Dec. 19, 1961 S. P. TSCHAPPAT 3,013,831

PACKING GLANDS

Filed June 14, 1957

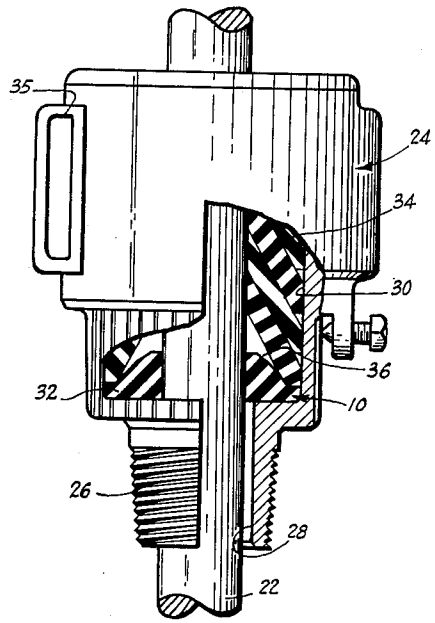


Fig. 1

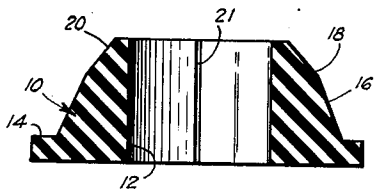


Fig. 2

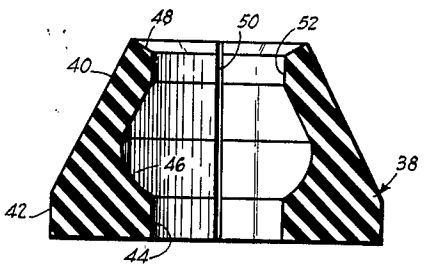


Fig. 3

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PACKING GLANDS

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This invention relates to improvements in packing glands and more particularly, but not by way of limitation, to a novel cone shaped packing gland member for utilization with stuffing boxes for oil well polished rods and the like.

As is well known in the oil industry, many of the producing oil wells are pumped by use of a rod type pump. The pumping unit is usually installed at the bottom of the well bore and is actuated by a string of rods extending downwardly from the surface of the ground. The uppermost rod which projects above the ground and from the well head is commonly called the polished rod. A stuffing box is ordinarily secured to the well head around the polished rod in order to prevent leakage of the pumped oil around the rod. The stuffing box is normally provided with a plurality of packing gland members therein disposed around the polished rod and in contact with the outer periphery thereof, as is well known in the art. During reciprocation of the polished rod, chips or small particles are often worn from the packing glands by the friction developed between the polished rod and the glands. These foreign particles tend to drop downwardly by gravity into the working parts of the pump and can cause serious damage thereto.

The present invention contemplates a novel cone shaped packing gland member so designed and constructed to divert any worn particles from their downward path through the well bore and preclude them from coming in contact with the pump and working parts thereof. The novel packing gland is adapted for disposition around the polished rod at a point below the packing gland members hereinbefore set forth. A tapered surface is provided on the outer periphery of the novel packing gland adjacent the polished rod in order to direct any worn particles from the upper packing glands outwardly away from the polished rod and adjacent the lower portion of the novel packing gland for precluding passage of the particles downwardly from the stuffing box. The novel packing gland is simple and durable and of an economical construction for greatly prolonging the life of the oil well pump and other working members.

It is an important object of this invention to provide a packing gland for an oil well stuffing box whereby the efficiency of the polished rod may be increased.

It is another object of this invention to provide a novel packing gland for an oil well stuffing box so designed and constructed to preclude worn particles from the gland from dropping downwardly out of the stuffing box and into the well bore, thereby enhancing the operation of the oil well pump.

It is another object of this invention to provide a novel packing gland for an oil well stuffing box which is simple and efficient in operation and durable and economical in construction.

Other objects and advantages of the invention will be evident from the following detailed description, read in conjunction with the accompanying drawings, which illustrate my invention.

In the drawings:

FIGURE 1 is a side elevational view partly in section of a stuffing box provided with a packing gland embodying the invention.

FIGURE 2 is a sectional elevational view of a packing gland embodying the invention.

FIGURE 3 is a sectional elevational view of a modified packing gland.

Referring to the drawings in detail, reference character **10** refers in general to a substantially cone shaped packing gland member preferably constructed of a suitable resilient material, such as rubber, neoprene, or the like, but not limited thereto. The packing member **10** is provided with an inner bore **12** of a diameter substantially the same as the outer diameter of an oil well polished rod for a purpose as will be hereinafter set forth. A circumferential flange **14** is provided at one end of the packing member **10** to provide a shoulder therearound. The outer periphery of the packing member **10** is tapered inwardly at **16** from the shoulder **14** upwardly to a point **18** spaced thereabove. The outer periphery of the gland **10** is tapered at **20** at a greater angle than the taper **16** and extends upwardly from the point **18** to the top of the packing gland.

The packing gland **10** is preferably provided with a longitudinal slit **21** in the wall thereof to facilitate disposition of the packing member around a polished rod **22** of an oil well stuffiing box generally indicated at **24**. The stuffing box **24** is normally provided with a reduced sleeve portion **26** having external threads thereon for securing the stuffing box to a well head (not shown). The diameter of the internal bore **28** is larger than the outer diameter of the polished rod **22** to provide for an unencumbered reciprocation of the polished rod therein. The stuffing box **24** is provided with an enlarged inner diameter **30** above the sleeve **26**, thereby forming an internal circumferential shoulder **32** adjacent the bore **28**. A plurality of packing members **34** are normally provided within the chamber **30** and disposed around the polished rod **22** for precluding leakage of fluid therearound as is well known in the industry. A packing gland follower member **35** is usually provided on the stuffing box **24** for exerting a pressure on the packing glands **34** to maintain an efficient seal between the rod **22** and the stuffing box **24**.

