A recoilless bucking bar system that includes a cylindrical housing with a first housing end and a second housing end, a tip adaptor shaft with a neck portion and a mouth portion, a spring, and compression springs. The neck portion has a neck portion first end and a neck portion second end. The neck portion first end is partially disposed within the cylindrical housing. The mouth portion can grip a bucking bar tip. The gripped bucking bar tip is able to be inserted in a space such that the system can be used as a bucking bar. The spring is axially disposed within the cylindrical housing at the second housing end. The spring communicates with the neck portion first end, and is axially aligned to the tip adaptor shaft. The compression springs are disposed around the circumference of the neck portion that is partially disposed within the cylindrical housing.
RECOILLESS BUCKING BAR SYSTEM

STATEMENT OF GOVERNMENT INTEREST

[0001] The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without payment of any royalties thereon or therefor.

BACKGROUND

[0002] A bucking bar is used when two or more pieces of material are joined together with a rivet. A rivet is a fastener that is placed in a hole through the materials. Typically an air hammer is placed on the rounded head of a rivet and the bucking bar is placed on the straight shaft of the rivet on the opposite side. Force is then applied by the hammer, and the bucking bar turns over that end, joining the pieces together.

[0003] Typical bucking bars do not absorb any vibrations, but instead amplify the vibration. This causes discomfort and possible injury to the user. Therefore, there is a need for a recoilless bucking bar system that reduces vibrations.

SUMMARY

[0004] The present invention is directed to a recoilless bucking bar system that meets the needs enumerated above and below.

[0005] The present invention is directed to a recoilless bucking bar system that includes a cylindrical housing, a tip adaptor shaft, a spring, and compression springs. The cylindrical housing has a first housing end and a second housing end. The tip adaptor shaft has a neck portion and a mouth portion. The neck portion has a neck portion first end and a neck portion second end. The neck portion first end is partially disposed within the cylindrical housing at the first housing end. The mouth portion is located at the neck portion second end and is able to grip a bucking bar tip. The gripped bucking bar tip is able to be inserted in a space such that the system can be used as a bucking bar. The spring is axially disposed within the cylindrical housing. The mouth communicates with the neck portion first end, and is axially aligned to the tip adaptor shaft. The compression springs are disposed around the circumference of the neck portion that is partially disposed within the cylindrical housing.

[0006] It is a feature of the present invention to provide a recoilless bucking bar system does not amplify vibrations.

[0007] It is a feature of the present invention to provide a recoilless bucking bar system that absorbs vibrations.

DRAWINGS

[0008] These and other features, aspects and advantages of the present invention will become better understood with reference to the following description and appended claims, and accompanying drawings wherein:

[0009] FIG. 1 is a perspective view of an embodiment of the recoilless bucking bar system;

[0010] FIG. 2 is a perspective view of embodiments of the bucking bar tips that can be used with the recoilless bucking bar system; and,

[0011] FIG. 3 is an internal side view of the recoilless bucking bar system.

DESCRIPTION

[0012] The preferred embodiments of the present invention are illustrated by way of example below and in FIGS. 1-3. As shown in FIGS. 1 and 3, the recoilless bucking bar system 10 has a cylindrical housing 100, a tip adaptor shaft 200, a spring 300, and compression springs 400. The cylindrical housing 100 has a first housing end 105 and a second housing end 110. The tip adaptor shaft 200 has a neck portion 205 and a mouth portion 207. The neck portion 205 has a neck portion first end 210 and a neck portion second end 215. The neck portion first end 210 is partially disposed within the cylindrical housing 100 at the first housing end 105. The mouth portion 207 is located at the neck portion second end 215 and is able to grip a bucking bar tip 50. Various embodiments, but without limitation, of the bucking bar tip 50 are shown in FIG. 2. The gripped bucking bar tip 50 is able to be inserted in a space such that the system 10 can be used as a bucking bar. The spring 300 is axially disposed within the cylindrical housing 100 at the second housing end 110. The spring 300 communicates with the neck portion first end 210, and is axially aligned to the tip adaptor shaft 200. The compression springs 400 are disposed around the circumference of the neck portion 205 that is partially disposed within the cylindrical housing 100.

[0013] In the description of the present invention, the invention will be discussed in an aircraft environment; however, this invention can be utilized for any type of application that requires use of a bucking bar.

