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PORTABLE POWER TOOL SET

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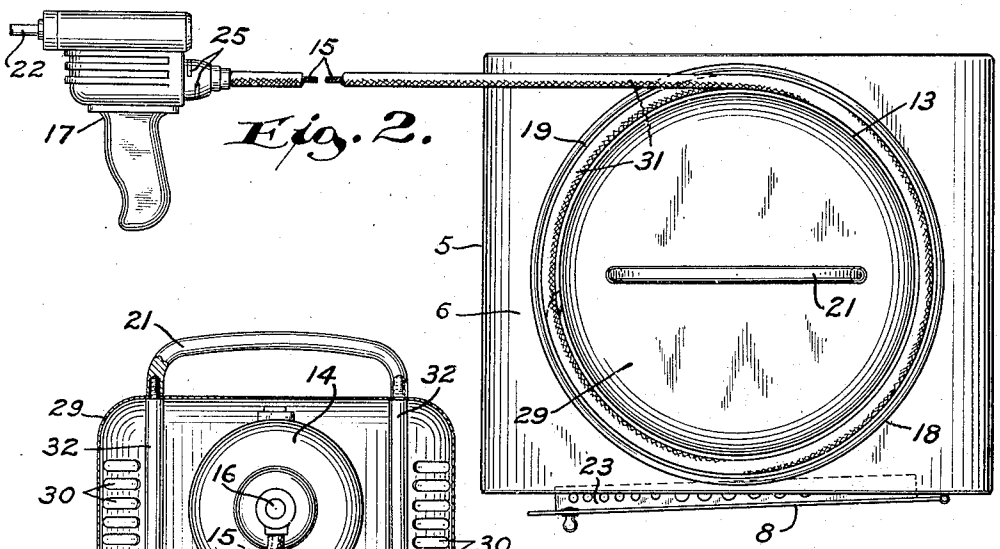


Fig. 2.

Fig. 3.

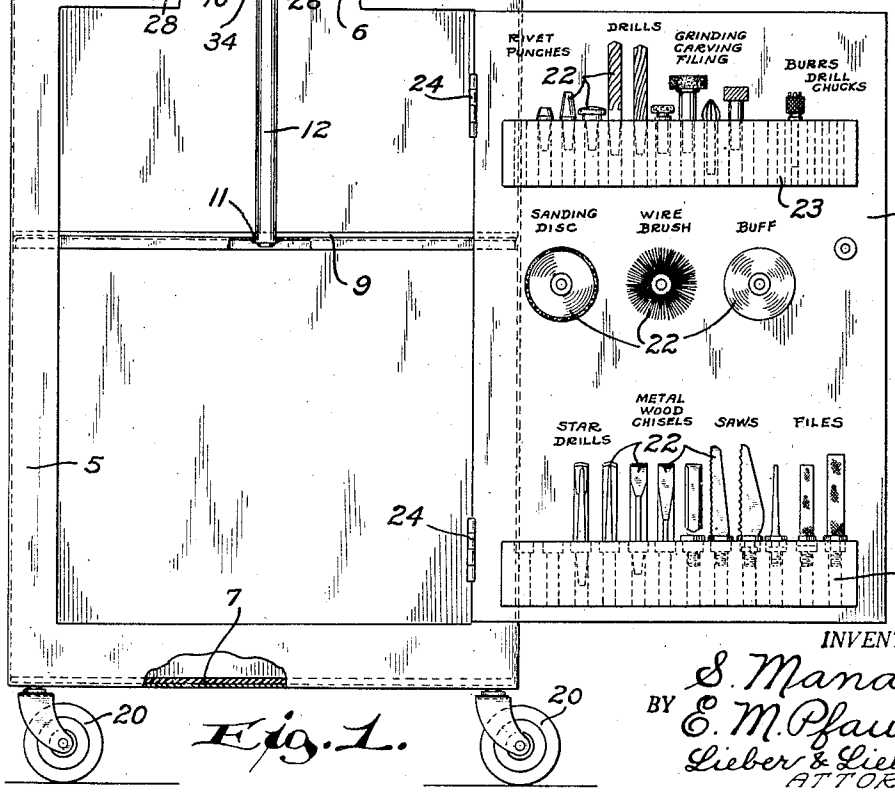


Fig. 1.

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PORTABLE POWER TOOL SET

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6 Claims. (Cl. 74—16)

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Our invention relates generally to improvements in the art of driving and manipulating various types of tools, and relates more specifically to improvements in portable power driven tool set storage and actuating assemblages adapted for diverse uses.

