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(54) **A maintenance device for grinding wheel**

(57) A maintenance device for a hand-grip -type grinding wheel (11) comprises mainly an angular connector (21) mounted with a grinding disk (29); the angular connector (21) has two through cylindrical holes (24) for mounting two screw bolts (25) respectively so as to fasten together with two short stubs (34) on a fixed member (32); an extension tube (14) mounted between the angular connector (21) and the handle (12) is furnished with a press button assembly (17), which is opposite to a po-

sitioning groove (16) of a transmission shaft (15); after the press button assembly (17) is pushed down, it will engage together with the positioning groove (16) of the transmission shaft (15) so as to prevent the shaft of the grinding disk from turning; in that case, a screw fastener (37) outside the grinding disk (29) can be turned and removed so as to replace the grinding disk (29), and to adjust the position of the guard plate (28) behind the grinding disk (29).

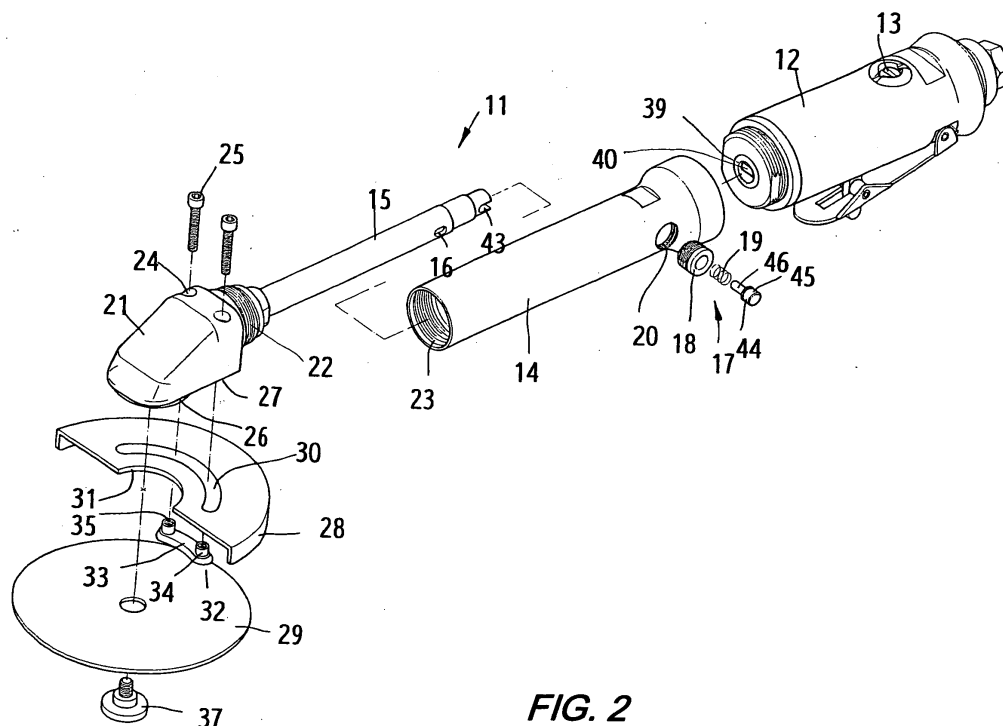


FIG. 2

Description

Background of the Invention:

1. Field of the Invention:

[0001] This invention relates to a grinding wheel machine, and particularly to a maintenance device for a hand-grip-type grinding wheel.

2. Description of the Prior Art:

[0002] In a conventional pneumatic grinding wheel, the handle thereof is usually furnished with a valve assembly for controlling a pressure air to flow; one end of the handle has a center shaft to connect directly with a L-shaped connector; the outer end of the L-shaped connector is mounted with a grinding disk, which is fastened in place with a screw fastener; the inner side of the grinding wheel is mounted with a guard plate fastened on a flat surface of the connector by means of a screw.

[0003] In a conventional grinding wheel, the guard plate thereof is usually fixed in place with a screw, and the direction thereof can not be adjusted.

[0004] In a conventional grinding wheel, the outer end of the handle is connected directly with a L-shaped connector by means of a screw, and is not furnished with an extension arm; consequently, the grinding wheel is unable to grind or cut in a deeper working space.

[0005] In a conventional grinding wheel, the grinding disk can be replaced only by fixing the grinding disk first so as to remove and fasten the screw fastener; in other words, the grinding wheel is not furnished with a positioning device, i.e., there is no any proper removing method designed.

Summary of the Invention:

[0006] The prime object of the present invention is to provide a maintenance device for a hand-grip-type grinding wheel, in which an extension tube and a transmission shaft are furnished between a handle and an angular connector so as to enable the grinding disk to extend into a deeper space for cutting or grinding work.

