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WALL CHANELLING MACHINE

(57)

A cutting tool (1, 1') which comprises a frame (20, 20') for facing a work surface, in use; a body (10, 10') movably mounted to the frame (20, 20'), the body (10, 10') comprising attachment means for attaching a cutting element (CD) to the body (10, 10'); a depth adjustment mechanism (30, 30') attached to the frame (20, 20'), the depth adjustment mechanism (30, 30') comprising a plurality of steps (301a-301i); an abutment member (40, 40') extending from the body (10, 10'); wherein an orientation of the depth adjustment mechanism (30, 30') is adjustable such that the abutment member (40, 40') can abut a selected one of the plurality of steps (301a-301i), to limit a position of the body (10, 10') relative to the frame (20, 20'), to set an intended cutting depth of the cutting element (CD), in use.

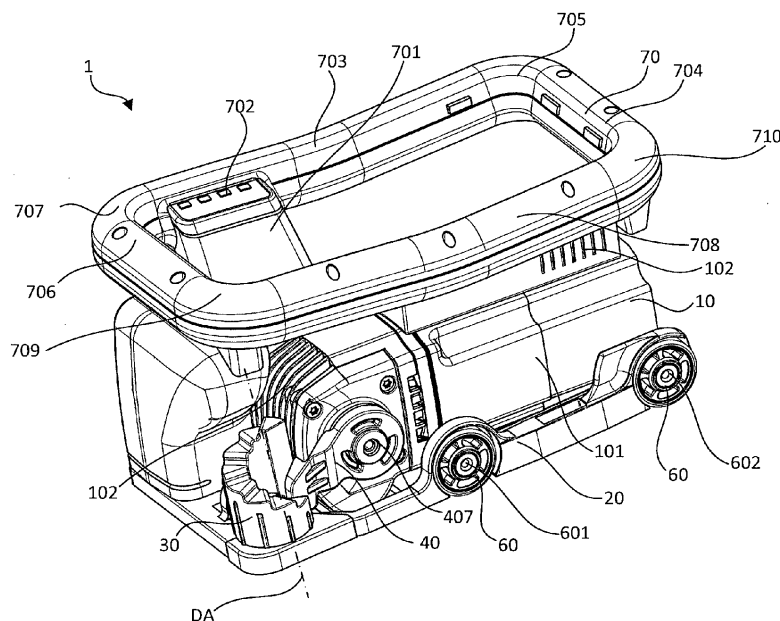


FIG. 1

Description**Technical Field of invention**

5 **[0001]** This invention relates generally to a cutting tool. More specifically, although not exclusively, this invention relates to cutting tool which is a wall channelling machine.

Background

10 **[0002]** Cutting tools sometimes have depth setting capabilities to adjust the intended cutting depth when the tool is used. In cutting tools where a first part, which contains the cutting element, moves relative to a second part, for example which faces a work surface, this means that depth setting might need be adjusted whilst holding the first part in a certain position relative to the second part. This can make depth setting arduous and cumbersome.

[0003] Also, some depth setting features of cutting tools are liable to slipping during use or being incorrectly secured in place, which can lead to inaccurate used of the cutting tool.

15 **[0004]** Furthermore, in some cases, due to cutting process generating dirt and dust, depth setting features can because difficult to manipulate due to the dirt or dust impeding movement of the depth setting features. Also, a user's view of the depth setting features may become obscured by dust or other debris, making depth setting even more challenging.

[0005] It would therefore be advantageous to provide a solution to at least some of these drawbacks.

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Summary of Invention

[0006] Accordingly, an aspect of the invention provides a cutting tool comprising a mechanism for adjusting a cutting depth of a cutting element.

25 **[0007]** The cutting tool may comprise a frame for facing a work surface, in use. The cutting tool may comprise a body pivotally mounted to the frame about a transverse axis. The body may comprise attachment means for attaching a cutting element to the body. The cutting tool may comprise a cutting element attached to, and extending from, the body. The cutting tool may comprise a depth adjustment mechanism attached to the frame. The depth adjustment mechanism may comprising a plurality of steps. The cutting tool may comprise an abutment member extending from the body. The orientation of the depth adjustment mechanism may be adjustable such that the abutment member can be arranged to abut any one of the plurality of steps, to set an intended cutting depth of the cutting element, in use. The relative position of the depth adjustment mechanism to the abutment member may be adjustable such that the abutment member can be arranged to abut any one of the plurality of steps to limit or set a position of the body relative to the frame, to set an intended cutting depth of the cutting element, in use. The position of the abutment member may be adjustable.

35 **[0008]** Another aspect of the invention provides a cutting tool comprising:

a frame for facing a work surface, in use;

a body movably mounted to the frame, the body comprising attachment means for attaching a cutting element to the body;

40 a depth adjustment mechanism attached to the frame, the depth adjustment mechanism comprising a plurality of steps;

an abutment member extending from the body;

45 wherein an orientation of the depth adjustment mechanism is adjustable such that the abutment member can abut a selected one of the plurality of steps, to limit, control or set a position of the body relative to the frame, to set an intended cutting depth of the cutting element, in use.

[0009] This may provide advantages in that depth is set by an abutment, rather than a system where parts are more integrated with one another. More specifically, even if dust and dirt is present on the depth adjustment mechanism or abutment member, a user will still be able to move these relative to one another to adjust the depth adjustment mechanism. Therefore, this system may be less prone to jamming, may be easier to see and may be easier to manipulate to adjust the intended cutting depth.

[0010] The body may be pivotally mounted to the frame about a transverse axis. The transverse axis may be perpendicular to an intended cutting direction of the cutting tool. The body may be pivotally mounted to the frame in an area at a rear of the cutting tool.

55 **[0011]** The depth adjustment mechanism may be rotatably mounted to the frame. The depth adjustment mechanism may be rotatably mounted to the frame about an axis of rotation which is perpendicular to the transverse axis. This may be such that one of the plurality of steps can be aligned with the abutment member, in use. The relative position of the depth adjustment mechanism to the abutment member may be adjustable by rotating the depth adjustment member.

[0012] The depth adjustment mechanism may be a knob. The knob may comprise a circumferential surface for gripping by hand. The circumferential surface may be knurled or may comprise undulations or a tactilely discernible surface roughness.

[0013] The steps of the depth adjustment mechanism may be arranged in an ascending pattern around a circumference of the depth adjustment mechanism.

[0014] The depth adjustment mechanism may be attached to the frame via a central fastener, about which the depth adjustment mechanism is rotatable. The frame may comprise a fastener boss for engaging the central fastener. The depth adjustment mechanism may comprise a recess for receiving the boss. A depth of the recess may be less than a height of the boss. This may be advantageous in that the depth adjustment mechanism is spaced from an upper surface of the frame. A fastener may be insertable or inserted through a hole in the depth adjustment mechanism to engage with the boss.

[0015] The abutment member may comprises a finger, which may otherwise be referred to as an arm. The finger may be configured to abut any one of the plurality of steps to set an intended cutting depth of the cutting element, in use. The finger may comprise an enlarged end for abutting any one of the plurality of steps.

[0016] The abutment member may comprise a mounting portion which is mounted or mountable to the body. The mounting portion may comprise location features configured to engage location features of a mounting portion of the body to rotationally constrain the abutment member relative to the body. The enlarged end may have a width with is less than a width of any one of the steps of the depth adjustment mechanism.

[0017] The mounting portion of the abutment member may have a circular boss on one side, the circular boss comprising the location features. The location features may comprise spines and grooves arranged around the circular boss. The grooves and/or spines may be configured to engage with a locking feature on the body. The locking feature of the body may be spines and grooves, for example such that the spines of the abutment member are received in grooves of the body and spines of the body are received in grooves of the abutment member. This may advantageously prevent rotation of the abutment member relative to the body, in that the abutment member is locked in position. This may be particularly advantageous in that use of the cutting tool may result in a moment being applied to the abutment member, which would act to rotate the abutment member relative to the body. The spines may provide a reaction force to prevent such rotation. This may also advantageously be used to set an angle of protrusion of the finger from the body.

[0018] The attachment means may be a drive means. The attachment means may be a drive means for driving the cutting element. The attachment means may be a drive means for attaching one or more cutting disc to the body. The one or more cutting disc may protrude from the body. The frame may comprise a cutting aperture. The one or more cutting disc may extend or be extendable through the cutting aperture. The frame may comprise shield walls surrounding the cutting aperture.

[0019] The cutting tool may comprise at least one wheel, for example two wheels located along each of two opposing sides of the frame. The frame may comprise a bottom face and the wheels may be rotatably mounted to the frame such that, when the cutting tool is placed on a planar work surface with the bottom face facing the work surface and the wheels on the work surface, the bottom face of the frame is spaced from the work surface.

[0020] When viewed in plan, a majority, e.g., 75%, 80%, 85%, 90%, 95%, of the body may overlap a part of an area bounded by a periphery of the frame.

