

- [54] **DRILL SHARPENER**
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 [58] **Field of Search**..... 51/73 R, 102, 128, 51/219 R, 241 R

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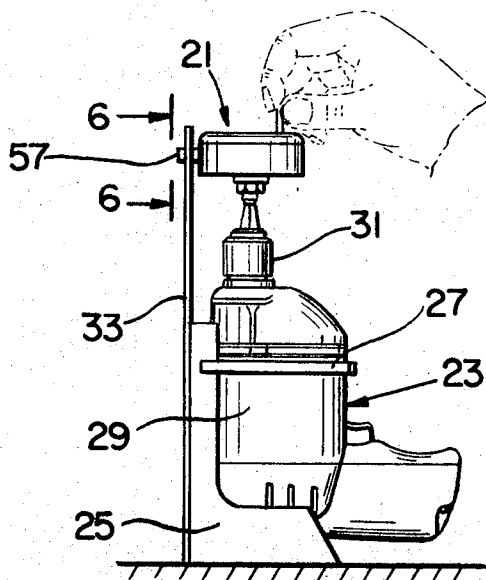
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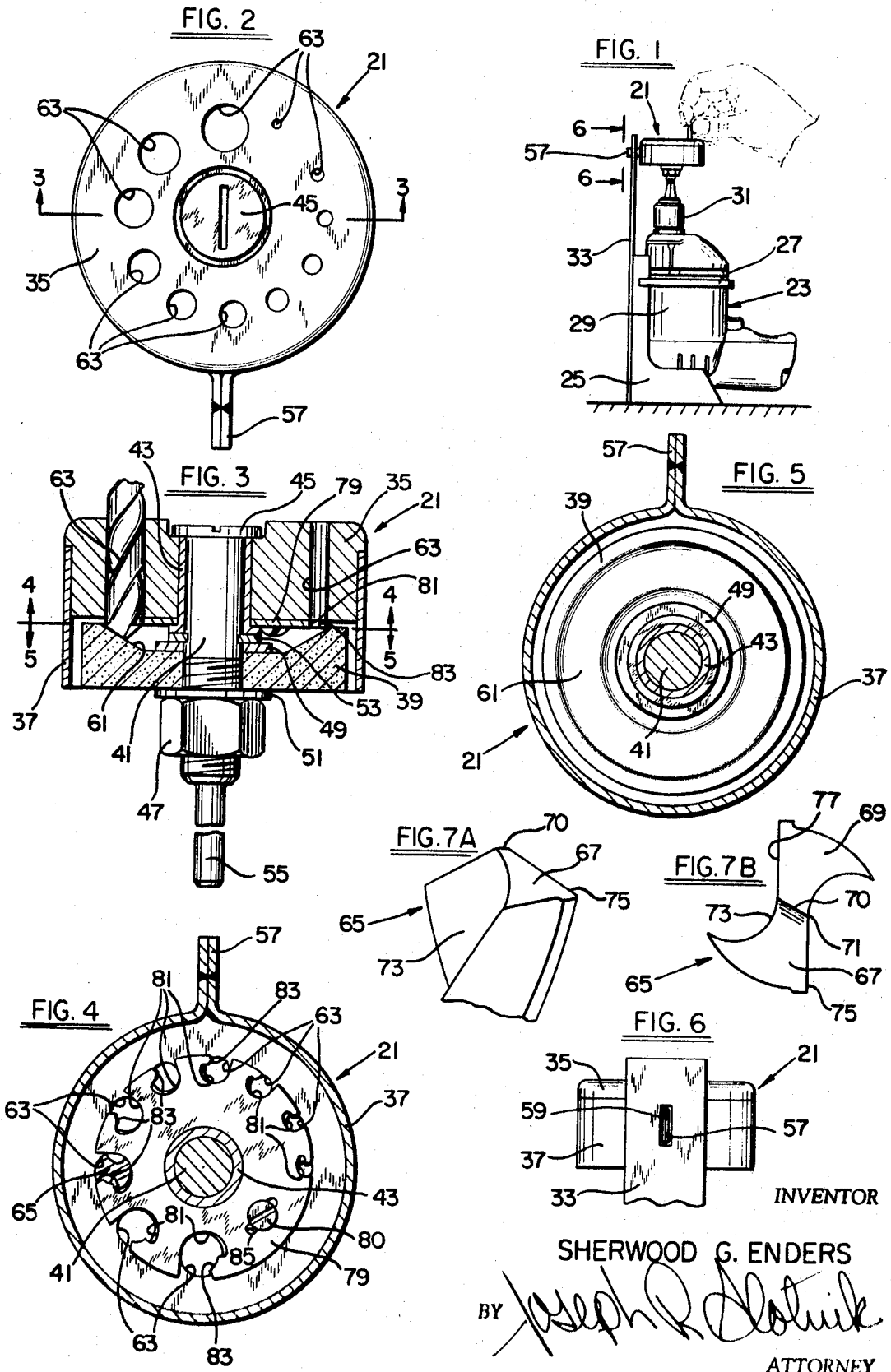
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[57] ABSTRACT

