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(54) **COATED WOODWORKING TOOL**

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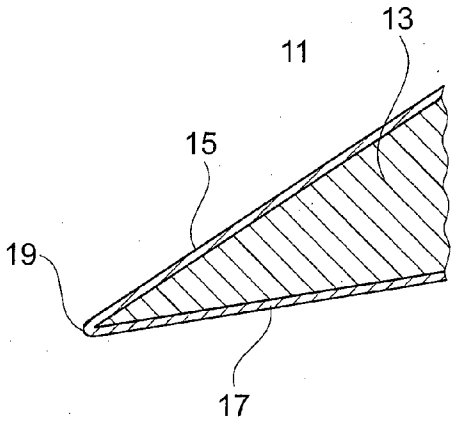
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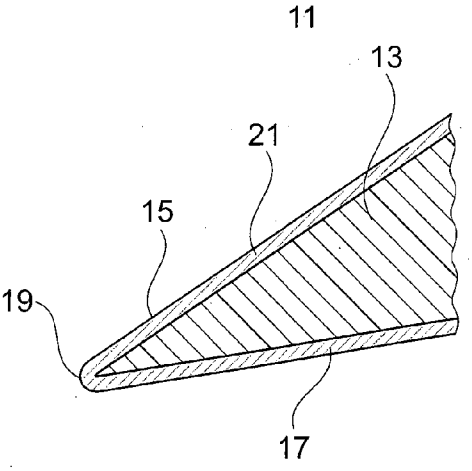
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(57) **ABSTRACT**

The invention relates to a coated woodworking tool, in particular a cutting tool comprising a tool body having a cutting part, on which cutting part a cutting edge is formed. At least the rake face or the rake and flank faces, and the cutting edge of the cutting part are coated with at least one hard-material layer and one sliding layer arranged above the at least one hard-material layer. The sliding layer may be made substantially of sulphides, tellurides or selenides having a transition metal of subgroup Va and VIa of the periodic table, in particular having Mo, Nb, Ta, W, Nb, Ta.





