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TWO-WAY JACK SHAFT ASSEMBLY WITH DADO ADAPTER FOR PORTABLE ELECTRIC SAWS

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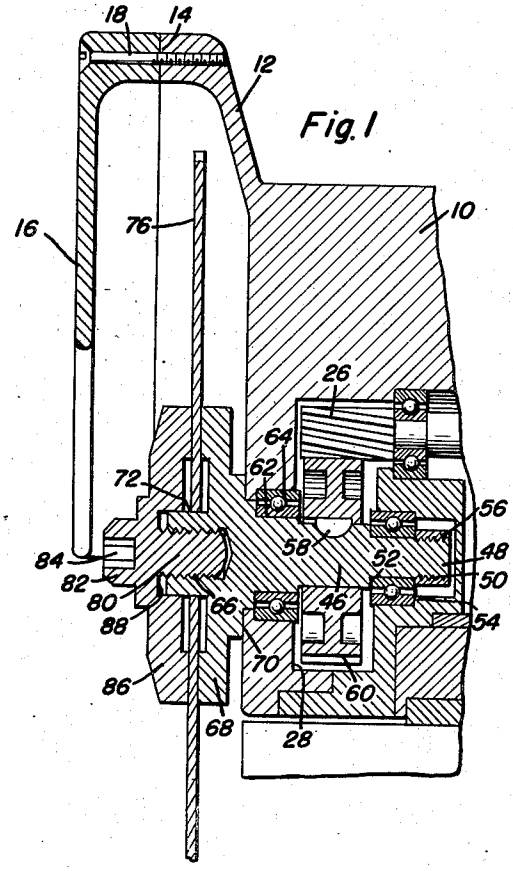


Fig. 1

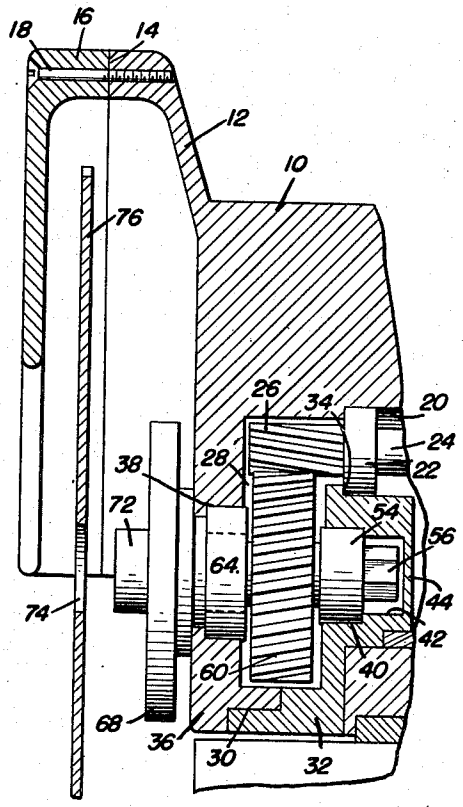


Fig. 2

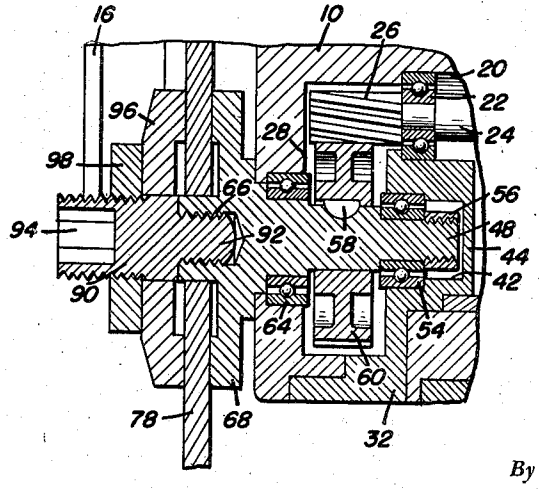


Fig. 3

Inventor

Theodore W. Kluck

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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TWO-WAY JACK SHAFT ASSEMBLY WITH DADO ADAPTER FOR PORTABLE ELECTRIC SAWS

Theodore W. Kluck, Houston, Tex.

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2 Claims. (Cl. 143—155)

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This invention comprises novel and useful improvements in a two-way jack shaft assembly with dado adapter for portable electric saws, and more specifically pertains to a jack shaft assembly specifically capable of replaceably mounting dado or saw wheels upon a portable electric hand saw for operation thereby.