The primary object of the present invention is to provide an improved portable tool storage and operating assemblage having a source of driving power associated directly therewith, and which also embodies various types of tools and actuating mechanisms adapted to interchangeably perform diverse classes of work.

It is frequently desirable in many industries to have available for immediate use, a portable power driven tool set for performing various classes of work, and having a source of actuating power and ample storage space for different types of tools associated directly therewith. Such a portable power tool set in order to be of any great value, should be adapted to interchangeably actuate either rotary, reciprocating, oscillatory, or impact tools of various kinds; and should also permit transmission of the power to the active tools while being manipulated in any desired position and at variable distances from the power source. The storage capacity of such power tool set should also be ample to accommodate numerous tools and actuating mechanisms of different types confined in orderly arrangement, so as to eliminate loss of time and to enhance the flexibility of the portable unit. Such an outfit should also be compact and readily movable from place to place, thereby making lightness and durability necessary factors, and so far as known, no prior equipment intended for similar purposes has met with all of the above mentioned requirements and desirable features.

The present invention therefore has for a more specific object, the provision of a new and useful portable power tool set adapted to perform many different kinds of work, and embodying ample power and storage capacities.

Another specific object of our invention is to provide a compact, durable, and readily transportable tool storage and driving unit, having instrumentalities for effectively transmitting its power to universally manipulable and operable tools of various types.

A further specific object of the invention is to provide an improved combined tool chest and tool propelling motor support, which may be compactly stored while being constantly available for immediate use in the performance of diverse classes of work.

Still another specific object of this invention is to provide a simple but sturdy portable tool driving assemblage which is extremely flexible in its adaptations and highly efficient in use.

An additional specific object of our present

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invention is to provide an improved portable power driven tool set and tool storage cabinet, which may be manufactured and sold at moderate cost, which is also neat and attractive in appearance, and which is moreover adapted to effectively drive a large variety of different tools of either the rotary, reciprocable, oscillatory, or impact types.

These and other specific objects and advantages of the invention will be apparent from the following detailed description; and some of the novel features of tool driving and manipulating mechanism shown but not specifically claimed herein, constitute the subject of other co-pending applications.

A clear concepton of the various features constituting our present invention, and of the mode of constructing and of utilizing portable power tool sets built in accordance with the present improvement, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the several views.

Fig. 1 is a part sectional front elevation of our improved portable tool chest and power plant, showing the front door of the storage cabinet swung wide open, and also showing the power motor housing and other fragmentary portions in section;

Fig. 2 is a top view of the portable tool storage and driving unit, showing the front door of the cabinet ajar, and also depicting a manually manipulable universally movable pistol grip tool driving mechanism associated with the driving motor of the unit; and

Fig. 3 is an enlarged central vertical section taken through the main motor supporting thrust bearing of the improved assemblage.

While the invention has been shown and described herein as being advantageously applicable to a portable combined tool driving and storage unit wherein the tools are operable by an electric motor which is bodily rotatable upon a tool housing cabinet mounted for transportation upon castors, it is not our desire or intent to thereby unnecessarily restrict the scope or to limit the utility of the improved features. It is also our intention that specific terms employed herein for descriptive purposes, be given the broadest possible meaning and interpretation consistent with the prior art.

Referring to the drawing, the improved portable power driven tool set or unit shown therein by way of illustration, comprises in general, a sturdy cabinet or tool housing 5 having a rigid top 6 and bottom 7 and a front closure or door 8, and being provided with a rigid transverse member or internal shelf 9 disposed beneath the top 6; an upper anti-friction combined thrust and guide bearing 10 disposed centrally of the hous-

ing top 6; a lower pivot and guide bearing 11 disposed centrally of the shelf 9 and in vertical axial alinement with the upper bearing 10; an upright spindle element or pivot shaft 12 journalled for free rotation within the bearings 10, 11, and having a motor support or deck 13 secured thereto and revolvable therewith above the housing top 6; an electric motor 14 or the like, mounted centrally upon the deck 13; a flexible elongated tool driving element or shaft 15 having one end drivingly connected to the motor shaft 16 while its opposite end is adapted to be drivingly connected to any of a number of diverse universally movable tool actuating mechanisms or devices 17 normally stored within the cabinet 5; means such as a rim 18 associated with the periphery of the deck 13 and providing an annular recess or groove 19 for confining either a portion or all of the flexible shaft 15 in coil formation; a plurality of rolling members or castor wheels 20 transportably supporting the housing 5; and an inverted U-shaped manipulating handle 21 secured to the deck 13 and extending centrally across the top of the motor 14 for bodily revolving the deck 13, motor 14 and coiling groove 19, and for effecting convenient transfer of the entire unit from place to place.

