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MACHINE TOOL COMPRISING A LATERAL CONTACT BODY AND AN ABUTMENT BODY

Abstract

A machine tool for machining workpieces has a machine base for setting down on a ground surface. The machine tool further has a drive assembly arranged on the machine base with a drive motor and a tool receptacle drivable by the drive motor. The machine base has a support surface for supporting the workpiece and has at least one side contact body with a side contact surface. The side contact body is at an angle to the support surface and extends along a longitudinal axis. The machine tool further has at least one abutment body with an abutment surface, which is configured to be fixed opposite the support surface by a holding device on the machine tool, so that the workpiece is supported adjacent to the side contact surface sandwiched between the support surface and the abutment surface.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This application is a continuation of U.S. application Ser. No. 17/603,189, filed Oct. 12, 2021, which is a national stage entry of International Application No. PCT/EP2020/058607, filed Mar. 26, 2020, which claims priority to U.S. Provisional Patent Application Ser. No. 62/833,369, filed Apr. 12, 2019. The contents of each are incorporated by reference in their entirety.

BACKGROUND OF THE INVENTION
Field of the Invention
[0002] The invention relates to a machine tool, in particular a semi-stationary or mobile machine tool and/or sawing machine for machining workpieces using a working tool, in particular a separating tool or a sawing tool, wherein the machine tool comprises a machine base for setting down on a ground surface and a drive assembly arranged thereon with a drive motor and a tool receptacle drivable by the drive motor for the working tool, in particular for a separating tool, wherein the machine base comprises a support surface for supporting the workpiece and comprises at least one side contact body with a side contact surface, which is at an angle to the support surface, in particular perpendicular, and extends along a longitudinal axis, and wherein the machine tool comprises at least one abutment body with an abutment surface, which can be fixed opposite the support surface by means of a holding device on the machine tool, so that the workpiece for machining by the working tool, in particular for the production of a crown-moulding cut, is supported adjacent to the side contact surface, e.g. sandwiched, between the support surface and the abutment surface.
Description of Related Art
[0003] Such machine tools in the form of mitre saws are described for example in U.S. Pat. No. 8,020,477 B2 or U.S. Pat. No. 8,122,803 B2. The abutment body is arranged in a support position above the support surface of the machine base, so that it supports the workpiece that is to be machined opposite the support surface. Thus, for example, profile strips, which are provided for mounting in room inner corners, rest against the side contact surface and are held in place in an oblique position with respect to the side contact surface and the support surface to perform so-called crown-moulding cuts. The abutment bodies described in U.S. Pat. No. 8,020,477 B2 are guided, for example, in longitudinal guides on the side stop body or side contact body and support the workpiece to be machined approximately punctiform. So that the workpiece can be optimally supported, two abutment bodies are provided in a longitudinal space with respect to the longitudinal axis.
[0004] Although only one abutment body per side contact body is provided in U.S. Pat. No. 8,122,803 B2, it has the advantage over the technology described in U.S. Pat. No. 8,020,477 B2 that its abutment surface extends to some extent along the longitudinal axis, so that the workpiece to be machined is supported over a greater length with respect to the longitudinal axis on the abutment body than in the case of the abutment bodies according to U.S. Pat. No. 8,020,477 B2.
[0005] However, the handling of the abutment body or its support of the workpiece to be machined is not optimal in the two concepts discussed.

SUMMARY OF THE INVENTION

[0006] It is therefore the object of the present invention to provide an improved support of the workpiece in a machine tool of the type mentioned.

[0007] To solve this problem, it is provided that, in a machine tool of the type mentioned, the abutment body can be releasably fixed on the machine base using the holding device, in at least two mutually different longitudinal positions with respect to the longitudinal axis.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Hereinafter, an exemplary embodiment of the invention will be explained with reference to the drawings. In the drawings:

[0009] FIG. **1** shows a perspective oblique view of a machine tool.

[0010] FIG. **2** shows a detail D**1** of a perspective oblique view of the machine tool.

[0011] FIG. **3** shows a side view of the machine tool according to the preceding figures.

[0012] FIG. **4** shows a section through a detail D**2** of the machine tool according to FIG. **1**, approximately along a section line A-A.

[0013] FIG. **5** shows the detail D**2**, but along a section line B-B in FIG. **1**.

[0014] FIG. **6** shows a perspective oblique view of a variant of the machine tool according to the above figures.

[0015] FIG. **7** shows the machine tool according to the above figure from behind.

[0016] FIG. **8** shows a section through a detail D**3** from the view according to FIG. **7**, approximately along a section line C-C in FIG. **7**.

[0017] FIG. **9** shows a perspective oblique view of a side stop body of the machine tool according to FIGS. **5-8**.

[0018] FIG. **10** shows a partial view of the machine tool according to FIG. **5** obliquely from behind.

[0019] FIG. **11** shows a section through the detail D**3** of FIG. **7**, approximately along a section line D-D in FIG. **7**.

[0020] FIG. **12** shows an abutment body of the machine tool according to FIGS. **5-11** in a perspective oblique view of its rear side.

DETAILED DESCRIPTION OF THE INVENTION

[0021] The concept according to the invention thus provides that the at least one abutment body or optionally also a plurality of abutment bodies are not arranged stationary relative to the longitudinal axis of the side contact surface but are adjustable. Thus, the abutment body can be brought into an optimal position with respect to the workpiece and/or the working tool. The abutment body can thus be adjusted, for example, towards the flat side of a saw blade or away from it along the linear axis. In particular, when longer or shorter workpieces abut against the side contact surface, the position of the abutment body can be optimally adjusted with respect to the longitudinal axis. Two or more longitudinal positions with respect to the longitudinal axis may be provided for the at least one abutment body, for example a fixed first and a fixed second longitudinal position, but also further longitudinal positions. Furthermore, it is possible that a plurality of abutment bodies is provided, for example two abutment bodies. It is possible that in each case one abutment body is assigned to one side stop surface or that a plurality of abutment bodies and thus several, for example two, abutment surfaces are assigned to one side stop surface.

