PORTABLE MOTOR OPERATED HAND SCROLL SAW

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PORTABLE MOTOR OPERATED HAND SCROLL SAW

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My invention relates to improvements in portable motor operated, hand scroll saws for cutting sheet material, especially, although not necessarily.

The primary object of my invention is to provide a simple form of inexpensive hand scroll saw with a motor drive and which is better adapted for scroll sawing sheet material than stationarily mounted scroll saws, is not liable to get out of order, and is designed for smooth operation with a reciprocating saw blade.

Other and subordinate objects, within the purview of my invention, together with the precise nature of my improvements will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in vertical section, with parts shown in elevation, of my invention in a preferred embodiment thereof;  

Figure 2 is a fragmentary view in vertical section taken on the line 2-2 of Figure 1;  

Figure 3 is a fragmentary view in vertical section taken on the line 3-3 of Figure 2 with parts eliminated for clearness of illustration;  

Figure 4 is a fragmentary view in horizontal section taken on the line 4-4 of Figure 1;  

Figure 5 is a detail fragmentary view in plan, partly broken away and shown in section;  

Figure 6 is a view in vertical section taken on the line 6-6 of Figure 1;  

Figure 7 is a view in front elevation drawn to a smaller scale, and partly broken away.

Referring to the drawings by numerals, according to my invention, as illustrated, a hand scroll saw is provided comprising a generally rectangular base, shoe plate 4 with upturned front and rear ends 2, 3, and adapted to be slid over sheet material to be sawed.

The shoe plate 4 has formed thereon, adjacent what constitutes the outer side edge of the same, an aperture 7 in which the usual saw blade 5 is reciprocated vertically, by means presently described, in a plane at a right angle to the plane of said plate. Between the aperture 4 and the rear side edge of said plate 1 is an elongated cast bracket 8 upstanding from said plate to extend longitudinally thereof parallel with the side edges of the plate and terminating at the rear end of said plate 1 in a loop handle 7. Screws 6 secure the bracket 8 on said plate 1.

A motor casing 9 of generally cylindrical shell form, with a closed rear end 10, and internal front end lugs 11, extends endwise across the bracket 8, and across said plate 1, forwardly of the handle 7 and has a pending bottom lug 12 pivoted by a pivot pin 13 in said bracket 8 so that the motor casing 9 is tiltable vertically about an axis transverse to said plate 1 and parallel with the line of movement of said plate over the work. A suitable wing head latching bolt 14 threaded into the bracket 6 to be turned against the lug 12 is provided for retaining the motor casing 9 in different tilted positions, for a purpose presently seen.

A substantially annular plunger head 15 with an open front side 16, vertically aligned top and bottom bosses 17, 18 thereon and a closed rear side 19 is fixed to the front end of the motor casing 9 concentrically thereof by screws 20 passing through said side 18 and into the lugs 11. A closure plate 21 is secured to the front side 16 of said head 15 by screws 22. As will be seen, the described head 15 is tilttable with the motor casing 9.

An electric motor 23 is secured in the motor casing 9 with its armature shaft 24 coaxial with that of said casing and running in a bearing 25 provided in the rear end 10 of said casing 9 and adapted to be lubricated through an oil plug 26. Lugs 27 on the front end of the motor 23 are bolted, as at 28, to a cross support 29 in said motor casing 9.

A train of reduction gearing 30 in the front end of the motor casing 9 operatively connects the armature shaft 24 to a short driven shaft 31 journaled in the rear side 19 of said head 15 in axial alignment with said shaft 24. The reduction gearing 30 comprises a pair of relatively small and large driving and driven gears 32, 33 fast on the armature shaft 24 and driven shaft 31 and a pair of reduction gears 34 meshing, respectively, with the gears 32, 33 and fast on a shaft 35 journaled in the cross support 29 in bearings 36 in said casing 9.

An eccentric 37 is fast on the front end of the driven shaft 31, in said head 15, in the rear of the head, also a fly wheel 38 between the eccentric 37 and the rear side 19 of said head 15 suitably counter weighted, as shown at 39, to counter balance the eccentric 37.

The eccentric 37 fits and revolves between a pair of vertically spaced collars 40 fixed by pins 41 on a vertical plunger shaft 42 arranged to reciprocate and rotate in the vertical axis of the head 15 and the aperture 4 with its lower end extending through and below boss 18 by way of a guide bore 43 in said boss, said saw blade 5 being secured in a vertical slot 44 in the lower end of said shaft by screws 45.

The plunger shaft 42 terminates at its upper end in said head 15 and is rotatable in said bore 43 and in a pair of upper and lower sectional cap bearings 45, 47 secured together and to the rear side 19 of the head 1 by bolts 48. Lubricating glands 49, 50 are threaded in the upper and lower bearings 45, 47 against packing 49, 50.

