March 30, 1926. 1,579,127

E. E. MILLER

EXPANSIBLE PACKER FOR PLUNGERS

Filed June 12, 1925

Fig. 1.

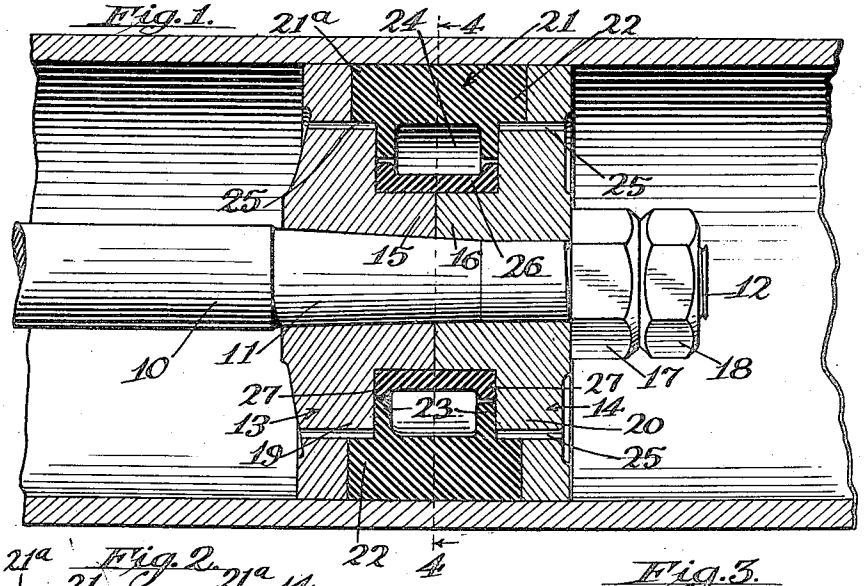


Fig. 2.

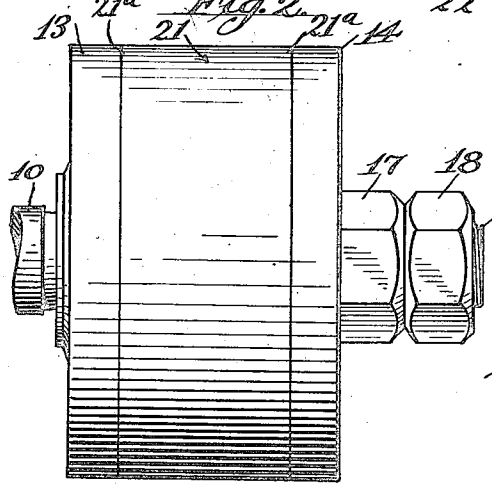


Fig. 3.

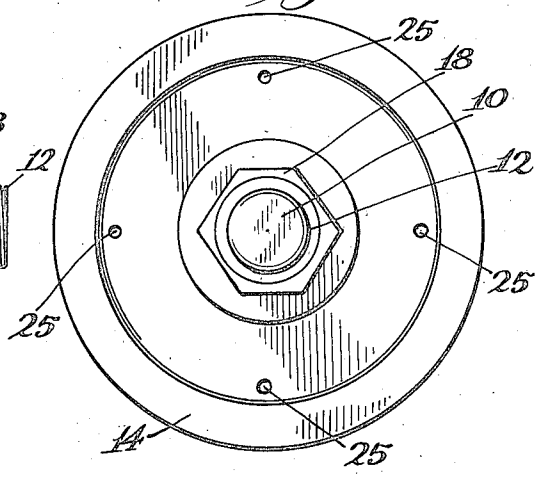


Fig. 4.

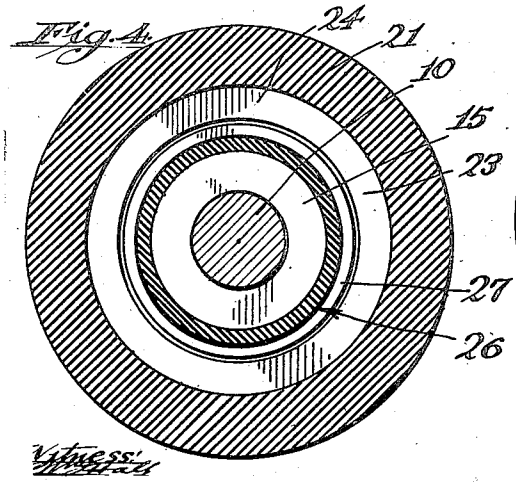


Fig. 5.

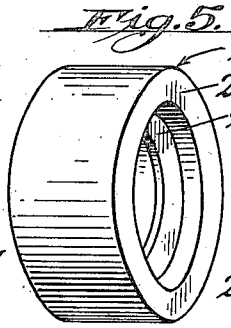
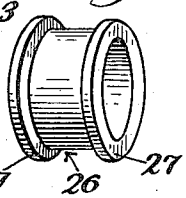


Fig. 6.



