

Description

This invention relates to a cutting insert according to the preamble of claim 1 (see US-A-3 894 722).

The insert in accordance with the present invention is formed of a hard wear-resistant material such as, for example, a cemented hard metal carbide and intended for use in metal grooving, parting, turning or boring operations.

BACKGROUND OF THE INVENTION

Such inserts are generally of the replaceable kind and are designed to be firmly held in an appropriate receiving seat formed in an insert holder. Thus, for example, the insert can be formed with a tapering, wedge-shaped body so as to be wedge clamped within a correspondingly wedge-shaped slot formed in the insert holder. Alternatively, the insert can be clamped between a pair of jaws of the insert holder, which jaws define a receiving slot, the jaws being biased into clamping the insert by suitable mechanical means.

Seeing that the metal cutting operations involve the removal (from the workpiece being cut) of metal, in the form of chips, the interests of safety and efficiency of cutting require that these chips be effectively removed from the cutting region. To this end it has long been known to provide such cutting inserts with chip breaking and/or chip forming means so as to ensure that the chips, shortly after their formation, are so shaped and/or broken that they can be readily removed from the work area without interfering with the continuing cutting process and without endangering the operating personnel.

In the use of such cutting inserts for the purposes indicated, it has long been known to draw a distinction between tools for parting or grooving operations, on the one hand, and tools for lateral turning (e.g. cylindrical) operations, on the other hand. In the first instance, there is a radial movement of the tool into the rotating workpiece to be grooved or parted whilst, in the second instance, there is a lateral or transverse movement of the tool. When carrying out these differing kinds of operations, it has long been known that it is necessary to replace the holder and the cutting insert when passing from one operation to the other, seeing that the cutting insert employed for any particular operation is designed so as to meet only the requirements of that operation.

This necessity to replace the cutting insert in accordance with the nature of the cutting operation is clearly time-consuming and requires the ready availability of differing kinds of holders and cutting inserts for differing kinds of operations. In the light

of this existing situation, the applicants have developed a new tool cutting system known by the applicants' trademark CUT-GRIP, wherein the same cutting insert can be used for both parting and grooving operations, on the one hand, and also for lateral turning operations, on the other hand. Such an insert will hereinafter be referred to as a "multidirectional cutting tool insert".

With the use of such multidirectional cutting tool inserts, the problem arises of effectively controlling the formation of chips whether these arose from radially directed parting or grooving operations or from laterally directed turning operations.

BRIEF SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a new and improved multidirectional cutting tool insert with effective chip control means.

According to the present invention there is provided a polygonally shaped metal cutting insert for use, on the one hand, in a parting or grooving operation and, on the other hand, in a separate turning operation comprising top and bottom faces and front, rear and a pair of side peripheral faces; a front cutting edge formed at the intersection of the top face and the front peripheral face for use in the parting or grooving operations and first and second side cutting edges formed respectively at the intersections of said top face and the two side peripheral faces for use in the separate turning operation and chip forming means located on said top face within an area defined by said cutting edges; characterised in that said chip forming means comprises a pair of spaced apart chip deflector ridges extending longitudinally along said top face and projecting therefrom above the level of the cutting edges, each ridge being formed with a front deflector surface and with a side deflector surface, the front deflector surfaces being spaced apart symmetrically with respect to a longitudinally directed median axis of the insert, being located in the vicinity of the front cutting edge and being respectively spaced from said front cutting edge by a pair of land surfaces, said side deflector surfaces extending respectively along the lengths of said cutting edges and being respectively spaced therefrom by land surfaces and positive side rake surfaces which become progressively less positive in a direction away from the front cutting edge.

In accordance with a preferred embodiment of the present invention, the insert is provided with a pair of opposite cutting ends located either at diametrically opposite ends thereof or at opposite ends of a top face, each cutting end having the structure as defined above in accordance with the invention. With such double ended inserts the portions of the top and bottom faces, which are de-

signed to the clamped between jaws of a tool holder, are preferably parallel and in order to ensure unimpeded insertion and removal of the insert from the tool holder it is essential that the chip deflector ridges do not project beyond the preferably parallel planes defined by the clamped portions of the insert.

