

Aug. 22, 1967

W. G. MOBERG
SHARPENING APPARATUS

3,336,699

Filed Oct. 28, 1964

2 Sheets-Sheet 1

FIG. 1

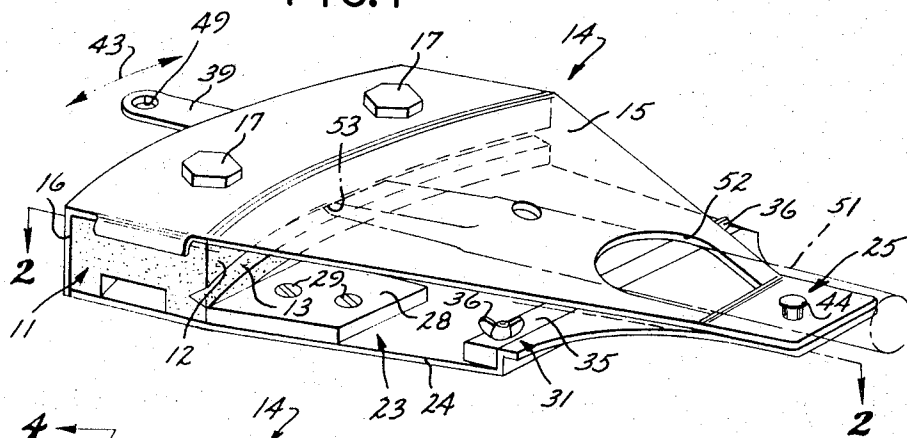


FIG. 2

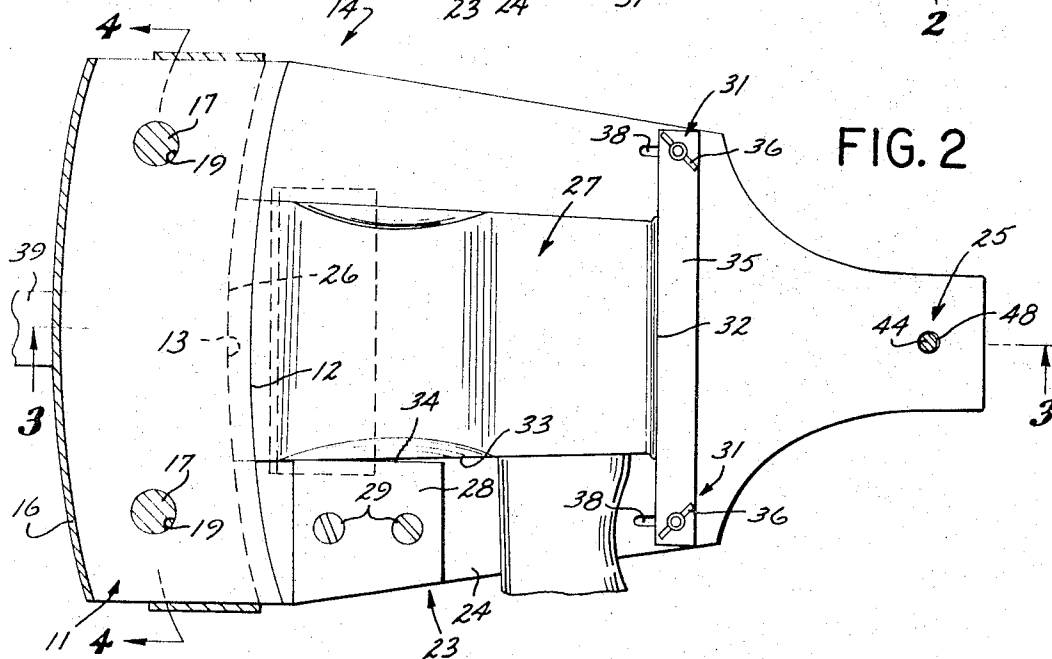
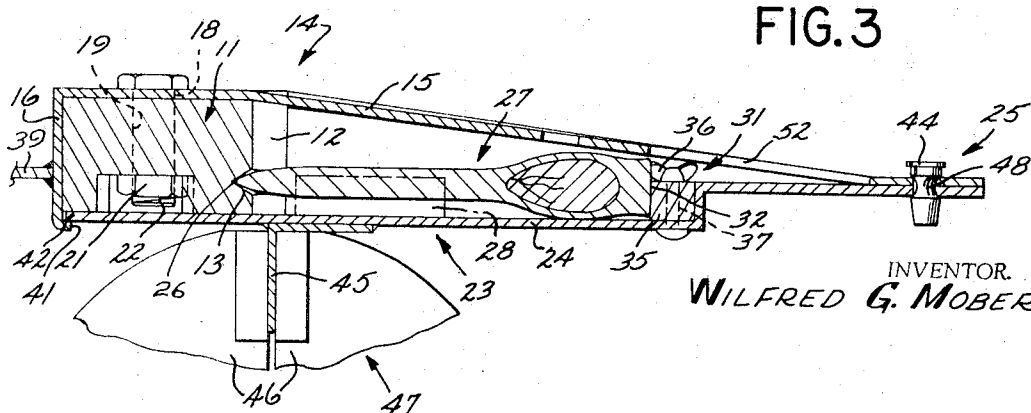


