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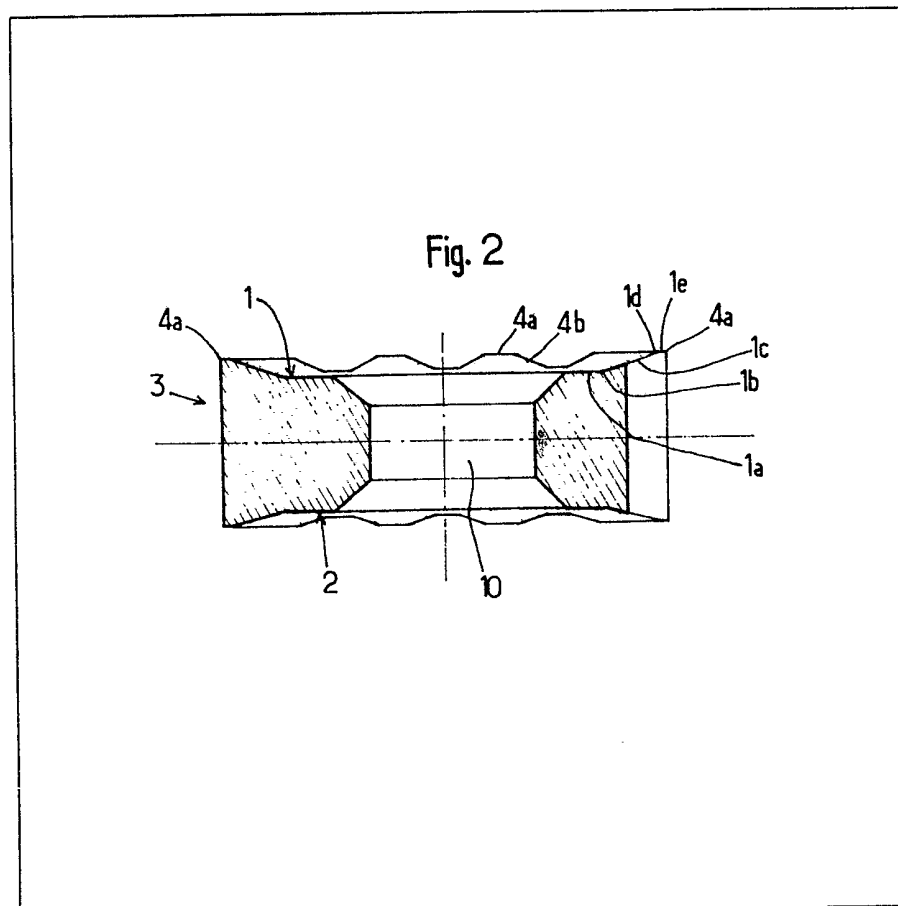
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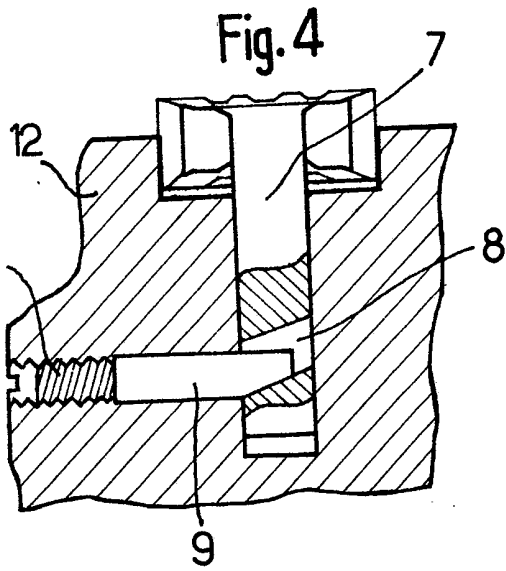