A pair of upper and lower expansion coil springs 51, 52 surround the plunger shaft 42, one inter-
mediate the upper collar 40 and the bearing 46, and the other intermediate the lower collar 40 and the gland 55, and which balance said shaft in an intermediate normal position.

Means are provided for setting the plunger shaft 42 into different angular positions, by rotating the same to correspondingly set the saw blade 5 and now to be described. At the top of the head 15 is a hand wheel 53 fast on the upper end of a saw setting shaft 54 vertically aligned with the plunger shaft 42 and having a lower squared end 55 slidable in a square axial socket 56 provided in the upper end of said shaft 42. The saw setting shaft 54 is rotatable in a packing gland 57 set into the upper boss 17 with the setting shaft 54 extending therethrough to said head 15. A cap plate 58 on said boss 17 secured thereto by screws 59 retains the packing gland 57 in its place. A collar 60 fixed to said collar 54, as at 66' and forming part of the said gland 57 prevents upward thrust of said shaft 54. A hub 61 on the hand wheel 53 prevents downward play of said shaft 54. A cam 62 with a hand lever 63 thereon is pivoted as at 64, on top of the cap plate 58 to be wedged against the hub 61 and thereby hold the hand wheel 53, the saw setting shaft 54, and plunger shaft 42 and saw blade 5 in different set positions in which the saw blade 5 is oblique to the line of movement of the shoe plate 1.

A suitable switch 66 operated by a finger piece 68 is provided on the handle 1 for controlling the motor 23 which may be provided with the usual plug in lead cables, not shown, for connection to a wall socket, or the like, not shown.

In operating the described hand scroll saw, the same is pushed along the work, not shown, with the shoe plate 1 sliding over the work. With the motor 23 running, the plunger shaft 42 is reciprocated with the saw blade 5 by the eccentric 37 working between the collars 40 and in opposition to the springs 52, 53 which tension said shaft 42 against movement in opposite directions from intermediate positions so that said springs function in reciprocating said plunger shaft and to take part of the load off the motor 23. The described reduction gearing 30 provide for the use of a high speed motor 23 with slower reciprocation of the saw 5 as will be apparent. During reciprocation of the plunger shaft 42, the same slides on the squared end 55 of the saw setting shaft 54. By setting the hand wheel 54, in the manner described the saw blade 5 may be adjusted to different angular positions in scroll saving, or like work. By tilting the motor casing 9 into different set positions on the pins 13, and as determined by use of locating bolt 14, the head 15 may be correspondingly tilted to tilt the plunger shaft 42 and the saw blades 5 laterally of the line of the cut as occasion may require in scroll saving work.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention, without further explanation.

Manifestly, the invention, as described, is susceptible of modification, without departing from the inventive concept, and right is herein reserved to such modifications as fall within the scope of the appended claims.

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

1. In a saw of the class described, a motor casing having a motor therein, a hollow head fast on said casing, a reciprocating and rotatable plunger shaft in said head having one end adapted to extend out of the head, a saw blade fixed to said end of said shaft in longitudinal alignment therewith, a drive between said motor and shaft for reciprocating said shaft, a shoe plate for sliding movement over the work, and means to mount said casing on said plate for tilting of the same together with said head, shaft and blade laterally of the line of movement of said plate, and means to rotate said shaft into different set angular positions to correspondingly set said blade in different oblique positions relative to the line of movement of the plate.

2. In a saw of the class described, a motor casing having a motor therein, a hollow head fast on said casing, a reciprocating and rotatable plunger shaft in said head having one end adapted to extend out of the head, a saw blade fixed to said end of said shaft in longitudinal alignment therewith, a drive between said motor and shaft for reciprocating the shaft, a supporting shoe plate for said casing and head and for sliding movement over the work, and means connected to the opposite end of said shaft for rotating the same into different set angular set positions to correspondingly set said blade into different oblique positions relative to the line of movement of said plate comprising a hand wheel rotatable on said head, a setting shaft rotatable by said wheel and splined in said opposite end of the plunger shaft, and a pivoted cam on said head for locking said wheel.

3. In a saw of the class described, a motor casing having a motor therein, a hollow head on said casing, a reciprocating and rotatable plunger shaft in said head having one end adapted to extend out of the head, a saw blade fixed to said end of said shaft in longitudinal alignment therewith, a drive between said motor and shaft for reciprocating the shaft, means supporting said casing and head for sliding movement over the work, and means connected to the opposite end of said shaft for rotating the same into different angular set positions to correspondingly set said blade into different oblique positions relative to the line of movement of said head comprising a hand wheel rotatable on said head, means connecting said wheel to said shaft to rotate said shaft while reciprocating and by rotation of said wheel, and a pivoted cam on said head for locking said wheel.

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