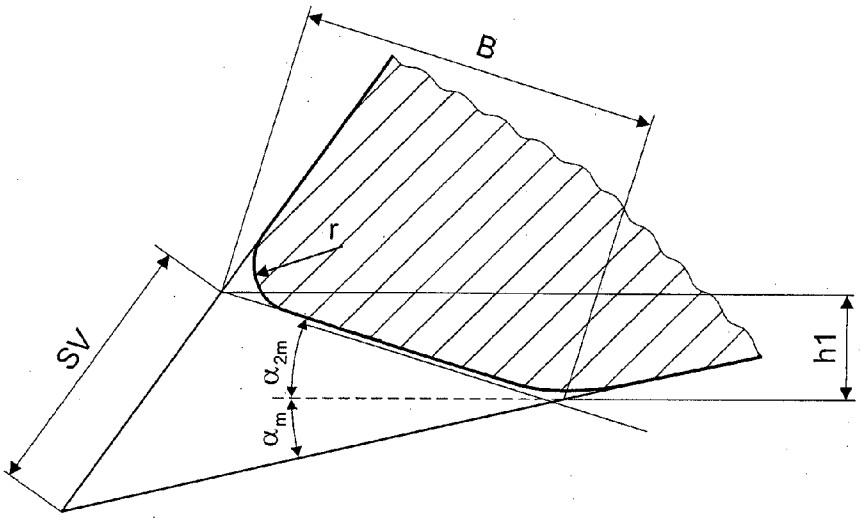


Fig. 1

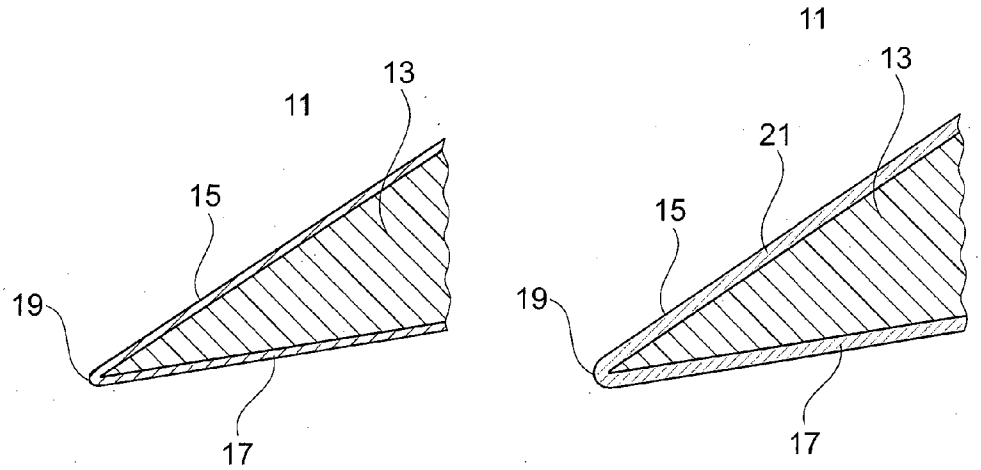


Fig. 2

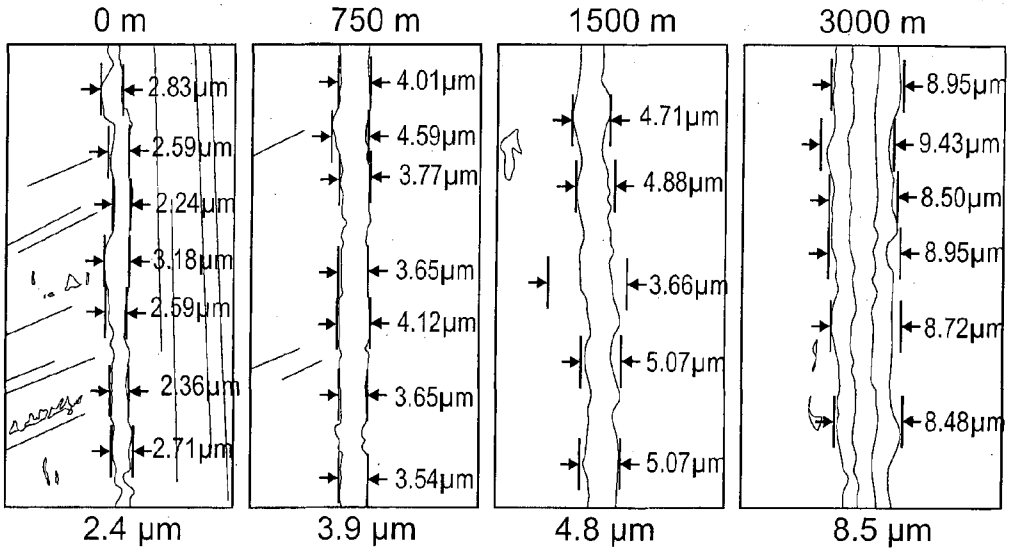

0 m
750 m
1500 m
3000 m
2.83µm
2.59µm
2.24µm
3.18µm
2.59µm
2.36µm
2.71µm
4.01µm
4.59µm
3.77µm
3.65µm
4.12µm
3.65µm
3.54µm
4.71µm
4.88µm
3.66µm
5.07µm
5.07µm
8.95µm
9.43µm
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8.95µm
8.72µm
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3.9 µm
4.8 µm
8.5 µm

Fig. 3

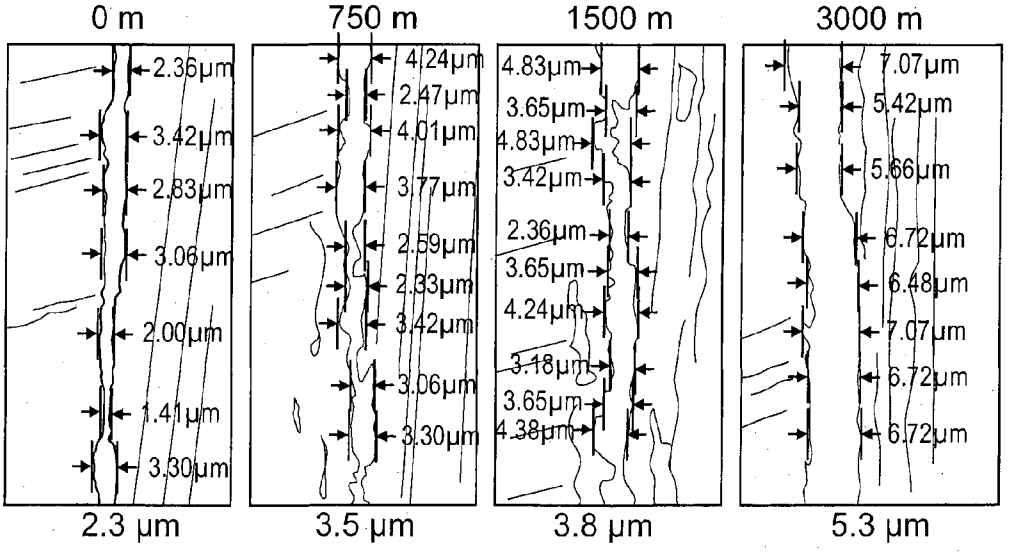

0 m
750 m
1500 m
3000 m
2.36µm
3.42µm
2.83µm
3.06µm
2.00µm
1.41µm
3.30µm
4.24µm
2.47µm
4.01µm
3.77µm
2.59µm
2.33µm
3.42µm
3.06µm
3.30µm
4.83µm
3.65µm
4.83µm
3.42µm
2.36µm
3.65µm
4.24µm
3.18µm
3.65µm
4.38µm
7.07µm
5.42µm
5.66µm
6.72µm
6.48µm
7.07µm
6.72µm
6.72µm
2.3 µm
3.5 µm
3.8 µm
5.3 µm