FIG. 3



INVENTOR.
WILFRED G. MOBERG

Aug. 22, 1967

W. G. MOBERG
SHARPENING APPARATUS

3,336,699

Filed Oct. 28, 1964

2 Sheets-Sheet 2

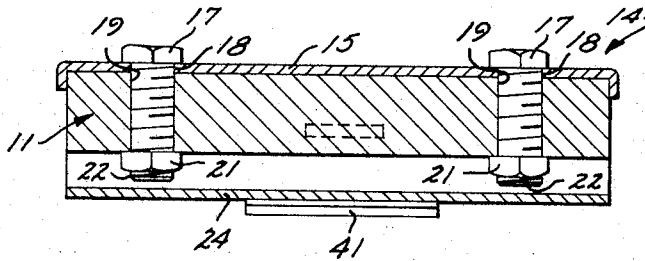


FIG. 4

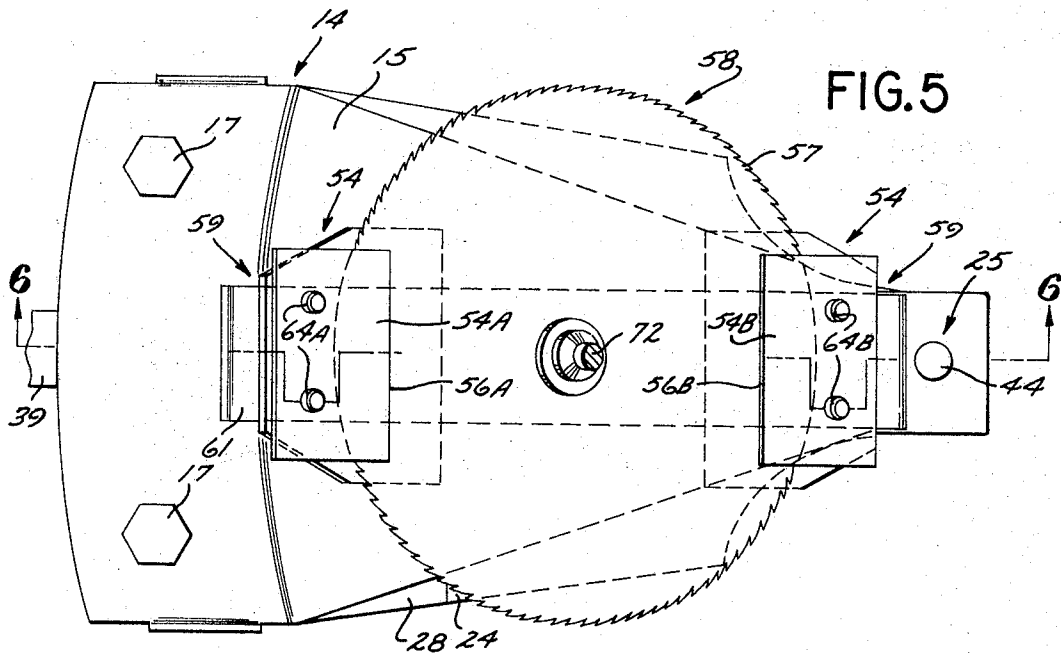


FIG. 5

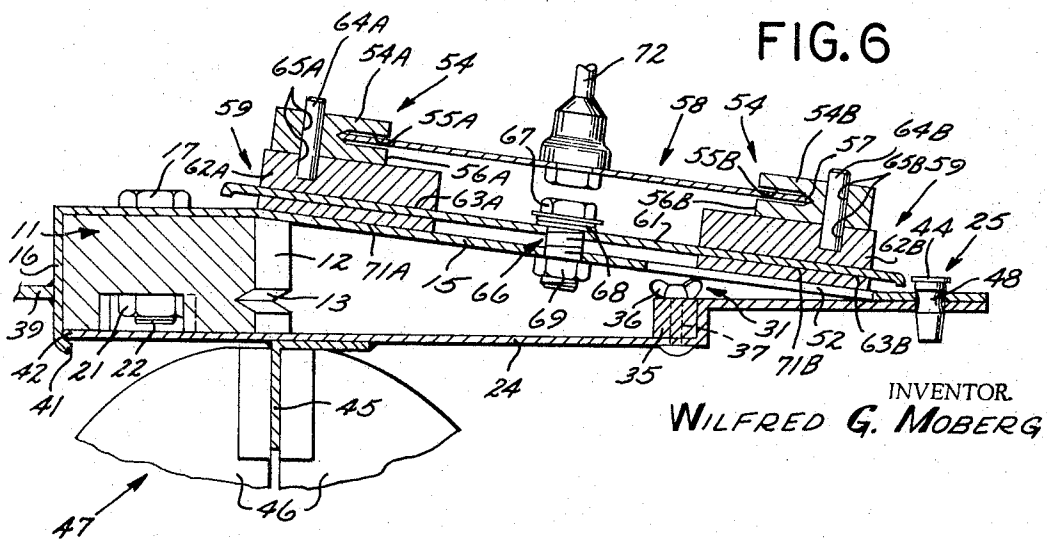


FIG. 6

INVENTOR.
WILFRED G. MOBERG

1

3,336,699

SHARPENING APPARATUS

Wilfred G. Moberg, 10 Colorado Circle,
Holden, Mass. 01520

Filed Oct. 28, 1964, Ser. No. 407,105

4 Claims. (Cl. 51—3)

ABSTRACT OF THE DISCLOSURE

In the first instance, the sharpening apparatus includes abrasive means with a side-edge-positioned sharpening slot which is carried by holding means, with the tool to be sharpened carried by a base member and which is connected in a pivotal manner to the holding means for swiveling movement of the holding means. The invention includes adjustable tool-tensioning means to maintain the proper engagement of the abrasive means with respect to the edge of the tool which is to be sharpened. The second form of the invention to sharpen a circularly shaped cutting edge, includes a pair of longitudinally spaced abrasive members with each having a sharpening recess-defining slot to receive opposite edge portions of the circular cutting edge to be sharpened so that it may be power-rotated and effectively sharpened along the circular length thereof. Also, in this form of the invention, the holding means comprises a resilient longitudinal guide plate member provided with and slidably mounting a pair of slider members for relative longitudinal movement toward and away from each other along the guide plate member and also includes an underlying longitudinal carrier plate member having the pair of slider members slidably carried thereabove and effectively provided with threaded clamping means cooperably engaged with respect to the longitudinal guide plate member and the carrier plate member adjacent to the center thereof for relatively drawing same toward each other to frictionally lock the pair of slider members and the pair of abrasive members in any selected relative positions along the length of the guide plate member.

Generally speaking, the present invention relates to sharpening apparatus and, more particularly, pertains to such sharpening apparatus adapted to hold abrasive means, such as one or more abrasive hone stones or the like, having side-edge-positioned sharpening slot or recess-defining means and further having holding means controllably removably engageably cooperable with respect to said abrasive means for holding and positioning same in a tool sharpening region, in a relatively movable manner with respect to the cutting edge of a tool positioned in said tool sharpening region. In other words, the invention provides a novel and highly advantageous sharpening apparatus for conveniently and easily sharpening the cutting edge of any of several different types of tools, such as the cutting (or chopping) edge of a hatchet or ax, or other side-edged tool, the cutting edge (or point) at the tip of a longitudinal tool, such as a chisel, or the like, and a circularly shaped cutting edge, such as might be found on a circular cutting tool such as the disks of a disk harrow type of agricultural implement, or the like.

