by recess 84 with sufficient clearance between the gate 20 and spindle 14 for the free and unobstructed flow of charge material from the gate into the basket under the varying pressure head on such material in the supply tank.

The movable element 34 covers an arc of over 180°, extending from a location at the front and central part of the apparatus proximate the position indicated at A, which is normally occupied by the centrifugal attendant, around one side of the curb top 16 and terminating on the opposite side of the curb top at points beyond the vertical projection of loading gate 20. The stationary element 32 covers an arc less than 180° and the two elements together, in the closed position of element 34, have margins which overlie the margins of opening 18 and substantially cover the entire opening except at peripheral recessed portions 110 and 112 which serve to accommodate other units of apparatus associated with the curb top, such as, for example, the discharger, washing apparatus and control apparatus.

The back part of the cover element 34 extends into an integral trough portion 90 that is adapted to underlie the loading gate 20 in the closed position of the cover element 34 and catch material falling from the gate. The trough portion 90 projects rearwardly beyond the circular peripheral edge of the flat outer portion 72 and has edges which overlie the rearwardly extended side margins of opening 18. The trough portion is constituted by a flat bottom 98 at the level of the flat outer portion 72, two spaced upright side walls 92 and 94 that extend forwards and backwards of the loading gate 20, a front transverse wall 96 between the side walls that lies in front of the gate and slopes backwardly and downwardly from the crest portion 76 of the cover element 34 to the bottom 98, and a rear transverse wall 100 between the side walls that lies behind the gate and has a front portion 102 sloping forwardly and downwardly to the bottom 98.

At the end of the trough 90 trailing the direction of curb movement, i. e. the left hand end as viewed in Figures 1 and 2, an outlet 104 is provided which opens into the space between the basket 12 and the curb 10. The outlet 104 is constituted in part by a vertical opening formed partly in the bottom 98 and partly in the sloping portion 102 of rear wall 100 and in part by a vertically cut away portion in the side wall 94 and adjacent said opening. The outlet serves to drain the material caught in the trough into a receiver 108 located below the curb top directly under the recessed portion 84 thereof. To facilitate the passing of material caught by the trough to the outlet 104, the inner surface 106 of the side wall 92 remote from the outlet and the bottom 98 may also be sloped downwardly toward said outlet.

In the preferred form illustrated, the receiver 108 is an elongated pan which is fixed to the underside of the curb top 16 and extends to opposite ends of the recess 84 so that its opposite ends underlie the limit positions of the outlet 104. The pan is open upwardly and slopes downwardly and rearwardly from a closed front side 114, located in front of the forwardmost part of the path of movement of outlet 104, to an open back side 116 which is adapted to discharge material in the pan onto the inclined top wall 118 of basket 12. By this construction the pan underlies the outlet 104 throughout its entire path of movement with the cover element 34 between open and closed positions of such element, and charge material falling from the trough through outlet 104 is deflected away from the basket top opening 120 and onto the outside surface of the top wall 118 of the basket. It will be evident that the windage caused by rotation of the basket within the curb 10 will effect a sucking action that will forcibly draw the drippings in the trough into the space between the basket 12 and the curb 10. In this manner the drippings caught by the trough 90 are continuously drawn off and deposited into a collector outside the basket 12, thereby eliminating the usual drip pan scraping associated with known sugar centrifugals and maintaining the basket charge clean and free of drippings material that is commonly deposited into the basket and blemishes the charge and renders it nonuniform.

It will be understood that the foregoing detailed description and the accompanying drawings are intended to exemplify the invention and that new parts, improvements and combinations herein disclosed may be employed in various other forms and arrangements of apparatus without departing from the substance of the disclosure or the intended scope of the appended claims.

What is claimed is:

1. In centrifugal apparatus including a rotatable basket and a surrounding curb having an opening in its top wall permitting access to the basket, a unitary horizontally movable curb top cover, swingable link means holding said cover for movement between a normal closed position covering said opening and an open position exposing said opening, said link means including a pair of links, each of said links being pivoted to a backward part of said cover and extending backwardly from it to a fixed pivot on a backward extension of said top wall, yieldable means connected to said link means and acting continuously thereon to urge said cover to closed position, power-operated means in driving relation to said cover for effecting movement of said cover to open position, said cover being movable toward open position independently of said power-operated means, and a handle on a part of said cover remote from said link means and by which said cover may at any time during or out of operation of said apparatus be moved manually to open position against the force of said yieldable means.