[0007] Another object of the present invention is to provide a maintenance device for a hand-grip-type grinding wheel, in which the outer side of the grinding disk is mounted with a guard plate having two symmetrical screw bolts to plug through two symmetrical cylindrical holes in the angular connector, and to fasten together with a fixed member in a curved groove of the guard plate so as to facilitate the guard plate to be adjusted as desired; the adjustment can be done by loosening the screw fastener with hexagonal wrench.

[0008] A further object of the present invention is to provide a maintenance device for a hand-grip-type grinding wheel, in which the transmission shaft and the extension tube mounted between the handle and the angular

connector are removable assemblies; in other words, the two assemblies each has different length, and can be replaced quickly so as to meet working requirement.

[0009] Still another object of the present invention is to provide a maintenance device for a hand-grip-type grinding wheel, in which the transmission shaft is furnished with an elongate position groove to facilitate the grinding disk to be removed and replaced easily; the extension tube is mounted with a press button assembly opposite to positioning groove of the transmission shaft; when the press button assembly can engage in the positioning groove to prevent the center shaft of the grinding disk from turning; in that case, the screw fastener of the grinding disk will be removed or replaced quickly and easily.

Brief Description of the Drawings:

[0010]

Fig. 1 is a perspective view of the present invention. Fig. 2 is a disassembled view of the present invention.

Fig. 3 is a sectional view of the present invention, showing a pneumatic motor to provide the grinding machine with a pneumatic power.

Fig. 4 is a fragmental sectional view of the present invention, showing the grinding wheel being removed.

Fig. 5 is a sectional view of the present invention, showing the control relation between the press button and the transmission shaft thereof.

Fig. 6 is a sectional view of the present invention, showing the structure relation between the grinding wheel and the transmission shaft thereof.

Fig. 7 is a sectional view of the present invention, showing the fastening structure by means of screw between the guard plate and the angular connector thereof.

Fig. 8 is a perspective view of the present invention, showing the angular adjustment of the guard plate.

Fig. 9 is a sectional view of the present invention, showing the fastening structure with screws between the guard plate and the grinding disk thereof.

Fig. 10 is a perspective view of the present invention, showing the power of the grinding wheel provided with an electric motor.

Detailed Description of the Preferred Embodiment:

[0011] This invention relates to a maintenance device for a hand-grip-type grinding wheel; as shown in Figs. 1 to 3, the grinding wheel 11 comprises a handle 12 with a built-in pneumatic motor for providing a pneumatic power, an angular connector 21, a transmission shaft is mounted between the handle 12 and the angular connector 21, and an extension tube 14. The extension tube enables the grinding disk to extend into a deeper space

for cutting or grinding upon controlled with a valve assembly 13 on the handle 12.

[0012] Referring to Figs. 1 to 3 and 6, the inside of the handle 12 of the grinding wheel 11 is mounted with a valve assembly 13 and a pneumatic motor; as shown in Fig. 10, the inside of the handle 12 is furnished with an electric motor, the central part of the transmission shaft 39 of the handle 12 is mounted with a coupling rod 40. Upon the pressure air flowing in, a power will be applied to the transmission shaft 39 and the coupling rod 40, and then to the angular connector 21 and the grinding disk 29 for cutting and grinding work.

[0013] The transmission shaft 39 is coupled with the transmission shaft 15; the transmission shaft 15 connected with the coupling rod 40 of the transmission shaft 39 in the center of the handle 12 has a suitable length; one end of the transmission shaft 15 is mounted with a bearing 49 and a bevel gear 50, and then is plugged into a cylindrical hole 51 of the angular connector 21, while the other end thereof is mounted with a guide sleeve 52 so as to have one end of the transmission shaft 15 coupled with the angular connector 21.

[0014] The outer surface of one end of the angular connector 21 is furnished with outer threads 22 so as to be matched with a screw hole 23 of an extension tube 14, which has a suitable length; one end of the transmission shaft 15 has a cut groove 43 to facilitate the same to connect with the transmission shaft 39 in the handle 12.

[0015] The transmission shaft and the extension tube 14 mounted between the handle 12 and the angular connector 21 are replaceable parts, i.e., the length thereof is different so as to facilitate the grinding wheel 11 to extend further into a working space for cutting or grinding work if necessary.

