(19) DANMARK

(10) DK/EP 3246121 T3

(12) Oversættelse af europæisk patentskrift

Patent- og Varemærkestyrelsen

(51) Int.Cl.: *B 23 D 47/02 (2006.01)*

(45) Oversættelsen bekendtgjort den: **2022-08-08**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2022-07-13**

(86) Europæisk ansøgning nr.: **17167914.5**

(86) Europæisk indleveringsdag: **2017-04-25**

(87) Den europæiske ansøgnings publiceringsdag: **2017-11-22**

(30) Prioritet: **2016-05-20 DE 102016109377**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(73) Patenthaver: **Festool GmbH, Wertstrasse 20, 73240 Wendlingen am Neckar, Tyskland**

(72) Opfinder: **Wolfgang, Spengler, Heckenäckerweg 7, 73272 Neidlingen, Tyskland**
WERBACH, Martin, Kauferstraße 8, 89264 Oberhausen, Tyskland

(74) Fuldmægtig i Danmark: **Zacco Denmark A/S, Arne Jacobsens Allé 15, 2300 København S, Danmark**

(54) Benævnelse: **Værktøjsmaskine med et anlægslegeme**

(56) Fremdragne publikationer:
JP-A- 2003 211 402
US-A- 5 297 463
US-A1- 2007 221 028

The invention relates to a machine tool, in particular a semi-stationary or mobile machine tool, for machining workpieces by means of a tool, according to the preamble of claim 1.

Such a machine tool in the form of a mitre saw is described in US 5,297,463A, for example.

Such a machine tool in the form of a compound mitre saw is described in, for example. In a compound mitre saw known from DE 10 2006 059 751 A1, locating bodies form stops against which the workpiece can be placed. The stops project far upwards in front of the locating surface, so that even large workpieces are optimally supported. The concept of providing the clamping device and its operating handle at the locating bodies has been found to be ergonomic. This, however, involves strict manufacturing requirements to ensure that the locating surface of a locating body is in alignment with a stationary locating surface which may be provided at the holder for the locating body, for example. Otherwise a step would develop there in practical applications, i.e. the workpiece cannot be in surface contact with the locating surface of the locating body and with the stationary locating surface at the same time.

The present invention is therefore based on the problem of providing an improved mounting concept for the at least one locating body.

To solve this problem, a machine tool according to claim 1 is provided.

In the machine tool referred to at the beginning, it is provided that the clamping force has a force component perpendicular to the locating surface or a force direction perpendicular to the locating surface and clamps regions of the clamping locating surface and of the clamping supporting surface which are not perpendicular to the locating surface and in particular parallel thereto against one another, so that the locating surface of the locating body adopts with respect to the non-perpendicular region of the clamping locating surface a predetermined longitudinal position with respect to that force component or force direction of the clamping force which is perpendicular to the locating surface and/or is in alignment with a stationary locating surface arranged to be stationary with respect to the support surface and located at the holder in particular.

It is thus a fundamental idea that the clamping locating surface and correspondingly the clamping supporting surface extend transversely to the support surface on which the

workpiece lies for machining by means of the tool, for example for producing a centre cut, for drilling or the like, and/or extend parallel to the locating surface, so that the position of the locating surface of the at least one locating body is defined relative to the clamping locating surface. The clamping locating surface is therefore not a surface extending parallel to the support surface, as in the compound mitre saw mentioned above, but extends at an angle thereto.

It proves to be advantageous that the clamping device including its control is located at the movable locating body, i.e. easily accessible in ergonomic terms. The at least one locating body is preferably removable from the holder, for example in the release position of the clamping device or in an enabling position of the clamping device, in which a hooking of the clamping body against the holder is cancelled. The clamping device expediently remains at the movable locating body even if the latter is removed from the machine tool. The movable components of the clamping device are preferably held captive at the locating body.

If a stationary locating surface is provided, for example at the holder or at another body of the machine base, the locating surface of the at least one locating body is in alignment therewith. It is therefore possible to provide an absolutely level or aligned position of locating surfaces that are movable or releasable, i.e. located at the locating body, and locating surfaces that are stationary, e.g. located at the machine base, in particular at the holder.

It is advantageously provided that the clamping supporting surface and/or the clamping locating surface and/or the at least one clamping locating region are/is parallel to the locating surface of the at least one locating body and/or to the stationary locating surface.

At this point, it should be mentioned, however, that an inclination of the clamping supporting surface, the clamping locating region or the clamping locating surface as a whole with respect to the locating surface of the locating body or the stationary locating surface or both is possible as well. A limit to this inclination is preferably a position parallel to the support surface, i.e. the clamping supporting surface, the clamping locating surface or the at least one clamping locating region is not parallel to the support surface. The inclination may however also be limited to an angle range of approximately 0-70°, in particular of 0° to 50° and particularly preferably a range of 0° to 45°. The inclination is in particular even less, for example in a range of 0-15° or 0-30°. In all of the above cases 0° corresponds to a position of the clamping supporting surface or the clamping locating surface which is parallel to the locating surface of the locating body. At minor inclinations of the clamping locating region or

the clamping locating surface or the clamping supporting surface relative to the locating surface of the at least one locating body, the position of the locating surface of the locating body relative to the support surface can be set in a particularly advantageous way with respect to a normal direction of the locating surface.

It is advantageously provided that at least one recess is provided at the clamping supporting surface and/or the clamping locating surface or the at least one clamping locating region. The at least one recess facilitates the collection of chips or other contaminants there, for example. The raised or projecting regions adjacent to the recess are preferably plane surfaces and represent the clamping locating surface, the clamping supporting surface or the clamping locating region.

It is preferred if the clamping supporting surface and/or the clamping locating surface and/or the at least one clamping locating region are/is designed as plane surfaces. In this context it is advantageous that these surfaces can have mutual surface contact. It is advantageous, however, if recesses or the like are provided in at least one pair of such mutually contacting surfaces. Dirt particles can collect there, for example, without affecting the clamping or the hold of the locating body at the holder.

It is furthermore expedient if the clamping supporting surface and/or the clamping locating surface and/or the at least one clamping locating region extend(s) parallel to the locating surface. The above surfaces therefore advantageously have an oblong shape.

It is expedient if the clamping supporting surface extends substantially along the entire length of the locating surface of the at least one locating body adjacent to the locating surface.

It is expediently provided that the clamping supporting surface and the locating surface of the at least one locating body form a step or are located at a step. It is possible that the clamping supportmg surface is offset towards the rear with respect to a normal direction of the locating surface relative to the locating surface of the locating body. The locating surface thus projects in front of the clamping supporting surface in the direction of the support surface.

It can advantageously be provided that the clamping supporting surface and the locating surface lie in one plane. The clamping supporting surface can thus merge into the clamping locating surface as it were, or vice versa.

It is expediently provided that the clamping supporting surface and the locating surface of the locating body are located on opposite sides of the locating body.

According to the invention it is provided that the perpendicular force component of the clamping force and the locating normal force pressing the workpiece against the locating surface of the locating body are aligned or point into the same direction. In this way the locating normal force advantageously acts for the purpose of increasing the clamping force and/or not for the purpose of reducing it.

It is preferred if the clamping supporting surface or the clamping body or both is/are provided at a clamping projection of the at least one locating body. In this a preferred configuration provides that the clamping supporting surface and the clamping body engage with a clamping receptacle of the holder while acting against each other. The clamping receptacle may for example be the guide receptacle to be explainer later or located thereat. It is advantageous, for example, if the clamping body is provided on a side of the clamping projection which is averted from the clamping supporting surface.

It is advantageous if the clamping body and the clamping supporting surface engage with a clamping receptacle of the holder in a splay foot-like manner.

It is advantageously provided that the at least one locating body with the holder is exclusively in contact with the clamping supporting surface and the clamping body when fixed to the holder by the clamping device. In this way a potential static redundancy can be avoided.

Although it would be conceivable in principle that the at least one stop body could be mounted at the holder in only a single longitudinal position transverse to the support surface, it would also be possible to provide several holders at which the stop body could optionally be mounted, for example two holders arranged transversely to the support surface adjacent to each other in front of said support surface.

It is preferably provided that the at least one locating body is longitudinally adjustable at a linear guide along a longitudinal axis transverse to the support surface.

A preferred arrangement provides that the holder has at least one guide receptacle or guide projection for the longitudinal guidance of the at least one locating body transverse to the support surface. On the guide projection of the guide receptacle the at least one locating body is mounted for longitudinal displacement transversely to the support surface. The guide

projection engages with a guide receptacle, or a guide projection of the locating body engages with the guide receptacle. The guide receptacle of the holder or of the locating body has a U-shaped, V-shaped or other trough-shaped cross-section, for example. A longitudinal axis along which the at least one locating body is guided at the guide receptacle or the guide projection advantageously extends parallel to a longitudinal axis along which the locating surface and/or the clamping supporting surface and/or the clamping locating surface extend(s).