[0022] It is also possible to refer to the abutment body as a hold-down device or hold-down device body which, as it were, holds down the workpiece to be machined in relation to the support surface. The abutment body can also be referred to as an abutment stop body. It is also possible to designate the at least one side contact body as side stop body.

[0023] The machine tool is expediently a mobile machine tool but can be used stationary. In particular, it is advantageous if the machine tool is indeed transportable, i.e. has a weight of less than 60-80 kg, but can be put down on a ground surface for sawing or other machining of the workpiece. The workpiece can be supported on the support surface for machining by the working tool and can be placed on the at least one side contact surface, while the separating cut or saw cut or other workpiece machining, for example a drilling or milling operation, is performed. At the same time, at least one abutment surface of the abutment body supports the workpiece with a force direction towards the contact surface.
[0024] A preferred embodiment of the invention provides that the machine tool is a table saw, a mitre saw, a slide saw, or a slide compound mitre saw. In particular, it is advantageous if the machine tool is a sawing machine for semi-stationary operation, i.e. that it can for example be taken on construction sites and operated there.
[0025] In principle, it is possible that the at least one abutment body, for example, is fixed or fixable or mounted directly on the machine base or the support surface. Thus, the abutment body, for example, can be adjustable with respect to the longitudinal axis independent of the side contact body.
[0026] However, a preferred concept provides that the abutment body is arranged or can be arranged on the at least one side contact body.
[0027] Thus, for example, the abutment surface is optimally arranged with respect to the side contact surface.
[0028] Furthermore, the abutment body can be adjustable, for example, together with the side contact body between the longitudinal positions along the longitudinal axis. Thus, when the side contact body is fixed to the machine base in a different longitudinal position along the longitudinal axis, the longitudinal position of the abutment body simultaneously changes, so that it is positioned particularly favourably relative to the machine base or the support surface.
[0029] The abutment body may be arranged stationary on the side contact body. For example, an abutment projection which forms the abutment body can be arranged on the side contact body.
[0030] It is preferred if the at least one abutment body is releasably fixed and/or is movably mounted on the respective side contact body by means of a fixing device. The abutment body can therefore be removed, for example, from the side contact body or be mounted on this.
[0031] The holding device may be dedicated to fixing the abutment body to the machine base, i.e. that it releasably fixes or supports only the abutment body with respect to the machine base.
[0032] However, it is preferred if the holding device is or comprises a holding device for holding the at least one side stop body on the machine base, so that the abutment body is releasably fixable on the machine base in the at least two longitudinal positions with respect to the longitudinal axis by adjusting the side stop body. It is possible that the abutment body is adjustable between the longitudinal positions together with the side stop body. This allows a particularly easy handling. But it is also possible that the side contact body is adjustable between the longitudinal positions without the abutment body mounted thereon and the abutment body is affixed to the side contact body, when the side contact body has taken one of the respective longitudinal positions. In both scenarios, it is possible that, so to speak, by adjusting the side stop body with respect to the machine base along the longitudinal axis, the position of the abutment body is also variable with respect to the longitudinal axis. Thus, for example, if longer workpieces are to be machined, the side stop body may be set at a greater distance from the working tool on the machine base with respect to the longitudinal axis than with shorter workpieces. At the same time, the longitudinal position of the abutment body is variable with respect to the longitudinal axis, so that this is optimally positioned in relation to the longitudinal axis with respect to the shorter workpiece and the longer workpiece, and each can optimally support the workpiece.
[0033] The holding device expediently has a base side contact surface, which is aligned with the side contact surface of the side contact body when the side contact body is mounted on the holding

device. Thus, for example, the base side contact surface is stationary in front of the support surface. The base side contact surface is extended so to speak by the side contact surface of the side contact body with respect to an axis extending away from the support surface, in operation e.g. a vertical axis.

[0034] It is advantageously provided that the holding device comprises clamping means for clamping the at least one side contact body or the least one abutment body with respect to the machine base and/or positive engagement contours for the positive holding of the at least one side contact body or the at least one abutment body with respect to the machine base.

[0035] A clamping device allows, for example, the attachment of the abutment body or side contact body in several longitudinal positions with respect to the longitudinal axis, in particular a continuous adjustment of the abutment body with respect to the longitudinal axis. The positive engagement contours comprise, for example, interlocking rear-engaging contours, grooves and groove projections, hooks and hook receptacles on the components to be fastened to one another, for example on the side contact body and the machine base or on the abutment body and the machine base.

[0036] For actuation between a fixing position, in which the respective side contact body or abutment body is fixed stationary relative to the support surface, and a release position in which the side contact body or abutment body is movable with respect to the support surface, in particular removable from the support surface, the holding device preferably comprises actuating means, in particular screwing means, one or more levers or the like.

[0037] The holding device expediently has a linear guide for a linear adjustment along the longitudinal axis of the at least one side contact body and/or the at least one abutment body. The linear guide comprises, for example, a guide groove in which a guide projection engages. The guide groove and/or the guide projection extend, for example, parallel to the longitudinal axis. It can be provided that at least two guide projections and/or at least two guide grooves are provided, which run along a guide axis, which runs parallel to the longitudinal axis, and have a longitudinal spacing with respect to the guide axis. Thus, a guide projection and/or a guide groove are possible, which are continuous with respect to the guide axis, but also e.g. segmented guide projections or guide grooves are possible.

[0038] The side contact surface of the at least one side contact body can comprise an identical vertical extension along the longitudinal axis with respect to a vertical axis which is angled to the longitudinal axis. Thus, the side contact surface can be the same height over the entire length of the side contact body along the longitudinal axis.

[0039] However, a preferred concept provides for a larger clearance for the working tool on a section of the side contact body, hereafter designated as a tool section, which is arranged closer to the working tools. Thus, for example, the working tool can be inclined obliquely in an axis transverse to the longitudinal axis of the side contact surface, in particular for making oblique cuts. Thus, it is preferably provided that the side contact surface of the at least one side contact body has a support section and a tool section, wherein the side contact surface protrudes further in front of the support surface in the region of the support section than in the region of the tool section, which is provided for making a larger clearance available for the working tool. The above explanations refer to a state in which the side contact body is fixed to the machine base. For example, the side contact body has different vertical extensions on mutually opposite longitudinal end regions with respect to the longitudinal axis in relation to a vertical axis which is angled to the longitudinal axis. It is possible that the side contact body comprises, for example, a step between its longitudinal ends with respect to the longitudinal axis, and/or an oblique gradient on a side facing away from the support surface or opposite to the support surface, in particular a narrow side.