With the above points in mind, it is an object of the present invention to provide a novel sharpening apparatus having the advantages referred to herein and including the features referred to herein, generically and/or specifically, and individually and/or in combination, and which is of relatively simple, inexpensive construction adapted for ready mass manufacture at relatively low cost whereby to be conducive to widespread use thereof.

Further objects are implicit in the detailed description which follows hereinafter (which is to be considered as

2

exemplary of, but not specifically limiting, the present invention), and said objects will be apparent to persons skilled in the art after a careful study of the detailed description which follows hereinafter.

For the purpose of clarifying the nature of the present invention, several exemplary embodiments of the invention are illustrated in the hereinbelow-described figures of the accompanying two sheets of drawings and are described in detail hereinafter.

FIG. 1 is a three-dimensional view of one exemplary embodiment of the present invention primarily adapted for use in sharpening side-edge tools, such as a hatchet or ax, although it is also adapted for sharpening front-edged or pointed tools of a longitudinal or long-handled variety, such as chisels or the like.

FIG. 2 is an enlarged top view, taken substantially along the plane indicated by the arrows 2—2 of FIG. 1 which is just below the surface of the upper member of the apparatus whereby to show certain lower portions of the apparatus in full elevation as seen in top plan view and whereby to show certain other portions of the apparatus in section. In this view, a typical side-edged tool (comprising a fragmentarily shown hatchet having an arcuate side cutting edge) is shown in mounted sharpening relationship with respect to the apparatus.

FIG. 3 is a fragmentary sectional view of the complete apparatus, although partly broken away, taken substantially along a plane such as is indicated by the arrows 3—3 of FIG. 2. Also in this view, the apparatus is shown firmly clamped in a controllably removable mounted relationship with respect to the jaws of a vise whereby to firmly hold the apparatus during a hatchet sharpening operation.

FIG. 4 is a fragmentary sectional view of the complete device, taken substantially along the arcuate plane indicated by the arrows 4—4 of FIG. 2.

FIG. 5 is a top plan view of the apparatus when in a position similar to that shown in FIG. 2, but this view differs from FIG. 2 in two respects—first, it is a complete top plan view including the upper member which is not shown in FIG. 2 and, second, it includes further attachment apparatus carried on said upper plate member whereby to effectively comprise a modified complete form of the invention from the first form illustrated in FIGS. 1—4 and intended to sharpen circular cutting edge means carried around the circumference of circular tool means.

FIG. 6 is a fragmentary sectional view, taken substantially along the plane indicated by the arrows 6—6 of FIG. 5, and illustrates the combination modified form of the invention of FIG. 5 in side section and also shows it firmly mounted in a controllably removable manner by the jaws of a vise (shown fragmentarily) whereby to hold the completely device during a sharpening operation of the circular cutting blade means illustrated in FIGS. 5 and 6.

Generally speaking, the exemplary first form of the invention illustrated in FIGS. 1—4 comprises abrasive means provided with side-edge positioned sharpening slot or recess-defining means and means for controllably removably holding same in a tool sharpening region in a position for relative movement of said abrasive means with respect to the cutting edge of a tool which is to be sharpened.

In said exemplary first form of the invention, the abrasive means is generally designated by the reference numeral 11 and comprises what might be termed an abrasive hone stone means of any suitable abrasive material such as Carborundum, or abrasive materials of joined particles of abrasive material finer than Carborundum whereby to provide less "tooth" or, on other words, a smoother abrasive surface and, therefore, a smoother sharpened cutting edge after completion of a sharpening

operation. The kind of abrasive material and the degree of relative roughness or smoothness thereof may be modified to any desired extent within the broad scope of the present invention.

The abrasive hone stone means 11 in the example illustrated has the inside edge 12 thereof provided with said sharpening slot or recess-defining means 13 therein, with both said inside edge 12 and said sharpening slot or recess-defining means 13 being of arcuate configuration as seen in top plan view (this is best shown in FIG. 2). However, it should be noted that the positioning and shape of said side edge 12 and said sharpening slot and recess-defining means 13 are not specifically so limited in all forms of the invention.

