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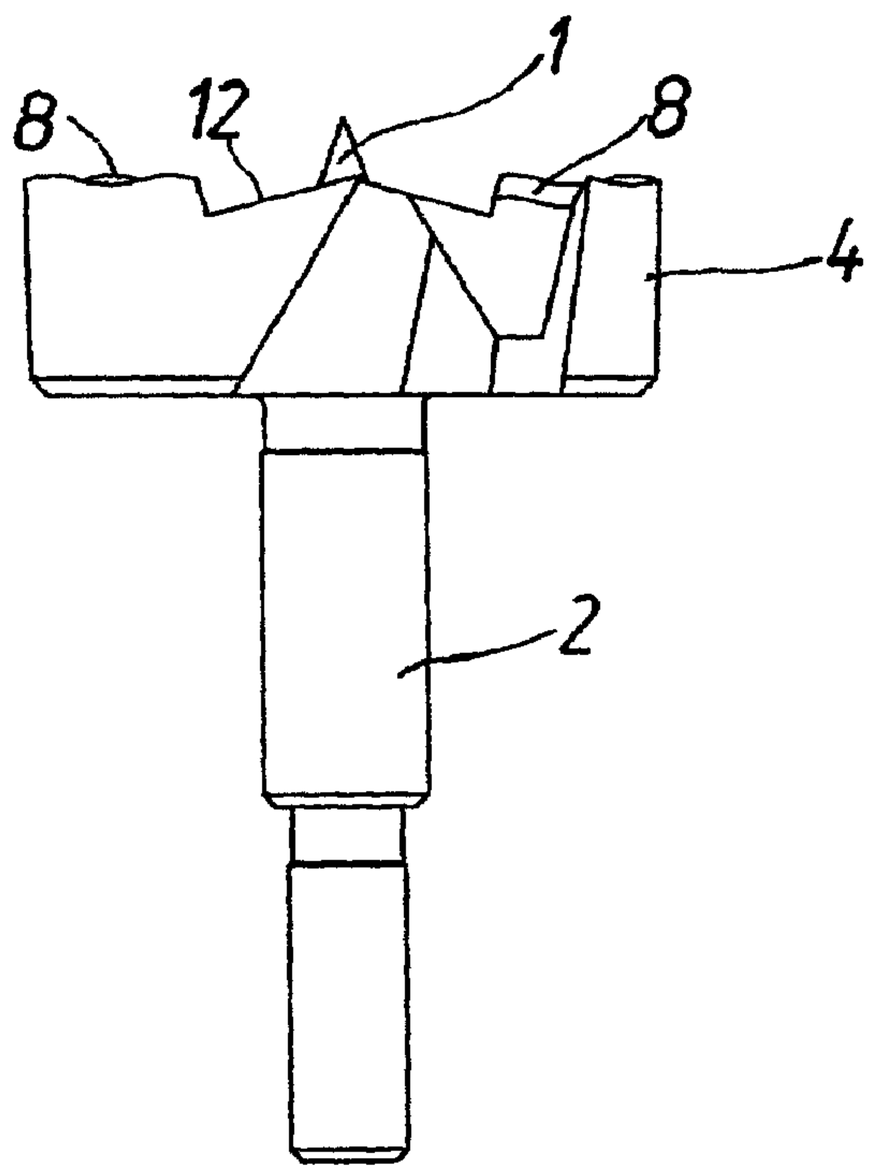
(72) Inventeur/Inventor:
EBERHARD, HELMUT, AT

(73) Propriétaire/Owner:
JOHANN EBERHARD GESELLSCHAFT M.B.H., AT

(74) Agent: FETHERSTONHAUGH & CO.

(54) Titre : MECHE, EN PARTICULIER MECHE FORSTNER OU A TETE DE CENTRAGE
(54) Title: DRILL, ESPECIALLY A FORSTNER BIT OR A MULTI-SPUR MACHINE BIT



(57) Abrégé/Abstract:
The invention relates to a drill, especially a Forstner bit or a multi-spur machine bit, having a drill shaft (2) and a cutter head (4) which is provided with a central mandrel (1). A first and a second spur cutter (100, 100') radially extend towards the outside from said mandrel and in opposite tool approach directions. A hollow cylinder segment-like wall (10) respectively that has a circumference cutter (8) and defines the circumference of the cutter head (4) is joined to the ends of the first and second spur cutter (100, 100'), whereby said ends face the circumference. Said wall defines a chip space (7) on the end thereof that faces away from the spur cutter (100, 100'). Said space opens to the respective remaining spur cutter and penetrates the drill head. The two circumference cutters (8) are provided with wave-shaped cavities (13) and elevations (14), at least partially along the side thereof.