[0040] It is advantageously provided that the at least one abutment body is arranged or can be arranged in the region of the support section and the at least one side contact body is adjustable with respect to the machine base and/or with respect to the longitudinal axis between a first

operating position, in which the tool section is arranged closer to the working tool than the support section, and a second operating position, in which the support section is arranged closer to the working tool than the tool section. The first operating position may be, for example, an operating position in which the machine tool is operated without the at least one abutment body, while the second operating position is the one in which the abutment body is arranged on the machine tool.
[0041] For example, it is advantageous if the machine tool has at least two side contact bodies, which are arranged or can be arranged on opposite sides of the working tool. If the two side contact bodies can be releasably connected to the machine tool, in particular its machine base, the operator can adjust the side contact body between the first and the second operating position, wherein a side contact body arranged initially left next to the working tool with respect to the longitudinal axis, and a side contact body arranged initially right next to the working tool with respect to the longitudinal axis are interchangeable for taking the first operating position and the second operating position.
[0042] A preferred concept provides that each side contact body respectively is releasably affixable on the machine base by means of a holding device, in at least two longitudinal positions with respect to the longitudinal axis. Thus, with each of the side contact bodies, the adjustment of the at least one abutment body associated therewith is realisable along the longitudinal axis.
[0043] The at least one abutment body can be adjusted with respect to the support surface between at least two longitudinal positions along the longitudinal axis by means of its associated holding device. A further adjustability of the at least one abutment body between at least two longitudinal positions along the longitudinal axis with respect to the support surface advantageously results from the fixing device, by means of which the at least one abutment body is releasably fastened and/or movably mounted on the respective side contact body. The at least one abutment body can thus be adjustable in two or more longitudinal positions along the longitudinal axis with the aid of the holding device and/or the fixing device with respect to the support surface.
[0044] Advantageously, it is provided that the machine tool has at least two side contact bodies. The side contact bodies are advantageously arranged or can be arranged on opposite sides of the working tool. Advantageously, both side contact bodies are adjustable with respect to the machine base, wherein it is possible for one of the side contact bodies to be arranged, for example, stationary relative to the support surface. It is preferred if each side contact body is adjustable towards or away from the working tool. It is advantageously provided that the abutment surface of the at least one abutment body or the abutment body as a whole is fixable in relation to the support surface by means of a fixing device fixed to a component of the machine tool, which is stationary relative to the support surface, in particular the at least one side contact body, such that it is fixable in at least one vertical distance, preferably at least two mutually different vertical distances, wherein the vertical distance extends along a vertical axis which extends transversely, in particular perpendicular, to the support surface. However, it is also readily possible for the abutment body to be detachably connected or connectable to another component of the machine tool other than the side contact body, for example to the machine base, by means of the fixing device. Thus, for example, an adjustment of the distance or vertical distance between the abutment surface and the support surface is possible, in order to sandwich the workpiece between the two surfaces.
[0045] The fixing device comprises, for example, clamping means for clamping the abutment body to the fixed component of the machine tool, screwing means for screwing with the stationary component or screwing the abutment body onto the stationary component or the like. It is also advantageous if the fixing device has positive engagement contours for the positive holding of the abutment body with respect to the stationary component, for example at least one positive locking projection and at least one positive locking receptacle which engage in one another.
[0046] An advantageous concept provides that the fixing device has a bearing, in particular a linear bearing and/or a linear guide, for adjusting the at least one abutment body between at least two vertical distances, in particular along an adjustment axis transverse, in particular perpendicular, to

the abutment surface, such that in these vertical distances the abutment surface has different distances to the support surface for the workpiece. The bearing may for example be a sliding bearing or linear bearings, but also a pivot bearing or rotary bearing. Combinations of sliding bearings and rotary bearing are readily possible. However, a linear mounting of the abutment body and thus its abutment surface is preferred.

[0047] Advantageously, for example, two linear bearings and/or two linear guides are provided, being firstly a linear guide with respect to the longitudinal axis and a linear guide along the adjustment axis, so that the abutment surface is optimally adjustable with respect to the longitudinal position along the longitudinal axis of the side contact surface as well as with respect to the adjustment axis, i.e. the distance between the abutment surface and the support surface of the machine base.

[0048] In the case of the aforementioned bearing, in particular the linear bearing or the linear guide, but also in the case of a pivot bearing, it is advantageous if the fixing device comprises a bolt body which passes through a bearing recess, in particular a longitudinal recess, of the bearing. The bolt body may for example simultaneously be part of the clamping means explained below. The bolt body may for example form a bearing axis of a pivot bearing. However, the bolt body can also form a guide body on which the abutment body is guided e.g. linearly guided.

[0049] Preferably, the fixing device has a bolt body which forms a part of clamping means for clamping the abutment body to a component of the machine tool, which component is stationary relative to the support surface.

[0050] On the bolt body, for example, a control element, in particular a hand wheel, is arranged for gripping by an operator, so that the operator can rotate the bolt body. The bolt body is captively held, for example, on the respective abutment body. Advantageously, the bolt body is rotatably mounted on a rotary bearing receptacle of the abutment body, wherein a wall of the abutment body engages sandwiched between the control element, in particular the handwheel, and the captive securing device.

[0051] The bolt body is preferably screwed or can be screwed into a screw receptacle of the component which is stationary with respect to the support surface, for example, in a screw on one or both of the side stop bodies.

[0052] It is advantageous if the fixing device has anti-rotation contours, which interlock with one another in positive engagement, for the non-rotatable holding of the abutment surface with respect to the support surface.

