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(54) **Knife and blade sharpener**

Messer- und Klingenschärfgerät

Dispositif d'affûtage de lames et de couteaux

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Description

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

[0001] THIS INVENTION relates to a knife sharpener as defined in the preamble of claim 1, see US-A-4,718,200.

[0002] Throughout the specification, the term "knife" shall include cutting devices and utensils of the type having a handle or grip; at least one cutting blade, which may be fixed, foldable or partially or wholly retractable relative to the handle or grip; the or each cutting blade having at least one cutting edge.

[0003] Examples of the cutting devices and utensils included within the term "knife" shall include kitchen knives, butcher's knives, chefs knives, sporting knives, box cutters or so-called "Stanley" (Trade Mark) knives, pocket knives, letter openers or bodkins, and the like.

2. PRIOR ART

[0004] Traditionally, knives such as butcher's knives and chefs knives were sharpened or honed using a honing steel and/or whetstone. However, as many people did not have the necessary skill to use such steels to produce good cutting edges on their knives, many different types of knife sharpeners have been developed over the years. While these knife sharpeners are easier to use for the average person, they generally have one or more practical limitations and so there is still a quest to develop an improved knife sharpener.

[0005] GB-A-517 242 discloses a knife sharpener with two sharpening members, which each has a sharpening face. The sharpening members are made of a rigid material, and thus are not flexible. The sharpening members are mounted in a respective holder and are hinged about respective pivot points. The sharpening members are interconnected by a tensioned spring arranged in such a way that the sharpening faces of the sharpening members are forced towards each other.

[0006] US-A-4,718,200 discloses a knife sharpener including: a base; at least one pair of sharpening members having a mounting bracket or plate mountable in or on the base, wherein each of the sharpening members has a plurality of resiliently flexible fingers or strips; and abrasive means in a form of a rigid abrasive block on each strip, wherein the abrasive blocks form inwardly directed opposed sharpening surfaces.

SUMMARY OF THE PRESENT INVENTION

[0007] It is an object of the present invention to provide a knife sharpener, which is easy to use without the necessity for special skills and which preferably provides a cutting edge which is similar to that produced by a honing steel.

[0008] It is a preferred object of the present invention to provide such a knife sharpener, which is relatively simple to manufacture and which may be relatively inexpensive to manufacture.

[0009] It is a further preferred object of the present invention to provide a knife sharpener, which can easily be varied in specification to suit the particular knives, which it is intended to sharpen.

[0010] It is a still further preferred object to provide such a knife sharpener, which may be freestanding; or which may be incorporated into a knife scabbard or knife block, or affixed to any solid or support surface.

[0011] Other preferred objects of the present invention will become apparent from the following description.

[0012] The present invention resides in a knife sharpener as initially defined, which is characterised by characterising features of claim1.

[0013] The base may be freestanding eg., to rest on a bench, or be mounted on a wall, and may be provided with a handle which preferably extends laterally to a sharpening axis of the sharpener. Alternatively, the base may include, or be incorporated in, a knife scabbard or knife block. Where the base is a knife scabbard or knife block, preferably the fingers or strips extend into a hole, aperture, slot, or groove in the scabbard or block, or are mounted on a side of the scabbard or block.

[0014] Preferably there are two or more pairs of the resiliently flexible fingers or strips provided in the overlapping arrangement.

[0015] Preferably one of the, or each pair of fingers is formed integrally with a mounting plate or bracket mountable in or on the base; and the other of the, or each pair of fingers is formed integrally with a second plate or bracket.

[0016] Preferably the fingers or strips are offset relative to the plane of the mounting brackets or plates and are curved or angled relative thereto in side view.

[0017] The fingers or strips may be formed from resilient material including metals and their alloys; polymeric materials; composite materials; elastomeric materials and/or a combination of two or more of these and the materials may be reinforced eg., with metal fibres, plastic fibres, carbon fibres, or other suitable materials.

[0018] The abrasive means may include abrasive material and/or abrasive surfaces.

[0019] The abrasive materials may include sapphires and other hard gems; diamond dust or crushings; manufactured abrasives, including diamond-like carbon and carborundum; natural abrasives eg., stone; hard metal alloys, such as WC, CrC, VC; hard ceramics and their composites; and/or a combination of two or more of these. The selection of the particular abrasive material (s) and the grit sizes may be varied to suit the particular composition of the steels/alloys of the blades and the desired finish of the cutting edges.

