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Worcester, Mass.

[56]

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[54] **SANITARY VALVE FOR VISCOUS MATERIALS**
2 Claims, 3 Drawing Figs.

[52] U.S. Cl. 137/546,
 251/324, 251/191
 [51] Int. Cl. F16k 3/24
 [50] Field of Search 257/324,
 191; 137/546

ABSTRACT: A gate or plug-type of valve including a housing and pipe connections, said housing having a chamber open at one side thereof and closed at the other side, and a gate or plug in said chamber, means for moving said plug axially to open and close the valve, the axis of the chamber and of the plug being coaxial and at an inclination with respect to the axis of the pipe connections and to the flow of the material therein.

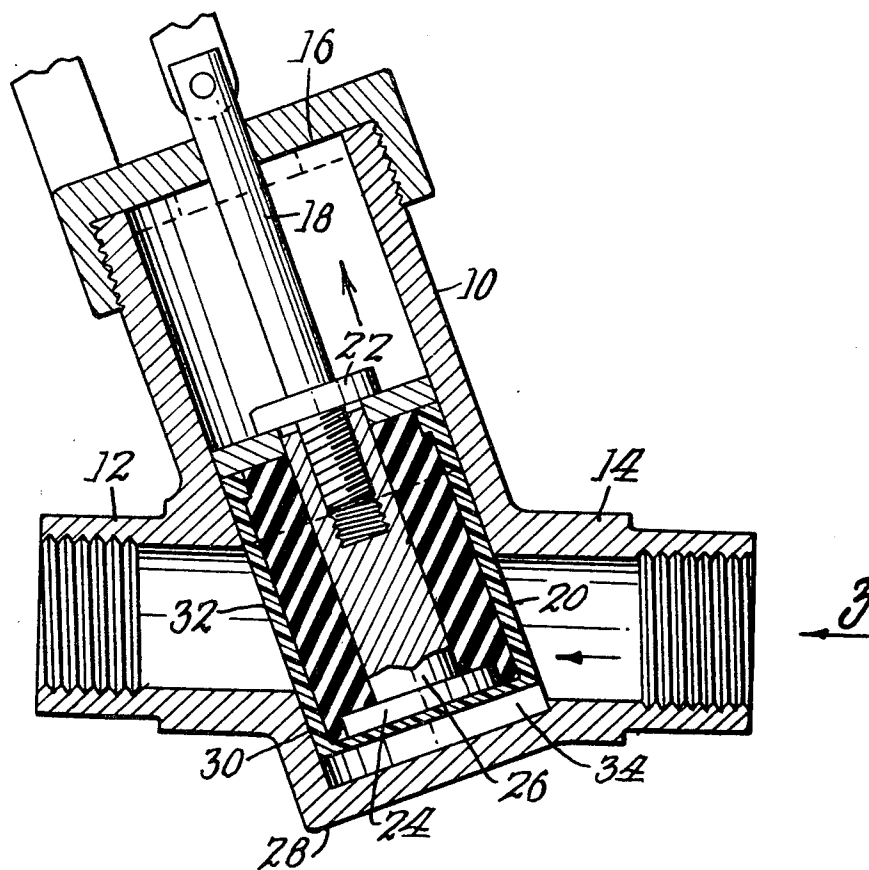


Fig. 2

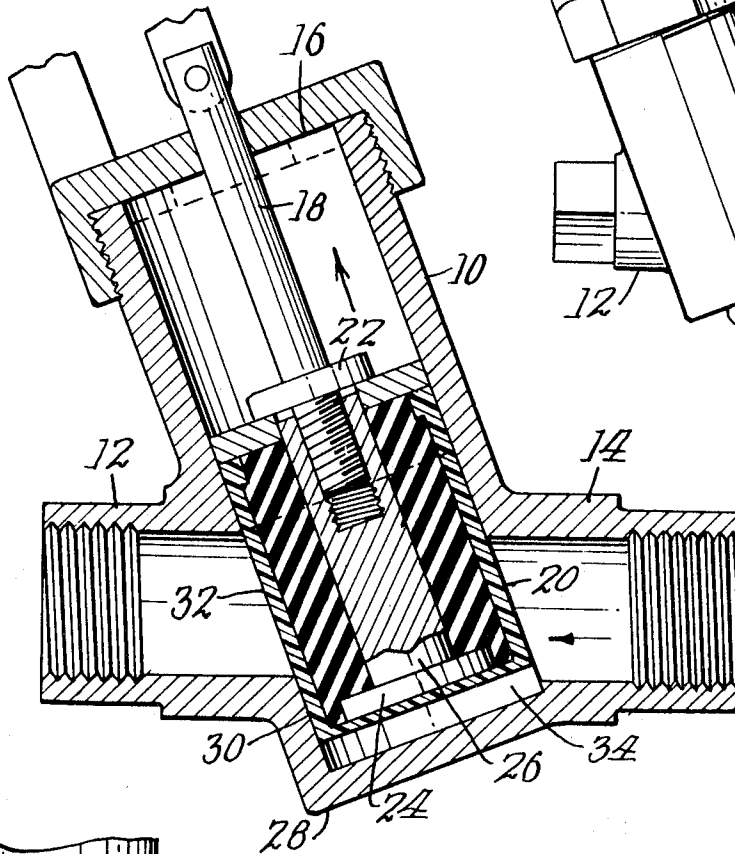


Fig. 1

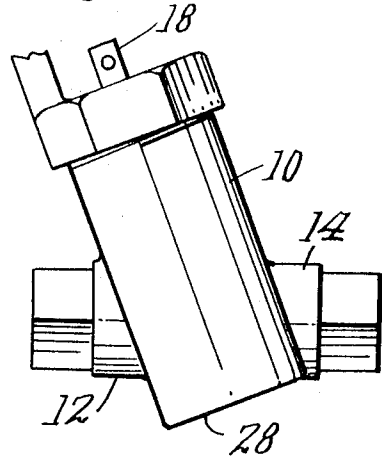
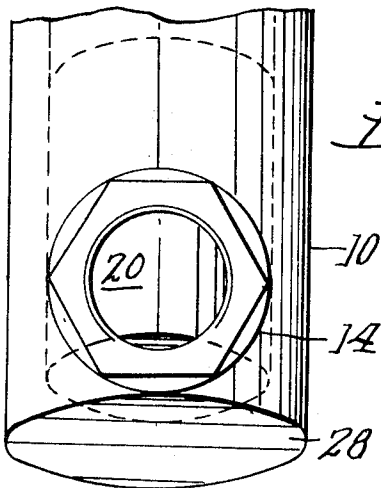


Fig. 3



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SANITARY VALVE FOR VISCOUS MATERIALS

BACKGROUND OF THE INVENTION

Sanitary valves include a type of valve used e.g. in the food packing industry for filling containers. These valves may be manually actuated but more frequently are open and closed in timed relation to correspond to the amount of material to be placed in the containers, being closed while the containers are indexed to present an empty container to be filled, the valve being open while filling.

Such sanitary valves present relatively few problems when the material to be packed is highly fluid, but when the fluid is highly viscous or contains solid matter, the valve member is apt to stick when it is moved to the closed position because it traps such thick or solid materials in the bottom of the valve, and therefore must very frequently be cleaned.

SUMMARY OF THE INVENTION

This invention provides a valve which obviates the above difficulties by providing a gate or plug-type of axially movable valve member at an angle or inclination with respect to the flow of the viscous or solid material being processed. The bottom of the plug remains open with respect to the upstream side of the material being processed even though the valve is closed and therefore the material may be squeezed out of the area at the bottom of the valve into the upstream side against the pressure of the oncoming material, and therefore this avoids actually trapping such material in the bottom of the valve and consequently avoids the necessity for frequent cleaning thereof. This construction also provides a quick, smoother closing action, due to the angle of approach of the valve member with respect to the oncoming stream of material since it is not at a right-angle thereto but is at an inclination, the inclination being such as to oppose the normal flow as the valve is being closed and to release the flow as the valve is opened.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in elevation illustrating the invention;
FIG. 2 is a longitudinal sectional view with respect thereto, and
FIG. 3 is a view in elevation looking in the direction of arrow 3 in FIG. 2.

PREFERRED EMBODIMENT OF THE INVENTION

As shown in the drawings, the present valve comprises essentially a housing 10, a pipe connection 12, and an opposite pipe connection 14. The housing 10 is preferably cylindrical having an open end 16 through which may extend a valve actuating member 18 of any kind desired. This member comprises in general a central stem for a gate or plug-type of valve member 20, this being firmly connected with respect to the stem 18 by means of plates 22 and 24 which are secured with respect thereto and particularly at the end 26 in any way desired.

