May 9, 1939. C. WIESSNER 2,157,375

FACING TOOL FOR STUFFING BOXES AND THE LIKE

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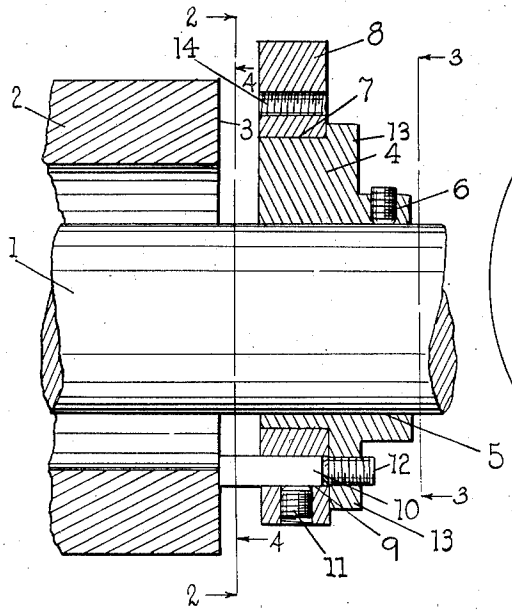


Fig. 1.

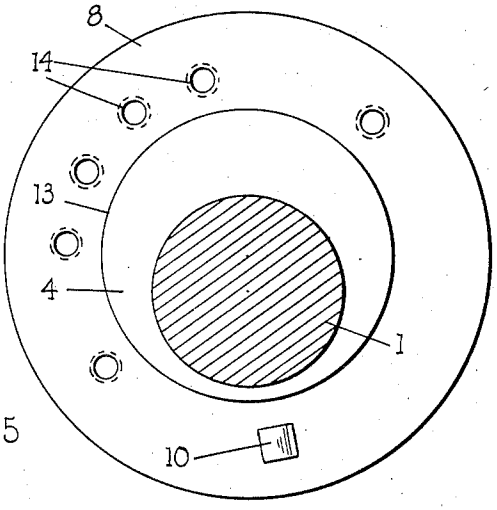


Fig. 2.

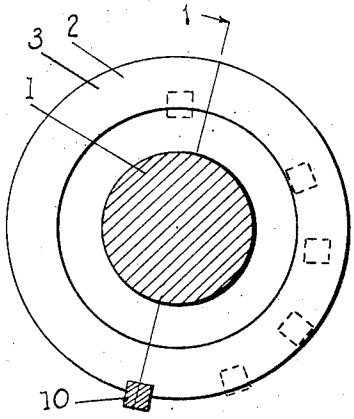


Fig. 4.

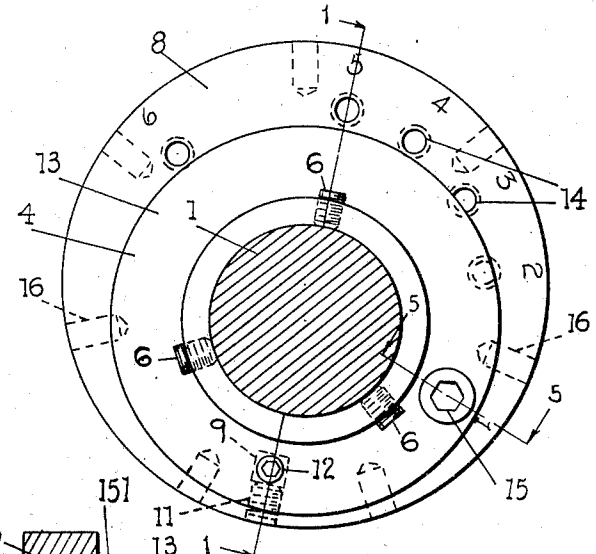


Fig. 3.

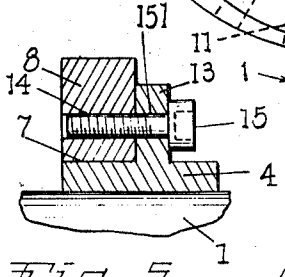


Fig. 5.

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FACING TOOL FOR STUFFING BOXES AND THE LIKE

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12 Claims. (Cl. 82—1)

This invention relates to improvements in facing tools for stuffing boxes and the like.