[0021] The cutting tool may comprise a handle. The handle may have a continuous, endless shape. The handle may have a peripheral shape enclosing an open centre. The handle may have an unbroken shape. The handle may have a shape which forms an enclosed area. The handle may have a substantially rectangular shape. Advantageously, a handle of this shape may provide improved handling to the user, for example because the user may move their hands around the handle to lift the body of the cutting tool, to adjust the depth adjustment mechanism, and then relocate their hands to perform cutting, without having to release the handle. The handle may have a first gripping portion, a second gripping portion, a third gripping portion and a fourth gripping portion. The first and fourth gripping portions may be parallel to one another. The second and third gripping portions may be parallel to one another. The first gripping portion may be substantially perpendicular to the second and/or third gripping portion. The fourth gripping portion may be substantially perpendicular to the second and/or third gripping portion. The handle may comprise four connecting portions connecting the gripping portions together. The connection portions may provide corners of the rectangular shape of the handle.

[0022] The handle may be attached to the body such that the body is between the peripheral handle and the frame. When viewed in plan, the peripheral shape of the handle may be located above a periphery of the body. The handle may comprise a stem which has attachment means at one end for attaching to the body of the cutting tool. The handle may comprise only one stem. Advantageously, this may provide more space for the user to move their hands around the handle for operation of the cutting tool, and for adjusting the cutting depth. The handle may comprise electrical controls for operating the cutting tool. The stem may comprise electrical controls for operating the cutting tool.

[0023] The handle may comprise a first gripping portion extending along an intended cutting direction. The handle may comprise a second gripping portion substantially perpendicular to the first gripping portion. The handle may comprise a third gripping portion substantially parallel to the second gripping portion and spaced therefrom. The handle may be

substantially U-shaped. The handle may be connected to one side of the body at a free end of each of the second gripping portion and the third gripping portion, so that the first gripping portion is aligned with the body.

[0024] The cutting tool may comprise the cutting element. The cutting element may comprise a, or a plurality of, cutting disc/s.

[0025] The cutting tool may be a wall channelling machine or a wall grooving machine, which may also be referred to as a wall channelling machine.

[0026] Another aspect of the invention provides a wall chaser or a wall grooving machine or a wall channelling machine. The wall channelling machine may be any of the aforementioned cutting tools.

[0027] Reference is made, throughout this specification, to 'upper' and 'lower', and this is to mean when the cutting tool is located on a horizontal surface in a cutting orientation. Furthermore, 'front', 'forward', 'rear' and 'rearward' relate to intended cutting directions of the cutting tool, in use.

[0028] For the avoidance of doubt, any of the features described herein apply equally to any aspect of the invention.

[0029] Within the scope of this application it is expressly intended that the various aspects, embodiments, examples and alternatives set out in the preceding paragraphs, in the claims and/or in the following description and drawings, and in particular the individual features thereof, may be taken independently or in any combination. That is, all embodiments and/or features of any embodiment can be combined in any way and/or combination, unless such features are incompatible. For the avoidance of doubt, the terms "may", "and/or", "e.g.", "for example" and any similar term as used herein should be interpreted as non-limiting such that any feature so-described need not be present. Indeed, any combination of optional features is expressly envisaged without departing from the scope of the invention, whether or not these are expressly claimed. The applicant reserves the right to change any originally filed claim or file any new claim accordingly, including the right to amend any originally filed claim to depend from and/or incorporate any feature of any other claim although not originally claimed in that manner.

Brief Description of Drawings

[0030] Example embodiment(s) of the invention are illustrated in the accompanying drawings, in which:

Figure 1 illustrates a first example of a cutting tool which is a wall channelling machine, set at a first cutting depth;

Figure 2 illustrates a frame, a depth adjustment mechanism and an abutment member of the wall channelling machine shown in Figure 1;

Figure 3 illustrates the abutment member of the wall channelling machine of Figure 1;

Figure 4 illustrates a mounting portion of the body of the wall channelling machine of Figure 1;

Figures 5A, 5B and 5C illustrate the wall channelling machine shown in Figure 1, during adjustment of the depth adjustment mechanism;

Figure 6 illustrates the wall channelling machine shown in Figure 1, set at a second cutting depth;

Figure 7 illustrates the wall channelling machine shown in Figure 1, set at a third cutting depth;

Figures 8A and 8B illustrate the wall channelling machine shown in Figure 1, set at a ninth cutting depth; and

Figures 9A and 9B illustrate a second example of a wall channelling machine.

Detailed Description

[0031] Reference is made, throughout this specification, to 'upper' and 'lower', and this is to mean when the cutting tool is located on a horizontal surface in a cutting orientation. Furthermore, 'front', 'forward', 'rear' and 'rearward' relate to intended cutting directions, in use.

[0032] Referring now to Figure 1, there is shown a cutting tool, which in this example is a wall channelling machine 1, which may otherwise be referred to as a wall chaser or a wall grooving machine. In this example the wall channelling machine 1 has a body 10, a frame 20, a depth adjustment mechanism 30, an abutment member 40 and a handle 70. The wall channelling machine 1 also has a cutting element in the form of a plurality of cutting discs CD, one of which is visible in Figure 5B, and which is attached to the body 10 via attachment means (not shown). In this example the attachment means are drive means configured to rotate the cutting discs CD, in use. The cutting discs CD may be any number of cutting discs and may be coaxially arranged and spaced apart. The cutting discs DC may have different diameters to one another. The wall channelling machine 1 is used to cut channels in walls, for example to route electrical cabling or plumbing pipes in the walls. The intended cutting depth of the cutting discs CD is set by rotating the body 10, about a transverse axis TA, relative to the frame 20, such that the cutting discs protrude by a desired amount beyond a bottom face of the frame 20. This specification describes an advantageous way of setting this intended cutting depth.

[0033] Referring now to Figure 2, the frame 20, depth adjustment mechanism 30 and abutment member 40 are shown in isolation.

[0034] In this example the frame 20 has a generally flat base portion 201 with a bottom face (not shown) which is

configured to face a work surface, which is a surface to be channelled by the wall channelling machine 1. The frame has a fastener boss 207 on an upper surface. The fastener boss 207 has an internal bore for receiving and engaging a fastener, preferably a screw, to attach the depth adjustment mechanism 30 to the frame, as is described in more depth subsequently.

[0035] In this example the frame 20 has a cutting aperture 201 through which the cutting discs CD pass to reach the work surface, in use. A plurality of shield walls 203 surround the cutting aperture 202, to prevent items from touching the cutting discs CD when the intended cutting depth is such that a portion of each cutting disc CD is located above the base portion 201 of the frame.

[0036] In this example the frame 20 has two intermediate wheel arches 204 located on opposite sides of the frame 30 and partway along a length of the frame 20, the length direction corresponded to a cutting direction, in use. In the centre of each intermediate wheel arch 204 is located an axle fastener boss 205. A wheel 60 of the wall channelling machine 1 is locatable in each intermediate wheel arch 204 such that the fastener boss 205 passes through a central hole of the wheel 60. A fastener with a washer is then attached to the axle fastener boss 205, the washer constraining the wheel 60 in the axial direction. The wheel 60 then rotates about the axle fastener boss 205. The axle fastener may be any suitable type, for example a screw.

[0037] In this example the frame 30 has two rear wheel arches 206 located on opposite sides of the frame 20 and at the rear of the frame 20, with respect to the cutting direction. In the centre of each rear wheel arch 206 is an axle hole 207. A single rear axle (not shown) is received through both axle holes and a wheel 60 is attached to either end of the rear axle via a rear axle fasteners 602. The rear axle passes through central holes in the wheels 60 and the rear axle fasteners 602 has washers which constrain the wheels 60 axially. The rear axle fasteners 602 are preferably bolts or screws.

[0038] In this example the diameter of each wheel 60 is such that, when the wall channelling machine 1 is placed on a flat working surface, the bottom face of the base portion 201 of the frame 20 is spaced from and parallel with the working surface.

[0039] In this example the depth adjustment mechanism 30 is rotatably attachable to the frame 20 about an axis of rotation DA. The depth adjustment mechanism 30 has a recess (not shown) on a surface which faces the frame 20, in use, and a central through-hole 303 at an end of the recess. The recess is for receiving the fastener boss 207 of the frame 20, to rotatably attach the depth adjustment mechanism 30 to the frame 20 using a fastener (not shown) received through the hole 303 and into the fastener boss 207. A depth of the recess in the depth adjustment mechanism 30 is less than a height of the fastener boss 207, which that a bottom face of the depth adjustment mechanism 30 is spaced from the base portion 201 of the frame 20. The depth adjustment mechanism 30 is in the form of a rotatable knob with spines 302 located around a radial surface, to enable the depth adjustment mechanism to be gripped by a user, to be rotated. The depth adjustment mechanism 30 has a plurality of steps 301a-301i which face upwards when the wall channelling machine 1 is used on a horizontal work surface (not shown). The steps 301a-301i are arranged in an ascending pattern in a circumferential direction, from a first intended cutting depth setting at a first step 301a through to a ninth intended cutting depth setting at a ninth step 301i. In this example, the steps correspond to the following intended cutting depths:

Step	Intended cutting depth (mm)
First step 301a	50
Second step 301b	45
Third step 301c	40
Fourth step 301d	35
Fifth step 301e	30
Sixth step 301f	25
Seventh step 301g	20
Eighth step 301h	15
Ninth step 301i	0

[0040] It will be appreciated, however, that these steps 301a-301i purely illustrative and that any number of steps, and different intended cutting depths, may be provided.

