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(54) **Forgó vágószerszám**

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

The invention relates to a rotating cutting tool with a main body, to which at least one segment is exchangeably fastened, the main body and the segment having fitting elements with mutually contacting faces.

Cutting tools of this type are known and are intended to make it possible for the segments, which are often loaded with cutting inserts, to be exchanged quickly and without any problems.

DE-A 14 27 052 describes a disc-type milling cutter which has on the circumference of a main body a number of segments which are loaded with cutting inserts and are releasably connected to the main body by screwing. At the contact point of the individual segments in relation to one another there is machined into the main body a dovetail-shaped groove, into which wedges which support the rearward ends of the individual segments, as seen in the direction of rotation, are pushed, the rearward flanks of the wedges, as seen in the direction of rotation, and the contacting flanks of the corresponding clearances in the segments being undercut obliquely. The opposite flanks, on the other hand, are configured at right angles.

For the lateral guidance of the segments, the main body is provided centrally with a fitting strip of a trapezoidal cross section, which engages in a correspondingly configured recess of the individual segments. The wedges that are dovetailed on one side serve here merely for taking along segments during the rotational movement of the milling cutter to relieve the screw connection. However, the fastening of the segments to the main body is only possible together with the screws.

US 1,278,630, which describes a rotating cutting tool with the features of the preamble of claim 1, describes

a blade for a circular saw having a plurality of spaced projections one edge of each projection being undercut. Plural L-shaped toothed sections have teeth at their outer edges and have an undercut extension adapted to fit the undercut projection of the blade. A wedge is arranged between one wall of a toothed section and the wall of the projection of the blade and the wall of an adjoining toothed section.

The object of the present invention is therefore to provide a rotating cutting tool in which segments can be fastened easily exchangeably to the main body in a simple manner by a clamping piece without a direct screw connection.

This object is solved by a rotating cutting tool according to claim 1.

The double-sided dovetailed configuration of the clamping piece, which on the one hand engages in a recess of the main body and on the other hand engages in the recess of the segment, combined with the wedge-shaped configuration of the clamping piece in the axial direction A achieves a secure connection between the segment and the main body without additional securing means being necessary. The clamping piece is in this case displaced in the axial direction A, in the direction tapering in wedge form, until it is clamped sufficiently strongly. The fitting elements with the mutually contacting faces between the main body and the segment ensure exactly secure positioning between the main body and the individual segments, which is not changed even by introduction of the clamping piece. Displacing the clamping piece counter to the direction tapering in wedge form has the effect of releasing again the connection between the main body and the segment in a simple manner and allowing the segments to be removed from the main body.

In a particularly advantageous refinement of the invention, the fitting elements are configured in the form of webs with a first contacting face, running substantially in the axial direction A, and a second contacting face, running substantially perpendicularly to the axial direction A, on respectively opposing peripheral regions of the main body and of the segment. In this way, good secure positioning of the main body and the segment in relation to one another is achieved, the fitting elements being easy to fabricate.

The clamping piece is passed through in the axial direction A by a screw, which can be screwed to the main body or the segment.

It is particularly advantageous in this case if the screw has two threaded portions with the same thread direction but different thread pitches.

This configuration has the effect that the screwing in of the screw achieves in a simple manner good wedging of the clamping piece in the recesses of the main body and the segment, which can be released again without any problem by unscrewing the screw.

For the dovetail-shaped parts of the clamping piece it has proven successful if they together form an angle α which lies in a range from 120° to 160° .

For the conicity in the axial direction of the clamping piece it has proven successful that the angle β with which the clamping piece tapers in wedge form in the axial direction A lies in a range from 8° to 16° .

The present invention is used particularly advantageously in the case of a disc-type milling cutter with segments arranged circumferentially or internally, the segments being configured as cartridges with exchangeably fastened cutting inserts.

The invention is explained in more detail below on the basis of drawings, in which:

- Figure 1 shows the detail of a disc-type milling cutter with circumferentially arranged cartridges with cutting inserts in an oblique view, partially in section,
- Figure 2 shows the enlarged detail of the disc-type milling cutter according to Figure 1 in a rear view,
- Figure 3 shows the section S-S corresponding to Figure 2,
- Figure 4 shows a disc-type milling cutter with internally arranged cartridges with cutting inserts.

