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G. R. LIVERGOOD

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PACKING FOR RODS AND THE LIKE

Filed July 29, 1925

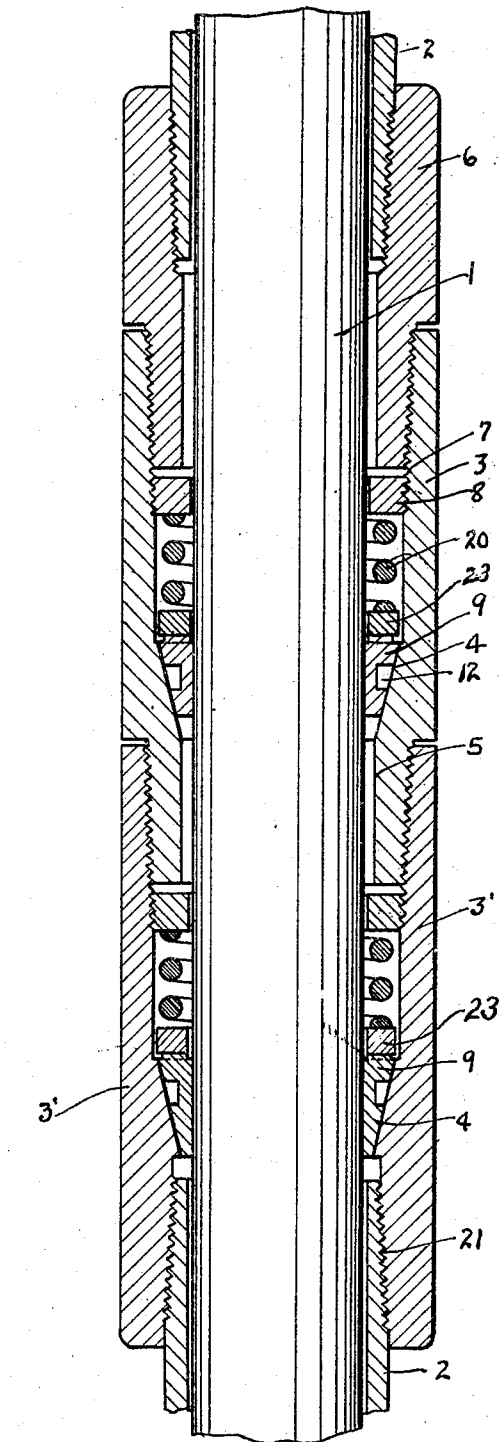


Fig. 1.

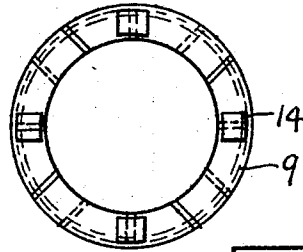


Fig. 2.

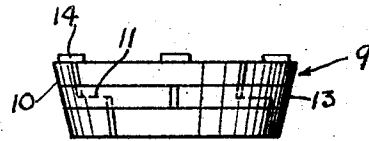


Fig. 3.

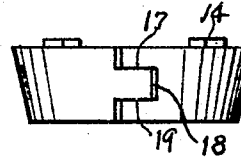


Fig. 4.

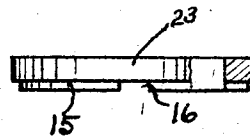


Fig. 5.

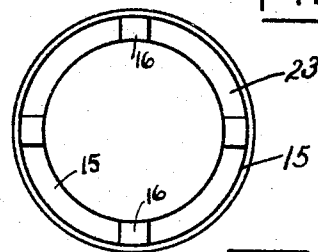


Fig. 6.

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UNITED STATES PATENT OFFICE

GERALD R. LIVERGOOD, OF HOUSTON, TEXAS, ASSIGNOR OF ONE-FOURTH TO W. L. PEARSON, OF HARRIS COUNTY, TEXAS; MARIE E. LIVERGOOD ADMINISTRATRIX OF GERALD R. LIVERGOOD, DECEASED

PACKING FOR RODS AND THE LIKE

Application filed July 29, 1925. Serial No. 46,320.

My invention relates to a metallic packing for use in preserving a fluid-tight closure about a rod or shaft so as to prevent leakage around the moving part.

It is an object of the invention to provide a packing that will withstand high pressures without injury, and which will not become jammed or "frozen" to its seat.

It is further desired that the packing be able to withstand heat, when necessary, and to be automatically adjustable to take up for wear. The objects also include the making of the packing in units or sections adapted to be placed at intervals along the rod, wherever desired.

The invention includes the particular construction and arrangement of parts which will be hereafter more particularly described and set forth.

Referring to the drawings herewith for a more particular description of the invention, Fig. 1 is a central longitudinal section through a packing device embodying my invention, the rod or shaft being shown in elevation. Fig. 2 is a top plan view of the sectional packing ring. Fig. 3 is a side elevation thereof. Fig. 4 is a side elevation of a slightly different embodiment of the packing ring. Fig. 5 is a side view partly in section of the ring employed to hold the sections of the ring in position, and Fig. 6 is a bottom plan view of the ring shown in Fig. 5. Like numerals of reference are employed to designate like parts in all the views.