[0020] The abrasive surfaces may be mechanically treated surfaces, such as grooves, knurling, random pitting or shot-blasting, or may be smooth, unmolested sur-

faces. The mechanically-treated surfaces may be similar to hard-chrome or hardened carbon steels, which may be coated with a hard surface (eg., hard chromed), hard or soft platings, or uncoated. Smooth surfaces are particularly suitable for fine honing of the cutting edges.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] To enable the invention to be fully understood, preferred embodiments will now be described with reference to the accompanying drawings in which:

FIG. 1 is a schematic, perspective view of a first embodiment of a knife sharpener in accordance with the present invention;
FIGS. 2 and 3 are perspective views of the fingers and associated mounting plates suitable for the embodiment of FIG. 1;
FIG. 4 is an end elevational view of a second embodiment;
FIG. 5 is a perspective view of a third embodiment; and
FIGS. 6 to 9 are perspective views of alternative abrasive surfaces on the fingers or strips.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] Referring to FIG. 1, the knife sharpener 10 of a first preferred embodiment of the present invention, to be hereinafter described, is designed to provide a sharp cutting edge 101 to the blade 102 of a knife 100 having a handle 103.

[0023] The sharpener 10 has a body 11 with a body flange 12 and optional backing plate 13 which may be bolted or fastened together by suitable bolts or fasteners 16.

[0024] A handle 14 is attached to, or formed integrally with, the body flange 12, and extends substantially at right angles to the sharpening axis of the knife sharpener 10 (along which knife 100 is shown to extend). A finger guard 15, of any suitable shape, overlies the handle 14 so that the handle 14 is squeezed by the user's hand/fingers and the guard 15 protects the hand/fingers against downward, accidental movement, of the knife blade 102.

[0025] As shown more clearly in FIGS. 2 and 3, a pair of sharpening members 20,30 are clamped to the body flange 12 so that the respective fingers 21-23 and 31-33 are arranged in an overlapping relationship shown in FIGS. 1 and 3.

[0026] In the specific embodiment illustrated, the sharpening members 20,30 are formed eg., by cutting and pressing from sheet metal. Each sharpening member 20,30 has a mounting plate 24,34 with holes 25,35 to allow the fasteners 16 to pass therethrough. The fingers 21-23 and 31-33 are curved and are outwardly offset relative to the mounting plates 24,34 and are connected thereto by substantially S-shaped intermediate sections 26,36, so that the lower portions of the fingers 21-3, 31-33 are spaced, and the fingers then overlap to form opposed sharpening faces 27-29 and 37-39 respectively.

[0027] Abrasive material 40 eg., fine diamond dust (see FIG. 6) is applied to the sharpening faces 27-29, 37-39, eg., by suitable adhesive or coating or plating means.

[0028] The operation of the sharpener will now be described with reference to FIG. 1.

[0029] The knife blade 101 is placed in the "valley" formed by the overlapping fingers 21-23, 31-33 so that the cutting edge 101 engages the sharpening faces 27-29, 37-39. As the knife 100 is pulled away from the sharpener 10, or pushed towards it, preferably with at least some downward pressure, the abrasive material on the sharpening faces 27-29, 37-39 grinds, or abrades, the cutting edge 101 to improve the quality of the cutting edge 101.

[0030] The blade 102 may be passed between the opposed fingers 21-23, 31-33 one or more times until the desired quality of cutting edge 101 is achieved.

[0031] In alternative embodiments, the sharpening faces 27-29, 37-39 can be mechanically treated to provide an abrasive surface that is non-abrasive particle based. The mechanically treated surfaces can incorporate grooves or knurling 41, random-pitting 42, a shot-blasted, eg., in the nature of standard hard-chromed or hardened carbon steels - see FIGS. 7 and 8.

[0032] In a further alternative embodiment, the sharpening faces 27-29, 37-39 can have smooth, unmolested surfaces, eg., for fine honing of the cutting edges.

[0033] The abrasive surfaces may be coated 43, eg,. with hard-chrome, hard or soft plating materials (see FIG. 9); or may be left unplated (eg., bare metal).

[0034] In a still further alternative embodiment, alternative sharpening faces 27-29, 37-39 may have abrasive materials and abrasive surfaces respectively; or the sharpening faces 27-29, 37-39 may have both abrasive materials and abrasive surfaces.

[0035] As the fingers 21-23, 31-33 are resiliently flexible, they can accommodate different blade thicknesses, cutting edge profiles and/or degree of downward pressure applied to the knife blade 102.

[0036] It will be readily apparent to the skilled addressee that the number of pairs of fingers; the curvature and angle and offset of the fingers; the construction of the fingers (eg., metal/metal alloys/fibre reinforced plastics); grit of the sharpening faces; type of abrasive material(s) /surface(s); width size of the abrasive material(s)/surface (s); and other desired details may be varied to suit the particular intended application, or manufacturing expediency.

[0037] Where the fingers are formed from plastics, composites and/or elastomeric materials, they may be moulded to shape and may incorporate fibre reinforcing materials (eg., metal fibres, glass fibres, carbon fibres).

[0038] It will be readily apparent to the skilled address-

ee that the knife sharpener 10 may be free standing, eg., to be used on a bench; or may be mounted eg., on a suitable support or bracket 50 on a wall or workbench 60, as shown in FIG. 4.