Even if the locating body is adjusted along the guide, the position of the clamping action provided by the clamping body remains the same, i.e. the locating body is clamped in its middle section by the clamping device of the holder, for example. At this point it should be mentioned that only a single clamping device is advantageously provided at the locating body, which makes operation easier.

It is self-evident that the locating body can have two or more clamping devices and/or two or more clamping bodies. It is also possible that the control is designed to operate at least two clamping bodies, for example by means of a transmission mechanism or transmission element between the control and the clamping bodies.

It is expediently provided that hook contours engaging with one another at least in the clamping position, but preferably in the release position as well, are provided at the holder and at the at least one locating body and/or the clamping body, so that the at least one locating body cannot be removed from the holder parallel to a vertical axis or normal axis of the support surface and/or is held captive at the holder in a transverse direction, in particular a single transverse direction, transversely to the clamping locating surface. It is preferably provided that the at least one locating body is displaceably mounted at the holder even if the hook contours are in engagement, being in particular capable of linear displacement along a displacement axis or transversely to the support for the workpiece. The locating body cannot be removed from the holder transversely to the displacement axis, however. It can also be possible for a guide receptacle of the holder to be laterally open in a longitudinal end region, for example, so that the locating body can be removed laterally from the guide receptacle in the longitudinal end region regardless of the hooking. By virtue of that hooking, however, the locating body cannot be pulled out of the guide receptacle, for example upwards.

The clamping body can be operated between the clamping position and the release position by means of the control. In the release position the hook contours of the clamping body and

the holder can be out of engagement. It is also possible, however, that the hook contours remain in engagement in the release position, so that a captive hold of the locating body at the holder can be realised. In this constellation it is also possible that the clamping body can, by means of the control, be moved from the release position of the clamping device further into an enabling position, in which the hook contours of the clamping body and the holder are out of engagement. As is advantageously provided in the case of the embodiment shown in the drawing, the clamping body can be adjusted by means of the control between the clamping position, the release position and an enabling position, wherein the hook contours of the clamping body and the holder are in engagement in the clamping position and in the release position, but not in the enabling position.

It is possible that a stationary hook contour which can engage with a stationary hook contour of the holder is provided at the locating body. It is for example possible to move the locating body into engagement with the hook contour of the holder by a pivoting movement. Preferably, however, the hook contour on the side of the locating body is not, or not exclusively, provided at the locating body, but at the clamping body. In this way the hook contour is provided at a movable component which can be brought into or out of engagement with the hook contour of the holder by operating the control.

The hook contour of the holder is expediently provided directly adjacent to the clamping locating surface. The hook contour is for example formed at or by an edge or edge section of the holder which projects into a guide receptacle. It is in particular advantageous if the clamping locating surface is provided at a guide groove, in particular its side wall or side leg, and if a recess is provided at a side leg to form or represent the hook contour. The clamping locating surface or clamping locating region is preferably located in the recess.

An expedient concept provides that the clamping body has a first hook contour for hooking to the holder and a second hook contour for hooking to the at least one locating body, which are in engagement with hook contours of the locating body and the holder at least in the clamping position. The clamping body can hold the hook contours of the holder and the locating body together, for example in the manner of a clip. It is preferred if this engagement of the hook contours is ensured in the release position as well, for example in order to displace the locating body relative to the holder, wherein the locating body is nevertheless held captive at the holder. It is also possible that the hook contours of the clamping body and the locating body remain in engagement in the above-mentioned enabling position, in which the locating

body can be removed from the holder and/or the hook contours of the clamping body and the holder are out of engagement.

It is possible, for example, that the hook contours of the clamping body and the locating body provide a swivel bearing and/or are in mutual engagement in the manner of a swivel bearing.

A preferred concept provides that a clamping section of the clamping body is located adjacent to a supporting surface of the locating body, in particular in a recess of the supporting surface, wherein said clamping section projects farther in front of the supporting surface in the clamping position than in the release position. The supporting surface and the clamping supporting surface are preferably provided on opposite sides of the clamping body. The supporting surface expediently forms a guide surface for guiding the locating body at the holder, for example along a guide groove. By means of the supporting surfaces or the guide surface, the locating body can preferably be displaced at the holder in a longitudinal direction transversely to the support for the workpiece. The supporting surface can obviously, as mentioned in the context of the clamping supporting surface, expediently have at least one recess or indentation in which chips or other such waste can collect, for example. Within a pivoting movement the clamping section can be moved in front of the supporting surface or back behind the supporting surface, for example.

The control expediently comprises a rotary knob. The control may also comprise an operating lever or the like, however. The control can be provided integrally at the clamping body. It is preferred if the control and the clamping body are separate components.

The clamping device expediently comprises an actuator for moving the clamping body between the release position and the clamping position. This means that the actuator can move the clamping body from the release position into the clamping position or from the clamping position into the release position or both. The gear mechanism or actuator expediently acts for the purpose of force amplification from the control to the clamping body. The gear mechanism can also implement a movement diversion from the control to the clamping body. The actuator can for example comprise one or more of the types listed below: worm gear, cam gear, wedge mechanism, lever mechanism.

The control is expediently mounted rotatably at the locating body by means of an anti-friction bearing, in particular a ball bearing. This facilitates a particularly easy operation.

It is preferred if the clamping body is mounted at the at least one locating body for pivoting, shifting or both between the clamping position and the release position. The mounting can be realised by hooking the clamping body to the locating body, for example.

The clamping body is expediently loaded towards the clamping position or the release position by a spring assembly. A coil spring is provided, for example. A leaf spring loading the clamping body towards the release position is particularly preferred. The spring assembly can also comprise a spring, for example, which has leaf-like or flat spring legs, of which one leg is supported on the locating body and the other leg is supported on the clamping body.

The clamping body expediently extends substantially from a top side – averted from the holder – of the locating body to an underside – facing the holder – of the clamping body. In the region of the top side there is preferably provided a hooking of the clamping body and/or a swivel bearing between the clamping body and the locating body.

It is preferred if an actuator or an adjusting body such as a bolt or adjusting screw or bearing pin passes through the clamping body. It is advantageous if this is located in a central section of the clamping body. It is for example advantageous if an adjusting body such as a bolt passes through the clamping body while being operable by the operator or forming a part of the control. The control is expediently provided for the operation of the adjusting body.

The adjusting body and/or the control are/is expediently located adjacent to the clamping supporting surface and/or in the region of the locating surface.

The control is expediently located on a rear side – averted from the locating surface – or on a top side – averted from the holder – of the locating body. This makes it easily accessible.

The tool can be a cutting tool, a milling tool or a drilling tool, for example. The cutting tool is preferably a saw blade or comprises a saw blade. The cutting tool may also comprise or be a cutting disc, however.

It is preferred if the machine tool has two or more locating bodies according to the invention. It is for example advantageous if one holder each for at least one locating body according to the invention each is provided on opposite sides of the tool. It is thus advantageous if the locating bodies can be adjusted towards the cutting tool or away therefrom.

It is furthermore advantageous if at least one supporting part capable of longitudinal displacement is mounted at the machine base or at least one supporting element can be connected to

the machine base, the supporting part having a workpiece support surface in alignment with the workpiece support surface of the machine base, so that the workpiece can be placed on a larger surface. The workpiece support surface of the supporting part is expediently located below or adjacent to the locating surface of the locating body. If the locating body is capable of longitudinal displacement or if the locating body is repositioned, it can also be located above the workpiece support surface of the supporting part, so that the locating body can make its workpiece locating surface available in the region of the supporting element as well.

The machine tool is expediently a mobile machine tool, capable of stationary use, however. It is in particular advantageous if the machine tool is portable, i.e. having a weight of less than 60 – 80 kg, but can be placed on a ground for a sawing operation or another machining of the workpiece. The workpiece is expediently held stationary with respect to the machine tool while the cut or saw cut or another machining operation, such as a drilling or milling operation, is carried out.

A preferred embodiment of the invention provides that the machine tool is a bench saw, a compound mitre saw, a pit saw or a mitre / pit saw. It is in particular advantageous if the machine tool is a sawing machine for semi-stationary operation, being capable of being taken to building sites and being operated there, for example.

It is advantageously provided that the machine base has a swivel base on which a swivel part is mounted for pivoting about a pivot axis to change a relative position of the tool holder for the tool, for example a cutting tool, and about a locating surface provided for locating a workpiece. The workpiece can be placed on the locating surface laterally or by its underside, for example.

It is in particular advantageous if the swivel part and/or the swivel base provide(s) a support or locating surface for the workpiece. The swivel part or the swivel base or both can also provide a carrying base for the drive assembly. The drive assembly is located or held at a support which projects upwards in front of the support or locating surface during the use of the machine tool.

The drive motor expediently is an electric drive motor.

The drive motor is advantageously provided for a rotary drive of the tool holder and thus of the cutting tool. It is also possible that a gearbox is provided between the drive motor and the

tool holder, for example for a speed change, and/or in the form of an angular gearbox and/or for generating an oscillating movement of the cutting tool.