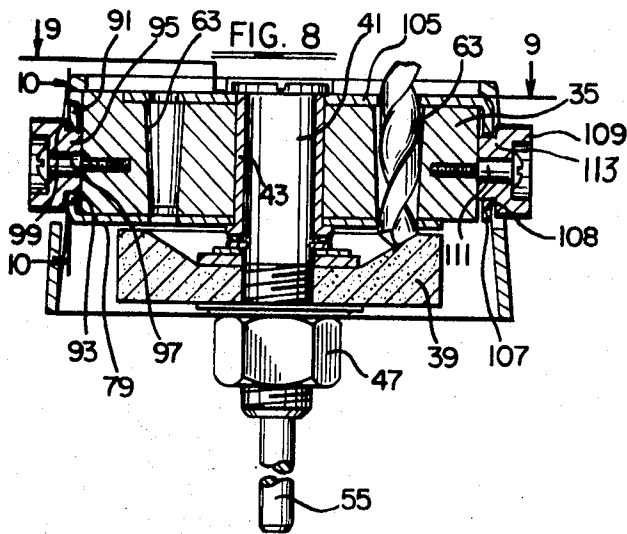
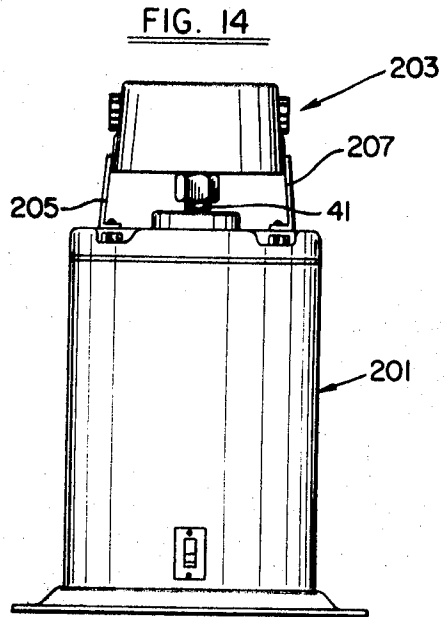
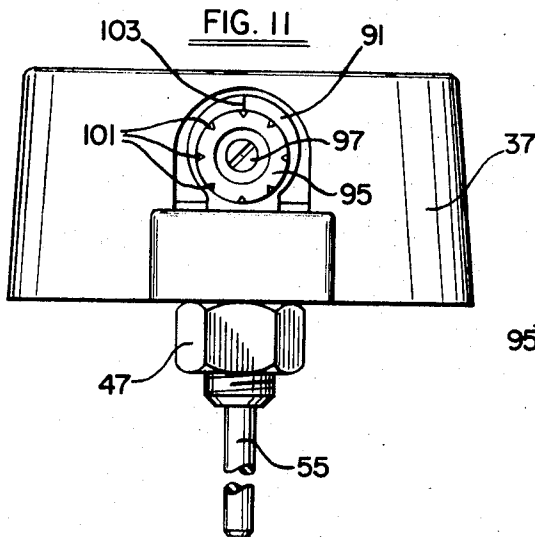
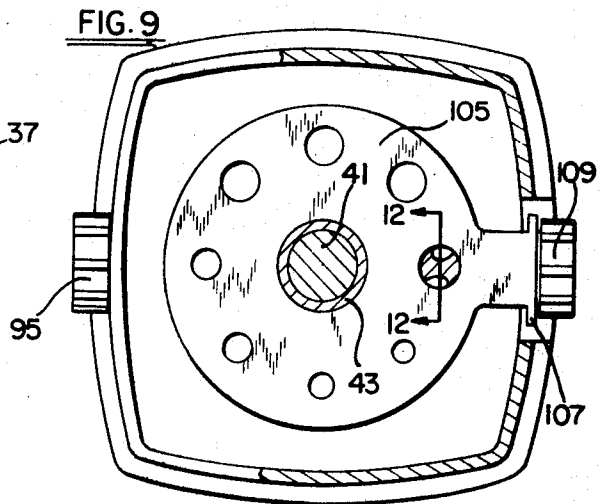
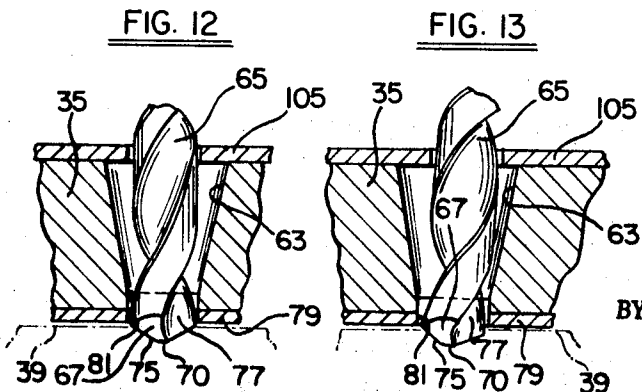
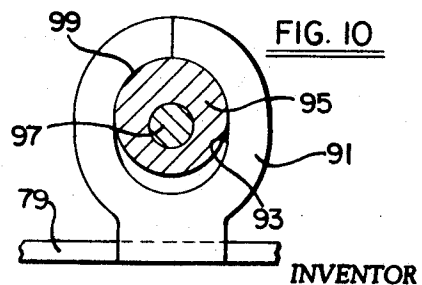
A drill sharpener including a stationary body having a plurality of different sized, generally parallel openings therethrough adapted to receive drill bits of different diameters. A rotatable grinding wheel is disposed beneath the body and has a cupped, conical sharpening surface aligned with the openings. Indexing means, which may be adjustable, is provided which engages at least one flute of a drill bit positioning one of the openings and properly positions the cutting land of that bit relative to the sharpening surface. The device may either be an attachment for another tool such as a drill, or it may be embodied in a self-contained unit having its own prime mover.