[0039] The knife sharpener 10 may also be provided in a knife scabbard or knife block 70, where the sharpening members 20,30 are mounted within the body 71 of the scabbard or block; and the fingers 21-23, 31-33 extend into a hole, aperture, groove or slot 72 within, or on, the body 71 of the scabbard or block 70.

Claims

1. A knife sharpener including:

a base (12, 50, 70); and
at least one pair of sharpening members (20, 30) having a mounting bracket or plate (24, 34) mountable in or on the base (12, 50, 70), wherein each of the sharpening members has a plurality of resiliently flexible, fingers or strips (21-23, 31-33),

characterised in that
at least one pair of fingers or strips (21-23, 31-33) are arranged in an overlapping arrangement; and
abrasive means is provided on at least one portion of inwardly directed, opposed, sharpening faces (27-29, 37-39) on the fingers or strips, so that the resiliently flexible fingers or strips form the sharpening faces (27-29, 37-39) and are operable to engage at least one cutting edge (101) on a blade (102) of a knife (100).

2. A sharpener as claimed in claim 1, wherein:

the base (15) is freestanding with a handle (14) extending laterally to a sharpening axis of the sharpener, or is mountable on a wall (60), or is incorporated in a knife scabbard or knife block (70).

3. A sharpener as claimed in Claim 2, wherein:

when the base is a knife scabbard or knife block (70), the mounting brackets or plates (24, 34) extend into a hole, aperture, slot, or groove (72) in the scabbard or block (70), or are mounted on a side of the scabbard or block.

4. A sharpener as claimed in any one of Claims 1 to 3, wherein:

there are two or more pairs of the resiliently flexible fingers or strips (21-23, 31-33) provided in the overlapping arrangement.

5. A sharpener as claimed in Claim 4, wherein:

the fingers or strips (21-23, 31-33) are is formed integrally with the a mounting brackets or plates 20, 30).

6. A sharpener as claimed in Claim 5, wherein:

the mounting brackets or plates (24, 34) are mountable in face-to-face contact in the base (12, 50, 70), and
the fingers or strips (21-23, 31-33) are offset relative to the plane of the mounting brackets or plates (24, 34) and are curved or angled relative thereto in side view.

7. A sharpener as claimed in any one of Claims 1 to 6, wherein:

the fingers or strips (21-23, 31-33) may be formed from resilient material including metals and their alloys; polymeric materials; composite materials; elastomeric materials and/or a combination of two or more of these, and the materials are optionally reinforced with metal fibres, plastic fibres, carbon fibres, or other suitable materials.

8. A sharpener as claimed in any one of Claims 1 to 7, wherein:

the abrasive means include abrasive material and/or abrasive surfaces.

9. A sharpener as claimed in Claim 8, wherein:

the abrasive materials include sapphires and other hard gems; diamond dust or crushings; manufactured abrasives, including diamond-like carbon and carborundum; natural abrasives, including stone; hard metal alloys, including WC, CrC, VC; hard ceramics and their composites; and/or a combination of two or more of these, the selection of the particular abrasive material(s) and the grit sizes being varied to suit the particular composition of the steels/alloys of the blades and the desired finish of the cutting edges.

10. A sharpener as claimed in Claim 8 or Claim 9, wherein:

the abrasive surfaces are mechanically treated surfaces, including grooves (41), knurling (41), random pitting (42) or shot-blasting, or are smooth, unmolested surfaces.

11. A sharpener as claimed in Claim 10, wherein:

the mechanically-treated surfaces are similar to hard-chromed or hardened carbon steels; optionally coated with hard surface inicluding hard chrome, hard or soft platings; or uncoated.

Patentansprüche

1. Messerschärfgerät, umfassend:

- eine Basis (12, 50, 70) und
- wenigstens ein Paar Schärfglieder (20, 30), die einen Befestigungsträger oder eine Befestigungsplatte (24, 34) aufweisen, die in oder an der Basis (12, 50, 70) befestigbar sind, wobei jedes der Schärfglieder eine Vielzahl von elastisch flexiblen Fingern oder Streifen (21-23, 31-33) aufweist,

dadurch gekennzeichnet, dass

- wenigstens ein Paar Finger oder Streifen (21-23, 31-33) in überlappender Anordnung angeordnet sind; und
- ein Schleifmittel an wenigstens einem Abschnitt von nach innen gerichteten gegenüberliegenden Schärfflächen (27-29, 37-39) an den Fingern oder Streifen vorgesehen ist, so dass die elastisch flexiblen Finger oder Streifen die Schärfflächen (27-29, 37-39) bilden und so betätigbar sind, dass sie an wenigstens einer Schneidkante (101) an einer Klinge (102) eines Messers (100) angreifen.