With such a cutting insert, in accordance with the present invention, when it is used in a radially directed parting or grooving operation the chips which are formed are shaped by the front chip deflector surfaces so as to acquire a substantially corrugated cross section. This leads to the narrowing of the chips (thus allowing for the continued grooving without the chips interfering therewith) and also allowing for the rigidizing of the chips and their eventual breaking. When, however, laterally directed turning operations are carried out, then the provision of the side chip deflector surfaces is effective in ensuring chip breaking over a wide range of operating conditions, thereby allowing for the carrying out of both preliminary and finishing operations with the same tool. This is of particular importance when the tool cutting operations are carried out with automatic machines, reducing the operating time and the number of tools which may be required.

BRIEF SUMMARY OF THE DRAWINGS

For a better understanding of the present invention, and to show how the same may be carried out in practice, reference will now be made to the accompanying drawings, in which

Figs. 1a and 1b are respectively side and top elevations of a tool cutting insert of a kind to which the invention is applied, shown clamped in a tool holder;

Fig. 2 is a top elevation of a multidirectional cutting tool insert in accordance with the present invention;

Fig. 3 is a side elevation of the cutting tool insert shown in Fig. 2;

Fig. 4 is a cross-sectional view of the insert shown in Fig. 2 taken along the line IV-IV.

DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS

Reference will first be made to Fig. 1 of the drawings, wherein is illustrated the mode of mounting of a multidirectional tool insert in a tool support and the use of this insert for radially directed grooving operations and laterally directed turning operations. As can be seen in the figure, a multidirectional cutting tool insert 1 (the detailed possible constructions of which will be described below with reference to the remaining figures), having a

pair of longitudinally parallel upper and lower surfaces 2a and 2b, is clamped between corresponding parallel surfaces 3a and 3b of jaws 4 and 5 formed integrally with a tool holder body 6, the surfaces 3a and 3b defining a receiving slot designed to receive the insert 1. This receiving slot communicates with a rearwardly directed slit 7, the provision of which allows for the necessary resilience required for clamping. The insert 1 is firmly clamped within the receiving slot by means of a clamping screw 8 which, when tightened, causes the jaws 4 and 5 clampingly to bear against the corresponding surfaces 2a and 2b of the insert. The surfaces 2a and 2b are respectively formed with longitudinally extending V-shaped faces in which mate corresponding convex V-shaped ribs formed of the corresponding jaw surfaces 3a and 3b. By virtue of the concave to convex mating of the ribs of the jaws 4 and 5 with the surfaces 2a and 2b, lateral movement of the insert with respect to the insert holder 6 is prevented.

As seen in the drawings, the tool is designed for use in machining a cylindrical workpiece 11 which is designed to be rotated by a workpiece holder (not shown) in the direction of the arrows 12. When it is desired to perform a grooving or parting operation, then the movement of the tool is along the direction of the arrows 13, i.e. radial with respect to the workpiece. When, however, the tool is used to effect a turning operation, then the tool moves in a transverse direction as seen in Fig. 1b.

Reference will now be made to Figs. 2 to 4 of the drawings for a detailed description of a first embodiment of a cutting insert in accordance with the invention. As seen in the drawings, the cutting insert consists of a polygonal body of substantially parallelepipedal shape. The insert has top and bottom faces 21a and 21b, front and rear peripheral faces 22a and 22b and side peripheral faces 23a and 23b. The top and bottom faces 21a and 21b are formed with longitudinally extending concave keying grooves 24a and 24b of V-shaped cross-section.

The insert is formed at diametrically opposite corners thereof with respective cutting ends which, when the insert is mounted in the insert holder as shown in Fig. 1 of the drawings, are alternately exposed for use. The cutting ends are of identical construction and one of them will now be described. At the intersection of the top face 21a and the peripheral faces 23a and 23b are formed first and second side cutting edges 25a and 25b which respectively extend from insert corners 26a and 26b to an intermediate position along the insert. Formed at the intersection of the top face 21a and the front peripheral face 22a is a front cutting edge 27 which extends between the corners 26a and 26b.

