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THREADED INSERT REMOVING AND APPLYING TOOL

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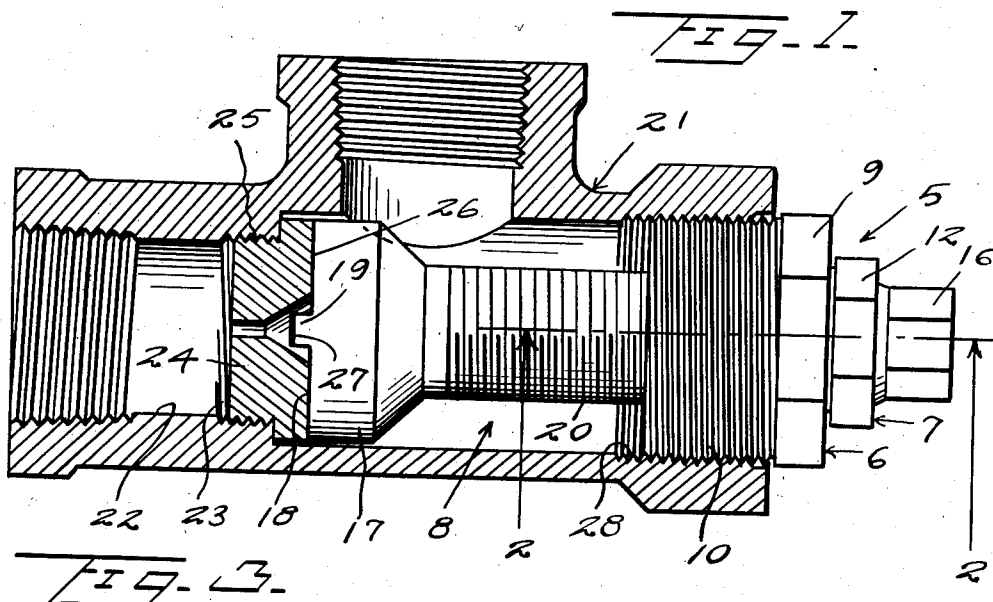


FIG. 3

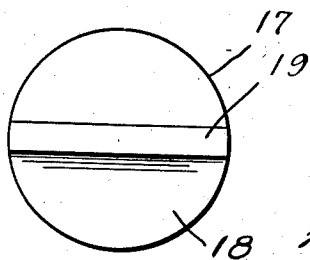


FIG. 2

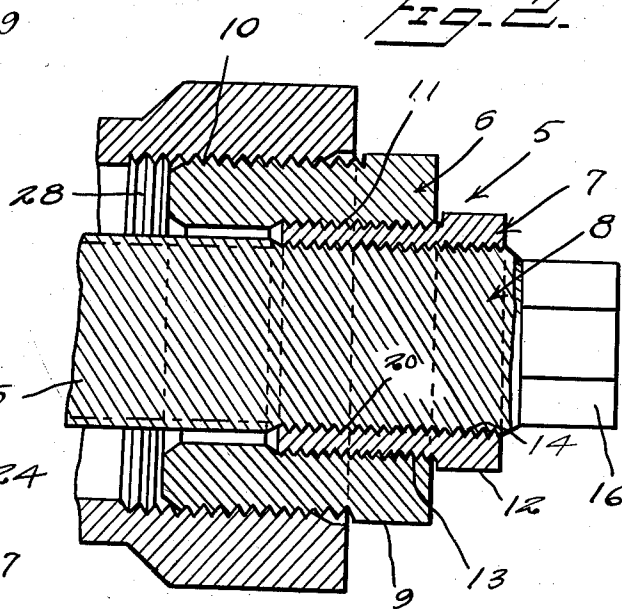
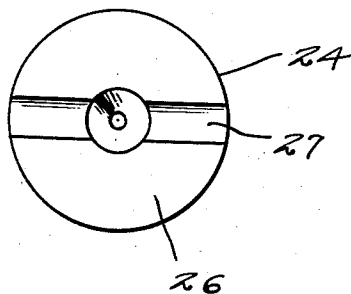


FIG. 4



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THREADED INSERT REMOVING AND APPLYING TOOL

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3 Claims. (Cl. 29—213)

This invention relates to a novel tool for effectively removing threaded inserts from surrounding body members without risk of damage to the body member or insert and is especially adapted for removing a threaded valve seat from a valve body without risk of the removing tool slipping out of engagement with the valve seat and scarring the internal threads of the valve body.