Abstract

The invention relates to a drill, especially a Forstner bit or a multi-spur machine bit, having a drill shaft (2) and a cutter head (4) which is provided with a central mandrel (1). A first and a second spur cutter (100, 100') radially extend towards the outside from said mandrel and in opposite tool approach directions. A hollow cylinder segment-like wall (10) respectively that has a circumference cutter (8) and defines the circumference of the cutter head (4) is joined to the ends of the first and second spur cutter (100, 100'), whereby said ends face the circumference. Said wall defines a chip space (7) on the end thereof that faces away from the spur cutter (100, 100'). Said space opens to the respective remaining spur cutter and penetrates the drill head. The two circumference cutters (8) are provided with wave-shaped cavities (13) and elevations (14), at least partially along the side thereof.

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Drill, especially a Forstner bit or a multi-spur machine bit

Field of the Invention

The invention relates to a drill, especially a Forstner bit or multi-spur machine bit, having a drill stem and a cutter head, which has a central mandrel, from which a first end cutting edge and a second end cutting edge extend radially outward in opposite in-feed directions, in each case one wall, which delimits the periphery of the cutting head, is in the form of a segment of a hollow cylinder and has a peripheral cutting edge, adjoining the peripheral-side ends of the first and second end cutting edges, which wall, at its end which is remote from the end cutting edge, delimits a chip space which in each case opens out toward the other end cutting edge and penetrates through the drilling head.

Background of the Invention

Drills of this type are mass-produced products which are intended for use in handheld, pillar, dowel or in-line multiple-spindle drilling machines and are produced and sold in large numbers. They can be used to drill holes with a relatively large diameter into a very wide range of materials, from plastic-coated chipboards, glued wooden boards through to acrylic plastic sheets and other base materials. The drawback of drills which have become known hitherto are the relatively high drilling forces or torques which have to be applied by the drilling machines, since the straight edges of the end cutting edges and the peripheral cutting edges have to overcome a high resistance from the material.

The peripheral cutting edges of known drills of this type tend to overheat on account of the high level of

load during the drilling operation, which becomes apparent from a blue start-up mark. This leads to permanent damage to the drill. To avoid this overheating effect, peripheral cutting edges with a tooth-like design have been used. However, these lead to a failure of the drill to cut cleanly and to the drilled hole tearing open.

It is an object of the invention to provide a drill of the type described in the introduction with the aid of which it is possible to increase the efficiency of the energy employed for a drilled hole to be made and with which it is possible to carry out drilling operations using low drilling forces, with the material load on the drill being kept at a relatively low level.

Summary of the Invention

According to the invention, this is achieved by the fact that the two peripheral cutting edges have undulating recesses and elevations at least along part of their profile.

The undulating peripheral cutting edges, which act as taper taps, reduce the constant friction within the drilling material which occurs with known peripheral cutting edges to more or less punctiform friction, thus avoiding permanent rubbing. Consequently, a lower drilling machine torque is required to drill a hole, and consequently the drill penetrates into the wood, for example, considerably more easily.

In a further refinement of the invention, it is possible to provide for the undulating recesses and elevations to be formed by cylindrical grinding.

Forming a cylindrically ground profile on the peripheral cutting edge ensures very clean cutting on the part of the drill and prevents the drilled hole from tearing open.

Furthermore, the invention relates to a process for producing a drill, especially a Forstner drill or a multi-spur machine bit.

It is an object of the invention to allow automated machining of the peripheral cutting edges of a drill in a technically simple and precise way.

According to the invention, this is achieved by the fact that undulating recesses and elevations are hard-milled into the peripheral cutting edges of the hardened drilling head along its profile.

After the drill bit blank has been hardened, the drill stem is ground, and then the elevations and recesses are hard-milled using a hard-milling machine, in particular so as to form a cylindrically-ground profile. In this way, it is possible to achieve a highly accurate configuration of the peripheral cutting edges.

