I. R. SMITH.

CUP PACKING EXPANDER.

APPLICATION FILED SEPT. 29, 1914.

1,185,355.

Patented May 30, 1916.

Fig. 1,

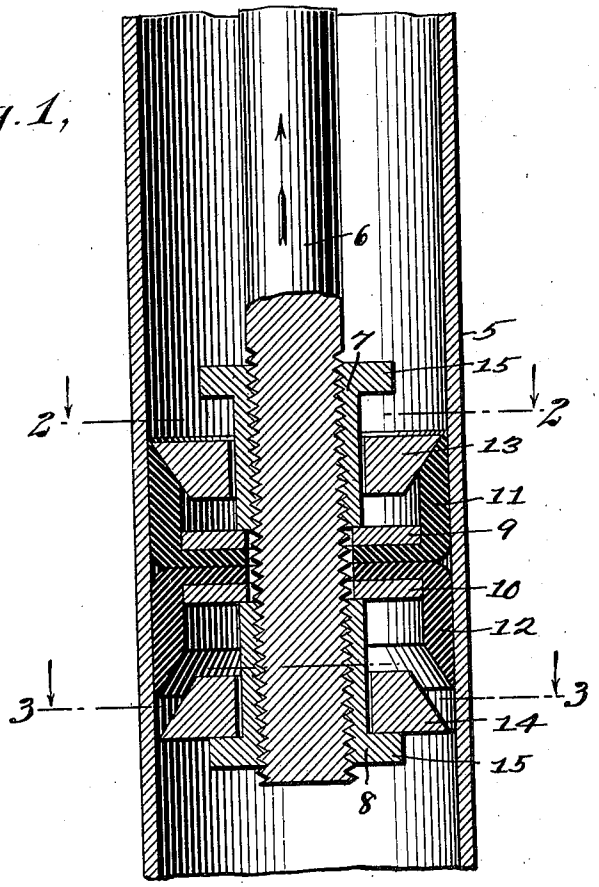


Fig. 2,

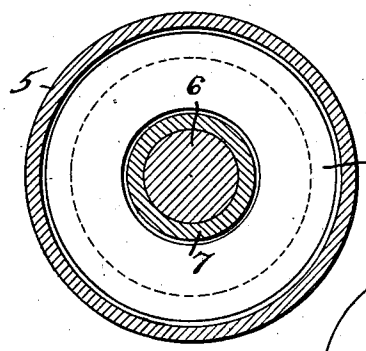


Fig. 3,

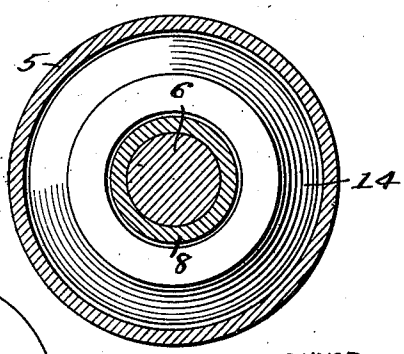
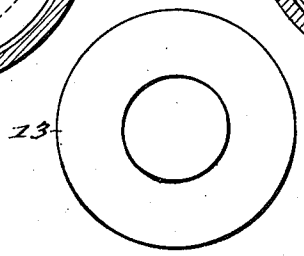


Fig. 4.



WITNESSES:

Edw. Thorpe.

J. C. Larsen

INVENTOR

Irvin R. Smith

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

IRVIN R. SMITH, OF HASTINGS, NEBRASKA, ASSIGNOR OF ONE-HALF TO JOHN S. WILLIAMS, OF HASTINGS, NEBRASKA.

CUP-PACKING EXPANDER.

1,185,355. Specification of Letters Patent. Patented May 30, 1916.

Application filed September 29, 1914. Serial No. 864,073.

To all whom it may concern:

Be it known that I, IRVIN R. SMITH, a citizen of the United States, and a resident of Hastings, in the county of Adams and State of Nebraska, have invented certain new and useful Improvements in Cup-Packing Expanders, of which the following is a specification.

My invention relates to pump packings of the cup class, and the main object thereof is to provide an automatic, mechanical, expander for such packings, whereby an even pressure is maintained between said packing cups and the walls of the pump cylinder, thus insuring a maximum efficiency thereto and insuring long life thereto by reason of the fact that it is impossible for the sides of the packing to wrinkle, crumble, or collapse, irrespective of the thickness thereof, even when worn very thin by long use.

