

Description

This invention relates to a cutting tool assembly comprising a replaceable cutting insert adapted to be held in an insert holder as described in the preamble of claim 1.

BACKGROUND OF THE INVENTION

Cutting tool assemblies of this kind are known wherein the replaceable cutting insert is formed with a main body portion having at one or both ends thereof terminal cutting edges. The insert holder is formed with a pair of clamping jaws defining between them an insert receiving recess. The insert is designed to be located within the recess with the operative cutting edge projecting outwardly and with the clamping jaws effectively gripping the insert at its body portion. The cutting tool assembly can be of the wedge-clamping type wherein the body portion is wedge-shaped as is the insert receiving recess, so that the insert is effectively wedge-clamped between the clamping jaws. Alternatively, one of the clamping jaws can be articulated with respect to the insert holder and mechanical means such as, for example, screw clamping means, are employed so as effectively to clamp the insert body portion between the clamping jaws.

In all cases, the effective clamping of the cutting insert in the insert holder must ensure that the insert is effectively retained against displacement under the cutting forces, and that the relative positioning of the insert with respect to the insert holder is maintained substantially invariant, both during cutting operations and also when inserts have to be replaced.

For this purpose, and in particular to ensure that the lateral position of the insert *vis-à-vis* the insert holder is maintained invariant both during cutting operations and upon replacement of inserts, it is known to provide the respective surfaces of the insert and clamping jaws which come into clamping relationship with each other (hereinafter "the clamping surfaces") with respectively elongated mating ribs and recesses of respectively convex and concave cross-sectional shapes. In this way, and when the insert is inserted into the insert receiving recess, the mating of the ribs within the recesses effectively inhibits lateral displacement of the insert with respect to the insert holder.

Thus, it is known in this connection to form the ribs and recesses with respectively V-shaped cross-sectional shapes or, alternatively, with smoothly curved, arcuate cross-sectional shapes. It is found in practice, however, that, as a result of production tolerances, it is practically impossible to ensure sufficiently close matching of the convex rib

within the concave recess. Thus, if the concave recess has significantly lesser dimensions than the convex rib, it will be clearly difficult for the rib to mate effectively within the recess. If, on the other hand, the concave recess is of significantly larger dimensions than the convex rib, it will be difficult, if not impossible, to ensure unique lateral positioning of the insert within the holder.

This problem is particularly aggravated in view of the fact that the cutting insert to be held within the holder is of very much harder material than that of the holder, and therefore the clamping surfaces of the clamping jaws tend to become rapidly worn, and this contributes to the difficulties in ensuring unique lateral dispositioning of the insert within the holder.

Whilst the difficulties referred to above occur with cutting tool assemblies used, for example, in parting operations wherein the cutting forces are radially directed with respect to the workpiece and are therefore directed along the longitudinal axis of the cutting insert, the difficulties become particularly acute where the cutting tool assembly is used for laterally directed cutting operations such as, for example, turning and wherein the cutting insert is therefore subjected to laterally directed forces tending to displace the cutting insert in a lateral direction.

A cutting tool assembly of the kind described in the preamble of claim 1 is known from European patent application 0.291.933. The clamping surfaces of a first unit are convex and polygonal-shaped, having sharp points at the corners of the side of the polygone shape, which sharp points become readily worn. The concave clamping surfaces of the other, second unit have a curved portion in the centre, merging into flat, rectilinear side portions.

BRIEF SUMMARY OF THE INVENTION

It is an object of the present invention to provide a new and improved cutting tool assembly in which the difficulties referred to above are substantially reduced.

According to the present invention, there is provided a cutting tool assembly as described in claim 1.

Preferably, the clamping surfaces of the first unit are of substantially circular cross-sectional shape of radius r_1 , and the clamping surfaces of the second unit each comprise two axially directed side portions symmetrically located with respect to the median plane, and of substantially circular cross-sectional shape of radius r_2 , where $r_1 < r_2$ and an axially directed central portion offset with respect to a plane defined by opposite longitudinal edges of said side portions and with respect to an

adjacent clamping surface of the first unit.

Thus, with a cutting tool assembly in accordance with the invention, the clamping of the cutting insert within the insert holder results in the convexly-shaped clamping surface of the one being located within the concavely-shaped clamping surface of the other and, independently of variations in production tolerances, clamping contact between the clamping surfaces always takes place along known, pre-determined, axially-directed locations.