In accordance with this invention, there is provided a drill bit comprising, a drill stem and a cutter head having a central mandrel, from which a first end cutting edge and a second end cutting edge extend radially outward in opposite in-feed directions, each forming a portion of a cutter head, said each portion of the cutter head is peripherally delimited by a wall in the form of a segment of a hollow cylinder provided with peripheral cutting edges, said segment adjoining peripheral-side ends of the first and second end cutting egdes, at an end remote from the end cutting edge is delimiting a chip space

opening out toward the other end cutting edge and extending through the drilling head, wherein the two peripheral cutting edges are configured with at least a partial profile of sequences of undulating recesses and elevations.

Brief Description of the Drawings

The invention is explained in more detail below with reference to the exemplary embodiment illustrated in the appended drawings, in which:

Fig. 1 shows an end view of an embodiment of the drill according to the invention;

Fig. 2 shows a side view of the drill illustrated in Fig. 1;

Fig. 3 shows a view which has been rotated through 90° compared to the illustration shown in Fig. 2, and

Fig. 4 shows a detail of the view shown in Fig. 3.

Detailed Description of Preferred Embodiments

Fig. 1 and Fig. 2 show a Forstner bit, which is substantially composed of a drill stem 2, which is to be clamped into a chuck, and a cutter head 4. The cutter head 4 has a protruding central mandrel 1, from which a first and a second end cutting edge 100, 100′ extend radially outward in opposite in-feed directions. In the exemplary embodiment shown in Fig. 1, the

central mandrel tapers to a point in the form of a pyramid, allowing accurate positioning of the drill onto a marker for a drilled hole. The mandrel 1 penetrates sufficiently far into the material which is to be drilled to prevent the drill from slipping when the drilling machine starts to operate.

In each case one wall 10, which delimits the periphery of the cutter head 4, is in the form of a segment of a hollow cylinder and has a peripheral cutting edge 8, adjoins the peripheral-side ends of the first and second end cutting edges 100, 100', which wall, at its end which is remote from the end cutting edge, delimits a chip space 7 which in each case opens out toward the other end cutting edge and penetrates through the drilling head. A surface 12 which in each case drops toward the adjoining wall 10 runs from the end cutting edges 100, 100'.

To avoid overheating of the peripheral cutting edges 8, there is provision for the two peripheral cutting edges 8 to have undulating recesses 13 and elevations 14 along their profile. They may also run only along partial regions of peripheral cutting edges 8.

The undulating recesses 13 and elevations 14 are preferably formed by cylindrical grinding.

The invention can be applied to a Forstner bit, a multi-spur machine bit or a similar wood-drilling bit.

The production of the drill according to the invention involves the following steps.

1) Forging of the blank, and if appropriate burnishing
2) Hardening
3) Grinding the drill stem

4) Hard-milling of the elevation/recesses or the cylindrically-ground profile from the hardened drilling head.

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CLAIMS:

1. A drill bit comprising, a drill stem and a cutter head having a central mandrel, from which a first end cutting edge and a second end cutting edge extend radially outward in opposite in-feed directions, each forming a portion of a cutter head, said each portion of the cutter head is peripherally delimited by a wall in the form of a segment of a hollow cylinder provided with peripheral cutting edges, said segment adjoining peripheral-side ends of the first and second end cutting egdes, at an end remote from the end cutting edge is delimiting a chip space opening out toward the other end cutting edge and extending through the drilling head, wherein the two peripheral cutting edges are configured with at least a partial profile of sequences of undulating recesses and elevations.

2. The drill bit as claimed in claim 1, wherein the undulating recesses and elevations of the peripheral cutting edges are hardmilled.

3. A process for producing a drill bit, in particular a Forstner bit or a multi-spur machine bit, comprising the steps of providing a hardened blank drill bit with peripheral cutting edges and hard-milling sequences of undulating recesses and elevations into the peripheral cutting edges at least along a portion of a profile of the cutting edges.

