June 19, 1934.

K. D. SMITH

1,963,424

VISCOLIZER VALVE

Filed Oct. 16, 1931

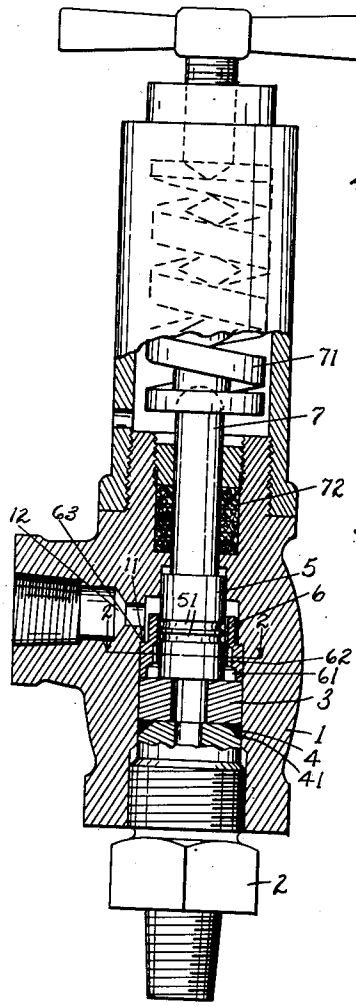


Fig. 1

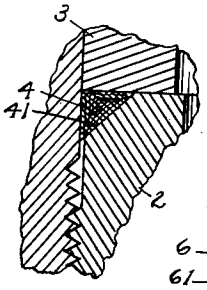


Fig. 6

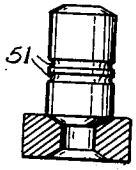


Fig. 7

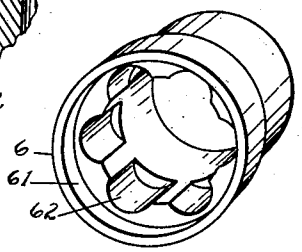


Fig. 4

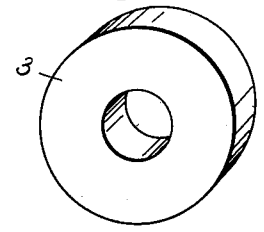


Fig. 5

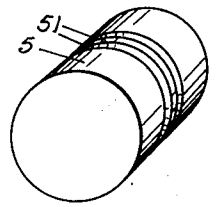


Fig. 3

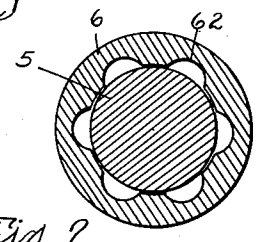


Fig. 2

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VISCOLIZER VALVE

Karl D. Smith, Battle Creek, Mich., assignor to Union Steam Pump Company, Battle Creek, Mich.

Application October 16, 1931, Serial No. 569,205

7 Claims. (Cl. 99—2)

The objects of the invention are:

First, to provide an improved blow-proof packing for such a structure.

Second, to provide an improved valve in which there is a double action on the material being treated, which tends to avoid undue viscosity in the product.

Third, to provide an improved construction of viscolizer valve in which there is a disposition of coacting surfaces around the periphery of the valve for a second stage treatment which reduces or avoids viscosity in the product.

Objects pertaining to details will appear from the description to follow. Preferred embodiments of my invention are shown in the accompanying drawing, in which:

Fig. 1 is a vertical central sectional view through a valve structure embodying the features of my invention, the valve plug itself being shown in full lines.

Fig. 2 is an enlarged transverse detail sectional view on line 2—2 of Fig. 1, looking down.

Fig. 3 is a detail perspective view of the valve plug.

Fig. 4 is a detail perspective view looking into the end of the breaker ring and guide embracing the periphery of the said plug valve.

Fig. 5 is a detail perspective view of the valve seat.

Fig. 6 is a vertical enlarged detail section showing details of construction of the blow-proof gasket.

Fig. 7 is a detail elevation view of a modification of the valve, showing tapered ends with a double valve seat in section corresponding thereto.

The parts will be identified by their numerals of reference which are the same in all the views.

1 is the valve casing embracing and carrying the other parts. 2 is the bottom plug for the said casing which provides the connection to the pressure pump. 3 is the double valve seat which is a cylindrical perforated plug with plane square top and bottom surfaces forming the valve seat. 4 is the blow-proof packing disposed under the valve seat 3 in a peripheral depression 41 at the upper end of the bottom plug 2, so that, as the valve seat 3 is forced down, it compresses the same so that the harder the pressure the tighter the packing fits.

5 is the double ended viscolizing valve which is shown cylindrical in form with square ends to cooperate with the square end of the valve seat 3. At the center of this cylindrical valve 5, which is preferably an inch in diameter, are formed a pair of semi-circular annular grooves 51, ⅛" in diameter. Around the valve 5 is the breaker ring 6 which is formed with an annular ring 61 at the bottom having fluted depressions 62 above the same, the upper end terminating in substantially a true cylinder about one thirty-second of an inch larger in diameter than the said valve 5. The true cylindrical part embraces the annular grooves 51.

