Jan. 31, 1950 R. B. LAWS 2,495,900

SLEEVE VALVE

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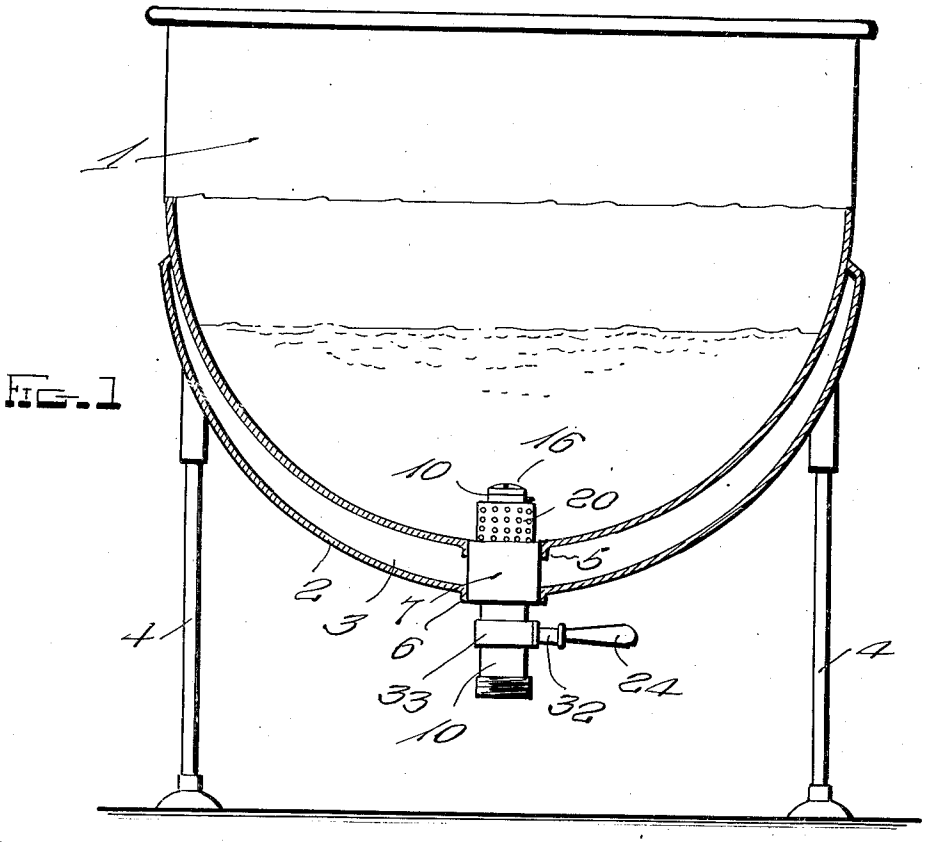


