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ICE SKATE SHARPENER

2 Sheets-Sheet 1

Fig. 1

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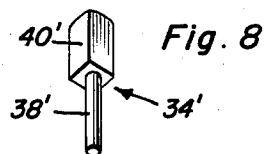
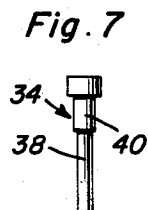
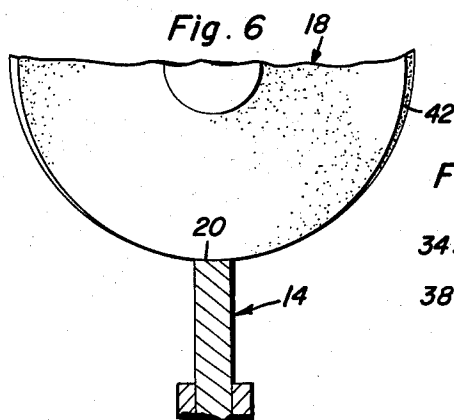
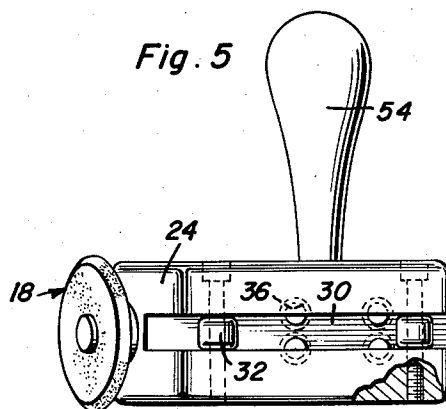
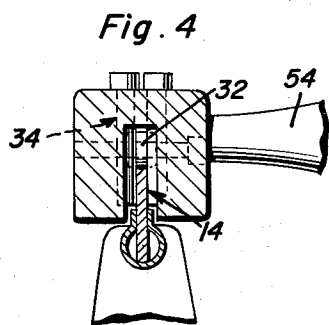
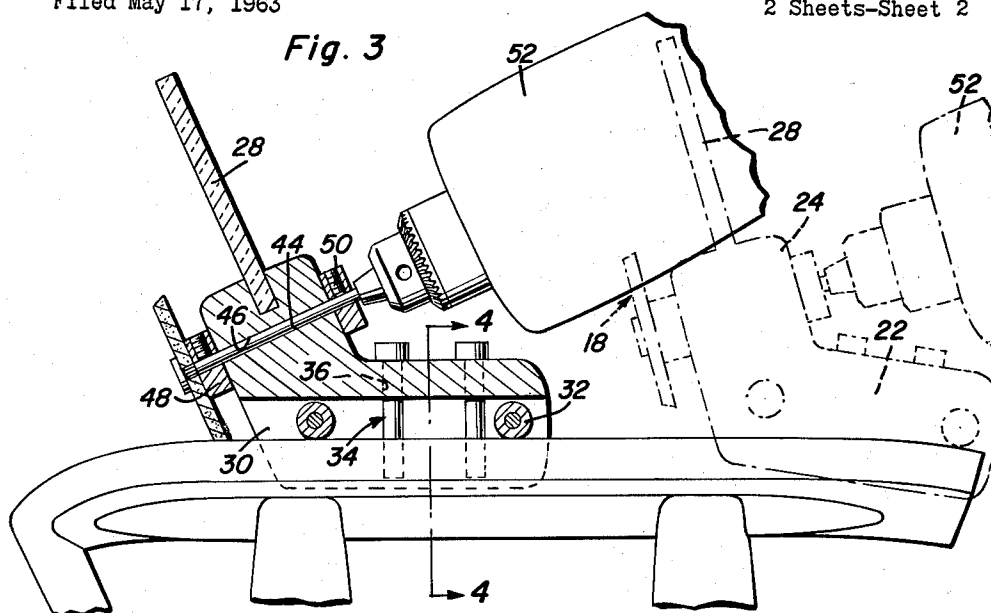
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ICE SKATE SHARPENER

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2 Sheets-Sheet 2



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ICE SKATE SHARPENER

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6 Claims. (Cl. 51-170)

The present invention generally relates to portable grinding devices, and is more particularly concerned with a novel ice skate blade grinding attachment for portable electric hand drills capable of hollow grinding the ice skate blades.