Also in the exemplary first form of the invention illustrated, the above generically referred to holding means is generally designated by the reference numeral 14 and may be said to comprise the complete upper plate 15, the downturned edge flange portion 16 thereof, and the headed fastening bolt means 17 carried by the left end of said plate 15 at the top thereof, the apertures 18 formed in the plate 15 and allowing the bolts 17 to pass downwardly therethrough, the aligned apertures 19 formed in the abrasive hone stone means 11 and the fastening nut means 21 threaded onto the threaded lower end 22 of each of the bolts 17 whereby to firmly fasten the abrasive hone stone means 11 immediately under the left end of the upper plate member 15 and immediately to the right of the downwardly directed edge flange portion 16 thereof as is clearly shown in FIGS. 1-4.

It should be noted that the exemplary first form of the invention illustrated also includes tool positioning means cooperable for receiving and positioning a cutting tool of the side-edged type, such as a hatchet, ax or the like, in the above-mentioned tool sharpening region for sharpening cooperation with the sharpening slot and recess-defining means 13 of the abrasive hone stone means 11.

In the exemplary first form of the invention illustrated, the above-mentioned tool positioning means is generally designated by the reference numeral 23 and comprises the complete base member 24 which is provided with effective swivel connection means, indicated generally at 25, effectively connecting same at one end thereof (the right end thereof as best shown in FIGS. 1-3) with respect to the corresponding right end of the plate 15 of the previously described holding means generally designated by the reference numeral 14 whereby to effectively together provide what might be termed controllably movable and position-adjustable means (actually comprising the swivel connection means 25 and the holding means 14) cooperable for relative movement of the abrasive hone stone means 11 relative to a cutting edge of a side edged cutting tool, such as the cutting edge 26 of the hatchet head, generally designated at 27 in FIGS. 2 and 3, for example, although not specifically so limited.

Also, said tool-positioning means includes a positioning plate 28 fastened by a screw means 29 to the base member 24, which is provided with a controllably positionally adjustable tool-tensioning means generally designated at 31 and positioned for engagement with the rear edge (such as shown at 32 in FIGS. 2 and 3) of the hatchet head 27 when the hatchet head is in the properly positioned relationship with the bottom edge 33 thereof positioned against the inner edge 34 of the positioning plate 28 as is best shown in FIG. 2.

It should be noted that the controllably positionally adjustable tool-tensioning means, generally designated at 31, comprises a transverse bar 35 provided with wing nuts 36 engaging the threaded upper ends of bolts 37 which lie in a pair of slots 38 whereby to make it possible to move the transverse positioning bar 35 toward the right or left as viewed in FIGS. 2 and 3 to any desired degree whereby to positively abut the rear edge 32 of the hatchet head 27 to a degree such as to force the forward cutting edge 26 of the hatchet head 27 into firm sharpening en-

gagement within the sharpening slot and recess-defining means 13 of the abrasive hone stone means 11 to any desired degree. After such partial adjustment of the positioning bar 35, the wing nuts 36 are tightened so as to lock the positioning bar 35 in the affixed position. Of course, after completion of a sharpening operation, the wing nuts 36 may be loosened to allow the positioning bar 35 to be retracted.

The operation of the device for sharpening a hatchet head such as shown at 27 in FIGS. 2 and 3, may be briefly described as follows. First, the projecting member 39 is manually grasped and is moved so as to disengage the latch member 41 from the lip member 42 and the entire holding means 14 is moved by force applied to the projecting member 39 in either direction indicated by the arrow 43 in FIG. 1 until the entire upper portion, comprising the holding means 14, is moved around the pivot pin or swivel rivet 44 of the swivel connection means 25 so as to no longer be superimposed over the lower plate or base member 24 of the apparatus. Of course, this is facilitated by reason of the fact that a downwardly projecting attachment flange 45 is clamped between the jaws 46 of a vise means, generally designated at 47 in FIG. 3 (although the invention is not specifically so limited and various other means for holding the device may be employed in lieu thereof).