These axially directed locations can be substantially linear or, alternatively, can be constituted by axially directed surfaces located between the side portions and the central portion.

Preferably, the body unit of the cutting insert is formed with the concavely directed clamping surface and therefore constitutes the second unit referred to above, whilst the clamping surfaces of the clamping jaws are formed with the convexly directed surfaces and therefore constitute the first unit referred to above.

BRIEF SUMMARY OF THE DRAWINGS

Various embodiments of a cutting tool assembly in accordance with the present invention will now be described by way of example and with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation of a cutting tool assembly in accordance with the present invention;

Fig. 2 is a front elevation of a cutting insert used in the cutting tool assembly shown in Fig. 1;

Fig. 3 is a front elevation on an enlarged scale illustrating one embodiment for the respective clamping surfaces of the insert and clamping jaws; and

Fig. 4 is similar view on an enlarged scale illustrating a second embodiment for the respective clamping surfaces of the insert and clamping jaws.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

As seen in the drawings, and particularly in Fig. 1 thereof, a cutting tool assembly comprises a tool holder 1 having a pair of integrally formed clamping jaws 2 and 3 constituting a clamping unit and which define between them an insert receiving recess 4 within which is located a cutting insert 5 having a central body unit 6 and a pair of terminal cutting edges 7a and 7b. The recess 4 communicates at an inner end thereof with an elongated slit 8. The end of the slit 8 remote from the recess 4 defines with an adjacent edge portion of the holder 1 a narrow neck 8a. A clamping screw 9 extends into the holder 1 through the clamping jaw

2 and the slit 8. It will be readily seen that, upon tightening of the clamping screw 9, the jaw 2 flexes downwardly about the narrow neck 8a so as effectively to clamp the insert 6 between the jaws 2 and 3.

As can be seen in Fig. 2 of the drawings, the body unit 6 of the insert 5 is formed with upper and lower, axially directed clamping surfaces 11a and 11b of concave, sarcuately cross-sectional shapes.

Corresponding longitudinally directed, clamping surfaces of the clamping jaws 2 and 3 are formed with longitudinally directed ribs seen in Fig. 3 as rib 12 and in Fig. 4 as rib 12'. (Only the rib 12, 12' of the jaw 3 is shown in Figs. 4 and 5 but it will be appreciated that the construction of the corresponding ribs of the jaw 2, as well as the construction of the upper, elongated arcuate recess of the body unit 6, are similar.)

As seen in Fig. 3 of the drawings, the rib 12 of the jaw 3 is formed with a clamping surface 12a of substantially circular cross-sectional shape, having a radius r_1 extending from an origin O_1 lying on a median plane 15 of the insert 5. The arcuately curved, elongated recess 11b of the insert 5 is, on the other hand, constituted by a pair of side portions 16a and 16b which are symmetrically located with respect to the median plane 15 and are separated from each other by a central curved portion 16c. The side portion 16a merges with the central portion 16c via a linear axial location 17a, whilst the side portion 16b merges with the central portion 16c via an axial linear location 17b. The side portions 16a and 16b are of substantially circular shape having a radius r_2 extending from an origin O_2 located on the median plane 15. The central axial portion 16c is of substantially circular cross-sectional shape of a radius r_3 extending from an origin O_3 on the median plane 15. A radial plane 18 which extends from the origin O_2 through the axial location 17 defines an angle α_1 with respect to the median plane 15.

As can be seen, $r_1 < r_2$, whilst $r_3 < r_1$. Thus, clamping contact between the arcuate rib 12 of the clamping jaw 3 and the arcuate recess 11 of the body unit of the insert 6 always takes place along the predetermined axial locations 17a and 17b. These locations are not affected by variations of production tolerances, seeing that the rib of the clamping jaw must always fit within the recess in the insert, seeing that the side portions of this recess are of higher radii of curvature than the radius of curvature of the rib. On the other hand, in view of the fact that the radius of curvature r_3 of the central portion 16c is less than the radius of curvature r_1 of the rib, the rib cannot penetrate into this central portion, which is effectively offset with respect to the rib surface. It will be realised that this offset central portion 16c does not necessarily

have to be of circular cross-section, the sole requirement being that this central portion is offset with respect to a plane defined by the opposite longitudinal edges of the side portions 16a and 16b.

