April 21, 1931. J. M. SHIMER 1,802,281

SLUSH PUMP

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Fig. 1.

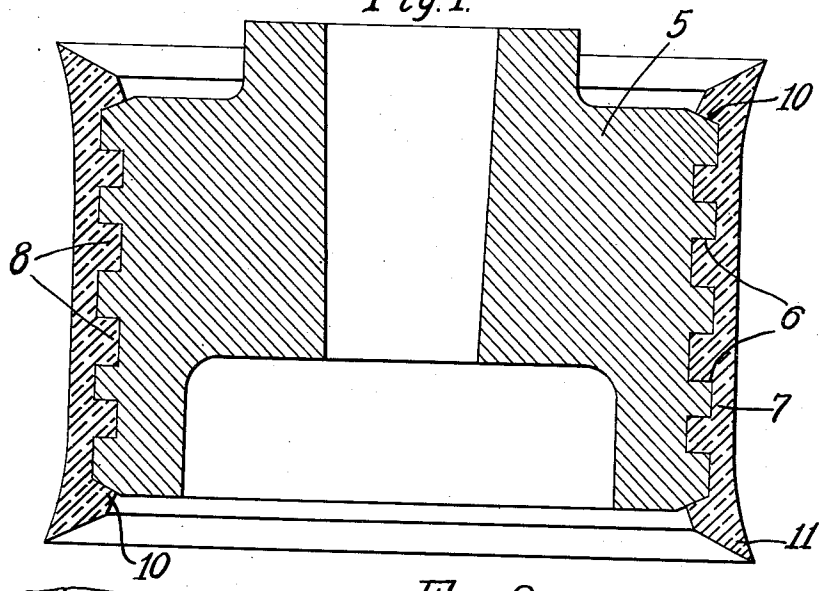
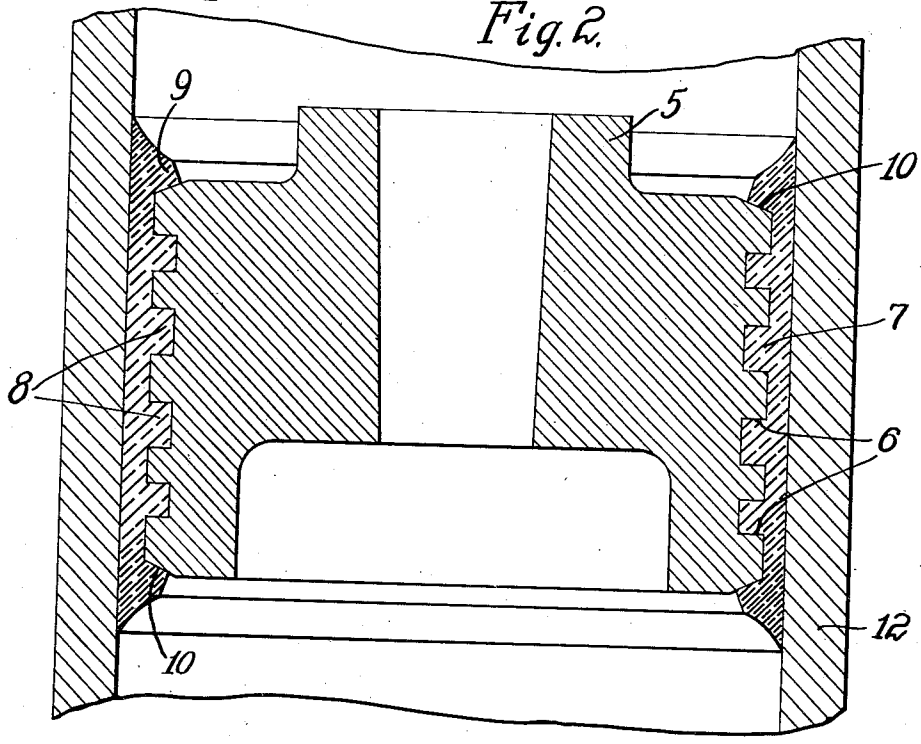



Fig. 2.




INVENTOR

John M. Shimer

By Green & McCallister

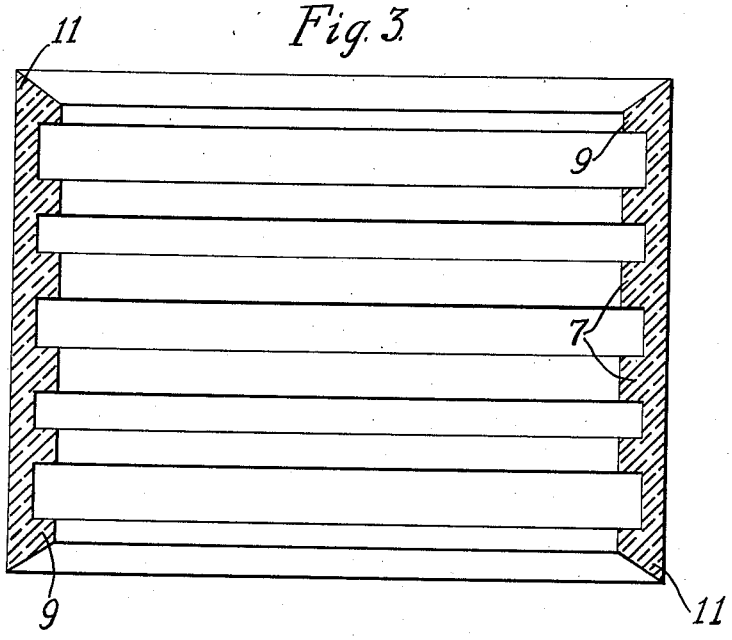
His Attorneys

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Fig. 3.