Then, with the apparatus completely open, the ax head 27 is placed in the position with respect to the lower portion of the apparatus best shown in FIG. 2, and the upper portion of the apparatus comprising the holding means 14 is then arcuately moved back so as to arcuately move the sharpening slot and recess-defining means 13 along the arcuately shaped cutting edge 26 of the hatchet head 27, and then the relative arcuate movement of the upper holding means 14 of the abrasive hone stone means 11 is positionally reversed again. This is repeated until such time as the cutting edge 26 of the hatchet head 27 has been fully sharpened, after which the apparatus is moved into the open relationship and the hatchet head 27 is removed.

Of course, as previously pointed out, the degree of abrasion of the cutting edge 26 may be controlled by the position of the positioning bar 35 which, of course, is held in any adjusted position by tightening the wing nut means 36 as previously described.

The arcuate sharpening relative movement described above may be done with the holding means 14 and hone stone means 11 in a relatively low position, or some degree of vertical repositioning thereof may be provided by reason of the reduced neck portion 48 of the effective swivel rivet 44. Also, this allows the apparatus to be locked for storing or carrying by engaging the locking lips 41 and 42, after which the entire apparatus can be hung up on a hook or nail by the mounting hole 49 in the operating projection or handle 39.

In describing the above, the phantom line showing of a longitudinal tool having a cutting edge or point at the forward tip thereof, as illustrated in phantom lines in FIG. 1 is to be ignored. However, it should be noted that the apparatus illustrated in FIGS. 1-4 may be used for sharpening such a tool, which is designated by the reference numeral 51 as shown in phantom in FIG. 1, in lieu of sharpening a side-edged tool, such as the previously described hatchet head 27. For this purpose, the upper plate member 15 is provided with a large cut-out, entry or through-passing aperture 52 through which the longitudinal tool 51 can be inserted so as to make it possible to place the cutting edge 53 thereof within the sharpening slot and recess-defining means 13 so that the tool 51 may be held stationary by its rear end (or by a handle attached thereto) while the previously described arcuate movement of the hone stone means 11 is effected by arcuately applying force to the projecting member or handle 39. This will effectively sharpen such a for-

5

ward cutting edge 53, after which the longitudinal tool 51 can be withdrawn from the cut-out entry aperture 52.

The modified form of the invention illustrated in FIGS. 5 and 6 employs all of the apparatus of the first form of the invention illustrated in FIGS. 1-4 and described above in detail. Therefore, all of the parts thereof are designated by the same reference numerals in FIGS. 5 and 6. However, the modified form of the invention illustrated in FIGS. 5 and 6 includes additional apparatus carried at the top of the apparatus of the first form of the invention illustrated in FIGS. 1-4, and together and in combination therewith, comprises a modified combination form of the invention adapted for use in sharpening circular tools having circular cutting edge means.

As illustrated in FIGS. 5 and 6, the additional apparatus carried at the top of the previously described apparatus includes abrasive hone stone means generally designated at 54 and comprising a pair of longitudinally spaced abrasive hone stone members 54A and 54B, each having an inwardly facing sharpening slot and recess-defining means 55A and 55B, respectively, carried by inwardly facing edge portions 56A and 56B of said abrasive hone stone members 54A and 54B, respectively. Furthermore, it should be noted that the sharpening slot and recess-defining means 56A and 56B are each of opposed arcuate shape having the same radius of curvature whereby to effectively provide an arrangement ideally suited for the reception of opposed portions of the cutting edge, such as indicated at 57, of a circular cutting tool such as generally designated at 58, whereby to abrade and sharpen same.

The additional apparatus illustrated in FIGS. 5 and 6 also includes holding means generally designated at 59 and comprising a resilient longitudinal guide plate member 61 provided with and slidably mounting a pair of slider members 62A and 62B, respectively, by reason of passing through corresponding slots 63A and 63B, respectively, in said slider members 62A and 62B.

The above mentioned holding means generally designated at 59 also includes controllably releasable attachment pin means 64A and 64B, respectively, for mounting the hone stone means 54A and 54B with respect to the slider members 62A and 62B by being mounted in aligned apertures 65A and 65B therein, respectively.