[0041] Referring now to Figure 2 and Figure 3, the abutment member 40 of this example is shown in detail. The abutment member 40 has a finger 401, or arm, with an enlarged end 402. The enlarged end 402 is for abutting any one

of the steps 301a-301i of the depth adjustment mechanism 30. The enlarged end 402 has a width which is less than a width of any one of the steps 301a-301i. At the other end of the finger 401 is a circular mounting portion 403. The finger 401 has a generally flat shape and extends from the mounting portion 403 in a radial direction, with the flat shape of the finger 401 being parallel to the flat shape of the circular mounting portion 403. The enlarged end 402 is also generally flat in shape, with a greater thickness and height than the part of the finger 401 between the enlarged end 402 and the mounting portion 403. The mounting portion 403 has a circular boss on one side, with spines 404 and grooves 405 arranged therearound. The abutment member 40 has a hole 406 through a centre of the mounting portion 403 for receiving an abutment member fastener 407 (shown in Figure 1) for attaching the abutment member 40 to the body 10.

[0042] Referring again to Figure 1, the body 10 has a housing 101 which houses a battery (not shown), an electric motor (not shown), control circuitry (not shown) and the attachment means (not shown) which are drive means for rotating the cutting discs CD. The housing 101 may also contain a drive train (not shown) for transferring rotational power from the electric motor to the drive means. The housing 101 may have various sub-housings such as a motor housing, attachment means housing and battery housing. However, it will be appreciated that other constructions of housing 101 may be used. In this example the housing 101 has air vents 102 for releasing heat energy from any of the components located inside of the housing 101, to outside of the housing 101. The body also has a rotation means (not shown) which is configured to rotatably connect the body 10 to the rear axle, such that the body 10 can be rotated about the transvers axis TA relative to the frame 20. It will be appreciated that the body 10 may be rotatably connected to the frame 20 elsewhere, as it is not essential that this connection is about the rear axle.

[0043] Referring now to Figure 4, a mounting arrangement 105 of the housing 101 of this example is shown. The mounting arrangement 105 is for attaching the abutment member 40 to the body 10. The mounting arrangement has a cylindrical recess with spines 106 and grooves 107 located around an inside periphery thereof. The mounting arrangement 105 has a central fastener boss 108.

[0044] In this example the wall channelling machine 1 has a handle 70. In this example the handle 70 has a peripheral shape enclosing an open centre. That is, the handle has a continuous, or unbroken, shape. The handle 70 has a substantially rectangular shape, when viewed in plan. The handle 70 has a stem 701 extending out of a central plane of the peripheral shape. The stem 701 has attachment means (not shown) for attaching the stem 701, and thereby the handle 70, to an upper surface of the body 10, the upper surface being a surface facing away from the frame 20. In this example, there is only one stem 701 and this stem provides the only attachment to the body 10. The stem 701 has electrical controls 702, or electronic control input means, on an upper surface, for controlling the wall channelling machine 1. When viewed in plan, the peripheral shape of the handle 70 of this example is located above a periphery of the body 10. That is, the handle 70 provides the extents the wall channelling machine 1 when viewed in plan. The length of the stem 701 is such that, when the handle 70 is attached to the body 10, there is sufficient space around the handle 70 for a user to grip the handle 70.

[0045] In this example the handle 70 comprises a first gripping portion 703 and a fourth gripping portion 708 extending along a cutting direction, and a second gripping portion 704 and a third gripping portion 706 substantially perpendicular to the cutting direction. The second gripping portion 704 is at a rear of the wall channelling machine 1, relative to the cutting direction, and the third gripping tool 706 is at a front of the wall channelling machine 1, relative to the cutting direction. The first gripping portion 703 and the second gripping portion 704 are connected by a first substantially continuous connecting portion 705, the third gripping portion 706 is connected to the first gripping portion 703 by a second substantially continuous connecting portion 707, the third gripping portion 706 is connected to the fourth gripping portion 708 by a third substantially continuous connecting portion 709, and the fourth gripping portion 708 is connected to the second gripping portion 704 by a fourth substantially continuous connecting portion 710. The connecting portions 705, 707, 709, 710 provide corners to the peripheral handle 70. In this way, the handle 70 is substantially rectangular in shape. The stem 701 is connected to the first gripping part 703. However, it will be appreciated that the stem 701 could be connected to another part of the handle 70.

[0046] In use, a user can slide their hands around the handle 70, as required, to perform cutting operations and to adjust the intended cutting depth.

[0047] In this example, the handle 70 is formed of a top part and a bottom part, which are attached together by fasteners, holes for which are visible in Figure 1.

[0048] The assembly of the wall channelling machine 1 is now described.

[0049] The abutment member 40 is attached to the body 10 by inserting the circular boss of the mounting portion 403 into the recess of the mounting arrangement 105. The spines 404 of the abutment member 40 are received in the grooves 107 of the mounting arrangement 105, and the spines 106 of the mounting arrangement 105 are received in the grooves 405 of the abutment member 40. This interlocking arrangement of spines and grooves prevents rotation of the abutment member relative to the body 10. The angle of the finger 40 relative to the body 10 is able to be set by selective engaging the spines with the grooves. A fastener, preferably a bolt or a screw, is inserted through the hole 406 of the abutment member to threadedly engage with the fastener boss 108 of the mounting arrangement 105.

[0050] The body 10 is mounted to the frame by the rotation means engaging the rear axle. The cutting discs CD pass

through the cutting aperture 202 of the frame 20. The depth with which the cutting discs CD protrude from the bottom face of the frame 20 is dependent upon the angle with which the body 10 is rotated relative to the frame 20.

[0051] The depth adjustment mechanism 30 is attached to the frame 20 by inserting the fastener through the central through-hole 303 in the depth adjustment mechanism 30, when the fastener boss 201 of the frame 20 is in the recess of the depth adjustment mechanism 30. A fastener is inserted through the hole 303 in the depth adjustment mechanism 30 to attach the depth adjustment mechanism 30 to the fastener boss 201 of the frame 20. The arrangement of the fastener boss 201 and the recess in the depth adjustment mechanism 30 is such that a bottom surface of the depth adjustment mechanism 30 is spaced from an upper surface of the frame.

[0052] The handle 70 is attached to the body via the attachment means of the stem 701 of the handle. In examples the attachment means are fasteners which pass through the housing 101 of the body 10 and are fixed to an end of the stem 701. The control circuitry is in electrical communication with the electrical controls 702 when the handle 70 is connected to the housing 101.

[0053] The use and adjustment of the intended cutting depth of the wall channelling machine 1 is now described, with reference to Figure 1 and Figures 5 to 8.

[0054] In Figure 1, the abutment member 40 is abutting the first step 301a, which, in this specific example, corresponds to an intended cutting depth of 50 mm. This means that the cutting discs CD protrude from the bottom face of the frame 20 by a maximum of 50 mm plus a gap between the bottom face and the work surface, provided by the wheels 60. Accordingly, when the cutting discs CD are rotated and the cutting tool is moved along a work surface, the wall channelling machine 1 cuts a channel in the work surface which is 50 mm deep. This channel may be chasing for running electrical cables or plumbing pipes in a wall or a floor, for example.

[0055] In Figure 6 the abutment member 40 is abutting the second step 301b, which corresponds to an intended cutting depth of 45 mm. In Figure 7 the abutment member 40 is abutting the third step 301c, which corresponds to an intended cutting depth of 40 mm. In Figures 8A and 8B, the abutment member 40 is abutting the ninth step 301i, which corresponds to an intended cutting depth of 0 mm, and so the cutting discs CD do not protrude sufficiently to cut a channel in a work surface. Setting the depth to 0 mm may be useful for moving the wall channelling machine 1 when not being used to cut a channel.

[0056] Changing of the intended cutting depth is depicted in Figures 5A, 5B and 5C. In order to change the intended cutting depth, a user lifts the body 10 about the transverse axis TA so that the abutment member 10 moves away from the depth adjustment mechanism 30. With the abutment member 40 moved away from the depth adjustment mechanism 30, the depth adjustment mechanism 30 is rotated until the desired step 301a-301i, that is the step 301a-301i which corresponds to a desired intended cutting depth, is aligned with the enlarged end 402 of the abutment member 40. The body 10 is then lowered such that the enlarged end 402 of the abutment member 40 abuts the desired step 301a-301i. This depth adjustment is ergonomic, simple and robust.

