International Journal of Innovative Research and Advanced Studies (IJIRAS)
Volume 5 Issue 7, July 2018

ISSN: 2394-4404

Design And Simplification Of Multipurpose Wrench

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Abstract: ***It deals with design and simplification of multipurpose wrench has been done in this present paper. For heavy continues use and safety in every day work. This paper gives the details in order to usage of multipurpose wrench. Which can be loosen or tighten the nut and bolt. And also which can be used as nail holding device. The initial design parameters and multipurpose usage are presented and discussed. Reduce the screw thread size. Time saver when during the process.***

Keywords: Design of wrench, multi-purpose, nuts-bolts

I. INTRODUCTION

A spanner is a small, fixed-size hand tool designed to tighten or loosen fasteners (holding two or more work pieces together) by turning a nut or bolt. This is made of single material. A wrench, also called a spanner, is a typically hand-operated tool that's used for tightening bolts and nuts. The tool works as a lever with notches at the mouth for gripping. The wrench is pulled at a right angle to the axes of the lever action and the bolt or nut. Some wrenches have mouths that can be tightened to better fit various objects that need turning. When it is necessary to apply considerable force on a wrench, it is usually advisable to pull instead of push. Pushing on a wrench may be dangerous, as a sudden loosening of the nut can lead to striking some part of the body against the machine being worked on. Whenever considerable effort is to be applied to a wrench, make sure that the footing is secure and take precautions against stumbling, slipping and falling. There are two main categories of wrenches: nonadjustable and adjustable. Nonadjustable Wrenches There are four main types of nonadjustable wrenches: open-end, box-end, hex key, and combination Open-End Wrenches. This wrench is often double-ended, with a different-sized opening at each end. The ends are generally oriented at an angle of around 15 degrees to the longitudinal axis of the handle. This allows a greater range of movement in enclosed spaces by flipping the wrench over. This wrench has an opening on each end. Each end is a specific size, and they measure the distance between flats ◊ of the wrench. Typical sizes are 7 /16-inch and 1 /2 –inch

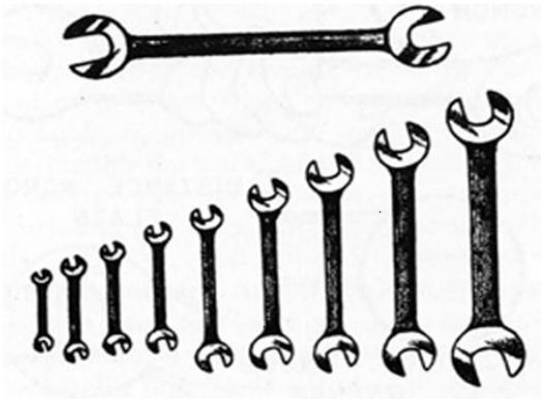

Figure 1.1

This wrench has smooth jaws that are used for turning nuts, bolts, and pipe fittings. This paper discusses about adjustable wrench and nail tool holder, and also thread cutter. Instead of using spring or adjustable warm drive with the simple parts like nut and bolt itself. The adjustable end wrench differs from the monkey wrench in that the gripping faces of the jaws are displaced to a (typically) 15 degree angle relative to the tool's handle, a design feature that facilitates the wrench's use in close quarters.

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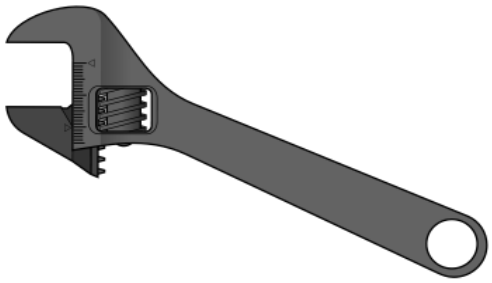

Figure 1.2

A nut is type of pin with thread hole. A bolt is a form of threaded fastener with an external male thread.