It is one of the primary objects of the instant invention to provide a means whereby the blade of an ice skate can be quickly and properly sharpened in a professional manner.

A further object of the instant invention is to provide a novel grinding attachment, including a blade jig and grinding wheel, which is mountable and driven by a conventional hand electric drill.

In conjunction with the above object, it is also an object of the instant invention to provide an ice skate sharpener which can be utilized anywhere a source of power for the hand drill is available, the skate being merely grasped between the knees and the jig being engaged over the blade so as to guide the rotating grinding wheel there along.

A further object of the instant invention is to provide means on the sharpener for accommodating a variety of different width blades.

Likewise, it is an object of the instant invention to, as deemed desirable, incorporate both a safety shield between the grinding wheel and the user, and an auxiliary handle for assisting in the guiding of the device along the skate blade.

An additional object of the instant invention is to provide a device which is relatively simple in construction, capable of economical manufacture, easy to use, and, aside from the grinding wheel itself, susceptible to no appreciable deterioration or wear regardless of the number of times it is used.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is an enlarged perspective view illustrating the manner of using the device of the instant invention;

FIGURE 2 is a perspective view of the grinding attachment or skate sharpener prior to attachment to the hand drill illustrated in FIGURE 1;

FIGURE 3 is an elevational cross-sectional view taken through the sharpener illustrating the manner in which it is attached to the power source and the manner in which the skate blade is engaged;

FIGURE 4 is a partial cross-sectional view taken substantially on a plane passing along line 4-4 in FIGURE 3;

FIGURE 5 is a bottom plan view of the sharpener attachment;

FIGURE 6 is a view illustrating the manner in which the grinding wheel engages the blade edge;

FIGURE 7 illustrates one of the pins used to reduce the effective width of the blade-receiving slot; and

FIGURE 8 illustrates another form of pin.

Referring now more specifically to the drawings, reference numeral 10 is used to generally designate the grinding attachment or ice skate blade sharpener. This sharpener 10 consists basically of a jig 12 receivable over the blade 14 of an ice skate 16 and movable there along, and a grinding wheel 18 engageable with the edge 20 of the blade 14 so as to produce the desired hollow grinding thereof.

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The jig 12 consists of a solid generally rectangular body 22 having the forward end 24 thereof upwardly and forwardly angled, the upper or forward end of the forward portion 24 having a transverse slot 26 therein, this transverse slot fixedly receiving an enlarged transparent plastic or glass shield 28 so as to protect the operator during the use of the sharpener 10.

Extending longitudinally through the body 22 of the jig 12 is a blade-receiving slot 30, this slot 30 extending inwardly from the bottom of the jig so as to allow for a positioning of the blade 14 therein in the manner illustrated in FIGURES 1, 3 and 4.

In order to facilitate movement of the jig 12 along the blade 14, the ice skate 16 normally being secured in position either by means of a vise or between the knees of the user of the sharpener 10 as illustrated in FIGURE 1, a pair of nylon roller bearings 32 are provided rotatably mounted adjacent each end of the slot 30, these rollers 32 being as close as possible to the inner end of the slot 30 so as to enable the use of as much of the slot depth as possible in guiding the jig 12 on the blade 14.

Furthermore, in order to adapt the sharpener 10 for different width blades 14, a means is provided for varying the effective width of the slot 30, it of course being realized that lateral movement between the jig 12 and blade 14 must be prevented if the proper grinding of the edge 20 is to result. While it is contemplated that various means be utilized to reduce the effective width of the slot 30 within the scope of the instant invention, the preferred means consist of the use of pins 34, preferably four in number, received in vertical bores 36 extending downwardly into and through a major portion of the body 22 of the jig 12, these bores, two on each side of the slot 30, being located so as to in effect have the central axis thereof in the same plane as the corresponding side of the slot 30 so as to provide that only one-half of each pin projects into the slot 30. These pins 34, with attention now being also directed to FIGURE 7, are to be provided in sets, each set having the lower portion 38 of the pins 34 therein of a predetermined diameter, the different sets having different diameter portions 38, it being appreciated that this portion 38 corresponds to the portion of the pin 34 which projects beyond the inner end of the slot 30 and into the slot 30, the upper portion 40 of each pin 34 being constant regardless of the diameter of the corresponding portion 38. This portion 40 is maintained constant for all of the pins 34 in order that the pins 34, regardless of the diameter of the portions 38, might be snugly received within the bores 36 so as to prevent any undesirable lateral movement thereof during the movement of the jig 12 along the blade 14.