The main objects of my invention are:

First, to provide a novel and improved tool of simplified construction adapted to be clamped on a pump shaft or other shaft and rotatable therewith to perform a face turning operation on the ends of a stuffing box or other surrounding member.

Second, to provide a tool of the type described having relatively few parts of simple construction whereby a number of successive concentric cuts may be taken to face the end of a stuffing box or other like surface.

Third, to provide a device of the type described which, due to its simplicity, is capable of being accurately manipulated by unskilled persons.

Further objects relating to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure embodying the features of my invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a fragmentary view in section on line 1—1 of Figs. 3 and 4, the shaft being in full lines.

Fig. 2 is a view in transverse section on line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2, looking in the opposite direction and in section on line 3—3 of Fig. 1.

Fig. 4 is a view similar to Figs. 2 and 3, being in smaller scale and in section on line 4—4 of Fig. 1.

Fig. 5 is a fragmentary detail view in section on line 5—5 of Fig. 3.

In the drawing, the reference numeral 1 indicates a shaft for a pump or other similar rotary mechanism, protruding from a stuffing box the end of which is indicated by the reference numeral 2. The tool of the present invention is a facing tool for machining the end 3 of the said stuffing box whereby a smooth facing surface will be provided thereon to cooperate with a suitable shaft packing or end seal parts. It is desirable to prepare such stuffing boxes to receive shaft packings without requiring a time consuming and arduous removal of the pump from its foundation, and the present invention provides a small compact tool of simple construction which may be readily mounted on the shaft of the said pump or other mechanism and, utilizing that shaft as a center and driving means, may be used to machine the end face of the stuffing box in a manner to be more particularly described.

The reference numeral 4 in general indicates a collar having an opening 5 therein adapted to receive the shaft 1, the collar being clamped to the shaft by a number of set screws 6. Collar 4 on one side has a circular land 7 eccentric of opening 5 slidably receiving a cutter holder 8, said holder being the tool carrying element of the two-part device comprising my invention and of which the other element is collar 4.

The annular cutter holder 8 has a square opening 9 therethrough extending parallel to the axis of the holder and shaft and constituting a cutter receiving seat. A suitable machine or lathe tool or cutter 10 is placed in opening 9, being secured therein by a radial set screw 11 and being adjusted lengthwise by means of an axially extending feed screw 12 carried by the circular flange 13 of the collar 4. The flange serves as a stop to limit lateral movement and sustain the thrust of the cutter holder.

Cutter holder 8 is by the construction above described adapted to be rotated on eccentric land 7 whereby the cutter seat 9 and cutter 10 on the cutter holder will be brought to positions at varying distances from the center of rotation of the tool as a whole, that center being the axis of shaft 1. Such being the case, if the holder 8 is clamped relative to the collar 4, by turning the said holder and collar as a unit with shaft 1, it will be apparent that cutter 10 will describe a circular path and perform a circular cutting operation on face 3. To selectively clamp holder 8 to collar 4, I utilize a number of threaded apertures 14 in the holder extending parallel to shaft 1, the same being concentrically arranged relative to the holder and being engageable with a bolt 15 extending axially through an opening 151 in flange 13 of collar 4. Accordingly, it will be seen that with one of the openings 14, designated "1" in Fig. 3, and opening 151 in alinement, and with bolt 15 threaded in the said alined openings, the cutter 10 will be operatively clamped relative to shaft 1 at a certain distance from the center of shaft 1. The tool is then rotated as a unit through the agency of a bar (not shown) engageable with capstan holes 16 in the periphery of holder 8 to describe a circular cutting stroke of cutter 10 relative to face 3.

When a cut is completed, bolt 15 is released and holder 8 rotated relative to the collar to bring another opening 14, designated by the indexing numeral "2" in Fig. 3, into alinement with opening 151 and accordingly to shift the cutter

10 radially relative to shaft 1. The cutter holder and collar are then locked by the bolt and rotated as a unit to form another cut overlapping the first cut. The successive indexing holes designated by the numerals "3", "4", "5", and "6" are thereafter brought into alinement with and engaged by bolt 15 in a similar manner, or enough of them are engaged to make sufficient radially overlapping circular cuts to machine the entire face 3.