Fig. 4

COATED WOODWORKING TOOL

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a national phase entry under 35 U.S.C. §371 of PCT/CH2012/000120 filed May 25, 2012, which claims priority to Swiss Patent Application No. 911/11 filed May 27, 2011, the entirety of each of which is incorporated by this reference.

[0002] The present invention relates to a coated woodworking tool as per claim **1** and a method for producing such coated woodworking tool as per claim **12**.

PRIOR ART

[0003] Cutting tools are characterised by one or a plurality of wedge-shaped cutting edges arranged on a shaft or blade which are used to shape a workpiece by cutting. Depending on the nature of the cutting process, a distinction is made between machining tools for manufacturing processes involving machining and cutting tools for manufacturing processes involving cutting (see www.wikipedia.de, keyword, cutting tool).

[0004] Depending on the type of material to be machined, the cutting tools used need to meet different requirements. When cutting a metallic workpiece, such as a high speed steel (HSS), temperatures reach between 800° C. and 1200° C. on the cutting wedge. This leads to chemical reactions on the surface, such as oxidation and diffusion processes. The cutting tool is also exposed to high mechanical and thermal alternating voltage. This results in wear on the cutting surfaces, comb cracks, cutting edge chipping, plastic deformation, erosion of the cutting tip (crater wear) etc.

[0005] Due to the low density of wood (<1 g/cm^3) compared with metal, fundamentally different demands are made on cutting tools used for woodworking. Wood is an anistropic material with a fibrous structure, typically has a residual moisture content of usually >10% and contains resins and tanning agents. Accordingly, cutting wear and tear is also different compared with metal working tools. In contrast with metal working tools, wear in woodworking tools is caused primarily by wear, however corrosion and gumming of the blades also play a major role. It is therefore obvious to a person skilled in the art that, due to the different requirements in respect of woodworking and metal working tools, knowledge from the manufacture of metal working tools is not easily transferred to woodworking tools.

[0006] Unlike cutting metal, when the metal is virtually 'broken away' (i.e. flows), wood fibres need to be cut cleanly when working with wood. Correspondingly, the cutting edges of woodworking tools have smaller cutting edge radii compared with metal working tools. Cutting edge radius in the context of the present application means the radius r of the actual cutting edge (FIG. **1**). In new, sharpened woodworking tools, said radius is generally between 1 and 4 micrometres. As soon as the blade is slightly worn (radius>10 μm), it begins to press down and compresses the wood fibres. The machined wood surface looks good at first, but when it is painted, the compressed fibres spring back up which produces an unusable result on the surface. In addition, working with a blade that is no longer 'sharp' creates much more dust with a particle size<100 μm, since the fibres are broken apart, not cut.

[0007] Compared with woodworking tools, the cutting edge radius in metal working tools is generally much larger than 10 micrometres. A further difference between metal and woodworking tools generally lies in the wedge angle. This is usually between 40 and 60 degrees in woodworking tools, but may be between approx. 45 and 55 degrees in tools used to machine inter alia solid wood, and in metal working tools generally >70 degrees. In special applications where extremely sharp blades are required, blades with very small wedge angles of less than 40 degrees, for example between 16 and 20 degrees, are used for woodworking. The different wedge angles of woodworking and metal working tools are determined by the various forces acting on the cutting tools during operation.

[0008] In order to increase their service life, cutting tools have long been coated with hard-material layers. Hard-material layers serve to reduce wear and are used particularly in metal cutting tools, and less so in wood cutting tools. Known hard-material layers for metal working tools consist of TiC, TiN, TiCN, TiAlN, WC, Al_2O_3, BC, SiC, VC, CrN or other ceramic compounds. The use of polycrystalline tools (PCD tools) and diamond coated tools is also known. The hard-material layers can be applied in a known manner by means of PVD (physical vapour deposition), CVD (chemical vapour deposition) and other methods known to a person skilled in the art.