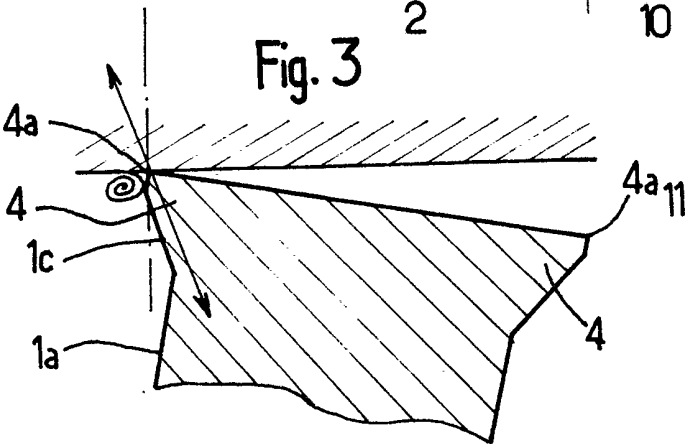
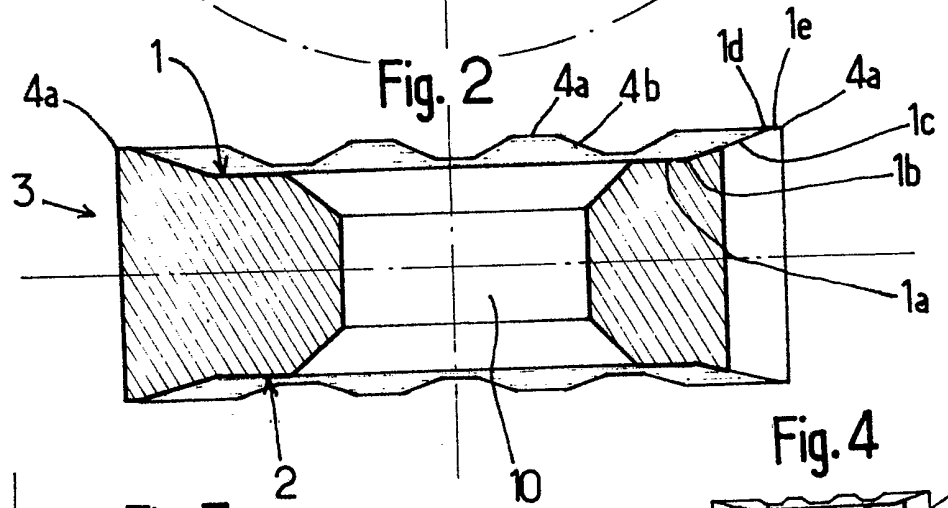
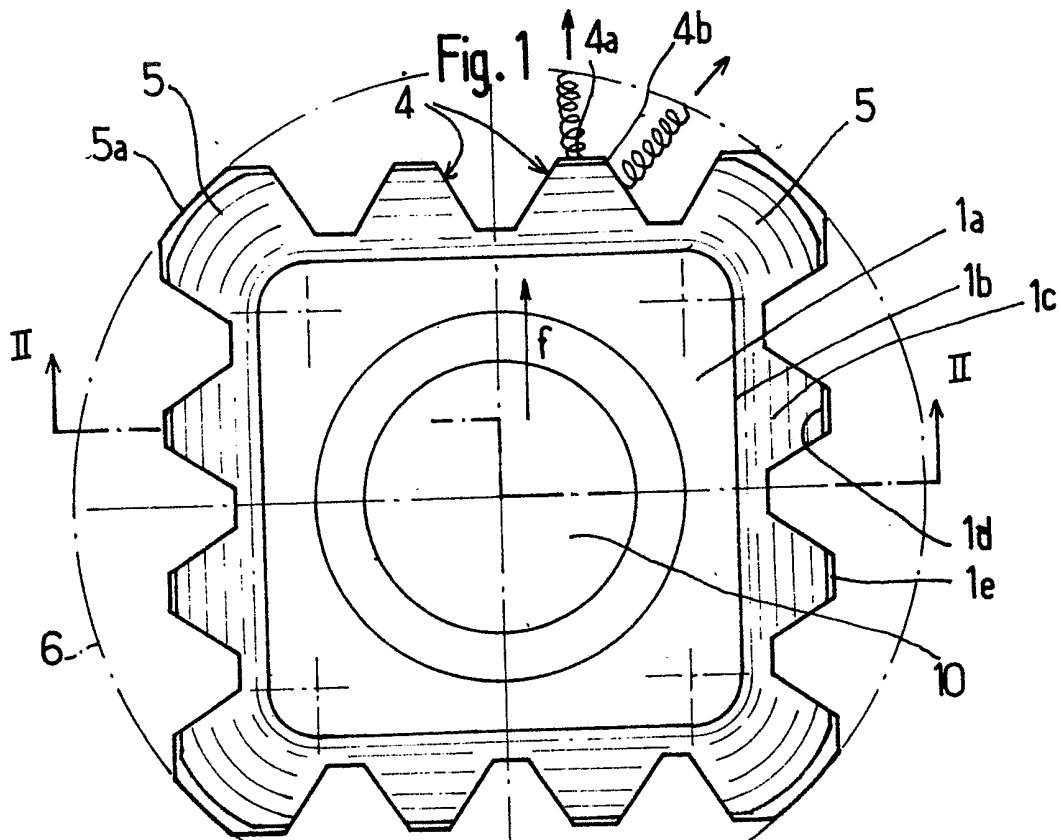
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(54) A detachable blade for a cutting tool