FETHERSTONHAUGH & CO.
OTTAWA, CANADA

PATENT AGENTS

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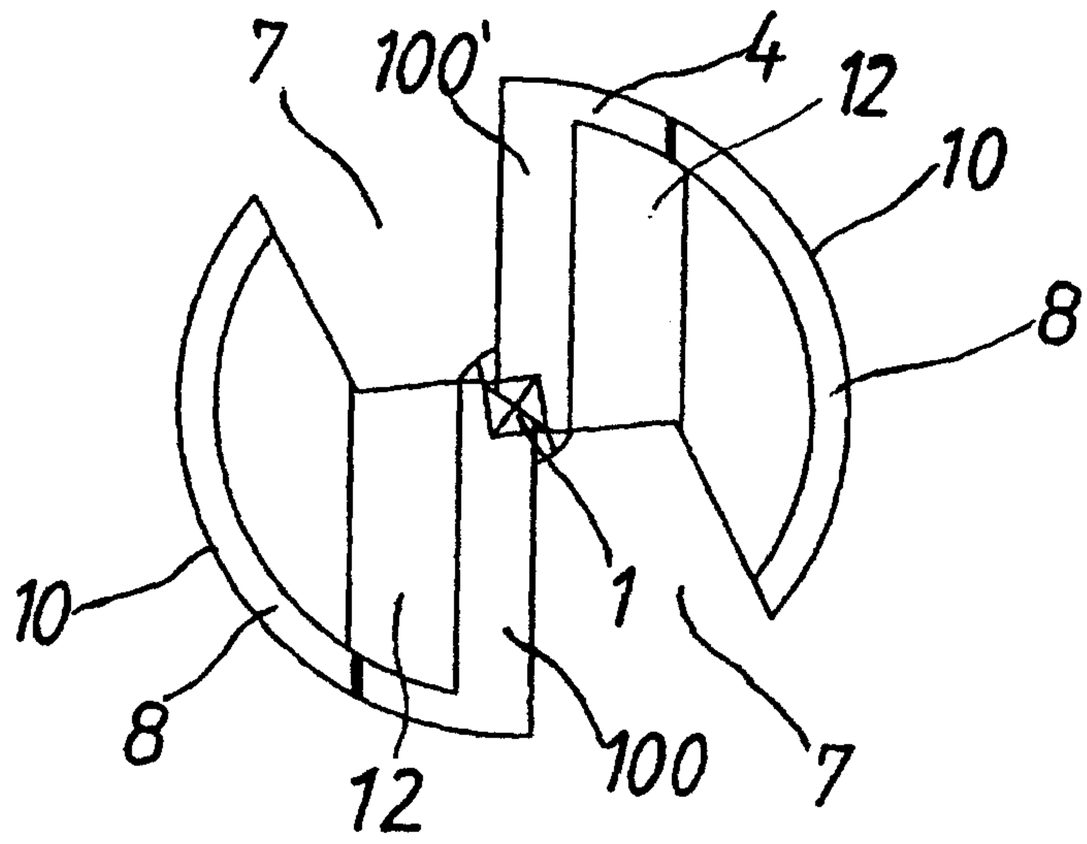