It will be noted that the resilient longitudinal guide plate 61 is provided with clamping means generally designated at 66 for effectively clamping the entire holding means 59 and the two slider members 62A and 62B in frictionally locked relationship with respect to the plate member 15, which was previously described in connection with the first form of the invention and referred to as comprising the upper plate member, but which, in this form of the invention, may be said to effectively comprise, with respect to the new apparatus added in this form of the invention, an underlying longitudinal carrier plate member designated at 15 in FIGS. 5 and 6 and which has the pair of slider members 62A and 62B slidably carried immediately thereabove.

The operation of the additional apparatus added to the apparatus of the first form of the invention and illustrated in FIGS. 5 and 6 may be briefly described as follows. The clamping means 66, which comprises a headed clamping bolt 67 having a tensioning spring 68 thereunder and a nut 69 fastened to the bottom end under the carrier plate member 15, may be relatively loosened so as to release any frictional engagement which may have existed heretofore between the bottom surfaces 71A and 71B of the slider members 62A and 62B and the corresponding portions of the top surface of the carrier plate member 15. This will allow said slider members 62A and 62B to be longitudinally moved apart so as to allow the insertion and positioning therebetween of a circular cutting blade such as shown at 58 in FIGS. 5 and 6, after which said slider members 62A and 62B are moved toward each other along the guide member

6

61 until the sharpening slot and recess-defining means 55A and 55B, respectively, are in a desired abrasive sharpening relationship with respect to corresponding portions of the cutting edge means 57 of the circular cutting tool 58. At this time the fastening clamp means 66 is effectively tightened by relative rotation of the headed bolt 67 with respect to the nut 69 until the two slider members 62A and 62B are firmly frictionally locked on the upper surface of the carrying and supporting plate member 15.

Torque may be applied to the circular cutting tool 58 by a power-driven shaft 72 and a driving motor or the like (not shown since such are well known in the art), and this will, of course, effectively sharpen the complete circumferential periphery of the cutting edge 57 of the circular cutting tool 58. Upon completion of this operation, the clamping means 66 is released or loosened and one or the other of the slider members 62A and 62B is moved sufficiently to allow removal of the circular cutting tool 58.

It should be noted in connection with both forms of the invention that the cross-sectional configuration of the sharpening slot and recess-defining means, such as illustrated at 13 in connection with the first form of the invention and at 55A and 55B in connection with the second form of the invention, may assume any desired configuration such as to bring about the desired type of sharpening of a cutting edge. This is also true with respect to the plan view configuration of said sharpening slot and recess-defining means.

It should be noted that the downwardly directed angle iron member comprising the mounting lip or flange 45 may be used for positioning the entire device by merely positioning it over a similarly shaped edge of a horizontal member, such as the edge of a workbench, table, or the like, in which position the apparatus may be held during use. Or said attachment lip 45 may be modified as to position and/or configuration or, in certain forms of the invention, may be eliminated entirely.

It should be understood that the figures and the specific description thereof set forth in this application are for the purpose of illustrating the present invention and are not to be construed as limiting the present invention to the precise and detailed specific structure shown in the figures and specifically described hereinbefore. Rather the real invention is intended to include substantially equivalent constructions embodying the basic teachings and inventive concept of the present invention.

I claim:

1. Sharpening apparatus comprising: abrasive means provided with side-edge-positioned sharpening recess-defining means; holding means controllably removably engageably cooperable with respect to said abrasive means for holding and positioning same in a tool sharpening region, said holding means effectively including controllably movable and position-adjustable means cooperable for relative movement with respect to the edge of a tool which is to be sharpened; tool positioning means cooperable for receiving and positioning a cutting tool having a side-positioned cutting edge, with the cutting edge in received engaged relationship with respect to said sharpening recess-defining means of said abrasive means, said tool-positioning means comprising a base member and swivel connection means effectively connecting same adjacent to one end thereof with respect to a corresponding end of said holding means whereby to provide for said relatively movable mounting of said abrasive means by said holding means relative to the edge of the tool, said relative movement comprising arcuate movement of said holding means about said swivel connection means relative to said base means and the cutting tool adapted to be carried thereby whereby to arcuately relatively move said sharpening recess-defining means of said abrasive means with respect to the cutting edge of the tool; and controllably positionally adjustable tool-tensioning means positioned for engage-

ment with a rear portion of the tool opposite to and spaced from said sharpening recess-defining means of said abrasive means and controllably positionally adjustable toward and away therefrom whereby to apply a controlled degree of biasing force with respect to the tool for forcing the cutting edge thereof into sharpening engagement with respect to said recess-defining means with a desired degree of biasing force for optimum sharpening purposes.