In the embodiment just described with reference to Fig. 3, the angle α_1 should preferably lie between 15° to 20° , the optimum angle wherein the holder is made of steel and the insert of hard metal being 17.5° .

Whilst in the embodiment shown in Fig. 3 the clamping surfaces of the insert and jaws contact along substantially linear, axial locations, in the embodiment shown in Fig. 4 contact is effected along intermediate axial surface locations of significant lateral extent.

In the case of this embodiment, the elongated rib of the jaw 3 is of radius r_1 extending from origin O_1 whilst the elongated, arcuate recess of the insert 5 is, as before, provided with side portions 16'a and 16'b of radius r_2 extending from origin O_2 . A central portion 16'c is of radius r_3 extending from origin O_3 . Located on either side of the central portion 16'c and merging respectively with the side portions 16'a and 16'b are intermediate curved portions 21a and 21b of radius r_1 extending from origin O_1 , i.e. equal in curvature to the curvature of the longitudinally extending rib of the jaw 3.

A radial plane 18 extends from the origin O_2 to the line of contact of the intermediate portion 21a with a central portion 16'c and defines, with the median plane 15, an angle α_2 . A radial plane 22 extends from the origin O_2 to the axial line of merger of the side portion 16'a and the intermediate portion 21a and defines with the median plane 15 an angle β .

It will be realised that in the embodiment shown in Fig. 4 of the drawings, clamping contact between the elongated rib of the jaw 3 and the elongated recess of the insert 5 is now no longer along axially directed, linear locations, but rather along axially directed surfaces, albeit of limited lateral extent. Nevertheless, in this embodiment as in the embodiment described with reference to Fig. 3 of the drawings, the regions of contact between the respective clamping surfaces are predetermined and therefore the positioning of the insert in the holder can be accurately predetermined despite manufacturing tolerances. In the embodiment shown in Fig. 4 of the drawings, the angle α_2 can range between 10° to 20° , whilst the angle β can range between 15° to 50° .

Whilst in the embodiment specifically described above the clamping surface of the insert has been shaped as a concave, arcuate recess whilst that of the clamping jaw as a convex, arcuate rib, the invention is equally applicable to the situation wherein the clamping surfaces of the jaws are

recessed whilst the clamping surfaces of the body unit of the insert are formed as convex, arcuate ribs.

5 Claims

1. A cutting tool assembly comprising a replaceable cutting insert (5) having a body unit (6) and at least one terminal cutting edge (7a, 7b) and an insert holder (1) having a pair of clamping jaws (2, 3), defining between them an insert receiving recess (4) and constituting a clamping unit; a first one of said units being formed with axially directed convex clamping surfaces, the other second one of said units being formed with axially directed concave clamping surfaces, with the convex clamping surfaces of said unit being adapted to mate with the concave clamping surfaces of said other unit symmetrically located about a longitudinally directed median plane (15), the clamping surfaces of at least one of said units being at least partially of curved shape, the arrangement being such that when said body (6) is clamped between said jaws (2, 3) the clamping surfaces of the units contact each other along discrete, axially directed locations (17a, 17b; 21a, 21b) which are symmetrically disposed with respect to and axially spaced from said median plane (15), **characterized in that** each clamping surface (12a; 12'a) of said first unit is of uniformly curved cross-sectional shape, whilst each clamping surface (16a, 16c, 16b; 16'a, 21a, 16c, 21b, 16'b) of said second unit is of non-uniformly curved cross-sectional shape.
2. A cutting tool assembly according to Claim 1, characterised in that the clamping surfaces (12a, 12'a) of said first unit are of substantially circular cross-sectional shape having a first radius (r_1) and the clamping surfaces of the second unit each comprise two axially directed side portions (16a, 16'a; 16b, 16'b) symmetrically located with respect to said median plane (15) of substantially circular cross-sectional shape having a second radius (r_2) where said first radius (r_1) is smaller than said second radius (r_2) and an axially directed central portion (16c, 16'c) offset with respect to a plane defined by opposite longitudinal edges of said side portions (16a, 16'a; 16b, 16'b) and with respect to an adjacent clamping surface (12a) of said first unit.
3. A cutting tool assembly according to Claim 2, characterised in that said central portion (16c) is of substantially circular cross-sectional



have to be of circular cross-section, the sole requirement being that this central portion is offset with respect to a plane defined by the opposite longitudinal edges of the side portions 16a and 16b.