[0016] The grinding disk 29 mounted to the transmission shaft in the angular connector 21 is replaceable upon the disk 29 worn out. To facilitate the replacement of the grinding disk 29, and to avoid the grinding disk 29 to rotate with the shaft, one side of the extension tube 14 is furnished with a screw hole 20 as shown in Figs. 2 to 5; a press button assembly 17 is mounted flexibly in the screw hole 20; the press button assembly 17 includes a screw seat 18, a spring 19 and a press rod 44; the outer surface of the screw seat 18 is furnished with threads; the center of the screw seat 18 is furnished with two cylindrical holes 41 and 42, of which the diameters are different; the larger cylindrical hole 42 is mounted with a spring 19; the press rod 44 includes two different round rods 45 and 46 having different diameters to be plugged into two cylindrical holes 41 and 42 of the screw seat 18 respectively; the round rod 46 is plugged through the cylindrical hole 42; after the press rod 44 is mounted in the screw seat 18; the whole press button assembly is mounted together by means of riveting; the spring 19 in the cylindrical hole 41 can provide the press rod 44 with a pushing force so as to have the press rod 44 pushed outwards elastically normally.

[0017] The press button assembly 17 is screwed in the

screw hole 20 of the extension tube 14; the transmission shaft 15 in the extension tube 14 has a positioning groove 16 opposite to the round rod 46 on the end of the press rod 44 of the press button assembly 17. When the press rod 44 is pushed inwards, the round rod 46 of the press rod 44 will be in contact with the transmission shaft 15. When the grinding disk 29 is turned, the transmission shaft 15 will be turned together; as soon as the positioning groove 16 of transmission shaft 15 is turned to the center line of the press button assembly 17, it will be stopped in place with the round rod 46 of the press button assembly 17; as shown in Fig. 4, the screw fastener 37 of the grinding disk 29 can be removed with a hexagonal wrench 38 so as to replace it with a new one; then, the screw fastener 37 is mounted to the transmission shaft by means of the hexagonal wrench 38, and the grinding disk 29 can be replaced simply and quickly.

[0018] Again referring to Figs. 2 to 4, and 7 to 9, the guard plate 28 has to be adjusted upon the operation angle of the grinding disk 29 being adjusted or the grinding disk 29 being replaced. The guard plate 28 can be adjusted by loosening two screw bolts 25 mounted through two symmetrical sunk cylindrical holes 24 respectively in the angular connector 21; after the adjustment is done, the two screw bolts 25 will be fastened together with a fixed member 32.

[0019] The angular connector 21 has a positioning post 26 facing the grinding disk 29; the positioning post 26 has a plane surface 27. The guard plate 28 mounted behind the grinding disk 29 is substantially a semicircular plate with a semi-circular cut 31 in the center thereof. The semi-circular cut 31 is designed to match the diameter of the positioning post 26; after the guard plate 28 is mounted on the plane surface 27 of the angular connector 21, the semi-circular cut 31 will be in contact with the surface of the positioning post 26.

[0020] The guard plate 28 has a curved groove 30, of which both sides are furnished with bevel surfaces at an angle of at least 30 degrees, i.e., the outside thereof is wider than the inside thereof; a fixed member 32 is to be mounted in the curved groove 30; both the inner surface and the outer surface of the fixed member 32 are set on the same level of the two surfaces of the guard plate 28 without affecting the close contact between the guard plate 28 and the plane surface 27.

[0021] The plate surface 33 of the fixed member 32 mounted in the curved groove 30 has a suitable length; the width of the plate surface 33 is designed to fit that of the curved groove 30 of the guard plate 28, and the thickness thereof is equal to or slightly less than the thickness of the curved groove 30. The outer edges of the plate surface 33 have symmetrical levels; after the plate surface 33 is mounted in the curved groove 30 of the guard plate 28, the outer surface of the plate surface 33 will be on the same level of the guard plate 28 exactly. Both ends of the plate surface 33 are furnished with two short stubs 34 respectively, and each short stub 34 has a through screw hole 35. The distance between the two

short stubs 34 are designed to fit to that of the two cylindrical holes 24 in the angular connector 21. After the fixed member 32 is mounted in the curved groove 30 of the guard plate 28, the two short stubs 34 will fit into the two cylindrical holes 24 in the plane surface 27 of the angular connector 21; then, two screw bolts 25 will be plugged through the two screw holes 35 of the two short stub 34 respectively so as to have the fixed member 32 pressed against the guard plate 28 to prevent the guard plate 28 from move.

[0022] In the general, the guard plate 28 is mounted flatly in contact with the plane surface 27 of the angular connector 21; the fixed member 32 is mounted in the curved groove 30 of the guard plate 28, and the two short stubs 34 of the fixed member 32 are plugged through the curved groove 30, and into the two cylindrical holes 24 of the angular connector 21 respectively; the other ends of the two cylindrical holes 24 are to be mounted with two screw bolts 25 respectively, which are fastened together with two short stubs 34 of the fixed member 32 respectively. The transmission shaft in the center of the angular connector 21 is mounted with a grinding disk 29, which is fastened in place with a screw fastener 37.