2. Sharpening apparatus as defined in claim 1, wherein said tool-positioning means further comprises a through-passing aperture carried by said holding means allowing a longitudinal tool member to be inserted therethrough and held with a forward cutting edge thereof in said sharpening region for reception within and relative arcuate movement with respect to said sharpening recess-defining means of said abrasive means.

3. Sharpening apparatus comprising: abrasive means provided with side-edge positioned sharpening recess-defining means; and holding means controllably removably engageably cooperable with respect to said abrasive means for holding and positioning same in a tool sharpening region, said holding means effectively including controllably movable and position-adjustable means cooperable for relative movement with respect to the edge of a tool which is to be sharpened; said abrasive means comprising a pair of longitudinally spaced abrasive members and said sharpening recess-defining means comprising a pair of opposed spaced sharpening recess-defining edge portions of each of said abrasive members facing each other for the reception of opposed cutting edge portions of a circular laterally-edged tool, said holding means comprising a resilient longitudinal guide plate member provided with and slidably mounting a pair of slider members for relative longitudinal movement toward and away from each other along said guide plate member and further provided with an underlying longitudinal carrier plate member having said pair of slider members slidably carried thereabove and having threaded clamping means cooperably engaged with respect to said longitudinal guide plate member adjacent to the center thereof and said carrier plate member adjacent to the center thereof for relatively drawing same toward each other whereby to frictionally lock said pair of slider members and said abrasive members in any selected relative positions along the length of said guide plate member and in proper receiving and edge-engagement relationship of said abrasive members with respect to said opposed cutting edge portions of said circular tool whereby relative rotation of said circular tool with respect to said spaced abrasive members will produce an effective sharpening of the complete circumferential periphery of said circular tool.

4. Sharpening apparatus comprising: abrasive means provided with side-edge positioned sharpening recess-defining means; and holding means controllably removably engageably cooperable with respect to said abrasive means for holding and positioning same in a tool sharpening region, said holding means effectively including controllably movable and position-adjustable means cooperable for relative movement with respect to the edge of a tool which is to be sharpened; said abrasive means comprising a pair of longitudinally spaced abrasive members and said sharpening recess-defining means comprising pair of opposed spaced sharpening recess-defining edge portions of each of said abrasive members facing each other for the reception of opposed cutting edge portions of a circular laterally-edged tool, said holding means comprising a resilient longitudinal guide plate member provided with and slidably mounting a pair of slider members for relative longitudinal movement toward and away from each other along said guide plate member and further provided with an underlying longitudinal carrier plate member having said pair of slider members slidably carried thereabove and having threaded clamping means cooperably engaged with respect to said longitudinal guide plate member adjacent to the center thereof and said carrier plate member adjacent to the center thereof for relatively drawing same toward each other whereby to frictionally lock said pair of slider members and said abrasive members in any selected relative positions along the length of said guide plate member and in proper receiving and edge-engagement relationship of said abrasive members with respect to said opposed cutting edge portions of said circular tool whereby relative rotation of said circular tool with respect to said spaced abrasive members will produce an effective sharpening of the complete circumferential periphery of said circular tool; and including controllably releasable attachment means for effectively attaching each of said spaced pair of abrasive members to the corresponding different one of said pair of slider members of said holding means.

References Cited

UNITED STATES PATENTS

308,046	11/1884	Williams	51—69 X
1,173,549	2/1916	Blair	51—181 X
2,048,868	7/1936	Johnston	51—58
2,426,925	9/1947	Ellis	51—161

FOREIGN PATENTS

29,679	10/1930	Australia.
483,124	5/1952	Canada.
19,216	8/1906	Great Britain.

HAROLD D. WHITEHEAD, *Primary Examiner.*