June 12, 1934. M. L. BICKART 1,962,120

HONING APPARATUS

Filed Oct. 1, 1931

Fig. 1.

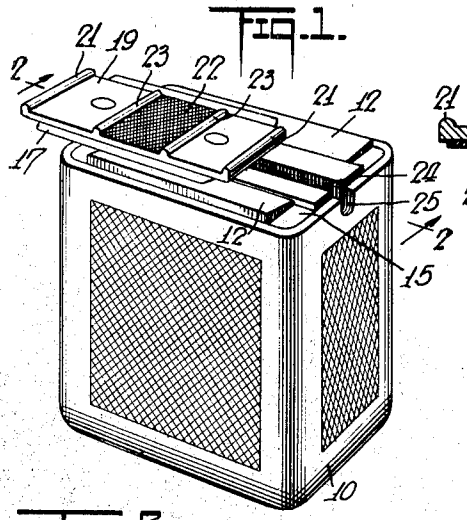


Fig. 2.

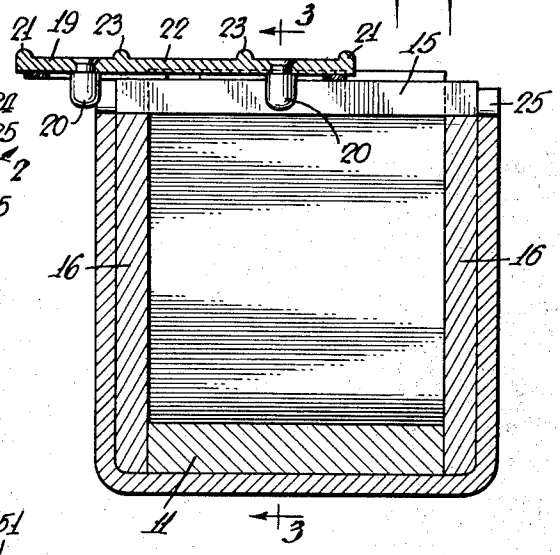
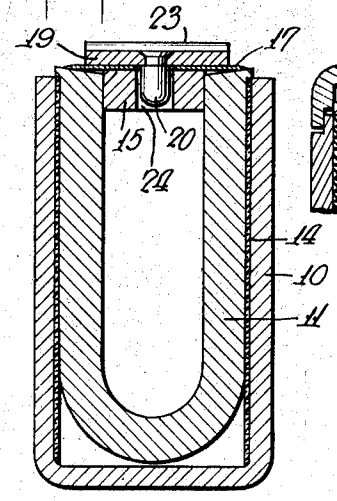


Fig. 3.



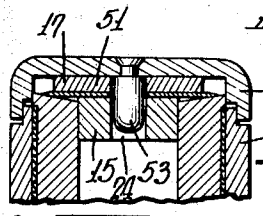


Fig. 6.

Fig. 4.

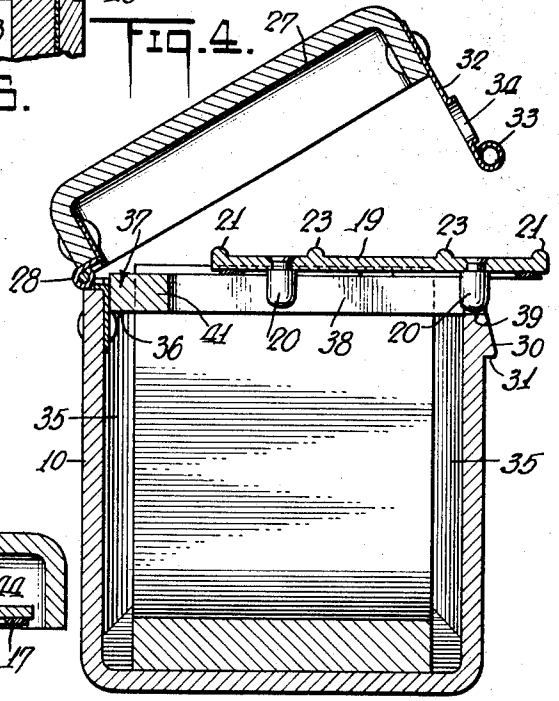
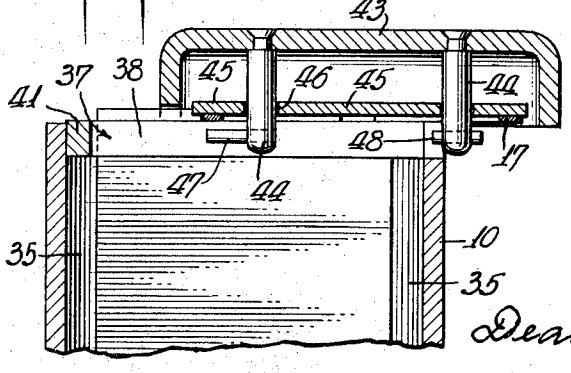