FIG. 1

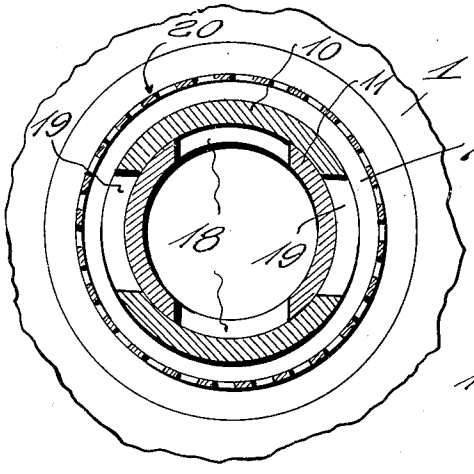


FIG. 4

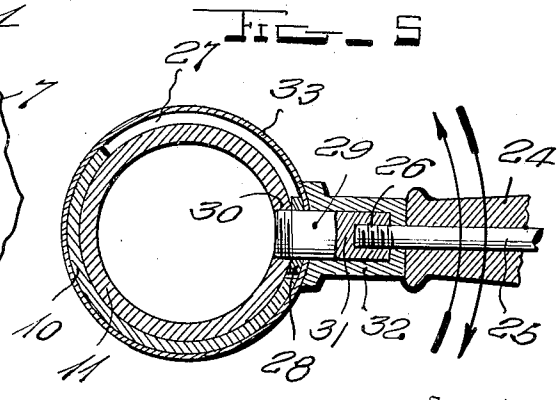


FIG. 5

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SLEEVE VALVE

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FIG. 2

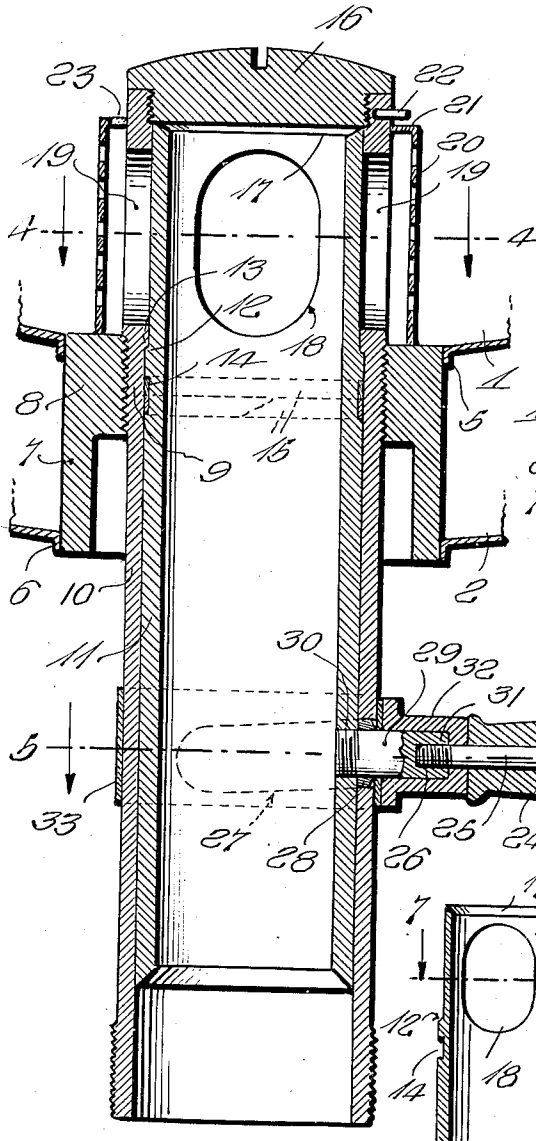


FIG. 3

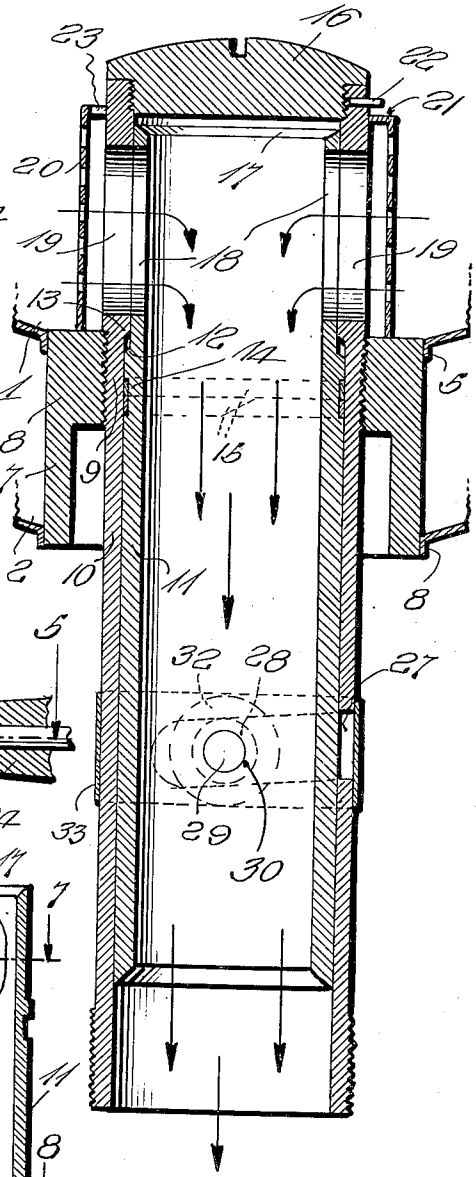


FIG. 7

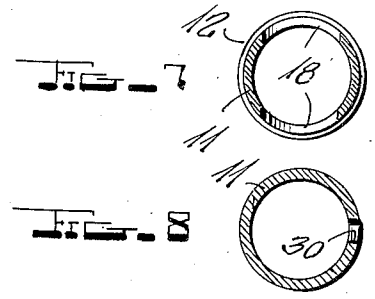


FIG. 8

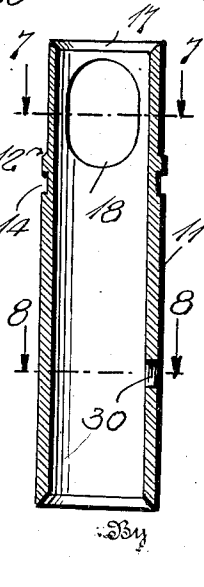


FIG. 6

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SLEEVE VALVE

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5 Claims. (Cl. 251—78)