With the conventional method now employed for removing valve seats or other threaded inserts from bodies, the internal threads of bodies are frequently damaged to such an extent that replacement is required, which replacements are often very costly.

Accordingly, it is an object for the present invention to provide a threaded insert remover which will positively prevent damage to the body in which the insert is disposed due to the fact that the tool cannot slip out of engagement with the insert while removing or applying the insert.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a side elevational view of the assembled tool shown in an applied position, in engagement with a valve body and valve seat, which parts are shown in section;

Figure 2 is an enlarged fragmentary longitudinal sectional view taken substantially along a plane as indicated by the line 2—2 of Figure 1;

Figure 3 is an end elevational view of the bit or head of the tool and

Figure 4 is an end view in elevation of the valve seat.

Referring more specifically to the drawing, the threaded insert removing and applying tool in its entirety and comprising the invention is designated generally 5 and includes an outer sleeve, designated generally 6, an inner sleeve, designated generally 7, and an insert engaging member, designated generally 8.

The outer sleeve 6 has an exterior outer end portion which is formed with wrench lands 9 and the remainder of the exterior of the sleeve 6 is threaded from the wrench lands 9 to the inner end thereof to provide a threaded portion 10. The interior or bore of the sleeve 6 is internally threaded as seen at 11 from the outer end thereof preferably to its inner end.

The inner sleeve 7 is likewise provided at its outer end and externally thereof with wrench lands 12 and is externally threaded as seen at 13 from the wrench lands 12 to its inner end. The interior or bore of the inner sleeve 7 is internally threaded as seen at 14 from end to end thereof. The threaded portions 11, 13 and 14 correspond in pitch and the threaded portion 10 is ordinarily of a different pitch than the threaded portions 11, 13 and 14. However, as will become apparent, the threaded portion 10 could be of the same pitch as the threaded portions 11, 13 and 14.

The insert removing member 8 includes an elongated

stem 15 having a restricted outer end of non-circular cross section defining wrench lands 16. The stem 15 at its opposite inner end is provided with an enlargement forming a head or bit 17. Said bit or head 17 has an outer face 18 as best seen in Figure 3, which is provided with an outwardly projecting rib 19 which preferably extends diametrically thereacross. The stem 15 is externally threaded as seen at 20 from its restricted outer end to adjacent the bit 17.

To illustrate one preferred application and use of the tool 5, a conventional valve body 21 is illustrated having a restricted bore portion 22 adjacent to one end thereof, the inner end of which is internally threaded as seen at 23. A conventional valve seat 24 is provided with an externally threaded restricted end 25 which threadedly engages the threaded bore portion 23. The pitch of the thread 25 corresponds with pitch of the thread 20. The enlarged opposite end of the valve seat 24 has an outer face 26, as best seen in Figure 4, which is provided with a groove or kerf 27 extending diametrically thereacross. The end of the valve body 21, located remote from the threaded bore portion 23, has an internally threaded outwardly opening bore portion 28. The threads of the sleeve portion 10 are cut to conform to the pitch of the threaded bore portion 28.

To utilize the tool 5 for removing the valve seat 24 for example, after removal of the valve, not shown, from the valve body 21, the head or bit end 17 of the removing member 8 is inserted into the valve body 21 through its threaded end 28 and the rib 19 is seated in the groove or kerf 27, said rib being of the proper size to be received in the groove or kerf. The outer sleeve 6 is then threaded into the bore portion 28, after which the inner sleeve 7 is simultaneously threaded into the outer end of the outer sleeve 6 and onto the outer threaded portion 20 of the stem 15. Suitable wrenches may be applied to the wrench lands 9 and 12 for applying the sleeves 6 and 7, as previously described. After the tool 5 had thus been assembled, as previously described and as illustrated in Figure 1, it will be readily apparent that the rib 19 will still be in engagement with kerf 27. Accordingly, a suitable wrench, not shown, may be applied to the wrench lands 16 for turning the removing element 8 in a direction for screwing said element outwardly through the inner sleeve 7 and for unscrewing the valve seat 24 simultaneously from the threaded bore portion 23. Since the member 8 cannot turn relatively to the valve seat 24, as said member is screwed outwardly through the inner sleeve 7 and outer sleeve 6, the valve seat 24 will obviously be unscrewed from the bore portion 23. In some cases the inner sleeve 7 may turn with the stem 15 relatively to the outer sleeve 6; however, the removal of the valve seat 24 will still be accomplished in the same manner.