16 Claims, 15 Drawing Figures





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DRILL SHARPENER

SUMMARY OF THE INVENTION

The present invention is directed to a very simple, inexpensive, and reliable sharpening device capable of enabling the skilled as well as the unskilled to quickly and easily sharpen a variety of conventional sized drill bits. The device is small and compact and may be employed as an attachment for a conventional power drill or it may be a self-contained unit having its own prime mover. Means is provided to angularly position the drill bits for proper sharpening, and this means preferably is adjustable to compensate for tolerance variations, bit variations, wear of the bit, etc.

Main objects of the present invention are to provide a novel drill bit sharpener capable of sharpening a variety of different bits quickly, easily and accurately.

Further important objects of the present invention are to provide a novel drill bit sharpener of the above character which is readily adjustable to accommodate variations in drill bits, which is made up of a minimum of separate parts, and which is equally adapted for use as an attachment or as a self-contained unit.

Additional important objects of this invention are to provide a novel sharpener of the above character which is relatively inexpensive to manufacture, rugged in construction, and reliable in use.

Other objects and advantages of the invention will become more apparent from a consideration of the detailed description to follow taken in conjunction with the drawings annexed hereto.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view illustrating the sharpener of the present invention constructed and embodied as an attachment for a portable electric drill;

FIG. 2 is an enlarged top plan view of the sharpener of FIG. 1;

FIG. 3 is a sectional view of the structure of FIG. 2 taken along the line 3—3 thereof;

FIG. 4 is a sectional view of FIG. 3 taken along the line 4—4 thereof and looking in the direction of the arrows;

FIG. 5 is a sectional view of FIG. 3 taken along the line 5—5 thereof and looking in the direction of the arrows;

FIG. 6 is an enlarged view of a portion of FIG. 1 taken along the line 6—6 and looking in the direction of the arrows;

FIG. 7A is an elevational view of the cutting end of a conventional drill bit;

FIG. 7B is a plan view of FIG. 7A;

FIG. 8 is a view similar to FIG. 3 but showing a modified form of the invention;

FIG. 9 is a sectional view of FIG. 8 taken along the line 9—9 thereof;

FIG. 10 is an enlarged sectional view of FIG. 8 taken along the line 10—10 thereof;

FIG. 11 is an elevational view of FIG. 8;

FIG. 12 is an enlarged sectional view taken along the line 12—12 of FIG. 9 and illustrating a drill bit in position in the unit for normal clearance;

FIG. 13 is a view similar to FIG. 12 but illustrating parts position for increased clearance; and

FIG. 14 is an elevational view illustrating the present invention in a self-contained unit.