The surfaces of the keying groove 24a terminate in a pair of ridges 28a and 28b having respective front surfaces constituting component front chip deflector surfaces 29a and 29b, outer side surfaces constituting first and second outer side chip deflector surfaces 30a and 30b and inner side surfaces constituting inner side chip deflector surfaces 30c and 30d. The side chip deflector surface 30a extends in the direction of the cutting edge 25a and is spaced therefrom by a positive rake surface 31a which merges with the cutting edge 25a via a land surface 32a which can be of varying width, preferably increasing in width from the corner 26a to the intermediate position of the insert. Similarly, the side chip deflector surface 30b is separated from the cutting edge 25b by a positive rake surface 31b and a land surface 32b, the rake surfaces 32a and 32b becoming less positive in a direction away from the front cutting edge 27.

The component front chip deflector surfaces 29a and 29b merge with the front cutting edge 27 via land surfaces 33a and 33b. Preferably the land surfaces 33a and 33b vary in width, widening towards the positive rake surface 34. Intermediate the component front chip deflector surfaces 29a and 29b the cutting edge 27 merges with a positive rake surface 34 which, in its turn, merges with a concave chip path surface 35.

In use, and when the cutting insert is used in a radially directed grooving operation, the chip which is cut by the cutting edge 27 and which is initially of a width equal to the width of the groove, encounters and passes over the front chip deflector surfaces 29a and 29b and side deflector surfaces 30a, 30b, 30c and 30d whilst the central portion and longitudinal edges of the chip are free to pass down the positive rake surfaces 34, 31 and 31b. The chip is thereby deformed, acquiring a corrugated shape which results in the chip becoming narrowed and rigidized. In this way the chip easily flows through and out of the groove and, as a consequence of residual stresses enhanced by the deflectors, is curled into a spiral and breaks for ready disposal.

On the other hand, when the insert is used for turning in a transverse direction, the chips which are cut by the side cutting edges 25a or 25b pass over the variable width lands 32a and 32b down the positive rake surfaces 31a and 31b, to be deflected upwardly by the side deflector surfaces 30a and 30b. Upon striking these deflector surfaces, the chips are in fact deflected in the direction of the side peripheral faces 23a and 23b, which they eventually strike below and longitudinally displaced away from the cutting edge so as to become broken.

It will be seen that in connection with all the embodiments of the insert in accordance with the

invention and as described above, the portion of the insert to the rear of the cutting end (i.e. the portion which is inserted and held in the tool holder) is inclined with respect to the cutting ends and is designed to be held in an appropriately inclined slot formed in the tool holder (see Fig. 1a). This feature helps to ensure that whilst, on the one hand, the upper clamping jaw 4 of the tool holder as seen in Fig. 1 can be of substantial depth (and therefore strength), on the other hand the front edge thereof can be sufficiently inclined with respect to the direction of chip flow so as to minimise resistance to chip flow.

Furthermore, in all the embodiments described above the chip forming means can include, in the regions between the side cutting edges and the side deflector surfaces, discrete projecting abutments and/or recesses. These are particularly effective in the deformation of chips of metals of a high degree of plasticity which must be radically deformed before they can be broken.

It will furthermore be appreciated that, with multidirectional cutting inserts as described above in accordance with the present invention, it is possible effectively to use the same tool and the same insert for grooving and for lateral turning operations ensuring efficient chip forming and breaking.

Claims

1. A polygonally shaped metal cutting insert (1) for use, on the one hand, in a parting or grooving operation and, on the other hand, in a separate turning operation comprising top (21a) and bottom 21(b) faces and front (22a), rear (22b) and a pair of side (23a,23b) peripheral faces; a front cutting edge (27) formed at the intersection of the top face (21a) and the front peripheral face (22a) for use in the parting or grooving operations and first (25a) and second (25b) side cutting edges formed respectively at the intersections of said top face (21a) and the two side peripheral faces (23a,23b) for use in the separate turning operation and chip forming means located on said top face (21a) within an area defined by said cutting edges (25a,25b, 27); characterised in that said chip forming means comprises a pair of spaced apart chip deflector ridges (28a,28b) extending longitudinally along said top face (21a) and projecting therefrom above the level of the cutting edges (25a,25b,27), each ridge (28a,28b) being formed with a front deflector surface (29a,29b) and with a side deflector surface (30a,30b), the front deflector surfaces (29a,29b) being spaced apart symmetrically with respect to a longitudinally directed median axis of the insert (1), being lo-