[0023] The guard plate 28 mounted fixedly on the angular connector 21 can provide a user with a protection function during cut operation; when the cutting angle of the grinding disk 29 is necessary to adjust, the direction of the guard plate 28 has to be adjusted; the adjustment can be done by loosening the screw bolts 25 in the cylindrical holes 24 of the angular connector 21 so as to release the fixed member 32 from pressing the guard plate 28; then, the guard plate 28 can be adjusted as desired; after the guard plate 28 is adjusted correctly, the screw bolts 25 can be turned tight so as to have the guard plate 28 fastened to the surface of the angular connector 21; it is deemed that the adjustment steps of the guard plate 28 is simple and quick.

[0024] While the invention has been described with reference to specific embodiments it must be understood that those embodiments are susceptible to many changes, substitutions, and modifications that will be readily apparent to those having ordinary skill in the art without departing from the scope and spirit of the invention.

Claims

1. A maintenance device for hand-grip-type grinding wheel comprising:

a handle mounted a power motor therein, a transmission shaft in center of said handle, and having outer threads on one end of said handle; an angular connector having a transmission shaft in center thereof, a grinding disk screwed on said transmission shaft; other end of said angular connector furnished with a cylindrical hole and a screw hole so as to facilitate said trans-

mission shaft to mount in place;

a transmission shaft, of which one end mounted with a bearing and a bevel gear via a cylindrical hole of said angular connector, and outer end thereof fastened in place with a screw sleeve, and other end thereof having a cut groove connected with a transmission shaft in said handle; an extension tube designed to fit to length of said transmission shaft, and both ends thereof furnished with screw holes respectively so as to connect with outer threads of said angular connector and said handle respectively.

2. A maintenance device for a hand-grip-type grinding wheel, wherein outer end of said angular connector is mounted with a grinding disk, and a transmission shaft and an extension tube are mounted between said angular connector and said handle; a check assembly is mounted between said transmission shaft and said extension tube, and said check assembly includes:

a screw hole furnished in one end of said extension tube for mounting a press button assembly; said press button assembly includes a screw seat, a spring and a press rod; said press rod has a larger diameter portion nearing outer end thereof and a smaller diameter portion to mount through said screw seat; said press rod is mounted with said spring to push said press rod outwards normally; a positioning groove furnished on said transmission groove which is substantially an elongate groove, being opposite to center of said screw hole of said extension tube.

3. A maintenance device for a hand-grip-type grinding wheel, wherein said transmission shaft in center of said angular connector is mounted with a grinding disk, of which inner side is mounted with a guard plate; said guard plate includes:

an angular connector, of which a plane surface is furnished with two cylindrical holes through other end thereof;

a guard plate furnished with a curved groove having a wider outer side and a narrower inner side;

a fixed member having a curved plate surface, of which both ends are furnished with two short stubs respectively; each said short stub has through screw hole; one side of said curved plate surface facing said curved groove is furnished with symmetrical bevel surfaces to fit to said curved groove in said guard plate; and two screw bolts to be plugged in two cylindrical holes respectively in one end of said angular connector, while other ends thereof to be

screwed into two screw holes of said fixed member.