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This invention relates to a sleeve valve which is particularly adapted for use as an element of a kettle or tank used for processing food and other products by cooking the same for a predetermined length of time.

When an outlet pipe of usual formation is used in conjunction with a conventional gate valve or globe valve, a small amount of the product being processed lies dormant in the outlet pipe between the valve and the inside surface of the vessel and becomes burned or overprocessed as it is not properly mixed with the remainder of the product in the kettle. In addition, product held between the valve and the outside of the jacket remains unmixed and underprocessed as it is not subjected to sufficient heat to process it.

In order to eliminate the under or over processing mentioned above, the operator is compelled to draw off an amount of the product being processed equal to the amount held within the outlet pipe and pour the same back into the kettle for reprocessing. This must be intermittently repeated until the processing operation is completed, thereby causing much additional labor by the workmen and also involving danger of the product not being properly processed.

Therefore, one object of the invention is to provide a steam jacketed kettle or tank with an outlet tube and valve so formed that pocketing of products being processed will be prevented and undercooking or overcooking prevented.

Another object of the invention is to provide a tube and sleeve having openings so formed and arranged that when the sleeve is turned in the tube or barrel in a closing direction, a shearing action takes place which will sever any solid or semi-solid material which may be caught in the openings and thereby allow portions of the material protruding inwardly into the sleeve to be cut off and pass through the tube.

Another object of the invention is to provide a sleeve which will be shifted upwardly as it is turned in a closing direction and its upper end brought onto such close fitting engagement with a cap closing the upper end of the tube or barrel that a tight closure will be formed at the upper end of the sleeve and leakage of liquid into the upper end of the sleeve prevented.

Another object of the invention is to provide an outlet valve of the improved construction so formed that it may be installed in a steam jacketed kettle or tank of conventional formation.

The invention is illustrated in the accompanying drawings wherein:

Figure 1 is a sectional view taken vertically through a kettle or tank equipped with an outlet valve of the improved construction.

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Figure 2 is a sectional view taken vertically through the improved valve and showing the valve closed.

Figure 3 is a view similar to Figure 1 showing the valve opened.

Figure 4 is a transverse sectional view taken through the upper portion of the valve along line 4—4 of Figure 2.

Figure 5 is a section view taken transversely through the valve along line 5—5 of Figure 2.

Figure 6 is a sectional view taken longitudinally through the inner tube of the valve.

Figure 7 is a sectional view taken along line 7—7 of Figure 6.

Figure 8 is a sectional view taken along line 8—8 of Figure 6.

The kettle which is indicated in general by the numeral 1 is of a conventional construction and has the usual jacket 2 providing space 3 into which steam is delivered to heat the kettle or tank 1. There have also been provided the usual legs 4 for supporting the kettle. At the centers of the kettle and the jacket are formed aligned openings surrounded by depending flanges 5 and 6 and through these flanges is mounted a bushing 7 which is formed of strong metal and welded to the flanges and has its upper portion 8 internally thickened and threaded for engagement with the threaded portion 9 of a tube constituting the outer barrel 10 of the improved valve.

The valve is of sufficient length to protrude upwardly into the tank 1 and downwardly from the bushing 7, and the lower end of the tube or barrel is externally threaded so that a pipe may be connected with it for delivering processed material to a suitable receptacle. If so desired, the pipe mentioned may be omitted and a receptacle placed under the valve. An inner sleeve or tube 11 fits snugly within the barrel or outer tube 10 and the upper portion of this inner tube is of reduced diameter to provide an annular shoulder 12 for limiting upward movement of the inner tube by engagement with an annular shoulder 13 formed within the barrel. Below the shoulder 12, the inner sleeve or tube is formed with a circumferentially extending groove 14 in which sealing rings 15 are mounted so that leakage can not occur between these rings and the lower end of the inner sleeve.

