

[54] WEDGE LOCK HYDRAULIC CYLINDER HEAD

3,722,374 6/1971 Densmore..... 92/165 R

[75] Inventor: Salvatore R. Agostino, Jr., Setauket, N.Y.

Primary Examiner—Samuel B. Rothberg
Attorney, Agent, or Firm—Stevens, Davis, Miller & Mosher

[73] Assignee: Edward D. Meyer, Nassau Point, N.Y.

[22] Filed: Mar. 27, 1973

[21] Appl. No.: 345,367

[57] ABSTRACT

[52] U.S. Cl..... 277/187, 277/136, 92/165 R

[51] Int. Cl..... F16j 15/00

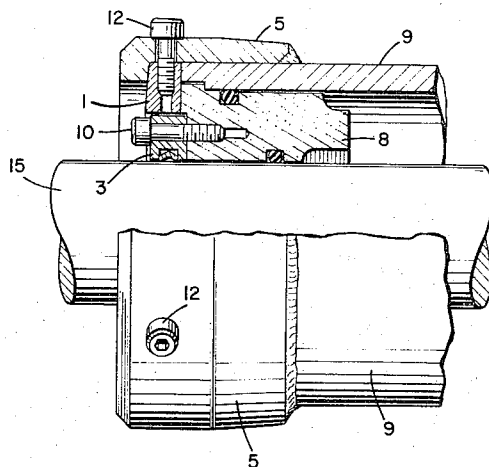
[58] Field of Search 277/136, 137, 187, 189, 277/11; 92/165 R, 168

A wedge-shaped locking means for a hydraulic cylinder head is disclosed. The packing head is firmly held in place via the locking means located between a collar on the cylinder tube and retaining means placed adjacent the locking means and the cylinder rod.

[56] References Cited
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6 Claims, 4 Drawing Figures