BROAD STATEMENT OF THE INVENTION

Broadly described, the present invention relates to a drill sharpener including a stationary body, an abrasive wheel supported adjacent said body and rotatable about a central axis, said wheel having a cupped concave conical surface symmetrical with its rotational axis and facing said body, said body having a plurality of different sized, spaced longitudinal passages therethrough having their longitudinal axes generally parallel to one another and to said axis and aligned with said conical surface, and means on said body engageable with at least one flute of drill bits positioned in said openings, and of a dimension to substantially engage opposite sides of said flute and stationarily position said bit during sharpening, whereby to substantially prevent rotation of and accurately position a cutting land of each of said bits relative to said abrasive wheel surface.

In still another aspect, the present invention relates to a drill sharpener comprising a stationary body, an abrasive wheel rotatably supported adjacent said body for rotation about a central axis and having a cupped concave conical surface facing said body, passage means defined by said body aligned with said conical surface and parallel to said axis and adapted to receive selective drill bits for sharpening by said abrasive wheel, and means on said body adjacent said abrasive wheel receivable in one of the flutes of a drill bit located in said passage means to angularly locate one cutting land of said bit for sharpening by the conical surface of said abrasive wheel, said angular locating means being adjustable relative to said body to compensate for manufacturing and wear differences in said bits.

In yet another aspect, the present invention relates to a drill sharpener including a stationary body, an abrasive wheel supported adjacent said body and rotatable about a central axis, said wheel having a cupped conical surface symmetrical with its rotational axis and facing said body, said body having a plurality of different sized, spaced passages therethrough generally parallel to one another and to said axis and aligned with said conical surface, and means on said body engageable with at least one flute of drill bits positioned in said passages, whereby to substantially prevent rotation of and accurately position the cutting land of each of said bits relative to said abrasive wheel surface, said flute engaging means being adjustable relative to said body, whereby to angularly adjust said bit cutting land relative to said abrasive wheel surface, and cam means supported upon said body and engageable with said adjustable means.

In yet another aspect, the present invention relates to a drill sharpener including a stationary body, an abrasive wheel supported adjacent said body and rotatable about a central axis, said wheel having a cupped conical surface symmetrical with its rotational axis and facing said body, said body having a plurality of different sized, spaced passages therethrough generally parallel to one another and to said axis and aligned with said conical surface, a plate on said body and having a plurality of apertures aligned with said passages, said plate having a projection overlaying each said aperture and adapted to fit into a flute of drill bits positioned in said passages, whereby to substantially prevent rotation of and accurately position a cutting land of each of said bits relative to said abrasive wheel surface, said plate being angularly shiftable substantially about the axis of

said wheel, a rotatable cam supported by said body and cooperable with cam follower means on said plate whereby to angularly shift said plate relative to said body.

In yet another aspect, the present invention relates to a drill sharpener including a stationary body, an abrasive wheel supported adjacent said body and rotatable about a central axis, said wheel having a cupped conical surface symmetrical with its rotational axis and facing said body, said body having a plurality of different sized, spaced passages therethrough generally parallel to one another and to said axis and aligned with said conical surface, and means on said body engageable with at least one flute of drill bits positioned in said passages, whereby to substantially prevent rotation of and accurately position a cutting land of each of said bits relative to said abrasive wheel surface, a plate disposed atop said body and having apertures aligned with but smaller than said passages, means for angularly shifting said plate relative to said body, whereby to angularly incline said bits relative to the axis of said wheel.

In yet another aspect, the present invention relates to a drill sharpener attachment comprising a body, an abrasive wheel rotatably supported by shaft means upon said body for rotation about a central axis, means restraining said wheel against axial movement relative to said body, said wheel having a conical surface facing said body, a plurality of openings extending through said body parallel to said axis and aligned with said conical surface, said shaft means including means attachable to a separate power unit whereby to rotate said wheel, means on said body operable to prevent rotation of said body, a plate supported upon said body and having apertures therein aligned with respective ones of said openings, said plate having projections extending into alignment with respective ones of said openings and engageable with at least one flute of drill bits positioned in said openings, whereby to position a cutting land of said bit angularly relative to the conical surface of said wheel, said plate being angularly shiftable substantially about the axis of said wheel, whereby to angularly shift the position of said cutting land relative to the conical surface of said wheel.

In yet another aspect, the present invention relates to a drill sharpener including a stationary body, a conical shaped abrasive wheel supported adjacent said body and rotatable about a central axis, said body having a plurality of different sized, angularly spaced passages therethrough generally parallel to one another and to said axis and aligned with said conical surface, a plate between said body and said wheel and supported upon said body, said plate having a plurality of apertures aligned with respective ones of said passages, said plate having one projection extending into each said aperture and adapted to fit into a flute of a drill bit located in a respective one of said passages and apertures, whereby to position a cutting land of each of said bits relative to said conical surface, said plate being angularly adjustable about said axis, whereby to angularly reposition said cutting land of each of said bits relative to said conical surface.