The upper end of the barrel is internally threaded to receive a cap 16 having a smooth lower end face and the upper end of the inner sleeve is formed with a bevelled edge face 17, thus

providing the inner sleeve with a sharp edge about its upper end for engaging the lower or inner end face of the cap and forming a tight joint when the inner sleeve is shifted upwardly from the position shown in Figure 3 to that of Figure 2. Openings 18 and 19 are formed through upper portions of the inner sleeve and the barrel 10 and so spaced from each other circumferentially of the sleeve and the barrel that by turning the inner sleeve its openings 18 may be moved from a position between the openings 19 of the barrel for closing the valve to a position for registering with openings 19 and opening the valve. The openings 18 and 19 are elongated longitudinally of the sleeve and the barrel and of substantially elliptical shape and since the inner sleeve is turned in the outer barrel and shifted longitudinally during this turning movement edges of the openings will move in shearing relation to each other as the inner sleeve is moved from the opened position to the closed position and any solid or semisolid material which may be lodged through the openings will be severed and carried downwardly through the inner sleeve by processed material flowing through the valve as it is shut. A sleeve of perforated metal which constitutes a screen or strainer 25 fits about the portion of the barrel which protrudes upwardly into the kettle and prevents large solid matter from entering the openings 19 of the barrel and this screen or strainer is formed about its upper end with an inwardly extending annular flange 21 which fits closely about the barrel and holds the screen in spaced relation thereto. A pin 22 carried by the barrel projects radially therefrom for engaging over the flange 21 and holding the screen in place about the barrel and since the flange 21 is formed at a point about its circumference with a radially extending slot 23 the strainer may be set in place about the barrel with the pin 22 passed through the slot in the strainer then turned to move the slot from under the pin and thus allow the pin to extend across an unbroken portion of the flange and effectively hold the screen in place.

In order to turn the inner sleeve to the opened and closed positions there has been provided a handle 24 formed with a longitudinal bore to receive a rod 25 which has its inner end portion projecting from the handle and threaded, as shown at 26. A slot 27 is formed about the barrel 10 for a portion of the circumference thereof and this slot extends spirally or diagonally, as shown in Figures 2 and 3, so that its edges constitute cam surfaces for engagement by a roller 28 carried by a connector 29. The connector is screwed into an opening 30 formed in the inner sleeve and its outer end is formed with a threaded socket 31 to receive the threaded end of the rod 25. A hub or ferrule 32 fits about the portion of the connector which protrudes from the barrel and when the rod 25 is tightened the outer end of the hub will be firmly gripped between the handle and the outer end of the connector and the flanged inner end of the hub will be pressed against a collar or sealing ring 33 which fits snugly about the barrel in covering relation to the slot 27, as shown in Figures 2 and 3. By providing the ring or collar dirt will be prevented from gathering in the slot. The rings 15 prevent any processed material from working downwardly between the sleeve and the barrel and out through the slot. Since the slot 27 extends diagonally about the barrel movement of the handle to turn the inner sleeve in the barrel will cause the sleeve to be shifted vertically or longitudinally in the barrel and the bevelled upper end of the sleeve moved into sealing engagement with the inner end of the cap as the sleeve is turned from the opened position of Figure 3 to the closed position shown in Figure 2. By removing the handle and the connector the inner sleeve may be withdrawn through the lower end of the barrel and since the cap may be unscrewed from the barrel and the cylindrical screen also easily removable the entire valve may be easily and quickly taken apart for thorough cleaning.

From the foregoing description of the construction of my improved sleeve valve, the operation thereof will be readily understood and it will be seen that I have provided a comparatively simple, inexpensive and efficient means for carrying out the various objects of the invention.

While I have particularly described the elements best adapted to perform the functions set forth, it is apparent that various changes in form, proportion and in the minor details of construction may be resorted to, without departing from the spirit or sacrificing any of the principles of the invention.