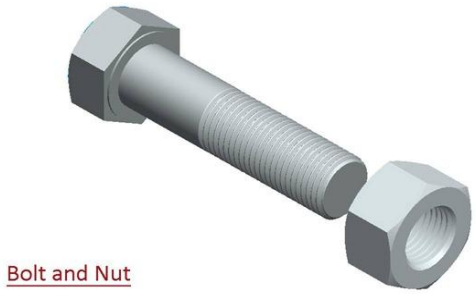

Figure 1.3

II. HISTORY

A wrench (or spanner outside of North America) is a tool used to provide grip and mechanical advantage in applying torque to turn objects—usually rotary fasteners, such as nuts and bolts—or keep them from turning. In Commonwealth English (excluding Canada), spanner is the standard term. The most common shapes are called open-ended spanner and ring spanner. The term wrench is generally used for tools that turn non-fastening devices (e.g. tap wrench and pipe wrench), or may be used for a monkey wrench - an adjustable pipe wrench. In North American English, wrench is the standard term. The most common shapes are called open-end wrench and box-end wrench. In American English, spanner refers to a specialized wrench with a series of pins or tabs around the circumference. (These pins or tabs fit into the holes or notches cut into the object to be turned.) In American commerce, such a wrench may be called a spanner wrench to distinguish it from the British sense of spanner. Higher quality wrenches are typically made from chromium-vanadium alloy tool steels and are often drop-forged. They are frequently chrome-plated to resist corrosion and for ease of cleaning. Hinged tools, such as pliers or tongs, are not generally considered wrenches in English, but exceptions are the plumber wrench (pipe wrench in British English) and Mole wrench (sometimes Mole grips in British English).The word can also be used in slang to describe an unexpected obstacle, for example, "He threw a spanner into our plans" (in U.S. English, "monkey wrench").

Solymon Merrick patented the first wrench in 1835. Another patent was granted to Daniel C. Stillson, a steamboat fireman, for a wrench in 1870. Stillson is the inventor of the pipe wrench. The story was that he suggested to the heating and piping firm Walworth that they manufacture a design for a wrench that could be used for screwing pipes together. He was told to make a prototype and "either twist off the pipe or break the wrench." Stillson's prototype twisted the pipe successfully.

III. LIST OF PARTS

- ✓ Nut
- ✓ Bolt
- ✓ Spanner
- ✓ Nail
- ✓ Hack saw blade

A. EXPLANATION OF EACH PART

a. NUT

A nut is a type of fastener with a threaded hole.

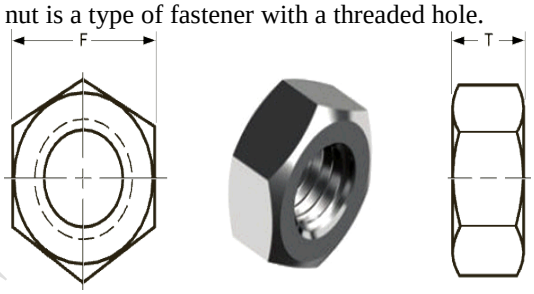

Figure 3.1.1

b. BOLT

Bolt is mechanical fastener that is usually used with a nut for connecting two or more parts. A bolted joint can be readily disassembled and reassembled; for this reason bolts or screw fasteners are used to a greater extent than any other type of mechanical fastener and have played an important part in the development of mass-produced articles and steel structures.

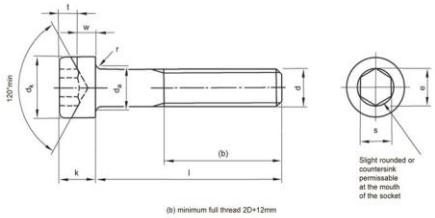

Figure 3.1.2

c. SPANNER

A tool with a shaped opening or jaws for gripping and turning a nut or bolt.

Figure 3.1.3

ISSN: 2394-4404

d. Nail

Nail is a pin-shaped object of metal (or wood, called a treenail or "trunnel" which is used as a fastener, as a peg to hang something, or sometimes as a decoration.

Figure 3.1.4

e. HACK SAW

A hacksaw is a fine-toothed saw, originally and mainly made for cutting metal. The equivalent saw for cutting wood is usually called bow saw.