Fig. 5.



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UNITED STATES PATENT OFFICE

1,962,120

HONING APPARATUS

Monroe L. Bickart, Stamford, Conn., assignor to Automatic Lighter Corporation, a corporation of Delaware

Application October 1, 1931, Serial No. 566,256

12 Claims. (Cl. 51—158)

My present invention relates to apparatus and methods for honing or conditioning cutting blades, particularly safety razor blades by resort to forces including that of magnetic attraction.

The invention in common with that of my co-pending application Serial No. 558,852 filed August 24, 1932 seeks to provide apparatus of the above type by which accurate engagement of the cutting edge area of the blade with a magnet is assured by which in the application, in the honing operation and in the removal of the blade, stresses prejudicial to the efficacy of the blade, are inherently avoided, in which misalignment or skewing of the cutting edge with respect to the magnet pole end and the need for any particular precaution in the utilization of the device are obviated, in which the danger of the user cutting his fingers or otherwise injuring himself during the honing operation is reduced to a minimum, all with the elimination of rotating parts, or transmission or bearing structures that involve cost and complication and may be subject to derangement.

A more specific object is to provide apparatus of the above type which includes only a single movable element apart from the blade itself and which affords particular facility for manipulation of said part in the mechanical honing operation.

According to the present invention the case enclosing the magnet affords a groove or slot longitudinally between the magnet poles serving as a track or guide for the mechanical sliding action of the blade regardless of the particular construction of the latter. The operative member for the blade, which is preferably a permanent magnet keeper superposed over the blade, is provided with downwardly extending studs, lugs or fins to cooperate with the perforations or notches in the blade construction and with the groove or slot in the case construction for correctly aligning and guiding the blade in initial setting, mechanical honing and removal thereof.

Another feature is the embodiment of the keeper as an element pre-disposed in coordinated relationship with and if desired permanently affixed in a cover for the case which cover itself serves as the grip for effecting the sliding action of the keeper and with it of the blade along the magnet pole ends.

The invention may be more fully understood from the following description in connection with the accompanying drawing, wherein

Fig. 1 is a perspective view of a sharpener embodying the invention,

Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1,

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2,

Fig. 4 is a sectional view similar to Fig. 2, but illustrating another form of the invention,

Fig. 5 is a fragmentary view similar to that of Fig. 2, but illustrating another modification, and

Fig. 6 is a sectional view similar to that of Fig. 3, but somewhat fragmentary, and illustrating another modification.

In the embodiment of the invention shown in Figs. 1 to 3, there is provided a rectangular open topped case 10 preferably of non-magnetic material such as a molded phenol condensation product, and enclosing a permanent horse shoe magnet 11 having interspaced pole faces 12.

In order to securely support the magnet 11 in the case 10, the legs of the magnet are securely held in position preferably by means of cardboard sheets 14 coated on both sides with cement, and snugly clamped between the legs of the magnet and the corresponding sides of the case 10.

Between the inwardly beveled pole faces 12, there is provided a bridging piece or spacer member 15 which is preferably of non-magnetic material such as phenol condensation product, and which has the outside surface thereof disposed somewhat above the inner or lower edges of the pole faces 12. This spacer member 15 is supported upon the ends of abutment members in the form of end plates 16, adhesively secured to the ends of the case 10, and having the bottom ends thereof supported on the bottom of said case, these end plates 16 are made of non-magnetic material, and not only serve to support the spacer member 15, but also aid in confining the magnet 11 in position.