[0009] U.S. Pat. No. 7,144,208 describes a metal working tool in the form of a low torque tap made from molybdenum-enriched high-speed steel which is coated with a wear-resistant, friction-reducing layer comprising metal nitrides, carbides or carbonitrides, borides or oxides. A distinction is made here between a first outer coating region, which is in contact with the tool during the cutting process, and a second inner coating region, which has a hard, temperature-resistant coating. The outer coating region may comprise a single layer with good tribological properties, such as molybdenum disulphide. As an alternative, the outer coating comprises molybdenum disulphide and a metallic additive. Typical metallic additives include Mo, Cr, Nb and/or Ti. A further alternative is suggested wherein alternating layers of molybdenum disulphide and the metallic additive are applied, each at thickness of between 0.1 and 500 nanometres. The total thickness of the coating should range between 0.1 and 10 micrometres. The second inner coating may, for example, have alternating layers of titanium nitride and silicon nitride with a total thickness between 0.5 and 20 μm. In addition, a metallic adherence coating consisting of or containing Al, Si, Ti, Cr, W or Zr can be applied directly to the substrate. The adherence coating may also have layers made up of a nitride of the above metals and a thickness between 1 and 3,000 nanometers.

[0010] U.S. Pat. No. 7,147,939 also discloses a metal working tool, namely a coated carbide tap, the substrate of which is coated with a wear-resistant layer consisting of metal nitrides, carbides, carbonitrides, borides and/or oxides. Said layer can be coated with a top outer friction-reducing layer comprised of MoS_2 or MoS_2 and transition metals. Both the wear-resistant substrate and the friction-reducing covering layer can be deposited in the form of multiple alternating layers. Moreover, the substrate of the tool can be provided with a metallic adherence coating. A metallic inner layer can also be provided between the wear-resistant layer and the friction-reducing layer.

[0011] As FIGS. **2** to **8** in U.S. Pat. No. 7,147,939 in particular clearly show, the radius of the cutting edge is increased significantly as a result of the coating. In the exemplary

embodiments shown, the cutting edge radius (as can be seen from the figures) is more than doubled as a result of the coating. If this were transferred to a woodworking tool, cutting edge radii would be produced that are not compatible with the definition of a sharp blade.

[0012] Molybdenum (MoS_2) is a compound with a layer-like structure similar to graphite. Although it has an extremely high melting point of over 2,000° C., it oxidises in air from 315° C. (sublimation temperature is 450° C.). Use up to 1100° C. is possible if no oxygen is present. Since woodworking tools are not cooled during the cutting process and therefore can become extremely hot, molybdenum disulphide has not been considered previously as a sliding layer for woodworking tools. MoS_2 is also known as a soft compound which deteriorates rapidly in a damp environment.

[0013] According to EP-A-2 279 837, corrosion resistance is one of the main problems in coated woodworking tools along with wear resistance. A higher residual moisture content of wood accelerates the dissolution of chromium from a hard fundamental CrN layer. In order to solve this problem, EP-A-2 279 837 suggests directly or indirectly coating the fundamental layer containing chromium with a layer containing chromium oxide. According to one embodiment, layers containing chromium, chromium nitride and chromium oxide respectively are applied alternately at least to the rake face of the cutting tool and consequently the coating remains intact also after the cutting tool has been sharpened, which is generally performed on the flank face.

[0014] DE-A-195 11 829 discloses a cutting tool, such as a drill, a milling tool, tap drill etc., which is particularly suitable for dry machining or working of light metals, such as aluminium/magnesium alloys, using a reduced quantity of coolant. Here, the cutting part is coated with a hard material layer with a thickness of between 1 and 10 μm and Vickers hardness between 2,000 and 10,000. A sliding layer with a thickness of between 0.01 and 5 μm and Mohs hardness between 1 and 2 is deposited on the hard material layer. The wear-resistant layer here may consist of TiN, TiAlN, TiCN, diamond, and the sliding layer of sulphides, selenides, tellurides or transition metals Nb, Ta, Mo and W. It is important that the sliding layer terminates at a distance in front of the main blades and consequently this is formed by the hard, wear-resistant substrate.

[0015] EP-A-1 209 254 relates to a cutting tool for machining which is coated with a layer of the compound MeS_xN_y where Me=Ti, Zr or Hf and $0.1 \leq y \leq 0.9$ and $0.1 \leq x \leq 2.2$. The layer is between 1 and 5 μm thick. The use of a solid lubricant layer consisting of MoS2 is advised against since it lacks the required hardness and adequate adhesive force.

[0016] EP-A-1 170 398 relates to a cutter insert for cutting stainless steel wherein the cutter insert is coated with a solid lubricant layer consisting of MeS_x where $0.8 \leq x \leq 2.2$ and Me=Ti, Zr or Hf. The solid lubricant layer is between 0.5 and 1 μm thick.

[0017] German Patent No. 2 02 898 discloses a hard-material and solid lubricant layer system which is deposited by means of sputtering onto cutting, stamping, drawing and machining tools. Here, a layer with a hexagonal lattice structure, in particular MoS_2, is overlaid onto the first hard-material layer. The overall layer thickness of the hard material and solid lubricant layer system is between 0.1 and 1 μm.