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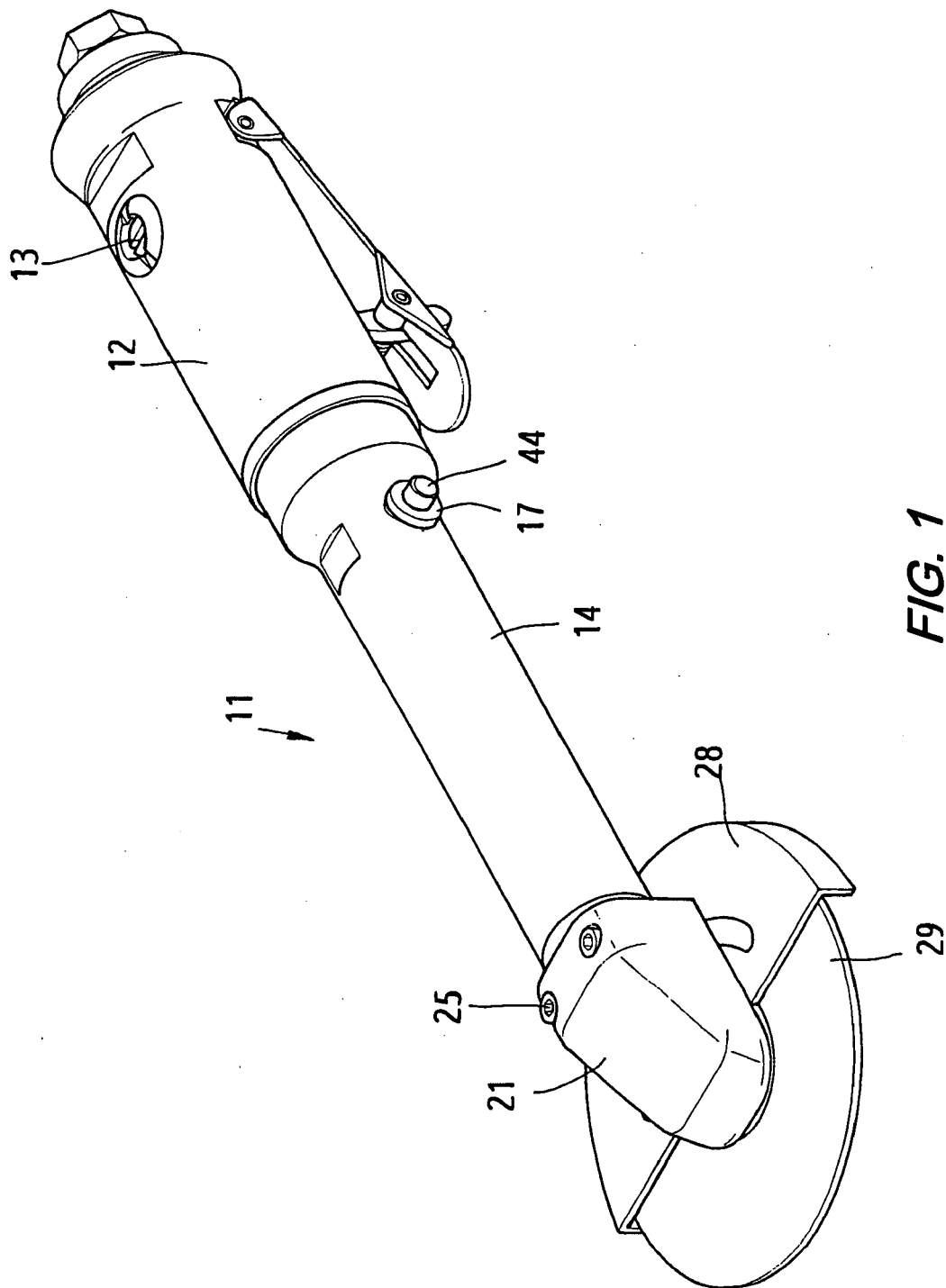