The present invention is shown as particularly adapted to the sharpening of a razor blade 17 of the double edge wafer type, such for instance as the Gillette or Probak type, but as far as the broad aspects of the invention are concerned, may be adapted for the sharpening of other ferrous blades, both single and double edged types. For honing operation, this blade 17 is bridged across the pole faces 12, which have lengths preferably at least equal to the length of the blade to be sharpened, and have the outer edges thereof separated by a distance greater than the width of the blade, and the inner edges by a distance

less than the width of the blade, so that the entire length of the cutting edge of the blade to be sharpened may be disposed in direct engagement with respect to the pole ends, as shown in the drawings.

The beveled edges of the blade 17, under the action of the magnet 11, are maintained in direct engagement with the magnetic poles. The cutting edges of the blade are thereby attracted into close contiguity with the pole faces 12, and the irregularities due to previous shaving operation, urged toward realinement with the plane of the blade.

In accordance with the present invention, a special type of blade keeper or carrier is provided which will serve as a handle by means of which a desirable sliding or mechanical stropping movement of the blade may be easily effected, and the blade easily slid into central bridging position. In the form shown, this keeper consists simply of a plate 19 which is preferably longer than the blade 17, and has a width narrow than that of the blade, but sufficiently wide so that the longitudinal edges of said plate overlie the pole faces 12 when said plate is mounted in operating position. In order to effect the interengagement of the blade 17 and the carrier plate 19, said plate is provided with pendant studs 20 which engage in the blade holes or the blade slot enlargement, as the case may be.

In order to provide means for manipulating the carrier plate 19, the top of said plate is provided at each end with a rib 21 which renders manipulation of said carrier more convenient. The carrier plate 19 has a knurled central portion 22 which is bounded at both ends by ribs 23, and which constitutes a receiving section adapted to be engaged by the thumb or the forefinger of the user when pushing the plate back and forth over the pole pieces of the magnet.

In order to guide the blade 17 and its associated carrier plate 19 into transverse central position with respect to the pole faces 12 during its sliding movement, the spacer member 15 is provided with a longitudinally extending slot 24, the ends of which register with corresponding cut outs or recesses 25 in the case 10. In operation, the studs 20 on the carrier plate 19 are guided within the slot 24, the blade being thereby maintained in transverse central position with respect to the pole faces 12 during sliding movement of the blade.

The carrier plate 19 may not only serve to facilitate the manipulation of the blade 17 in mounting and dismounting the blade in bridging position across the pole faces 12, but may also be used for sliding the blade back and forth over the pole faces of the magnet, so that a mechanical honing action is exerted concurrently with the magnetic honing action of the magnet 11. Also, the application of pressure on top of the carrier plate 19 by the fingers of the manipulator, causes the outer edges thereof to press the corresponding portion of the blade 17 against the pole faces 12, this pressing action being effected along a continuous line overlying the pole faces 12, so that the pressure will be transmitted equally along the cutting edge of said blade.

Sometimes, razor blades are either made of chromium steel, or other similar alloy, which somewhat reduces the magnetic properties of the blade. It is therefore preferable to compensate for the reduction in magnetic property of the blade by making the carrier plate of a strongly magnetic material, such as soft iron, which is very susceptible to the attraction of the magnet. The magnet's attraction for the carrier plate causes the blade 17 to be pressed with greater force against the magnet pole ends, the magnetic attraction of the magnet for the blade alone being thus supplemented.

The attraction of the magnet for both the blade and carrier plate not only aids materially in properly centering and drawing these members together into cooperative relationship, but is also effective for maintaining said carrier plate and blade in position during periods of idleness of the sharpener. Also, the bridging of the magnetic poles by a carrier plate of strong magnetic properties during the periods of idleness, serves to maintain the magnetic circuit closed, thereby materially prolonging the life of the magnet.

In Fig. 4 is shown another form of the present invention, in which the case 10 is provided with a flanged cover 27 hinged at 28 to the edge of the case. For locking the cover 27 in closed position, the forward edge of the case is molded preferably with a latch lug 30 which is rounded at its upper face, and which forms a shoulder 31 at its lower edge, which is laterally rounded as shown. The cover 27 has riveted or otherwise secured thereto a metal fingerpiece 32 with a coiled lower edge 33, and an aperture 34 adjacent thereto, and adapted to snap over the latch lug 30.