The packing which I have devised may be employed to preserve a fluid-tight closure about any type of moving rod or shaft. It is also designed to be used in pumping to preserve the fit between the working barrel and the plunger of the pump. In the drawing, I have shown the shaft or plunger 1 which it is understood may be a solid or tubular member, as occasion arises. The rod in this device is intended for reciprocation within the packing. The barrel 2 is packed about the rod 1 by means of the invention, which will now be described. A sleeve 3 is shaped to fit loosely about the moving member 1, and has formed therein a tapered seat

4. This seat is formed by the gradual thickening of the walls of the sleeve to a point spaced somewhat from the moving member, the interior face 5 below the seat being cylindrical and adapted to allow the passage of fluid. The upper end of the sleeve 3 is connected with the barrel 2 by means of a coupling 6. This is threaded internally at its upper end for engagement with the barrel 2, and the lower end is reduced in external diameter and threaded for engagement with the upper end of the sleeve 3, as shown in the drawing. The threaded portion 7 at the upper end of the sleeve is of sufficient length to allow the screwing therein below the coupling 6 of a ring 8, the purpose of which will be presently described.

The tapered seat 4 is adapted to receive the sectional packing ring 9, the construction of which is shown best in Figs. 2 to 4 inclusive. The ring is tapered on its outer face, as shown at 10, to fit within the tapered seat 4 in the sleeve. It is divided longitudinally into a plurality of sections, and I have shown four such sections. In Figs. 2 and 3, the line of division between the sections is offset between the upper and lower ends of the ring to provide a horizontal portion 11, the faces of which are slidable upon each other but which prevent the passage of fluid vertically past the ring. The ring is provided midway of its ends with a groove, or channel, 12 to receive an auxiliary sectional ring 13. Said ring 13 fits within said groove and is tapered on its outer face to conform to the taper of the ring 9. It is also divided into sections but is placed upon the ring 9 so that the division line between the sections will be offset, or staggered, relative to the division lines between the sections of the ring 9. This will assist, therefore, in preventing the passage of fluid past the ring.

The sections of the ring are adapted to be held against relative circumferential movement by means of a ring 23, which I will call the radius ring. The ring 9 has on its upper face teeth, or lugs, 14; one on each of the four sections of the ring. The ring 23 has a downwardly extending boss 15 which has spaced recesses, or grooves, 16 therein to re-

ceive the teeth 14 upon the ring 9. The recesses 16 allow free radial movement of the sections of the ring 9 toward, or away, from the moving member 1, but serve to prevent relative movement of the sections in a lateral direction. In this way, the sections of the ring 9, which may be spaced slightly apart, will be held in uniformly spaced relation as is desirable.

The ring 9 may be cut longitudinally into sections by a double offset line, as shown in Fig. 4, that is, the line of division between the adjacent sections will be offset laterally at 17, and then vertically at 18, and horizontally again at 19. This provides two points of sliding fit between the sections at 17 and 19, which will effectively prevent the passage of fluid longitudinally in the ring, and when the ring is thus divided, the auxiliary ring 23 may be omitted, as shown.

In holding the packing in position so that it will effectively seal the space about the moving member 1, I provide a spring 20, the upper end of which bears against the ring 8 and the lower end of which bears against the ring 13. The spring is under compression and hence holds the packing ring 9 resiliently in its seat at all time. The tension upon the spring may be varied through the adjustment of the ring 8 in an obvious manner.

The packing of this nature may be arranged in units so that any desired number of packing rings may be employed. In Fig. 1, I have shown but two of these units, although it is to be understood that one, or several of these rings may be used, as desired, and as found necessary under the particular conditions in which the packing is used. In the drawings, I have shown the lower section 3', having its lower end below the seat 4, as being threaded internally at 21 to engage with the end of the adjacent section of the barrel 2.

The packing constructed in the manner described is obviously easy to install and to remove or repair, as occasion may require. It may be made entirely of metal and resistant to heat and wear. The manner in which the packing rings are made sectional allows them to expand or contract about the moving member, and the use of the radius ring 13 holds the sections in proper position, so that the expansion and contraction will be uniform and even. The packing will thus serve its purpose of sealing the space outside the moving member for long periods of time without replacement. It is adapted to withstand high fluid pressures without injury and will seal the space about the member effectively, either under high or low pressures. The other advantages of the invention will be obvious to those skilled in the art.

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

1. A packing assembly comprising in co-

operation a rod, a sleeve about said rod, said sleeve being threaded internally and externally on opposite ends, a tapered seat within said sleeve, a sectional packing adapted to wedge in said seat and contract to engage said rod, a ring seated upon said packing, a coil spring urging said ring into engagement with said packing, and a retaining ring screwed into said sleeve to adjustably compress said spring.

2. A packing assembly comprising in cooperation a rod, a sleeve about said rod, said sleeve being threaded internally and externally on opposite ends, a tapered seat within said sleeve, a sectional packing adapted to wedge in said seat and contract to engage said rod, a ring seated upon said packing, a coil spring urging said ring into engagement with said packing, a retaining ring screwed into said sleeve to adjustably compress said spring, and a second sleeve arranged to be screwed into said first sleeve above said retaining ring.

3. In combination a reciprocating plunger, a barrel therefor made up of units, each comprising a tubular sleeve, a downwardly tapered seat therein spaced from said plunger, a sectional metallic packing ring in said seat and adapted to fit said plunger, a stop ring secured in said sleeve above said seat, a spring between said packing ring and said stop ring, and means to hold said packing resiliently on said plunger.

In testimony whereof I hereunto affix my signature this 23rd day of July, A. D. 1925.
GERALD R. LIVERGOOD.