[0053] A favourable variant provides that the anti-rotation contours comprise or are formed by at least one guide projection of the linear guide, which guide projection extends along the adjustment axis and which engages in a guide receptacle of the linear guide, which guide receptacle extends along the adjustment axis. For example, a guide groove and a guide projection, which engages in the guide groove, are arranged on the side contact body, on which the respective abutment body is arranged, and on the abutment body. It is preferred if the guide groove is arranged on the side stop surface of the side contact body.

[0054] At the bottom of the guide groove a screw receptacle is expediently provided for the bolt body.

[0055] In general, it should be noted that at least one component of the fixing device is advantageously arranged on the side contact surface of the side contact body, while one other component of the fixing device working in conjunction with this is arranged on the abutment body, which is to be arranged on the side contact body.

[0056] The components arranged on the side contact body of the fixing device are preferably not in front of the side contact surface of the side contact body.

[0057] It is further expedient if the machine tool has an adjustment device for adjusting the at least one abutment body between a use position, in which the abutment surface for supporting the workpiece is arranged next to the side contact surface and protrudes in front of the side contact

surface, and a non-use position in which the abutment surface of the side contact surface is moved away, in particular such that the side contact surface is ready over its entire vertical extension for attaching the workpiece.

[0058] In the non-use position, the entire side contact surface of the side contact body is preferably free for attaching the workpiece. For example, the adjustment device comprises a guide for the abutment body, which extends from the side contact surface of the side contact body to its upper side or to a rear side facing away from the side contact surface. Furthermore, the adjustment device may for example also comprise a pivot bearing, with which the abutment body is adjustable toward the side contact surface in the use position and away from the side contact surface in the non-use position. The pivot bearing comprises, for example, a pivot axis which runs parallel to the longitudinal axis of the side contact surface. The abutment body can be pivoted away and/or adjusted away from the use position in the direction of the rest position by means of the adjustment device, for example, away from the side contact surface.

[0059] Advantageously, it is provided that the machine base has a pivot base, on which a pivot member is pivotably mounted about a pivot axis for changing a relative position of the tool receptacle for the working tool, for example a separating tool, and a side contact surface provided for attaching a workpiece. The workpiece can be attached to the contact surface, for example laterally or with its lower side.

[0060] It is advantageous both in the case of at least one side contact body and in the at least one abutment body if it is for example designed plate-like or is formed by a plate. While the side contact body is advantageously made of metal, for example aluminium, the abutment body is preferably made of plastic. The abutment body and/or the side contact body may be reinforced by a rib structure.

[0061] In particular, it is advantageous if the pivot member and/or the pivot base provides a support surface or contact surface for the workpiece. The pivot member or pivot base or both may also provide a support base for the drive assembly. For example, the drive assembly is arranged or held on a carrier which projects upwardly in front of the support surface or contact surface during use of the machine tool.

[0062] The drive motor is expediently an electric drive motor.

[0063] The drive motor is advantageously provided for rotational driving of the tool receptacle and thus of the separating tool. It is also possible that a transmission between the drive motor and tool receptacle is provided, for example, for changing the speed and/or in the form of an angular gear and/or for generating an oscillating movement of the separating tool.

[0064] Advantageously, the tool receptacle, in particular the drive assembly as a whole, is pivotable about a mitre pivot axis, by means of a depth pivot bearing or by means of a mitre pivot bearing, towards the support surface for the workpiece and away from the support surface. The depth or mitre pivot axis is preferably horizontal when using the machine tool. The machine tool can then be e.g. be a mitre saw.

[0065] An advantageous concept, in particular in an embodiment of the machine tool as a slide saw or as a slide compound mitre saw, provides that the drive assembly is mounted linearly along a longitudinal axis with respect to the pivot base on a linear guide, for performing longitudinal cuts with the separating tool. The linear guide comprises, for example, at least one elongated guide body, in particular a guide bar or a guide rod, which extends along the longitudinal axis. The at least one elongated guide body, in particular the guide bar or the guide rod, can be movable relative to the machine base of the machine tool. For example, a bearing receptacle for the at least one elongated guide body is then provided on a tower-like carrier. It is also possible that the elongated guide body is arranged in a stationary manner on the machine base.

[0066] In particular, it is preferred if the drive assembly is mounted to be linearly movable in the manner of a carriage relative to the machine base, in particular on a carrier which projects upwards in front of the machine base. The depth pivot bearing or mitre pivot bearing is expediently provided