The feed screw 12 is employed merely to advance cutter 10 to adjust the depth of cut, after which the cutter is clamped by set screw 11 and the feed screw 12 backed away. Reference to Fig. 4 clarifies the manner in which the successive cuts are made. In that figure, the position of cutter 10 relative to the stuffing box face is indicated in section as viewed in Fig. 1, and the relative positions thereof when bolt 15 is engaged with successive threaded openings 14 is indicated in dotted lines. It is apparent that the entire surface of face 3 is thus accurately machined to a uniform depth. Obviously, the position of the cutter 10 need not be changed once it has been set by feed screw 12. The number of threaded openings 14 may be varied as desired so that less metal is removed on each cut and the thickness of the cut may be adjusted at will by manipulation of screws 11 and 12 as will be apparent.

My novel tool is characterized essentially by simplicity of construction and ease of operation. Furthermore it is not necessary to remove the pump from its foundation and take it to a suitable machine tool, such as a boring mill, which may possibly be located at a considerable distance from the place at which the pump is operating, in order to prepare the face of the stuffing box thereof for the reception of a shaft packing such as a mechanical seal. The operation of so preparing the face may be performed in a short space of time and by persons relatively unskilled in machining work.

I have illustrated and described my improvements in an embodiment which is very practical. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A tool for machining the face of a stuffing box or similar member, comprising a collar adapted to be clampingly engaged in mounted position with a shaft normally extending through said stuffing box, said collar having a land thereon eccentric of said shaft in mounted position, an annular tool holder surrounding and slidably associated with said land, said collar having a peripheral flange adjacent said land acting as a lateral stop for said tool holder, said tool holder having a cutter receiving opening therein and a plurality of threaded keeper openings disposed in an arc circumferentially of the tool holder, said flange having an opening adapted to be brought selectively into alinement with said keeper openings by rotation of the tool holder on said land, a bolt extending through said flange opening for selective engagement with one of said keeper openings, a cutter element in said cutter receiving opening, and a set screw for clamping the cutter in place, said cutter being shiftable to different positions radially of the shaft by shifting of the tool holder on the land whereby successive rotations of the shaft cause successive radially stepped and overlapping cuts to be made on the end face of the stuffing box by the cutter.

2. A tool for machining the face of a stuffing box or similar member, comprising a collar adapted to be clampingly engaged in mounted position with a shaft normally extending through said stuffing box, said collar having a land thereon eccentric of said shaft in mounted position, an annular tool holder surrounding said land, said tool holder having a cutter receiving opening therein and a plurality of threaded keeper openings disposed in an arc circumferentially of the tool holder, said collar having an opening adapted to be brought selectively into alinement with said keeper openings by rotation of the tool holder on said land, a bolt extending through said collar opening for selective engagement with one of said keeper openings, a cutter element in said cutter receiving opening, and a set screw for clamping the cutter in place, said cutter being shiftable to different positions radially of the shaft by shifting of the tool holder on the land whereby successive rotations of the shaft cause successive radially stepped and overlapping cuts to be made on the end face of the stuffing box by the cutter.

3. A tool for machining the face of a stuffing box or similar member, comprising a collar adapted to be clampingly engaged in mounted position with a shaft normally extending through said stuffing box, said collar having a land thereon eccentric of said shaft in mounted position, an annular tool holder surrounding said land, said tool holder having a cutter receiving opening therein and a plurality of keeper openings disposed in an arc circumferentially of the tool holder, said collar having an opening adapted to be brought selectively into alinement with said keeper openings by rotation of the tool holder on said land, means on said collar for selective engagement with one of said keeper openings, a cutter element in said cutter receiving opening, and a set screw for clamping the cutter in place, said cutter being shiftable to different positions radially of the shaft by shifting of the tool holder on the land whereby successive rotations of the shaft cause successive radially stepped and overlapping cuts to be made on the end face of the stuffing box by the cutter.