2. In a cyclically operated centrifugal apparatus including a rotary basket, a curb surrounding the basket and having an opening in its top wall permitting access to said basket, a loading gate for delivering charge material through said opening into the basket and power-operated means for opening said gate, the combination comprising a curb cover movable from a normal closed position covering said opening to an open position exposing said opening, means rendered operative as said cover is moved to its closed position to render said gate opening means inoperable, and means operated by opening movement of said cover to render such gate opening means operable.

3. In centrifugal apparatus including a rotatable basket, a curb surrounding the basket and having an opening

in its top wall permitting access to said basket, a loading gate for delivering charge material through said opening into the basket and fluid pressure operated means for opening said gate, a curb top cover movable from a normally closed position covering said opening to an open position exposing said opening, fluid pressure operated means in driving relation to said cover for moving said cover to open position, each of said fluid pressure operated means having a supply line for leading fluid under pressure thereinto, control means for supplying fluid under pressure into said supply lines simultaneously to initiate a centrifugal loading operation, a valve in the fluid supply line of said gate opening means between the latter and said control means, means rendered operative by closing movement of said cover to hold said valve closed when said cover is in its closed position, and means operated as said cover opens to open said valve.

4. In centrifugal apparatus including a rotary basket, a curb surrounding the basket and having an opening in its top wall permitting access to said basket, a loading gate for delivering charge material through said opening into the basket and a gate operating motor, a curb top cover movable from a normal closed position covering said opening to an open position exposing said opening, a cover operating motor for moving the same to open position, gate motor energizing means including a shiftable element movable between a motor energizing position and a motor deenergizing position, a first energy supply line connected with said motor energizing means and comprising control means operable to supply energy to the latter, another energy supply line normally connecting said cover operating motor with said first line to supply energy to said cover operating motor upon operation of said control means, means rendered operative in response to movement of said cover to its closed position to hold said shiftable element in said motor deenergizing position, and means operated by opening movement of said cover to move said shiftable element to said motor energizing position.

5. In centrifugal apparatus including a rotatable basket, a stationary curb surrounding the basket and having a top opening permitting access to said basket and a loading gate located for delivery of charge material through said opening into the basket, a curb cover element movable horizontally from a normal closed position covering said opening to an open position exposing said opening, a portion of said cover element forming an upwardly facing trough below said gate to catch drippings from said loading gate, said trough underlying said gate when said cover is in its closed position and being displaced from below said gate as said cover is moved to its open position, said trough being provided with an outlet for draining such drippings therefrom, and a fixed receiver extending horizontally below said outlet throughout the path of movement of said outlet to catch material draining from said trough in any position of said cover element.

6. In centrifugal apparatus including a rotatable basket, a stationary curb surrounding the basket and having a top opening permitting access to said basket and a loading gate located for delivery of charge material through said opening into the basket, a curb cover element movable horizontally from a normal closed position covering said opening to an open position exposing said opening, a portion of said cover element forming an upwardly facing trough below said gate to catch drippings from said loading gate, said trough underlying said gate when said cover is in its closed position and being displaced from below said gate as said cover is moved to its open position, said trough being provided with an outlet for draining such drippings therefrom, and a fixed receiver extending horizontally below said outlet throughout the path of movement of said outlet to catch material draining from said trough in any position of said cover element, said receiver comprising a pan mounted in the space between said curb top and the top of the basket and said curb top being cut away over said pan.

7. In centrifugal apparatus including a rotatable basket, a stationary curb surrounding the basket and having a top opening permitting access to said basket and a loading gate located for delivery of charge material through said opening into the basket, a curb cover movable horizontally from a normal closed position covering said opening to an open position exposing said opening, said cover being shaped to form spaced upright end walls to extend both forward and backward of said loading gate and spaced forwardly and backwardly sloping side walls extending between backward and forward ends, respectively, of said end walls, said walls defining an upwardly facing trough below said gate to catch drippings from said loading gate, said trough underlying said gate when said cover is in its closed position and being displaced from below said gate as said cover is moved to its open position, said trough being provided with an outlet for draining such drippings therefrom and its bottom sloping toward said outlet.

8. In centrifugal apparatus including a rotatable basket, a stationary curb surrounding the basket and having a top opening permitting access to said basket and a loading gate located for delivery of charge material through said opening into the basket, a curb cover movable horizontally from a normal closed position covering said opening to an open position exposing said opening, a portion of said cover forming an upwardly facing trough to catch material falling from said loading gate, said trough underlying said gate when said cover is in its closed position and being displaced from below said gate as said cover is moved to its open position, and mounting means for said cover comprising a pair of links each having a relatively fixed pivot at one end, said fixed pivots being located on a backward extension of said curb cover, the other ends of said links being pivotally connected to said curb cover on opposite sides of said trough and in back of said gate, and the pivots of said links defining substantially a parallelogram.

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