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Clemens

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[54] **IDENTIFIED WRENCH ADAPTOR**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 415,140, Nov. 12, 1973, abandoned.

[52] **U.S. Cl.** **81/185;** 81/DIG. 5; 81/DIG. 11

[51] **Int. Cl.**[2] **B25B 13/58**

[58] **Field of Search**..... 81/185, DIG. 5, DIG. 11

[56] **References Cited**

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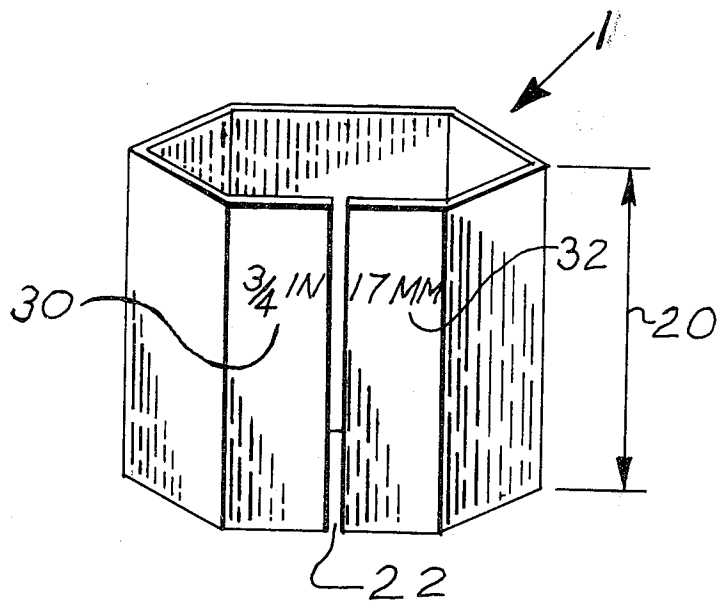
Assistant Examiner—James G. Smith

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[57] **ABSTRACT**

Adaptors for use with conventional socket wrenches to convert U.S. inch dimensions to metric dimensions are identified to readily establish the specific metric sized nut or bolt which a specific U.S. inch sized wrench is designed to apply torque to with the accommodation of the adaptor. The adaptor comprises a band of material conforming to the socket nut wrench or bolt torquing surfaces on its outside surfaces and conforming to a smaller metric bolt or nut wrenching surface on its inside surfaces. The adaptor material is of sufficient compressive strength to transmit normal wrenching torque forces between the inside surfaces of the socket wrench and the nut or bolt wrenching surfaces without permanent deformation of the adaptor. The adaptor thickness is designed to adapt one particular socket wrench size to accommodate one particular smaller size metric nut or bolt.