on the carriage.
[0067] It is preferable if the drive assembly is mounted pivotably relative to the machine base by means of an oblique pivot bearing, about an oblique pivot axis perpendicular with respect to the machine base. Thus, for example, mitred cuts or oblique cuts can be made in the workpiece.
[0068] A combination of the two aforementioned measures provides that the drive assembly is mounted on the one hand linearly movable and on the other hand obliquely pivotable relative to the machine base. It is advantageous that a carrier for the drive assembly is pivotable about an oblique pivot axis with respect to the machine base by means of the inclined bearing, and the linear guide for the drive assembly is provided on the carrier. For example, the at least one elongated or bar-like guide body protrudes in front of the carrier and in particular extends above a support surface for the workpiece.
[0069] A machine tool **10** comprises a machine base **11** which can be placed on a ground surface. The machine tool **10** is, for example, a sawing machine that is semi-stationary, i.e. it can be taken to a specific usage location. There, the machine tool **10** can be put down on the ground surface and used.
[0070] On the machine base **11**, a drive assembly **30** is arranged with a drive motor **32** for rotational driving of a tool receptacle **31**. The drive motor **32** drives the tool receptacle **31** directly or via a transmission. A working tool **36**, for example a separating tool or saw blade, is held on the tool receptacle **31** so that a workpiece W can be machined with the machine tool **10**, e.g. cut.
[0071] The machine base **11** has a pivot base **12**, on which a pivot member **15** is pivotably mounted about a pivot axis GS, which is typically vertical during use. The pivot base **12** has feet **13** for putting down on the ground surface and support sections **23**, from which the feet **13** protrude and which comprise support surfaces **14** for placing the workpiece W on their side facing the working tool **36** or drive assembly **30**, which in the operating position is their upper side. Between the support sections **23**, a receiving space is provided for the pivot member **15**, in particular a pivot member base body **16**, which is rotatably or pivotably mounted in this receiving space about the pivot axis GS.
[0072] The pivot member **15** has a support surface **17** for placing the workpiece W, which is aligned with the support surfaces **14**, on its side facing the working tool **36** or the drive assembly **30**, which in the operating position is its upper side. Thus, the workpiece W can be placed on the support surfaces **14** and **17** and is supported by them for machining by the working tool **36**.
[0073] From the pivot member base body **16** protrudes an actuating arm **18** for gripping by an operator, which forms an operating handle for pivotably actuating the pivot member **15** relative to the pivot base **12**. On the actuating arm **16** and the support surface **17** extends a slot **19**, into which the working tool **36** can plunge.
[0074] Furthermore, between the pivot member **15** and the pivot base **12**, a pivot fixing device **20** is provided to fix the pivot member **15** with respect to the pivot base **12** in one or more predetermined pivoting positions with respect to the pivot axis GS. The pivot fixing device **20** can be actuated by means of an actuating element **21** between a fixing position and a release position, in which the pivot member **15** is fixed or released with respect to the pivot base **12**. To show the respective pivoting position, for example, a scale **22** is provided on the pivot base **12**.
[0075] A carrier **25** projects from the machine base **11**, which in the use position projects up in front of the support surfaces **14**, **17**.
[0076] On the carrier **25**, the drive assembly **30**, in particular the tool receptacle **31** and thus the working tool **36**, is in particular multiaxially pivotably mounted and/or linearly adjustably mounted by means of a bearing device **24**, in order to position the working tool **36** relative to the support surfaces **14**, **17** and thus relative to the workpiece W positioned thereon, in order to machine the workpiece W.
[0077] On the carrier **25**, an oblique pivot bearing **26** is provided, by means of which the drive assembly **30** is pivotably mounted about an oblique pivot axis SA. For example, a support arm **27**

of the drive assembly **30** is pivotably mounted on the pivot bearing **26** about the oblique pivot axis SA.
[0078] The support arm **27** protrudes in front of the carrier **25** and carries a linear guide **33** at its end section **28**, which is spaced away from the machine base **11**. The linear guide **33** comprises, for example, rod-shaped guide bodies **34**, on which a carriage **33** is displaceably mounted along an adjustment axis X. The working tool **36** is arranged between the rod-shaped guide bodies **34**.
[0079] The working tools **36** can be displaced back and forth along the adjustment axis X by means of the linear guide **33**. The slot **19** extends parallel to the adjustment axis X.
[0080] The adjustment axis X is parallel to the oblique pivot axis SA. The adjustment axis X and the oblique pivot axis SA typically extend horizontally when the machine tool **10** is in use.
[0081] The adjustment axis X and the oblique pivot axis SA extend perpendicular to the pivot axis GS.
[0082] A drive part **37**, comprising the drive motor **32** and the tool receptacle **31**, could be arranged stationary on the carriage **29** so that the working tools **36** can only perform a linear movement with respect to the support surfaces **14**, **17**.
[0083] However, the drive member **37** is pivotably mounted about a depth adjustment axis TS using a mitre pivot bearing or depth pivot bearing **35**, so that the working tool **36** can occupy different depth positions with respect to the support surfaces **14**, **17**, which are shown in FIG. **3** by dashed lines, in order to accordingly plunge into the workpiece W. For example, the working tools **36** can also plunge into the slot **19**.
[0084] The depth adjustment axis TS runs perpendicular to the oblique pivot axis SA and/or perpendicular to the adjustment axis X and perpendicular to the pivot axis GS.
[0085] With the aid of the bearing device **24**, it is therefore possible to introduce separating cuts into the workpiece W in various orientations, for which, however, a firm hold or a firm support of the workpiece W on the machine tool **10** is required. On the one hand, the workpiece W can be supported on the, as it were, central support surface **17**, but also on the support surface **14** that extends the support surface **17**, so that it is, so to speak, optimally supported from below. On the other hand, further contact surfaces or stop surfaces are provided, which are explained below.
[0086] The machine tool **10** has side contact surfaces **42**, angled toward the support surfaces **14**, **17**, in this case perpendicularly, which are provided on side contact bodies **40**, **41**. Between the side contact bodies **40**, **41**, the working tool **26** is arranged. The side contact surfaces **42** are aligned with each other and extend along a longitudinal axis L.
[0087] The side contact bodies **40**, **41** are or comprise, for example, contact plates or side stop plates.
[0088] The side contact surfaces **42** have a tool section **43** and a support section **44**, wherein the tool section **43** extends with respect to a vertical direction or vertical axis H less far in front of the support surfaces **14**, **17** than the support section **44**. Thus, therefore, the support section **44** also optimally supports workpieces W, which protrude further in front of these contact surfaces, when in the state of being placed on the support surfaces **14**, **17**.
[0089] The tool section **43**, on the other hand, provides a clearance for the working tool **36** when it is pivoted, for example, about the oblique pivot axis SA from its centre position shown in the drawing, so that it has, for example, an inclination of up to 45° or more with respect to the centre position. In the centre position, for example, a cutting surface of the working tool **36** is orthogonal to the support surfaces **14**, **17** and orthogonal to the side contact surfaces **42**.
[0090] The side contact bodies **40**, **42** are thus arranged or can be arranged on mutually opposite sides of the working tool **36**, wherein in a normal sawing position, which is not shown in the drawing, the tool section[s] **43** are closer to the working tools **36** than the support sections **44**, so that a support of the workpiece W away from or at a greater distance to the working tools **36** is optimal. With respect to the vertical axis H, therefore, each of the side contact bodies **40**, **41** is lower in a longitudinal end region **45** with respect to the longitudinal axis L than opposite