The principal objects of this invention are to provide an improved portable electric hand saw wherein the jack shaft assembly of the same shall be of a greatly simplified construction having a minimum number of parts; shall be capable of an improved mounting in the casing of the electric saw; wherein an improved detachable connection is provided for securing saws or dado wheels to the jack shaft assembly; and wherein the jack shaft assembly may be readily inserted into or removed from the casing of the saw.

These, together with various ancillary features and objects of the invention, which will later become apparent as the following description proceeds, are attained by the present invention, a preferred embodiment of which has been illustrated, by way of example only, in the accompanying drawings, wherein:

Figure 1 is a fragmentary vertical central sectional view through a conventional form of portable electric hand saw in which the improved jack shaft assembly of the present invention has been applied, a saw wheel being mounted thereon;

Figure 2 is a view similar to Figure 1 but with the saw retainer removed from the jack shaft assembly and the saw blade removed therefrom; and

Figure 3 is a view similar to Figure 1 but showing the manner in which a dado wheel is applied to the jack shaft assembly.

Referring now more specifically to the accompanying drawings, wherein like numerals designate similar parts throughout the various views, it will be seen that the numeral 10 designates a portion of the casing of any conventional form of portable electric hand saw, this casing being of conventional construction and therefore only such parts of the casing have been illustrated as are necessary to understand the manner in which the present invention is to be applied thereto. At one end, the casing is provided with an integral cup-shaped flange 12 constituting a hood and which, at its extreme end, is provided with a plane surface 14 adapted to be engaged by a similar surface of a saw guard 16, the latter being retained upon the casing, as by fastening

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screws or the like 18. The hood 12, together with the guard 16, overlies the end of the casing 10 and constitutes a guard housing or shield for partially enclosing the end of a saw or dado wheel to be driven by the device.

As will be further apparent, the casing 10 is provided with a drive shaft passage 20 in which is suitably journaled, as by bearing members 22, a drive shaft 24 which may be either connected to or may constitute a part of the armature of an electric motor by means of which the portable hand saw is powered.

At its extreme end, the drive shaft 24 is provided with a helically splined portion 26 which extends into a chamber 28 constituting and hereinafter referred to as a gearing chamber. Conveniently, the casing 10 is provided with an inwardly extending or shouldered portion 30 which constitutes a seat for receiving a correspondingly shaped bearing bracket 32 which constitutes a closure for the chamber 28, and which also has a supporting surface 34 constituting a stop or seat for receiving the bearing member 22 of the drive shaft 24.

The chamber 28 has a fixed end wall 36 formed in the casing 10, the above mentioned bearing bracket 32 constituting the other wall of the casing. The fixed end wall 36 is apertured to constitute a bearing seat 38, while the bearing bracket 32, in turn, is provided with a bearing receiving recess 40 from one end of which extends a further axially extending and diametrically reduced recess 42 terminating in a closed end wall 44.

The novel replaceable jack shaft assembly forming an essential part of the present invention is adapted to be journaled in the chamber 28 and in the bearing seats 38 and 40 as set forth hereinafter.

Referring now more specifically to Figure 1, it will be seen that the improved jack shaft assembly for the saw blade consists of a jack shaft 46 having a diametrically reduced inner end 48 which is externally threaded as at 50 and which is provided with a shouldered portion 52. An anti-friction bearing assembly 54 is received upon the inner end of the jack shaft 46 and pressed against the shouldered portion 52 and retained thereagainst as by a fastening nut 56 engaging the screw-threaded end 50.

Keyed upon an intermediate portion of the jack shaft 46, as by a key 58, is a gear 60 having teeth continuously meshed with the above-mentioned helical splines 26 of the driving shaft.

The gear members 26 and 60 thus constitute a gearing transmission connecting the drive shaft 24 with the jack shaft assembly.

The bearing assembly 54 on the inner end of the jack shaft is seated in the bearing seat 40, while the inner end of the jack shaft extends into the previously mentioned recess 42 in the bearing bracket 32.

The jack shaft 46 is further provided with a bearing surface 62 upon which is mounted an anti-friction bearing assembly 64, the latter being seated in the above-mentioned bearing seat 38 in the end wall 36 of the casing.

At its outer end, the jack shaft 46 is provided with an internally threaded bore 66 and adjacent this bore is further provided with a laterally enlarged annular flange 68 which has a bearing surface 70 adapted to abut the outer surface of the casing 10, as clearly indicated in the figures of the drawings.

The outer end of the jack shaft, surrounding the internally threaded bore 66 is provided with or constitutes a hub portion 72 which is adapted to receive the apertured portion 74, see Figure 2, of disk saw 76, or of a dado wheel 78, see Figure 3, or any other implement adapted to be mounted upon the jack shaft assembly and rotated thereby.