[0057] Referring now to Figures 9A and 9B there is shown a second example of a wall channelling machine 1', which may also be referred to as a wall grooving machine. This wall channelling machine 1' has similar features to the previous wall channelling machine 1, and these similar features are denoted with the same reference numeral with a succeeding prime (').

[0058] The wall channelling machine 1' of this example differs from the previous cutting tool in that the handle 70' is not a peripheral handle. In this example, the handle 70' comprises a first gripping portion 703' extending along a grooving direction of the body 10' and a second gripping portion 704' substantially perpendicular to the first gripping portion 703'. The first gripping portion 703' and the second gripping portion 704' of the handle 70' are connected by a first substantially continuous connecting portion 705'. In use, a user can slide a hand from the first gripping portion 703' to the second gripping portion 704' without releasing the handle 70'. The handle 70' also comprises a third gripping portion 706', which is substantially perpendicular to the first gripping portion 703'. The third gripping portion 706' is connected to the first gripping portion 703' by a second connecting portion 707', so that the handle 70' is substantially U-shaped.

[0059] The handle 70' is also connected to a side of the body 10' at a free end of each of the second gripping portion 704' and the third gripping portion 706'. In this way, the first gripping portion 703' is aligned with the body 10'.

[0060] The second connecting portion 707' of the handle 70' is connected to the body 10' such that each end of the third gripping portion 706' of the handle 70' is connected to the body 10'. The third gripping portion 706' of the handle 70' protrudes beyond the side of the body 10' to which it is connected, further than the second gripping portion 704', in order to allow offset gripping of the handle 70'.

[0061] The second connecting portion 707' extends at an acute angle β relative to the first gripping portion 703' and the third gripping portion 706'. The first connecting portion 705' may extend at an acute angle α relative to the first gripping portion 703' and the second gripping portion 704'.

[0062] At least part of at least one of the gripping portions 703', 704', 706' and/or connecting portions 705', 707' of the handle 870' may extend at an acute angle to the bottom face of the frame 20' to facilitate gripping by a user.

[0063] In this example, the first gripping portion 703' converges towards the bottom face of the frame 20' as it extends from the first connecting portion 705'. The second gripping portion 704' also converges towards the bottom face of the

frame 20' as it extends from the first connecting portion 705'. The third gripping portion 706' also converges towards the bottom face of the frame 20' as it extends from the second connecting portion 707'. The third gripping portion 706' is further from the bottom face of the frame 20' than the second gripping portion 704'.

[0064] In this example, the handle 70' is tubular and comprises a substantially continuous wall formed as a unitary structure, for example formed by extrusion blow moulding.

[0065] The wall channelling machine 1' of this example also differs from the wall channelling machine 1 of the previous example in that the abutment member 40' is unitary with a part of the body, for example with the housing 101' or the motor housing specifically. However, it will be appreciated that this may, instead, be attached at the same point as the forward end of the handle 70' and so be more similar to the assembly in the previous example.

[0066] Although there are slight difference between the structure of the wall channelling machine 1' of this example and that of the previous example, it will be appreciated that operation and adjustment is achieved in substantially the same way.

[0067] It will be appreciated by those skilled in the art that several variations to the aforementioned embodiments are envisaged without departing from the scope of the invention. For example, the control circuitry may be located elsewhere, for example in a different part of the handle or in the body. It will also be appreciated that although the example refer to a wall channelling machine, the depth adjustment may be applicable to other cutting tools where a first part is moved relative to a second part to adjust a cutting depth.

[0068] It will also be appreciated by those skilled in the art that any number of combinations of the aforementioned features and/or those shown in the appended drawings provide clear advantages over the prior art and are therefore within the scope of the invention described herein.

Claims

1. A cutting tool (1, 1') comprising:

a frame (20, 20') for facing a work surface, in use;
a body (10, 10') movably mounted to the frame (20, 20'), the body (10, 10') comprising attachment means for attaching a cutting element (CD) to the body (10, 10');
a depth adjustment mechanism (30, 30') attached to the frame (20, 20'), the depth adjustment mechanism (30, 30') comprising a plurality of steps (301a-301i);
an abutment member (40, 40') extending from the body (10, 10');

wherein an orientation of the depth adjustment mechanism (30, 30') is adjustable such that the abutment member (40, 40') can abut a selected one of the plurality of steps (301a-301i), to limit a position of the body (10, 10') relative to the frame (20, 20'), to set an intended cutting depth of the cutting element (CD), in use.

2. A cutting tool (1, 1') according to claim 1, wherein the body (10, 10') is pivotably mounted to the frame (20, 20') about a transverse axis (TA).

3. A cutting tool (1, 1') according to claim 1 or claim 2, wherein the depth adjustment mechanism (30, 30') is rotatably mounted to the frame (20, 20'), such that one of the plurality of steps (301a-301i) can be aligned with the abutment member (40, 40'), in use.

4. A cutting tool (1, 1') according to claim 3, wherein the steps (301a-301i) of the depth adjustment mechanism (30, 30') are arranged in an ascending pattern around a circumference of the depth adjustment mechanism (30, 30').

5. A cutting tool (1, 1') according to any of claims 2 to 4, wherein the depth adjustment mechanism (30, 30') is attached to the frame (20, 20') via a central fastener, about which the depth adjustment mechanism (20, 20') is rotatable.

6. A cutting tool (1, 1') according to claim 5, wherein the frame (20, 20') comprises a fastener boss (207) for engaging the central fastener, and wherein the depth adjustment mechanism (30, 30') comprises a recess for receiving the boss (207), wherein a depth of the recess is less than a height of the boss (207).

7. A cutting tool (1, 1') according to any preceding claim, wherein the abutment member (40, 40') comprises a finger (401), the finger (401) being configured to abut any one of the plurality of steps (301a-301i) to set an intended cutting depth of the cutting element (CD), in use.

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8. A cutting tool (1) according to claim 7, wherein the abutment member (40) comprises a mounting portion (403) which comprises location features (404, 405) configured to engage location features (106, 107) of a mounting portion (105) of the body (10) to rotationally constrain the abutment member (40) relative to the body (10).

9. A cutting tool (1) according to claim 8, wherein the mounting portion (403) of the abutment member (40) comprises a circular boss on one side, the circular boss comprising the location features, the location features comprising spines (404) and grooves (405) arranged around the circular boss, the grooves (405) and/or spines (404) configured to engage with a locking feature (106, 107) on the body (10).

10. A cutting tool (1, 1') according to any preceding claim, wherein the attachment means is a drive means for attaching one or more cutting disc (CD) to the body (10, 10'), wherein the frame (20, 20') comprises a cutting aperture (202), and wherein the one or more cutting disc (CD) is extendable through the cutting aperture (202).

11. A cutting tool (1) according to any preceding claim, comprising a handle (70) which has a continuous, endless shape.

12. A cutting tool (1) according to claim 11, wherein the handle (70) comprises a stem (701) which has attachment means at one end for attaching to the body (10) of the cutting tool (1).

13. A cutting tool (1) according to claim 11 or claim 12, wherein the handle comprises electrical controls (702) for operating the cutting tool (1).

14. A cutting tool (1, 1') according to any preceding claim, comprising the cutting element (CD), wherein the cutting element comprises a plurality of cutting discs (CD).

15. A cutting tool (1, 1') according to any preceding claim, wherein the cutting tool (1, 1') is a wall channelling machine.