The packing member **10** is preferably disposed around the polished rod **22** in such a manner that the circumferential flange **14** rests on the internal shoulder **32** of the stuffing box **24** and bears against the larger diameter portion **30**. In this manner, the gland **10** is placed within the stuffing box enlarged portion or chamber **30** below the packing members **34** as hereinbefore set forth. The internal bore **12** of the member **10** fits snugly around the outer periphery of the polished rod **22** and functions as a wiping end for the rod to keep paraffin, corrosion, and other undesirable particles from collecting and adhering to the outer periphery of the polished rod. This maintains the outer periphery of the polished rod substantially clean at all times and prevents undue damage to the inner periphery of the packing members **34**, thereby greatly prolonging the life thereof. Similarly, any particles worn from the inner peripheries of the packing members **34** by the friction caused by the reciprocation of the polished rod **22** will be precluded from dropping downwardly around the polished rod by the contact of the bore **12** with the outer periphery of the polished rod. The angular or tapered portion **20** of the packing gland **10** will divert any worn particles radially outwardly and downwardly from the polished rod whereby they will be trapped in the annular chamber **36** formed between the lowermost of the packing rings **34** and the packing member **10** as clearly shown in FIG. 1. It will be apparent that a film of oil or lubricant will usually be present on the outer periphery of the polished rod since the rod is reciprocated in the oil in the well bore. A portion of the oil on the rod will tend to collect in the chamber **36** with the foreign particles. The lubricant or oil thus trapped will provide for further lubrication of the polished

rod during its reciprocal action and thereby facilitate the operation thereof.

Referring now to FIG. 3, a modified packing member 38 is shown therein. The member 38 is of a substantially conical configuration and is preferably constructed from a suitable resilient material, such as rubber, neoprene, or the like, but not limited thereto. The outer periphery of the packing gland 38 is tapered at 40 in an upwardly and inwardly direction and a substantially straight sided lower portion 42 is provided on the outer periphery of the member 38 for a purpose as will be hereinafter set forth. An internal bore 44 extends longitudinally throughout the length of the packing gland member 38 and is provided with an enlarged central portion 46 preferably of an arcuate configuration as clearly shown in FIG. 3. In this manner, an internal chamber is provided within the member 38. A counter-sunk portion 48 is provided within the member 38 at the uppermost end of the bore 44.

The packing gland 38 is preferably provided with a longitudinally extending slit 50 in the side wall thereof for facilitating the disposition of the gland 38 around the polished rod 22. The member 38 may be used in a manner as hereinbefore set forth in the preferred embodiment and is preferably disposed around the polished rod 22 on the shoulder 32 in such a manner that the straight sided portion 42 of the packing gland is adjacent the periphery of the chamber 30. The bore 44 functions to wipe the polished rod as hereinbefore set forth. However, the foreign particles worn from the packing members 34 by the reciprocation of the polished rod 22 tend to fall downwardly around the rod and are gathered in the counter-sunk portion 48. The reciprocation of the rod tends to move the worn particles downwardly and into the chamber 46 where they will accumulate without dropping further downwardly into the oil well pump (not shown). As hereinbefore set forth, a film of oil usually present in the outer periphery of the polished rod 22 will tend to leave a deposit in the chamber 46 with the accumulated worn particles. The lubricant trapped in the chamber 46 will increase the lubrication of the polished rod during its reciprocal action and thereby improve the operation thereof.

It will be apparent that the upper portion 52 of the longitudinal bore 44 is subjected to a radial pressure as applied to the upper packing glands 34 in order to maintain the portion 52 tightly engaged with the outer periphery of the polished rod 22. Thus, the portion 52 will be subject to wearing in the same manner as the upper glands 34, and will release minute foreign particles into the chamber 46 along with the worn particles from the upper packing members. However, there is substantially no radial pressure exerted on the bore 44 below the chamber 46. Thus, the bore 44 will move easily along

the outer periphery of the polished rod 22 with substantially no wear, thereby precluding the downward loss of the particles from the chamber 46, as well as precluding the wearing of the bore 44 adjacent the rod 22.

From the foregoing, it will be apparent that the present invention provides a novel cone shaped packing gland member particularly designed and constructed for use with an oil well stuffing box whereby worn particles of the upper packing gland members will be diverted and precluded from falling downwardly from the stuffing box into the working parts of the oil well pump therebelow. The novel packing gland member also functions as a wiper for cleaning the outer periphery of the polished rod and protecting the upper packing gland members from undue wear.

Changes may be made in the combination and arrangement of parts as heretofore set forth in the specification and shown in the drawings, it being understood that any modification in the precise embodiment of the invention may be made within the scope of the following claim without departing from the spirit of the invention.

I claim:

A packing gland comprising a substantially conical shaped rubber body portion, a slit portion provided in said body for facilitating disposition thereof around a polished rod, an elongated internal bore provided in the body and adapted for disposition adjacent the outer periphery of the polished rod for wiping said rod throughout the length of the bore during the reciprocation of the rod, a downwardly and outwardly directed tapered portion provided on the outer periphery of the body adjacent one end thereof for diverting foreign particles outwardly from the polished rod, and a second downwardly and outwardly directed tapered portion conterminous with and of different angularity than the first tapered portion, the lower portion of said body being provided with an outwardly extending shoulder for supporting an adjacent conical packing ring that cooperates with said body portion to provide a cavity therebetween for accumulation of the diverted foreign particles.

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