FIG. 1

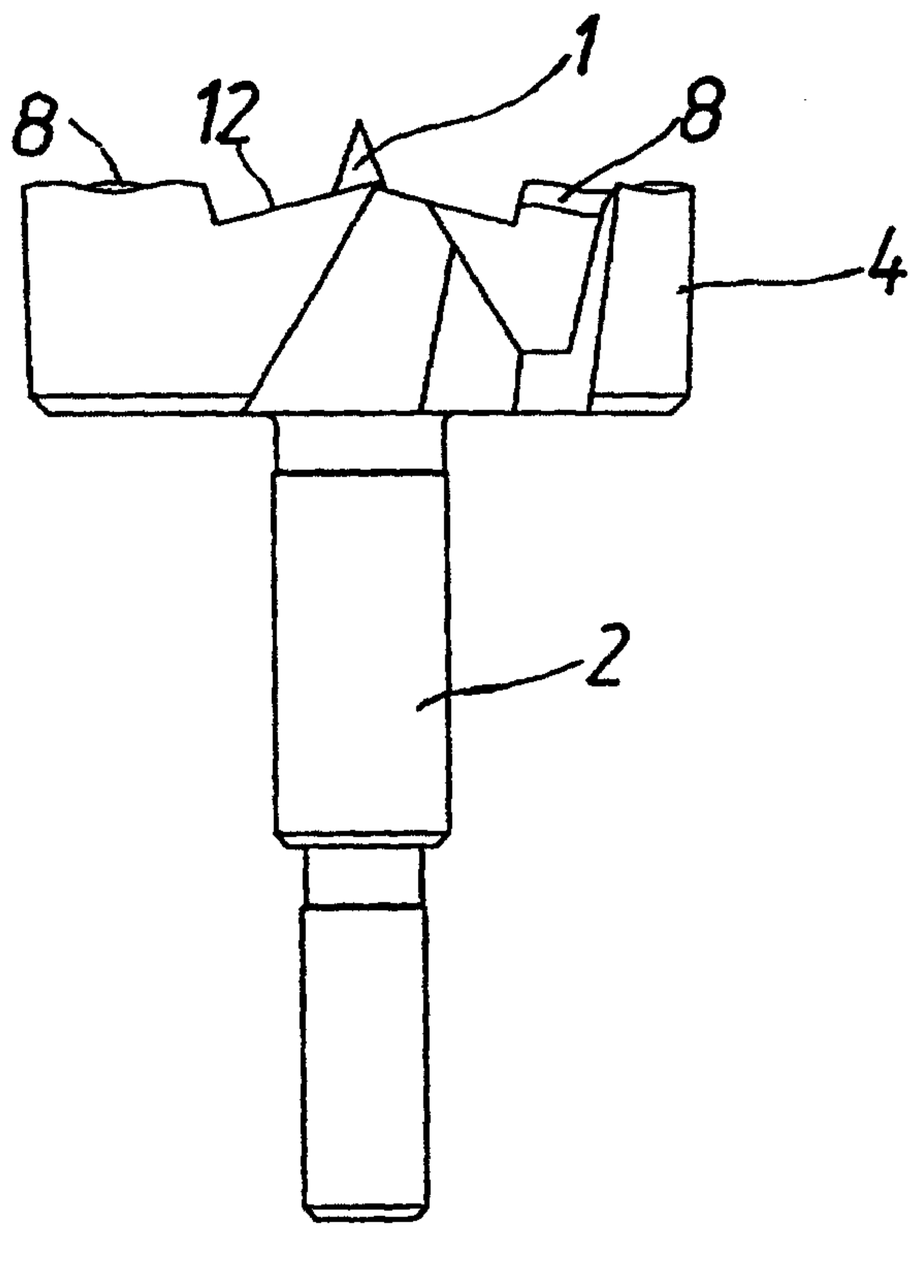


FIG. 2

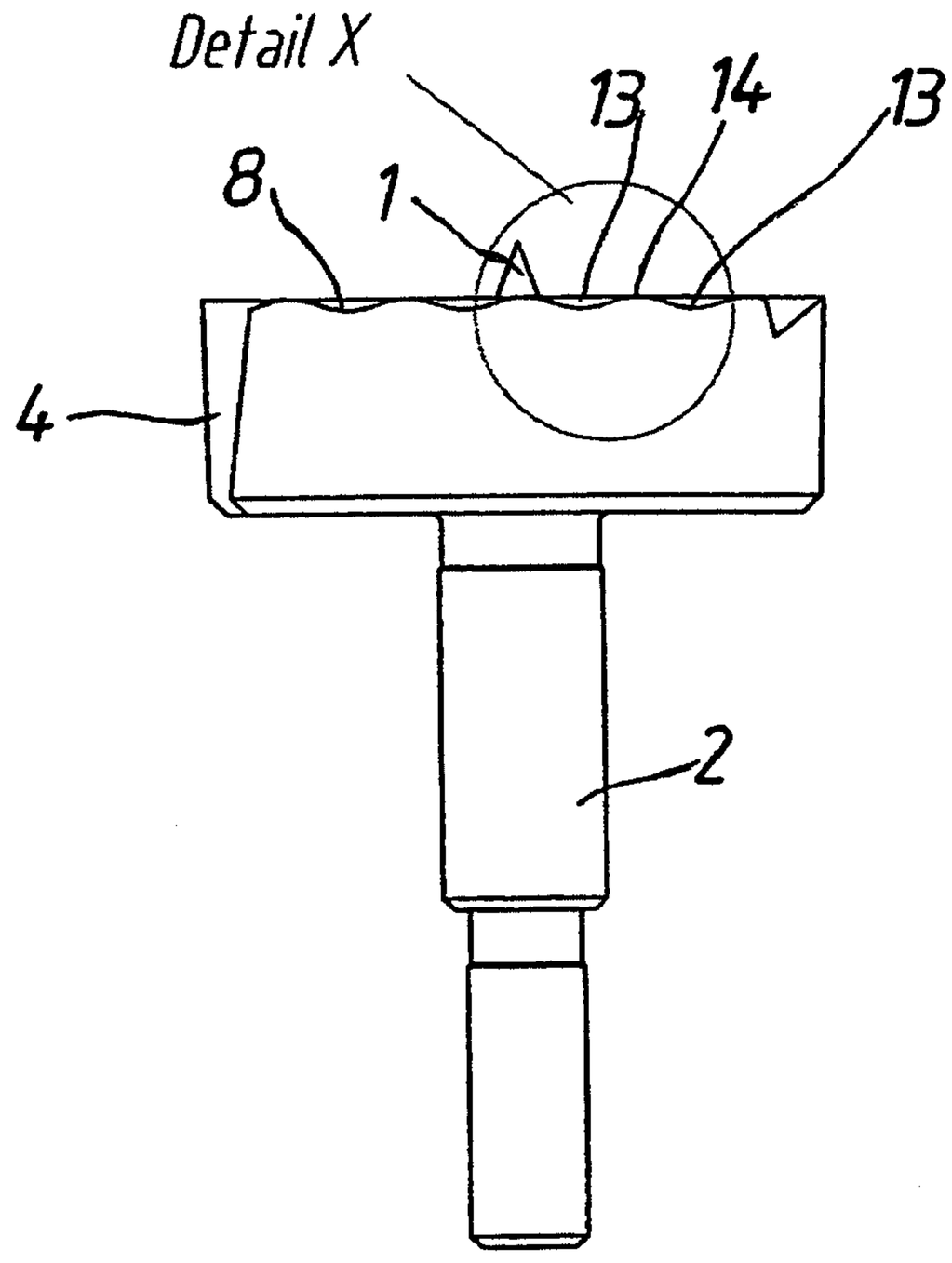