The case 10 is preferably formed with longitudinal fillets 35 extending along the vertical edges thereof, the upper edges of these fillets forming stops or shoulders 36 for supporting a spacer member 37. This spacer member 37 is provided with a slot 38 extending to the forward edge of the case 10, and alined with a corresponding cut out or recess 39 in the forward portion of said case. This slot 38 does not extend across to the rear of the case 10, but is bridged near said rear end by a transverse extension 41 which acts as a stop for the rear pendant stud 20. The carrier plate 19 is similar to that shown in Fig. 1, and is sufficiently short so that it may be retained in bridged position across the magnet when the cover is closed.

In Fig. 5 is shown another form of the present invention in which the case 10 is provided with a flanged cover 43 which is slidable along the top of the case, and which serves to support a carrier plate 45, and the razor blade 17. For that purpose, the cover has connected thereto a pair of pendant studs 44 which support the carrier plate 45, having holes 46 for engaging said studs. Since this carrier plate is not in a position to be directly manually operated, it may be of plane form without the provision of ribs and knurled surfaces as shown in the construction of Figs. 1 to 4. In order to retain the carrier plate 45 in engagement with the studs 44, the lower ends of these studs are provided with pins 47 and 48 extending transversely therefrom, these pins serving to prevent the blade and carrier plate from falling off before the cover 43 is mounted for honing operation. These pins, although sufficiently long to prevent the removal of the carrier plate therefrom, are not sufficiently long to prevent hooking a blade into engagement with said studs especially with those blades having slots with spaced enlargements thereabout.

The case 10 is provided with a spacer member

37 which is similar to that shown in Fig. 4, and having a slot 38 which is adapted to engage the studs 44. In the construction of Fig. 5, it should be noted that the cover 43 not only serves to close the case 10, but also serves as a means whereby the carrier plate 45 may be slid along the top of the case to effect the centering of the razor blade in position with respect to the pole faces 12, or if desired, to supplement the magnetic action of the magnet by a reciprocating movement of said cover. The stop piece 41 is contacted by pin 47 and thus serves as a stop for preventing the cover 43 from overrunning the rear end of the case 10.

In Fig. 6 is shown an embodiment of the invention, in which the case 10 is provided with a cover 50 which is slidable in a longitudinal direction along the open end of said case, and which has permanently fixed thereto a carrier plate 51 of paramagnetic material, said carrier plate being cemented or otherwise secured to the underside of said cover. In order to guide said cover 50 for slidable movement along the open end of the case 10, the upper ends of the sides of said case are rabbet jointed with the bottom of the sides of said cover 50, there being a clearance between the cover and the case, so that said cover and the plate 51 rest on the blade 17 which lies flat with its beveled cutting edge in face to face contact with the beveled pole ends.

In order to effect the movement of the blade 17 and the cover 50 in unison, said cover has connected thereto a pair of pendant studs 53 which pass through the openings or enlargements in said blade, and which extend into the groove 24 in a fashion similar to that construction shown in Fig. 3. The device, in accordance with this modified construction, may be operated in a manner similar to that described with reference to the construction of Fig. 5.

While entirely good results are accomplished in each of the embodiments by interposing the plate between the magnet pole end and the keeper plate and performing the manipulation set forth, it contributes to best results to repeat the operation with the blade in reversed position, all substantially as set forth in the prior patent to Girtanner No. 1,796,096, granted March 10, 1931.

Through the instrumentality of the present invention, the centering of the blade with respect to the pole ends is insured during the operation of emplacing the blade with the cutting edges in engagement with the pole ends, or removing said blade therefrom. Furthermore, the fingers do not come in contact with the blade itself, the manipulation necessary for sliding the blade into honing position merely consisting in engaging the top of the carrier plate or cover by one or more fingers, and pushing said plate or cover along the pole faces of the magnet. No direct finger engagement with the blade is necessary, and the danger of the manipulator cutting his fingers is reduced. Furthermore, during this operation, the blade is guided with the lugs from the plate or cover extending in the space between the pole faces, so that the blade will at all times be disposed in transverse centered position with respect to the pole faces. No resetting of the blade from askewed position is therefore necessary as a result of the present invention.

