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MOTOR DRIVEN SHARPENER FOR EDGED TOOLS

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Fig. 1.

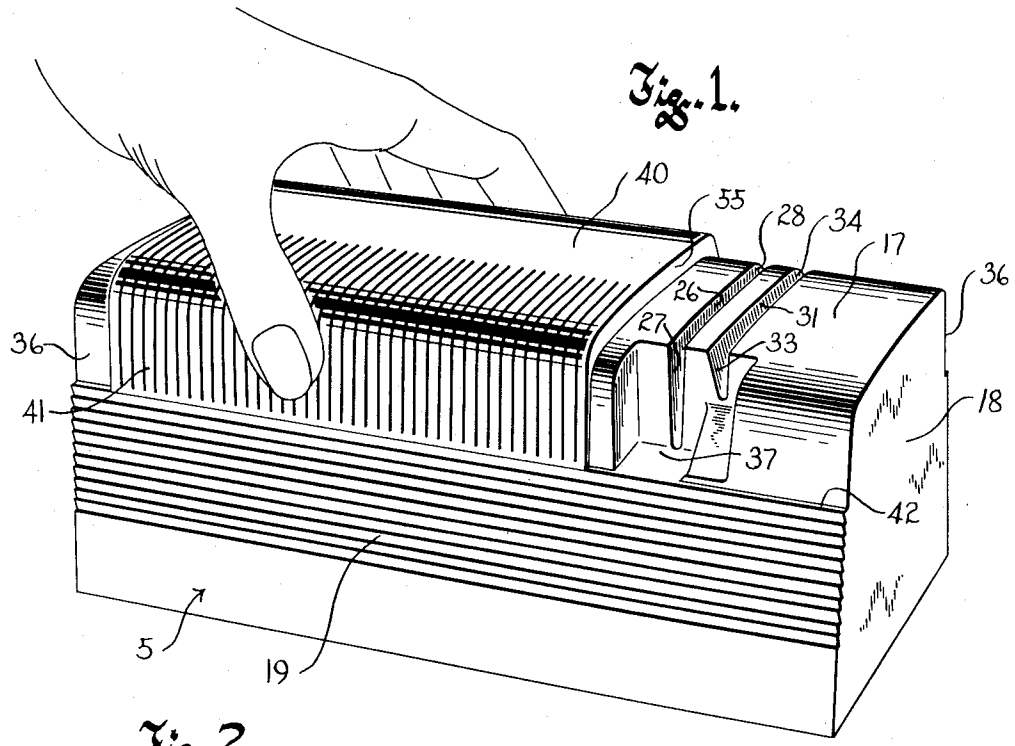
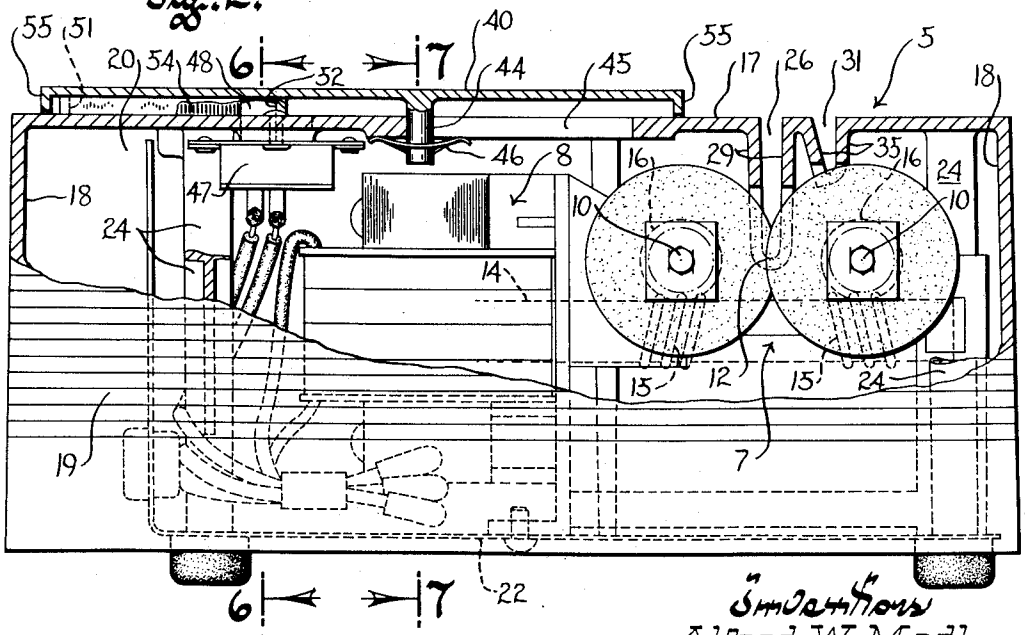