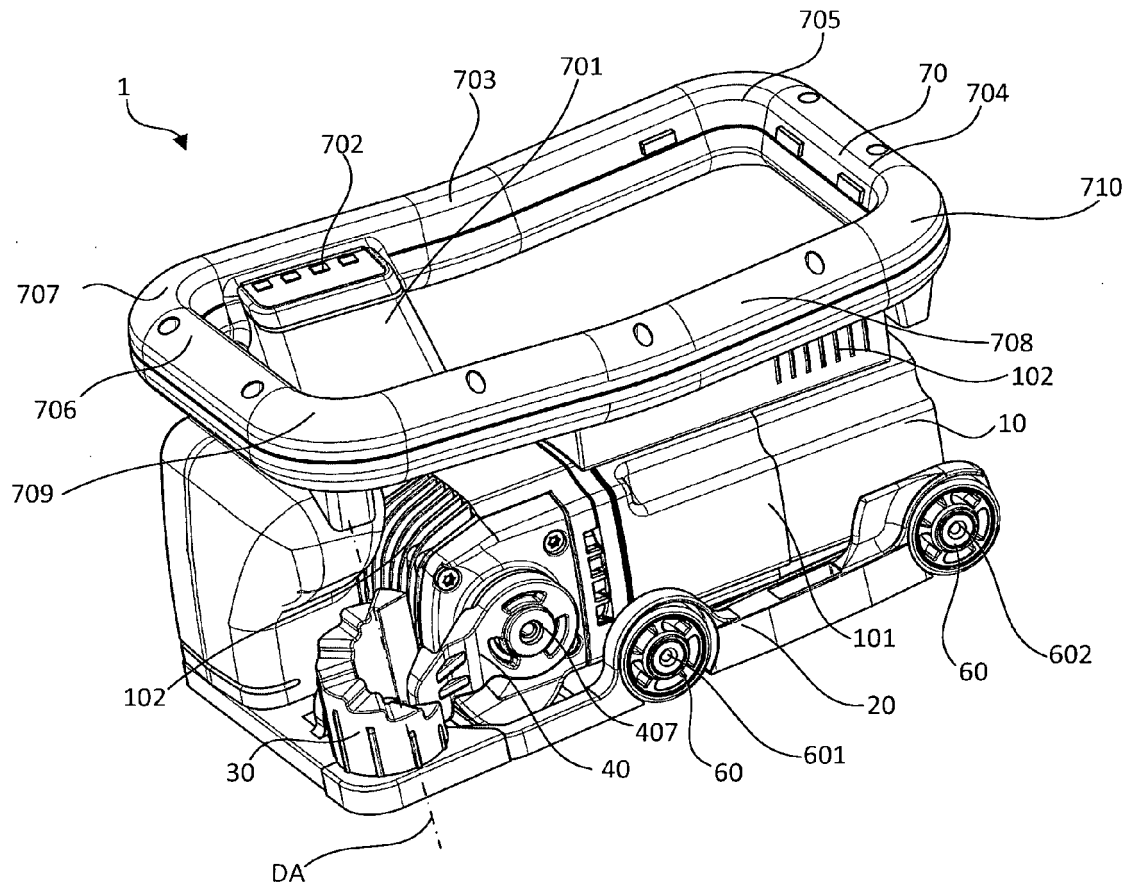


FIG. 1

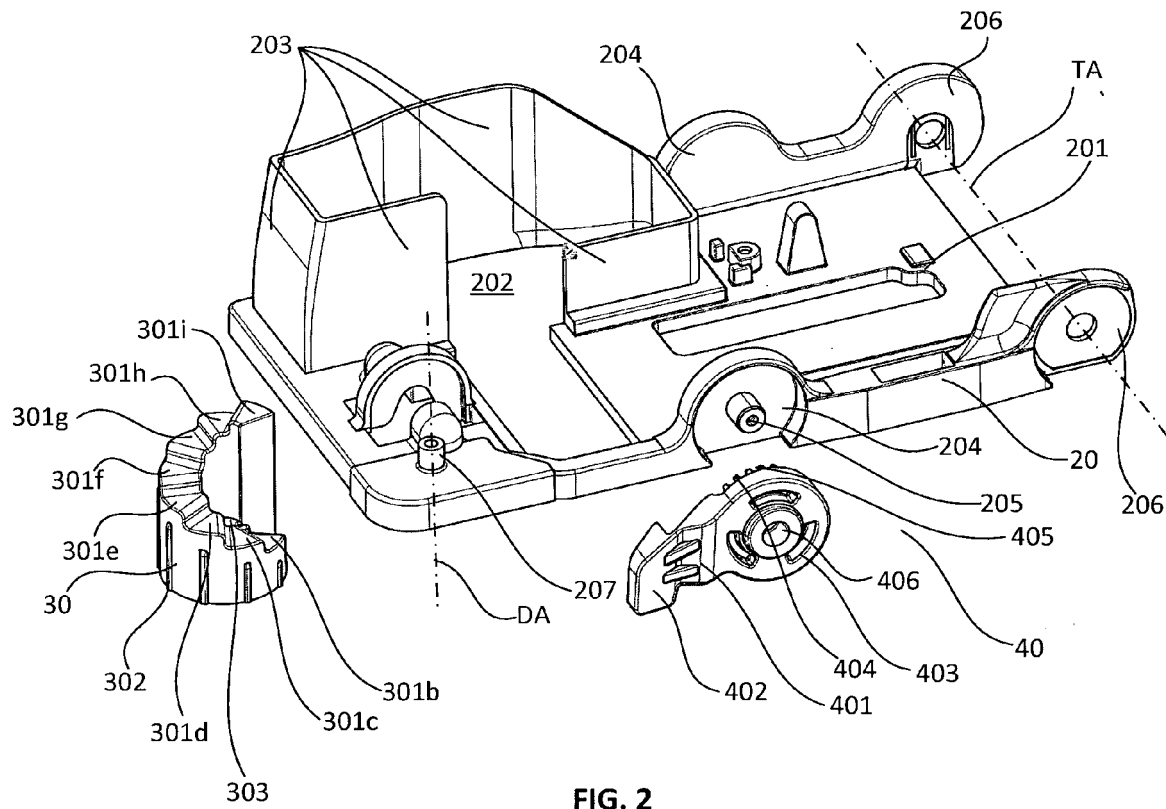


FIG. 2

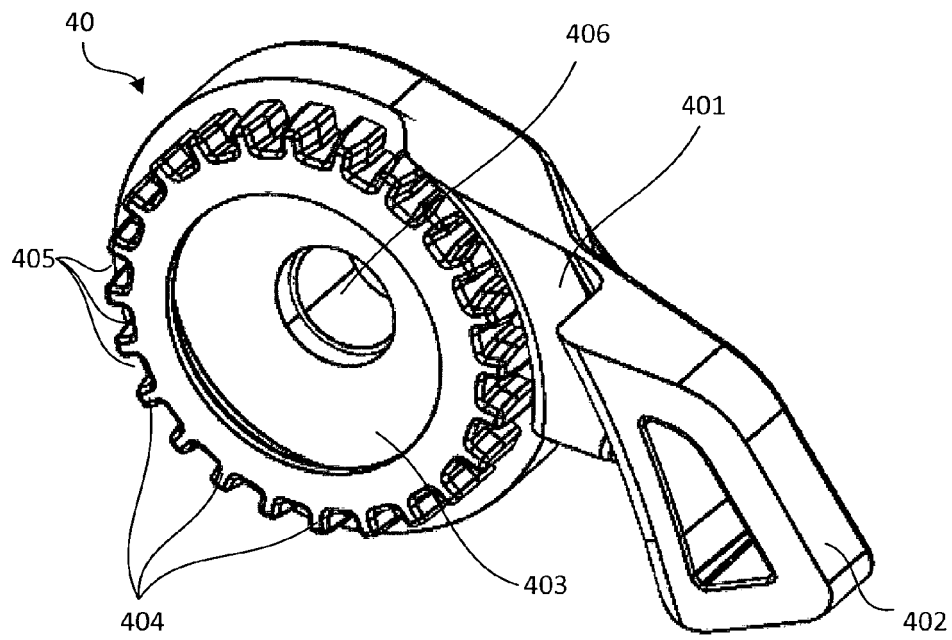


FIG. 3

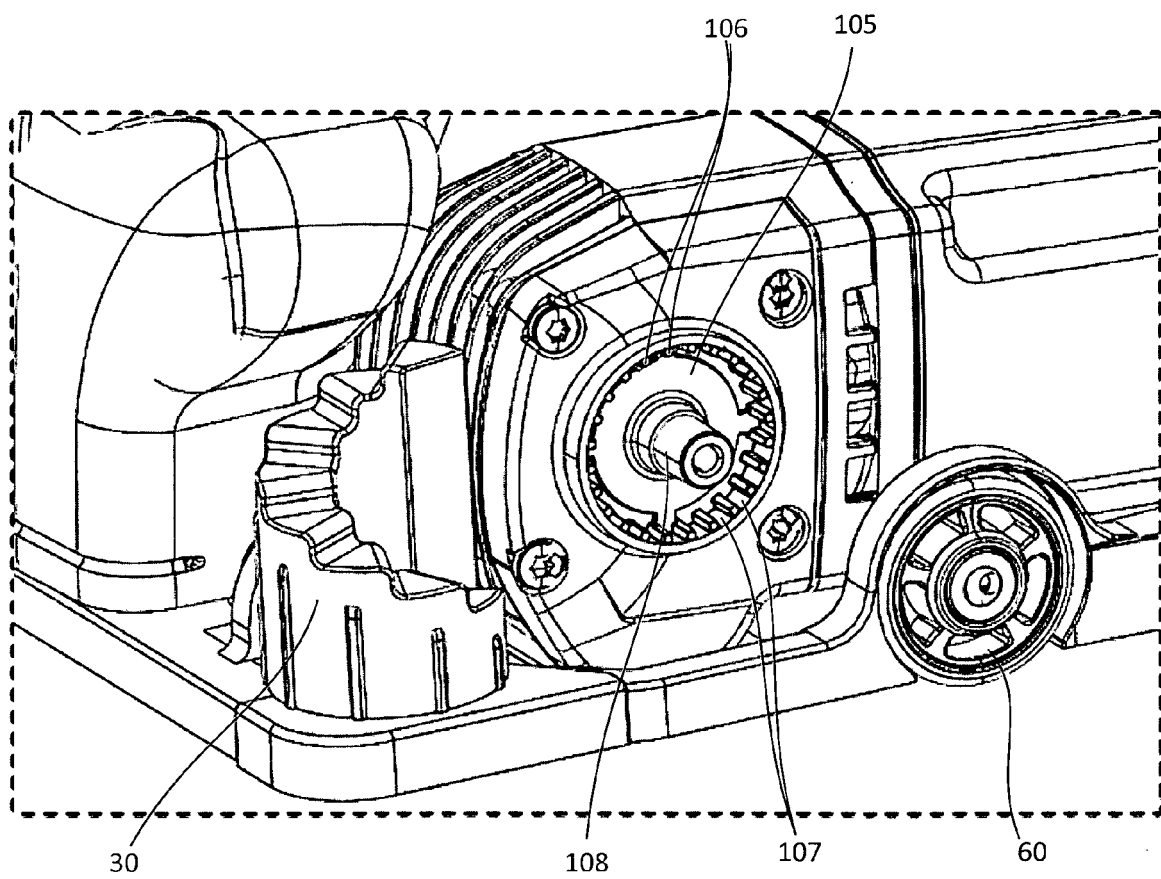


FIG. 4

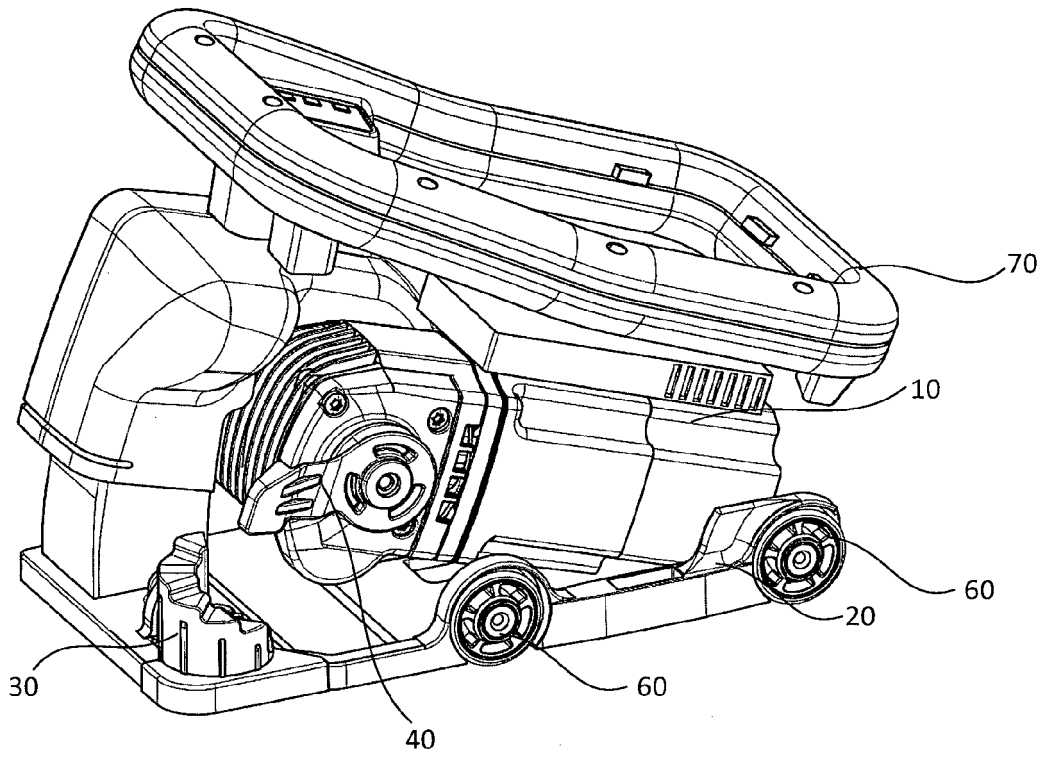


FIG. 5A

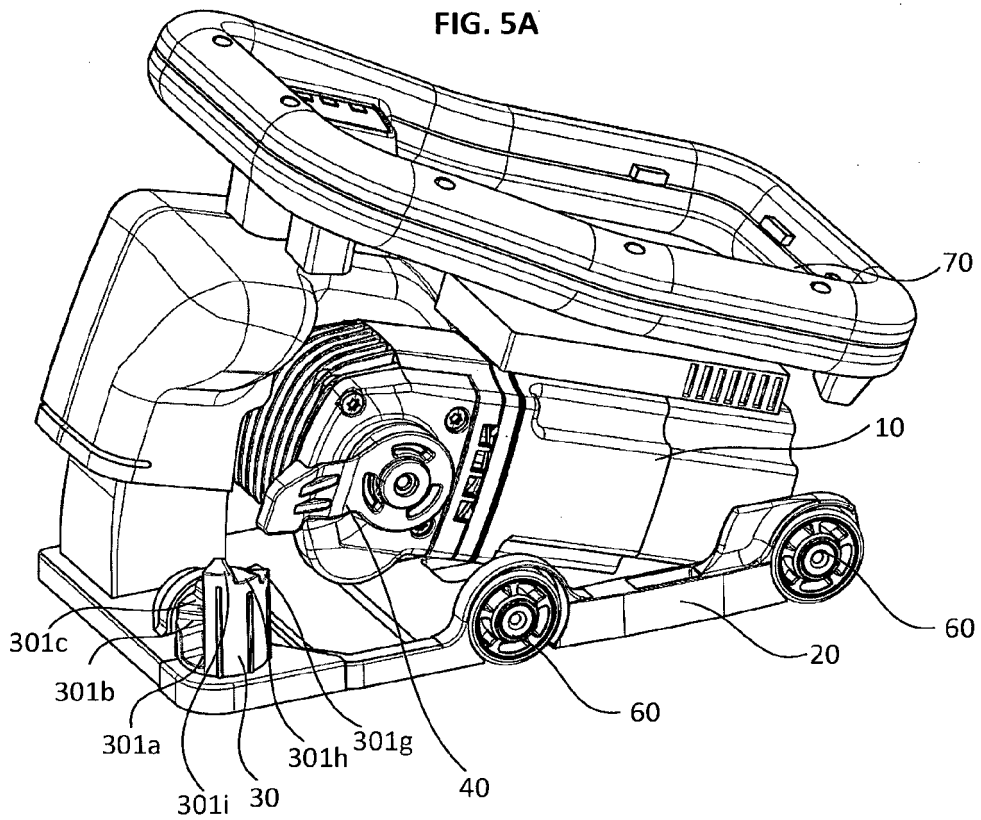