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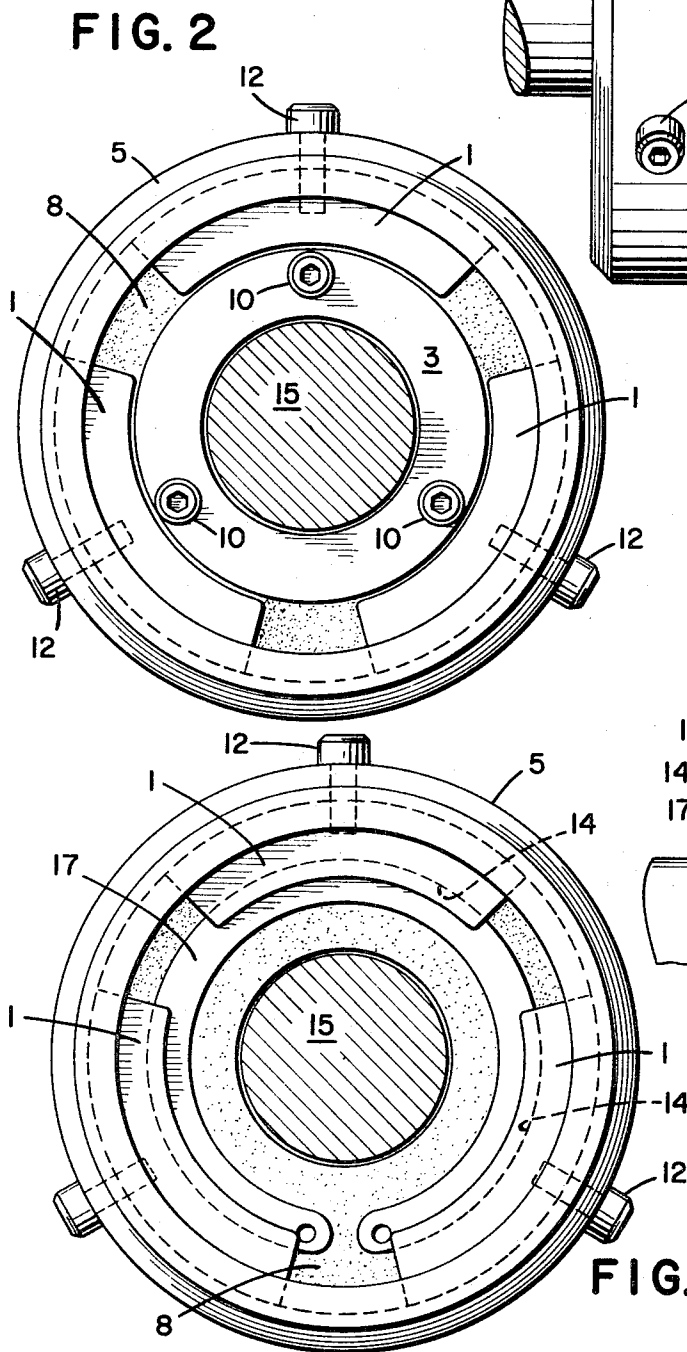
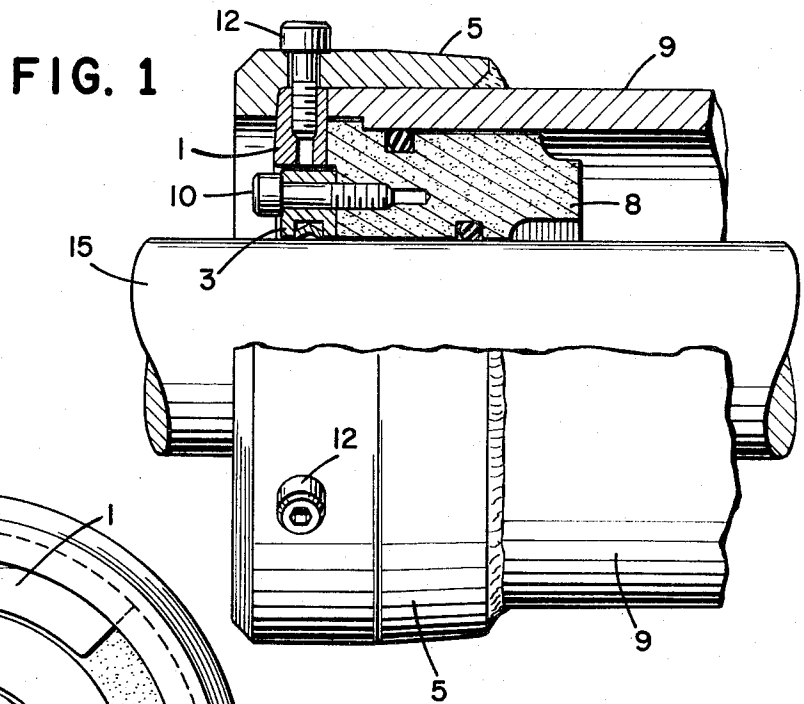


FIG. 4

WEDGE LOCK HYDRAULIC CYLINDER HEAD

This invention relates to a cylinder head with locking means. More particularly, it relates to a hydraulic cylinder head with wedge-shaped locking members characterized by high strength, simplicity of design and ease of repair.

Locking means previously used for hydraulic cylinder heads in order to hold the packing in place have included a cover plate bolted to the cylinder tube designed to prevent displacement of the packing head during operation of the cylinder. It has been found, however, to break down from the high degree of tension exerted thereupon during operation. A more common locking means is a cap which screws down over the cylinder to hold the packing head into place. Of course, this cap is subjected to a high degree of lateral pressure during actual operation which in turn causes the threads to be stripped and creates a situation wherein the packing can be literally blown out of the cylinder. The present invention is directed to a locking mechanism on a hydraulic cylinder head which will overcome the problems of the prior art devices.

It is an object of the invention to provide locking means for hydraulic cylinder heads which can be easily installed.

It is a further object of the present invention to provide locking means for hydraulic cylinder heads which will assure lengthy operation of the hydraulic cylinder head and an ease of repair.

The invention generally concerns a hydraulic cylinder head having a plurality of wedge-shaped spaced locking members placed between a collar on the hydraulic cylinder tube and a retaining means which is located between the cylinder rod and the wedge-shaped locking members.

The present invention has been found to be very effective for operating under high pressure conditions as it does not wear out and more importantly from a viewpoint of safety, it will not blow out. Due to the interaction of one embodiment of the retaining means discussed herein below and the locking members, a seal will be formed around the packing head and the hydraulic cylinder.