The tool holder, in particular the drive assembly as a whole, is advantageously pivotable about a mitre pivot axis towards a support surface for the workpiece and away from the support surface by means of a mitre swivel bearing. During the use of the machine tool the mitre pivot axis preferably extends horizontally. In this case the machine tool may be a compound mitre saw, for example.

An advantageous concept, in particular if the machine tool is designed as a pit saw or or a mitre / pit saw, provides that the drive assembly is mounted in a linear fashion along a longitudinal axis with respect to the swivel base at a linear guide for making longitudinal cuts with the cutting tool. The linear guide for example comprises at least one elongated guide body, in particular a guide bar or guide rod, which extends along the longitudinal axis. The at least one elongated guide body, in particular the guide bar or guide rod, can be movable relative to the machine base of the machine tool. In this case there is then for example provided a bearing seat for the at least one elongated guide body at a tower-type support. It is also possible that the elongated guide body is located on the machine base in a stationary manner. It is in particular preferred if the drive assembly is mounted for linear movement relative to the machine base in the manner of a slide, in particular at a support which projects upwards in front of the machine base. The mitre swivel bearing is expediently provided at the slide.

It is preferred if the drive assembly is mounted for pivoting with respect to the machine base about an inclined pivot axis by means of an angular swivel bearing with respect to the machine base. In this way mitre cuts or bevel cuts can be made in the workpiece, for example.

A combination of the above measures provides that the drive assembly is capable of linear movement on the one hand and mounted for oblique pivoting with respect to the machine base on the other hand. It is advantageous that a support for the drive assembly is pivotable about an inclined pivot axis with respect to the machine base by means of the tilting bearing and that a linear guide for the drive assembly is provided at the support. The at least one elongated or rod-like guide body projects in front of the support, for example, extending in particular above a support surface for the workpiece.

An embodiment of the invention is explained below with reference to the drawing, of which:

Figure 1 is a perspective oblique view of a machine tool in the form of a pit / mitre saw,

Figure 2 shows the machine tool according to Figure 1 with supporting parts moved away from the machine base,

Figure 3 shows the machine tool according to Figure 2 at an angle from below,

Figure 4 is a perspective view of the machine tool at an angle from the rear and above, with a stop body moved closer to the tool of the machine tool,

Figure 5 shows a detail D1 of the machine tool according to Figure 4, with the stop body moved farther away from the tool, however,

Figure 6 is a side view of the machine tool according to the preceding figures,

Figure 7 is a section through the machine tool according to Figure 6 along a line A-A in Figure 6,

Figure 8 shows a detail D2 from Figure 7 to illustrate a clamping device, and

Figure 9 shows a variant of the machine tool according to the preceding figures with an alternative clamping device in an illustration corresponding approximately to the detail D2 from Figure 7.

A machine tool 10 is designed as a compound mitre saw, for example. A drive assembly 11 of the machine tool 10 comprises a drive motor 12 driving, either directly or via a gearbox not shown in the drawing, a tool holder 13, to which a cutting tool 14, e.g. a saw blade, can be releasably attached. The drive motor 12 is an electric motor, in particular a brushless drive motor.

The drive assembly 11 is located above a support surface 15 for placing a workpiece W. The workpiece W can be placed on the support surface 15 and against a locating surface 16 in order to make a centre cut using the cutting tool 14.

The support surface 15 is provided at a swivel part 17, which is pivotable about the pivot axis S relative to a swivel base 18. The swivel base 18 forms a machine base 20.

An angular position of the tool holder 13 and thus of the cutting tool 14 relative to the locating surface 16 is adjustable by pivoting the drive assembly 11 about a pivot axis S, so that centre cuts can be made in the workpiece W at different angles, in particular mitre angles.

The drive assembly 11 is held at a support 21, which projects upwards in front of the swivel part 17 in the position of use.

The support 21 is joined to the swivel part 17. A variant can provide that the support 21 is permanently joined to the swivel part 17, so that the cutting tool 14 is oriented at a fixed angle, in particular perpendicular, to the locating surface 16 and the support surface 15. A preferred embodiment, however, provides that the support 21 is mounted pivotably about an inclined pivot axis S2 at the swivel part 17 by means of an inclined swivel bearing 22, so that bevel cuts can be made in the workpiece W as well.

The inclined swivel bearing 22 for example has a bearing part 23 located at the swivel part 21, in particular at a swivel part body 19 of the swivel part 17, and a bearing part 24 at the support 21; these are rotatably joined to each other by a bearing axis element not shown in the drawing. The bearing parts 23, 24 can be fixed relative to each other, wherein only a handle 26 of a fixing device 25 is shown. By means of the handle 26 the support 21 can be non-rotatably fixed at the swivel part 17 with respect to the inclined pivot axis S2. For this purpose the bearing axis element not shown in the drawing is moved along its longitudinal axis by the handle 26, for example, in order to clamp, latch or otherwise fix the bearing parts 23, 24 to each other. At the inclined swivel bearing 22 an actuator (not shown) can be provided for adjusting an inclined position of the tool holder 13 relative to the support surface 15, e.g. an actuator as described in DE 10 2006 059 751 A1.

For supplying the drive motor 12 with energy, the machine tool 10 can have a connection of an energy storage device (not shown), for example a battery pack and/or – as shown in the drawing – a mains connection 27, for example a mains cable, for connection to an electric energy supply network, e.g. 110 V to 240 V AC.

The drive assembly 11 could be mounted at the support 21 in a non-displaceable manner. In the present case, however, a linear guide 30 having guide bodies 31, for example guide rods, at which a slide 32 is mounted for linear displacement along a longitudinal axis L, is provided for the drive assembly 11. The slide 32 has guide receptacles 33, for example, through which

the guide bodies 31 pass. The drive assembly 11 can thus be adjusted along the longitudinal axis L, so that the machine tool 10 realises the function of a pit saw. An adjusting movement along the longitudinal axis L is indicated by an arrow SL in the drawing.

To realise the compound mitre function, the tool holder 13, in particular the drive assembly 11 as a whole, is mounted at the slide 32 for pivoting about a mitre / pivot axis S3 by means of a mitre / swivel bearing 35. The cutting tool 14 can therefore be pivoted about the mitre / pivot axis S3 away from the support surface 15 and thus from the workpiece W or towards the support surface 15 and thus to the workpiece W, which is indicated by arrows K1, K2 in the drawing. For this purpose the operator expediently takes hold of the drive assembly 11 at a handle 28, where preferably a drive switch 29 for switching the drive motor 12 on and off is provided as well.

When being pivoted towards the support surface 15, the drive assembly dips through between the guide bodies 31, wherein the cutting tool 14 can dip into a slot 36 at the swivel part 17.

If the machine tool 10 is placed on a flat ground, the pivot axis S is vertical, while the pivot axes S2 and S3 extend horizontally. The pivot axes S, S2 and S3 are perpendicular to one another.

The drive motor 12 is preferably accommodated in a motor housing 37. For the cutting tool 14 the drive assembly 11 preferably has an upper cover 38 and an adjustable cover 39, so that of the cutting tool 14 only the section dipping into the slot 36 and the section facing the support 21 are exposed as a rule.

From the machine base 20 or the swivel base 18, foot parts 57, the feet 58 of which are provided for placing on a ground, project laterally. The foot parts 57 expediently have support surfaces 59 lying in one plane with the support surface 15 of the swivel part 17. The foot parts 57 are preferably permanently joined to the swivel base 18, in particular integrated therewith.

Locating bodies 44 providing the locating surface 16 are held at the foot parts 57. The two locating bodies 44 extend to the flat side of the cutting tool 14, thus also extending above the support surface 15 of the swivel part 17. The locating bodies 44 are plate-shaped or represented by plates, for example.

The support surface 15 can be made larger by supporting parts 40 located at the swivel base 18 or the machine base 20. The supporting parts 40 for example have supporting feet 41 for placing on a ground. The supporting parts 40 are mounted displaceably relative to the swivel base 18 by means of guide elements 41, in particular linearly along a linear axis VS. It is preferably provided that the supporting parts 40 cannot be removed from the swivel base 18 or the machine base 20, but a removal facility is also possible. The supporting parts 40 preferably have support surfaces 43 lying in one plane with the support surface 15 of the swivel part 17.

An operating arm 46 projects radially outwards from an e.g. flat cylindrical swivel part base body 45 of the swivel part 17. The operating arm 46 expediently has a support surface 47, which is joined to the support surface 15 provided at the swivel part base body 45 and lies in the same plane. The slot 36 extends from the support surface 15 into the support surface 47. The operating arm 46 is furthermore supported on a ground by a support 48. The support 48 is expediently adjustable and comprises a suitable adjusting screw 49.

An operator can grip the operating arm 46 in order to pivot the swivel part 17 and thus the drive assembly 11 with the tool holder 13 about the pivot axis S, which is indicated by arrows K2 and K3.