(57) A detachable blade for a cutting tool has a prismatic form and is of square cross-section with side faces (3) defining trapezoidal teeth (4). Each

of the end faces (1, 2) of the blade defines a recessed portion in the form of a frustum of a square based pyramid, the larger square base of which is defined by edges (1d) of the blade joined to the outer edges (4a) of the adjacent end face (1, 2).





SPECIFICATION

A detachable blade for a cutting tool

The present invention relates to a detachable blade for a cutting tool, which blade is of prismatic form and of square cross-section, and having side faces defining trapezoidal teeth.

Detachables blades of this type are already known, and are preferably made of tungsten carbide. Usually, the blade is removably mounted in a housing provided in a rotary cutting tool, in which housing the blade is blocked. These detachable blades offer the advantage that each of their eight main edges which are defined at the intersection of their front faces and their side faces, may be used as a cutting edge. To this end, it suffices, when one of these edges is worn, to unblock the blade from its housing and change its position so that a fresh edge is in a cutting position.

The working conditions of these known blades, whose front faces are flat and perpendicular to the side faces, make it necessary for them to cut negatively to permit successive use of the eight main edges of the blade. However, machining by negative cutting proves to be less advantageous than machining by positive cutting. Furthermore, these blades have flat surfaces at their corners which renders these zones particularly sensitive to wear.

It is an object of the present invention to overcome or substantially mitigate the aforesaid disadvantage of these known detachable blades.

According to the present invention there is provided a detachable blade for a cutting tool, said blade being a prismatic form and of square cross section, and having side faces defining trapezoidal teeth, each of the end faces of the blade defining a recessed portion in the form of a frustum of a square based pyramid and the larger square base of which is defined by edges of the blade joined to the outer edges of the adjacent end face.

Preferably, the edges of the larger square base are recessed with respect to the outer edges of the end faces so as to form, at the location of each of the trapezoidal teeth, a flat portion.

Preferably also, four teeth are formed at the four corners of the blade respectively each of which teeth has face of arcuate cross-section, these arcs being located on a single circle centred on the longitudinal axis of the blade.

The present invention will now be described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is an elevational view of a detachable blade for a cutting tool according to the invention. Fig. 2 is a view in section along line II—II of Fig. 1.

Fig. 3 is a schematic sectional view illustrating a mode of using the blade according to the invention.

Fig. 4 is a sectional view illustrating a mode of blocking the blade a housing formed in the cutting tool.