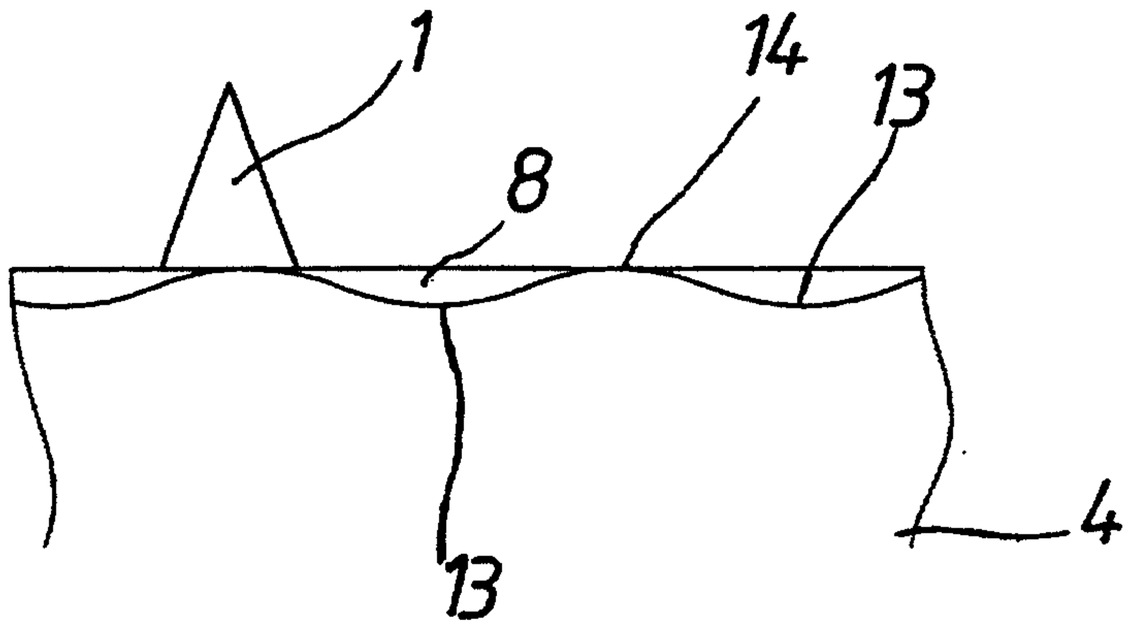
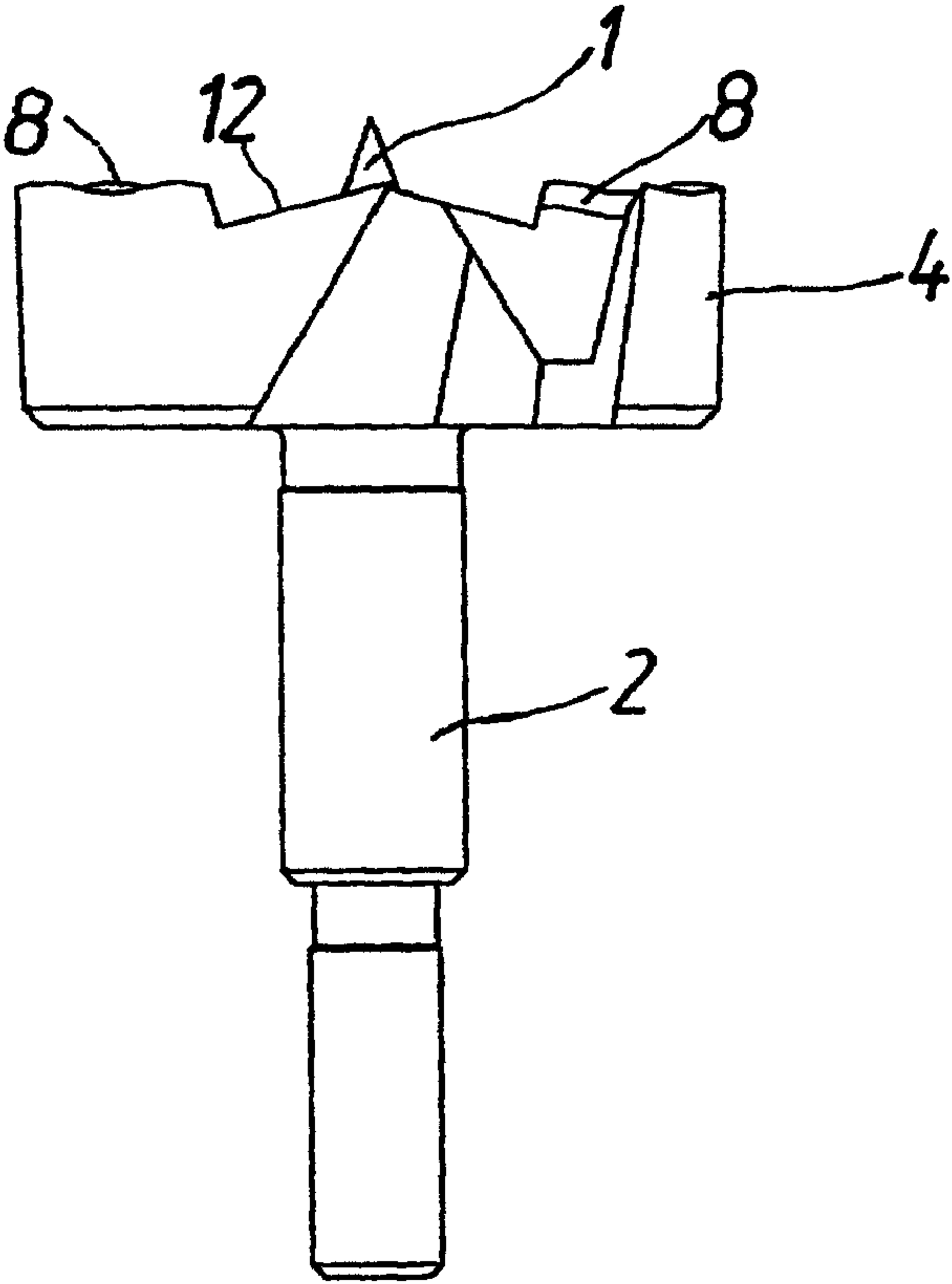


FIG.3



Detail X

FIG.4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