The tool housing cabinet 5 and its closure door 8 should be sturdily constructed of sheet metal or the like, and should be of ample capacity to normally store a number of different types of rotary, reciprocable, and impact tools 22 and their manipulating and actuating devices 17, when not in use. In order to permit systematic and orderly storage of tools 22 such as rivet punches, twist drills, rotary cutters, abrasive wheels, burring tools, drill chucks, sanding disks, wire brushes, buffers, star drills, chisels, saws, and files, as well as many other implements, the interior of the door 8 may be provided with racks 23 as shown, and the door 8 is preferably swingably secured to the housing 5 by means of sturdy hinges 24. The shelf 9 and cabinet bottom 7 may be utilized to support diverse pistol grip and other kinds of universally movable tool manipulating and actuating devices 17, one form of which is shown in Fig. 2, and these devices 17 are adapted to be interchangeably drivingly connected to the power delivery end of the flexible shaft 15 with the aid of latches 25. In order to insure maximum utility for the tool set, the tool actuating devices 17 should permit interchangeable operation by the motor 14, of rotary, reciprocable, or impact tools 22 adapted to perform various classes of work on objects located either near or remote from the unit.

The upper and lower vertically alined bearings 10, 11 which are carried by the housing top 6 and shelf 9 respectively, should be formed to freely rotatably support the upright pivot shaft 12, and the upper bearing 10 is preferably of an anti-friction type and coacts with a collar 26 firmly secured to the shaft 12 so as to assume the thrust and to prevent axial displacement of the shaft 12 when in normal use. The shaft 12 and collar 26 may, however, be freely vertically removed from the bearings 10, 11 so as to permit storage of the deck 13 and motor 14 within the lower portion of the casing 5 when the unit is not in use, thus also providing for compact packing of the apparatus for shipment, and the deck 13 may be formed of durable sheet-metal or the like and may be detachable but firmly attached to the upper extremity of its supporting shaft 12 with the aid of a sturdy hub 27.

The tool driving motor 14 which is supported centrally upon and is bodily revolvable with the deck 13 and shaft 12, may be either a rotary electric or any suitable fluid pressure actuated type of rotary motor; and this motor 14 is preferably firmly attached to the revolvable deck 13 by means of bolts 28 and may have its shaft 16 either direct connected to the driven end of the flexible shaft 15, or through speed reducing gearing, in any suitable manner. The motor 14 may be housed within a readily removable inverted cup-shaped enclosing cover 29 formed of sheet-metal or the like and coacting with the deck 13 as shown in Fig. 1, and this cover may be held in position by the manipulating handle 21 and is provided with ventilating openings or slots 30. The elongated flexible tool driving shaft 15 is enclosed and freely rotatable within a flexible tubular conduit 31 which extends through an opening or slot in the lower portion of the cover 29 near the reel groove 19, and the annular rim 18 which forms this groove 19 may either be formed integral with or attached to the periphery of the deck 13. The inverted U-shaped manipulating handle 21 may be formed of an upper external section which spans the top of the motor 14, and a pair of vertical rods 32 which extend downwardly through the motor cover 29 and are detachably attached to the deck 13 by nuts 33; and this handle 21 may obviously be utilized to either revolve the deck 13 so as to confine more or less of the flexible shaft 15 in coil formation within the groove 19, or to assist the castor wheels 20 in transporting the entire unit from place to place, although a spiral spring 34 interposed between the shaft 12 and shelf 9 may also be utilized to take up excess flexible shaft length.

During normal use of the improved portable power tool set or unit, the equipment may be quickly and conveniently assembled for operation as shown in Figs. 1 and 2, whereupon any desired type of tool 22 and manipulating and actuating device 17 may be drivingly associated with the universally movable driven end of the flexible shaft 15. The motor 14 may then be placed in operation to drive the tool 22 carried by the device 17, and the manipulating grip of this device 17 may thereafter be utilized to apply the tool 22 to the work in any desired position and at localities near to or remote from the casing 5 but within the range of the shaft 15 without necessarily shifting this casing. If the work is disposed beyond the range afforded by the length of the flexible shaft 15, the castor supported housing 5 may be readily shifted with the help of the handle 21; and if the work is in fact well within the flexible shaft range the excess shaft length may be coiled within the groove 19 either by the spring 34 or by merely revolving the deck 13 with the aid of the handle 21. Various different kinds of tools 22 and devices 17 may thus be applied to the flexible shaft 15 with the aid of the latches 25, and the additional tools and devices which are not being utilized may obviously be stored in compact and orderly arrangement within the housing casing 5.