In Figures 1 to 3, the implementation of the invention is described in more detail by the example of a disc-type milling cutter with circumferentially arranged, exchangeable cartridges with cutting inserts, only a peripheral region of the disc-type milling cutter being represented in the form of a detail. The main body -1- of the disc-type millin cutter has circumferentially on one side at the peripheral region a web-like fitting element -3- with a first contacting face -4- and a second contacting face -5-. Circumferentially, a number of segments -2- in the form of cartridges with cutting inserts -6- are exchangeably connected to the main body -1-. The segments -2- have circumferentially at the peripheral region in the contact zone with respect to the main body -1- likewise web-like fitting elements -3- with a first contacting face -4- and a second contacting face -5-. These web-like fitting elements -3- of the main body -1- and of the segments -2- are arranged on respectively opposing sides, so that the web-like fitting elements -3- of the main body -1- and of the segments -2- engage in the corresponding, adjacently lying recesses and respectively rest against the first and second mutually contacting faces -4- and -5-, whereby aligned positioning of the segments -2-

with the main body -1- is achieved. Respectively arranged in the central region of the segments -2- is a clamping piece -7- dovetailed on two sides. The clamping piece -7- has a thickness which corresponds approximately to the thickness of the web-like fitting element -3- of the main body -1- and engages with a first dovetail-shaped part -9- in a corresponding recess of the fitting element -3- of the main body -1-, while the second dovetail-shaped part -10- engages in a corresponding recess in the region lying thereabove of the respective segment -2-. The two dovetail-shaped parts -9-, -10- together form an angle α of 150° . In the axial direction A, the clamping piece -7- is configured such that it tapers in wedge form with an angle β of 8° .

The clamping piece -7- is passed through in the axial direction A by a screw -8-, which has two threaded portions -11- and -12- with the same thread direction but different thread pitches. The threaded portion -11- with the greater thread pitch engages in a corresponding threaded bore of the respective segment -2-, while the threaded portion -12- with the smaller thread pitch engages in a corresponding threaded bore of the clamping piece -7-. In this way, quick wedging and releasing of the clamping piece -7- in the corresponding recess of the main body -1- and of the respective segment -2- is achieved when turning the screw -8-. At the same time, adequately great force can be applied to the clamping piece -7-, so that secure clamping is ensured.

It is important for good wedging and secure positioning of the main body -1- and the segments -2- that the end faces -13- and -14- of the dovetail-shaped parts -9- and -10- that are enclosed by the flanks undercut in a dovetailed manner are non-contacting in the corresponding recesses of the main body -1- and the segment -2-. This ensures a slight possibility of automatically aligning the clamping piece -7- during introduction in the recesses, whereby overdetermination

of the clamping system, and consequently indeterminate clamping, is ruled out.

Figure 4 shows a disc-type milling cutter in which, in contrast to the disc-type milling cutter according to Figures 1 to 3, the segments -2- configured as cartridges with cutting inserts -6- are not configured circumferentially but internally.

However, the invention is not in any way restricted to disc-type milling cutters but can likewise be used in the case of other rotating cutting tools, such as end milling cutters or drilling tools.

FORGÓ VÁGÓSZERSZÁM**Szabadalmi igénypontok**

1. Forgó vágószerszám alaptesttel (1), amelyen legalább egy szegmens (2) van cserélhetően rögzítve, és az alaptest (1) és a szegmens (2) egymással érintkező felületekkel (4, 5) ellátott illesztőelemekkel (3) rendelkezik,

azzal jellemezve, hogy

a cserélhető rögzítés egy kétoldalt fecskefarok-alakúan kiképzett szorítótaggal (7) történik, amely tengelyirányban (A) ékalakúra összefutóan van kiképezve, mimellett a szorítótagnak az első fecskefarok-alakú része az alaptestnek (1) egy annak megfelelő, illetve ahhoz hozzárendelt bemélyítésébe, illetve kivágásába, a szorítótag (7) második fecskefarok-alakú része (10) pedig a szegmens (2) egy hozzárendelt, illetve neki megfelelő bemélyítésébe kapcsolódik, illetve kapaszkodik,

azzal jellemezve, hogy

a szorítótagon (7) axiális irányban (A) egy csavar (8) van átvezetve, amely az alaptesttel (1) vagy a szegmenssel (2) összezsavarozható.