As will be readily seen from Figure 2, the extreme outer end of the jack shaft assembly terminates closely adjacent the end wall of the casing 10 and is disposed within and is overlaid by the hood 12 and the guard 16.

In order to detachably secure the saw blade 76 or the dado wheel 78 to the end of the jack shaft, a retainer is provided. For retaining the saw blade upon the jack shaft, the retainer shown in Figure 1 is utilized. This retainer consists of a central portion comprising an externally threaded axial extremity 80 having a rounded ball end adapted to be screw-threadedly engaged in the internally threaded bore 66 having a cup-shaped socket therein for receiving the rounded end, and an outer axial extension 82 which may conveniently be provided with a socket or recessed opening 84 adapted to accommodate a wrench or the like. The fastening means further includes an annular flange 86 which is complementary to the flange 68 and is adapted to frictionally engage and clamp the saw blade 76 therebetween. The flange 86, however, is provided with an axial recess or chamber 88 which surrounds the externally threaded extension 80, this chamber or recess slidably receiving and accommodating the hub portion 72 of the jack shaft.

It will thus be apparent that by the retaining means the saw blade is retained and positioned upon the hub portion 72 and is frictionally engaged by the adjacent complementary surfaces of the flanges 86 and 68.

However, easy access may be had to the retainer from the open end of the hood and guard for releasing the retaining means and removing the saw, as suggested in Figure 2.

Alternatively, other disks or tools of greater width may be quickly and easily attached to the jack shaft assembly in place of the saw blade without the necessity of removing the guard 16. In order to accomplish this, a longer jack shaft is required. Thus, as shown in Figure 3, a dado wheel 78 may be mounted upon the jack shaft by means of the dado adapter, which consists of an externally threaded bolt 90, having a diametrically reduced, externally threaded inner portion

with a ball pivot 92, received in the above-mentioned internally threaded bore with ball socket 66, and having at its outer end a shouldered socket or recess 94 for the reception of a wrench or the like. On the above-mentioned externally threaded bolt 90 there is provided an annular retaining flange 96 which is slidably received upon the bolt 90 and is removably or releasably clamped upon the dado wheel 78 for securing the same against the retaining flange 68 of the jack shaft, as by a lock nut 98. By means of this adapter, sufficient strength with minimum friction is afforded to permit the use of dado blades and other tools of varying width up to $\frac{13}{16}$ of an inch.

Also, by means of this easily removable and replaceable dado adapter, the shorter retainer comprising the above mentioned externally threaded axial extremity 80 is easily and quickly exchanged without the necessity of removing the saw guard 16. The shorter retainer is required for close work and for sawing vertical angles, since the longer jack shaft retainer would extend out beyond the saw guard 16 and interfere with close work and with sawing vertical angles.

From the foregoing, it will be apparent that there is provided a greatly simplified construction of a jack shaft assembly, and one which is particularly characterized by the adequate bearing means for journaling the same, the detachable bearing bracket which serves both as a closure for the gear chamber and also as a bearing member for the jack shaft; and which provides an improved means for quickly attaching or removing saw disks or dado wheels, as desired.

Since, from the foregoing, the construction and advantages of this invention are readily apparent, further description is believed to be unnecessary.

However, since numerous modifications and equivalents will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to the exact embodiment shown and described, but all suitable modifications and equivalents may be resorted to which fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In a portable electric hand tool having a casing with an electric motor and a jack shaft assembly mounted in the casing and operatively connected to said electric motor, said assembly including a jack shaft internally threaded at its outer end, and a hood on the casing overlying the outer end of the jack shaft, the improvement comprising a dado mounting including a bolt having a threaded reduced end to be secured in the outer end of the jack shaft, the outer end of said bolt being threaded, an annular retaining flange slidable upon said bolt to releasably clamp a dado blade, and a lock nut on the threaded outer end of the bolt to secure the flange and blade in place.

2. In an electric hand tool having a casing, a jack shaft assembly mounted in said casing, a power connection to said jack shaft, said shaft protruding from said casing, a hood on said casing and a tool guard secured to said hood, a tool mounting comprising an annular flange on said jack shaft adapted to abut the outer surface of the casing, an internally threaded hub extending axially from said flange, an enlarged annular tool engaging face on said flange, a hub extension in-

cluding a diametrically reduced, externally threaded portion received in said internally threaded hub, a tapered seat in said hub, a ball pivot on the end of said externally threaded portion, said ball pivot seating on said seat when said extension is secured on said hub, an external thread on the outer end of said extension, an annular retaining flange slidably received on said hub, a nut threadedly mounted on said hub extension, a socket in the end of said hub extension.

THEODORE W. KLUCK.

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