[0018] EP-A-0 534 905 discloses tools for machining materials coated with a solid lubricant layer, such as MoS2. The coating is applied at temperatures of below 550° C. by means of cathode sputtering. It is important that as per the teaching of EP-A- 0 534 905, no hard material layer is used, but rather that the MoS_2 layer is deposited directly onto the workpiece. The tools are used for machining light metals.

[0019] DE-A-198 25 572 discloses a tool made of a hard metal, cermet, ceramic or steel base body and at least one layer deposited thereon, wherein the outer layer substantially consists of MoS_2. In order to improve adhesion and oxidation resistance, said layer contains between 0.5 and 6 atom %.

[0020] DE-A-196 22 823 relates to a composite material consisting of a substrate body and a hard-material layer deposited thereon, wherein the outer layer contains a dispersive second phase comprising at least one sulphide and/or selenide of a metal in group IVa, Va and/or VIa of the periodic table. TiS_x may be used as the second phase wherein x can be between 1 and 2.

[0021] The above-mentioned citations all relate to metal working tools which are generally cooled during operation using a coolant. This is not possible, however, when working with wood.

[0022] Finally, U.S. Pat. No. 6,716,483 discloses a wood cutting tool having a relatively hard first layer and a friction-reducing second layer, which is applied to the first layer. As per the teaching in U.S. Pat. No. 6,716,483, the tool must be cooled for a certain period to an extremely low temperature in order to modify the microstructure of the cutting tool and the coating. Compounds of sulphides, tellurides or selenides with metals in group IVa, Va or VIa of the periodic table are suggested as friction-reducing coatings.

[0023] Problem

[0024] A problem to be solved by the invention is to provide a coated woodworking tool with a service life that is as long as possible. A further aim is to provide a woodworking tool with improved 'cutting ability' which produces less dust during cutting operations than in the case of conventional tools. More particularly, the aim is to reduce the percentage of dust with a particle size of <100 μm. A further aim is to provide a tool which produces good surface quality of machined wood workpieces. Another aim is to propose a woodworking tool which can be produced at low cost in few process steps.

SUMMARY OF THE INVENTION

[0025] This and other aims are achieved through the features of the independent claims. Developments and/or advantageous embodiments of the invention are the subject of the dependent claims.

[0026] The invention relates to a coated woodworking tool, in particular a cutting tool, comprising a tool body having a cutting part. A cutting edge with a cutting edge radius of <10 μm or <5 μm, as is typical for woodworking tools, is formed on the cutting part. Such woodworking tools are characterised further in that the wedge angle of the cutting part is less than 65 degrees. At least the rake face of the cutting part or ideally the whole blade, including the cutting edge, is coated with a hard-material layer, wherein the hard-material layer can also be multi-layered and have different compositions. Woodworking tools in the context of the present invention include, for example, knives, blades, cutting edges, drills, milling tools etc.

[0027] As per the invention, a sliding layer containing sulphides, tellurides or selenides, in particular sulphides, tellurides or selenides having transition metals such as Mo, Nb or Ta, is deposited onto the hard material layer, which sliding layer is known for its advantageous tribological properties.

Surprisingly it was found that a sliding layer as per the invention or solid lubricant layer respectively, for example, a molybdenum disulphide coating, leads to a significantly longer service life of the woodworking tool coated with said layer in spite of oxygen sensitivity and lower sublimation temperature. A possible reason for this surprising result is that the woodworking tool is heated far less than usual due to the friction-reducing coating. The chemical affinity between wood and the sulphur compounds used in the sliding layer could also play a role. The inventors also found to their surprise that the surface quality of wood workpieces, in particular solid wood workpieces, which had been cut using a cutting tool having a coating as per the invention, was considerably better than that of wood workpieces, which had been machined using conventional, uncoated cutting tools or tools with only a hard-material coating. The cutting tools used had the same cutting edge radii in both cases in terms of measurement accuracy, and consequently it could actually be expected that the result would be the same. Surprisingly it was not possible to achieve the same surface quality with woodworking tools, the blades of which were coated with a hard-material layer, as with cutting tools with a sliding layer as per the invention. The measurement of surface quality was performed subjectively by sweeping the palm of the hand over the machined wood. Comparative tests with various people showed that this way of measuring surface quality provided practical results. The cutting tools as per the invention are not only suitable for machining solid wood, but also glued wood such as chipboard or finger jointed, glued wood, which is particularly abrasive due to the adhesives it contains. The inventors also found to their surprise that when cutting wood using a woodworking tool as per the invention, approximately 25% fewer fine dust particles (particle size of <100 □m) were produced over the life of the tool.