[0014] As shown in FIG. 3, the cylindrical housing 100 has a hollow. The cylindrical housing 100 may also contain a first end cap 115 disposed at the first housing end 105, and a second end cap 120 disposed at the second housing end 110. The first end cap 115 may include an aperture 125, which corresponds to the neck portion 205 of the tip adaptor shaft 200 that is partially disposed within the cylindrical housing 100.

[0015] As shown in FIG. 2, in one of the preferred embodiments, the bucking bar lips 50 each have a rivet portion 51 that corresponds to the particular rivet being worked on, and a threaded extension 52 disposed on the other end of the bucking bar tip 50. As shown in FIG. 3, the tip adaptor shaft 200 includes a threaded bore 220 disposed at the neck portion second end 215. The threaded bore 220 corresponds to the threaded extension 52 of each bucking bar tip 50, such that the bucking bar tip 50 can be attached to the tip adaptor shaft 200. Accordingly, the bucking bar tip 50 may be gripped by screwing the threaded extension 52 into the threaded bore 220. However, the neck portion second end 215 may grip a bucking bar tip 50 by any other means practicable, such as, but without limitation, a magnet system, a clip system, or a snap system.

[0016] The cylindrical housing 100, the tip adaptor shaft 200, and the bucking bar tips 50 may be manufactured from any material practicable.

[0017] As shown in FIG. 3, the tip adaptor shaft 200 may also include an annular flange 225 and an annular boss 230. An annular flange 225 may be defined, but without limitation, as a circular rim or collar projecting from the tip adaptor shaft 200. Consequently, the annular flange 225 has an outer diameter larger than neck portion 205. An annular boss 230 may be defined, but without limitation, as a cylinder protruding from the tip adaptor shaft 200, having a smaller diameter than the neck portion 205. Both the annular flange 225 and the annular boss 230 are axially aligned to the neck portion 205.
The annular flange 225 is disposed between the neck portion first end 210 and the annular boss 230. The annular boss 230 communicates with the spring 300 such that the spring (or spring forces) can act upon the annular boss 230, which in turn can act upon neck portion 205 and thus the tip adaptor shaft 200. The annular flange 225 communicates with the internal diameter 130 of the cylindrical housing 100 such that the annular flange 225 can slide axially along the internal diameter 130 of the cylindrical housing 100, consequently, allowing the tip adaptor shaft 200 to slide along the internal diameter 130 of the cylindrical housing 100.

[0018] When introducing elements of the present invention or the preferred embodiment(s) thereof, the articles “a,” “an,” “the,” and “said” are intended to mean there are one or more of the elements. The terms “comprising,” “including,” and “having” are intended to be inclusive and mean that there may be additional elements other than the listed elements.

[0019] Although the present invention has been described in considerable detail with reference to certain preferred embodiments thereof, other embodiments are possible. Therefore, the spirit and scope of the appended claims should not be limited to the description of the preferred embodiment(s) contained herein.

What is claimed is:

1. A recoilless bucking bar system, comprising:
   a cylindrical housing, the cylindrical housing having a first housing end and a second housing end;
   a tip adaptor shaft comprising a neck portion, a mouth portion and a circumference, the neck portion having a neck portion first end and a neck portion second end, the neck portion first end partially disposed within the cylindrical housing at the first housing end, the mouth portion located at the neck portion second end and able to grip a bucking bar tip, the tip being able to be inserted in a space such that the system can be used as a bucking bar; a spring, the spring axially disposed within the cylindrical housing at the second housing end and axially aligned to the tip adaptor shaft; and, compression springs disposed around the circumference of the neck portion that is partially disposed within the cylindrical housing.

2. The recoilless bucking bar system of claim 1, wherein the bucking bar tip includes a threaded extension, the tip adaptor shaft includes a threaded bore disposed at the neck portion second end such that the threaded bore corresponds to the threaded extension allowing attachment.

3. The recoilless bucking bar system of claim 2, wherein the system further includes interchangeable bucking bar tips.

4. The recoilless bucking bar system of claim 3, wherein the tip adaptor shaft includes an annular flange and an annular boss, the annular flange and the annular boss axially aligned to the neck portion, the cylindrical housing being hollow and having an internal diameter allowing the annular flange to slide along the diameter of the cylindrical housing, the annular boss communicating with the spring such that the spring can act upon the tip adaptor shaft.