longitudinal end regions **46**, where the support sections **44** are provided.
[0091] The side contact bodies **40**, **41** have a shorter extension at the longitudinal end regions **45** between their upper side **47** and their lower side **50** than at the longitudinal end regions **46**. From the longitudinal end region **45** to the longitudinal end region **46**, the upper side **47** has, for example, a rising oblique section **48**, i.e. the height of the respective side contact body **41**, **42** increases from the longitudinal end region **45** in the direction of the support section **44**, in particular continuously. In the region of the support section **44**, the distance between the upper side **47** and the lower side **50**, for example, remains the same, i.e. narrow sides of the side contact body **40**, **41** on the lower side **50** and the upper side **47** extend, for example, parallel to each other.
[0092] However, a step **48**A can also be provided between the tool section **43** and the support section **44**.
[0093] Holding devices **60** serve for mounting the side contact bodies **40**, **41** with respect to the contact surfaces **14**, **16** and/or on the machine base **11**. The holding devices **60** are fixed to the pivot base **12** of the machine base **11**, for example above the support surfaces **14**.
[0094] The holding devices **60** comprise holding bodies **38**, for example profiled bodies. The holding bodies **38** are fixed to the machine base **11** by means of screws **39** or similar attachment means, but could also be integral with the machine base **11**.
[0095] The holding bodies **38** extend from the support surfaces **40** of the pivot base **12** in the direction of the pivot member **15**, so that longitudinal end regions of the holding bodies **38** extend over the supporting surface **17** in the direction of the slot **19**. The holding body **38** has a base side contact surface **59** which is aligned with the side contact surfaces **42** of the side contact bodies **40**, **41** when they are arranged on the holding bodies **38**.
[0096] On the lower sides of the side contact bodies **40**, **41**, on the one hand, a lower side contact surface **51** is provided, which is supported on the holding bodies **38** on their side facing away from the support surfaces **14**, **17**, in the use position this is their upper sides. Between the projections **57**, a guide groove **56** of a linear guide **55** is realised, which constitutes a part of the holding device **60**.
[0097] In front of the lower side support surface **51** of the side contact bodies **40**, **41** guide projections **52**, **53** protrude aligning with one another, which can be brought into guiding engagement with the guide groove **56** in order to realise the linear guide **55**. In front of the guide projections **52**, **53**, rear-engaging projections **54** project transversely to the longitudinal axis thereof, which can be brought into rear engagement with projections **57** projecting toward the guide groove **56**.
[0098] Thus, these projections **57** form rear-engaging contours **58** for a rear engagement by the rear-engaging projections **54** of the side contact body **40**, **41**. The guide projections **52**, **53** and the transversely or laterally projecting rear-engaging projections **54**, for example, form a T-shaped structure in front view.
[0099] Using the linear guides **55**, the side contact bodies **40**, **41** can be adjusted along the longitudinal axis L, so that, for example, workpieces W projecting further in front of the machine base **11** can be supported on the side contact surfaces **42** at a greater distance from the working plane of the working tool **36**. For example, the side contact bodies **40**, **41** can be adjusted between longitudinal positions L**1** and L**2**, as well as further longitudinal positions (not shown), along the linear guide **55**, in particular continuously.
[0100] In the respective longitudinal positions, a fixing of the holding device **60** can be realised using clamping means **61**. The clamping means **61** comprise a clamping body **62**, which is adjustable using a tension rod **63** or other actuating member, with the help of an actuating lever **64**, between a clamping position and a release position or a fixing position and a release position.
[0101] The clamping body **62** is received in the guide groove **56**. The clamping body **62** is preferably plate-like. The clamping body **62** is aligned with the guide projections **52**, **53**. For example, the clamping body **62** projects with the rear-engaging projections **54** approximately aligning transversely in front of the tension rod **63**.

[0102] In the clamping position or fixing position, the clamping body **62**, which is designed for example in the manner of a sliding block, is positioned in a clamping fit against the projections **57** of the guide groove **56**, see FIG. **8**. In the release position, however, the clamping fit is unlocked, i.e. the clamping body **62**, for example, is arranged at a distance from the projections **57**, so that the respective side contact body **40**, **41** [is] displaceable along the longitudinal axis L by means of the linear guide **55**.
[0103] The actuating lever **64** is pivotably mounted about a pivot axis BH by means of an axle element **65** on the respective side contact body **40**, **41**. The actuating lever **64** has a bearing section which extends around the axle element **65** and has a bearing surface **66** which can be supported on a support surface **67** in a stationary position relative to the respective side contact body **40**, **41**.
[0104] The actuating lever **64** can be adjusted for adjusting the clamping means **61** from the clamping position, in which the actuating lever **64** occupies e.g. the position shown in solid lines in FIG. **7**, into a position shown in dashed lines in FIG. **7**, in which the bearing surface **66** presses with lesser force on the support surface **67** or is lifted from this, wherein the tension rod **63** can release the clamping body **62** for movement away from the projections **57** or can actively move away from the projections **57**. In its position associated with the clamping position (shown in dashed lines in FIG. **7**), the actuating lever **64** preferably assumes an over-centre position.
[0105] Instead of a respective side contact body **40** or **41**, however, it is also possible to use a somewhat modified side contact body, for example a side contact body **141** shown by way of example instead of the side contact body **41**. With respect to the holding device **60**, the side contact body **141** corresponds to the side contact body **41** and **42**. Furthermore, the side contact body **141** is to be understood as an example, i.e. instead of the side contact body **40**, a correspondingly geometrically adapted side contact body, which is usable on the left side, could be provided in the manner of the side contact body **141**, which, however, is mirror symmetrical to the side support abutment body **141** with respect to the support section **44** and the tool section **43**.
[0106] In any case it is possible that the side contact bodies **40**, **41**, **141** either have the support section **44** arranged closer to the working tool **36**, as shown in the drawing, or have tool sections **43** arranged closer to the working tool **36**, for example when the abutment body **70**, **170**, explained below, is not needed.
[0107] On the side contact bodies **40**, **41**, **141**, the abutment bodies **70**, **170** can be releasably fixed, for example by means of a fixing device **80**. The side contact bodies **70**, **170** have abutment surfaces **79** which lie opposite the support surfaces **14**, **17**, when the abutment body **70**, **170** is in the state of being fixed to the side abutment body **40**, **41**, **141**, so that the workpiece W is held sandwiched between the abutment surfaces **79** and the support surfaces **14**, **17**, for example in an oblique position according to FIG. **3**.
[0108] This oblique position is particularly suitable for performing so-called crown moulding saw cuts. The workpiece W is optimally supported with its narrow side WS on the abutment surface **79** and can also be supported on the side contact surface **42**.
[0109] The abutment bodies **70**, **170** have plate bodies **71**, **171**. While the plate bodies **71** are rectangular in plan view, the plate bodies **171** of the abutment bodies **170** are wider in the region of their abutment surface **79**, so that a longer or more generous support of the workpiece W is possible than with the abutment body **70**. In the area of the abutment surface **79**, the abutment body **170** has, for example, a kind of wider support leg or wider foot section.
[0110] The plate bodies **70**, **170** have longer narrow side walls **72** which extend between shorter narrow side walls **73**, **74**, **174**. The abutment surfaces **79** are arranged on the narrow side walls **74**, **174** of the plate body **71**, **171**.
[0111] In the case of the abutment body **170**, recesses **179**A are provided in the region of its abutment surface **79**.
[0112] The plate bodies **71**, **171** have a base wall **76** which is reinforced by a rib structure **77**, and they extend between the respective narrow side walls **72**, **73**, **74**, **174**. The end faces of the narrow