A scale 34 at the swivel base 18 facilitates the reading of a respective adjusting angle or pivoting angle of the swivel part 17 relative to the swivel base 18.

The swivel part 17 and thus the drive assembly 11 can be fixed in various rotary angle positions with respect to the pivot axis S relative to the swivel base 18, for which a clamping device 50 is provided, for example. The clamping device 50 comprises a clamping operating handle 51, for example a rotary knob. The clamping operating handle 51 for example projects in front of a free end region of an arm body 52 of the operating arm 46, so that an operator can easily grip the clamping operating handle 51 for pivoting the swivel part 17 with respect to the swivel base 18. The operator can furthermore put the palm of his hand around the clamping operating handle 51, for example, and thus operate it to rotate, in order to move the clamping device 50 between a clamping position clamping the swivel part 17 to the swivel base 18 and a release position in which the swivel part 17 can be pivoted about the pivot axis S with respect to the swivel base 18.

A rod-shaped clamping element 53 extending in the longitudinal direction of the operating arm 46 projects with a free end region towards a clamping contour 54 of the swivel base 18, for example. The clamping element 53 can for example be screwed into a thread that is stationary with respect to the operating arm 46, for example at a nut, and screwed out of the thread, wherein the clamping element 53 is moved along its longitudinal axis from a clamping position into a release position and vice versa. In the clamping position the free end of the clamping element 53 clamps or presses with its end face against the clamping contour 54, while being spaced from the clamping contour 54 in the release position. In the region of the clamping operating handle 51 the clamping element 53 is rotatably mounted in a bearing body 56. The bearing body 56 has a cylindrical shape, for example. The bearing body 56 has a bearing receptacle 57, through which the clamping element 53 passes.

With the clamping device 50 the rotary angle of the swivel part 17 relative to the swivel base 18 is virtually infinitely adjustable. For a fast operation, in which predetermined rotary angle positions of the cutting tool 14 / the tool holder 13 relative to the locating surface 16 have to be set, the latching device 60 explained below proves to be fast and effective.

The latching device 60 comprises a latching element 61, e.g. a latching projection, which can be moved out of engagement with mating latching contours 63 at the swivel base 18 by means of an operating element 62 and then adopts a release position, or is in engagement with one of the mating latching contours 63, so that the swivel part 17 is latched and non-rotatably fixed to the swivel base 18. The mating latching contours 63 extend in a curved fashion around the pivot axis S. The mating latching contours 63 are provided at an underside of the swivel base 18, i.e. at an underside of the machine base 20. The latching element 61 is loaded by a spring assembly 65 into a latching position, i.e. into engagement with one of the mating latching contours 63.

The operating element 62 is designed as an operating lever pivotably mounted at an operating element bearing 64. A handle section in an end region of the operating element 62 is located close to the clamping operating handle 51 and can therefore be gripped by the operator with one hand and pivoted towards the clamping operating handle 51, so that the operating element 62 moves the latching element 61 into a release position, i.e. out of engagement with one of the mating latching contours 63, with its end region remote from the handle section.

A configuration in which the locating bodies 44 are fixed to the machine base 20 would be conceivable in principle. It is preferred, however, if the locating bodies 44 are releasably

connectable to holders 200 provided on opposite sides of the drive assembly 11 and thus of the tool 14. In addition it is expedient that the locating bodies 44 are secured to the holders 200 at different distances from the cutting tool or tool 14, so that the locating surface 16 can be configured variably.

On one side of the drive assembly 11, for example, there is provided a stop body 44A, and on the other side a stop body 44B, which can be releasably mounted on holders 200A and 200B and are displaceable in particular. In the following text, however, the holders 200A and 200B are described as holder 200 and the stop bodies 44A and 44B are described as stop body 44 by way of simplification.

The holders 200 are held at mounting projections 202 projecting upwards in front of the foot parts 57. The holders 200 are for example joined to each other by a curved connecting element 216 extending around the support 15 of the swivel part 17. The holders 200 could also be individual components, however, which are not joined to each other. The mounting projections 202 engage with mounting receptacles 201 of the holders 20 and are permanently joined thereto, for example bolted, bonded or welded. A configuration in which a respective holder 200 forms an integral, in particular one-piece, part of the machine base 20 would easily be conceivable as well.

The mounting receptacles 201 are formed between supporting legs 204, 205 on the one hand and a supporting projection 203 of the holder 200 on the other hand, which engages with a gap between the mounting projections 202. A respective holder 200 is therefore positively joined to the machine base 20, in the present case to a respective foot part 57.

On a side facing the support surface 15, each of the holders 200 has a stationary locating surface 206, where the workpiece W can be stopped. The locating surfaces 16 extend the stationary locating surface 206 towards the top and to the side in the position of use of the machine tool 10. In any case the locating surfaces 16 are in alignment with the respective stationary locating surface 206, which is advantageously realised by the mounting concept of the locating bodies 44 at the holders 200 as explained below. The workpieces W can in any case lie flat against the stationary locating surface 206 and against the respective locating surface 16 as well.

The locating surfaces 16 are provided at locating sections 220 of the locating bodies 44. Adjacent to the locating sections 220 there are clamping sections 221 provided for joining to

the holders 200. The clamping sections 221 are provided at or have clamping projections 222, which engage with clamping receptacles 207 of the holders 200. The clamping supporting surface 223 then bears against clamping locating regions 217 of clamping locating surfaces 208 of the clamping receptacles 207.

The clamping receptacles 207 have a substantially U-shaped cross-section. Opposite the clamping locating surface 208 a clamping abutment surface 209 is provided. The clamping locating surface 208 and the clamping abutment surface 209 extend at an angle away from a base 201 of the clamping receptacle 207.

In the free end region or opposite the base 201 an insertion opening 218 is provided, into which the clamping projection 222 of the locating body 44 can be inserted.

The clamping supporting surface 223 then bears against the clamping locating surface 208, in particular against the clamping locating region 217. Opposite the clamping supporting surface 223 there is provided a supporting surface 224 at the clamping projection 222, which is supported on the clamping abutment surface 209.

Both the clamping receptacle 208 and the clamping projection 222 have an oblong shape and extend along a longitudinal axis AS. The longitudinal axis AS is parallel to the longitudinal axis VS. The clamping receptacle 208 and the clamping projection 222 therefore form a guide projection and a guide receptacle. The clamping projection 222 can be displaced in the clamping receptacle 207 along the longitudinal axis AS, so that the distance of the locating surface 16 of the locating body 44 from the tool holder 13 and thus from the tool 14 can be adjusted in this way. The locating surface 16 of a locating body 44 can furthermore be moved away from the tool holder 13 towards the supporting parts 40, so that at least one section of the locating surface 16 is available for the support and location of the workpiece W above the support surfaces 43 for the workpiece W as well.

In this context it should be noted that there is a relatively large play between the guide receptacles or clamping receptacles 207 and the guide projections or clamping projections 222, so that the locating bodies 44 are easily movable in the longitudinal guides or guide receptacles (the clamping receptacles 207). Even contamination by chips, sawdust or the like has hardly any disruptive effect, because the play is suitably large.

An advantageous measure furthermore provides that the clamping supporting surface 223 or the supporting surface 224 is provided with recesses 225, into which dirt, chips, sawdust or

the like can fall, so that the clamping supporting surfaces 223, 224 can as it were be kept free for a flat contact at the stationary surfaces, the clamping locating surface 208 and the clamping abutment surface 209. The recesses 225 can be cleaned easily, for example by removing the locating bodies 44 from the holders 200 and by brushing or knocking out.

The longitudinal displaceability of the locating bodies 44 is for example limited by a longitudinal stop 226 at the respective locating body 44, which hits the body of the holder 200 or another point of the machine base 20 when the locating body 44 is moved towards the tool holder 13.

It is furthermore expedient if the guide receptacle of the clamping receptacle 207 is provided with a longitudinal stop 214, which limits the movement of a locating body 44 away from the cutting tool 14. The longitudinal stop 214 is hit by a stop projection 252, for example, which projects laterally in front of the locating body 44.

The locating bodies 44 can be inserted into the clamping receptacle 207 or guide receptacles through lateral openings 215 or insertion openings or upper openings 218.

In principle it would be conceivable that the locating bodies 44 are supported on a top side 212 of the holders 200. In the present case, however, the free end face or surface between the clamping supporting surface 223 and the supporting surface 224 of the clamping projection 222 is provided for support on the base 210 of the holder 200. The base 210 furthermore has a recess 219, which improves the play of a respective locating body 44 in the guide receptacle or the clamping receptacle 207 along the longitudinal axis AS, because chips or other dirt can enter the recess 219 and/or the contact area between the locating body 44 and the base 210 or the holder 200 is reduced,

It may also be provided, however, that supporting surfaces 227 provided laterally adjacent to the clamping projection 222 are supported, in particular guided, on the top side surface 212.