It will also be readily apparent that the valve seat 24 may be applied by the tool 5 in the same manner as previously described except that the insert engaging member 8 will be turned in the opposite direction for screwing it inwardly through the sleeves 7 and 6.

It will be obvious that the tool 5 is equally well adapted for applying and removing other types of threaded inserts and that the pitch of the externally threaded outer sleeve portion 10 may be varied to accommodate the tool 5 to different body portions or housings having threaded inserts to be applied or removed. It will also be obvious that other means than the rib 19 may be provided on the face 18 for keying the insert engaging member 8 to the insert to be applied or removed, as for example, diametrically spaced pins or studs projecting from the face 18 for engaging recesses of the outer face of the insert.

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It will be obvious that slippage of the tool relatively to the body member 21 while applying or removing the insert 24 is rendered impossible due to the construction of the tool 5, so that the threaded bore portion 28 and other portions of the interior of the body may not be damaged by any part of the tool 5 while employed to turn the insert 24.

Various other modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as herein-after defined by the appended claims.

I claim as my invention:

1. A threaded insert removing and applying tool of the character described comprising an outer sleeve having an externally threaded inner and adapted to threadedly engage in a threaded bore end of a body or housing, said outer sleeve having an internally threaded outer end, and inner sleeve having an externally threaded inner end threadedly engaging in the internally threaded outer end of the outer sleeve, said inner sleeve having an internally threaded bore extending from end to end thereof, an insert engaging member comprising an elongated stem having a restricted wrench engaging portion defining an outer end thereof, said stem being threaded from adjacent to its inner end to said wrench engaging portion and threadedly engaging the bore of said inner sleeve, the internally and externally threaded portions of the inner sleeve corresponding in pitch with one another, with the internally threaded portion of the outer sleeve, with the threaded portion of said stem and with the threaded portion of the threaded insert, said wrench engaging portion being disposed outwardly of the outer end of said inner sleeve, and said stem having a bit at the inner end thereof of larger cross-sectional size than the threaded stem portion provided with means adapted to non-turnably fit a threaded insert of the body or housing whereby when the stem is rotated for movement longitudinally through the said sleeves the threaded insert will be turned therewith without relative longitudinal movement for applying the threaded insert to or for

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removing the threaded insert from the body or housing portion engaged thereby.

2. A tool as in claim 1, said outer sleeve having external wrench land portions at its outer end disposed beyond the adjacent end of said body portion or housing, and said inner sleeve having external wrench land portions at its outer end disposed in an exposed position between the outer end of the outer sleeve and the restricted wrench receiving outer end of said stem.

3. A tool for applying and removing a threaded insert comprising an outer sleeve having an outer end and an inner end, an inner sleeve and an insert engaging member, said insert engaging member having a stem portion extending threadedly through the inner sleeve, said inner sleeve having an inner end engaging threadedly in the outer end of the outer sleeve, the pitch of the threads of the inner sleeve corresponding with one another, with the pitch of the threads of the outer sleeve, with the thread of the stem portion and with the threaded portion of the threaded insert, the inner end of the outer sleeve being adapted to threadedly engage in an end of a body portion or housing, and said insert engaging member having an inner end, of larger cross-sectional size than the stem portion, defining a bit portion provided with means adapted to non-turnably inter-engage with a threaded insert of the body portion or housing whereby said insert will be turned in unison with the insert engaging member of the tool without relative longitudinal movement for applying the insert to or removing the insert from a threaded insert receiving portion of the housing or body portion.

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