FIG. 5B

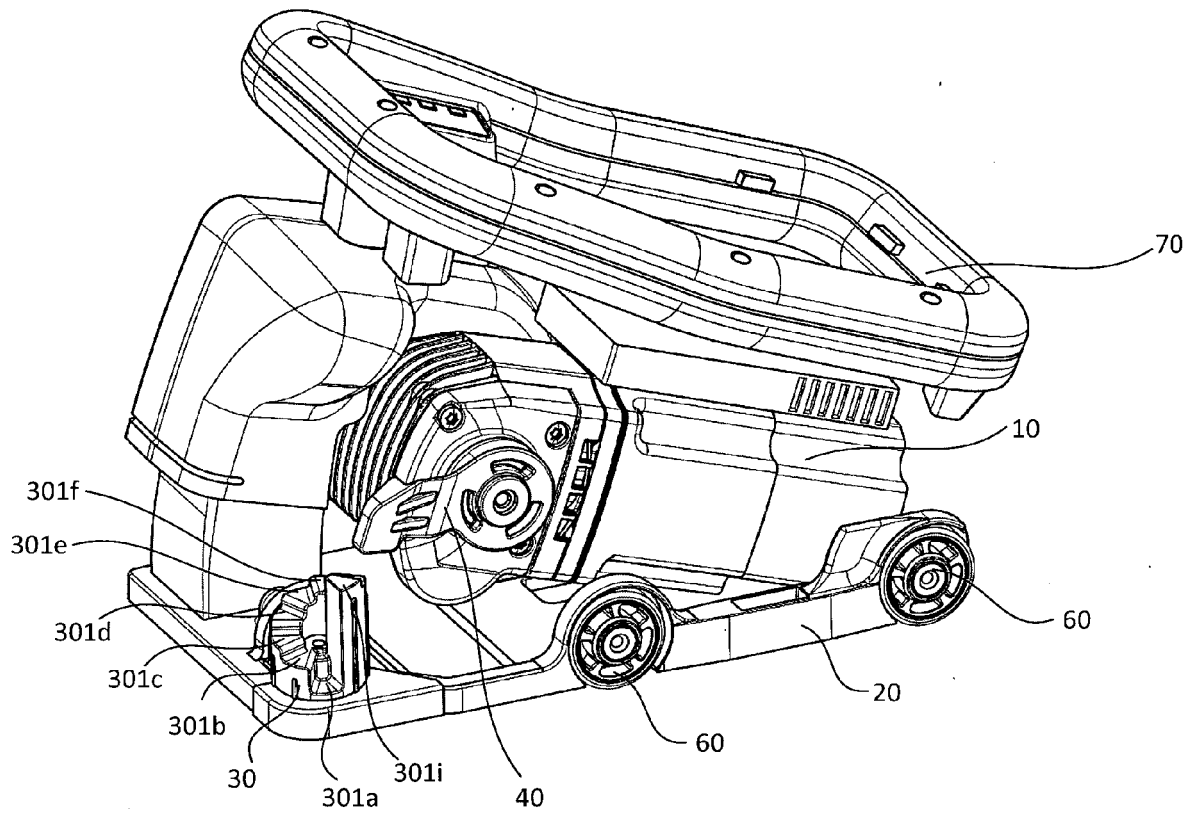


FIG. 5C

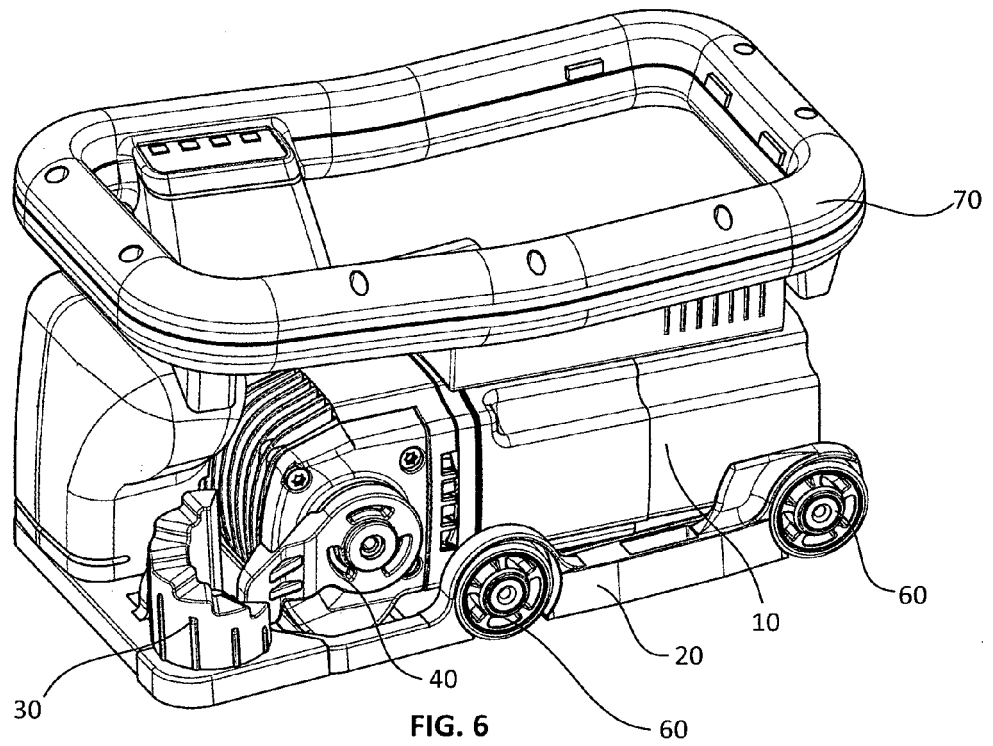


FIG. 6

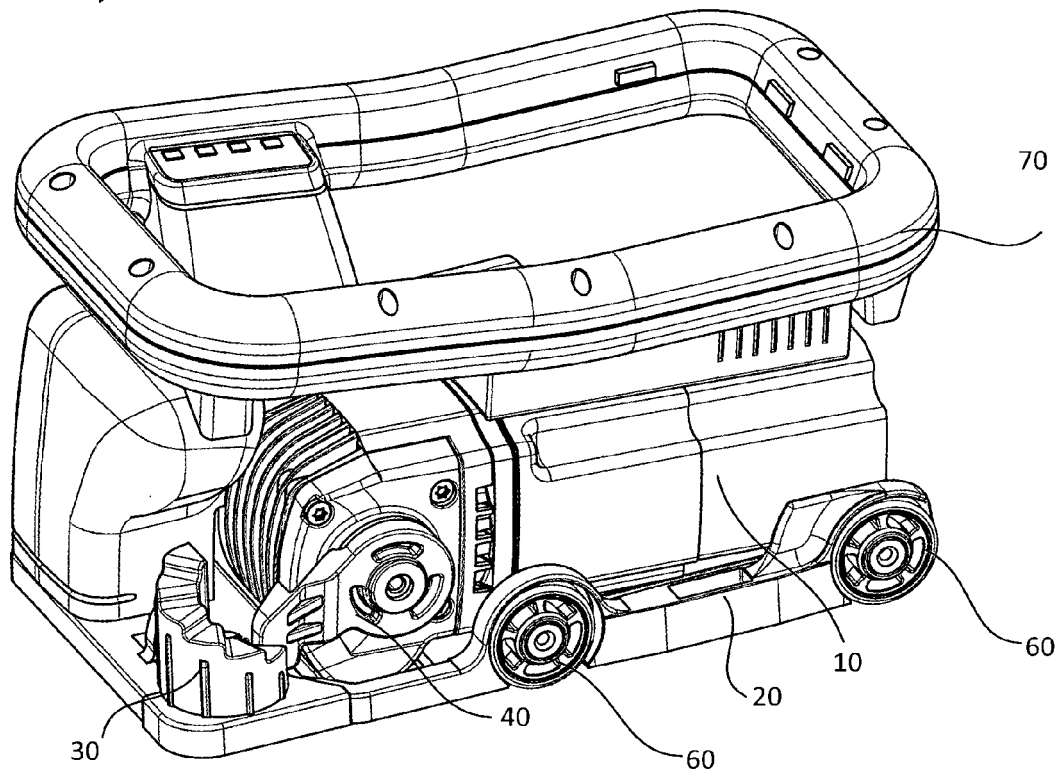


FIG. 7

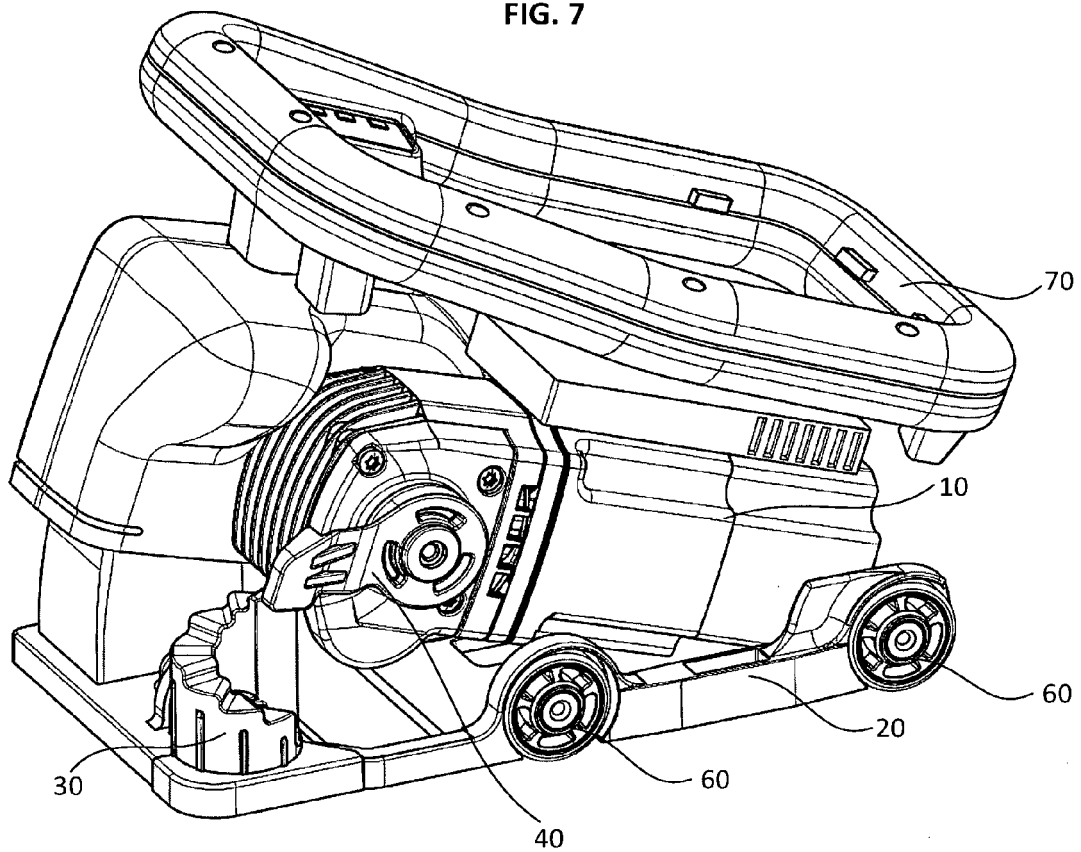


FIG. 8A

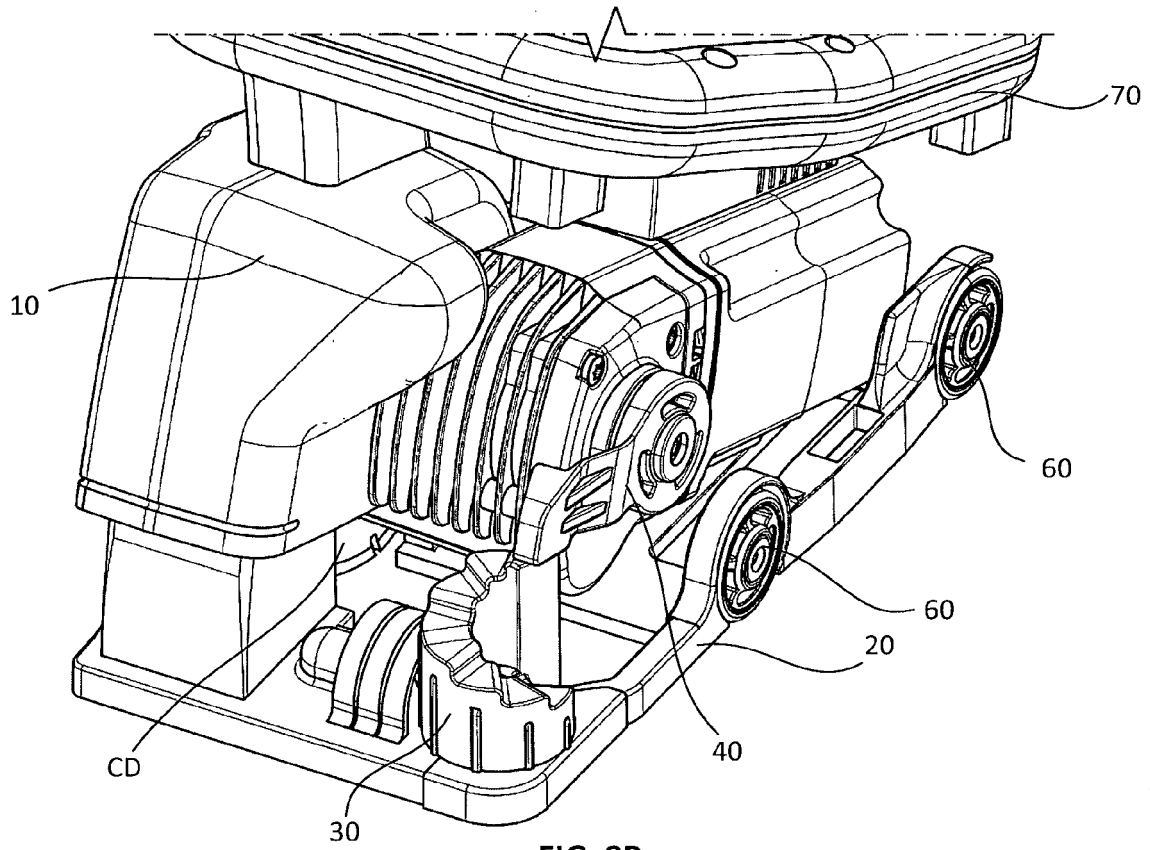


FIG. 8B

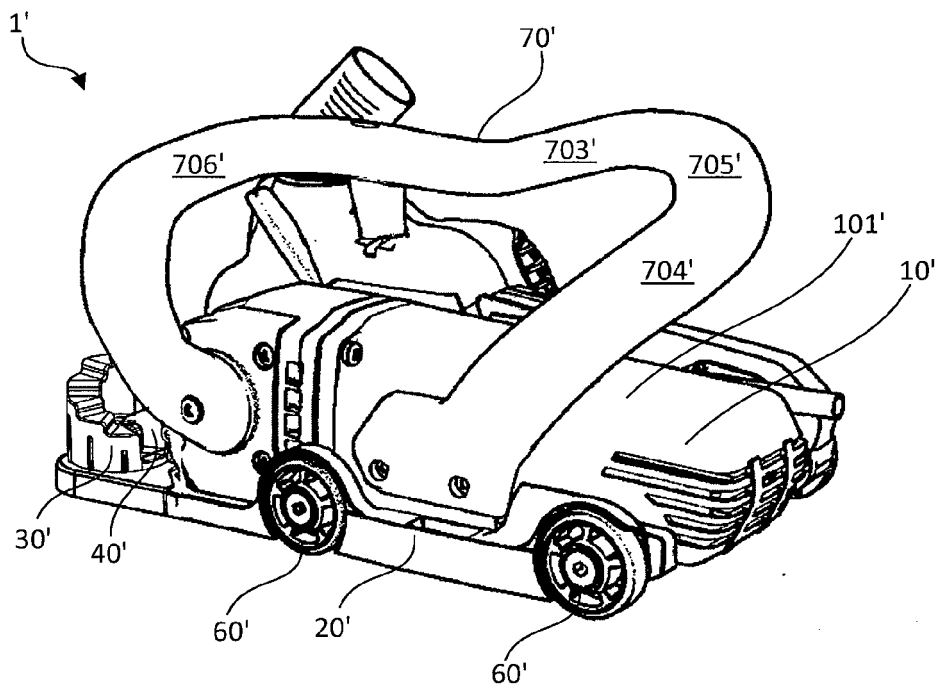