If the locating body 44 is fixed or clamped to the holder 200 in a stationary manner, however, other contact surfaces of the holder 200 and the locating body 44, which extend at an angle to the support surface 15 or are not parallel thereto, are preferably in contact with one another in order to realise a flat or aligned position between the locating surface 16 and the stationary locating surface 206.

Clamping devices 230 are provided to locate a locating body 40 at the holder 200. Each of the clamping devices 230 comprises a clamping body 231, which can be adjusted by an actuating device 240 between a clamping position KS shown in continuous lines in Figure 8 and a release position LS shown in broken lines in Figure 8.

The clamping bodies 231 are accommodated in receptacles 239 of the locating bodies 44. The clamping bodies 231 are movable in the receptacles 239 between the clamping position KS and the release position LS.

In the clamping position KS a clamping section 232 of the clamping body 231 presses against the clamping abutment surface 209, which is illustrated by a force arrow P1 in Figure 8. This applies a clamping force P2 acting against the clamping locating region 217 to the clamping supporting surface 223. The clamping supporting surface 223 and the clamping locating region 227 extend perpendicularly to the support surface 15 and in the present case parallel to the locating surface 16. The clamping force P2 extends parallel the support surface 15 and perpendicularly to the locating surface 16. The clamping force P2 is therefore optimal.

The clamping locating surface 208, in particular the clamping locating region 217, is as it were stepped back behind the stationary locating surface 206 and parallel thereto, but the clamping supporting surface 223 and the locating surface 16 are averted from each other. On the one hand this design and arrangement of mutually supporting surfaces or locating surfaces for the workpiece facilitates a simple mechanical production, while on the other hand allowing a precise flatness. In Figure 8 it can be seen, for example, that the locating surface 16 of the locating body 44 mounted at the holder 200 is in exact alignment with the stationary locating surface 206 or lies in a common vertical plane V, so that the workpiece W can be plane parallel to both locating surfaces 16, 206, e.g. with a locating normal force AN.

The locating force AN expediently points in the same direction as the clamping force P2, thus acting for the purpose of reinforcement.

In the clamping position KS it is preferred if the locating body 44 is exclusively in surface contact with the clamping locating surface 208, in particular the clamping locating region 217, by way of the clamping supporting surface 223, and if in addition the clamping body 223 is supported on the clamping abutment surface 209 by way of the clamping section 232. Further surfaces of the holder 200 which might influence the aligned orientation of the

locating surface 16 and the stationary locating surface 206 are preferably not in mutual contact.

In the clamping position KS and preferably in the release position LS as well, a hook section 234 is furthermore in engagement with a hook receptacle 228 of the locating body 44. This as it were hooks the clamping body 231 to the locating body 44. The hook receptacle 228 is for example formed at a hook projection 229 projecting towards the clamp or the clamping body 231. The hook receptacle 228 and the hook section 234 in each case form hook contours.

The hook section 234 is for example provided at a projection 235, which, like a further projection 236, projects in front of an operating section 233 of the clamping body 231. The projection 236 has or represents the operating section 233. The projections 236, 235 form together with the operating section 233 a clamp-type contour of the clamping body 231, which could also be described as a clamp accordingly.

The projection 236 also forms a hook projection. The projection 236 engages with a hook receptacle 211 at the clamping locating surface 208. The base of the hook receptacle 211 provides the clamping locating region 217. The projection 236 and the hook receptacle 211 form further hook contours.

In the clamping position KS and in the release position LS, the clamping body 231 is therefore, in the manner of a clamp, in engagement with the hook receptacle 211 of the holder 200 and the hook receptacle 228 of the locating body 44, so that the two components are held together in the manner of a clamp. In the release position LS, however, the locating body 44 is displaceable in the clamping receptacle or the guide receptacle 204 along the longitudinal axis AS. The hook receptacle 211 is expediently designed in the manner of a longitudinal groove in which the clamping body 231 is displaceable along the longitudinal axis AS.

To remove it from the holder 200, the locating body 44 can be pulled out of the lateral opening 215, for example. The clamping body 231 can furthermore be moved beyond the release position LS farther away from the hook receptacle 211, so that its hook projection 236 moves out of engagement with the hook receptacle 211 and the locating body 44 can be pulled out of the insertion opening 218 in an upward direction.

To operate the clamping bodies 231 of the locating bodies 44, the actuating devices 240 are provided. The actuating devices 240 comprise a control 241, e.g. a rotary knob, located on a side of the locating body 44 averted from the locating surface 16. The rotary knob or the

control 241 can be gripped with two fingers of a hand, for example, and rotated. This screws a nut 242 onto a tensioning body with an oblong shape, in particular a bolt 243 supported on the locating bodies, or unscrews it from the tensioning body or bolt 243. The nut 244 is non-rotatably joined to the control 241 or forms an integral part of the control 241.

A head 244 of the bolt 243 is supported at the locating body 44, for example, in particular in a recess 245 of the locating body 44. The bolt 243 passes through a through-opening 246 of the locating body 44 and a through-opening 247 of the clamping bodies 231 and is screwed into the nut 242 by a screw section 247.

A preferred concept provides that the bolt 243 and/or the nut 242 are/is rotatably mounted with respect to the locating body 44 by means of an anti-friction bearing 248, in particular a swivel bearing, so that an operator can rotate the control 241 using little force.

When the control 241 is rotated, the nut 242 is screwed onto the bolt 243, for example, so that it moves towards the locating surface 16 while operating the clamping body 231 towards the clamping position KS. The clamping body 231 pivots about a bearing region defined by the hook section 234 or the hook projection 235. The hook projection 235 for example rotates about the hook projection 229, on which it is suspended as it were. This brings the clamping section 232 into engagement with the clamping locating region 217 or clamps it against the clamping locating region 217 with the clamping force P1.

A holding body 238 can be provided to hold the clamping body 231 in the receptacle 239. The holding body 238 is located opposite the swivel bearing realised between the hook projection 229 and the projection 235 of the clamping body 231, for example. The holding body 238 or supporting body can be designed in the manner of a wedge body or supporting wedge or the like, in order to hold the operating body or clamping body 231 movable in the receptacle 239.

The clamping section 232 is located in a recess 249 of the supporting surface 224. The clamping section 232 projects in front of the supporting surface 224 even in the release position LS, so that the locating body 44 is hooked to the holder 200. The clamping section 232 can however be moved behind the supporting surface 224 by means of the actuator or actuating device 240, in order to remove the locating body 44 from the holder 200.

A variant could now provide that the nut 242 or the control 241 is motion-coupled to the clamping body 231 in the direction of the release position LS as well, for example by means of a suitable entrainment or driver coupled to or located at the control 241.

A spring assembly 250 is preferable provided, however, for example with a leaf spring 251 loading the clamping body 231 towards the release position LS. The spring assembly 250 is for example supported at the clamping body 231, in particular its operating section 233, and at the other end at a section 253 of the locating body 44, where the head 244 of the bolt 242 is supported as well.

Together with the bolt 243, the nut 242 forms an actuator or operating mechanism for the clamping body 231.

Regions 251 of the locating bodies 44 which are farther away from the tool 15 project farther in front of the support surface 15, 43, 58. Towards the tool 15 the locating bodies 44 have bevels 250, which means that the locating surface 16 is lower there. The view of the cutting region of cutting edge into the workpiece W is therefore less restricted by the locating bodies 44. It is advantageously provided that the clamping devices 240 are provided in the higher regions 251 of the locating bodies 44, which are not bevelled.

A drive concept offering an alternative to the actuating device 240 is illustrated diagrammatically in Figure 9. At a locating body 344 of a similar structure as the locating body 44, a clamping body 331 is provided, for example, which resembles the clamping body 231. The clamping body 231 has a projection 236, which can be brought into engagement with the clamping abutment surface 209, in order to bring the clamping locating surface 208 into engagement with the clamping supporting surface 223 or clamp it thereto. In addition to the clamping body 331, a clamping device 340 for example has a control 341 having a handle arm 343 and an operating arm 342. Using the handle arm 343, the operating arm 342 can be pivoted about its longitudinal axis, whereby an operating contour 347, which is eccentric with respect to the longitudinal axis, is twisted. In a rotary position corresponding to the release position LS, the operating contour 347 permits a movement of the clamping body 331 away from the clamping abutment surface 209. In another rotary position, for example twisted by 90°, the operating contour 347 presses the clamping body 331 against the clamping abutment surface 209, whereby the clamping supporting surface 223 is clamped against the clamping locating surface 208.

It can easily be seen in Figure 9 that, as a variant of the embodiment shown in the drawing, the clamping locating surface 208 and the clamping supporting surface 223 can easily be located on the right-hand side in the drawing, i.e. closer to the stationary locating surface 206, while the clamping element or the clamping body 331 can be movable in the other direction, i.e. away from the stationary locating surface 206 into the clamping position KS.