In yet another aspect, the present invention relates to a drill sharpener comprising a stand-up housing having an electric motor therein, a shaft driven by said motor and extending upwardly of said housing, a sharpener head supported on said housing, a sharpening wheel in said head and coupled to said shaft, said head including

a plurality of spaced, vertically disposed openings therein aligned with said wheel, said openings having different diameters to receive drill bits of corresponding diameters for sharpening by said wheel, and unitary indexing means separate from said head and having flute engaging means adjacent each of said openings and said sharpening wheel and cooperable with at least one flute of said drill bits when the latter is in position in said openings, whereby to angularly position said drill bit for sharpening by said wheel.

In yet another aspect, the present invention relates to, in a drill bit sharpener, the combination of an abrasive wheel rotatably driven about its axis, a body axially of the wheel and substantially concentric therewith, the body having means therein for selectively receiving drill bits of different diameter and generally guiding the same into engagement with the wheel, indexing means between the body and the wheel, said indexing means including means for preventing substantial rotation of and thereby properly positioning respective drill bits with respect to the wheel, and means for adjusting said indexing means circumferentially about the axis of the wheel, thereby accommodating tolerance accumulations and facilitating the sharpening of drill bits of various design and manufacture.

In yet another aspect, the present invention relates to, in a drill bit sharpener, the combination of an abrasive wheel rotatably driven about its axis, a body axially of the wheel and substantially concentric therewith, the body having a plurality of longitudinal through bores for selectively receiving drill bits of different diameter and generally guiding the same into engagement with the wheel, and a single indexing plate disposed between the body and the wheel, said plate having a plurality of projection means, one for each of said bores, said projection means engaging at least one flute of a respective drill bit and thereby positioning the bit with respect to the wheel during the sharpening operation.

DETAILED DESCRIPTION

Referring now more specifically to the drawings, the present invention is shown in FIGS. 1-6 embodied as an attachment for a conventional portable electric drill or other power unit. Thus, as seen in FIG. 1, the drill sharpener, indicated generally at 21, is attached to and powered by a portable electric drill 23 supported upon a stand 25 and fixed thereto by a strap 27. The drill 23 includes a motor (not shown) disposed within a motor housing 29 and which, when energized, rotates a chuck 31 to which the sharpener 21 is releasably secured. The stand 25 also includes a vertical post 33 which cooperates with the sharpener 21 in a manner to be described.

Turning now to FIGS. 2-6, the sharpener 21 is seen to include a body 35 having a dependent peripheral skirt 37 secured thereto. An abrasive wheel 39 is disposed beneath the body 35 within the skirt 37 and is rotatably secured to the body 35 by a shaft 41. As shown, the shaft 41 extends through a bearing 43 fitted in the body 35 and through the abrasive wheel 39 and has a screw head 45 at one end and a nut 47 threaded on its other end. A pair of washers 49, 51 are provided on the shaft 41, one on either side of the wheel 39, and a retaining ring 53 is disposed between the washer 49 and the bearing 43.

The shaft 41 has a projecting shank 55 adapted to be received within and clamped by the chuck 31 so that when the power source 23 is energized, the abrasive

wheel 39 rotates. On the other hand, the body 35 is intended not to rotate and to this end, the skirt 37 has a laterally projecting flange 57 adapted to be received in an opening 59 formed in the stationary post 33.

As shown in FIG. 3, the abrasive wheel 39 is cupped and has a conical surface 61 facing the body 35. A plurality of spaced openings 63, which are generally parallel to one another and to the axis of the shaft 41, are formed through the body 35 and are aligned with the conical surface 61 of the abrasive wheel 39. These openings 63 are sized to receive the various sized drill bits to be sharpened and these are inserted therein in a manner to be described.

It will be appreciated that the cutting tips of drill bits conventionally have two diametrically disposed lands separated by a pair of spiral flutes. One such conventional drill bit is shown generally at 65 in FIGS. 7A and 7B, its land being enumerated 67, 69, and its flutes 71, 73. In addition, the lands 67, 69 originate with leading cutting edges 75, 77 and regress therefrom in spiral fashion thereby forming the so-called relief. Furthermore, the lands 67, 69 converge toward the center of the bit, meeting at a chisel edge 70, and generally define an included angle from about 118° to about 120°.