FIG. 9A

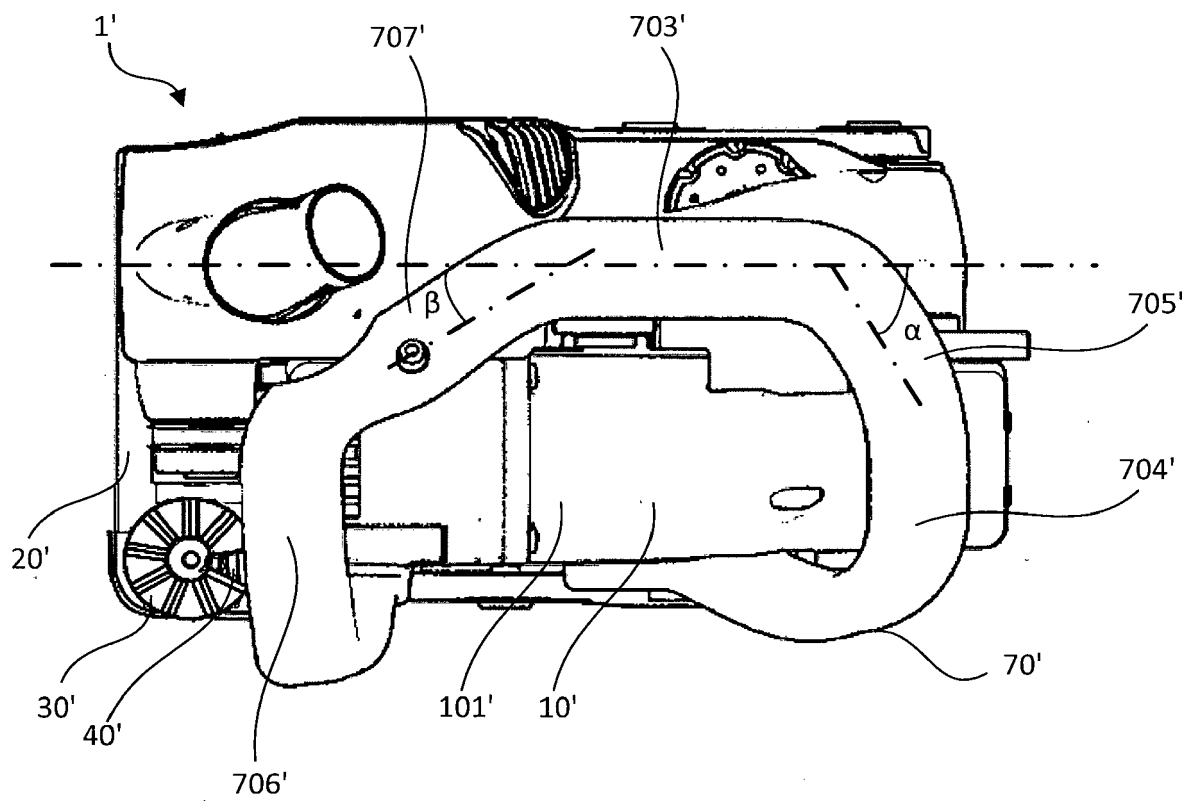


FIG. 9B



EUROPEAN SEARCH REPORT

Application Number

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A	* figures 2,3,5,11-15 *	8,9, 11-13	B28D1/18

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A	* paragraphs [0001], [0026], [0028], [0036], [0037] *	6,8,9, 11-15	

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		5 September 2024	Chariot, David
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T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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