A further object is to provide such expanders on each side of a piston, in such manner that pressure is only exerted upon that particular packing in action and thus insure positive action with fluids of any density, but insuring greater and firmer contact with the walls of the cylinder as the density of gas, fluid or semi-fluid being pumped is greater.

A further object is to so construct the expanders that, upon a return stroke of the piston, the packing which had been in action is instantly and automatically released from any strain or wear; and further objects are to provide such expanders which are simple in construction, positive in use, not likely to get out of order, to require repair, and comparatively inexpensive.

My invention is fully described in the following specification, of which the accompanying drawings form a part, in which the separate parts are designated by the same reference characters in each of the views, and in which:—

Figure 1 is a central, longitudinal, section taken through the barrel of a pump provided with my invention, shown in section; Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a section taken on the line 3—3 of Fig. 1; and Fig. 4 is a plan view of the expander detached from the pump.

In the drawings forming a part of this application I have shown a present preferred form of embodiment of my invention, comprising a pump cylinder or barrel 5 having a piston rod 6 longitudinally movable therein, threaded at its end as shown in Fig. 1, and adjustably held thereon, by means of two threaded sleeves 7 and 8, are two clamping plates 9 and 10, for packing cups 11 and 12, respectively.

Slidable upon each of the sleeve 7 and 8 is a disk 13 and 14, respectively, the peripheries of which are of the approximate internal diameter of the barrel 5 and are inwardly tapered to form conical bearing surfaces for the flared edges of the respective cups, and it will be seen that, if one of the disks, hereinafter referred to as the expanders, be moved toward the clamping plates 9 and 10, the corresponding edge of the cup is forced into close and even contact with the interior of the barrel 5, the firmness of this contact being in the degree of pressure exerted upon the expander; by reference to Fig. 1 it will be seen that each sleeve is provided with a flange 15 which serves to imprison the corresponding expander, but is sufficiently far removed from the operative position thereof to permit a considerable degree of play to the expanders, longitudinally of the rod 6, thus permitting the inactive expander to recede from its contact with the corresponding packing cup and thereby relieving said cup of all strain or pressure against the interior of the barrel, whereby no wear on the inoperative cup is possible.

Inasmuch as the cups are immovable, the pressure of gas or fluid pumped is upon the corresponding expander, which is thus forced into contact with the corresponding cup, and which is forced against the interior walls of the barrel in the degree of pressure exerted upon the expander, and this is determined by the volume being pumped, or by the weight thereof, as with gas fluids or semi-fluids of considerable density. This expander pressure upon the active packing cup is true regardless of the degree of wear of the latter, as said expander is free to move toward the clamping plates as the cup is being worn away, nor does the thickness of the walls of the cups affect this expander action thereon, and it will be seen that, because of the relieving of said cups from activity, alternately, the life thereof is doubled over those in conventional pumps.

It will also be seen that a piston provided with my expanders differs from the conventional pistons in that I rely upon the ex-

panders to take the fluid strain to force the cup walls into barrel contact, whereas in those now employed, the fluid being pumped forces said cup walls outwardly, and the degree of pressure between cup walls and barrel is only that of the weight or density of the material being pumped over the very limited interior cup wall area, and this is very slight when the cups are worn considerably, resulting in leakage, but with my expanders there is no possibility of leakage until the cups are entirely worn out because of the relatively great area of the fluid contacting side of the expander.

Further, I take advantage of the well known principle of the wedge for forcing the cup walls into barrel contact, and this is not possible to the convention cup packings.

While I have shown certain details of specific form, I do not limit myself thereto, but may make changes thereover, within the scope of the following claim, without departing from the spirit of my invention, or sacrificing its advantages.

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

The combination with a pump barrel, of a piston rod, clamping plates held thereon, sleeves in threaded engagement with said rod on each side of said plates for holding the latter in place, a cup packing held between said plates, and a conical expander slidable on and for the full length of each of said sleeves and engaged with the edge of said packing, said sleeves having, each, a flange on the outer end thereof to confine the expander thereon.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

IRVIN R. SMITH.

Witnesses:
HARVEY A. SMITH,
LLOYD J. WILLIAMS.