4. A tool for machining the face of a stuffing box or similar member, comprising a collar adapted to be clampingly engaged in mounted position with a shaft normally extending through said stuffing box, said collar having a land thereon eccentric of said shaft in mounted position, an annular tool holder surrounding said land, said tool holder having a plurality of keeper openings disposed in an arc circumferentially of the tool holder, said collar having an opening adapted to be brought selectively into alinement with said keeper openings by rotation of the tool holder on said land, means on said collar for selective engagement with one of said keeper openings, and a cutter element carried by said tool holder, said cutter being shiftable to different positions radially of the shaft by shifting of the tool holder on the land whereby successive rotations of the shaft cause successive radially stepped and overlapping cuts to be made on the end face of the stuffing box by the cutter.

5. A tool for machining the end face of a stuffing box or similar member, comprising a collar

having a shaft receiving opening and adapted to be clampingly engaged with a shaft normally extending through a stuffing box, an annular tool holder mounted on said collar eccentric of said opening, said tool holder carrying a cutting tool and having a plurality of keeper openings disposed circumferentially of the tool holder, said collar having an opening adapted to be brought selectively into alinement with said keeper openings by rotation of the tool holder on said collar, and means engaging said collar for selective engagement with said keeper openings, said cutter being shiftable to different positions radially of the shaft by said movement of the tool holder on the collar whereby upon rotation of the shaft successive radially stepped and overlapping cuts are made on the end face of the stuffing box by the cutter.

6. In a facing tool of the type described, a collar adapted to be mounted on a shaft, a cutter supporting element on said collar eccentric of said shaft in mounted position, a cutter carrying member on said eccentric element, means for securing said member on said element at a plurality of angular positions, a facing cutter carried by said member, means carried by said collar for initially adjusting said cutter in a direction parallel to the shaft into operative position for a cutting stroke, and means for securing said cutter in adjusted position on said member.

7. In a facing tool of the type described, a collar adapted to be mounted on a shaft, a cutter supporting element on said collar eccentric of said shaft in mounted position, a cutter carrying member on said eccentric element, means for securing said member on said element at a plurality of angular positions, and a facing cutter carried by said member, said cutter being adjustable in a direction parallel to the shaft for succeeding facing cuts.

8. In a facing tool for a stuffing box or similar member and adapted to be mounted on a shaft extending through the stuffing box or member, an annular member, means to secure said annular member on the shaft, said member having a surface eccentric of the axis of the shaft, a tool holder member slidably mounted on said surface, said annular member having a clamping opening and a bolt receivable thereby, said tool holder member having a plurality of threaded openings disposed circumferentially of the tool holder member and adapted to be selectively brought into alinement with said clamping opening for engagement by said bolt, a cutter carried by said tool holder member, and means for securing said cutter in operative position on said tool holder member.

9. In a facing tool for a stuffing box or similar member and adapted to be mounted on a shaft extending through the stuffing box or member, an annular member, means to secure said annular member on the shaft, said member having a surface eccentric of the axis of the shaft, and a tool holder member slidably mounted on said surface, said annular member having a clamping opening and a bolt receivable thereby, said tool holder member having a plurality of threaded openings disposed circumferentially of the tool holder member and adapted to be selectively brought into alinement with said clamping opening for engagement by said bolt.

10. A facing tool for a stuffing box or similar member and adapted to be mounted on a shaft extending therethrough comprising a collar means to removably secure the collar to shaft, an annular cutter holder eccentrically mounted on said collar, means for securing said cutter holder in adjusted positions on said collar, and a cutter carried by said cutter holder whereby rotative adjustment of the cutter holder will vary the radial distance of the cutter relative to the axis of the collar.

11. A facing tool of the class described for a shaft enclosing element having a shaft extending therethrough and rotatable relative thereto, comprising a member having provision for securing the same to the shaft and having a surface eccentric to its axis, a tool holder rotatably mounted on said surface, means for securing said tool holder in adjusted positions on said member, a cutter carried by said tool holder and disposed parallel to the axis of the shaft, and means for adjusting said cutter parallel to the axis and securing it in its adjusted position.

12. A facing tool of the class described for a shaft enclosing element having a shaft extending therethrough and rotatable relative thereto, comprising a member having provision for securing the same to the shaft and having a surface eccentric to its axis, a tool holder rotatably mounted on said surface, means for securing said tool holder in adjusted positions on said member, and a cutter carried by said tool holder for adjustment in a direction parallel to the axis of the shaft.

CHRISTOPHER WIESSNER.