The breaker ring is provided with a shoulder 63 which contacts with a corresponding stop shoulder 11 in the valve casing. 7 is the valve stem having a square end to rest against the cylindrical valve 5, it being held yieldingly in place by the usual adjustable spring 71. The usual packing 72 is provided for the said valve stem.

In operation, cream or the mixture being treated, as the case may be, is introduced under high pressure up through bottom plug 2, lifts the valve 5, which is preferably under a pressure of fifteen hundred pounds or more, expands against the inner wall of the breaker ring 6 at right angles thereto with great force into the annular chamber 61, and is forced upwardly through the flutes 62 through the narrow annular space between the breaker ring and the sides of the valve 5, passing over the annular grooves 51 and thence being discharged through the side opening 12 in the valve casing.

Ordinarily, as thus treated, if it be cream, if it is discharged by single action under a viscolizer valve of this description, the viscosity of the cream is greatly increased, a thing which it is frequently desirable to avoid. It is avoided in this double acting valve by passing the cream through a space of about one sixty-fourth of an inch or of size suited to capacity, and past the annular grooves which has the effect of reducing the viscosity of the treated mixture to substantially the same as the mixture is introduced.

Theories might be advanced as to why this action occurs. But pressures are high; it is impossible to see what is done, and it would seem to do no good to theorize about it, but be sufficient to state the fact.

As pointed out, the valve can be modified by providing a tapered end fitted to a correspondingly countersunk face in the valve seat. Other packings might be provided for the valve, but I have found that here made use of to be substantially perfect, as it does not blow out.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a viscolizer valve, the combination of a valve casing, a bottom plug therefor perforated

for receiving cream or mixture to be treated, the said plug being chamfered at its periphery, a packing disposed in the said periphery, a valve having a member resting on the said packing to compress the same, a cylindrical valve having its end conformed to the valve seat and having annular grooves centrally disposed thereon, and a breaker ring surrounding the said valve having an annular recess to receive the discharge past the said valve and having corrugations to pass the same upwardly with a cylindrical portion spaced from the said valve substantially 1/64 of an inch in proximity to the said grooves, whereby the treated material is passed up through the annular passage and broken up to avoid viscosity of the finished material.

2. In a viscolizer valve, the combination of a valve casing, a bottom plug therefor perforated for receiving cream or mixture to be treated, the said plug being chamfered at its periphery, a packing disposed in the said periphery, a valve having a member resting on the said packing to compress the same, a cylindrical valve having its end conformed to the valve seat and having annular grooves centrally disposed thereon, and a breaker ring surrounding the discharge past the said valve and having corrugations to pass the same upwardly with a cylindrical portion spaced from the said valve in proximity to the said grooves, whereby the treated material is passed up through the annular passage and broken up to avoid viscosity of the finished material.

3. In a viscolizer valve, the combination of a valve casing, a bottom plug therefor perforated for receiving cream or mixture to be treated, the said plug being chamfered at its periphery, a packing disposed in the said periphery, a valve having a member resting on the said packing to compress the same, a cylindrical valve having its end conformed to the valve seat and having annular grooves centrally disposed thereon, and a breaker ring surrounding the said valve having an annular recess to receive the discharge past the said valve and having corrugations to pass the discharge upwardly with a cylindrical portion spaced from the said valve substantially 1/64 of an inch in proximity to the said annular grooves, whereby the treated material is passed up through the annular passage and broken up to avoid viscosity of the finished material.

4. In a viscolizer valve, the combination of a valve casing, a bottom plug therefor perforated for receiving cream or mixture to be treated, the said plug being chamfered at its periphery, a packing disposed in the said periphery, a valve having a member resting on the said packing to compress the same, a cylindrical valve having its end conformed to the valve seat and having annular grooves centrally disposed thereon and a breaker ring surrounding the discharge past the said valve and having corrugations to pass the discharge upwardly with a cylindrical portion spaced from the said valve in proximity to the said annular grooves, whereby the treated material is passed up through the annular passage and broken up to avoid viscosity of the finished material.

5. In a viscolizer valve, the combination of a valve casing, a bottom plug therefor perforated for receiving cream or mixture to be treated, a valve having a member supported by said plug, a cylindrical valve having its end conformed to the valve seat and having annular grooves centrally disposed thereon and a breaker ring surrounding the discharge past the said valve and having corrugations to pass the discharge upwardly with a cylindrical portion spaced from the said valve in proximity to the said annular grooves midway of said cylindrical valve, whereby the treated material is passed up through the annular passage and broken up to avoid viscosity of the finished material.

6. In a viscolizer valve, the combination of a valve casing, a bottom plug therefor perforated for receiving cream or mixture to be treated, the said plug being chamfered at its periphery, a packing disposed in the said periphery, a valve having a member resting on the said packing to compress the same, a spring pressed valve having its end conformed to the valve seat.

7. In a viscolizer valve, the combination of a valve casing, a bottom plug therefor perforated for receiving cream or mixture to be treated, a valve having a member supported by said plug, a cylindrical valve having its end conformed to the valve seat and a breaker ring surrounding the discharge past the said valve and having corrugations to pass the discharge upwardly with a cylindrical portion spaced from the said valve in proximity to the said cylinder intermediate its ends, whereby the treated material is passed up through the annular passage and broken up to avoid viscosity of the finished material.

KARL D. SMITH.