SPEED-SETTING INDICATORS FOR PORTABLE ELECTRIC TOOLS

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This invention relates to speed-setting indicators for portable electric tools adapted to be used with cutters of various sizes for cutting different materials.

It is known that for each material and cutter size there exists an optimum speed for most efficient removal of material. In a prior United States patent application Serial No. 215, filed January 4, 1960, a built-in speed regulating control system for a portable electric drill is described in which optimum speeds may be set by dialing a specific drill size for a single material. It is desirable to extend this speed setability to other materials ordinarily encountered and the present invention relates to means for its accomplishment.

It is an object of this invention to provide a speed-setting indicator for a portable electric tool having a speed-regulating control system whereby optimum cutting speeds for different cutter sizes and different materials may be conveniently preset.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby, will be readily understood by those skilled in the art.

In the drawings,

FIG. 1 is a side elevational view of a portable electric tool having a portion cut away to show a speed-setting element embodying the invention.

FIG. 2 is an enlarged plan view of the speed-setting indicator shown in FIG. 1.

FIG. 3 is a vertical sectional view, partly in elevation, taken on the line 3—3 of FIG. 2.

FIG. 4 is a plan view, partly in section, taken on the line 4—4 of FIG. 3.

FIG. 5 is a plan view, partly in section, taken on the line 5—5 of FIG. 3.

Referring to the drawings, FIG. 1 shows a portable electric drill 10 having a built-in speed regulating control system of the type shown and described in the United States patent application Serial No. 215, filed January 4, 1960. It is sufficient for the purposes of this invention to point out that 11 designates the speed-setting potentiometer resistance as shown in the reference structure.

The potentiometer 11 is mounted on the handle portion 12 of the drill 10 and is secured thereon by a nut 13 threaded onto a stud portion 14, as seen best in FIG. 3.

A knob 15 is secured to the potentiometer shaft 16 by means of a set-screw 17 and provides means for manually adjusting the setting of the potentiometer 11 and thus for controlling the cutting speed corresponding thereto.

A rotatable index disc 18 is formed with a central circular apertured portion 19 which engages a raised boss 20 formed on the handle portion 12 to provide a bearing structure therefor and thus to confine its movement to a rotary one about the axis of the shaft 16.

A cup 21 pressed into the wall of the handle portion contains a compression spring 22 and a ball 23 urged out of said cup but retained therein by a spun-over edge 24 of the cup. The ball 23 cooperates with depressions 25 made in the under face of the index disc 18 to provide a detent for indexing said disc to several predetermined angular positions. To limit the rotation of disc 18 to a practical range, stop pins 26 screwed into the disc 18 cooperate with arcuate slots 27 in the handle portion 12, as seen best in FIG. 4.

A stationary index mark 28 on the handle portion 12 cooperates with indicia 29 in the form of depressed dots on the index disc 18 corresponding to the material (plastic, wood, steel) to be cut, to provide a movable index means for the knob 15 to effect recalibration of the potentiometer in accordance with the different materials selected. Indicia 30 in the form of depressed dots corresponding to cutter size (in this case, drill bit diameters) cooperate with an index mark 31 on the knob 15 to provide means for setting the potentiometer to correspond to a predetermined optimum speed for the material and cutter size so selected.

It will be understood that matched color coding may be used to facilitate convenience in use, in which case index mark 28 and indicia 29 are made in one color while index 31 and indicia 30 are made in another distinctly different color.

While the invention has been described herein as applied to portable electric drills it is not to be construed as so limited thereto but may be adapted to any portable electric tool wherein two predetermined variables have a direct influence on the optimum operating speed for the conditions imposed. Other possible applications, for example, are for a saber saw and a belt sander. In these cases one variable would be the material to be sawed or sanded and the second variable would be the coarseness of the blade (teeth per inch) and the coarseness of the sanding belt, respectively.

Having thus set forth the nature of the invention, what I claim herein is:

1. An adjustable speed-setting element for a portable electric tool having attachable cutter elements of various sizes, a commutator motor having series-connected field and armature windings and a speed-regulating control system for said motor, comprising knob and pointer means for adjusting said element, and a normally stationary index plate carrying indicia of material kind and cutter size cooperating with said knob and pointer means for adjusting said speed-setting element to a predetermined optimum speed corresponding to a selected material kind and cutter size, said index plate being movable selectively with respect to said speed-setting element to effect recalculation thereof in accordance with the kind of material to be cut.

2. An adjustable speed-setting element for a portable electric tool having attachable cutter elements of various sizes, a driving electric motor therefor and a speed-regulating system for said motor, comprising means for adjusting said speed-setting element including a knob, a normally stationary index plate, means for indexing said knob relatively to said plate and means for angularly moving said index plate relatively to a stationary index in accordance with the kind of material to be cut.

3. A speed-setting indicator for a portable electric tool having a speed-regulating control system comprising a
speed-setting element, a shaft for adjusting the element, a knob secured to said shaft, an index plate selectively rotatable about the axis of said shaft, first indicia carried by said index plate corresponding to kind of material and second indicia carried by said index plate corresponding to cutter size, stationary marker means cooperating with said first indicia for indexing said index plate in accordance with the kind of material to be cut, and marker means on said knob cooperating with said second indicia for indexing said knob in accordance with the cutter size.

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