K. D. SMITH.

HIGH PRESSURE PUMP.

APPLICATION FILED MAY 13, 1919.

1,387,623. Patented Aug. 16, 1921.

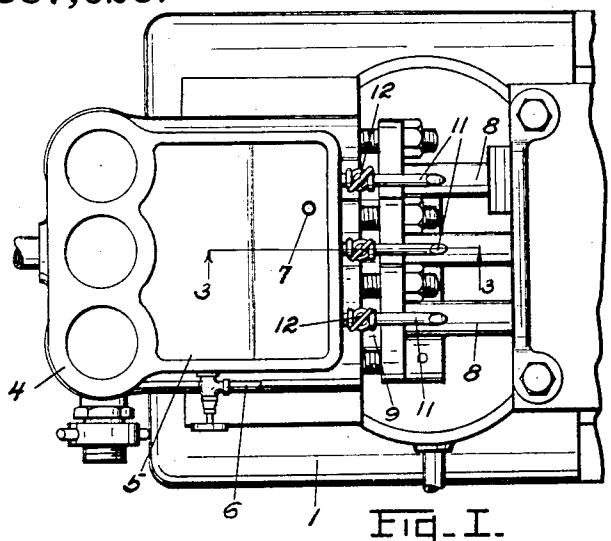



FIG. I.

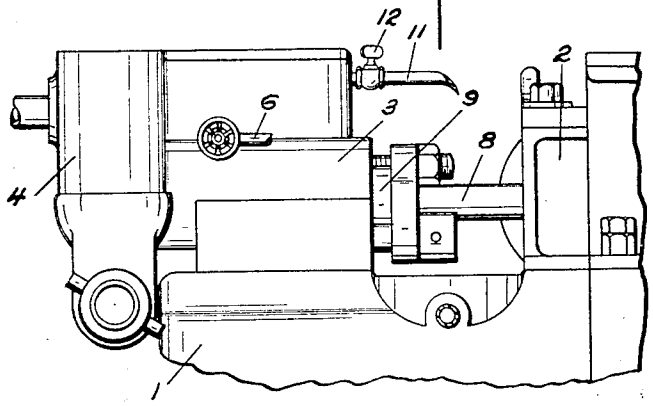



FIG. II.

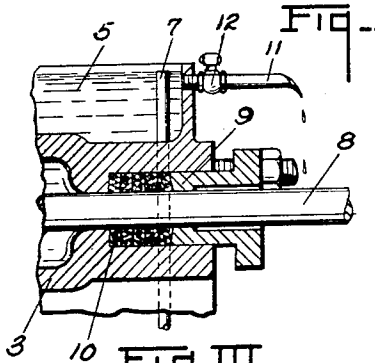



FIG. III.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

KARL D. SMITH, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO UNION STEAM PUMP COMPANY, OF BATTLE CREEK, MICHIGAN.

## HIGH-PRESSURE PUMP.

1,387,623. Specification of Letters Patent. Patented Aug. 16, 1921.

Application filed May 13, 1919. Serial No. 296,898.

*To all whom it may concern:*

Be it known that I, KARL D. SMITH, a citizen of the United States, residing at Battle Creek, county of Calhoun, State of Michigan, have invented certain new and useful Improvements in High-Pressure Pumps, of which the following is a specification.

This invention relates to improvements in pressure pumps.

I herein illustrate my improvements as I have particularly designed and embodied them in high pressure pumps for pumping milk under high pressures in homogenizing machines and processing of condensed milk.

The main object of this invention is to provide an improved pump in which the cylinders are cooled and the piston rods are washed and provided with a lubricating and cooling film of water at the packing glands.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing forming a part of this specification, in which:

Figure I is a detail plan view of a three cylinder pump embodying the features of my invention, the valves and the top for the water tank being omitted, the power end being broken away.

Fig. II is a detail side elevation of the structure appearing in Fig. I with the cover for the water tank in position.

Fig. III is an enlarged detail vertical section on a line corresponding to line 3—3 of Fig. I.

In the drawing, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the base 1 is adapted to support the cylinders and power end, the part 2 of which is illustrated. The pump cylinders 3 are formed as an integral casting there being three cylinders in the structure illustrated.

The valve casings 4 are formed integrally with the cylinders. Above the cylinders and at the inside of the valve casings is a cooling tank 5 having a water supply connection 6 and an overflow pipe 7. The discharge of the overflow pipe is not shown.

The piston rods 8 are provided with packing glands and packings 9 and 10 respectively. Above each piston rod is a drip pipe 11 provided with a valve 12 for regulating the flow of water. These pipes are disposed so that the water dropping therefrom falls upon the piston rods, washing them and providing them with a lubricating film of water at the glands. When pumps of this character are used for the handling of condensed milk and the like for which this pump is especially designed and extensively used, there is a tendency for the milk to collect and harden on the surface of the piston rods and in the packing so that after the pump has been operated and allowed to stand for a short time, this accumulation which is similar to glue destroys the elasticity of the packing causing it to score, also adhering to the piston rods. The application of water, as the applicant has provided for, to the piston rods prevents the accumulating and drying of the condensed milk in the packing and on the surface, thereby enabling the operation of the pump for a long period of time without the expense and annoyance of frequent repacking and at the same time provides the lubrication necessary; also preventing the parts becoming unduly heated as otherwise would be the case in these high pressure pumps particularly as when used for the handling of milk products cannot be kept flooded with oil as might be permissible under other conditions. The packings for this purpose are commonly of asbestos and it is found that water serves as an efficient lubricant as well as washing and cooling, as stated.

By means of the valve 12, the flow of water to the piston rods may be regulated so as to secure the desired results.

I have illustrated my improvements as I have embodied the same in a pressure pump of a homogenizing machine as seems desirable to illustrate a practical adaptation of my improvements and certain of these parts are shown mainly in conventional form. It is believed that the disclosure made will enable those skilled in this art to embody or adapt my improvements as may be desired.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent is:

1. In a pressure pump, the combination of a plurality of integrally formed cylinders disposed side by side and having valve casings formed integrally therewith, a cooling tank above said cylinders, said cylinders and valve casings constituting walls of said tank, piston rods, packing glands for said piston rods, and a series of drip pipes projecting from said tank over said piston rods to drip water thereon, said pipes being provided with valves for the purpose specified.

2. In a pressure pump, the combination of a plurality of integrally formed cylinders disposed side by side, and having valve casings formed integrally therewith, a cooling tank above said cylinders, said cylinders and valve casings constituting walls of said tank, piston rods, packing glands for said piston rods, and a series of drip pipes projecting from said tank over said piston rods to drip water thereon, for the purpose specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

KARL D. SMITH. [L. S.]

Witnesses:
GERTRUDE R. GANKA,
JESSE F. HAGELSHAW.