Patentkrav

1. Værktøjsmaskine, især halvstationær eller mobil værktøjsmaskine (10), til bearbejdning af emner (W) ved hjælp af et værktøj (14), hvor værktøjsmaskinen (10) har en maskinbasisdel (20) til afsætning på et underlag og hvorpå der er anbragt en drivenhed (11) med en drivmotor (12) og en værktøjsoptagelse (13), der kan drives ved hjælp af drivmotoren (12), til værktøjet (14), især til et skæreværktøj, og en holder (200) til mindst et anlægslegeme (44), hvor maskinbasisdelen (20) tilvejebringer en understøtningsflade (15), og det mindst ene anlægslegeme (44) tilvejebringer en anlægsflade (16), der rager vinklet, især vinkelret frem fra understøtningsfladen (15), til emnet (W), således at emnet (W) til bearbejdning ved hjælp af værktøjet (14) liggende på understøtningsfladen (15) kan lægges an mod anlægsfladen (16), hvor det mindst ene anlægslegeme (44) omfatter en klemmeindretning (230) til fastklemning med holderen (200), hvor klemmeindretningen (230) omfatter et manuelt betjeneligt betjeningselement (241) og et klemmelegeme (231), der ved hjælp af betjeningselementet (241) kan aktiveres mellem en klemmestilling (KS) og en frigørelsesstilling (LS) og i klemmestillingen (KS) spænder en klemmestøtteflade (223) af det mindst ene anlægslegeme (44) med en klemmekraft (P2) mod en klemmeanlægsflade (208) af holderen (200) og frigiver den i frigørelsesstillingen (LS), således at det mindst ene anlægslegeme (44) er fastklemt i forhold til holderen (200) i klemmestillingen (KS) og kan bevæges i frigørelsesstillingen (LS), og hvor klemmeanlægsfladen (208) har mindst et klemmeanlægsområde (217), der strækker sig ved siden af anlægsfladen (16) på tværs af understøtningsfladen (15), eller er dannet af klemmeanlægsområdet (217), som klemmestøttefladen (223) i klemmestillingen (KS) er fastklemt imod med en kraftkomponent af klemmekraften (P2), der er vinkelret på anlægsfladen (16), således at anlægslegemets (44) anlægsflade (16) indtager en forudbestemt længdeposition i forhold til klemmeanlægsområdet (217) og/eller flugter med en stationær anlægsflade (206), der er stationær i forhold til understøtningsfladen (15) og især er anbragt på holderen (200), **kendetegnet ved, at** den vinkelrette kraftkomponent af klemmekraften (P2) og en anlægskraft (AN), som emnet (W) presses mod anlægsfladen (16) med, er ensrettet eller peger i samme retning, og/eller at en anlægskraft (AN), som emnet (W) påvir-

ker anlægslegemets (44) anlægsflade (16) med, fungerer som en kraftforstærkning af klemmekraften (P2).

2. Værktøjsmaskine ifølge krav 1, **kendetegnet ved, at** klemmestøttefladen (223) og/eller klemmeanlægsfladen (208) og/eller det mindst ene klemmeanlægsområde (217) er parallelt med anlægsfladen (16) af det mindst ene anlægslegeme (44) og/eller med den stationære anlægsflade (206) eller har en skrå hældning på mindre end 45°, især mindre end 30° eller 15° i forhold til anlægsfladen (16) eller den stationære anlægsflade (206).

3. Værktøjsmaskine ifølge krav 1 eller 2, **kendetegnet ved, at** der på klemmestøttefladen (223) og/eller klemmeanlægsfladen (208) og/eller i klemmeanlægsområdet (217) er anbragt mindst en fordybning, og/eller at klemmestøttefladen (223) og/eller klemmeanlægsfladen (208) og/eller det mindst ene klemmeanlægsområde (217) er udformet som plane flader og/eller strækker sig parallelt med anlægsfladen (16).

4. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** klemmestøttefladen (223) og anlægsfladen (16) af det mindst ene anlægslegeme (44) danner et trin eller er anbragt ved et trin og/eller i det væsentlige har den samme langsgående længde og/eller i forhold til et i brugsposition horisontalt plan og/eller understøtningsfladen (15) er anbragt ved siden af hinanden, især på modsatte sider af understøtningsfladen (15).

5. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** klemmestøttefladen (223) og/eller klemmelegemet (231) er tilvejebragt ved et klemmefremspring (222) af det mindst ene anlægslegeme (44).

6. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** klemmelegemet (231) og klemmestøttefladen (223) virkende modsat hinanden griber ind i en klemmeoptagelse (207) af holderen (200), der især danner en føringsoptagelse til længdeforskydelig føring af anlægslegemet (44).

7. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** holderen (200) har mindst et føringsfremspring eller mindst en føringsoptagelse

til længdeforskydelig lejring af mindst et anlægslegeme (44) på tværs af understøtningsfladen (15).

8. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** der på holderen (200), især ved siden af klemmeanlægsfladen (208), og på det mindst ene anlægslegeme (44) og/eller på klemmelegemet (231) er tilvejebragt krogkonturer, der i det mindste i klemmestillingen (KS), fortrinsvis også i frigørelsesstillingen (LS), griber ind i hinanden, således at mindst et anlægslegeme (44) holdes fast på holderen (200) i en tværgående retning, især en enkelt tværgående retning, på tværs af klemmeanlægsfladen (208) og/eller parallelt med en vinkelret akse eller normalakse af understøtningsfladen (15) ikke kan fjernes fra holderen (200), hvor det fordelagtigt er tilvejebragt, at klemmelegemet (231) har en første krogkontur (236) til sammenhægtning med holderen (200) og en anden krogkontur (235) til sammenhægtning med det mindst ene anlægslegeme (44), hvilke i klemmestillingen (KS) er i indgreb, især som en klemme, med krogkonturer af anlægslegemet (44) og holderen (200).

9. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** et klemmeafsnit af klemmelegemet (231) er anbragt ved siden af en støtteflade (224) af anlægslegemet (44), især i en udsparing (249) på støttefladen, og i klemmestillingen (KS) rager længere ud fra støttefladen (224) end i frigørelsesstillingen (LS), hvor støttefladen (224) i klemmestillingen (KS) hensigtsmæssigt er fjernet fra en modsat beliggende flade af holderen (200).

10. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** klemmeindretningen (230) omfatter et indstillingsgear, især et skruegear og/eller knastgear og/eller kilegear og/eller armgear, til indstilling af klemmelegemet (231) mellem frigørelsesstillingen (LS) og klemmestillingen (KS).

11. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** klemmelegemet (231) er monteret drejeligt og/eller forskydeligt mellem klemmestillingen (KS) og frigørelsesstillingen (LS) på det mindst ene anlægslegeme (44), især ved hjælp af en krogkontur, der kan hægtes sammen med anlægslegemet (44), og/eller at klemmelegemet (231) i klemmestillingen (KS) eller frigørelsesstillingen (LS) er belastet af en fjederanordning, og/eller at et

indstillingslegeme, der kan betjenes ved hjælp af betjeningselementet (241) eller udgør en del af betjeningselementet (241), især skruebolte, går gennem klemmelegemet (231).

12. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** klemmestøttefladen (223) og anlægsfladen (16) er anbragt på modsat beliggende sider af anlægslegemet (44).

13. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** der på modsat beliggende sider af værktøjet på maskinbasisdelen (20) i hvert tilfælde er tilvejebragt mindst en holder (200) til et anlægslegeme (44), og/eller der på maskinbasisdelen (20) bevægeligt er monteret eller kan fastgøres mindst en støttedel, der har en understøtningsflade (43), der flugter med maskinbasisdelens (20) understøtningsflade (15), til emnet (W), hvor det mindst ene anlægslegeme (44) kan positioneres over støttedelens (40) understøtningsflade (15).

14. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** maskinbasisdelen (20) udgør en drejebasisdel (18), hvorpå der drejeligt er monteret en drejedel (17) omkring en drejeakse (S) til ændring af en relativ position af værktøjsoptagelsen (13) til værktøjet (14), især skæreværktøjet (14), og af anlægsfladen (16), der er tilvejebragt til anlæggelse af et emne (W), hvor drejedelen (17) og/eller drejebasisdelen (18) fordelagtigt tilvejebringer understøtningsfladen (15) til emnet (W) og/eller en bærebasisdel til drivenheden (11), og/eller holderen (200) til det mindst ene anlægslegeme (44) hensigtsmæssigt er stationær i forhold til drejebasisdelen.

15. Værktøjsmaskine ifølge et af de foregående krav, **kendetegnet ved, at** drivenheden (11) i forhold til maskinbasisdelen (20) er monteret lineært på en lineær føring (30) til gennemføring af længdesnit med skæreværktøjet (14) og/eller er monteret drejeligt omkring en skrådrejeakse (S3) i forhold til maskinbasisdelen (20) og/eller ved hjælp af et kapdrejeleje (35) er monteret drejeligt mod emne-understøtningsfladen (15), der er tilvejebragt til aflæggelse af et emne (W), og væk fra denne.