2. Schärfgerät nach Anspruch 1, bei dem die Basis (15) frei steht und einen Griff (14) aufweist, der sich seitlich zu einer Schärfachse des Schärfgeräts erstreckt oder an einer Wand (60) befestigt werden kann oder in ein Messerfutteral oder einen Messerblock (70) eingebaut ist.

3. Schärfgerät nach Anspruch 2, bei dem, wenn die Basis ein Messerfutteral oder Messerblock (70) ist, die Befestigungsträger oder -platten (24, 34) sich in eine Vertiefung, eine Öffnung, einen Schlitz oder eine Nut (72) in dem Futteral oder Block (70) erstrekken oder an einer Seite des Futterals oder Blocks befestigt sind.

4. Schärfgerät nach einem der Ansprüche 1 bis 3, bei dem zwei oder mehr Paare der elastisch flexiblen Finger oder Streifen (21-23, 31-33) in der überlappenden Anordnung vorgesehen sind.

5. Schärfgerät nach Anspruch 4, bei dem die Finger oder Streifen (21-23, 31-33) einteilig mit den Befestigungsträgern oder -platten (20, 30) ausgebildet sind.

6. Schärfgerät nach Anspruch 5, bei dem die Befestigungsträger oder -platten (24, 34) einander zugewandt in der Basis (12, 50, 70) befestigbar sind, und die Finger oder Streifen (21-23, 31-33) bezüglich der Ebene der Befestigungsträger oder -platten (24, 34) versetzt und in Seitenansicht bezüglich dieser gebogen oder in einem Winkel angeordnet sind.

7. Schärfgerät nach einem der Ansprüche 1 bis 6, bei dem die Finger oder Streifen (21-23, 31-33) aus elastischem Material gebildet sein können, einschließlich Metallen und ihrer Legierungen; Polymermaterialien; Verbundwerkstoffen; Elastomermaterialien und/oder einer Kombination aus zwei oder mehr daraus, und die Materialien fakultativ mit Metallfasern, Kunststofffasern, Kohlenstofffasern oder anderen geeigneten Materialien verstärkt sind.

8. Schärfgerät nach einem der Ansprüche 1 bis 7, bei dem das Schleifmittel Schleifmaterial und/oder Schleifflächen umfasst.

9. Schärfgerät nach Anspruch 8, bei dem die Schleifmaterialien Saphire und andere Hartedelsteine, Diamantstaub oder -bruch, künstlich hergestellte Schleifmittel, darunter diamantartiger Kohlenstoff und Karborund; natürliche Schleifmittel, darunter Stein; Hartmetalllegierungen, darunter WC, CrC, VC; Hartkeramiken und ihre Verbundstoffe; und/oder eine Kombination von zwei oder mehr daraus umfassen, wobei die Auswahl des speziellen Schleifmaterials (der speziellen Schleifmaterialien) und der Körnungsgrößen variiert werden, so dass sie zu der speziellen Zusammensetzung der Stähle/Legierungen der Klingen und der gewünschten Bearbeitung der Schneidkanten passen.

10. Schärfgerät nach Anspruch 8 oder 9, bei dem die Schleifoberflächen mechanisch behandelte Oberflächen sind, die mit Nuten (41), einer Rändelung (41), willkürlichen Vertiefungen (42) versehen sind oder kugelgestrahlt sind oder glatte, unbehandelte Oberflächen sind.

11. Schärfgerät nach Anspruch 10, bei dem die mechanisch behandelten Oberflächen ähnlich hartverchromtem oder gehärteten Kohlenstoffstählen; fakultativ mit harten Oberflächen einschließlich Hartchrom, harten oder weichen Beschichtungen überzogen, oder unbeschichtet sind.

Revendications

1. Dispositif d'affûtage de couteaux comprenant :

une base (12, 50, 70) ; et
au moins une paire d'éléments d'affûtage (20,

30) ayant un support ou plaque de montage (24, 34) pouvant être monté dans ou sur la base (12, 50, 70), dispositif dans lequel chacun des éléments d'affûtage présente une pluralité de doigts ou de bandes flexibles élastiquement (21-23, 31-33),

caractérisé en ce que

au moins une paire de doigts ou de bandes (21-23, 31-33) est disposée en agencement de chevauchement ; et
des moyens abrasifs sont disposés sur au moins une portion des faces d'affûtage opposées dirigées vers l'intérieur (27-29, 37-39) sur les doigts ou bandes, de sorte que les doigts ou bandes flexibles élastiquement forment les faces d'affûtage (27-29, 37-39) et peuvent être actionnés pour coopérer au moins avec un bord de coupe (101) sur une lame (102) d'un couteau (100).

2. Dispositif d'affûtage selon la revendication 1, dans lequel :

la base (15) est indépendante et comporte une poignée (14) s'étendant latéralement par rapport à un axe d'affûtage du dispositif d'affûtage ou peut être montée sur une paroi (60) ou est incorporée dans un fourreau ou bloc de couteau (70).