FIG. 1

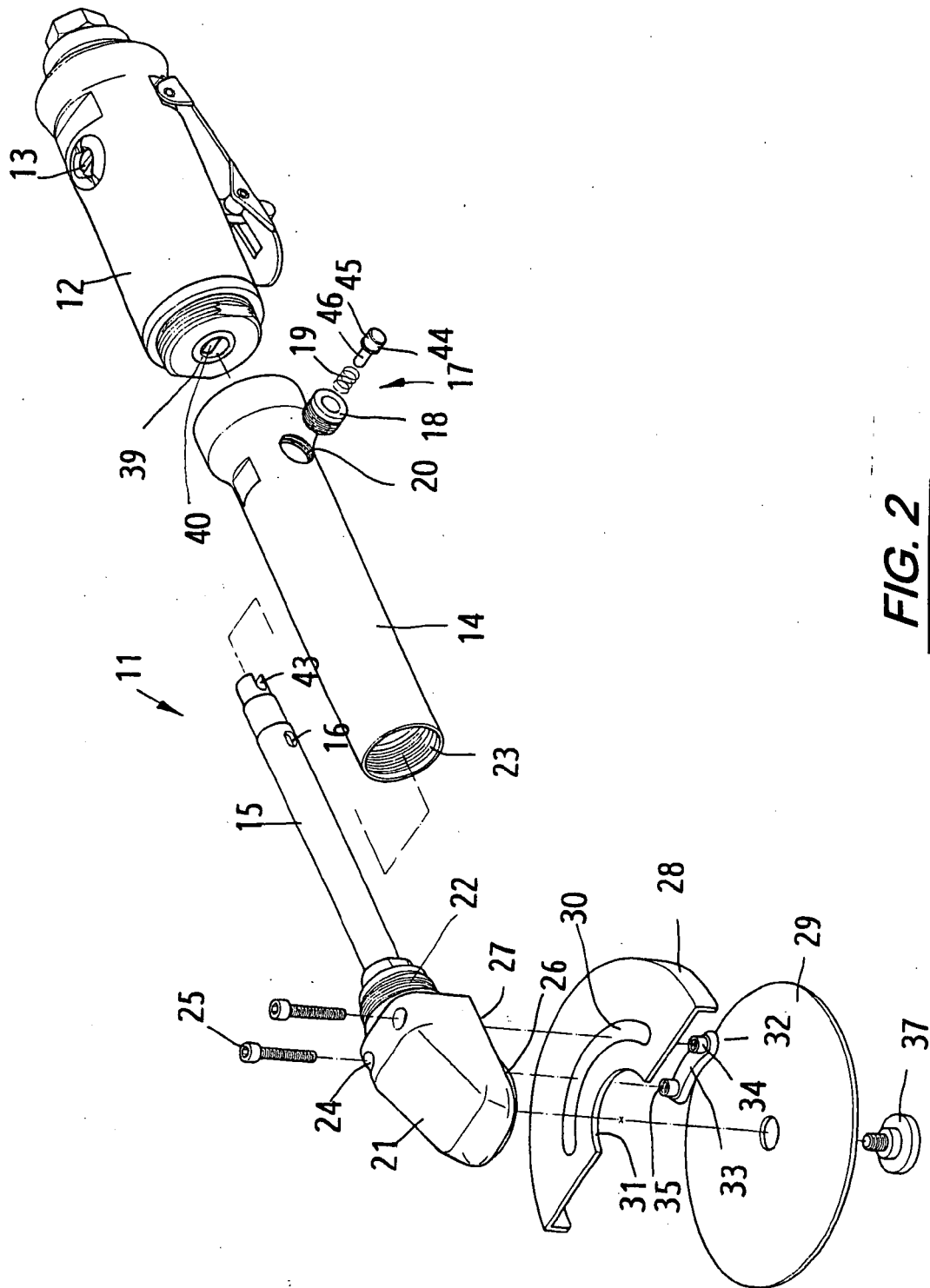


FIG. 2

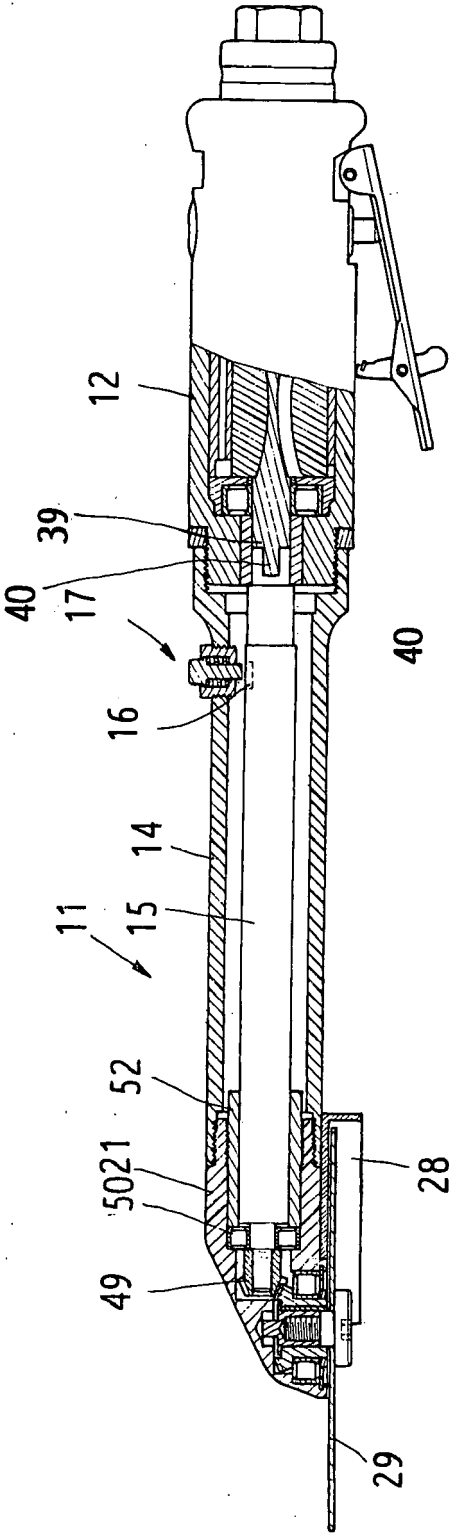