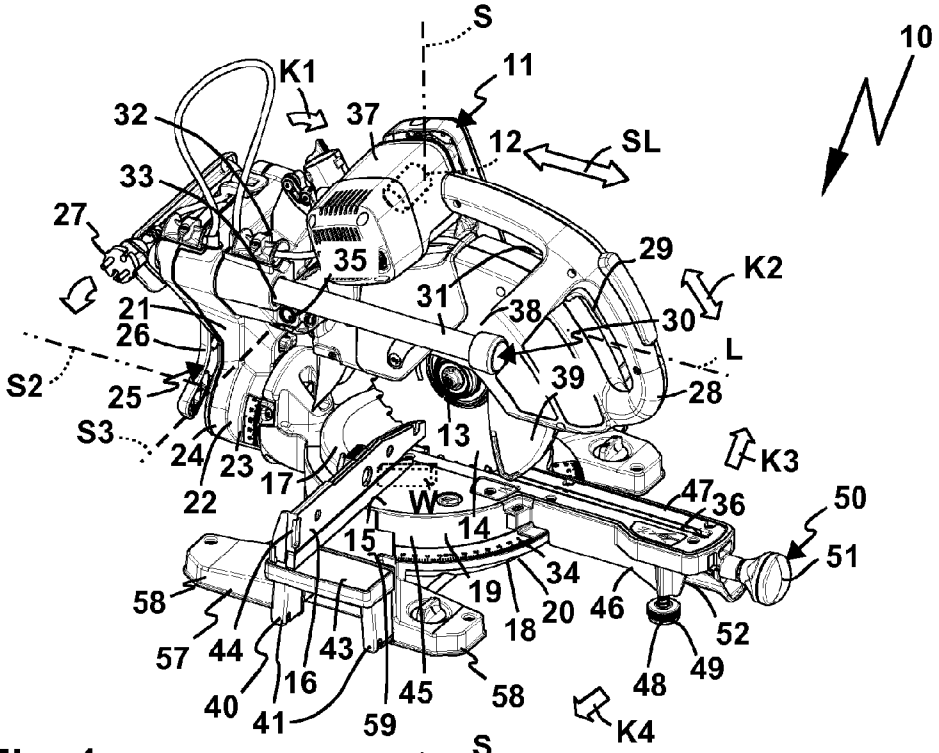
S
10
K1
11
32
37
12
SL
33
27
29
K2
35
31
38
30
21
26
L
S2
39
28
25
13
S3
24
23
17
K3
22
W
47
36
50
14
15
51
34
58
19
18
20
46
52
57
44
43
48
49
16
45
58
40
41
59
K4

Fig. 1

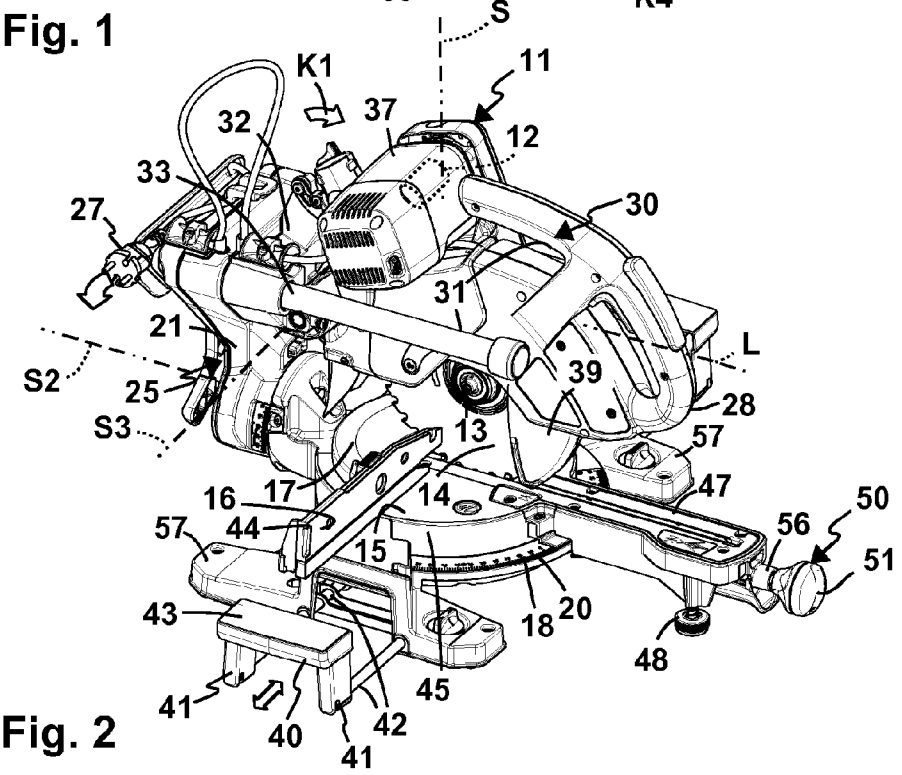
S
K1
11
37
32
12
33
30
27
31
21
L
S2
39
25
28
S3
13
57
16
17
14
47
50
57
44
56
15
51
43
18
20
48
45
41
40
42
41