Fig. 2.



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Fig. 3.

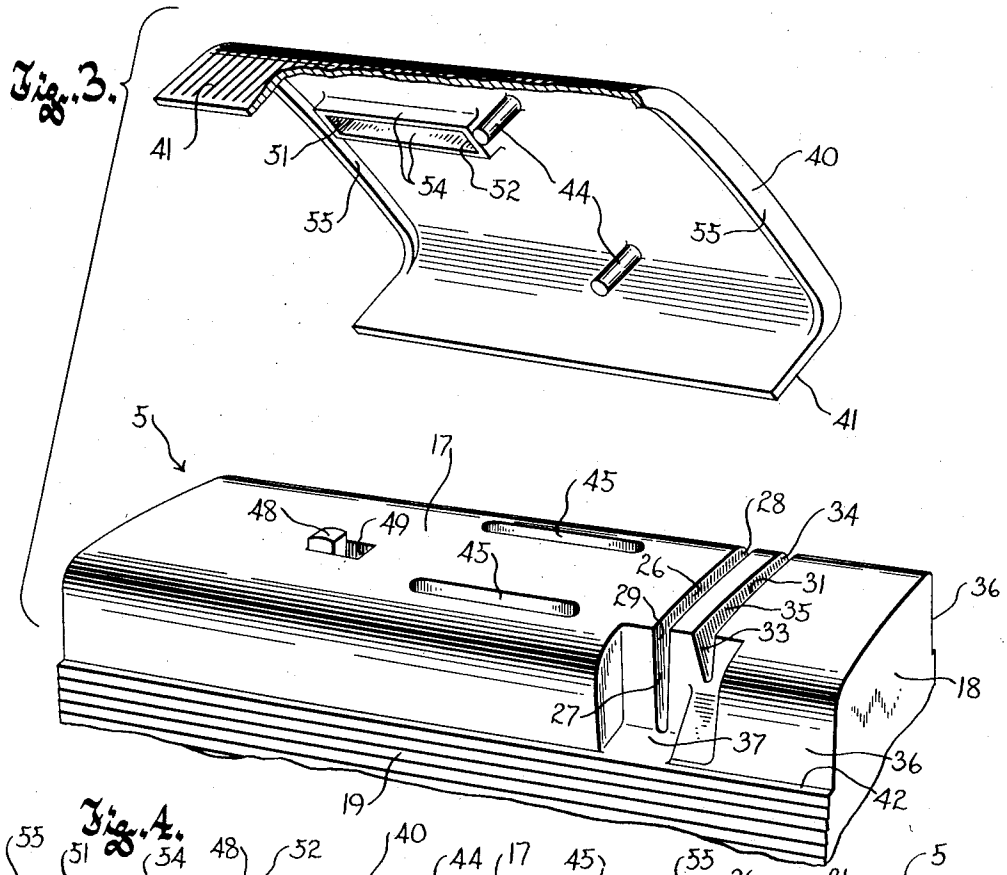


Fig. 4.