The surfaces of the keying groove 24a terminate in a pair of ridges 28a and 28b having respective front surfaces constituting component front chip deflector surfaces 29a and 29b, outer side surfaces constituting first and second outer side chip deflector surfaces 30a and 30b and inner side surfaces constituting inner side chip deflector surfaces 30c and 30d. The side chip deflector surface 30a extends in the direction of the cutting edge 25a and is spaced therefrom by a positive rake surface 31a which merges with the cutting edge 25a via a land surface 32a which can be of varying width, preferably increasing in width from the corner 26a to the intermediate position of the insert. Similarly, the side chip deflector surface 30b is separated from the cutting edge 25b by a positive rake surface 31b and a land surface 32b, the rake surfaces 32a and 32b becoming less positive in a direction away from the front cutting edge 27.

The component front chip deflector surfaces 29a and 29b merge with the front cutting edge 27 via land surfaces 33a and 33b. Preferably the land surfaces 33a and 33b vary in width, widening towards the positive rake surface 34. Intermediate the component front chip deflector surfaces 29a and 29b the cutting edge 27 merges with a positive rake surface 34 which, in its turn, merges with a concave chip path surface 35.

In use, and when the cutting insert is used in a radially directed grooving operation, the chip which is cut by the cutting edge 27 and which is initially of a width equal to the width of the groove, encounters and passes over the front chip deflector surfaces 29a and 29b and side deflector surfaces 30a, 30b, 30c and 30d whilst the central portion and longitudinal edges of the chip are free to pass down the positive rake surfaces 34, 31 and 31b. The chip is thereby deformed, acquiring a corrugated shape which results in the chip becoming narrowed and rigidized. In this way the chip easily flows through and out of the groove and, as a consequence of residual stresses enhanced by the deflectors, is curled into a spiral and breaks for ready disposal.

On the other hand, when the insert is used for turning in a transverse direction, the chips which are cut by the side cutting edges 25a or 25b pass over the variable width lands 32a and 32b down the positive rake surfaces 31a and 31b, to be deflected upwardly by the side deflector surfaces 30a and 30b. Upon striking these deflector surfaces, the chips are in fact deflected in the direction of the side peripheral faces 23a and 23b, which they eventually strike below and longitudinally displaced away from the cutting edge so as to become broken.

It will be seen that in connection with all the embodiments of the insert in accordance with the

invention and as described above, the portion of the insert to the rear of the cutting end (i.e. the portion which is inserted and held in the tool holder) is inclined with respect to the cutting ends and is designed to be held in an appropriately inclined slot formed in the tool holder (see Fig. 1a). This feature helps to ensure that whilst, on the one hand, the upper clamping jaw 4 of the tool holder as seen in Fig. 1 can be of substantial depth (and therefore strength), on the other hand the front edge thereof can be sufficiently inclined with respect to the direction of chip flow so as to minimise resistance to chip flow.

Furthermore, in all the embodiments described above the chip forming means can include, in the regions between the side cutting edges and the side deflector surfaces, discrete projecting abutments and/or recesses. These are particularly effective in the deformation of chips of metals of a high degree of plasticity which must be radically deformed before they can be broken.

It will furthermore be appreciated that, with multidirectional cutting inserts as described above in accordance with the present invention, it is possible effectively to use the same tool and the same insert for grooving and for lateral turning operations ensuring efficient chip forming and breaking.

Claims

1. A polygonally shaped metal cutting insert (1) for use, on the one hand, in a parting or grooving operation and, on the other hand, in a separate turning operation comprising top (21a) and bottom 21(b) faces and front (22a), rear (22b) and a pair of side (23a,23b) peripheral faces; a front cutting edge (27) formed at the intersection of the top face (21a) and the front peripheral face (22a) for use in the parting or grooving operations and first (25a) and second (25b) side cutting edges formed respectively at the intersections of said top face (21a) and the two side peripheral faces (23a,23b) for use in the separate turning operation and chip forming means located on said top face (21a) within an area defined by said cutting edges (25a,25b, 27); characterised in that said chip forming means comprises a pair of spaced apart chip deflector ridges (28a,28b) extending longitudinally along said top face (21a) and projecting therefrom above the level of the cutting edges (25a,25b,27), each ridge (28a,28b) being formed with a front deflector surface (29a,29b) and with a side deflector surface (30a,30b), the front deflector surfaces (29a,29b) being spaced apart symmetrically with respect to a longitudinally directed median axis of the insert (1), being lo-