side walls **72**, **73**, **74**, **174** which are facing away from the base wall **76**, advantageously also end faces of ribs of the rib structure **77**, provide support surfaces **75** for support on the side contact surface **42**. Consequently, therefore, the respective abutment body **70**, **170** can be supported in a planar manner by the side contact surface **42** in the region of the support surfaces **75**.

[0113] On the base wall **76**, a passage opening **78** is provided, in the present case a longitudinal slot, which is penetrated by a bolt body **81** of the fixing device **80**.

[0114] On the bolt body **81**, a handgrip **82** is arranged to be rotated by an operator. While in the case of the abutment body **70** the handgrip **82** protrudes in front of the base wall **76**, in the case of the abutment body **170** it plunges down at a recess **177**, so that it does not project in front of the base wall **76**.

[0115] The bolt body **81** is captively held by a securing device **83**, such as a disc body, a nut or the like, on the abutment body **70**, **170**.

[0116] The bolt body **81** can be screwed into a screw receptacle **84** on the respective side contact body **40**, **41**, **141** in order to clamp the abutment body **70**, **171** with the side contact body **40**, **41**, **141**. Thus, the fixing device **80** is designed as a clamping device, or the bolt body **81**, together with the handgrip **82** supported on the base wall **76**, forms a clamping means **80**A for clamping the abutment body **70**, **171** with the side contact body **40**, **41**, **141**.

[0117] When the bolt or bolt body **81** is released, i.e. the clamping means **80**A occupy a release position, the respective abutment body **70**, **171** can be adjusted along the vertical axis H in the context of an adjusting movement VH, to bring the abutment surface **79** into contact with the workpiece W, in particular its narrow side WS. Thus, therefore, the abutment surface **79** can be adjusted with respect to the workpiece W with the linear adjusting movement VH with respect to the vertical axis H. Crosswise, i.e. in the direction of the longitudinal axis L, an adjusting movement VL is possible by the clamping means **61** being released. Thus, therefore, the abutment surface **79** can be positioned optimally with respect to the workpiece W both with respect to the longitudinal axis L and with respect to the vertical axis H.

[0118] Between the abutment body **70**, **170** and the side contact body **40**, **41**, **141**, a bearing **85**, for example, a linear bearing or sliding bearing and/or a pivot bearing, is provided.

[0119] In the case of the abutment body **70**, the bearing **85** is to be used for example as a linear bearing, for example, by the abutment body **70** being displaceable along the slot forming a bearing recess **78**, which is realised through the passage opening **78**. In addition, the bearing **85** can also be used as a pivot bearing, for example not only to use the shorter narrow side walls **73** or **74** as an abutment surface **79**, but also to use the longer narrow side walls **72**. Specifically, the abutment body **70** is rotatable about the axis of the bolt body **81** when the clamping means **80**A are released.

[0120] In the case of the abutment body **171**, the bearing **85** is realised as a linear bearing with a linear guide **86**. The linear guide **86** comprises a guide receptacle **87** on the side contact body **141**, for example a guide groove into which at least one guide projection **88**, in the present case two guide projections **88**, engage, so that the abutment body **171** is linearly adjustable in an axial direction parallel to the vertical axis H along an adjustment axis V with respect to the side contact body **141**. The guide projections **88** extend, for example, parallel to the slot-shaped passage opening **78**.

[0121] A particularly favourable linear guide can be seen in this construction, namely such that the abutment surface **79** of the abutment body **171** is guided exactly parallel to the longitudinal axis L and exactly parallel to the vertical axis H using the linear guides **55**, **86**.

[0122] At the same time, the guide receptacle **87** and the guide projections **88** form anti-rotation contours **89** which prevent the abutment body **171** from rotating relative to the side contact body **141**.

[0123] Another embodiment may provide that an abutment body, for example an abutment body **270**, is held movably on a side contact body, but is captively held. For example, in the exemplary embodiment according to FIG. **6**, the abutment body **270** is arranged mounted on the side contact

body along the adjustment axis V, that is to say displaceable in the plane of the side contact surface **42**. The abutment body **270** comprises, for example, a support body, which is incorporated in a bearing opening of a bearing **85** on the side contact body **40**, displaceable along the adjustment axis V.

[0124] It is possible that the abutment body **270** is adjustable between the use position shown in solid lines, in which it protrudes in front of the side contact surface **42**, and a non-use position shown in dashed lines, in which it is adjusted away from the side contact surface **42**, for example behind this, and thus does not get in the way when not in use. Thus, for example, the bearing **85** at the same time forms an adjustment device **90** for adjusting the abutment body **20** between the non-use position and the use position.

[0125] The abutment body **270** may, for example, be fixable in a stationary position on the side contact body **40** with respect to one or more longitudinal positions along the adjustment axis V, using clamping, latching, for example by means of a clamping screw or the like.