FIG. 3

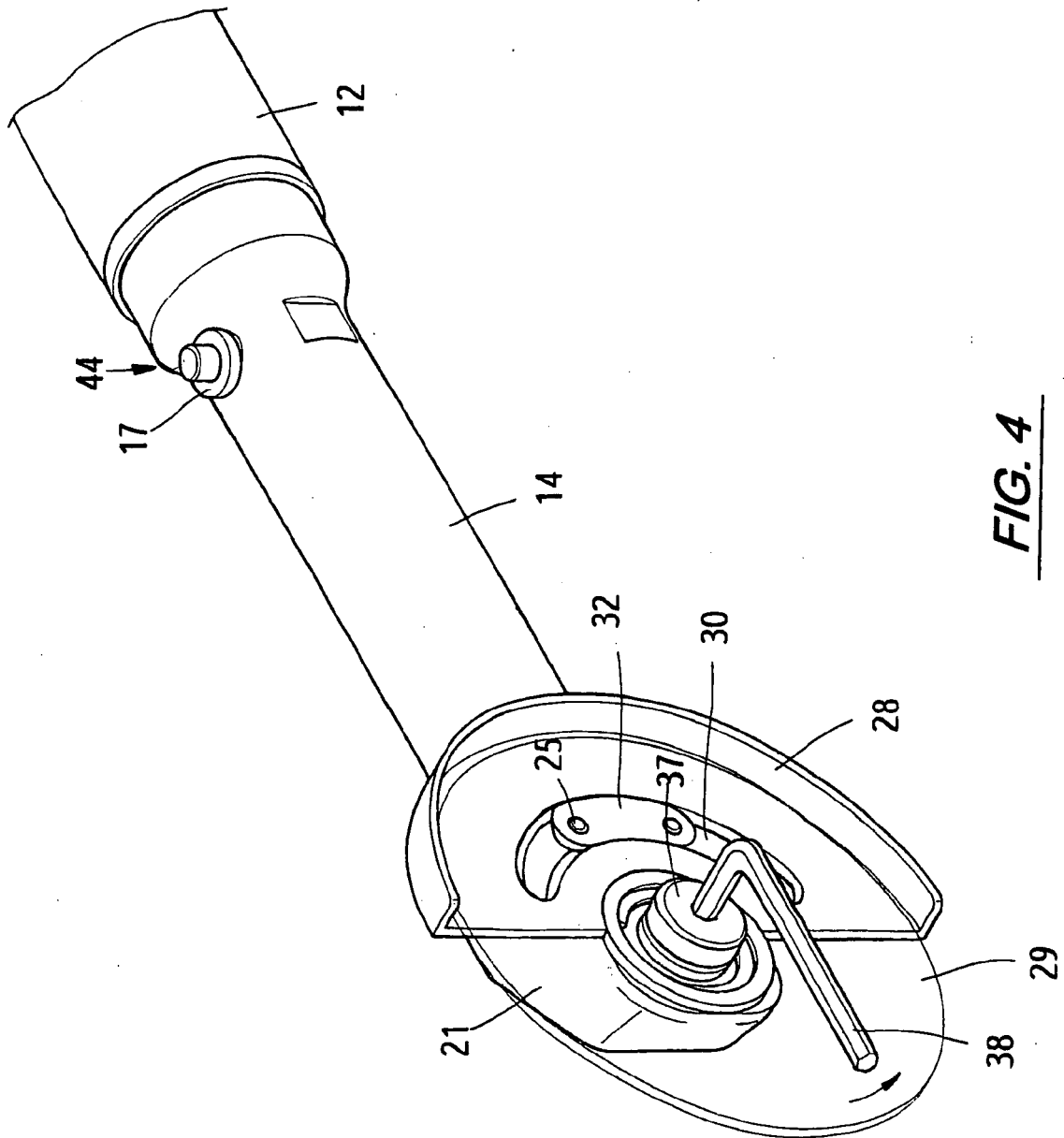


FIG. 4