4 Claims, 3 Drawing Figures



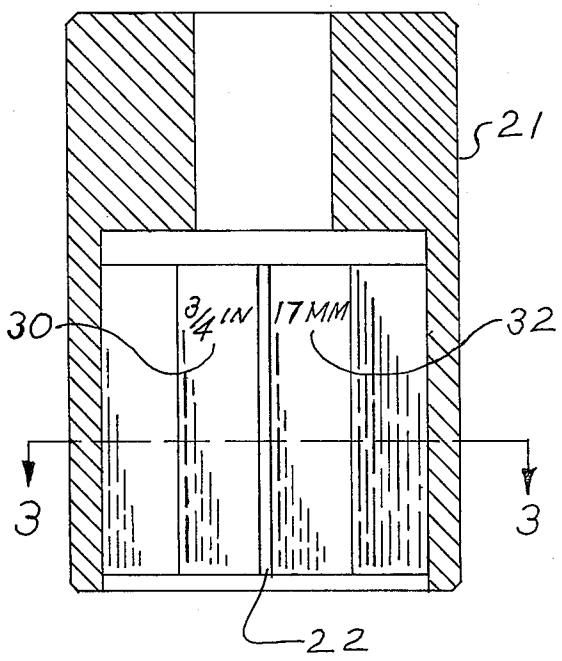


FIGURE 2

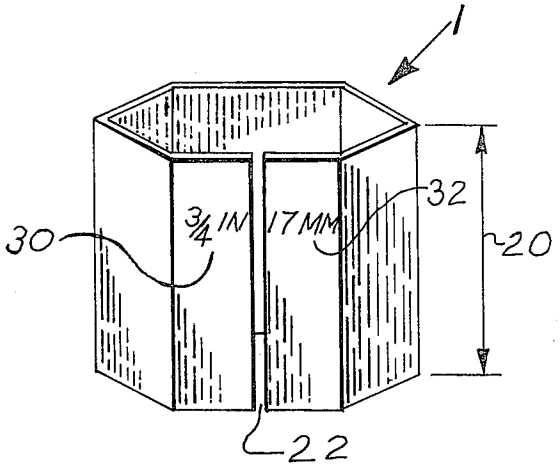


FIGURE 1

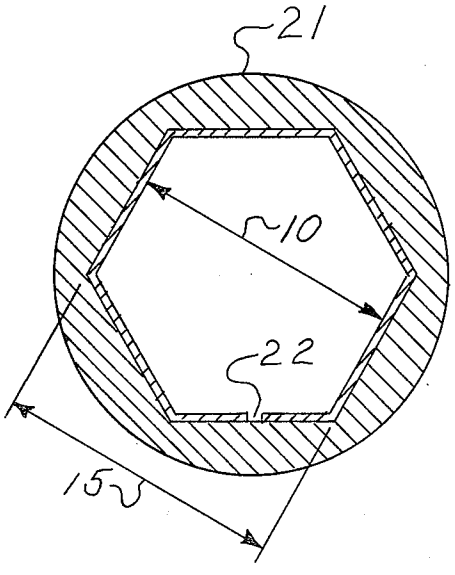


FIGURE 3

IDENTIFIED WRENCH ADAPTOR

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of application Ser. No. 415,140 filed Nov. 12, 1973, now abandoned for a wrench adaptor.

BACKGROUND OF THE INVENTION

This invention relates to making standard socket, box end, and open end wrenches with United States fractional inch measurements readily usable to apply torque to smaller metric nuts or bolts.

A change to the metric measurement system in the United States, and the introduction of foreign machinery using metric fasteners in the United States makes the availability of an efficient method for adapting United States inch measurement wrenches to metric fasteners very desirable.

Many methods to adopt socket wrenches and other fixed size wrenches to apply the wrenching torque to smaller sized nuts or bolts have been designed, but have not been put into general use due to lack of efficiency. A problem with these former wrench adaptors is that normal wrench manufacturing tolerances were provided for by such methods as spring forces in the adaptor. This results in great difficulty in readily determining the particular size application of the adaptor as the effective diameters cannot be measured.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide an efficient, practical, versatile, and inexpensive adaptor which is readily usable in application to either a bolthead or nut or the wrench itself.

It is another object of the present invention to provide an adaptor to adapt a wrench to a different size nut or bolt which can be readily and accurately selected for a specific application.

Briefly, in accordance with the invention, there is provided an adaptor for nuts, bolts, wrenches and the like that is a single piece, split-ring type, which is resiliently formed with a combination of outer and inner periphery patterns to fit the wrench torquing surface and members to be turned respectively and identified to indicate its effective outer and inner diameters for ready application.

Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a perspective view of an adaptor according to the present invention;

FIG. **2** is a sectional view of the adaptor of FIG. **1** positioned in a conventional socket wrench;

FIG. **3** is a sectional view in the direction of arrows **3—3** of the adaptor of FIG. **2** as positioned in the socket wrench.