To sharpen these conventional drill bits, the conical surface 61 of the abrasive wheel defines an angle of about 59° to 60° with the axis of the wheel or an included angle of about 118° to about 120°. Also, the conical surface 61 is cupped so that when a drill bit is positioned in one of the openings 63 and with one of its cutting edges 75, 77 engaged with the surface 61 and with the chisel edge 70 substantially perpendicular to a radial line of the wheel 39 and that opening 63, the profile defined by that portion of the grinding wheel surface 61 which engages the land 67, 69 inherently defines the desired "clearance." It will be appreciated that the extent of this clearance is a function of the diameter of the wheel 39, and particularly the diameter of the actual sharpening area of the conical surface 61. Thus, the diameter of the wheel 39 conveniently is kept relatively small.

As described above, the bits are sharpened preferably by locating the bit chisel edge 70 perpendicular to a radius of the wheel 39. To this end, an index plate 79 is mounted on the body 35 and is secured thereto by a screw 80. This index plate 79 has a plurality of openings 81 which align with the openings 63 in the body 35, and a projection 83 which extends into a part of each opening 63. Each of these projections 83 is sized and shaped to fit into one flute 71, 73 of a drill bit 65 positioned in respective ones of the openings 63, and is positioned to angularly locate the chisel edge 70 of each said bit 65 perpendicular to a radius of the abrasive wheel 39.

To compensate for manufacturing tolerances and variations in bits, the index plate 79 may be angularly adjustable relative to the body 35 by means of an elongated aperture 85 in the plate 79 through which the screw 80 extends. Thus, when the screw 80 is loosened, the index plate 79 can be angularly shifted one way or the other. Since the flutes 71, 73 are spiraled, this shifting of the index plate 79, and specifically the shifting of the projections 83, acts to angularly reposition the bits 65 in the openings 63 and the lands 67, 69 relative to the surface of the wheel 39.

In use, the sharpening unit 21 is attached to the power drive 23 and the parts are secured to the base 25

and post 33. The power unit 23 is turned "on" and a bit 65 to be sharpened is inserted in the appropriate opening 63 with the projection 83 received in one flute 71, 73. With the bit 65 held against the conical surface of the wheel 39, one land 67, 69 is sharpened. Thereafter, the bit 65 is withdrawn to the extent necessary to free the projection 83 from the one flute 71, 73, rotated through 180°, and repositioned so that the projection 83 is received in the other flute, whereby the other land 67, 69 is sharpened.

If the plate and one or more of its projections 83 are inaccurately positioned for sharpening a particular bit 65, this will result in the lands 67, 69 thereof not being completely sharpened and this is readily recognized by visual inspection of the bit 65 after sharpening. In that case, the index plate 79 is adjusted in the proper direction (after the screw 80 is loosened and as described above) and the lands 67, 69 are resharpened.

A modified form of the present invention is illustrated in FIGS. 8-13. In this form, the index plate 79 has an upstanding arm 91 at one side thereof which has a vertically elongated aperture 93 therein. An adjustment knob 95 is rotatably supported upon the body 35 by a screw 97 and has an eccentric portion 99 rotatably disposed within the aperture 93. Thus, when the adjustment knob 95 is turned, the eccentric portion 99 shifts the index plate 79 in one direction or the other about the axis of the shaft 41. If desired, the knob 95 can be provided with markings 101 about its periphery which align with a reference line 103 on the arm 91 to accurately indicate the extent of adjustment of the index plate 79 effected by the knob 95.

Another feature of this modified form resides in an adjustable guide plate 105 disposed atop the body 35 and rotatably supported upon the shaft 41. This guide plate 105 has a dependent arm 107 which, like the arm 91, has a vertically elongated aperture 108 therein. An adjustment knob 109 is rotatably supported upon the body 35 by a screw 111 and has an eccentric portion 113 received in the aperture 108. The openings 63 in the body 35 are somewhat enlarged here and are tapered toward the abrasive wheel 39. The guide plate 105 has a plurality of apertures 115 therein adapted to align with but sized smaller than the openings 63.

It will be appreciated that by angularly shifting the guide plate 105 on the shaft 41 (by turning the adjustment knob 109), the drill bits 65 positioned in the openings 63 will be canted one way or the other and inclined relative to the axes of the shaft 41. This, in turn, will increase or decrease the clearance on the sharpened drill bit 65 depending on which way the plate 105 is shifted. If desired, the guide plate 105 (or the knob 109) can be marked to indicate which direction of adjustment increases or decreases the clearance.

