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(71) Applicant: **Oudt, Jan Rein Willem**

1633 GB Avenhorn (NL)

(72) Inventor: **Oudt, Jan Rein Willem**

1633 GB Avenhorn (NL)

(74) Representative: **Voncken, Bartholomeus Maria
Ch.**

**De Vries & Metman,
Overschiestraat 180**

1062 XK Amsterdam (NL)

(54) **Apparatus for sharpening ice skates**

(57) An apparatus is provided for sharpening ice skates which are provided with a blade having a bottom face and two opposite side faces, said apparatus comprising two magnetic parts each with a first side for magnetically engaging a respective one of the opposite side faces of the ice skate blade, and each with a second side

perpendicularly to the first side and in parallel to the bottom face of the ice skate blade for magnetically engaging a sharpening block intended for engaging the bottom face of the ice skate blade, and further comprising a housing with recesses for receiving the two magnetic parts and sharpening block in an at least partially movable manner.

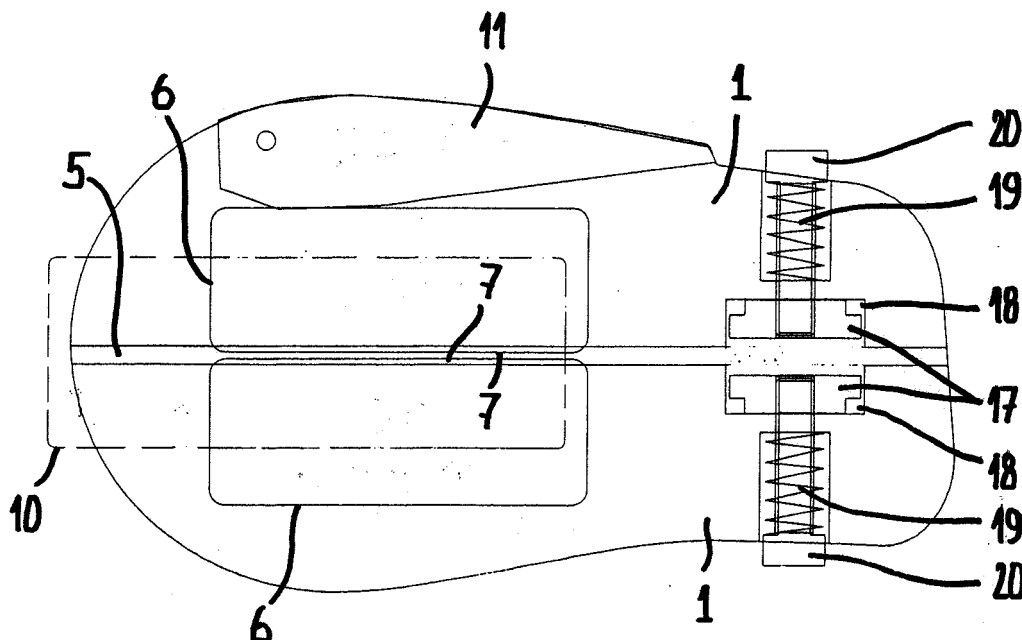


Fig. 2

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Description

[0001] The invention relates to an apparatus for sharpening ice skates which are provided with a blade having a bottom face and two opposite side faces.

[0002] A major problem when sharpening ice skates relates to maintaining a sharpening block in a proper orientation relative to the blade of the ice skate. Generally it is mandatory to maintain the sharpening block exactly perpendicularly to the blade side faces, such that the bottom face of the blade after sharpening also will extend perpendicularly to the side faces.

[0003] In a known apparatus a jig is provided in which the ice skates (or only the blades thereof) can be mounted, after which a sharpening block is moved along the blades. The use of such an apparatus requires a lot of skill, and such an apparatus is rather bulky.

[0004] It is an object of the present invention to provide an improved apparatus of the type referred to above.

[0005] Thus, in accordance with the present invention, an apparatus for sharpening ice skates is provided, comprising two magnetic parts each with a first side for magnetically engaging a respective one of the opposite side faces of the ice skate blade, and each with a second side perpendicularly to the first side and in parallel to the bottom face of the ice skate blade for magnetically engaging a sharpening block intended for engaging the bottom face of the ice skate blade, and further comprising a housing with recesses for receiving the two magnetic parts and sharpening block in an at least partially movable manner.