When it becomes desirable to store or ship the tool set, the handle 21 may also be utilized to bodily remove the deck 13, motor 14, and shaft 12 after the flexible shaft has been disposed in neatly coiled formation within the reel groove 19, and the shaft 12 may thereafter be withdrawn from the deck hub 27 thereby permitting insertion and compact packing of the removed structure within the casing 5. If it should be desirable

to gain access to the normally concealed and protected motor 14, it is only necessary to release the nuts 33 and to remove the cover 29 with the aid of the handle 21, thus making all parts of the improved unit readily accessible and manipulable.

From the foregoing detailed description of the construction and operation of our improved power tool set, it should be apparent that the present invention provides an improved portable unit which besides being extremely simple, compact and durable in construction, is also highly efficient in use and flexible in its adaptations. Although the unit is exceedingly compact in its assemblage, it is nevertheless adapted to perform various types of work in relatively inaccessible places, by virtue of the universal movability of the tools and their manipulating and driving devices, and the portable housing 5 besides providing a readily transportable support for the tool driving motor and mechanism, also provides an effective confining casing within which the extra tools and propelling mechanisms may be compactly and neatly stored for immediate subsequent use. All portions of the improved assemblage are obviously quickly accessible for inspection, and by mounting the deck 13 and the elements carried thereby in the manner shown and described herein, these portions of the improved unit may be quickly removed and also housed within the casing 5. The improved assemblage has proven highly practical and successful in actual use for performing a large variety of different types of work with the aid of rotary, reciprocable and impact tools, and the outfit is obviously so simple that it may be readily manufactured and sold at moderate cost.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of use, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

We claim:

1. A portable power tool driving unit comprising, a portable support having rigid upper and lower vertically spaced members, vertically alined bearings carried by said members, an upright shaft journalled for rotation within said bearings, one of said bearings being formed to resist end thrust imposed upon said shaft, a deck secured to and being freely revolvable with said shaft above said support, a motor supported by and being revolvable with said deck, a flexible power transmitting shaft having one end permanently drivingly connected to the motor shaft while its opposite end is universally movable, and a manipulating handle secured to said deck for bodily revolving said motor and for transferring said support from place to place.

2. A portable power tool driving unit comprising, a portable support having rigid upper and lower vertically spaced members, vertically alined bearings carried by said members, an upright rigid shaft journalled for rotation within said bearings, one of said bearings being formed to resist end thrust imposed upon said shaft, a deck secured to and being freely revolvable with said shaft above said support, a motor supported by and being revolvable with said deck, a flexible power transmitting shaft having one end permanently drivingly connected to the motor shaft while its opposite end is universally movable, means forming an annular groove surrounding said motor for confining said flexible shaft in coil formation, and a manipulating handle secured to said deck and extending centrally across the top of said motor for bodily revolving the motor and said shaft coiling groove.

3. A portable power tool driving unit comprising, a portable structure having vertically spaced and alined bearings associated therewith, a vertical pivot shaft journalled for free rotation within said bearings and having a deck secured thereto above said portable structure, a motor carried by and being freely bodily revolvable with said shaft and deck, an elongated flexible shaft drivingly connected at one end to the motor shaft while its opposite end is freely universally movable, means forming an upwardly open peripheral groove carried by said deck and surrounding said motor for receiving and confining said flexible shaft in coil formation, and a manipulating handle secured to said deck for bodily revolving said motor and said shaft coiling groove.

4. A portable power tool driving unit comprising, a portable structure having vertically spaced and alined bearings associated therewith, a vertical pivot shaft journalled for free rotation within said bearings and having a deck secured thereto above said portable structure, a motor carried by and being freely bodily revolvable with said shaft and deck, and a manipulating handle secured to said deck and bridging said motor for effecting rotation and bodily removal of the deck and motor.

5. A portable power tool driving unit comprising, a portable structure having vertically spaced and alined bearings associated therewith, a vertical pivot shaft journalled for free rotation within said bearings and having a deck secured thereto above said portable structure, a motor carried by and being freely bodily revolvable with said shaft and deck, a manipulating handle secured to said deck and bridging said motor for effecting rotation and bodily removal of the deck and motor, a flexible shaft driven by said motor, and a coiling reel for said flexible shaft carried by said pivot shaft.

6. A portable power tool driving unit comprising, a movable support having vertically alined bearings disposed centrally thereon, a rigid upright shaft journalled for free rotation within said bearings, a horizontal deck secured to the upper end of said shaft and having an annular peripheral groove, an electric motor mounted upon said deck centrally of said groove, a flexible shaft drivingly connected to said motor and being adapted for disposition in coil formation within said groove, and a manipulating handle secured to said deck for bodily revolving both said motor and said groove.

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