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(84) Designated Contracting States: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE Designated Extension States: AL LT LV MK RO SI	(72) Inventor: Chen, Ching Tai Ping City, Taichung Hsien (TW)
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(54) Spanner

(57) A spanner includes a shank with a head (20,220) having a first jaw (21) and a second jaw (24) with a throat portion (220) connected therebetween which has a concavity (22) defined therein. The first jaw (21) has a first recess (26) defined in the inside thereof with a first engaging surface (242) connected between the first recess and the throat portion. The second jaw (24) has a second recess (27) defined in the inside thereof and a second engaging surface (243) extending from one of two ends of the concavity toward the second recess, and a third engaging surface (241) connected between the second engaging surface and the second recess. An angle is defined between the first engaging surface and the inside of the first jaw. Each of the second engaging surface and the third engaging surface has a respective angle defined between the inside of the second jaw. An object can be clamped between the first engaging surface and the third engaging surface.

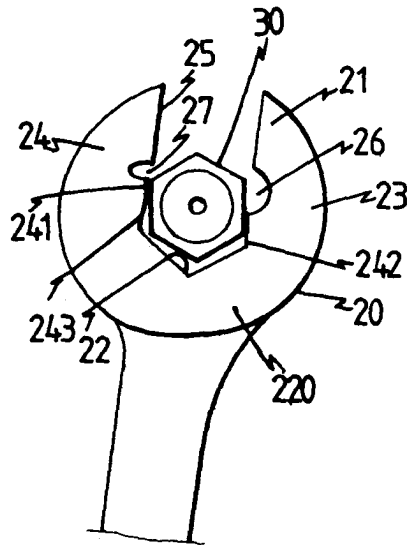


FIG.3

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a spanner, and more particularly, to an improved spanner wherein each of the two jaws has a recess and an engaging surface so that the spanner can be reciprocatingly operated without removing the spanner from the object clamped between the two jaws.

BACKGROUND OF THE INVENTION

[0002] A conventional open end spanner is shown in Fig. 1 and includes a shank 10 with an open end head 11 which has two jaws 110 extending separately from the head 11. An object such as a nut 12 is clamped between the two jaws 110 so as to be rotated. However, in order to conveniently receive the nut 12 between the two jaws 110, the width between the two jaws 110 is larger than the width of the nut 12. When rotating the spanner, the contact points between the jaws 110 and the nut 12 will be at only two points as shown in Fig. 1 at position 13 and 14. There will be a severe stress concentration at the two contact points 13 and 14 so that the nut 12 tends to be broken at the corners. Once the corners of the nut 12 is damaged or broken, the nut 12 cannot be used by the spanner. Furthermore, when tightening or loosening the nut 12, the spanner has to be removed from the nut 12 whenever it is re-engaged with the nut 12 again after a pivoting movement. This takes time and prolongs the operation time so that such a conventional spanner needs to be improved.

[0003] The present invention intends to provide an open end spanner which can be used reciprocatingly without removing the spanner from the object to be tightened or loosened. The spanner of the present invention can mitigate and/or obviate the disadvantages of the conventional spanner.

SUMMARY OF THE INVENTION

[0004] In accordance with one aspect of the present invention, there is provided a spanner comprising a shank with a head which has a first jaw and a second jaw with a throat portion connected therebetween. The throat portion has a concavity defined therein. The first jaw has a first recess defined in the inside thereof and a first engaging surface is connected between the first recess and the concavity. An angle "A1" is defined between the first engaging surface and the inside of the first jaw.

[0005] The second jaw has a second recess defined in the inside thereof and a second engaging surface extends from one of two ends of the concavity toward the second recess. A third engaging surface is connected between the second recess and the second engaging surface. An angle "A2" is defined between the second

engaging surface and the inside of the second jaw. An angle "A3" is defined between the inside of the second jaw and the third engaging surface.

[0006] It is an object of the present invention to provide a spanner wherein the object clamped at the first engaging surface and the third engaging surface.

[0007] Another object of the present invention is to provide a spanner which can be reciprocatingly operated without removing the spanner from the object.