- cated in the vicinity of the front cutting edge (27) and being respectively spaced from said front cutting edge (27) by a pair of land surfaces (33a,33b), said side deflector surfaces (30a,30b) extending respectively along the lengths of said cutting edges (25a,25b) and being respectively spaced therefrom by land surfaces and positive side rake surfaces (31a,31b) which become progressively less positive in a direction away from the front cutting edge.
2. An insert (1) according to claim 1 characterised in that said front cutting edge (27) merges directly with a positive rake surface (34) intermediate said component front chip deflector surfaces (29a,29b) and with said component front chip deflector surfaces (29a,29b) via respective land surfaces (33a,33b).
 3. An insert (1) according to claim 2 characterised in that said front cutting edge (27) merges with positive rake surfaces on either side of said component front chip deflector surfaces (29a,29b).
 4. An insert (1) according to claim 2 or 3 characterised in that said positive rake surface (34), intermediate said component front chip deflector surfaces (29a,29b) merges with a chip path surface (35) directed upwardly with respect to the top face (21a).
 5. An insert (1) according to claim 4 characterised in that said chip path surface (35) is directed substantially parallel to said side cutting edges (25a,25b).
 6. An insert (1) according to any one of the preceding claims characterised in that said component front chip deflector surfaces (52a, 52b) are of concave arcuate shape.
 7. An insert (1) according to any one of the preceding claims characterised in that said component front chip deflector surfaces (41a,41b,) are of substantially planar shape.
 8. An insert (1) according to any one of the preceding claims, characterised in that said land surfaces (32a,32b) vary in width along the lengths thereof.
 9. An insert (1) according to any one of the preceding claims characterised in that said ridges (41a,41b) are spaced apart on said top face (21a) in the direction of said front cutting edge (27).
 10. An insert (1) according to any one of the preceding claims characterised in that inner surfaces (30c,30d) of said ridges (28a,28b) merge along a median line of said top face (21a).
 11. An insert (1) according to any one of the preceding claims characterised in that it is provided with cutting ends respectively comprising front (27) and side (25a,25b) cutting edges and chip forming means formed adjacent opposite ends of the insert.
 12. An insert (1) according to claim 11 characterised in that said cutting ends are formed at opposite ends of said top face (21a).
 13. An insert (1) according to claim 11 characterised in that said cutting ends are formed respectively at opposite ends of said top (21a) and bottom (21b) faces.
- Patentansprüche**
1. Polygonal geformter Metallschneideinsatz (1) zum sowohl Trennen oder Nuten als auch zum getrennten Drehen, mit einer Oberseite (21a), einer Unterseite (21b), einer Vorderseite (22a), einer Rückseite (22b) und einem Paar Seitenflächen (23a, 23b) am Umfang; einer vorderen Schneidkante (27), die an der Schnittlinie der Oberseite (21a) und der vorderen Umfangsfläche (22a) zum Trennen oder Nuten ausgebildet ist, und ersten (25a) und zweiten (25b) seitlichen Schneidkanten, die entsprechend an den Schnittlinien der Oberseite (21a) und den beiden seitlichen Umfangsflächen (23a, 23b) zum getrennten Drehen ausgebildet sind, und mit einer Spanformeinrichtung an der Oberseite (21a) innerhalb eines durch die Schneidkanten (25a, 25b, 27) gebildeten Bereichs; dadurch gekennzeichnet, daß die Spanbildungseinrichtung ein Paar beabstandete Spanabweisstegel (28a, 28b) aufweist, die sich in Längsrichtung entlang der Oberseite (21a) erstrecken und von dieser über die Höhe der Schneidkanten (25a, 25b, 27) vorstehen, wobei jeder Steg (28a, 28b) mit einer vorderen Abweisfläche (29a, 29b) und mit einer seitlichen Abweisfläche (30a, 30b) ausgebildet ist, die vorderen Abweisflächen (29a, 29b) symmetrisch bezüglich einer in Längsrichtung gerichteten Mittelachse des Einsatzes (1) beabstandet, in der Nähe der vorderen Schneidkante (27) angeordnet und jeweils von der vorderen Schneidkante (27) durch ein Paar Stegflächen