Figure 3.1.5

IV. SKETCH

A. SKETCH OF EACH PART

a. NUT

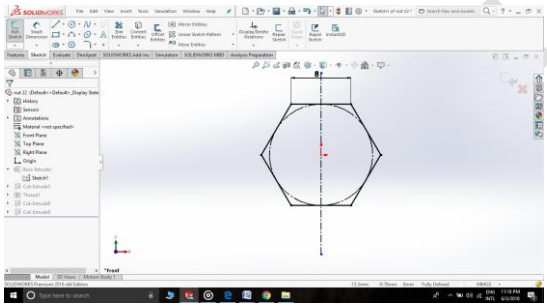

Figure 4.1.1

b. BOLT

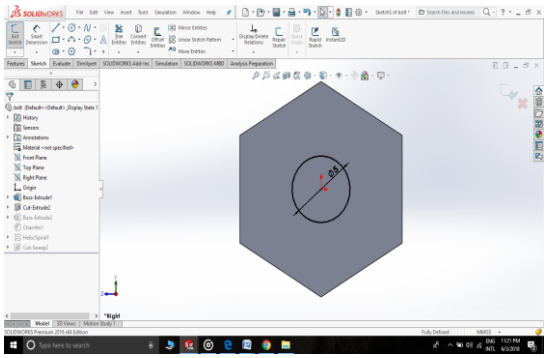

Figure 4.1.2

c. SPANNER

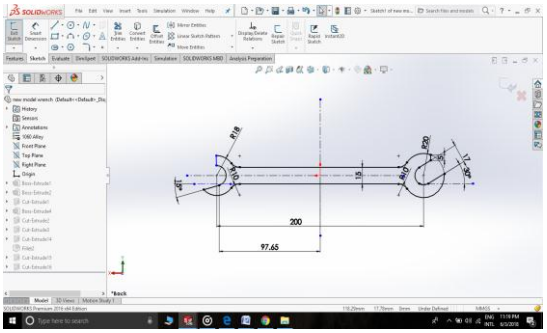

Figure 4.1.3

d. HACK SAW

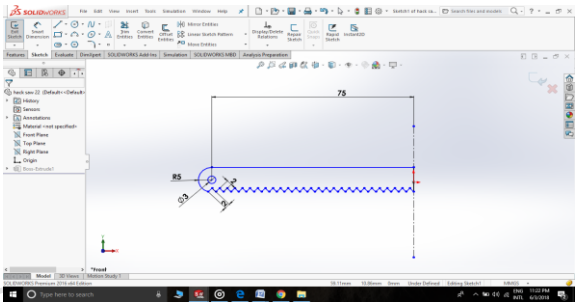

Figure 4.1.4

B. COMPLETE 3D MODEL

a. NUT

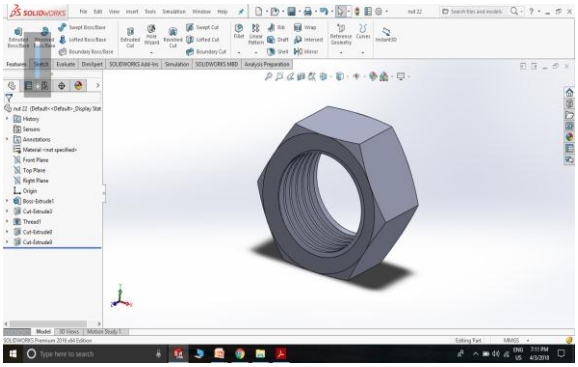

Figure 4.2.1

b. BOLT

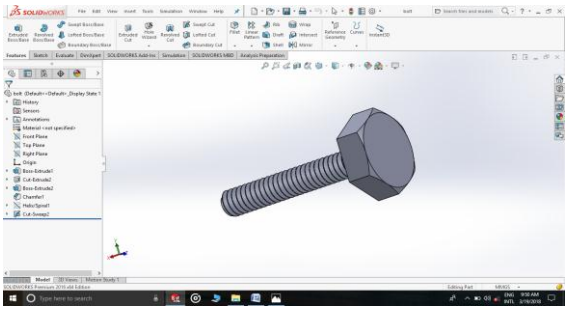

Figure 4.2.2

ISSN: 2394-4404

c. HASKSAW

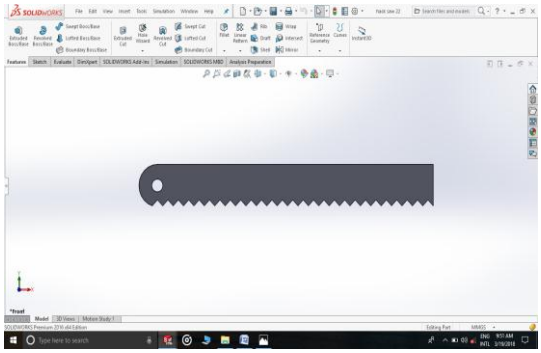

Figure 4.2.3

d. SPANNER MODEL

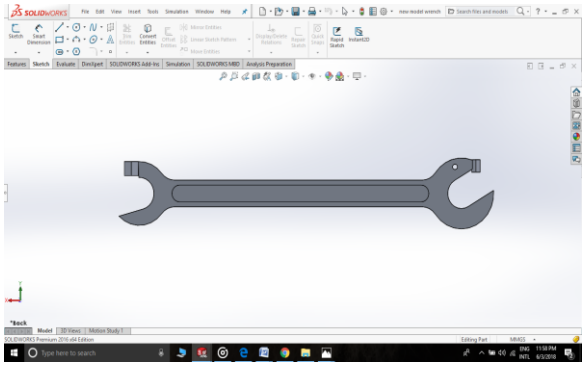

Figure 4.2.4

e. FINAL MODEL

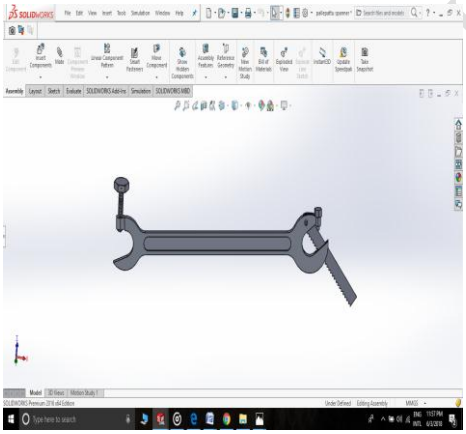

Figure 4.2.5

V. LITERATURE REVIEW

Study of multipurpose wrench:

Solymon Merrick patented the first wrench in 1835. Another patent was granted to Daniel C. Stillson, a steamboat fireman, for a wrench in 1870.But in this journal given details about new innovation multipurpose wrench, actually there are so many adjustable spanners are available, but my product is somewhat innovative and different with comparing those

Study of existing wrenches:

There are two main categories of wrenches: nonadjustable and adjustable. Nonadjustable Wrenches There are four main types of nonadjustable wrenches: open-end, box-end, hex key, and combination Open-End Wrenches. This wrench is often double-ended, with a different-sized opening at each end. The ends are generally oriented at an angle of around 15 degrees to the longitudinal axis of the handle

VI. RESULTS

It can be used as nail holding device and turning process, and adjusting screw.

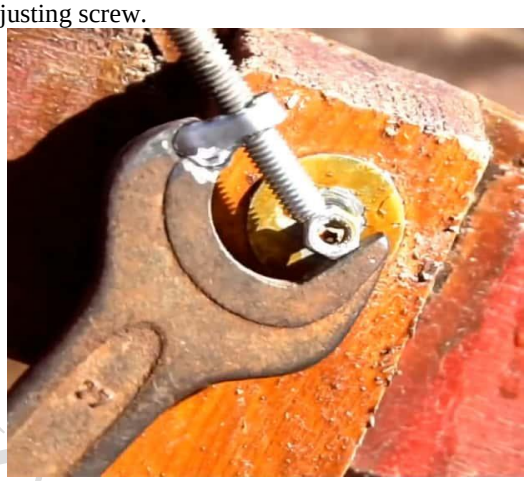

Figure 6.1

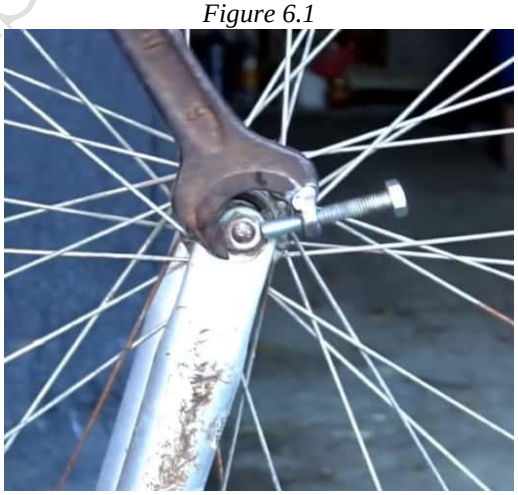

Figure 6.2

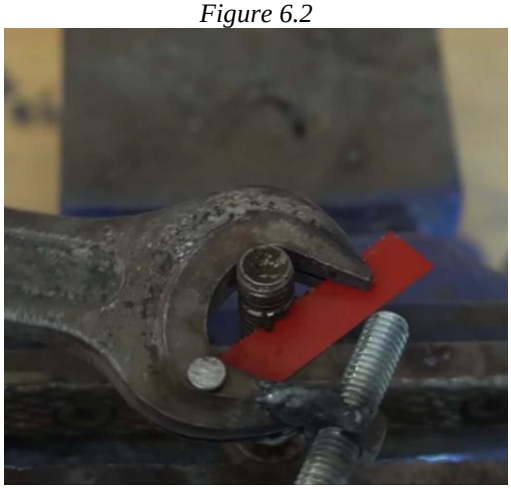

Figure 6.3

VII. CONCLUSIONS AND FUTURE SCOPE

In this journal which is act as wood cutting tool, nail holder, loosen or tighten of for every size of nuts. And also reducing the thread about the bolt when it has more than required size. The machine is constructed based on safety. Finally the device is comfortable and recommend to use and reducing the time. It is also more features to cutting, loosen or tighten the nuts at any size. This can use for holding nail, cutting the wood, loosen and tighten the nuts and reduce the thread size to required size. The presented results can help to plan the machining of work piece with expected tolerance. The following major conclusions may be drawn from the study.

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