Fig. 2

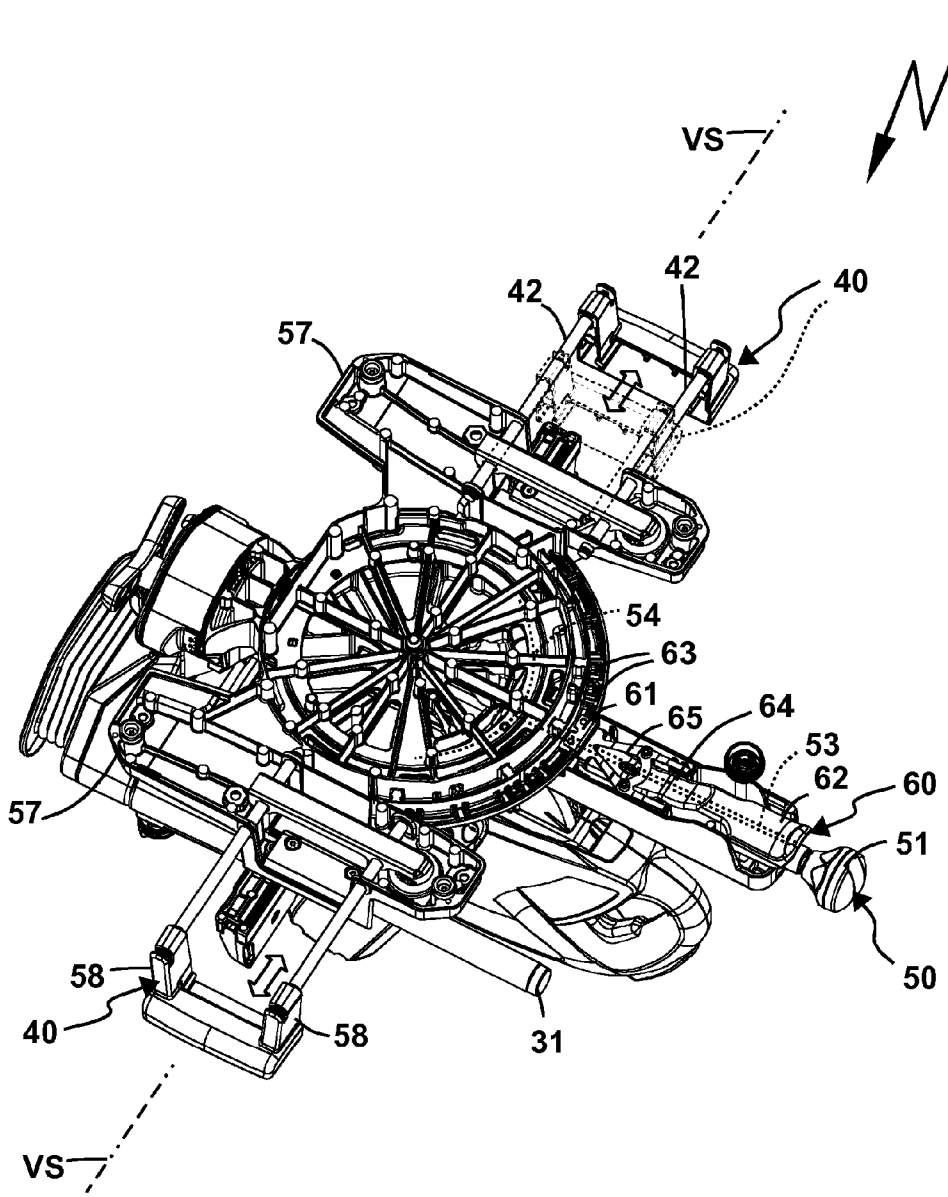

Fig. 3

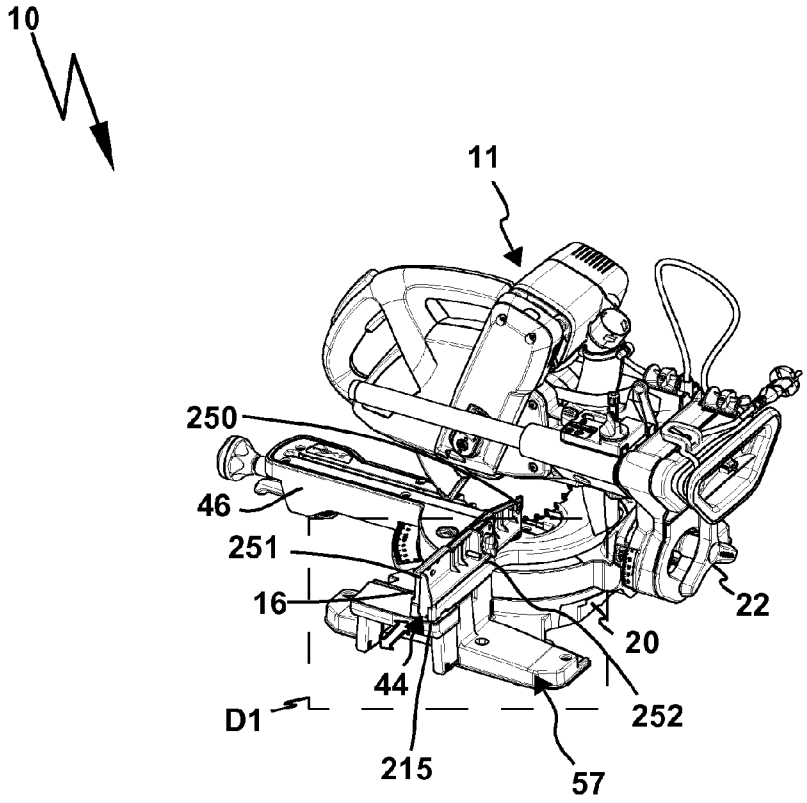
10
11
250
46
251
16
22
20
44
252
D1
215
57

Fig. 4

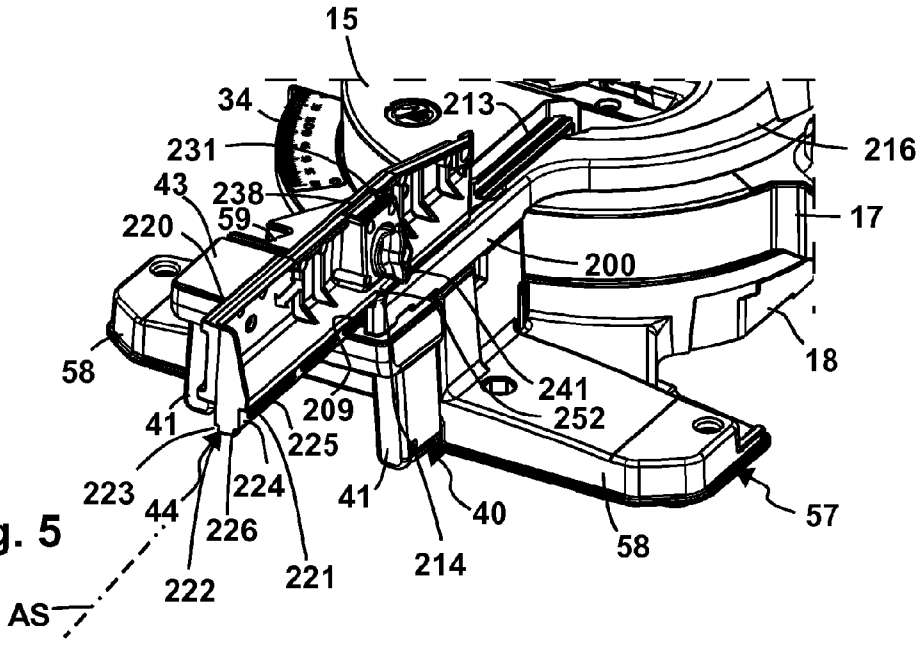
15
34
213
231
216
43
238
17
59
220
200
58
18
241
209
252
41
225
223
224
41
40
57
44
226
58
214
221
222
AS

Fig. 5

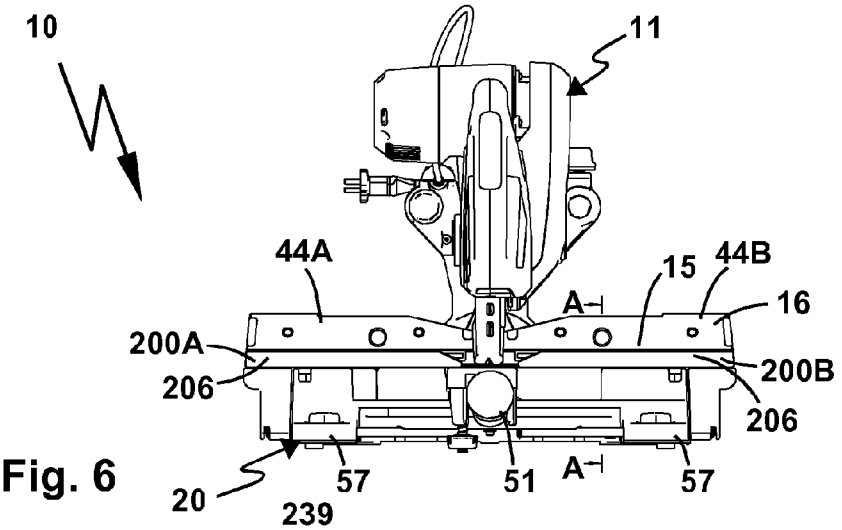

Fig. 6

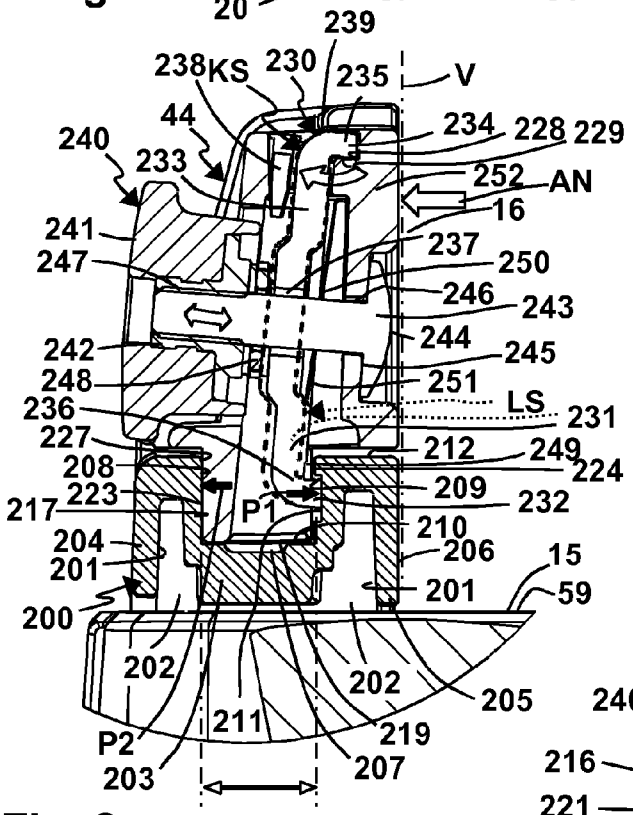

Fig. 8

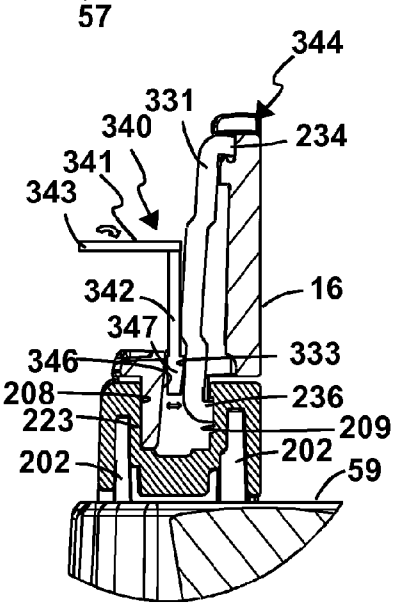

Fig. 9

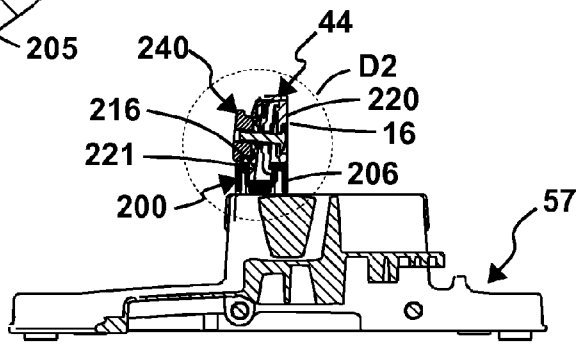

Fig. 7