[0028] Advantageously, the sliding layer contains MoS_2, NbS_2, TaS_2, $W5_2$, $MoSe_2$, $NbSe_2$, $TaSe_2$, WSe_2, $MoTe_2$, $NbTe_2$, WTe_2 or mixed compounds thereof as well as nanostructured layers consisting of the last cited compound as a substantial element. 'Substantial element' in the context of the present invention means a percentage in terms of weight of over 50%, of more than 70% or of more than 90% of the compound or mixed compound in question. The remaining percentage in terms of weight can, for example, be a metal from the sub-group IVb, Vb or VIb of the periodic table, in particular Ti, Zr, Hf, W, V, Ta, Cr, Mo or Nb. Such a percentage of one or more of the above-mentioned metals may be added to the sliding layer containing sulphides, tellurides or selenides such that the metals dissolve in the sliding layer.

[0029] Appropriately, the thickness of the sliding layer has a lower limit of 0.2 μm, 0.5 μm, or 0.8 μm. A layer thickness of 3 μm, 2μm, or 1.5 μm, is favoured as an upper limit. The sliding layer may, however, also be over 3 μm thick in the case of particular applications, although previous experience indicates that layer thickness of more than 3 μm do not lead to a substantial extension of service life.

[0030] Although it has been previously assumed that the cutting edge radius would increase by the thickness of the coating if a coating were applied, measurements showed that the cutting edge radius only increased slightly as a result of coating with a hard-material layer and a sliding layer as per the invention, although the cutting edge (in contrast to the teaching of DE-A-195 11 829) was also coated. It was possible to limit the cutting edge radius to less than 50%, less than 40% or less than 30% of the layer thicknesses applied to the rake face and/or flank face of the cutting tool. This has the advantage that a subsequent coating of the coated woodworking tool can be dispensed with.

[0031] Advantageously, the thickness of the hard-material layer of the coated woodworking tool on the rake face has a lower limit of 0.5 μm, 1 μm 1.5 μm, and an upper limit of 7 μm, 5 μm, or 3.5 μm. Tests have shown that a resharpening of the cutting edge can be avoided with such layer thicknesses and a long service life achieved. The hard-material layer consists preferably of compounds of metals in groups IVa, Va, VIa of the periodic table having the elements boron, carbon, nitrogen or oxygen. They may contain TiC, TiN, TiCN, TiAlN, WC, Al_2O_3, BC, SiC, VC, CrN, CrBN, CrCN, CrAlN, CrSiN, CrTiN, AlTiN, AlTiCrN, BN, ZrN, ZrCN, AlCrN, Ti2N, SixNy, or mixed compounds of two or a plurality of the above-mentioned materials as a substantial element or consist entirely of said materials.

[0032] The hard-material layer preferably has a Vickers hardness (VH) between 1,000 and 5,000 or between 2,000 and 4,000 HV. The hard-material layer can also be configured as a gradient layer in which the relative percentage of one or a plurality of metal, in particular chromium, decreases from the inside outwards.

[0033] The base material of the woodworking tool can be HSS, hard metal, cermet or ceramic. Advantageously, the base body of the tool is a hard alloy containing percentages of chromium, wolfram, nickel, molybdenum, cobalt, iron and/or carbon. A metallic adherence layer, which may contain transition metals, can first be applied to the base material of the tool body. The hard-material layer can be a mono-layer or multi-layered, wherein metal intermediate layers, in particular containing transition metals, can also be present between the individual hard-material layers.

[0034] The invention also relates to a method for producing a woodworking tool as per the invention, wherein the woodworking tool is coated using a PVD method, in particular an arc evaporation method.

[0035] Here, in principle every suitable method known per se of the kind referred to above for producing a woodworking tool as per the invention is a possibility, wherein one method may include coating using just one evaporation cathode.

[0036] In one exemplary embodiment of a method as per the invention, which is particularly important in practice, a woodworking tool is coated in accordance with the following special method:

[0037] Provide a vacuum coating chamber with an arc evaporation source and place a cutting tool on a moveable substrate holder of the coating chamber. Then create a high vacuum in the coating chamber and increase the temperature to between 100 and 600° C., or between 400 and 600° C., for an hour by means of a radiant heater. The surface of the cutting tool to be coated is subjected here to ion cleaning by means of Ar ions for between approx. 5 and 60 minutes, or between 15 and 35 minutes. A hard-material layer, such as a layer containing Cr, which may be between 0.5 and 3 μ thick, is then deposited onto the cleaned surface by means of arc evaporation using a bias voltage of between 10 and 1,000 V. A metallic adherence layer composed of Mo, Cr, Ti, Zr, Si, Al, W, Nb, Ta, B or mixtures and compounds of the same may also be applied to the surface of the cutting tool beforehand to improve adhesive strength. Nitrogen gas is admitted to the coating chamber to deposit a CrN layer. The bias voltage is set here at between 20 and 200 V. It is possible to apply a CrN partial gradient layer where, during deposition of the CrN

partial gradient layer, the nitrogen partial pressure is increased linearly from 0.2 Pa up to 20 Pa until a thickness of the Cr partial gradient layer of between 1 and 3 mm is achieved. A further coating of molybdenum disulphide with a thickness of between 0.5 and 3 micrometres may then be applied by means of a generally known magnetron sputtering method.