2. Az 1. igénypont szerinti forgó vágószerszám, **azzal jellemezve, hogy** az illesztőelemek (3) bordaalakúra vannak kiképezve, egy lényegében a tengelyirányban (A) húzódó első felfekvési, illetve érintkezési felülettel (4), valamint egy, lényegében a tengelyirányra (A) merőlegesen húzódó második felfekvési felülettel (5) az alaptest (1) és a szegmens (2) megfelelő szemben lévő kerületmenti tartományain.

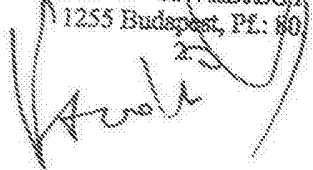
3. Az 1. vagy 2. igénypont szerinti forgó vágószerszám, **azzal jellemezve, hogy** a csavarnak (8) két, azonos menetirányú, de egymástól eltérő menetemelkedésű menetes szakasza (11, 12) van.

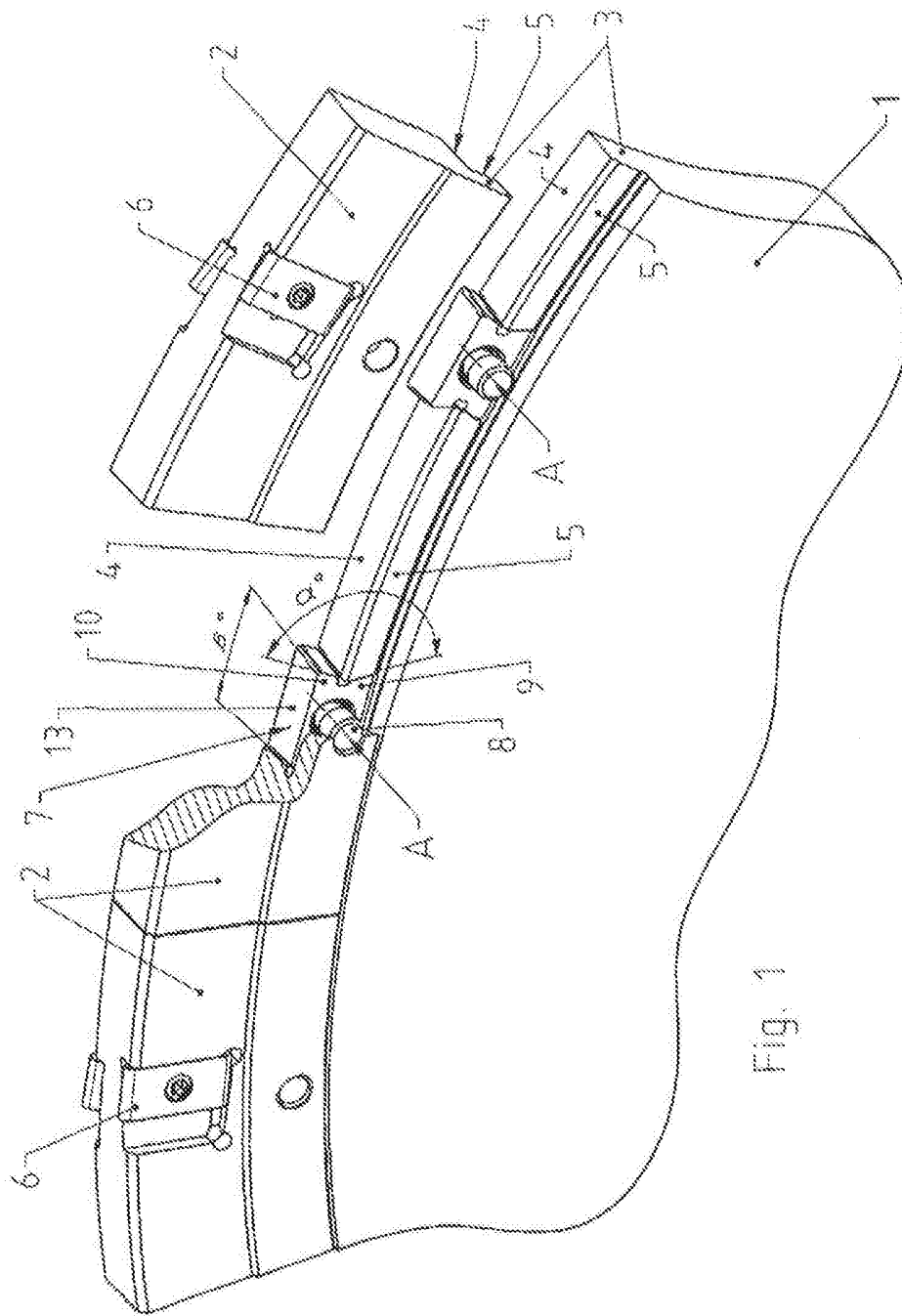
4. Az 1-3. igénypontok bármelyike szerinti forgó vágószerszám, **azzal jellemezve, hogy** a szorítótag (7) két fecskefarok-alakú részének (9, 10) egymással bezárt szöge (α) 120° és 160° közötti tartományban van.