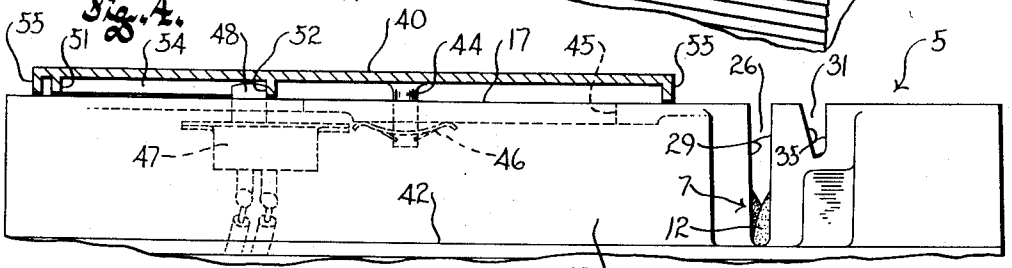
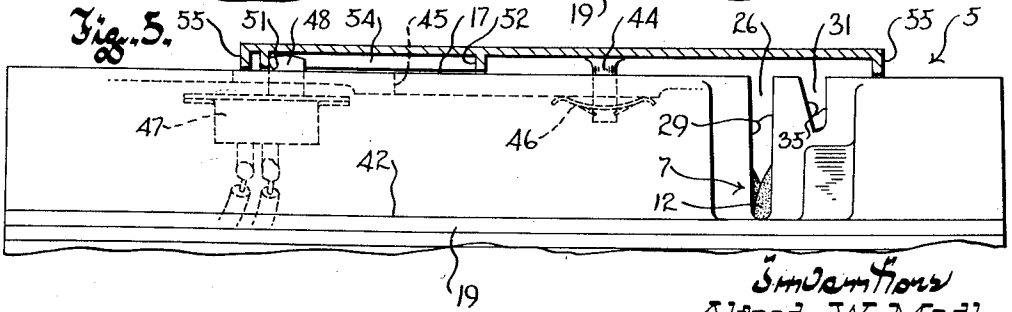


Fig. 5.



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Fig. 6.

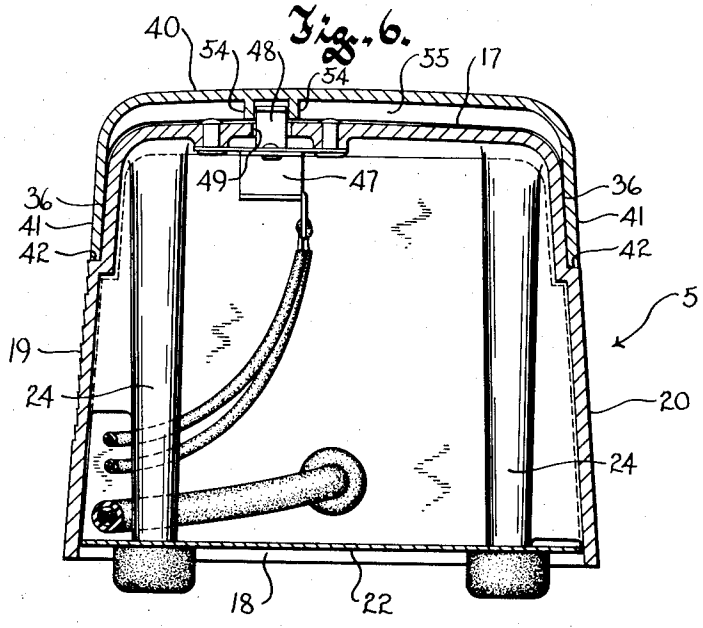
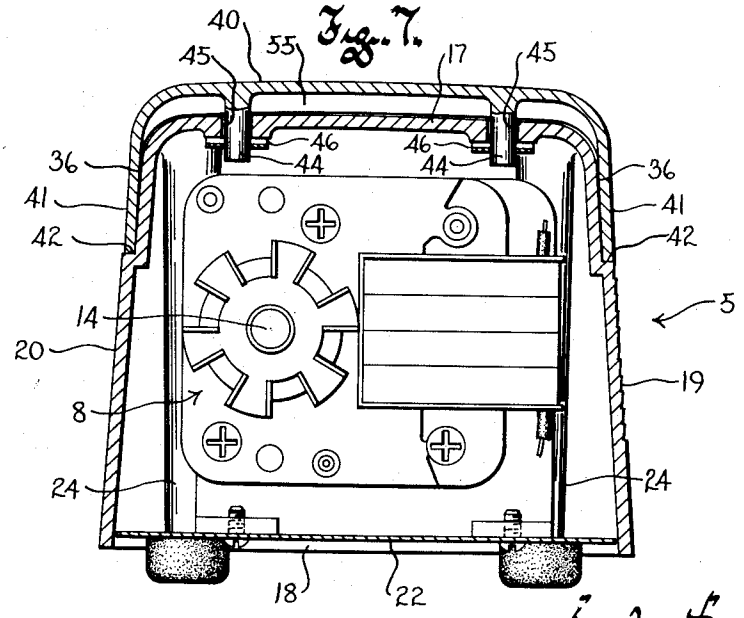