If it becomes necessary to replace any worn seals or cylinder rods, the operation can be readily undertaken by removing the locking members and the retaining means with simple hand tools.

The invention is more accurately described by reference to the drawings.

FIG. 1 is a side view of the hydraulic cylinder head with a cut-away view of the wedge lock hydraulic cylinder.

FIG. 2 is a front view of the hydraulic cylinder head of FIG. 1.

FIG. 3 is a side view of the hydraulic cylinder head of the present invention with a cut-away view of the wedge lock hydraulic cylinder head having a snap ring as a back-up safety feature for the wedge lock.

FIG. 4 is a front view of FIG. 3.

As shown in FIG. 1, a collar 5 is permanently attached to the cylinder tube 9 in order to receive the locking rings 1 which are held in place by bolts 12 as a further safety measure.

The primary function of bolts 12 is to pull the wedge-shaped lock members into place, in the space created between collar 5 and the cylinder tube 9. It is, of

course, important to attach the collar to the cylinder tube in such a fashion that it is permanent, preferably by welding, and so spaced as to insure a tight fit between the wedge lock and its reception area. The locking rings are preferably wedge-shaped with a 5° taper on the collar side and a thickness of five-eighths inch measured at the top of the wedge lock. However, the locking ring can be maintained in the collar holding the packing head 8 in place through the use of a retainer ring 3. This retainer ring can also be bolted into place with bolts 10 which are also secured inside packing 8.

As mentioned, the wedge-shaped locking members are held in place by a flange on the collar to prohibit movement in a lateral direction during operation of the cylinder rod. The locking members are designed to wedge tightly into place to eliminate pressure upon the bolts which are placed within the locking members.

The locking rings are preferably segmented and spaced as shown in FIG. 2. Three tapered wedge locking rings, one each have a 90° arc, are spaced symmetrically along the collar. Other embodiments, of course, are readily contemplated.

The number of wedge locks employed can vary but three each with a 90° arc are preferred. Two, four, five and six wedge locking rings are also contemplated but as the number of rings increases, there is an accompanying increase in the effort involved when replacement or repair is necessary.

In the hydraulic cylinder head, the wedge locking rings can be easily removed by removing the retainer ring and the wedge locking ring bolts. A sharp blow is then struck to the outside of the collar permitting removal of the wedge locking rings.

FIG. 3 shows another embodiment of the present invention wherein the retaining means is a snap ring 17 which is a flexible, strong ring which can be snapped into place into a groove 14 in the wedge-shaped locking rings preferably located at a distance one-third of the way in toward the packing. This snap ring functions as a safety device for holding the locking rings into place. Due to the fit between the locking rings and the cylinder head, the packing is held securely in place during lateral movement of cylinder rod 15 during operation.

FIG. 4 is a front view of the wedge-shaped hydraulic cylinder head with a snap ring retaining means 17 in place.

Having described the hydraulic cylinder head in detail, it is apparent that other modifications can be made without changing the scope of the contemplated invention as set out in the appended claims.

What is claimed is:

1. A hydraulic cylinder head with a locking means comprising
 - a hydraulic cylinder tube,
 - a collar on said hydraulic cylinder tube,
 - a cylinder rod located within said cylinder tube,
 - a solid packing around said cylinder rod and within said cylinder tube, and
 - a plurality of wedge-shaped spaced locking members placed between said collar and retaining means, said retaining means being located between said wedge-shaped locking means and said cylinder rod.

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2. The hydraulic cylinder head of claim 1, wherein said collar has a portion thereof overlapping said cylinder tube.

3. The hydraulic cylinder head of claim 1, wherein said retaining means is a retaining ring.

4. The hydraulic cylinder head of claim 1, wherein said locking members are three 90° wedges symmetri-

cally spaced around said collar.

5. The hydraulic cylinder head of claim 1, wherein said retaining means is a snap ring.

6. The hydraulic cylinder head of claim 1, wherein said locking members are secured to said collar with bolts.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,847,404
DATED : November 12, 1974
INVENTOR(S) : Salvatore R. Agostino, Jr.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

The assignment designation should read

-- 10% assignment to Edward D. Meyer,
Nassau Point, New York --.

Signed and Sealed this
twenty-second Day of July 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

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