3. Dispositif d'affûtage selon la revendication 2, dans lequel :

lorsque la base est un fourreau ou un bloc de couteau (70), les supports ou plaques de montage (24, 34) s'étendent dans un trou, ouverture, fente ou gorge (72) dans le fourreau ou bloc (70) ou sont montés sur un côté du fourreau ou bloc.

4. Dispositif d'affûtage selon l'une quelconque des revendications 1 à 3, dans lequel :

sont prévues deux ou plus de deux paires des doigts

ou bandes flexibles élastiquement (21-23, 31-33) disposées en agencement de chevauchement.

5. Dispositif d'affûtage selon la revendication 4, dans lequel :

les doigts ou bandes (21-23, 31-33) sont formés solidairement avec les supports ou plaques de montage (20, 30).

6. Dispositif d'affûtage selon la revendication 5, dans lequel :

les supports ou plaques de montage (24, 34) peuvent être montés en contact face à face dans la base (12, 50, 70), et
les doigts ou bandes (21-23, 31-33) sont décalés par rapport au plan des consoles ou plaques de montage (24, 34) et sont incurvés ou forment un angle avec ceux-ci en vue latérale.

7. Dispositif d'affûtage selon l'une quelconque des revendications 1 à 6, dans lequel :

les doigts ou bandes (21-23, 31-33) peuvent être formés à partir de matériau élastique comprenant des métaux et leurs alliages ; des matériaux polymères ; des matériaux composites ; des matériaux élastomères et/ou une combinaison de deux ou plus de deux de ceux-ci, et les matériaux sont facultativement renforcés par des fibres métalliques, des fibres plastiques, des fibres de carbone ou autres matériaux appropriés.

8. Dispositif d'affûtage selon l'une quelconque des revendications 1 à 7, dans lequel :

les moyens abrasifs comprennent un matériau abrasif et/ou des surfaces abrasives.

9. Dispositif d'affûtage selon la revendication 8, dans lequel :

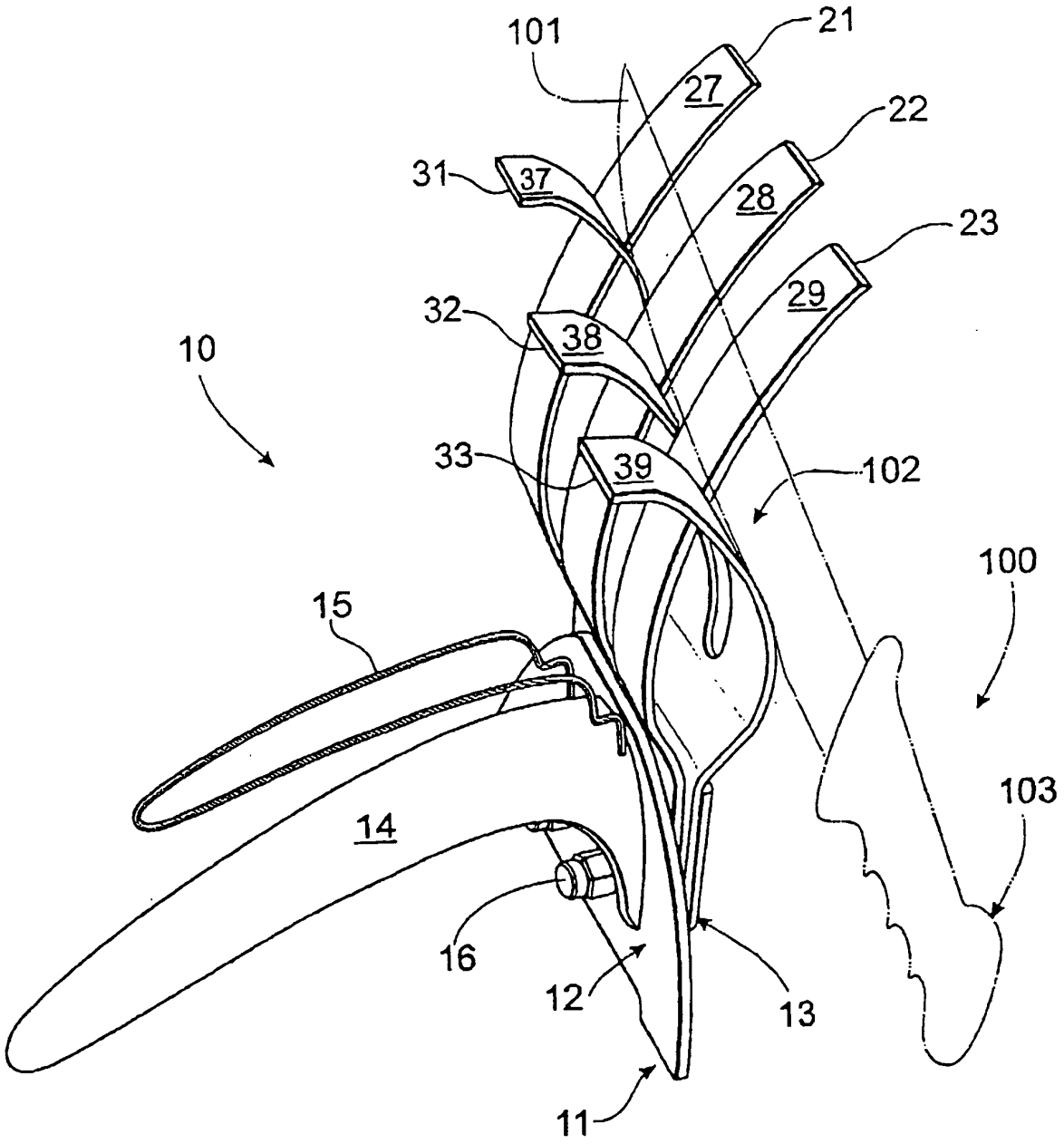
les matériaux abrasifs comprennent des saphirs et autres pierres dures ; de la poussière ou des morceaux de diamant ; des abrasifs fabriqués, comprenant du carbone de type diamant et du carborundum ; des abrasifs naturels, y compris la pierre ; des alliages de métaux durs, comprenant WC, CrC, VC ; des céramiques dures et leurs composites ; et/ou une combinaison de deux ou plus de deux de ceux-ci, la sélection du ou des matériaux abrasifs particuliers et les dimensions granulaires variant pour s'adapter à la composition particulière des aciers/alliages des lames et du fini souhaité des bords de coupe.