[0006] In use, during sharpening an ice skate, the blade of the ice skate is positioned between the two magnetic parts which are magnetically attracted to each other and to the blade positioned therebetween. As a result, the first sides of the magnetic parts are positioned in a well-defined position engaging the two opposite side faces of the blade, which results in a well-defined position of the second sides of the magnetic parts, such that the sharpening block engaging said second sides is positioned perpendicularly to the bottom face of the blade, as required for properly sharpening the blade of the ice skate. The magnetic force between the magnetic parts and the blade at one hand, and the magnetic force between the magnetic parts and the sharpening block on the other hand assist in maintaining the correct relative positions of all parts, such that during sharpening the ice skate it is ensured that the sharpening block is maintained in a correct position relative to the bottom face of the blade. Notwithstanding the magnetic attraction between the magnetic parts and the blade, latter can be moved to and fro between the magnetic parts and thus relative to the sharpening block, leading to a sharpening effect of the blade.

[0007] The magnetic parts and sharpening block are received in respective recesses of the housing, such that during the to and fro movement of the blade and after removing a sharpened blade, the magnetic parts and sharpening block are maintained substantially in a cor-

rect relative position, ready for sharpening an other blade of an ice skate.

[0008] Because the two magnetic parts and sharpening block are received in the recesses of the housing in an at least partially movable manner, said magnetic parts and sharpening block can move relative to the housing in a limited way to automatically obtain the correct position in which, as described above, a situation occurs in which the sharpening is carried out in an appropriate manner.

[0009] In a preferred embodiment of the apparatus in accordance with the present invention, both magnetic parts are permanent magnets. This increases the force with which the magnetic parts engage the blade at one hand and the sharpening block at the other hand. As a result the correct positioning of all parts is more effectively maintained.

[0010] It is noted, however, that it also might be possible that only one of the magnetic parts is a permanent magnet, whereas the other magnetic part is magnetised under influence of the magnetic part which is a permanent magnet. Further it is conceivable, that also the sharpening block is a permanent magnet.

[0011] In accordance with yet another embodiment of the apparatus according to the present invention, the magnetic parts are biased towards each other by extra means in addition to the magnetic force. Such extra means can be helpful in maintaining the correct position of all relevant parts of the apparatus.

[0012] For example, in one embodiment one magnetic part has a substantially stationary position within the housing, whereas the other magnetic part is movably housed in the housing. The magnetic part having a substantially stationary position within the housing basically defines the orientation of the blade and, indirectly, the orientation of the other magnetic part and sharpening block. The movable magnetic part is biased to increase the force with which the magnetic parts engage the blade.

[0013] In such a case it is possible, that the movable magnetic part is engaged by a pusher which is manually operable by a user of the apparatus. This means, that the user of the apparatus can choose the moment at which the movable magnetic part is biased. Generally this will be when a blade has assumed its position between the two magnetic parts and is moved to and fro relative to the magnetic parts and sharpening block for sharpening it. During introducing the blade between the magnetic parts and during removing the blade therefrom, the user will not engage the pusher, such that the force with which the magnetic parts engage the blade is decreased, making the introduction or removal of the blade easier.

[0014] Preferably, in such a case, the pusher is a lever which is pivotally connected to the housing.

[0015] In accordance with another, preferred, embodiment of the apparatus, the housing further comprises deburring devices for deburring the blade. When the blade has been sharpened, generally burrs will be

present on the blade, which have to be removed. By incorporating deburring devices into the apparatus no additional device apart from the apparatus according to the present invention is needed.

[0016] Preferably such deburring devices comprise two movable deburring devices positioned opposite each other in recesses and biased away from each other and having operating ends projecting from the housing for manually moving the deburring devices towards each other and towards an ice skate blade positioned therebetween. In an inoperative position the deburring devices are biased away from each other and will not engage the blade of the ice skate. Only when a user manually moves the operating ends of the deburring devices towards the housing (inwardly) said deburring devices will engage the ice skate blade positioned therebetween.

[0017] Then, constructively it is preferred that the housing comprises a longitudinal slot for temporarily receiving the ice skate blade to be sharpened, wherein at a first longitudinal position of said slot the recesses for receiving the two magnetic parts and sharpening block are located, whereas at a second longitudinal position of said slot the recesses for receiving the deburring devices are located. Introducing the ice skate blade to be sharpened into the longitudinal slot automatically positions it in a correct position relative to the magnetic parts and sharpening block as well as relative to the deburring devices.

[0018] When, in accordance with yet another embodiment of the apparatus according to the present invention, the longitudinal slot debouches in a face of the housing with opposite diverging slot walls, introducing the ice skate blade into the longitudinal slot is facilitated.

