

The present invention concerns a thread-cutting screw having one or more threads extending over at least part of the screw shank, a screw tip and a screw head, wherein the edge of the flights forming the thread border is shaped to be at least partly undulating on the threads running to the end of the screw tip, wherein the undulating ridge of the thread on the screw tip and at least on the first of the thread path of the screw shaft at least on the side surface in the region of the valleys of the thread ridges of the side surfaces provides spaced apart recesses, whose upper limit forms the edge itself of the thread ridge.

This kind of screw is already known from the German Patent Application 33 35 092.2. In the case of this known slotted screw the recesses are formed symmetrical to the midline of the undulating edge so that the recesses are formed as symmetrical parabolas. As opposed to the previously known screw this known slotted screw already has a reduced screw-in moment and an increased unscrewing moment.

The present invention is based on the object of improving this known screw to the effect that a further reduction of the screw-in moment is achieved at the same time as the unscrewing moment is increased.

According to the invention this is achieved in that the recesses are formed asymmetrical, such that their front side surfaces in the screw-in direction are steeper than the rear side surfaces in the screw-in direction. In this respect it is also advantageous that the transition of the recesses in the side faces take the form of a parabola, the axis of which is displaced by an acute angle α in the screw-in direction towards the midline of the undulating edge which forms the upper limit running through the longitudinal axis of the screw.

It is also advantageous that the recesses are formed one opposite the other on two side faces of the thread path. Owing to the embodiment according to the invention, consequently when screwing in, the resistance is lower due to the flatter formation of the rear part of the parabola in the screw-in direction, and on the other hand it is more difficult to loosen the screw according to the invention owing to the steeper arrangement of the parabola face lying in front in the screw-in direction.

The invention is explained in more detail in the light of the example illustrated in the attached drawings, where:

Figure 1 shows a part view of a screw according to the invention;

Figure 2 shows a partial section along the line of A-B in Figure 1, and

Figure 3 shows a partial section through a recess of the side face of the screw according to Figure 1 along the section C-D in Figure 2.

As can be seen from Figure 1, a screw according to the invention consists of a screw shank 1, a screw head 2 with a simple slot or cross slot and a screw tip 3. The screw shank 1 has the same diameter over its whole length, and the screw tip 2 tapers to the screw shank continuously up to its end. A screw thread 4 is formed on the screw shank tip 1 and at the screw tip 3 and runs to the end of the screw tip 3. The edge 5 of the flights forming the thread ridge is undulating on the thread path forming the thread 4, i.e. there is a constant sequence of elevations (peaks 12) and recesses (valleys 13), wherein the outside diameter of the thread is determined by the distance of the thread edge 5 from the mid axis of the screw in the region of the peaks 12. Furthermore, at least on the side 10 of the thread paths facing the screw tip in the region of the valley 13 of the thread edge 5 recesses 6 are formed. In this respect the edge 5 forms the upper limit of the recesses 6 in the region of the valley 13. As can be seen especially from Figure 2 in conjunction with Figure 3, the recesses are formed asymmetrical, such that the front faces 7 of the screw according to the invention in the screw-in

direction are steeper than the rear surfaces 8 seen in the screw-in direction of the screw. In this case the transition 9 to the other side faces of the thread side 10 is formed as a parabola. The axis 4 of the parabola is displaced by an acute angle in the screw-in direction towards the midline 15 of the undulating edge 5 which forms the upper limit running through the longitudinal axis X-X of the screw. Advantageously there is a pitch over the recesses of about one flight of about 8 to 13 recesses 6. In this respect the recesses 6 may be present in the whole thread area, that is also on the screw tip itself. The depth of the recesses 6 may more suitably amount to $1/3$ to $1/2$ of the height of the thread H. As can be seen from the Figures there is a progressive transition between the recesses 6 and the other side region of the thread side so that no sharp edges occur here and hence a stressing effect is prevented. The same also applies to the transition between the valleys 13 which form the limit of the recesses 6. The peaks 12 are formed relatively short compared to the valleys.

In the illustrated example of Figure 1 the recesses 6 are arranged opposite one another asymmetrical to edge 5 on both side faces of the thread path 4. However it is also within the scope of the invention, that recesses 6 may also be provided only on one side of the side surfaces.

CLAIMS

1. Thread-cutting screw having one or more threads (4) extending over at least part of the screw shank (1), a screw tip (3) and a screw head (2), wherein the edge (5) of the flights forming the thread border is shaped to be at least partly undulating on the threads (4) running to the end of the screw tip (3) and the undulating ridge of the thread on the screw tip (2) and at least on the first of the thread path of the screw shaft (1) at least on the side surface in the region of the valleys (13) of the thread ridges of the side surfaces provides spaced apart recesses (6), whose upper limit forms the edge (5) of the thread ridge, characterised in that the recesses (6) are formed asymmetrical, such that the front side surfaces (7) in the screw-in direction are steeper than the rear side surfaces (8) in the screw-in direction.
2. Thread-cutting screw according to Claim 1, characterised in that the transition (9) of the recesses (6) in the side faces (10) take the form of a parabola (9), the axis (4) of which is displaced by an acute angle in the screw-in direction towards the midline (15) of the undulating edge (5) which forms the upper limit running through the longitudinal axis X-X of the screw.



3. Thread-cutting screw according to Claim 1 or 2, characterised in that the distance between the recesses (6) becomes smaller towards the acute end in the region of the screw tip (3).
4. Thread-cutting screw according to one or more of Claims 1 to 3, characterised in that the recesses (6) extend one over another on both sides (10) of the thread (4).



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