[0038] Molybdenum disulphide can be formed here by the evaporation of molybdenum and simultaneous admission of a gas containing sulphur. Alternatively, an MoS_2 target can be used and MoS_2 sputtered on said target. The latter method may be preferred since the sliding layers produced using said method result in a long service life of the coated tool.

BRIEF DESCRIPTION OF THE DRAWINGS

[0039] Exemplary embodiments of the invention are described below using the figures.

[0040] FIG. **1** shows a diagram of the forms of wear in woodworking;

[0041] FIG. **2** shows a comparison of an uncoated (left) and a coated cutting edge in the prior art (right-hand figure);

[0042] FIG. **3** Edge radius without coating in linear metres;

[0043] FIG. **4** Edge radius with coating in linear metres.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

[0044] FIG. **1** shows forms of wear in woodworking as described in the dissertation by K. Reh, TU Dresden (2001). The arrow r identifies the cutting edge radius. The following wear parameters can also be defined on the flank face of the cutting tool:

[0045] a_m micro-clearance angle

[0046] h1 wear measurement

[0047] B width of wear mark

[0048] The left-hand diagram in FIG. **2** shows the cutting wedge **13** of an uncoated woodworking tool **11**. Here, the rake face has the reference number **15** and the flank face the reference number **17**. The rake face **15** and the flank face **17** are separated by the cutting edge **19**. The right-hand diagram shows the same cutting wedge **13** with a coating **21**. As can be seen from FIG. **2** (see also FIG. **4** in U.S. Pat. No. 7,147,939), it is generally assumed that the cutting edge radius increases significantly if the cutting edge is coated. In the present case, the coatings would produce more than a doubling of the cutting edge radius.

Exemplary Embodiment 1

[0049] A woodworking tool A having a defined edge radius is coated by means of a generally known PVD arc method in a coating system as per EP 1 524 329 A1 or WO 0250865 with a base layer containing chromium, for example, CrN. The thickness of the CrN layer is between approx. 1 and 3 micrometres.

[0050] Molybdenum disulphide with a thickness of approx. 1 micrometre is then applied to the tool A in a further coating system by means of a generally known magnetron sputtering method.

[0051] The measured edge radius was between 2 and 4 micrometres. Resharpening is therefore not necessary.

[0052] The edge radius was checked before and after coating on a scanning electron microscope (FIGS. **3** and **4**).

[0053] The tool was then used on a Conturex wood milling machine from Michael Weinig AG. The milling parameters were as follows:

[0054] Speed: 12,000 U/min

[0055] Feed rate: 12,000 mm/min

[0056] The cutting edge radius was measured by means of a scanning electron microscope after 750, 1,500 and 3,000 linear metres. The residual moisture in the wood was between 10% and 14% during the tests. The increase in edge radius can be slowed significantly by the coating. The increased wear resistance also means an increase in service life, i.e. of linear meters to be achieved.

[0057] Table 1 shows the results.

TABLE 1

Edge radius (in µm) in linear metres

	Linear meters			
	0 m	750 m	1,500 m	3,000 m
Radius blank [µm]	2.4	3.9	4.8	8.5
Radius coated [µm]	2.3	3.5	3.8	5.3

[0058] The invention relates to a coated woodworking tool, in particular a cutting tool, comprising a tool body having a cutting part, on which cutting part a cutting edge is formed. At least the rake face or the rake and flank faces, and the cutting edge of the cutting part are coated with one hard-material layer and one sliding layer arranged above the one hard-material layer. The sliding layer may be made substantially of sulphides, tellurides, or selenides having a transition metal, in particular having Mo, Nb, Ta, W, Nb, Ta. The sliding layer may consist substantially of MoS_2, which may have a hexagonal lattice structure and with substantially stoichiometric composition, wherein deviations of ±20%, less than ±10% or less than ±5% are possible. In practice, deviation from the stoichiometric composition may be <1% or <0.3%. Such a layer is obtained by sputtering a MoS_2 target in a known magnetron sputtering method.