In the embodiment just described with reference to Fig. 3, the angle α_1 should preferably lie between 15° to 20° , the optimum angle wherein the holder is made of steel and the insert of hard metal being 17.5° .

Whilst in the embodiment shown in Fig. 3 the clamping surfaces of the insert and jaws contact along substantially linear, axial locations, in the embodiment shown in Fig. 4 contact is effected along intermediate axial surface locations of significant lateral extent.

In the case of this embodiment, the elongated rib of the jaw 3 is of radius r_1 extending from origin O_1 whilst the elongated, arcuate recess of the insert 5 is, as before, provided with side portions 16'a and 16'b of radius r_2 extending from origin O_2 . A central portion 16'c is of radius r_3 extending from origin O_3 . Located on either side of the central portion 16'c and merging respectively with the side portions 16'a and 16'b are intermediate curved portions 21a and 21b of radius r_1 extending from origin O_1 , i.e. equal in curvature to the curvature of the longitudinally extending rib of the jaw 3.

A radial plane 18 extends from the origin O_2 to the line of contact of the intermediate portion 21a with a central portion 16'c and defines, with the median plane 15, an angle α_2 . A radial plane 22 extends from the origin O_2 to the axial line of merger of the side portion 16'a and the intermediate portion 21a and defines with the median plane 15 an angle β .

It will be realised that in the embodiment shown in Fig. 4 of the drawings, clamping contact between the elongated rib of the jaw 3 and the elongated recess of the insert 5 is now no longer along axially directed, linear locations, but rather along axially directed surfaces, albeit of limited lateral extent. Nevertheless, in this embodiment as in the embodiment described with reference to Fig. 3 of the drawings, the regions of contact between the respective clamping surfaces are predetermined and therefore the positioning of the insert in the holder can be accurately predetermined despite manufacturing tolerances. In the embodiment shown in Fig. 4 of the drawings, the angle α_2 can range between 10° to 20° , whilst the angle β can range between 15° to 50° .

Whilst in the embodiment specifically described above the clamping surface of the insert has been shaped as a concave, arcuate recess whilst that of the clamping jaw as a convex, arcuate rib, the invention is equally applicable to the situation wherein the clamping surfaces of the jaws are

recessed whilst the clamping surfaces of the body unit of the insert are formed as convex, arcuate ribs.

5 Claims

1. A cutting tool assembly comprising a replaceable cutting insert (5) having a body unit (6) and at least one terminal cutting edge (7a, 7b) and an insert holder (1) having a pair of clamping jaws (2, 3), defining between them an insert receiving recess (4) and constituting a clamping unit; a first one of said units being formed with axially directed convex clamping surfaces, the other second one of said units being formed with axially directed concave clamping surfaces, with the convex clamping surfaces of said unit being adapted to mate with the concave clamping surfaces of said other unit symmetrically located about a longitudinally directed median plane (15), the clamping surfaces of at least one of said units being at least partially of curved shape, the arrangement being such that when said body (6) is clamped between said jaws (2, 3) the clamping surfaces of the units contact each other along discrete, axially directed locations (17a, 17b; 21a, 21b) which are symmetrically disposed with respect to and axially spaced from said median plane (15), characterized in that each clamping surface (12a; 12'a) of said first unit is of uniformly curved cross-sectional shape, whilst each clamping surface (16a, 16c, 16b; 16'a, 21a, 16c, 21b, 16'b) of said second unit is of non-uniformly curved cross-sectional shape.
2. A cutting tool assembly according to Claim 1, characterised in that the clamping surfaces (12a, 12'a) of said first unit are of substantially circular cross-sectional shape having a first radius (r_1) and the clamping surfaces of the second unit each comprise two axially directed side portions (16a, 16'a; 16b, 16'b) symmetrically located with respect to said median plane (15) of substantially circular cross-sectional shape having a second radius (r_2) where said first radius (r_1) is smaller than said second radius (r_2) and an axially directed central portion (16c, 16'c) offset with respect to a plane defined by opposite longitudinal edges of said side portions (16a, 16'a; 16b, 16'b) and with respect to an adjacent clamping surface (12a) of said first unit.
3. A cutting tool assembly according to Claim 2, characterised in that said central portion (16c) is of substantially circular cross-sectional



shape having a third radius (r_3) where said third radius (r_3) is smaller than said first radius (r_1).