Referring to the drawings, Fig. 1 and 2 show

65 the blade which is of prismatic form and of square cross-section. The blade comprises two end or transverse faces 1 and 2, and four short side faces 3. Each of the side faces 3 defines a trapezoidal toothing constituted by a succession of teeth 4 each having a cross section in the form of an isosceles trapezium and which teeth are separated from one another by indented portions also in the form of isosceles trapeziums. Each of the end faces 1, 2 of the blade defines a recessed portion in the form of a frustum of a square based pyramid. As the two faces 1 and 2 are made in the same way, only one of them will be described hereafter, namely the upper front face 1. This upper end face 1 defines a central hole 10, around which a transverse surface 1a is recessed with respect to the cutting edges defined by the individual edges 4a of the various trapezoidal teeth 4 of the blade. This surface 1a is defined by the sides 1b of the smaller square base of the pyramidal frustum of which the side surfaces 1c terminate in the sides 1d of the larger square base located in the transverse plane containing the cutting edges 4a of the various teeth 4. In fact, the sides 1d do not merge with the edges 4a, but flat portions 1e are provided between the sides 1d and the edges 4a, to reinforce the cutting teeth 4.

As may be seen in Fig. 1, the central part of each front face is thus recessed and each of the cutting edges 4a of the individual teeth 4 is connected to this central portion firstly by one of the flat portions 1e, then by an inwardly inclined face, constituting a part of the side surface 1c of the pyramidal frustum.

The corners of the frustum of pyramid are preferably rounded to strengthen the resistance in these zones.

The four teeth 5 which are located at the corners of the blade each present an outer surface 5a of concentric circular arcuate cross-section, the cross sections of the four outer surfaces themselves being located on the same circle 6 centered on the axis of the blade. In this way, the teeth 5 located at the corners are reinforced.

Fig. 3 illustrates the manner in which a blade according to the invention in each of its front faces effectively cuts positively.

Fig. 4 illustrates the manner in which a blade may be blocked in a housing in a cutting tool. The central hole 10 of the blade is penetrated by a pin 7 with a milled head which is pierced in its lower part with a bore 8 which is inclined walls with respect to the longitudinal axis of the pin 7. Into this housing projects a locking wedge 9 which may be driven in by means of a screw 11. Thus, by driving the wedge 9 into the bore 8 by means of the screw 11, the pin 7 is driven into the housing provided in the tool 12, due to the inclined surfaces in contact, and consequently the blade is held in an operating position.

Fig. 1 also schematically shows the manner in which the cutting blade according to the invention operates when it is moved in the direction of the arrow *f*. Due to the mounting of the blade in the

tool 12, each of the teeth 4 causes the formation of two swarfs, namely a front swarf cut off by the actual cutting edge 4a and a side swarf which is cut off by one of the side edges 4b of the trapezoidal tooth which attacks metal to be cut obliquely. Sliding of the side edges 4b over the metal also occurs to some extent, which considerably facilitates penetration into the metal. As a result, a considerable saving of energy is made, of up to 30%, since the work of the blade is facilitated. Additionally, the coefficient of friction is reduced resulting in minimal heating and the life of the blade is, therefore, increased.

CLAIMS

1. A detachable blade for a cutting tool, said blade being of prismatic form and of square cross section, and having side faces defining trapezoidal teeth, each of the end faces of the blade defining a

20 recessed portion in the form of a frustum of a square based pyramid and the larger square base of which is defined by edges of the blade joined to the outer edges of the adjacent end face.

2. A blade as claimed in claim 1, wherein the edges of the larger square base are recessed with respect to the outer edges of the end faces so as to form, at the location of each of the trapezoidal teeth, a flat portion.

3. A blade as claimed in claim 1 or 2, wherein four teeth are formed at the four corners of the blade respectively each of which teeth has an outer surface of arcuate cross-section, these arcs being located on a single circle centred on the longitudinal axis of the blade.

4. A detachable blade for a cutting tool substantially as hereinbefore described with reference to the accompanying drawing.