[0126] It is also readily possible for the abutment body **270** to be arranged in a stationary manner on the side contact surface **42**, for example in the position shown in solid lines.

[0127] For clamping or for holding an abutment body on a side contact body, clamping can also be provided, for example using the clamping means **61**. Thus, for example, a clamping body movably mounted on the abutment body may be provided, which is received in the manner of a sliding block or grooved track in a receiving groove, for example in the manner of the guide groove **56** with its inwardly projecting projections **57** incorporated on the side contact body. The clamping body can be moved into a clamping position or into a release position by an actuating mechanism, for example a screw, an actuating lever in the form of the actuating lever **64** or the like, such that in the clamping position it holds projections engaging behind the receiving groove and clamping these to the abutment bodies in the clamping fit on the side contact bodies, or such that in the release position the clamping body is movable relative to the receiving groove and thus also the abutment body is movable with respect to the side abutment body.

[0128] Such a receiving groove may be provided for example on a side contact surface. There, the clamping body is then located in the use position, in which its abutment surface of the support surface is opposite the machine base.

[0129] The receiving groove may also extend, for example, on the upper side **47** and expediently over the upper side **47** to the rear side of the respective side contact body, so that the clamping body is guided into the receiving groove and the abutment body can be guided along the path of the receiving groove from the side contact surface to the top and/or back of the side contact body, where it then occupies a non-use position. The clamping body is then designed, for example, as a transverse bolt or rod-shaped clamping body, which can also follow the path of the receiving groove via curved sections or arced sections or angular sections. [0130] **10** Machine tool [0131] **11** Machine base [0132] **12** Pivot base [0133] **13** Feet [0134] **14** Support surface on **23** [0135] **15** Pivot member [0136] **16** Pivot member base body [0137] **17** Support surface [0138] **18** Actuation arm [0139] **19** Slot [0140] **20** Pivot fixing device [0141] **21** Actuating element [0142] **22** Scale [0143] **23** Support sections [0144] **24** Bearing device [0145] **25** Carrier [0146] **26** Oblique pivot bearing SA [0147] **27** Support arm [0148] **28** End section [0149] **29** Carriage [0150] **30** Drive assembly [0151] **31** Tool receptacle [0152] **32** Drive motor [0153] **33** Linear guide adjustment axis X [0154] **34** Guide body [0155] **35** Depth pivot bearing mitre pivot bearing [0156] **36** Working tool [0157] **37** Drive part [0158] **38** Holding body of **60** [0159] **39** Screw [0160] **40** Side contact body left [0161] **41** Side contact body right [0162] **42** Side contact surface [0163] **43** Tool section [0164] **44** Support section [0165] **45** Longitudinal end region at **43** [0166] **46** Longitudinal end region at **44** [0167] **47** Upper side [0168] **48** Oblique section stage **48**A [0169] **49** Straight section [0170] **50** Lower side [0171] **51** Lower side support surface [0172] **52** Guide projection [0173] **53** Guide projection [0174] **54** Rear grip projection [0175] **55** Linear guide [0176] **56** Guide groove [0177] **57** Projections for rear engagement [0178] **58** Rear engagement contours [0179] **59** Base side

contact surface [0180] **60** Holding device [0181] **61** Clamping means [0182] **62** Clamping body [0183] **63** Tension rod [0184] **64** Actuating lever pivot axis BH [0185] **65** Axis element [0186] **66** Bearing surface [0187] **67** Support surface [0188] **68** Actuation arm [0189] **69** [0190] **70** Abutment body [0191] **71** Plate body **171** [0192] **72** Longer narrow side wall [0193] **73** Shorter narrow side wall [0194] **74** Shorter narrow side walls [0195] with abutment surface [0196] **75** Support surface for **42** [0197] **76** Base wall **177** recess [0198] **77** Rib structure [0199] **78** Passage opening/slot [0200] **78**A Bearing recess [0201] **79** Abutment surface recess **179**A [0202] **80** Fixing device [0203] **80**A Clamping means [0204] **81** Bolt body [0205] **82** Handgrip [0206] **83** Securing device [0207] **84** Screw receptacle on **40**/**41** [0208] **85** Bearing/linear bearing [0209] **86** Linear guide [0210] **87** Guide receptacle [0211] **88** Guide projections [0212] **89** Anti-rotation contours [0213] **90** Adjustment device [0214] V Adjustment axis [0215] VH Adjusting movement vertical axis H [0216] VL Adjusting movement longitudinal axis [0217] W Workpiece [0218] WS Workpiece narrow side [0219] GS Pivot axis [0220] SA Oblique pivot axis [0221] X Adjustment axis [0222] TS Depth adjustment axis [0223] L Longitudinal axis [0224] H Vertical axis [0225] L**1** L**2** Longitudinal positions

Claims

1. A machine tool for machining a workpiece, comprising: a machine base having a support surface for supporting the workpiece; at least one side contact body mounted on the machine base and including a side contact surface extending along a longitudinal axis; at least one abutment body movably supported on the side contact body, the abutment body comprising: an abutment surface extending in a direction parallel to the longitudinal axis for supporting the workpiece between the support surface and the side contact surface, a guide projection engaged with a guide groove in the side contact body for movement of the abutment body along an adjustment axis angled with respect to the longitudinal axis, and a fixing device disposed between the guide projection and the abutment surface, the fixing device comprising a user-actuated threaded fastener that is engageable with the side contact body to releasably fix the abutment body in position along the adjustment axis.

2. The machine tool of claim 1, wherein the guide groove and the guide projection include interlocking anti-rotation contours.

3. The machine tool of claim 1, wherein the fixing device is operable to apply a retaining force that urges the guide projection against at least one surface of the guide groove to maintain the position of the abutment body.

4. The machine tool of claim 1, wherein the threaded fastener is manually actuated by a rotary knob.

5. The machine tool of claim 1, wherein the adjustment axis is a vertical axis.

6. The machine tool of claim 1, wherein the guide groove comprises opposing inner surfaces that extend generally parallel to the adjustment axis, and the guide projection is configured to be received between the opposing inner surfaces in a manner that limits lateral displacement of the abutment body relative to the adjustment axis.