4. A cutting tool assembly according to Claim 2 or 3, characterised in that the side portions (16'a, 16'b) merge respectively with the central portion (16'c) via relatively narrow axially directed intermediate portions (21a, 21b) having substantially circular cross-sectional shape of a radius substantially equal to said first radius (r_1). 5
5. A cutting tool assembly according to any one of the preceding claims, characterised in that the first unit is constituted by said body unit (6). 10
6. A cutting tool assembly according to any one of Claims 1 to 4, characterised in that said first unit is constituted by said clamping jaws (2, 3). 15
7. A cutting tool according to Claim 2 or 3, characterised in that said first unit is constituted by said clamping jaws (2, 3) and that each side portion (16a, 16b) merges with the central portion (16c) at an axial location such that a radial plane (18) extending from a centre of curvature of said side portion (16a, 16b) to said axial location defines an angle (α_1) with respect to said median plane (15), said angle (α_1) lying within a range of substantially 15° to 20°. 20
8. A cutting tool assembly according to Claim 7, characterised in that said angle (α_1) substantially equals 17.5°. 25
9. A cutting tool assembly according to Claim 4, characterised in that said first unit is constituted by said clamping jaws (2, 3) and that each axially directed intermediate portion (21a, 21b) merges with the central portion (16'c) at an axial location such that a first radial plane (18') extending from a centre of curvature of said side portions (16'a, 16'b) to said axial location defines a first angle (α_2) with respect to said median plane (15) and a second radial plane (22) extending from said centre of curvature to an intermediate axial location on said intermediate portion defines a second angle (β) with respect to said median plane, said first angle (α_2) lying within a range of substantially 10° to 20°, whilst said second angle (β) lies within a range of substantially 15° to 50°. 30

Patentansprüche

1. Schneidwerkzeuganordnung mit einem auswechselbaren Schneideinsatz (5), mit einer Körpereinheit (6) und mindestens einem Endschneiderand (7a, 7b) und einer Einsatzhalterung (1) mit einem Paar Klemmbacken (2, 3), wo dazwischen eine dem Einsatz aufnehmende Aussparung (4) bestimmt wird und eine Klemmeinheit gebildet wird; wobei eine erste der Einheiten, mit axial angeordneten, nach außen gewölbten Klemmflächen gebildet ist, wobei die andere zweite der Einheiten mit axial angeordneten, nach innen gewölbten Klemmflächen gebildet ist, wobei die nach innen gewölbten Klemmflächen der Einheit angepasst sind um mit den nach innen gewölbten Klemmflächen der anderen Einheit ineinander zu greifen, welche Einheit symmetrisch um eine längsgerichtete mittlere Ebene (15) gelegen ist, wobei die Klemmflächen von mindestens einer der Einheiten mindestens teilweise eine gekrümmte Form haben, wobei die Einrichtung derart ist, daß wenn der Körper (6) zwischen den Klemmbacken geklemmt wird (2, 3), die Klemmflächen der Einheiten einander entlang diskreten, axial angeordneten Stellen (17a, 17b; 21a, 21b) berühren, die hinsichtlich der mittleren Ebene (15) symmetrisch angeordnet sind und axial im Abstand zur mittleren Ebene axial aufgestellt sind, **dadurch gekennzeichnet**, daß jede Klemmfläche (12a; 12'a) der ersten Einheit eine einheitlich gekrümmte Querschnittsform hat, während jede Klemmfläche (16a, 16c, 16b; 16'a, 21a, 16c, 21b, 16'b) der zweiten Einheit eine nichteinheitlich gekrümmte Querschnittsform hat. 35
2. Schneidwerkzeuganordnung nach Anspruch 1, **dadurch gekennzeichnet**, daß die Klemmflächen (12a, 12'a) der ersten Einheit eine im wesentlichen runde Querschnittsform mit einem ersten Radius (r_1) haben und die Klemmflächen der zweiten Einheit jede zwei axial angeordnete Seitenteile (16a, 16'a; 16b, 16'b) haben, die hinsichtlich der Mittelebene (15) symmetrisch gelegen sind, welche Klemmflächen der zweiten Einheit eine im wesentlichen runden Querschnittsform, mit einem zweiten Radius (r_2) haben, wobei der erste Radius (r_1) kleiner ist als der zweite Radius (r_2) und mit einem axial angeordneten zentralen Teil (16c, 16'c), der hinsichtlich einer durch entgegengesetzten Längsränder der Seitenteilen (16a, 16'a; 16b, 16'b) bestimmten Ebene und hinsichtlich einer angrenzenden Klemmfläche (12a) der ersten Einheit, versetzt ist. 40