10. Dispositif d'affûtage selon la revendication 8 ou 9, dans lequel :

les surfaces abrasives sont des surfaces traitées mécaniquement, comprenant des gorges (41), des moletages (41), des formations de piqûres aléatoires (42) ou de grenaillage, ou sont des surfaces lisses, non traitées.

11. Dispositif d'affûtage selon la revendication 10, dans lequel :

les surfaces traitées mécaniquement sont similaires à des aciers au carbone trempé ou chromé ; facultativement revêtues d'une surface dure comprenant du chrome dur, des placages durs ou mous ; ou non revêtues.


101
21
27
22
31
37
28
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32
38
10
33
39
102
100
15
103
14
16
12
13
11

FIG. 1

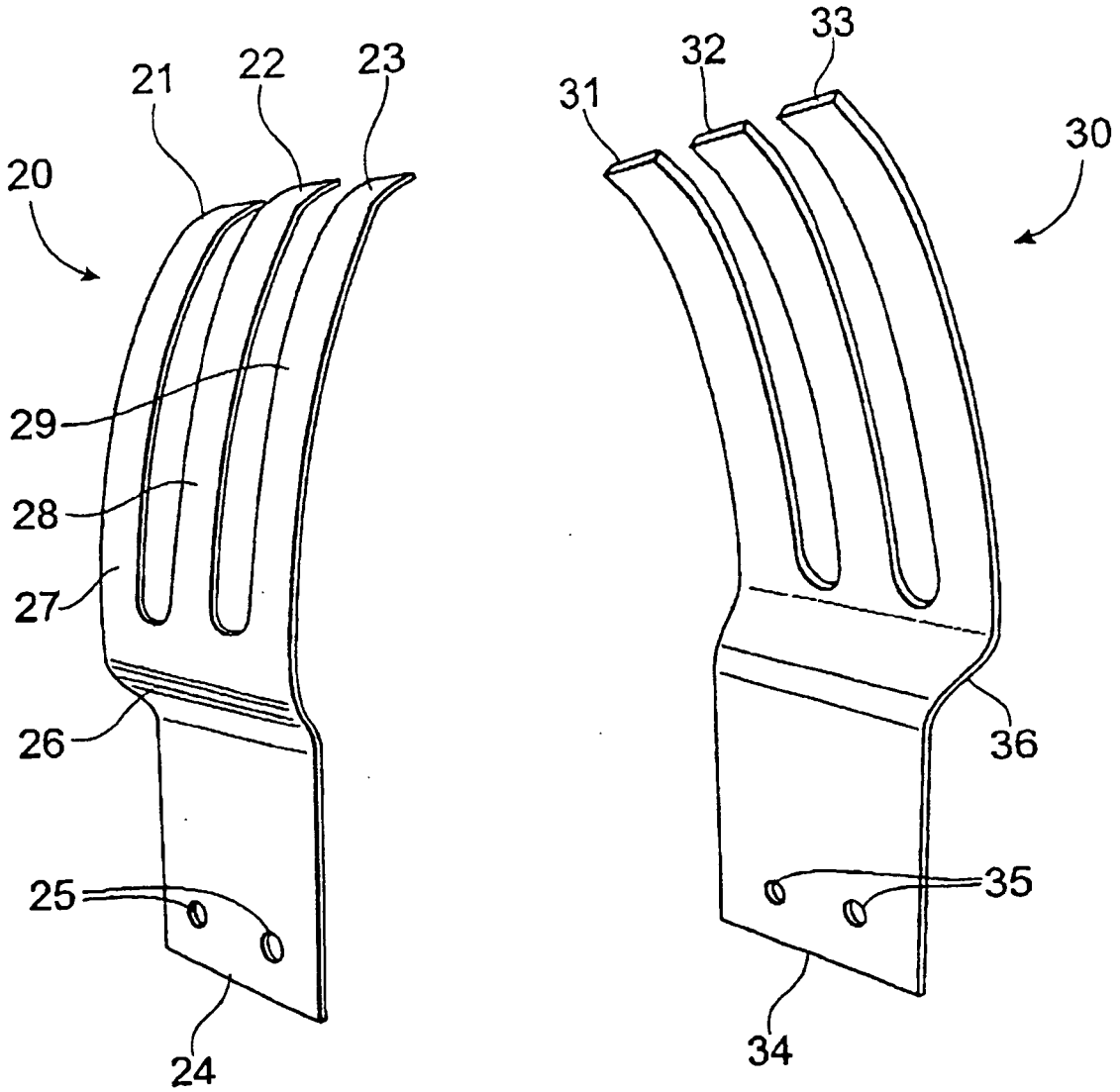

FIG. 2

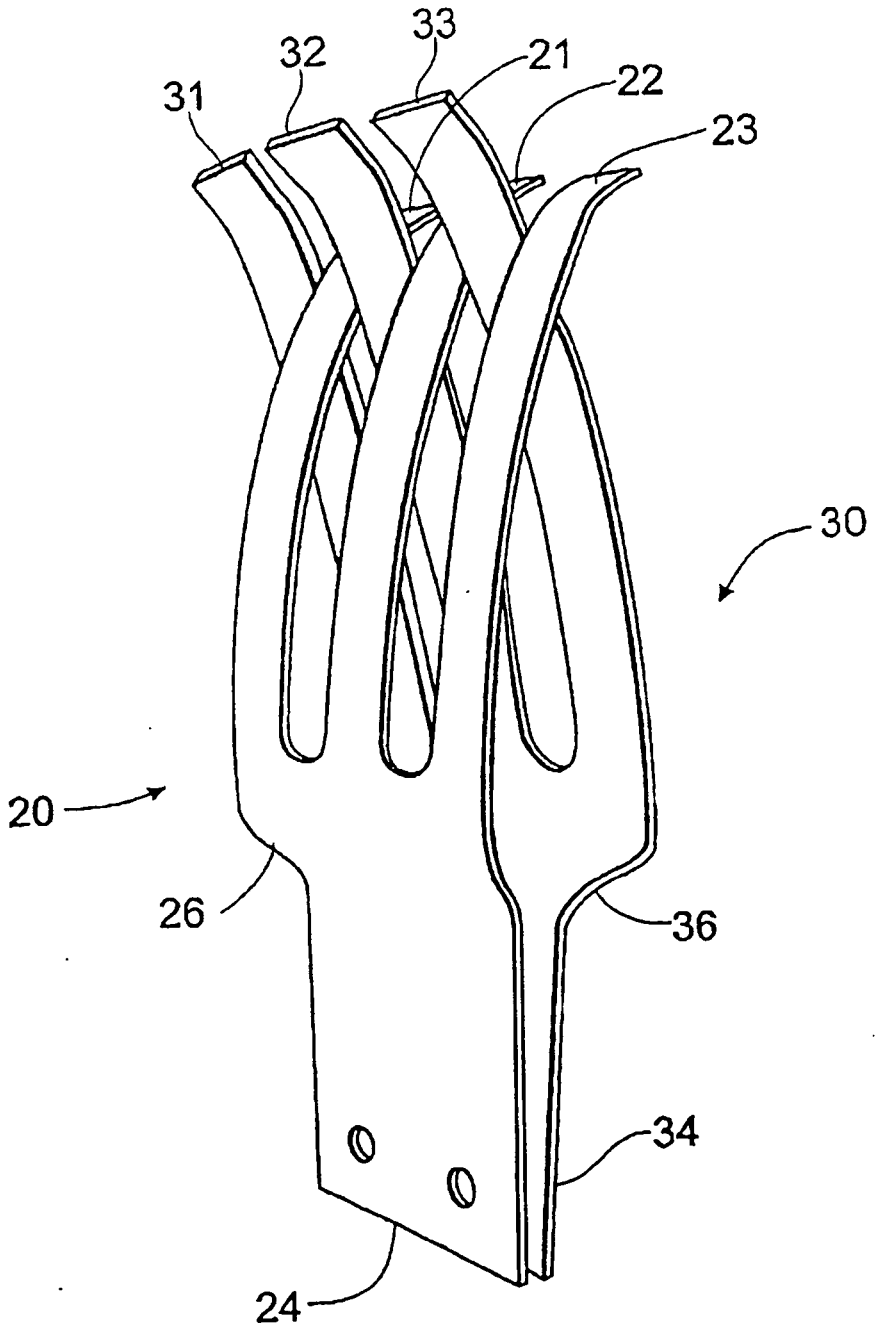

FIG. 3