FIG. 12 illustrates the position of the parts for normal bit sharpening, that is, with the plate 105 positioned so that the drill bit 65 in the opening 63 is generally parallel to the axis of the shaft 41 and the axis of the grinding wheel 39. The grinding wheel 39, illustrated in dot-dash lines, sharpens the land 67 and provides a normal clearance.

In FIG. 13, however, the guide plate 105 has been shifted toward the right (or counterclockwise as seen in FIG. 9). Here, the axis of the bit is inclined relative to the axis of the shaft 41 and the grinding wheel 39 and now, the land 67 is sharpened to a correspondingly greater clearance. It will be appreciated that the in-

crease in clearance provided is a function of the angle of inclination of the bit 65. Should it be desired to reduce the clearance, the guide plate 105 is moved toward the left as seen in FIGS. 12 and 13 (or clockwise as seen in FIG. 9).

In all other respects, the construction of FIGS. 8-13 is substantially the same as that illustrated and described above for FIGS. 1-6 and like numerals refer to like parts in all the figures.

FIG. 14 illustrates still another modified form of the invention. Here, the sharpener is shown as a self-contained unit, that is, one which includes its own prime mover. Thus, an electric motor assembly 201 is coupled to the shaft 41 of the sharpener 203 which is supported upon and fixed to the motor assembly 201 by shiftable brackets 205, 207. In all other respects, this construction is the same as that described above for FIGS. 8-13.

By the foregoing, there has been disclosed a novel drill bit sharpener calculated to fulfill the inventive objects set forth hereinabove, and while preferred embodiments have been illustrated and described herein, various additions, substitutions, modifications, and omissions may be made thereto without departing from the spirit of the invention.

I claim:

1. A drill sharpener including a stationary body, an abrasive wheel supported adjacent said body and rotatable about a central axis, said wheel having a cupped concave conical surface symmetrical with its rotational axis and facing said body, said body having a plurality of different sized, spaced longitudinal passages therethrough having their longitudinal axes generally parallel to one another and to said central axis and aligned with said conical surface, and means on said body engageable with at least one flute of drill bits positioned in said passages and of a dimension to substantially engage opposite sides of said flute and stationarily position said bit during sharpening, whereby to substantially prevent rotation of and accurately position a cutting land of each of said bits relative to said abrasive wheel surface.

2. A drill sharpener as defined in claim 1 wherein said means is adjustable relative to said body, whereby to angularly adjust said bit cutting land relative to said abrasive wheel surface.

3. A drill sharpener as defined in claim 1 wherein said means comprises a plate having a plurality of apertures aligned with said passages, said plate having a projection extending into each said aperture and adapted to fit into said flute.

4. A drill sharpener as defined in claim 1 which includes shaft means fixed to said wheel and rotatably supported upon said body, means for attaching said shaft means to a rotary drive, and means restraining said body against rotation.

5. A drill sharpener including a stationary body, a conical shaped abrasive wheel supported adjacent said body and rotatable about a central axis, said body having a plurality of different sized, angularly spaced passages therethrough generally parallel to one another and to said axis and aligned with said conical surface, a plate between said body and said wheel and supported upon said body, said plate having a plurality of apertures aligned with respective ones of said passages, said plate having one projection extending into each said aperture and adapted to fit into a flute of a drill bit

located in a respective one of said passages and apertures, whereby to position a cutting land of each of said bits relative to said conical surface, said plate being angularly adjustable about said axis, whereby to angularly reposition said cutting land of each of said bits relative to said conical surface.

6. A drill sharpener comprising a stationary body, an abrasive wheel rotatably supported adjacent said body for rotation about a central axis and having a cupped concave conical surface facing said body, passage means defined by said body aligned with said conical surface and parallel to said axis and adapted to receive selective drill bits for sharpening by said abrasive wheel, and means on said body adjacent said abrasive wheel receivable in one of the flutes of the drill bit located in said passage means to angularly locate one cutting land of said bit for sharpening by the conical surface of said abrasive wheel, said angular locating means being adjustable relative to said body to compensate for manufacturing and wear differences in said bits.

7. A drill sharpener including a stationary body, an abrasive wheel supported adjacent said body and rotatable about a central axis, said wheel having a cupped conical surface symmetrical with its rotational axis and facing said body, said body having a plurality of different sized, spaced passages therethrough generally parallel to one another and to said axis and aligned with said conical surface, and means on said body engageable with at least one flute of drill bits positioned in said passages, whereby to substantially prevent rotation of and accurately position a cutting land of each of said bits relative to said abrasive wheel surface, said flute engaging means being adjustable relative to said body, whereby to angularly adjust said bit cutting land relative to said abrasive wheel surface, and cam means supported upon said body and engageable with said adjustable means.