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# UNITED STATES PATENT OFFICE

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## SLUSH PUMP

Application filed February 13, 1929. Serial No. 339,536.

This invention relates to slush pumps such as are commonly employed in connection with well drilling operations and more particularly to a novel construction of piston for use in pumps of this general type.

As is well understood in this particular art, mud or slush pumps must handle a thick mud fluid containing a large percentage of abrasive material so that it will be apparent that the design of the piston in the fluid end of the pump is of extreme importance. It is the usual practice to provide slush pump pistons with a yieldable or resilient portion which is pressed against the associated cylinder wall so as to have a wiping action thereon to wipe the grit from such wall and to reduce the wear between the piston and liner to the lowest possible degree.

An object of this invention is to provide a piston of the type set forth having an improved construction and arrangement.

A further object is to provide a pump piston having a resilient surface bearing on the associated cylinder wall which is of such construction and arrangement as to accomplish its purpose without the introduction of any great pressure on the cylinder wall.

A still further object is to provide a slush pump piston which will be simple in construction, durable in operation and relatively cheap to manufacture and assemble.

These and other objects which will be apparent to those skilled in this particular art are accomplished by means of the invention illustrated in the accompanying drawings in which Fig. 1 is a transverse sectional view through a slush pump piston assembly constructed in accordance with one embodiment of this invention. Fig. 2 is a similar view of the assembly located in an associated pump cylinder and Fig. 3 is a similar view through a resilient sleeve before it is applied to the piston.

The present invention contemplates a piston which is preferably formed of only two separable parts, namely, a metallic body and a sleeve of resilient material which is stretched over the body so as to form a wearing surface in contact with the wall of the associated cylinder. The engaging surfaces between the piston body and the resilient sleeve are so formed that the edges of the latter are pressed outwardly so that when the assembly is positioned in a cylinder, such edges are flexed by the cylinder wall and are thus placed under such a strain as to be pressed against the wall thereof with a light but none the less definite pressure resulting from such flexure.

As illustrated, the piston includes a metallic body 5, having a series of circumferential grooves 6 formed therein and a resilient sleeve 7 stretched over the piston body and having a plurality of tongues 8 seating in the piston grooves 6. The end tongues 9 at each end of the sleeve have the same square shoulder formation at their inner ends as the other tongues, but the annular surfaces 10 at each end of the piston body are so beveled as to bend the end tongues 9 of the sleeve outwardly and thus flex the edges 11 of the sleeve outwardly in the manner shown in Fig. 1. The outer shoulder of each end tongue 9 is sloping, and provides a reinforcement or thickened support for the skirt or edge 11, which is caused to flare by the beveled surface 10. When the assembly is placed within an associated cylinder 12, the diameter of which is approximately equal to the diameter of the major portion of the piston assembly, the flaring ends of the sleeve are flexed and the resilient material of these ends, and more particularly the end tongues 9, which support and reinforce these ends are compressed in the manner shown in Fig. 2 so that each skirt 11 of the piston sleeve is pressed against the wall of the cylinder 12 with a definite pressure resulting from such flexing. As shown in Fig. 1 the piston assembly provides, in effect, a yieldable or resilient piston surface of

concave shape, the outer edges of which are compressed when placed in a cylinder.

The piston sleeve is normally somewhat smaller in diameter than the piston body so that it is necessary to stretch the sleeve in applying it to the body. The resulting binding of the sleeve on the piston cooperates with the tongue and groove construction to permanently hold the sleeve in place during operation. The beveled piston surfaces flex the edges of the sleeve outwardly so that the sleeve is normally of substantially concave shape resulting in such edges being pressed against the wall of an associated cylinder as a result of the flexure thereof when the piston assembly is positioned therein. It will be apparent that the ends of the sleeve will bear against the cylinder wall throughout the useful life of the sleeve, the flexure of the sleeve causing the edges to be held against the cylinder wall even after considerable wear of the edges has occurred, and it will also be apparent that this is accomplished without the introduction of any great pressure of the sleeve on the cylinder wall with the relatively great friction that would result.

Although I have described one specific form of piston in more or less detail, it will be apparent that various changes, additions, omissions and substitutions can be made therein without departing from the spirit of this invention or the scope of the appended claims.

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

1. A piston having in combination a body portion provided with a plurality of circumferentially arranged grooves, and a resilient sleeve adapted to be stretched over said body portion and having tongues fitting in said grooves, said body portion having at each end a beveled surface for flexing the ends of said sleeve so as to cause them to press against an associated cylinder wall.

2. A piston having in combination a body portion having a beveled end and a resilient sleeve stretched over said body portion and provided with a tongue engaging said beveled surface and pressed outwardly thereby so as to flex the associated end of said sleeve outwardly.

3. A piston having a circumferential tongue and a resilient sleeve covering said piston and provided with a groove of different cross section from the cross sectional shape of said tongue for cooperating therewith to flex the associated portion of said sleeve outwardly.

4. A piston comprising in combination a body portion having a beveled end, and a removable sleeve of resilient material mounted on the body portion, said sleeve having a thickened skirt portion engaged by said bevel of the piston, said skirt portion being thereby flared outwardly.

5. A piston having in combination a body portion and a removable sleeve of resilient material mounted on the body portion, said sleeve having a thickened skirt extending beyond the body portion with an inwardly facing shoulder within the sleeve engaging the body portion to flare the thickened skirt.

In testimony whereof, I have hereunto subscribed my name this 11th day of February, 1929.

JOHN M. SHIMER.