[0019] The effectiveness of the apparatus may be improved further, when the sharpening block is movable in its receiving recess and biased towards the magnetic parts. This offers an extra possibility for assuring that all parts of the apparatus assume an optimal position relative to the blade to be sharpened.

[0020] The bias of the sharpening block may be caused by a spring member positioned in the housing, such as for example a compression spring carrying at its end engaging the sharpening block a dome-like member for engaging the sharpening block.

[0021] Finally it is possible, that the housing has an ergonomic shape adapted to the hand of a user. For example, such an ergonomically shaped housing may resemble a computer mouse.

[0022] Hereinafter the invention will be elucidated while referring to the drawing, in which an embodiment of an apparatus in accordance with the present invention is illustrated. Herein:

figure 1 shows a side elevational view of an embodiment of the apparatus according to the present invention;

figure 2 shows a cross-sectional view, in accordance with II-II in figure 1;

figure 3 shows a cross-sectional view in accordance with III-III in figure 1, and

figure 4 shows a cross-sectional view in accordance with IV-IV in figure 1.

[0023] It is noted, that, in some aspects, the figures are schematical and that the cross-sectional views according to figures 2-4 do not fully correspond with the exact geometrical cross-sections.

[0024] Firstly referring to figure 1, the apparatus for sharpening ice skates is provided with a housing 1 which, as will appear later, receives all operative parts of the apparatus and which has an ergonomic shape adapted to the hand of a user.

[0025] Referring to figure 3, part of a blade 2 of an ice skate (not shown) is illustrated. Said blade 2 comprises a bottom face 3 and two opposite side faces 4.

[0026] Next, reference is made to figure 2. The housing 1 is provided with a longitudinal slot 5 (best visible in figures 3 and 4) which extends over the entire length of the housing 1. Said longitudinal slot 5 is joined by recesses (not illustrated) which receive two magnetic parts 6, each with a first side 7 for magnetically engaging a respective one of the opposite side faces 4 of the ice skate blade 2 (as illustrated best in figure 3). Each magnetic part 6 further comprises a second side 8 (see figure 3) which extends perpendicularly to the first side 7 and in parallel to the bottom face 3 of the ice skate blade 2.

[0027] In a recess 9 (see figure 3) a sharpening block 10 is received which is intended for engaging the bottom face 3 of the ice skate blade 2. The second sides 8 of the magnetic parts 6 will magnetically engage said sharpening block 10.

[0028] In figure 2 the sharpening block 10 has been indicated in dotted lines.

[0029] When the magnetic parts 6 both are permanent magnets, they will engage the respective side faces 4 of the blade 2 firmly. Moreover they will engage in a magnetic manner the sharpening block 10, thus maintaining the sharpening block 10 in an optimal position for sharpening the blade 2.

[0030] A lever 11 is pivotably connected to and housed in the housing 1 and engages one of the magnetic parts 6. A user may push against said lever 11 to bias the respective magnetic part 6 towards the opposite magnetic part 6, thus increasing the force with which both magnetic parts 6 engage the blade 2.

[0031] Above the sharpening block 10 a spring member 12 is received in a respective recess 13 for pushing a ball-(or dome-) shaped member 14 against the sharpening block 10 which, in result, is firmly pressed against the magnetic parts 6 and against the bottom face 3 of the blade 2.

[0032] As shown best in figures 3 and 4, the longitudinal slot 5 debouches in a face 5 of the housing 1 with opposite diverging slot walls 16. This facilitates the introduction of the blade 2 into the slot 5.

[0033] Longitudinally spaced from the magnetic parts

6 deburring devices 17 are provided which are received in corresponding recesses 18 (figure 2). The deburring devices 17 are positioned opposite each other and are biased away from each other by means of spring members 19 cooperating with operating ends 20. The operating ends 20 project from the housing 1 and can be moved manually inwards so that the deburring devices 17 are moved towards each other and towards an ice skate blade 2 positioned therebetween.

[0034] When a blade 2 to be sharpened has been positioned into the slot 5 (as illustrated in figure 3) it is positioned between the magnetic parts 6 which engage the opposite side faces 4 of the blade 2 with their respective first sides 7. The second sides 8 of the magnetic parts 6 engage the sharpening block 10 which further engages the bottom face 3 of the blade 2 (it is noted, that in figure 3 the bottom face 3 of the blade 2 faces upwardly, but that such a bottom face faces downwardly when the respective ice skate is used, hence the indication "bottom face"). Now the apparatus may be moved to and fro along the blade 2 (the blade 2 moves to and fro in the longitudinal slot 5) which is sharpened by the sharpening block 10. Next the deburring devices 17 may be pushed inwardly by means of the operating ends 20, thus engaging the opposite side faces 4 of the blade 2 for removing any burrs when, in such a position, the apparatus (or blade) again is moved to and fro.