3. Schneidewerkzeuganordnung nach Anspruch 2, **dadurch gekennzeichnet**, daß der zentrale Teil (16c) eine im wesentlichen runde Querschnittsform hat, mit einem dritten Radius (r_3), wobei der dritte Radius (r_3) kleiner ist als der erste Radius (r_1).

4. Schneidewerkzeuganordnung nach Anspruch 2 oder 3, **dadurch gekennzeichnet**, daß die Seitenteile (16'a, 16'b) in den zentralen Teil (16c) über relativ schmale axial angeordnete Zwischenteile (21a, 21b) jeweils aufgehen, welche Zwischenteile eine im wesentlichen runde Querschnittsform haben, und einen Radius, der im wesentlichen dem ersten Radius (r_1) gleich ist.

5. Schneidewerkzeuganordnung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, daß die erste Einheit durch die Korpereinheit (6) gebildet ist.

6. Schneidewerkzeuganordnung nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet**, daß die erste Einheit durch die Klemmbacken (2, 3) gebildet ist.

7. Schneidewerkzeug nach einem der Ansprüche 2 oder 3, **dadurch gekennzeichnet**, daß die erste Einheit durch die Klemmbacken (2, 3) gebildet ist und daß jeder Seitenteil (16a, 16b) in den zentralen Teil (16c) an einer axialen Stelle aufgeht, derart daß eine radiale Ebene (18), die sich von einem Krümmungsmittelpunkt des Seitenteils (16a, 16b) zu der axialen Stelle ausstreckt, einen Winkel (α_1) hinsichtlich der Mittelebene (15) bestimmt, wobei der Winkel (α_1) innerhalb eines Bereichs von im wesentlichen 15° bis 20° liegt.

8. Schneidewerkzeuganordnung nach Anspruch 7, **dadurch gekennzeichnet**, daß der Winkel (α_1) im wesentlichen gleich 17.5° ist.

9. Eine Schneidewerkzeuganordnung nach Anspruch 4, **dadurch gekennzeichnet**, daß die erste Einheit durch die Klemmbacken (2, 3) gebildet ist und daß jeder axial angeordnete Zwischenteil (21a, 21b) in den zentralen Teil (16c) an einer axialen Stelle aufgeht, derart daß sich eine erste radiale Ebene (18'), die sich ab eines Krümmungsmittelpunktes der Seitenteile (16'a, 16'b) bis zu der axialen Stelle ausstreckt, einen ersten Winkel (α_2) bezüglich der Mittelebene (15) bildet und eine zweite radiale Ebene (22), die sich vom Krümmungsmittelpunkt bis zu einer mittleren, axialen Stelle auf dem zwischenteil ausstreckt, einen zweiten Winkel

(β) bezüglich der Mittelebene bildet, wobei der erste Winkel (α_2) innerhalb eines Bereichs von im wesentlichen 10° bis 20° liegt, während der zweite Winkel (β) innerhalb eines Bereichs von im wesentlichen 15° bis 50° liegt.

Revendications

1. Assemblage d'outil de coupe comportant un insert coupant (5) remplaçable ayant une unité formant corps (6) et au moins un bord coupant (7a, 7b) terminal, et un dispositif (1) de maintien de l'insert possédant une paire de mâchoires de serrage (2, 3) définissant entre elles un évidement (4) recevant l'insert et constituant une unité de serrage ; une première desdites unités étant formée par des surfaces de serrage convexes orientées dans le sens axial, la seconde desdites unités étant formée de surfaces de serrage concaves orientées dans le sens axial, les surfaces de serrage convexes de ladite unité étant aptes à s'associer avec les surfaces de serrage concaves de ladite autre unité située de manière symétrique autour d'un plan médian (15) orienté longitudinalement, les surfaces de serrage d'au moins une desdites unités étant au moins partiellement de forme courbe, La disposition étant telle que lorsque ledit corps (6) est serré entre lesdites mâchoires (2, 3) les surfaces de serrage des unités sont en contact entre elles le long de positions (17a, 17b ; 21a, 21b) discrètes orientées dans le sens axial qui sont disposées de manière symétrique par rapport audit plan médian (15) et espacées dans le sens axial de celui-ci, caractérisé en ce que chaque surface de serrage (12a ; 12'a) de ladite première unité est de forme uniformément courbe en section transversale, alors que chaque surface de serrage (16a, 16c, 16b ; 16'a, 21a, 16c, 21b, 16'b) de ladite seconde unité est de forme non uniformément courbe en section transversale.