(33a, 33b) beabstandet sind, wobei sich die seitlichen Abweisflächen (30a, 30b) jeweils entlang der Längsausdehnung der Schneidkanten (25a, 25b) erstrecken und von diesen jeweils durch Stegflächen und positive seitliche Räumflächen (31a, 31b) beabstandet sind, die in einer Richtung von der vorderen Schneidkante weg zunehmend weniger positiv sind.

2. Einsatz (1) nach Anspruch 1, dadurch gekennzeichnet, daß die vordere Schneidkante (27) sich direkt mit einer positiven Räumfläche (34) zwischen den vorderen Spanabweisflächen (29a, 29b) und mit den vorderen Spanabweisflächen (29a, 29b) über entsprechende Stegflächen (33a, 33b) sich vereinigt.

3. Einsatz (1) nach Anspruch 2, dadurch gekennzeichnet, daß die vordere Schneidkante (27) sich mit positiven Räumflächen auf jeder Seite der vorderen Spanabweisflächen (29a, 29b) vereinigt.

4. Einsatz (1) nach Anspruch 2 oder 3, dadurch gekennzeichnet, daß die positive Räumfläche (34) sich zwischen den vorderen Spanabweisflächen (29a, 29b) mit einer Spanleitfläche (35) direkt oberhalb bezüglich der Oberseite (21a) vereinigt.

5. Einsatz (1) nach Anspruch 4, dadurch gekennzeichnet, daß die Spanleitfläche (35) im wesentlichen parallel zu den seitlichen Schneidkanten (25a, 25b) gerichtet ist.

6. Einsatz (1) nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die vorderen Spanabweisflächen (52a, 52b) konkav und bogenförmig sind.

7. Einsatz (1) nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die vorderen Spanabweisflächen (41a, 41b) im wesentlichen planar ausgebildet sind.

8. Einsatz (1) nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die Stegflächen (32a, 32b) entlang ihrer Längsausdehnung in Breitenrichtung variieren.

9. Einsatz (1) nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die Stege (41a, 41b) auf der Oberseite (21a) in Richtung der vorderen Schneidkante (27) beabstandet sind.

10. Einsatz (1) nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß Innen-

flächen (30c, 30d) der Stege (28a, 28b) entlang einer Mittellinie der Oberseite (21a) sich vereinigen.

5 11. Einsatz (1) nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß er mit Schneidenden versehen ist, die jeweils vordere (27) und seitliche (25a, 25b) Schneidkanten und Spanformeinrichtungen aufweisen, die benachbart zu gegenüberliegenden Enden des Einsatzes ausgebildet sind.

10 12. Einsatz (1) nach Anspruch 11, dadurch gekennzeichnet, daß die Schneidenden an entgegengesetzten Enden der Oberseite (21a) ausgebildet sind.

15 13. Einsatz (1) nach Anspruch 11, dadurch gekennzeichnet, daß die Schneidenden jeweils an entgegengesetzten Enden der oberen Fläche (21a) und der unteren Fläche (21b) ausgebildet sind.

Revendications

25 1. Plaquette de coupe (1) pour le métal, de forme polygonale destinée à être utilisée, d'une part, dans une opération de tronçonnage ou saignée et, d'autre part, dans une opération de tournage distincte, comprenant des faces supérieure (21a) et inférieure (21b) et des faces avant (22a), arrière (22b) et une paire de faces périphériques latérales (23a, 23b); une arête (27) tranchante avant, formée à l'intersection de la face (21a) supérieure et de la face (22a) périphérique avant, destinée à être utilisée dans les opérations de tronçonnage ou de saignée, et des première et seconde arêtes (25a, 25b) tranchantes latérales formées respectivement aux intersections de ladite face (21a) supérieure et des deux faces (23a, 23b) périphériques latérales, destinées à être utilisées dans l'opération de tournage distinctes, et des moyens de mise en forme des copeaux situés sur ladite face (21a) supérieure, dans une zone définie par lesdites arêtes (25a, 25b, 27) tranchantes; caractérisée en ce que lesdits moyens de mise en forme des copeaux comprennent deux crêtes (28a, 28b) défectrices de copeaux, espacées, s'étendant longitudinalement le long de ladite face (21a) supérieure et qui s'élèvent sur cette face au-dessus du niveau des arêtes (25a, 25b, 27) tranchantes, chaque crête (28a, 28b) étant munie d'une surface (29a, 29b) défectrice avant et d'une surface (30a, 30b) défectrice latérale, les surfaces (29a, 29b) défectrices avant étant espacées symétriquement par rapport à un axe