Fig. 7.



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MOTOR DRIVEN SHARPENER FOR EDGED TOOLS

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Application August 22, 1957, Serial No. 679,617

5 Claims. (Cl. 51—80)

This invention relates to sharpeners for edged tools, and refers more particularly to a sharpener comprising rotatable abrasive means driven by an electric motor and which is especially intended for home use in sharpening knives, scissors and the like.

In general, the object of this invention is to provide an improved knife and scissors sharpener of the character described having a number of unusual features and advantages, many of which will become apparent from the following description and the annexed claims.

A specific object of this invention resides in the provision of an unusually attractive motor driven grinding tool for household use, especially adapted for sharpening knives and scissors, which is provided with a slidable cover that conceals and protects the abrasive wheels when the machine is not in use, not only enhancing the appearance of the machine but also preventing any possibility of dirt or foreign matter falling onto the abrasive wheels or into the mechanism by which they are rotatably driven.

It is also an object of this invention to provide a motor driven knife and scissors sharpener especially suited for home use, wherein a sliding cover which conceals and protects the abrasive wheels when the machine is not in use also actuates a switch by which energization of the motor is controlled, so that movement of the cover to its inoperative position, covering the wheels, actuates the switch to its "off" position, and movement of the cover to its operative position, permitting access to the wheels, actuates the switch to its "on" position.

Another object of this invention resides in the provision of a sharpener having a pair of motor driven abrasive wheels rotatable on parallel axes and disposed in overlapping axially adjacent relationship, which sharpener features means for guiding a knife blade to be sharpened into grinding engagement with both abrasive wheels in the zone of their overlapping peripheries, and means for guiding a scissors blade into grinding engagement with another peripheral zone of one of the abrasive wheels, near the top thereof, to thus assure that each type of edged tool will be properly sharpened by the machine.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a front perspective view of the sharpening machine of this invention;

Figure 2 is a front elevational view of the machine with portions of the housing and cover broken away and shown in section;

Figure 3 is a fragmentary perspective view of the sharpening machine of this invention with the cover removed and having portions broken away;

Figure 4 is a fragmentary view, partly in side elevation and partly in longitudinal section, showing the machine of this invention with the cover thereof in its operative position;

Figure 5 is a view similar to Figure 4 but showing the machine with the cover in its inoperative position;

Figure 6 is a cross sectional view taken on the plane of the line 6—6 in Figure 2; and

Figure 7 is a cross sectional view taken on the plane of the line 7—7 in Figure 2.

Referring now more particularly to the accompanying drawings in which like numerals designate like parts throughout the several views, the numeral 5 designates generally a housing for the edged tool sharpener of this invention, which encloses a grinding mechanism preferably comprising a pair of abrasive wheels 7 and an electric motor 8 by which the wheels are rotatably driven.