2. Assemblage d'outil de coupe selon la revendication 1, caractérisé en ce que les surfaces de serrage (12a, 12'a) de ladite première unité sont de forme sensiblement circulaire en section transversale, ayant un premier rayon (r_1), et en ce que les surfaces de serrage de la seconde unité comprennent chacune deux parties latérales (16a, 16'a ; 16b, 16'b) orientées dans le sens axial, situées de manière symétrique par rapport audit plan médian (15), de forme sensiblement circulaire en section transversale, ayant un second rayon (r_2), où ledit premier rayon (r_1) est plus petit que ledit second rayon (r_2) et comprennent une partie



- centrale (16c, 16'c) orientée dans le sens axial, décalée par rapport à un plan défini par des bords longitudinaux opposés desdites parties latérales (16a, 16'a : 16b, 16'b) et par rapport à une surface de serrage (12a) adjacente, de ladite première unité. 5
3. Assemblage d'outil de coupe selon la revendication 2, caractérisé en ce que ladite partie centrale (16c) est de forme sensiblement circulaire en section transversale, ayant un troisième rayon (r_3), où ledit troisième rayon (r_3) est plus petit que ledit premier rayon (r_1). 10
4. Assemblage d'outil de coupe selon la revendication 2 ou 3, caractérisé en ce que les parties latérales (16'a, 16'b) fusionnent par rapport à la partie centrale (16'c) par l'intermédiaire de parties intermédiaires (21a, 21b) étroites orientées dans le sens axial ayant une forme sensiblement circulaire en section transversale, d'un rayon sensiblement égal audit premier rayon (r_1). 15 20
5. Assemblage d'outil de coupe selon l'une quelconque des revendications précédentes, caractérisé en ce que la première unité est constituée par ladite unité formant corps (6). 25
6. Assemblage d'outil de coupe selon l'une quelconque des revendications 1 à 4, caractérisé en ce que ladite première unité est constituée par lesdites mâchoires de serrage (2, 3). 30
7. Assemblage d'outil de coupe selon la revendication 2 ou 3, caractérisé en ce que ladite première unité est constituée par lesdites mâchoires de serrage (2, 3) et en ce que chaque partie latérale (16a, 16b) fusionne avec la partie centrale (16c) en une position axiale telle qu'un plan radial (18) s'étendant depuis d'un centre de courbure de ladite partie latérale (16a, 16b) jusqu'à ladite position axiale définisse un angle (α_1) par rapport audit plan médian (15), ledit angle (α_1) se situant dans une plage sensiblement de 15° à 20° . 35 40 45
8. Assemblage d'outil de coupe selon la revendication 7, caractérisé en ce que ledit angle (α_1) est sensiblement égal à $17,5^\circ$. 50
9. Assemblage d'outil de coupe selon la revendication 4, caractérisé en ce que ladite première unité est constituée par lesdites mâchoires de serrage (2, 3) et en ce que chaque partie intermédiaire (21a, 21b) orientée dans le sens axial fusionne avec la partie centrale (16'c) en une position axiale telle qu'un premier plan 55

radial (18') s'étendant depuis un centre de courbure desdites parties latérales (16'a ; 16'b) jusqu'à ladite position axiale définisse un premier angle (α_2) par rapport audit plan médian (15) et un second plan radial (22) s'étendant dudit centre de courbure jusqu'à une position axiale intermédiaire sur ladite partie intermédiaire définisse un second angle (β) par rapport audit plan médian, ledit premier angle (α_2) se situant dans une plage de sensiblement 10° à 20° , alors que ledit second angle (β) se situe dans une plage de sensiblement 15° à 50° .