While the invention will be described in connection with the preferred embodiment, it will be understood that it is not intended to limit the invention to those embodiments. On the contrary, it is intended to cover all alternatives, modifications, and equivalents that may be included within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE INVENTION

Referring first to FIG. **1**, there is shown a preferred form of the present invention, wherein a wrench adaptor is generally indicated at **1**. The adaptor **1** is made of a material of sufficient hardness to withstand normal wrenching forces without compressive deformation when used with the correct size conventional wrench. Cold rolled steel is one such suitable material. The adaptor material thickness is selected to produce a modified wrench torquing surface **10** (FIG. **3**) smaller than the conventional fixed wrench torquing surface so that a fixed wrench width can be adapted to fit a desired nut or bolt size. When adapting United States fractional inch wrench sizes to the smaller metric hexagonal nut and bolt sizes, the following table lists the most efficient conversions:

U. S. Socket Wrench Size (inches)	Metric Hexagonal Nut & Bolt Size (millimeters)
7/16	10
1/2	11
9/16	12
9/16	13
5/8	14
11/16	15
11/16	16
3/4	17
3/4	18
13/16	19
7/8	20
7/8	21
15/16	22
1	23
1	24
1-1/16	25
1-1/16	26
1-1/8	27
1-1/4	28
1-1/4	29
1-1/4	30

The adaptor length **20** is selected to fit the adaptor **1** to a socket wrench **21** as shown in FIG. **2** or to fit the adaptor **1** to apply to a bolt or nut for use with an open end or other wrench. The adaptor shape is made to conform to the bolt or nut shape which would be generally hexagonal as shown. Other shapes such as square or triangular could also be used when applicable.

The adaptor **1** is preferably made with a gap **22** in one side as shown. The gap **22** allows deformation of the basic adaptor shape to produce a spring load against the conventional socket internal wrenching surfaces, or against the outer wrenching surface of a bolt or nut, to provide tension for adaptor **1** against inadvertent separation from the socket wrench, or the nut or bolt.

Due to gap **22** which provides the retaining spring force, the adaptor **1** when not inserted into the socket **21** will be expanded to a dimension larger than the socket wrench dimension **15**, thereby making the intended socket size into which the adaptor is designed to be inserted undeterminable by simple measurement of the adaptor **1**. Additionally, the adaptor thickness must allow for the normal socket wrench dimensional variations and still accommodate the intended nut or bolt with allowance for the dimensional variation in the nut or bolt. This makes the intended nut or bolt size undeterminable by simple measurement of the adaptor thickness. To overcome these problems, the particular wrench size **30** and nut or bolt size **32** which the adaptor is designed to accommodate are stamped or other-

wise legibly marked on preferably adjacent outside surfaces of the adaptor **1**. As shown in FIGS. **1** and **2**, the adaptor **1** is shown as it would be marked when designed to adapt a ¾ inch fixed dimension socket wrench for application to a 17 millimeter nut or bolt.

Thus, it is apparent that there has been provided in accordance with the invention, an identified wrench adaptor that fully satisfies the objects, aims, and advantages set forth above. While the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications, and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications, and variations as fall within the spirit and scope of the appended claims.

I claim:

1. A wrench size-reducing adaptor for reducing the torquing surface of a wrench to make the wrench effective to apply torque to a member to be turned which has a wrenching surface that is normally too small to be turned by the wrench comprising:

a resilient, single-piece, split-ring formed with a thickness defining outer and inner periphery patterns to fit a specific size wrench and a specific size member to be turned respectively, said split ring being formed so as to tend to expand outwardly with force against the inner periphery of an oversized wrench when the adaptor is forced into said wrench to hold it securely therein, and

means affixed to said ring identifying the specific sizes of said outer and inner periphery patterns of said ring.

2. Apparatus as set out in claim **1** wherein the specific sizes of said outer and inner periphery patterns are the same as the specific sizes of the wrench and member to be turned respectively and said identifying means is affixed to said ring with the specific sizes of the wrench and member to be turned located on adjacent portions of the adaptor whereby the particular application of the adaptor is readily determinable.

3. Apparatus as set out in claim **2** wherein the outer periphery of said ring corresponds to a specific wrench size in inches and the inner periphery of said ring corresponds to a specific metric size of a member to be turned.

4. Apparatus as set out in claim **3** wherein said identifying means includes the size of the wrench in inches and the size of the member to be turned in millimeters.

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