[0035] Although not shown in detail, it is possible that the housing 1 of the apparatus comprises a number of separate parts which can be taken apart for removing or exchanging parts of the apparatus, for example the magnetic parts 6, sharpening block 10 and deburring devices 17.

[0036] The invention is not limited to the embodiment described before, which may be varied widely within the scope of the invention as defined by the appending claims.

Claims

1. Apparatus for sharpening ice skates which are provided with a blade having a bottom face and two opposite side faces, said apparatus comprising two magnetic parts each with a first side for magnetically engaging a respective one of the opposite side faces of the ice skate blade, and each with a second side perpendicularly to the first side and in parallel to the bottom face of the ice skate blade for magnetically engaging a sharpening block intended for engaging the bottom face of the ice skate blade, and further comprising a housing with recesses for receiving the two magnetic parts and sharpening block in an at least partially movable manner.
2. Apparatus according to claim 1, wherein both magnetic parts are permanent magnets.
3. Apparatus according to claim 1 or 2, wherein the magnetic parts are biased towards each other by extra means in addition to the magnetic force.
4. Apparatus according to claim 3, wherein one magnetic part has a substantially stationary position within the housing, whereas the other magnetic part is movably housed in the housing.
5. Apparatus according to claim 4, wherein the movable magnetic part is engaged by a pusher which is manually operable by a user of the apparatus.
6. Apparatus according to claim 5, wherein the pusher is a lever which is pivotably connected to the housing.
7. Apparatus according to one of the previous claims, wherein the housing further comprises deburring devices for deburring the blade.
8. Apparatus according to claim 7, wherein the deburring devices comprise two movable deburring devices positioned opposite each other in recesses and biased away from each other and having operating ends projecting from the housing for manually moving the deburring devices towards each other and towards an ice skate blade positioned therebetween.
9. Apparatus according to claim 8, wherein the housing comprises a longitudinal slot for temporarily receiving the ice skate blade to be sharpened, wherein at a first longitudinal position of said slot the recesses for receiving the two magnetic parts and sharpening block are located, whereas at a second longitudinal position of said slot the recesses for receiving the deburring devices are located.
10. Apparatus according to claim 9, wherein the longitudinal slot debouches in a face of the housing with opposite diverging slot walls.
11. Apparatus according to any of the previous claims, wherein the sharpening block is movable in its receiving recess and biased towards the magnetic parts.
12. Apparatus according to claim 11, wherein the bias of the sharpening block is caused by a spring member positioned in the housing.
13. Apparatus according to any of the previous claims, wherein the housing has an ergonomic shape adapted to the hand of a user.