Also during this operation of emplacing or removing the blade by sliding action, the honing operation is accelerated by this action. If desired, the carrier plate or cover may be used to reciprocate the blade rapidly across the pole faces, so that honing operations may be still further accelerated, and made more effective.

Also, by providing a carrier plate having longitudinal straight edges, which press against the intermediate portion of the blade being honed, said edges are subjected to equal pressure thereabout, so that the cutting edge will be subjected to uniform pressure, and therefore will be disposed in exact alinement.

While the keeper plate is shown with studs adapting it more particularly for use with blades of the Gillette or Probak type it will be understood that in accordance with the principles best disclosed in my copending application above identified, a keeper plate may be provided with studs, pins or fins for coordination with blades of the Gem type or of the Valet type or of any other type either now in existence or that may hereafter be devised. No alteration is required in the construction or arrangement of the magnet. It is merely the keeper plate or rather the arrangement of studs, pins or fins thereon which should be specially adapted for the particular type of blade to be honed.

It will thus be seen that there is herein described an apparatus in which the several features of this invention are embodied, and which in its action attain the various objects of the invention and is well suited to meet the requirements of practical use.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A hone for a blade, including a magnet, a blade carrier plate of magnetic material, means for interengaging said blade and carrier plate for slidable movement in unison, said blade overhanging the corresponding edge of said carrier plate, with the blade and plate interengaging, and means for guiding said blade and carrier plate for reciprocal movement along one of the pole ends of said magnet, with the cutting edge of said blade in engagement with said pole end and a portion of said carrier plate overlying said pole end and magnetically pressing the blade thereagainst.

2. A hone for a double edge flexible razor blade having openings therethrough, comprising a casing, a horse shoe magnet mounted in said casing, and having a pair of inwardly bevelled, symmetrically conformed and positioned magnetic pole ends at the open end of said casing, a spacer member extending across the open end of said casing, and having a groove extending longitudinally between the pole ends of the magnet, said pole ends being sufficiently wide and interspaced a sufficient distance so that the razor blade may be bridged across said pole ends, with the cutting edges thereof in engagement with said pole ends, a blade carrier plate of magnetic material having a pair of longitudinally extending edges in parallel relationship, and interspaced a distance smaller than the distance between the cutting edges of said blade, a pair of lugs extending from the surface of said plate, and adapted to pass through the openings in said blade,

whereby said plate and blade may be interengaged for sliding movement in unison, said lugs being adapted to extend into the groove of the spacer member, whereby said blade may be guided along the pole ends of the magnet, with the cutting edges thereof in engagement with the pole ends, the width of said blade being such that the longitudinal edges thereof overlie the pole ends of the magnet during honing operation.

3. In a device of the class described, the combination of a casing, a cover therefor, a magnet mounted in said casing, and having the pole end finished to provide a honing surface, said pole end being disposed at the open end of said casing, and means for holding the blade to be sharpened, with its cutting edge in engagement with said pole ends, and including a blade carrier plate of magnetic material adapted to be disposed in appositive relationship with the blade, so as to press the cutting edge of said blade across the pole end of the magnet as a result of the attraction of the magnet for said plate interengaging means on the carrier plate and magnet for guiding the manual reciprocation of the carrier plate as the latter thrusts the blade along the pole end, the casing and its cover being sufficiently large so that the cover may be closed, while retaining the plate and blade in honing position in said casing.

4. In a device of the class described, the combination of a casing, a flanged cover therefor hinged on to said casing, a horse shoe magnet mounted in said casing, and having the pole ends thereof near the open end of said casing, and means for holding a double edge flexible razor blade with the cutting edges thereof in engagement with the pole ends of said magnet, and including a plate of magnetic material of greater width than the space between the magnet poles and of less width than the plate adapted to lie across the top of said blade and to press the cutting edges of said blade against the pole ends of the magnet under the influence of magnetic force, said casing and cover being sufficiently large so that the cover may be closed, and the plate and blade retained in the casing in honing relationship with the magnet.