- médian de la plaquette qui est dirigé longitudinalement, étant situées dans le voisinage de l'arête (27) tranchante avant et étant respectivement espacées de ladite arête (27) tranchante avant par deux surfaces (33a, 33b) de replat, lesdites surfaces (30a, 30b) déflectrices latérales s'étendant respectivement selon les longueurs desdites arêtes (25a, 25b) tranchantes et étant respectivement espacées de ces arêtes par des surfaces de replat et des surfaces (31a, 31b) d'attaque latérales positives qui deviennent progressivement moins positives dans le sens s'éloignant de ladite arête tranchante avant.
2. Plaquette (1) selon la revendication 1, caractérisée en ce que ladite arête (27) tranchante avant rejoint directement une surface (34) d'attaque positive intermédiaire entre lesdites surfaces (29a, 29b) composantes déflectrices de copeaux avant, et avec lesdites surfaces (29a, 29b) composantes déflectrices de copeaux avant avec interposition de surfaces (33a, 33b) de replat respectives.
 3. Plaquette (1) selon la revendication 2, caractérisée en ce que ladite arête (27) tranchante se raccorde à des surfaces d'attaque positive sur chaque côté desdites surfaces (29a, 29b) composantes déflectrices de copeaux avant.
 4. Plaquette (1) selon la revendication 2 ou 3, caractérisée en ce que ladite surface (34) d'attaque positive qui est intermédiaire entre lesdites surfaces (29a, 29b) composantes déflectrices de copeaux avant rejoint une surface (35) de passage des copeaux dirigée vers le haut par rapport à ladite surface (21a) supérieure.
 5. Plaquette (1) selon la revendication 4, caractérisée en ce que ladite surface (35) de passage des copeaux est dirigée sensiblement parallèlement auxdites arêtes (25a, 25b) tranchantes latérales.
 6. Plaquette (1) selon une quelconque des revendications précédentes, caractérisée en ce que lesdites surfaces (52a, 52b) composantes déflectrices de copeaux avant sont d'une forme incurvée concave.
 7. Plaquette (1) selon une quelconque des revendications précédentes, caractérisée en ce que lesdites surfaces (31a, 31b) composantes déflectrices de copeaux avant sont d'une forme pratiquement plane.
 8. Plaquette (1) selon une quelconque des revendications précédentes, caractérisée en ce que lesdites surfaces (32a, 32b) de replat varient en largeur selon leur longueur.
 9. Plaquette (1) selon une quelconque des revendications précédentes, caractérisée en ce que lesdites crêtes (28a, 28b) sont espacées sur ladite face (21a) supérieure dans la direction de l'arête (27) tranchante avant.
 10. Plaquette (1) selon une quelconque des revendications précédentes, caractérisée en ce que les surfaces intérieures (30c, 30d) desdites crêtes (28a, 28b) se rejoignent le long d'une ligne médiane de ladite face (21a) supérieure.
 11. Plaquette (1) selon une quelconque des revendications précédentes, caractérisée en ce qu'elle est munie d'extrémités de coupe qui comprennent respectivement des arêtes (27) et (25a, 25b) tranchantes, avant et latérales, et des moyens de mise en forme de copeaux formés adjacents aux extrémités opposées de la plaquette.
 12. Plaquette (1) selon la revendication 11, caractérisée en ce que lesdites extrémités de coupe sont formées sur des extrémités opposées de ladite face (21a) supérieure.
 13. Plaquette (1) selon la revendication 11, caractérisée en ce que lesdites extrémités de coupe sont formées respectivement à des extrémités opposées desdites faces (21a) et (21b) supérieure et inférieure.