The mechanism inside the housing, comprising the motor and abrasive wheels, may be like that shown in the patent to M. I. Fillweber No. 2,707,852. In general the abrasive wheels are mounted on shafts 10 extending crosswise of the housing and journaled in suitable bearings (not shown) by which the wheels are supported with their axes horizontal and parallel to one another, and spaced apart a distance slightly less than the diameter of one of the abrasive wheels, so that peripheral portions of the wheels overlap one another slightly, as at 12. The wheels are disposed in axially adjacent relationship, with one slightly behind the other.

The motor has an elongated shaft 14 which extends lengthwise of the housing, transversely to the wheel axes and below them. The driving connection between the motor and the abrasive wheels may be provided by a pair of worms 15 on the motor shaft, each of which is in meshing engagement with a worm wheel 16 coaxially secured on the shaft of one of the abrasive wheels. The two worms 15 are threaded in opposite directions so as to rotate the wheels in directions to move their overlapping peripheral portions upwardly away from one another.

The housing which encloses the mechanism just described has a top wall 17, opposite end walls 18, and front and rear walls 19 and 20, respectively, and may be formed as an integral unit, either as a plastic molding or as a metal die casting. The housing is open at its bottom to fit over a base 22 upon which the motor and abrasive wheels are mounted. Bosses 24 extend downwardly from the top wall of the housing to engage the upper surface of the base and provide for securement of the housing thereto in any suitable manner.

To enable a knife blade to be brought into grinding engagement with the peripheral surfaces of the abrasive wheels in the zone of their overlapping peripheries, the upper portion of the housing has a slot 26 extending transversely thereacross, vertically aligned with the overlapped peripheral portions of the abrasive wheels and extending downwardly into the front and rear walls of the housing, as at 27 and 28. The housing is also provided with wall portions 29 which form the sides of this slot and define a channel in which a knife blade to be sharpened on the abrasive wheels may be guided. This channel is substantially U-shaped in cross section in front of and behind the wheels, but its lower portion is cut away in the neighborhood of the wheels to provide clearance for them, as best seen in Figure 2. It will be observed that the U-shaped cross section of the channel helps to

prevent dirt and foreign matter from falling into the interior of the housing through the slot.

It will be apparent that when a blade is inserted into the slot **26** to be grindingly engaged by the peripheries of both abrasive wheels near the zone of their overlap, the edge portion of such blade will be substantially uniformly ground at both faces thereof. While it is very desirable to grind a knife blade in this manner, the blade of a scissors must be ground only on its chamfered face, and the machine of this invention therefore incorporates special provision for insuring the proper grinding of scissors blades. To this end the top wall of the housing has a second upwardly opening slot **31** extending transversely thereacross, parallel to the slot provided for the accommodation of knife blades, and spaced therefrom a distance such that said second slot **31** leads downwardly and provides access to one of the abrasive wheels at a zone near the top thereof. The slot **31**, like the knife blade slot, continues downwardly into the front and rear walls, as at **33** and **34**, and wall portions **35** on the housing extend downwardly into this scissors blade slot to provide it with a generally U-shaped cross section except in the neighborhood of the abrasive wheel.

It will be seen that a scissors blade inserted into the slot **31** will be guidingly held thereby at a proper angle of presentation to the periphery of the adjacent abrasive wheel to insure that the chamfered face of the blade will be properly ground.

Both the front and rear walls of the housing have their upper portions inwardly offset, as at **36**, for reasons explained hereinafter, but in addition to this offset the front wall **19** has a substantially deep inwardly offset recess portion **37** in the neighborhood of the overlapping peripheral portions of the two abrasive wheels. This recess accommodates the handle of a knife or scissors being sharpened on the machine and thus assures that the adjacent rear portion of the blade can be properly presented to and sharpened by the grinding wheels.

