MOUNTING FOR SWITCH ASSEMBLY FOR ROTARY HAMMER DRILL

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MOUNTING FOR SWITCH ASSEMBLY FOR ROTARY HAMMER DRILL
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ABSTRACT OF THE DISCLOSURE

A resilient mounting for a switch assembly mounted in the handle of a rotary hammer drill or other portable tool which in operation is subject to extreme vibration. Such mounting consists of rubber pads mounted on opposite sides of the mounting bracket of the switch assembly. These pads are engaged between the inner surfaces of the handle parts to hold the assembly in place. Vibration transmitted by the handle is absorbed or greatly damped by the pads so that less damaging vibration is transmitted to the switch assembly. The useful life of the switch of such assembly is tripled when the switch assembly is so mounted.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to a portable electrically driven tool, particularly a hammer drill, which provides hammering with rotation or rotation only. Such tools have a switch assembly which includes a moulded base which houses stationary and movable contacts, a composite metal frame member including a mounting bracket, which may have openings, is secured to the moulded base, and an operating superstructure of the trigger type is carried by such frame member. The switch assembly is mounted within the handle for such tool with the trigger projecting therefrom. The method of mounting the switch assembly to avoid its deterioration by excessive vibration is the subject of this invention.

Description of the prior art

The most pertinent prior art patents are:

U.S. 2,571,467 which teaches a switch assembly like that used in this embodiment of the invention mounted within the handle of the tool by bolts or screws;

U.S. 2,500,036 which merely teaches a vibration damping mounting for the handle of a portable percussion tool;

U.S. 2,633,519 which teaches a switch mounted within the cavity of an insulating housing by a resilient U-shaped member which merely forces the switch body against a wall of such cavity;

U.S. 2,977,438 and U.S. 3,215,800 both of which teach the use of sponge rubber to cushion the impact of a magnetic relay core within the housing of the relay; and

U.S. 3,215,807 which teaches a floating mount for a circuit breaker within a conventional housing which renders them resistant to inadvertent tripping.

None of these patents suggest insulating the vibration of a portable tool subject to excessive vibration while in operation from the switch assembly to prolong the life of the switch.

SUMMARY OF THE INVENTION

The essence of this invention is the use of pads of rubber or other resilient material which are engaged in seats on the inside of the parts forming the handle of the rotary hammer drill or other portable tool and engage the opposite sides of the mounting bracket of the trigger operated switch assembly. Pins may also be employed which are engaged in openings in the mounting bracket and fitted in openings in the pads to secure the bracket and switch assembly against undue displacement in use.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a view in side elevation of a rotary hammer drill having a switch assembly mounted in accordance with this invention;

FIG. 2 is a sectional view taken on the meandering line 2—2 of FIG. 1 showing the mounting bracket of the switch assembly, the attached trigger, the resilient pads, and the handle and handle cover; and

FIG. 3 is a fragmentary exploded view in perspective showing the base part of the handle with a seat and a cover for such handle also having a seat and boss, the mounting pads and engaging pins, and the switch assembly including the mounting bracket.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing by reference numerals a portable electric hammer drill indicated generally at 10 is used to illustrate one device using a trigger operated switch assembly which may be mounted in accordance with the teaching of this invention. Such hammer drill is of conventional design and includes a hollow handle formed by a base handle member 12 and a cover 14. A switch assembly of well-known design such as described in U.S. Pat. 2,571,467 is mounted within the confines of the handle so formed.

Such switch assembly has a moulded base or housing 16 which contains the fixed and movable contacts of the switch. To this base is fastened a composite metal member 18 which pivotally supports a trigger 20 and from which integrally projects the switch assembly mounting bracket 22. The trigger 20 is spring biased to off position and is connected by linkage and over center mechanism (both not shown) to the movable contact in the housing 16. The member 12 and cover 14 are each provided with notches 24 (only one shown) which cooperate to provide an opening through which the trigger 20 projects as shown in FIG. 1.

The customary method of mounting the switch assembly within a tool handle was by bolts or screws securing the mounting bracket directly on metal to metal contact with the handle (see U.S. Pat. 2,571,467, col. 5, lines 12—17). Thusly mounted the severe vibration of the tool was transmitted to the switch assembly. Two major damages occurred to the switch assembly as a result. One was that the structural parts of the composite metal member 18, some of which were spot welded to each other, fatigued and separated. Another was that in the closed position of the switch the vibration caused contact bounce and consequent arcing which material reduced the serviceable life of the switch.

According to this invention the base handle member 12 and the cover 14 are provided with internal pads 26 and 28 each of which has a recess or seat 30 and 32 respectively from the base of which project bosses 34 and 36. Rectangular pads 38 and 40 of rubber, or other resilient material such as synthetic rubber known as neoprene, having a diameter of approximately 60 are seated on opposite sides of the mounting bracket 22 and held in place by rolled hollow pins 42 which are press fitted in openings 44 in the bracket 22 and seated firmly in holes 46 formed in the pads 38 and 40. The length of such pins is such that their ends do not extend to the outer surfaces of such pads. The pads 38 and 40 have recesses 48 and 50 which extend inwardly from their outer surfaces. The pads 38 and 40 are seated in the seats 30 and 32 and the bosses 34 and 36 fit within the open-

ings 48 and 50 all with a frictional fit. Thus with the handle cover 14 fastened in place, the switch assembly is completely isolated from any metal to metal contact with the handle of the hammer drill.

The cushioning obtained by thusly mounting the switch assembly has eliminated the breakdown of the composite metal member 18 and the arcing at the contacts to such an extent that the life test of switch assemblies so mounted has been tripled over that of the previous method of mounting.

I claim:

1. A mounting for a switch assembly mounted in the handle of a portable power tool comprising:
   - a portable power tool;
   - a switch assembly having a mounting bracket;
   - resilient pads engaging the sides of said mounting bracket;
   - a handle for said tool having opposing parts forming an interior on which said switch assembly is carried.
   - said opposing parts engaging said pads to hold said switch assembly in place without direct contact between said assembly and said handle.

2. A mounting as set forth in claim 1 wherein:
   - said mounting bracket and said pads having aligned openings therein; and
   - there are metal pins frictionally engaged with said openings in said bracket and pads to hold said pads against said bracket.

3. A mounting as set forth in claim 2 wherein:
   - said opposing parts and said pads having interengaging projections and recesses to lock said parts and pads against lateral displacement.

4. A mounting as set forth in any one of claims 2 and
   - said pads have a durometer of approximately 60.

5. A mounting as set forth in any one of claims 2 and
   - said metal pins are hollow rolled.

References Cited

UNITED STATES PATENTS

1,502,169  7/1924 Bennett --------- 173-170
2,733,621  2/1956 Newman --------- 173-170

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