[0008] These and further objects, features and advantages of the present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, several embodiments in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Fig. 1 is a side illustrative view to show a nut is clamped by a conventional spanner at two points; Fig. 2 is a side illustrative view to show the spanner in accordance with the present invention; Fig. 3 is a side illustrative view to show a nut is clamped by the first engaging surface and the third engaging surface of the spanner in accordance with the present invention, and Fig. 4 is a side illustrative view to show that the width between the two insides of the first jaw and the second jaw is sized to prevent the nut from releasing therefrom.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0010] Referring to Figs. 2 and 3, the spanner in accordance with the present invention comprises a shank with a head 20 connected to one of two ends thereof. The head 20 has a first jaw 21 and a second jaw 24 respectively extending in separate therefrom, a throat portion 220 connected between the first jaw 21 and the second jaw 24, the throat portion 220 having a concavity 22 defined therein which is located between the first jaw 21 and the second jaw 24.

[0011] The first jaw 21 has a first recess 26 defined in the inside 210 thereof and a first engaging surface 242 is connected between the first recess 26 and the concavity 22. An angle "A1" is defined between the first engaging surface 242 and the inside 210 of the first jaw 21. The first engaging surface 242 is oriented divergently from the first recess 26 toward the root portion of the first jaw 21.

[0012] The second jaw 24 has a second recess 27 defined in the inside 25 thereof and a second engaging surface 243 extends from one of two ends of the concavity 22 toward the second recess 27. A third engaging surface 241 is connected between the second recess

27 and the second engaging surface 243. The second engaging surface 241 is oriented divergently from the second recess toward the root portion of the second jaw 24. The third engaging surface 243 is oriented divergently from the second engaging surface 241 toward second recess 27. An angle "A2" is defined between the second engaging surface 243 and the inside 25 of the second jaw 24. An angle "A3" is defined between the inside 25 of the second jaw 24 and the third engaging surface 241. The angle "A1" and the angle "A3" are preferably both less than 6 degrees.

[0013] When using the spanner, a nut 30 is clamped between the first jaw 21 and the second jaw 24 at the first engaging surface 242 and the third engaging surface 241, that is to say, the nut 30 and the two jaws 21, 24 contact at two surfaces, not two points. The first engaging surface 242 and the third engaging surface 241 provide sufficient areas to apply a torque onto the nut 30 so as to rotate the nut 30 effectively. The concavity 22 allows the peak portion of the nut 30 to be received therein so that when reciprocatingly operating the spanner, the nut 30 can be maintained between the first jaw 21 and the second jaw 24. Similarly, the first recess 26 and the second recess 27 allow the two peak portions of the nut 30 to be received therein so that the spanner does not need to be removed from the nut 30 while operated reciprocatingly.

[0014] The width between the two respective insides 210, 25 of the first jaw 21 and the second jaw 24 at the opening between the two jaws 21, 24 is less than the width between the first engaging surface 242 and the second engaging surface 243. That is to say, the width between the two respective insides 210, 25 at the opening between the two jaws 21, 24 is slightly larger than the width of the nut 30 so that the nut 30 will not be released from the opening between the two jaws 21, 24 easily as shown in Fig. 4. This is helpful when operating the spanner.

[0015] While we have shown and described various embodiments in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope and spirit of the present invention.

Claims

1. A spanner comprising:

a shank with a head connected to one of two ends thereof, said head having a first jaw and a second jaw extending in separate therefrom, a throat portion connected between said first jaw and said second jaw, said throat portion having a concavity defined therein which is located between said first jaw and said second jaw;
said first jaw having a first recess defined in the

inside thereof and a first engaging surface connected between said first recess and said concavity, an angle "A1" defined between said first engaging surface and the inside of said first jaw, and

said second jaw having a second recess defined in the inside thereof and a second engaging surface extending from one of two ends of said concavity toward said second recess, a third engaging surface connected between said second recess and said second engaging surface, an angle "A2" defined between said second engaging surface and the inside of said second jaw, an angle "A3" defined between said inside of said second jaw and said third engaging surface.