When the knife sharpener of this invention is not in use, the knife and scissors blade slots are both closed by a substantially channel shaped cover **40** which overlies the top wall of the housing and has its leg portions **41** extending downwardly and overlying the inwardly offset upper portions of the front and rear walls. Each of these inwardly offset wall portions defines an upwardly facing horizontal ledge **42** which extends along the entire length of the housing, and the lower edges of the legs of the cover ride on these ledges to mount the cover for endwise sliding motion on the housing. The cover is substantially shorter than the housing, being preferably about two-thirds of the length of the housing.

To hold the cover in place on the housing, transversely spaced studs or pins **44** project downwardly from the medial portion of the cover through lengthwise extending slots **45** in the top wall of the housing, and spring clips **46** (so-called speed nuts) or similar securement means on the lower end portions of the studs engage the underside of the housing top wall to retain the cover against upward displacement off of the housing. The limits of endwise travel of the cover are defined by the ends of the slots **45**, and these constrain the cover to motion between an inoperative position (shown in Figure 5) in which it entirely covers the knife and scissors slots and the recessed portion of the front wall, and an operative position (shown in Figure 4) in which its end adjacent the slots is spaced well to one side of the slots.

Movement of the cover to its operative or its inoperative position also actuates a switch **47** by which energization of the motor is controlled. The switch may be of a conventional type, with an actuator **48** that is movable back and forth to effect switch operation, and it is preferably mounted on the underside of the top wall of the housing with its actuator projecting upwardly through a lengthwise extending slot **49** in said wall.

On its underside the cover has a pair of opposing spaced apart abutments **51** and **52** which are adapted to engage the actuator of the switch and move it to the "switch on" position when the cover is moved to its operative position and to the "switch off" position when the cover is moved to its inoperative position covering the blade slots. The distance between the abuments **51** and **52** is of course no greater than the length of the slots **45** in which studs **44** travel, less the distance through which the switch actuator travels between its "off" and its "on" positions.

To insure adequate rigidity to both the cover and the abutments **51** and **52**, the abutments preferably comprise the end walls of a substantially rectangular or box-like trough which projects downwardly from the cover and which also includes side walls **54** spaced apart a distance to slidingly clear the switch actuator. To provide room for this trough-like structure, the underside of the cover is spaced above the top wall of the housing by the engagement of the legs **41** of the cover with the ledges **42** on the housing, and downwardly projecting flanges **55**, extending across the ends of the cover, snugly engage the top wall of the housing to close the space between the cover and the housing top wall.

From the foregoing description taken together with the accompanying drawings it will be apparent that this invention provides a motor driven sharpening tool for household use, having special provision for the sharpening of knife blades and scissors blades, to assure that each type of cutting tool will have the proper type of edge ground thereon. It will also be apparent that the sharpener of this invention has a protective and ornamental cover, slideable to and from a position covering the abrasive wheels and closing off the grinding mechanism, which cover also actuates a switch whereby energization of the motor is controlled, so that movement of the cover to its inoperative position, covering the slots which afford access to the abrasive wheels, causes deenergization of the motor, and movement of the cover to its operative position, uncovering the slots, effects starting of the motor.

What we claim as our invention is:

1. In a knife sharpener having a rotatable abrasive wheel and an electric motor drivingly connected with the abrasive wheel: a housing having end walls and top, front and rear walls, said housing enclosing the abrasive wheel and the motor but having a groove-like opening extending transversely across its top wall and downwardly into the front and rear walls and into which opening a knife blade may be inserted to be engaged against the abrasive wheel; a switch for controlling energization of the motor, mounted in the housing between said opening and one end wall of the housing, said switch having an actuator movable back and forth, endwise of the housing, between "on" and "off" positions; a cover overlying a portion of the top wall of the housing; cooperating means on said cover and the housing mounting the cover for endwise sliding motion over the top wall of the housing to and from a position covering said groove-like opening; and opposing lengthwise spaced apart abutments on the underside of the cover engageable with the actuator of the switch to move said actuator to its "on" position upon sliding of the cover to a position uncovering said groove-like opening in the housing and to its "off" position when the cover is shifted to a position covering said opening.