Witness:

Inventor:
Erwin E. Miller.
By Hazard and Miller
Attorneys.

Patented Mar. 30, 1926. 1,579,127

UNITED STATES PATENT OFFICE.

ERWIN E. MILLER, OF FULLERTON, CALIFORNIA.

EXPANSIBLE PACKER FOR PLUNGERS.

Application filed June 12, 1925. Serial No. 36,671.

To all whom it may concern:

Be it known that I, ERWIN E. MILLER, a citizen of the United States, residing at Fullerton, in the county of Orange and State of California, have invented new and useful Improvements in Expansible Packers for Plungers, of which the following is a specification.

This invention relates to improvements in plungers for pumps and the like, which employ expansible packing.

Some difficulty has been heretofore experienced in preventing leakage between the heads of the plunger. The plungers of the improved construction are primarily designed to be used upon mud pumps and the like, although they may be employed upon other constructions as well. In using the plungers on mud pumps, fluid is pumped containing sand and grit, and the fluid is pumped under a comparatively high pressure. If any leakage occurs between the heads, it is but a matter of an extremely short time before the fluid carrying the grit and sand cuts away portions of the plunger rod and the heads, thus requiring replacement.

It is therefore an object of the invention to prevent leakage between the plunger heads by providing an improved sealing ring.

Another difficulty encountered in pump plungers of this type is that the outer edges of the expansible packing become worn and chewed up, and as soon as they are slightly damaged require replacement. The cause of this is that the fluid pressure which expands the expansible packing is most effective at the center of the packing and will not efficiently cause the expansible packing to bear against the pump barrel at its outer edges where most of the wear takes place.

Another object of the invention is to provide a pump plunger of an improved construction, which will effectively cause the outer edges of the expansible packing to be urged against the interior surfaces of the pump barrel by the fluid pressure.

A further object of the invention is to provide an improved plunger head on which the improved construction can be embodied.

With the foregoing and other objects in view which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a vertical section through the barrel and through the improved plunger therein,

Fig. 2 is a side elevation of the plunger,

Fig. 3 is an end elevation of the plunger,

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 1,

Fig. 5 is a perspective view of the improved expansible packing, and

Fig. 6 is a perspective view of the sealing ring.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the improved plunger consists of a plunger rod 10, tapered at 11 and provided with a threaded cylindrical portion 12. On the plunger rod there are positioned two heads 13 and 14, which have projecting hubs 15 and 16 respectively which abut each other. The heads are maintained upon the plunger rod with their hubs 15 and 16 abutting by means of a nut 17 and a lock nut 18. On the opposed faces of the heads 13 and 14 there are formed annular shoulders 19 and 20. The expansible packing 21, which is preferably formed of soft flexible rubber or of an equivalent material, is in the form of a ring, which has portions 22 at its sides which are engageable upon the shoulders 19 and 20. The packing 21 is provided with inwardly extending flanges 23 which are arranged inwardly from the side faces of the expansible packing and define a recess 24. The inwardly extending flanges 23 bear against the opposed faces of the heads 13 and 14 and serve as check valves for ports or apertures 25. These ports are arranged longitudinally through the heads 13 and 14 and terminate upon the shoulders 19 and 20, so that the fluid pressure within the pump barrel can be admitted therethrough to a location between the portions 22 and the shoulders 19 and 20. About the abutting hubs 15 and 16 there is positioned a sealing ring 26 which has outwardly extending flanges 27 bearing against the opposed faces of the heads 13 and 14.

The advantages of the improved construction are as follows: When the recess 24 is filled with the fluid under pressure so as to expand the expansible packing 21, any leakage between the abutting surfaces of the hubs 15 and 16 is effectively pre-

vented by the sealing ring 26. In this manner there can be no leakage between the heads, which if it once started would quickly cut away the heads and require replacement of the plunger parts. Upon the reciprocation of the plunger, fluid pressure within the barrel is admitted through the ports or apertures 25, and if the fluid pressure is greater than the fluid pressure within the recess 24, the fluid will escape past the flanges 23 to fill the recess and cause the expansible packing 21 to be expanded. After the pump has been operated a sufficient length of time to cause the pressure within the recess 24 to be substantially equal to the pressure within the pump barrel, no further fluid escapes past the flanges 23 from the bores 25 into the recess 24 except that which is occasioned by the wear of the packing. In such instances the pressure upon the reciprocation of the plunger is supplied between the shoulders 19 and 20 and the portions 22 on the expansible packing 21, thus forcing the portions 22 against the interior surface of the pump barrel. This is an important feature of the construction for the reason that the outer edges 21[a] of the expansible packing are those edges which become chipped or chewed up, and the pressure within the recess 24 is not effective to urge these edges against the interior surface of the pump barrel to take up on the wear. In this manner the ports 25 being located upon the shoulders 19 and 20 cause the expansible packing 21 to be expanded or urged into expanded position with a considerable force near its outer edges where such expansion is most needed. The flanges 27 on the sealing ring 26 bear against the opposed faces on the heads 13 and 14 when the recess 24 is filled with fluid so that escape of fluid between the sealing ring and the heads or hubs is thus effectively prevented. The flanges 27 are not absolutely necessary but are preferably employed for this purpose.