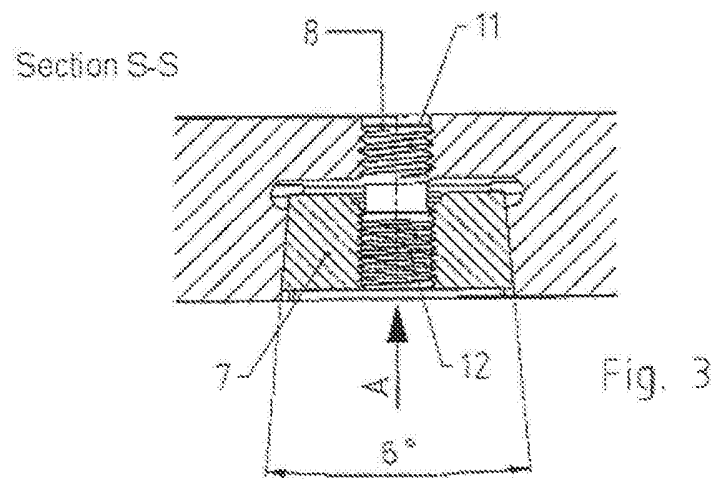
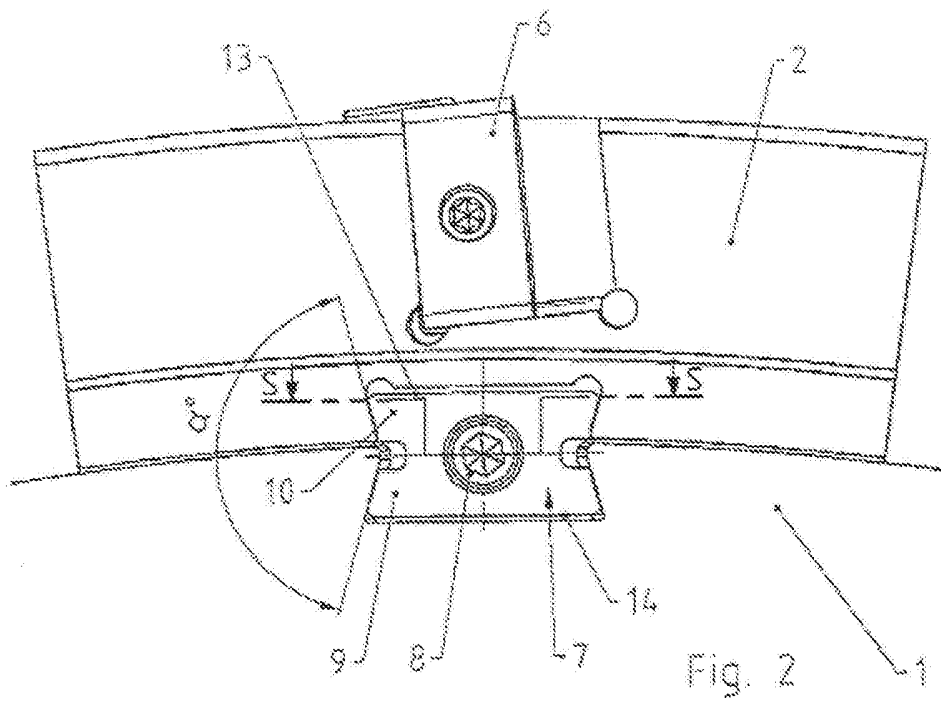
5. Az 1-4. igénypontok bármelyike szerinti forgó vágószerszám, **azzal jellemezve, hogy** a szög (β), amellyel a szorítótag (7) a tengelyirányban (A) összefut, illetve elkeskenyedik, 8° és 16° közötti tartományban van.