2. In a knife sharpener having a rotatable abrasive wheel and an electric motor drivingly connected with the abrasive wheel: a housing enclosing the abrasive wheel and motor and having a top wall and opposite side and end walls, the side walls having their upper portions inwardly offset relative to their bottom portions and one of said side walls having an offset recess in its upper portion near one end of the housing, said housing having a transverse slot in its top wall opening to the abrasive wheel and which is continuous with an upwardly opening

slot in said recess in the one side wall and with an upwardly opening slot in the opposite side wall, in which slot the blade of an edged tool is adapted to be inserted for engagement with the periphery of the abrasive wheel; a substantially channel-shaped cover overlying the top wall of the housing and having its legs closely overlying the inwardly offset upper portions of the side walls, said cover being substantially shorter than the housing; means mounting the cover on the housing for sliding motion lengthwise of the housing to and from a position covering said slot; a switch for controlling energization of the motor mounted on said housing, under the cover, said switch having an actuator movable back and forth, endwise of the housing, to "off" and "on" positions; and opposing abutments on the cover, engageable with the actuator on said switch, for moving the switch to its "on" position in consequence of moving the cover to a position uncovering the slot, and to its "off" position in consequence of movement of the cover to a position covering the slot.

3. A blade sharpening tool having an abrasive wheel, a motor drivingly connected with the abrasive wheel, and a housing enclosing the abrasive wheel and motor and having a top wall and opposite side and end walls: said tool being characterized by the fact that said housing has a slot extending transversely across its top wall and continuing downwardly partway into each side wall, said slot being in vertical alignment with one zone of the periphery of the abrasive wheel so that a blade to be sharpened can be brought into grinding engagement with said zone of the abrasive wheel through said slot and will be guidingly confined by the edges of the slot during such engagement; further characterized by a second slot extending across the top wall of the housing, substantially parallel to and spaced from the first and continuing partway down into at least one side wall, and said second slot being in vertical alignment with, and providing access to, another zone of the periphery of the abrasive wheel for sharpening of another type of blade, and further characterized by a substantially channel shaped cover mounted on the top of the housing and having leg portions extending downwardly, partway over each side wall, at least as far as the bottoms of said slots, said cover being mounted for sliding motion to and from a position covering said slots.

4. The blade sharpening tool of claim 3, further characterized by the fact that each of the side walls of the housing has its upper portion inwardly offset to provide a narrow upwardly facing ledge extending the full length of the housing, below the bottoms of the slot portions in the side walls; further characterized by the fact that the bottom edges of said leg portions of the cover slidingly rest on said ledges; and further characterized by members on the cover projecting downwardly therefrom through lengthwise extending slots in the top wall of the housing, and securment means on said members engaging the underside of the top wall of the housing to confine the cover against upward displacement relative to the housing.

5. In a blade sharpening tool having an abrasive wheel rotatably driven by an electric motor and a housing enclosing the motor and the abrasive wheel, said housing having a slot therein aligned with the abrasive wheel and into which a blade may be inserted to be guided for sharpening engagement with the abrasive wheel: a cover; means mounting said cover to overlie a wall of the housing and to slide in opposite directions to and from a position covering said slot; said mounting means including inwardly projecting members on the cover extending through apertures in said wall of the housing which are elongated in said directions, and securement members on the inner ends of said projecting members, underlying said wall of the housing holding the cover on the housing and confining it to sliding motion in said directions; a switch for controlling energization of the motor, mounted on the housing under said cover, said switch having an actuator extending through said housing wall and movable in the same directions as the cover to "off" and "on" positions; and abutments on the cover, engageable with the switch actuator to move the latter to is "off" position in consequence of movement of the cover to its position covering said slot and to its "on" position in consequence of movement of the cover to a position uncovering said slot.

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