From the above it will be appreciated that an improved plunger construction is provided having an expansible packing which is properly expanded at its edges where expansion is most required, and which effectively prevents leakage between the plunger heads.

It will be understood that various changes in the detail of construction may be made without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A plunger for pumps and the like comprising a plunger rod, means providing heads upon the plunger rod having annular shoulders upon their opposed faces, and an expansible packing loosely mounted between the heads about the shoulders, there being ports formed in the heads terminating upon the shoulders whereby upon reciprocation of the plunger rod, fluid may enter said ports and be discharged between the packing and the shoulders to expand the packing.

2. A plunger for pumps and the like comprising a plunger rod, means providing heads upon the plunger rod having annular shoulders upon their opposed faces, and an expansible packing loosely mounted between the heads about the shoulders, there being ports formed in the heads terminating in grooves upon the shoulders whereby upon reciprocation of the plunger rod, fluid may enter said ports and be discharged between the packing and the shoulders to expand the packing.

3. A plunger head having an annular shoulder formed on one side face thereof and ports formed in the head terminating in grooves upon the shoulder.

4. A plunger for pumps and the like comprising a plunger rod, means providing two heads upon the plunger rod, means providing spaced shoulders upon the opposed faces of the heads, a single packing ring disposed between said heads and having portions engageable upon the shoulders, and spaced portions disposed between them, and means for admitting fluid pressure between the shoulders and the packing ring to expand the ring.

5. A pump plunger comprising a plunger rod, two heads mounted upon said plunger rod having abutting hubs and faces which are in spaced relation to each other, means providing annular shoulders upon said faces, a sealing ring fitting around the hubs, a packing ring having portions resting upon said shoulders and having inwardly extending flanges bearing against the faces of said heads, and means providing ports through said heads opposite said flanges whereby fluid pressure may enter between the packing and the sealing ring to expand the packing and force the sealing ring to fit snugly around said hubs.

6. A pump plunger comprising a plunger rod, two heads mounted upon the plunger rod, a sealing ring disposed between the heads for preventing leakage therebetween, an expansible packing disposed between the heads about the sealing ring, and means for admitting fluid pressure between the packing and sealing ring.

7. A pump plunger comprising a plunger rod, two heads having abutting hubs mounted upon the plunger rod, a sealing ring disposed about the hubs for preventing leakage therebetween, an expansible packing arranged between the heads, and means for admitting fluid pressure between the packing and sealing ring.

8. A pump plunger comprising a plunger rod, two heads having abutting hubs

mounted upon the plunger rod, a sealing ring disposed about the hubs for preventing leakage therebetween, an expansible packing arranged between the heads having portions in spaced relation to the sealing ring, and means for admitting fluid to the space between the sealing ring and the expansible packing.

9. A pump plunger comprising a plunger rod, two heads mounted upon the plunger rod, a sealing ring disposed between the heads for preventing leakage between the heads, an expansible packing disposed between the heads about the sealing ring, said packing having inwardly extending flanges bearing upon the opposed faces of the heads, and means for admitting fluid pressure to the space between the flanges on the packing.

10. A pump plunger comprising a plunger rod having two heads mounted thereon, a sealing ring disposed between the heads, said sealing ring having outwardly extending flanges which bear against the opposed faces of the heads, and an expansible packing disposed between the heads.

11. A pump plunger comprising a plunger rod, heads mounted upon the plunger rod having abutting hubs, a sealing ring disposed about the hubs for preventing leakage therebetween, said sealing ring having outwardly extending flanges bearing against the opposed faces of the heads, and an expansible packing disposed between the heads having inwardly extending flanges bearing against the opposed faces of the heads.

12. A plunger for pumps and the like comprising a plunger rod, heads mounted upon the plunger rod having abutting hubs, means providing annular shoulders upon the opposed faces of the heads, an expansible packing disposed between the heads having portions engageable upon the shoulders, said packing having inwardly extending flanges bearing upon the opposed faces of the heads, and means for supplying fluid pressure between the packing and the shoulders to expand the packing.

13. A plunger for pumps and the like comprising a plunger rod, heads mounted upon the plunger rod having abutting hubs, means providing annular shoulders upon the opposed faces of the heads, an expansible packing disposed between the heads having portions engageable upon the shoulders, said packing having inwardly extending flanges bearing upon the opposed faces of the heads, means for supplying fluid pressure between the packing and the shoulders to expand the packing and a sealing ring disposed about the hubs for preventing leakage therebetween.

In testimony whereof I have signed my name to this specificaton.

ERWIN E. MILLER.