2. The spanner as claimed in claim 1, wherein said angle "A1" is less than 6 degrees.
3. The spanner as claimed in claim 1, wherein said angle "A3" is less than 6 degrees.
4. The spanner as claimed in claim 1, wherein the width between said two respective insides of said first jaw and said second jaw is less than the width between said first engaging surface and said second engaging surface.
5. The spanner as claimed in claim 1, wherein said first engaging surface is oriented divergently from said first recess toward the root portion of said first jaw.
6. The spanner as claimed in claim 1, wherein said second engaging surface is oriented divergently from said second recess toward the root portion of said second jaw.
7. The spanner as claimed in claim 1, wherein said third engaging surface is oriented divergently from said second engaging surface toward second recess.

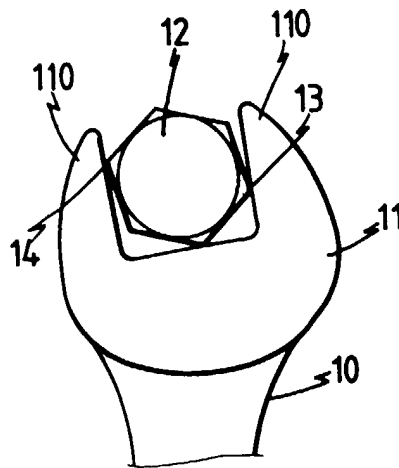


FIG.1
PRIOR ART

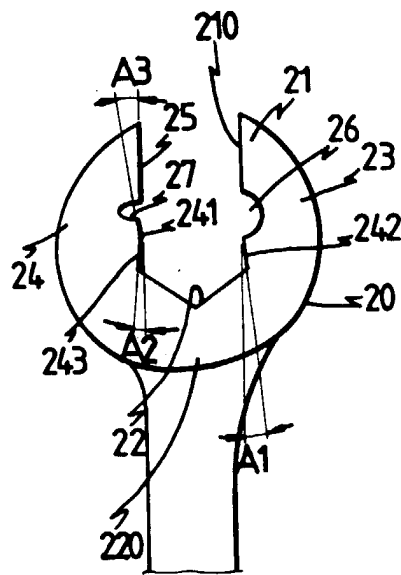


FIG. 2

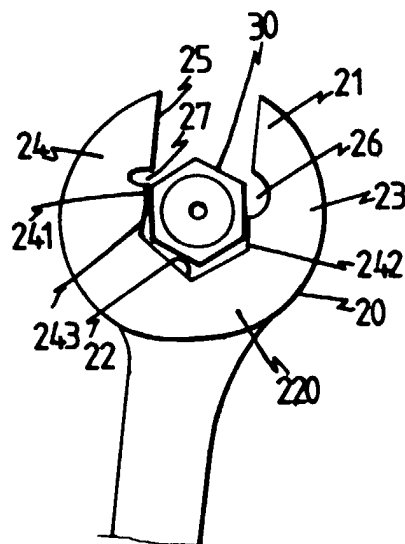


FIG. 3

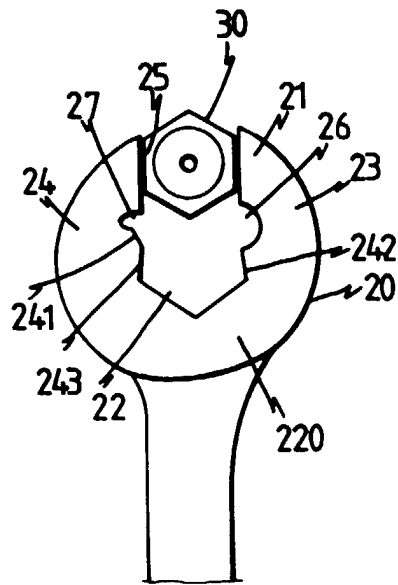


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 10 7040

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION
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A	US 5 131 312 A (R.J.MACOR) 21 July 1992 (1992-07-21) * abstract; figures 3,5,6 *	1	
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A	DE 21 56 086 A (SPECIALTY TOOLS INC.) 17 May 1973 (1973-05-17)		
			TECHNICAL FIELDS SEARCHED
			B25B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		13 September 1999	Majerus, H
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 10 7040

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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13-09-1999

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