It is also pointed out that this member may be expanded as by the means proposed in my copending application Ser. No.

816,554, filed Apr. 16, 1969, but this is not necessary to the successful operation of the device although it is preferred that the plug 20 shall be either permanently expanded or temporarily expanded during the operation thereof in order to make the valve completely leakproof.

Whereas the valve member (plug) 20 and its housing 10 are both cylindrical and coaxial, they are located at an inclination with respect to the pipe connections 12 and 14 and the axis or direction of flow of the material is shown by the arrows indicating the upstream and the downstream sides thereof.

Also the housing and the connections include an offset generally indicated at 28 providing an interior surface 30 contacted by the plug in the closed position thereof as in FIG. 2, in which it is seen that the downstream side 32 is completely closed so that all flow of the material in the pipe ceases, but at the same time there is a slight space at 34 at the bottom of the plug 20 and this is open with respect to the upstream side in the pipe connection 14 although the valve is completely closed in this condition of the parts.

Now supposing that the material flowing is highly viscous or is comprised of a great many flowing discrete particles or is fluid and containing solid particles as commonly encountered in the food packing industry, it will be seen that when the valve 20 is moved downwardly to close off the flow of material, it will tend to squeeze some of the material in the chamber at 24, but this chamber has an outlet access with respect to the upstream pipe connection 14, so that material is not trapped in this area, i.e., mashed, etc.

With a similar valve with the plug working at a right angle with respect to the direction of flow of the material, the fluid will become trapped in the bottom of the valve and soon interferes with the smooth accurate dispensing of the materials which are to be packed in the containers. The valve becomes dirty and caked and must be cleaned often. However with the present invention this is not possible because of the presence of the space below the valve at 34 which has communication with the upstream side of the valve.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A sanitary valve comprising a housing having a chamber therein open at one end thereof and closed at the other end, an axially aligned inlet and outlet comprising a through passage, a valve member movable in said chamber for closing and opening the valve, means for moving said valve member to open and close the same, said chamber and valve member being generally coaxial along an axis at an inclination with respect to the through passage and path of motion of the material to be conveyed through the valve, said valve member being a plug having a free bottom area, the valve housing having a portion receiving the bottom of said plug in slightly spaced relationship with respect thereto when the valve is closed as respects the downstream side of the valve, thus forming a chamber in the bottom of the valve, said chamber being always open and in communication with respect to the upstream side of the valve.

2. The valve of claim 1 wherein the plug is movable to fill the chamber at its free bottom area, forcing material in the chamber out of the chamber into the upstream side of the valve.