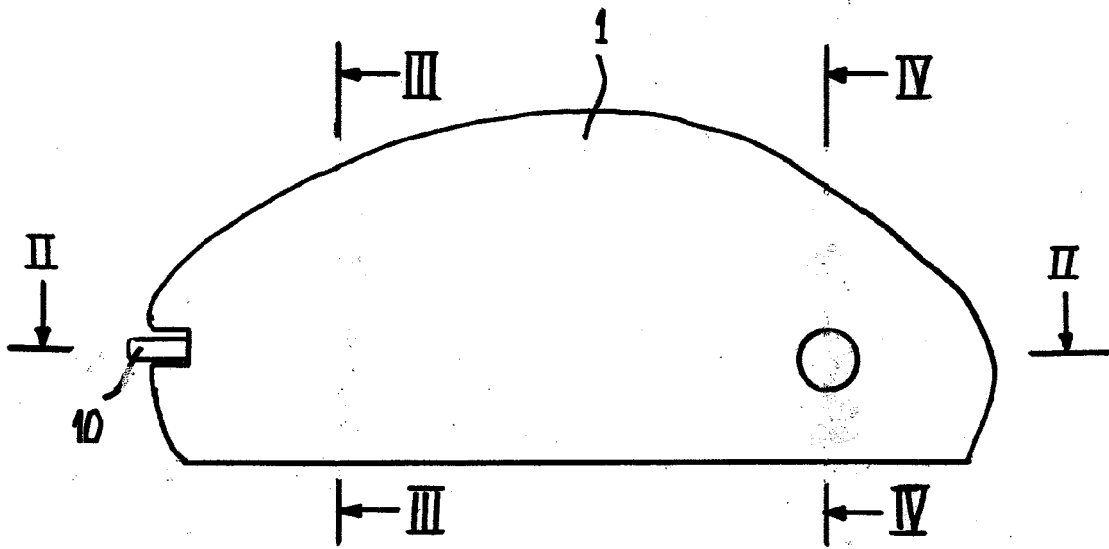


Fig. 1

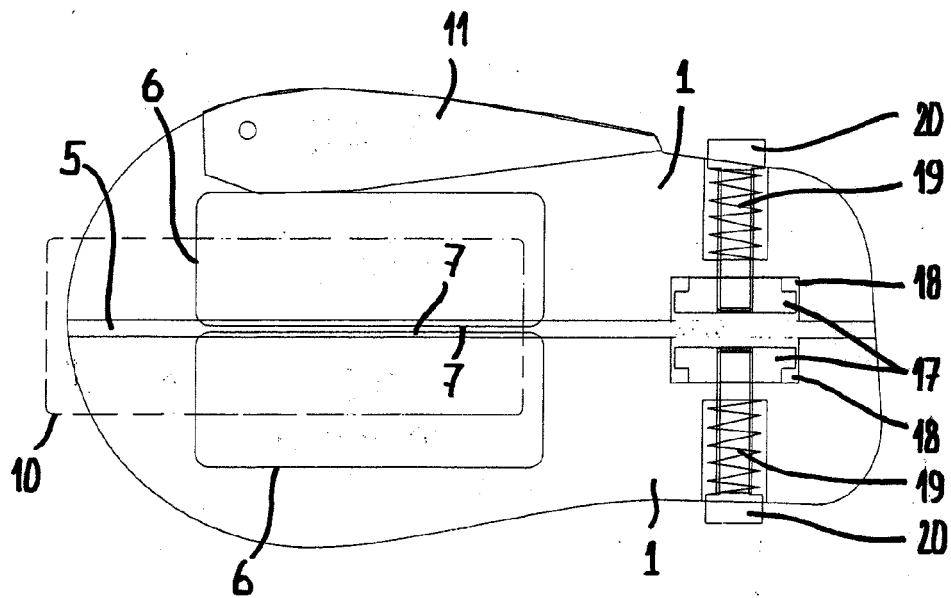


Fig. 2

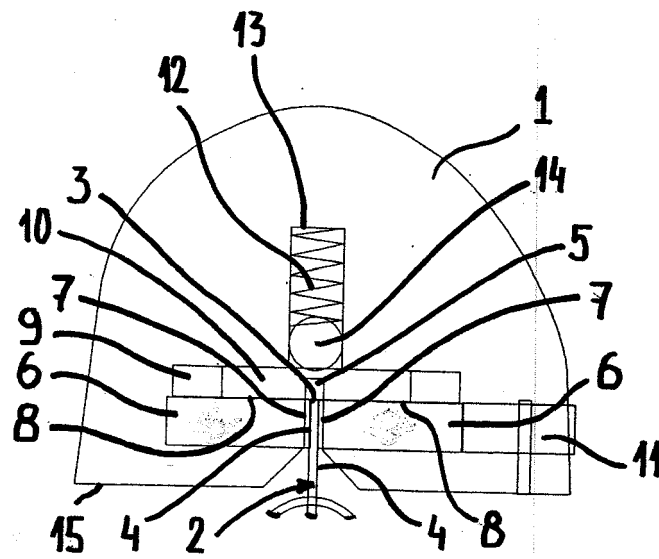


Fig. 3

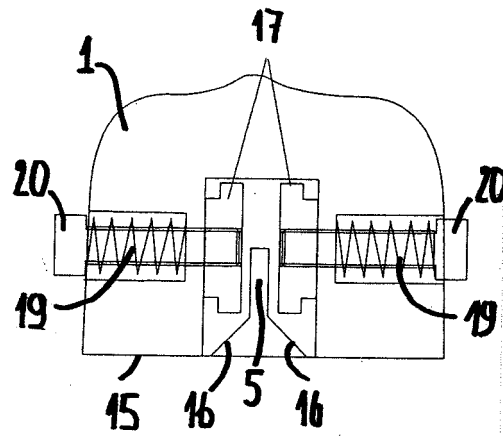


Fig. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 06 12 4625

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 24 April 2007	Examiner Sluimer, Paul
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 06 12 4625

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24-04-2007

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