Referring to FIGURE 8, it will be noted that a modified form of pin 34' has been shown therein, this pin having a polygonal upper portion 40' and a cylindrical lower portion 38' depending eccentrically therefrom. The lower portion 38' is spaced a different distance from each of the sides of the portion 40', which is snugly received within a mating polygonal vertical bore, whereby the effective width of the slot 30 can be varied by a rotation of the pins 34'. It will of course be appreciated that a withdrawal of the upper portion 40' from the bore is necessary before the pin 34' can be rotated.

The actual grinding of the edge 20 of the blade 14 is accomplished by the grinding wheel 18. This wheel 18, having a beveled edge 42, includes an elongated shank 44 fixed to the center thereof and extending laterally therefrom through a downwardly and forwardly inclined bore through the forward portion 24 of the jig 12, the shank or shaft 44 being rotatably received therein. Maintaining the grinding wheel 18 a fixed predetermined distance from the forward face of the angled forward portion 24 are a pair of adjustable collars 48 and 50 secured about the

shaft 44. The driving power is supplied to the grinding wheel 13 through the shaft 44 from a conventional portable electric hand drill 52, or for that matter, any other suitable power source capable of engaging the free end of the shaft 44 and effecting a rotation thereof.

In operation, first the width of the slot 30 is adjusted, if necessary, through the pins so as to correspond to the width of the blade 14 to be sharpened. Next, the location of the grinding wheel 13 is adjusted by means of the collars 48 and 50 so as to ensure the desired grinding contact with the blade edge 20, it incidentally being noted that the bore 46 and slot 30 are in the same vertical plane thus ensuring the proper hollow grinding contact of the wheel 13 with the blade edge 20. The jig 12 is then positioned on the blade 14 adjacent the end of the blade 14 closest to the operator, the sharpener being tilted slightly back on the rear nylon roller bearing 32 so as to maintain the grinding wheel out of contact with the blade edge 20, this being illustrated in phantom lines in FIGURE 3. The electric motor 52 is turned on and the sharpener gradually tipped forward until the blade edge 20 is engaged by the grinding wheel 13 at which time the sharpener is moved forward and backward along the blade edge 20 until the required sharpness is achieved, this required sharpness being gaged by the front roller coming in contact with the blade edge 20 and limiting the forward pivoting movement of the sharpener 10. After the required sharpness is achieved in this manner on the major portion of the length of the blade 14, the skate 16 is reversed and the end which was previously nearest to the operator is finished and blended into the adjoining sharpened portion of the blade 14. If necessary, a flat grinding stone can be used to remove any burrs which might have developed at the side of the blade. Furthermore, in order to assist in guiding the jig 10 along the blade 14, it is contemplated that a handle be secured to one side thereof and project laterally therefrom, this handle being referred to by reference numeral 54.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A jig for use in conjunction with a grinding wheel and drive means therefor, said jig consisting of a solid body having an upwardly and forwardly angled forward portion, a downwardly and forwardly angled bore through said forward portion, and a full length slot extending inwardly from the bottom of said body, spaced roller bearing means located within the slot adjacent the bottom thereof, and means for varying the effective width of the slot, said last mentioned means consisting of spaced pairs of vertical bores extending inwardly from the top of the body, said bores each having a diameter thereof coplanar with one or the other of the vertical sides of the slot, and elongated pins of a predetermined effective diameter removably positioned within these vertical bores.

2. The device of claim 1 wherein said slot is in the same vertical plane as the angled bore through the forward portion of the jig body.

3. The device of claim 2 including a transparent shield secured to the upper end of the upwardly angled forward portion and extending upwardly therefrom at substantially the same angle.

4. The device of claim 3 including a handle secured to and projecting laterally from the jig body.

5. A sharpener for ice skate blades including a jig consisting of a body having a full length vertical blade receiving slot in the bottom thereof, an upwardly and forwardly angled portion on said body, a downwardly and forwardly angled bore through said angled portion, a grinding wheel located forward of the angled portion, a shaft secured at one end to the center of said wheel and extending laterally therefrom and through the bore, and motor means drivingly engaged with the other end of the shaft.

6. The device of claim 5 including means for varying the distance between the wheel and the forward face of the angled portion, and means for varying the effective width of the slot.

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