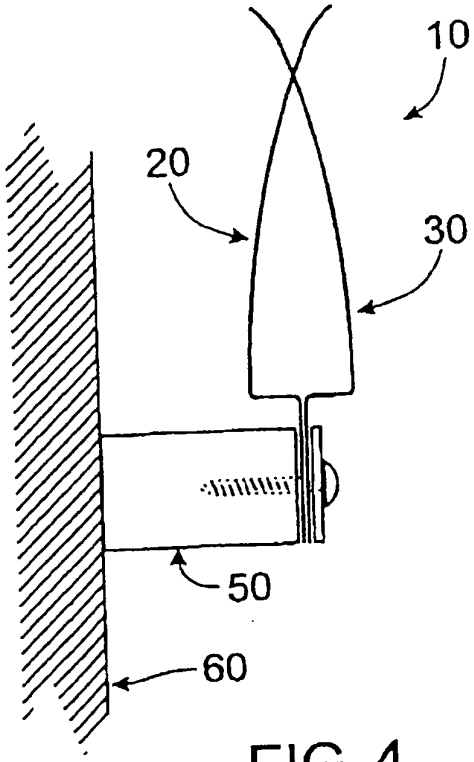

FIG. 4

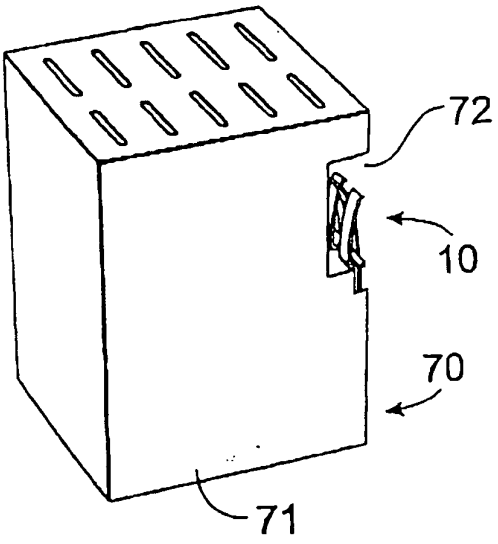

FIG. 5

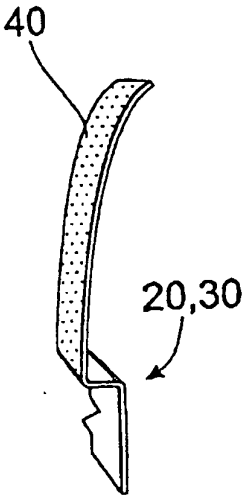

FIG. 6

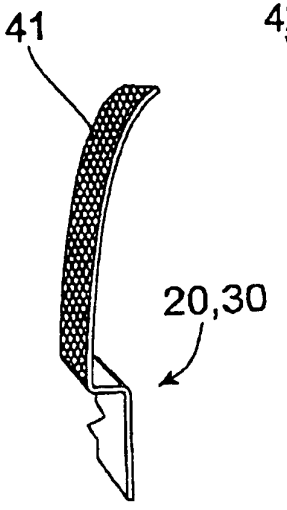

FIG. 7

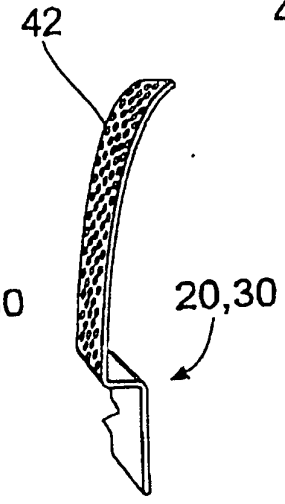

FIG. 8

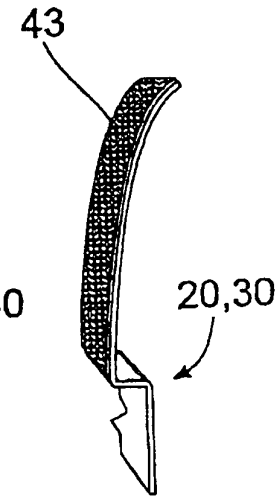

FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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- GB 517242 A **[0005]**