5. A device of the class described, including a casing, a horse shoe magnet mounted in said casing, and having the pole ends thereof disposed near the open end of said casing, a flange cover adapted to slide along the open end of said casing, means connected to said casing for holding the blade to be sharpened in engagement with said cover for sliding movement in unison therewith, said blade being mounted so that the cutting edges thereof may be slid across the pole ends of the magnet, and a magnetic plate disposed on top of said blade and carried by said cover, said plate being adapted to be attracted by the pole ends of the magnet, whereby the cutting edges of said blade are pressed against said pole ends.

6. A device of the class described, including a casing, a horse shoe magnet mounted in said casing, and having the pole ends thereof disposed near the open end of said casing, a flanged cover adapted to slide along the open end of said casing, a pair of lugs extending from inside of said cover, and adapted to engage a double edge flexible razor blade, a plate of magnetic material engaged by said lugs for movement in unison therewith, and adapted to rest upon the blade to be sharpened, said blade being mounted on said cover so that the cutting edges thereof are slid along the pole ends of the magnet, when said cover is slid along the open end of the casing.

7. A device of the class described, including a casing, a magnet disposed in said casing, and having one of the pole ends thereof disposed near the open end of said casing, a slidable cover member for said casing, a plate of magnetic material, and means on said cover member for carrying said plate and the blade to be sharpened in appositive relationship, so that when the cover is slid along the top of said casing, the cutting edge of said blade comes in contiguous relationship with the pole end of the magnet with the plate pressing against said blade.

8. A device of the class described, including a casing, a magnet disposed in said casing, and having one of the pole ends thereof disposed near the open end of said casing, a cover member for said casing, a plate of magnetic material, means on said cover member for carrying said plate and the blade to be sharpened in appositive relationship, and means for guiding the cover member along the open end of said casing, so that the cutting edge of the blade is slid along the pole end of the magnet, with the magnetic plate pressing against said blade.

9. In a device of the class described, the combination of a casing, a flanged cover for said casing, said cover being provided with a pair of lugs, said casing having a guide groove extending along the top thereof, and in which said lugs are adapted to extend, a magnet mounted in said casing, and having a pole end near the open end of said casing, means on said flanged cover for carrying a blade and a magnetic plate, with said plate resting on said blade, said blade being so mounted that when the cover is slid along the open top of said casing with said lugs travelling in said groove, the cutting edges of said blade will be slid along the pole end of the magnet, with the plate pressing against said blade.

10. In a device of the class described, the combination of a casing, a horse shoe magnet mounted in said casing, and having the pole ends thereof disposed in symmetrical position, said casing being provided with a guide groove between said pole ends, a flanged cover member adapted to slide along the open top of said casing, a pair of lugs extending from the top wall of said flanged cover, and adapted to engage a double edge flexible razor blade, said lugs extending in said grooves when said cover is slid along the open top of said casing, and a plate of magnetic material resting on top of said blade, and having holes engaged by said lugs, said blade being so mounted that when said cover is guided along the open top of said casing, the cutting edges of said blade slide along the pole ends of the magnet, with the magnetic plate pressing against said blade.

11. In a device of the class described, the combination of an open topped casing, a horse shoe magnet mounted in said casing, and having the pole ends thereof exposed from the open end of said casing, and spaced to receive a razor blade of the double edge type thereacross, with the cutting edges of said blade in engagement with said pole ends, a cover adapted to slide along the open top of said casing, a plate of magnetic material permanently secured to the inside of said casing, said plate being sufficiently wide with respect to the direction of movement of said cover, whereby the longitudinal edges thereof engage said blade and overlie the pole ends of said magnet, and

means for guiding said cover along the open end of said casing, with the sides of the plate engaging said blade, and the weight of the cover and plate being supported on said blade.

12. A combined magnetic and mechanical honing device for double-edged razor blades including a horse shoe magnet having spaced pole faces adapted to serve as honing surfaces, a magnetizable carriage plate and magnetic keeper of greater width than the space between the poles and of lesser width than the blade to be sharpened, said keeper having studs thereon for engagement with the blade and means associated with the magnet affording a trackway in which said studs travel, whereby to guide the carrier plate for manual reciprocation in operative relationship to the pole faces.

MONROE L. BICKART.