8. A drill sharpener including a stationary body, an abrasive wheel supported adjacent said body and rotatable about a central axis, said wheel having a cupped conical surface symmetrical with its rotational axis and facing said body, said body having a plurality of different sized, spaced passages therethrough generally parallel to one another and to said axis and aligned with said conical surface, a plate on said body and having a plurality of apertures aligned with said passages, said plate having a projection overlaying each said aperture and adapted to fit into a flute of drill bits positioned in said passages, whereby to substantially prevent rotation of and accurately position a cutting land of each of said bits relative to said abrasive wheel surface, said plate being angularly shiftable substantially about the axis of said wheel, a rotatable cam supported by said body and cooperable with cam follower means on said plate whereby to angularly shift said plate relative to said body.

9. A drill sharpener as defined in claim 8 wherein said plate includes a tab portion having an opening therein, said rotatable cam extending through said opening.

10. A drill sharpener including a stationary body, an abrasive wheel supported adjacent said body and rotatable about a central axis, said wheel having a cupped conical surface symmetrical with its rotational axis and facing said body, said body having a plurality of different sized, spaced passages therethrough generally parallel to one another and to said axis and aligned with said conical surface, and means on said body engage-

able with at least one flute of drill bits positioned in said passages, whereby to substantially prevent rotation of and accurately position a cutting land of each of said bits relative to said abrasive wheel surface, a plate disposed atop said body and having apertures aligned with but smaller than said passages, means for angularly shifting said plate relative to said body, whereby to angularly incline said bits relative to the axis of said wheel.

11. A drill sharpener attachment comprising a body, an abrasive wheel rotatably supported by shaft means upon said body for rotation about a central axis, means restraining said wheel against axial movement relative to said body, said wheel having a conical surface facing said body, a plurality of openings extending through said body parallel to said axis and aligned with said conical surface, said shaft means including means attachable to a separate power unit whereby to rotate said wheel, means on said body operable to prevent rotation of said body, a plate supported upon said body and having apertures therein aligned with respective ones of said openings, said plate having projections extending into alignment with respective ones of said openings and engageable with at least one flute of drill bits positioned in said openings, whereby to position a cutting land of said bit angularly relative to the conical surface of said wheel, said plate being angularly shiftable substantially about the axis of said wheel, whereby to angularly shift the position of said cutting land relative to the conical surface of said wheel.

12. An attachment as defined in claim 11 which includes a cam supported upon said body and engageable with said plate.

13. In a drill bit sharpener, the combination of an abrasive wheel rotatably driven about its axis, a body axially of the wheel and substantially concentric therewith, the body having means therein for selectively receiving drill bits of different diameter and generally guiding the same into engagement with the wheel, indexing means between the body and the wheel, said indexing means including means for preventing substantial rotation of and thereby properly positioning respec-

tive drill bits with respect to the wheel, and means for adjusting said indexing means circumferentially about the axis of the wheel, thereby accommodating tolerance accumulations and facilitating the sharpening of drill bits of various design and manufacture.

14. In a drill bit sharpener, the combination of an abrasive wheel rotatably driven about its axis, a body axially of the wheel and substantially concentric therewith, the body having a plurality of longitudinal through bores for selectively receiving drill bits of different diameter and generally guiding the same into engagement with the wheel, and a single indexing plate disposed between the body and the wheel, said plate having a plurality of projection means, one for each of said bores, said projection means engaging at least one flute of a respective drill bit and thereby positioning the bit with respect to the wheel during the sharpening operation.

15. A drill sharpener comprising a stand-up housing having an electric motor therein, a shaft driven by said motor and extending upwardly of said housing, a sharpener head supported upon said housing, a sharpening wheel in said head and coupled to said shaft, said head including a plurality of spaced, vertically disposed openings therein aligned with said wheel, said openings having different diameters to receive drill bits of corresponding diameters for sharpening by said wheel, and unitary indexing means separate from said head and having flute engaging means adjacent each of said openings and said sharpening wheel and cooperable with at least one flute of said drill bits when the latter is in position in said openings, whereby to angularly position said drill bit for sharpening by said wheel.

16. A drill sharpener as defined in claim 15 wherein said indexing means comprises a plate supported on said head and angularly adjustable relative thereto, said plate having openings generally aligned with said openings in said head, said plate having at least one projection extending into each opening therein and adapted to engage said at least one flute of drill bits positioned in said head openings.

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