6. Az 1-5. igénypontok bármelyike szerinti forgó vágószerszám, **azzal jellemezve, hogy** a vágószerszám a kerületmenti oldalon vagy belül elhelyezkedő szegmensekkel (2) rendelkező tárcsamaró, ahol a szegmensek (2) cserélhetően rögzített vágóbetétekkel ellátott kazettákként vannak kialakítva.

A meghatalmazott:

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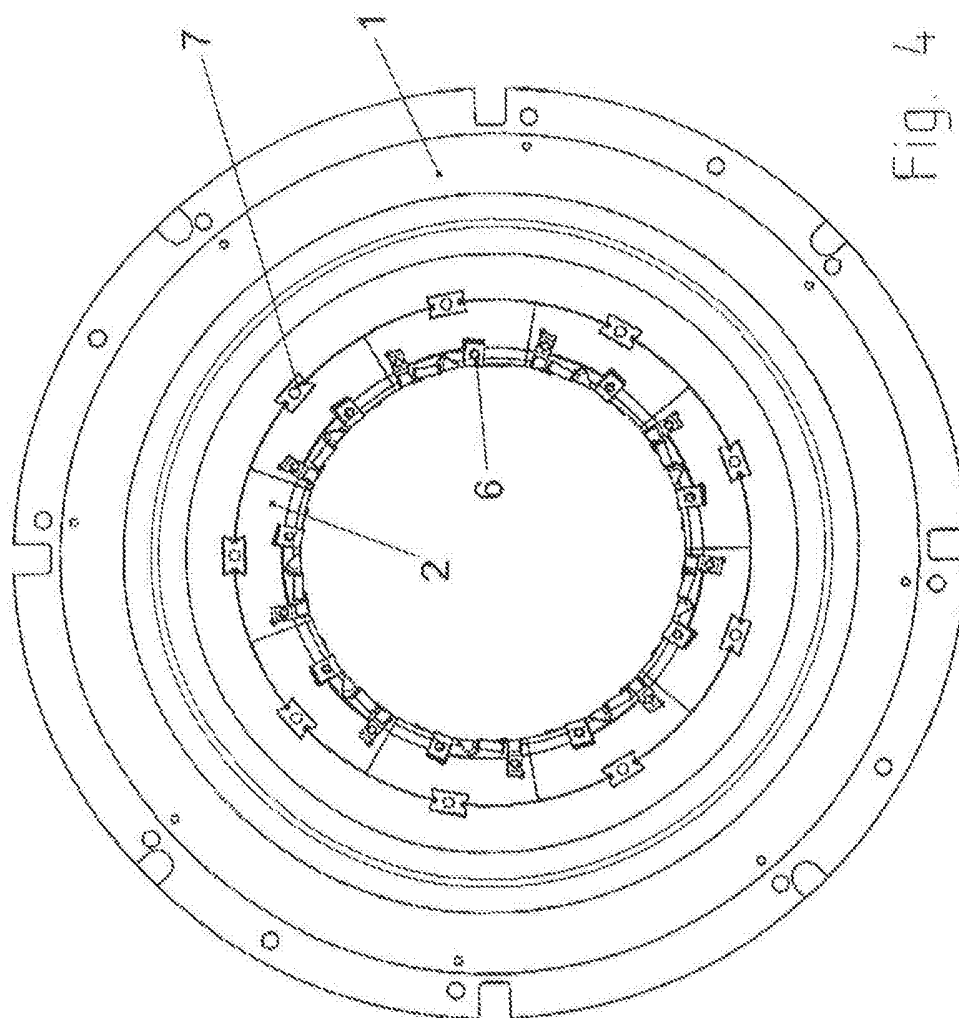


Fig. 4