Having thus described the invention, what is claimed is:

1. In combination with a kettle formed through its bottom with an opening, and a bushing in the opening internally threaded from its upper end; a valve comprising a barrel extending vertically through the bushing in threaded engagement therewith with portions above and below the bushing, the protruding upper portion of said barrel being formed with circumferentially spaced openings, a cap in threaded engagement with the upper end of said barrel, a tube fitting snugly in said barrel and being rotatable and slidable longitudinally therein and having its upper portion formed with side openings for registering with the openings of the barrel when the tube is turned to an opened position, the openings of the tube and the barrel being substantially elliptical in shape and elongated longitudinally of the tube and the barrel, a screen about the protruding upper portion of said barrel, an interval shoulder about the upper end of said barrel, an external shoulder about said tube disposed under the opening of the tube and overlapped by the shoulder of the barrel, sealing rings about the tube below its shoulder, a portion of the barrel below the bushing being formed with a slot extending diagonally for a portion of the circumference of the barrel, and a handle for turning said tube extending laterally from said barrel and having an attaching member passing through the slot and connected with the tube, edges of the slot constituting cam surfaces for acting upon the attaching member of the handle and shifting the tube vertically to move its upper end into tight sealing engagement with the inner end face of the cap as the tube is turned in a closing direction and move the shoulder of the tube into close contacting engagement with the under face of the shoulder of the barrel.

2. In combination with a kettle formed through its bottom with an opening, and a bushing in the opening internally threaded from its upper end; a valve comprising a barrel mounted vertically through the bushing with portions projecting above and below the bushing, a cap closing the upper end of the barrel, the protruding upper portion of the barrel being formed with an outlet opening, a tube fitting snugly in said barrel and being rotatable in the barrel and slidable

vertically therein and formed with opening for registering with opening of the barrel when the tube is turned to an opened position, the lower portion of the barrel being formed with a slot extending circumferentially thereof, means for forming a liquid tight joint between portions of the tube and the barrel below the opening of the barrel and disposed diagonally to provide cam surfaces, and a handle having a mounting member passing through the slot and engaged with the tube whereby upon moving the handle circumferentially of the barrel to turn the tube to a closed position the tube is shifted vertically and its upper end moved into closing engagement with the inner face of the cap and sealed thereby.

3. A valve comprising a barrel adapted to be mounted vertically through the bottom of a container with its upper portion projecting into the container and its lower portion projecting downwardly therefrom, said barrel having its upper portion formed with side openings, a closure for the upper end of said barrel, a tube in said barrel rotatable and slidable vertically therein and formed with side openings for registering with the openings of the barrel when the tube is turned to an opened position, means for forming a liquid tight joint between portions of the tube and the barrel below the openings of the tube and the barrel, a handle for turning said tube in said barrel, and said barrel being provided with cam means for acting upon the handle and shifting the tube upwardly and moving its upper end into sealing engagement with the closure when the tube is turned to a closed position.

4. A valve comprising a barrel adapted to be mounted vertically through the bottom of a container with its upper portion projecting into the container and its lower portion projecting downwardly therefrom, said barrel having its upper portion formed with side openings, a closure for the upper end of said barrel, a tube in said barrel rotatable and slidable vertically therein and formed with side openings for registering with the openings of the barrel when the tube is turned to an opened position, companion shoulders carried by the tube and the barrel below the openings therein, sealing rings about the tube below the shoulder thereof, said barrel being formed with a slot extending circumferentially

of the barrel and disposed at an incline to provide cam surfaces of edges of the slot, a connector carried by said tube and projecting outwardly through said slot, a roller upon said connector in the slot, a hub about the protruding outer portion of said connector, a handle, and a rod passing longitudinally through the handle and through said hub and having a threaded end screwed into a threaded socket formed in the connector, said handle constituting means for turning the tube in the barrel, and said roller being engaged with the cam surfaces of the slot for shifting the tube vertically in the barrel and holding its upper end in sealing engagement with the closure and its shoulder in engagement with the shoulder of the barrel when the tube is turned to a closed position.

5. A valve comprising a barrel adapted to be mounted vertically through the bottom of a container with its upper portion projecting into the container and its lower portion projecting downwardly therefrom, said barrel having its upper portion formed with side openings, a closure for the upper end of said barrel, a tube in said barrel rotatable and slidable vertically therein and formed with side openings for registering with the openings of the barrel when the tube is turned to an opened position, means for forming a liquid tight joint between portions of the tube and the barrel below the side openings of the tube and the barrel, and means for turning the tube in the barrel and shifting the tube vertically to move its upper end into sealing engagement with the closure when the tube is turned to a closed position.

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