[0059] The invention relates to a coated woodworking tool **11**, in particular a cutting tool comprising a tool body having a cutting part **13**, on which cutting part **13** a cutting edge **19** is formed. At least the rake face **15** or the rake and flank faces **15**, **17**, and the cutting edge **19** of the cutting part are coated with at least one hard-material layer and one sliding layer arranged above the at least one hard-material layer. The sliding layer may be made substantially of sulphides, tellurides or selenides having a transition metal of subgroup Va and VIa of the periodic table, in particular having Mo, Nb, Ta, W, Nb, Ta.

1-16. (canceled)

17. A coated woodworking tool, comprising:

a tool body comprising a cutting part having a cutting edge, a rake face and a wedge angle less than about 65 degrees, at least the rake face of the cutting part coated with a hard-material layer; and

a sliding layer containing at least one of sulphides, tellurides and selenides applied to the hard-material layer.

18. The woodworking tool of claim **17**, wherein the sliding layer contains ate least one of MoS_2, NbS_2, TaS_2, WS_2, $MoSe_2$, $NbSe_2$, $TaSe_2$, WSe_2, $MoTe_2$, $NbTe_2$, WTe_2 as a substantial element.

19. The woodworking tool of claim **17**, wherein the thickness of the sliding layer has a lower limit of one or about 0.2 μm, 0.5 μm and 0.8 μm, and an upper limit of one of about 3 μm, 2 μm and 1.5 μm.

20. The woodworking tool of claim **17**, wherein the cutting edge has a cutting edge radius of less than about 10 μm after coating.

21. The woodworking tool of claim **20**, wherein the cutting edge radius after application of the sliding layer is less than one of about 5 μm, 1.5 μm and 4 μm.

22. The woodworking tool of claim **21**, wherein the cutting edge radius after application of the sliding layer is between about 2 μm and 3.5 μm.

23. The woodworking tool of claim **1**, wherein the thickness of the hard-material layer has a lower limit of one of about 0.5 μm, 1 μm and 1.5 μm, and an upper limit of one of about 7 μm, 5 μm, and 3.5 μm.

24. The woodworking tool of claim **17**, wherein the hard-metal layer comprises at least one compound of TiC, TiN, TiCN, TiAlN, WC, Al_2O_3, BC, SiC, VC, CrN, CrBN, CrCN, CrAlN, CrSiN, CrTiN, AlTiN, AlTiCrN, BN, ZrN, ZrCN, AlCrN, Ti2N and SixNy and nanostructured layers consisting of the at least one compound of a plurality of the at least one compound and comprises a substantial component of the hard-metal layer.

25. The woodworking tool of claim **17**, wherein the hard-material layer contains at least one of chromium, titanium, aluminium, silicon and zirconium and has a thickness of on of between one of 0.4 and 5 μm, between 0.6 and 4 μm or between 0.8 and 3 μm, and wherein the sliding layer contains at least one of MoS_2, NbS_2, TaS_2, WS_2, $MoSe_2$, $NbSe_2$, $TaSe_2$, WSe_2, $MoTe_2$, $NbTe_2$ and WTe_2 and has a thickness of between one of about 0.1 and 3 μm, between about 0.2 and 2 μm, or between about 0.3 and 1.5 μm.

26. The woodworking tool of claim **17**, wherein the hard-material layer contains chromium in the form of at least one of Crn, CrBN, CrCN, CrAlN, CrSiN, CrTiN, AlTiCrN, ZrCN or AlCrN in combination with at least one other hard-material compound.

27. The woodworking tool of claim **17**, further comprising an MoS_2 layer with an hexagonal lattice structure is deposited onto the hard-material layer.

28. The woodworking tool of claim **17**, wherein the wedge angle of the cutting part is between about 40 and 60 degrees or between about 45 and 55 degrees.

29. The woodworking tool of claim **17**, further comprising a base body made of HSS, hard metal, cermet or ceramic.

30. The woodworking tool of claim **29**, wherein the base body comprises a hard alloy and contains a percentage of at least one of chromium, cobalt, iron, nickel, tungsten, molybdenum and carbon.

31. A method for producing a coated cutting tool for woodworking, comprising:

coating at least a rake face of a cutting tool with a hard-material layer;

depositing a sliding layer comprising at least one of sulphides, tellurides and selenides having at least one transition metal of subgroup Vb or VIb of the periodic table onto the hard-material layer.

32. The method of claim **31**, further comprising depositing a base layer containing a chromium compound and at least one other ceramic hard-material compound as a hard-material layer and depositing a MoS_2 sliding layer on the base layer by sputtering MoS_2 in a PVD method.

33. The method of claim **31**, wherein coating comprises coating a cutting edge of the cutting tool having a cutting edge radius of less than about 7 μm, less than about 4 μm or between about 2 μm and 7 μm.

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