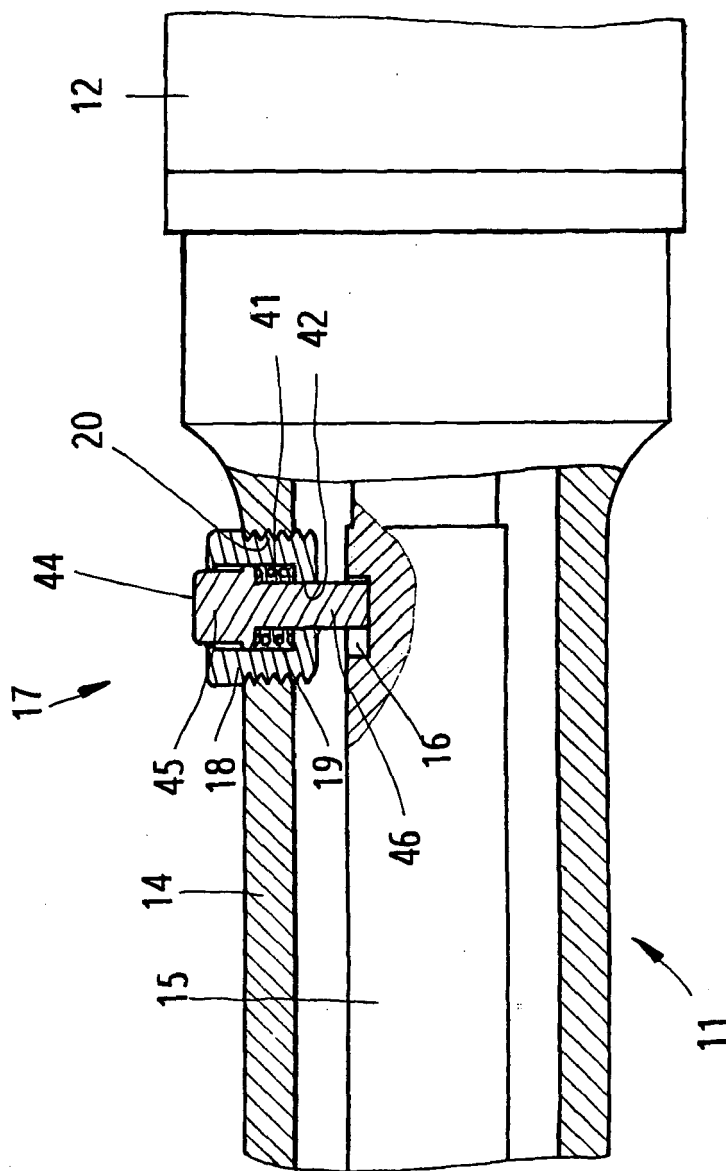


FIG. 5

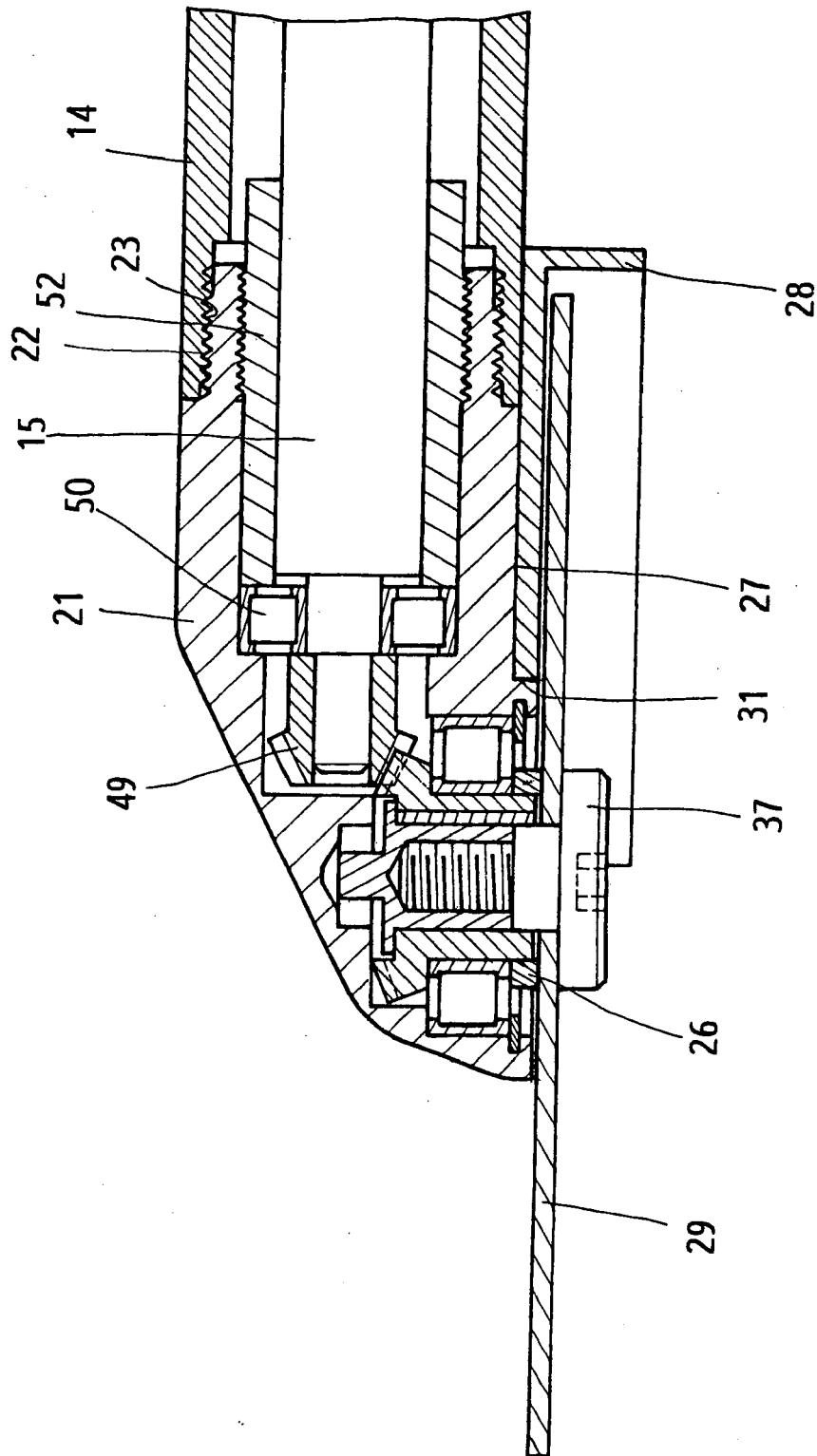


FIG. 6

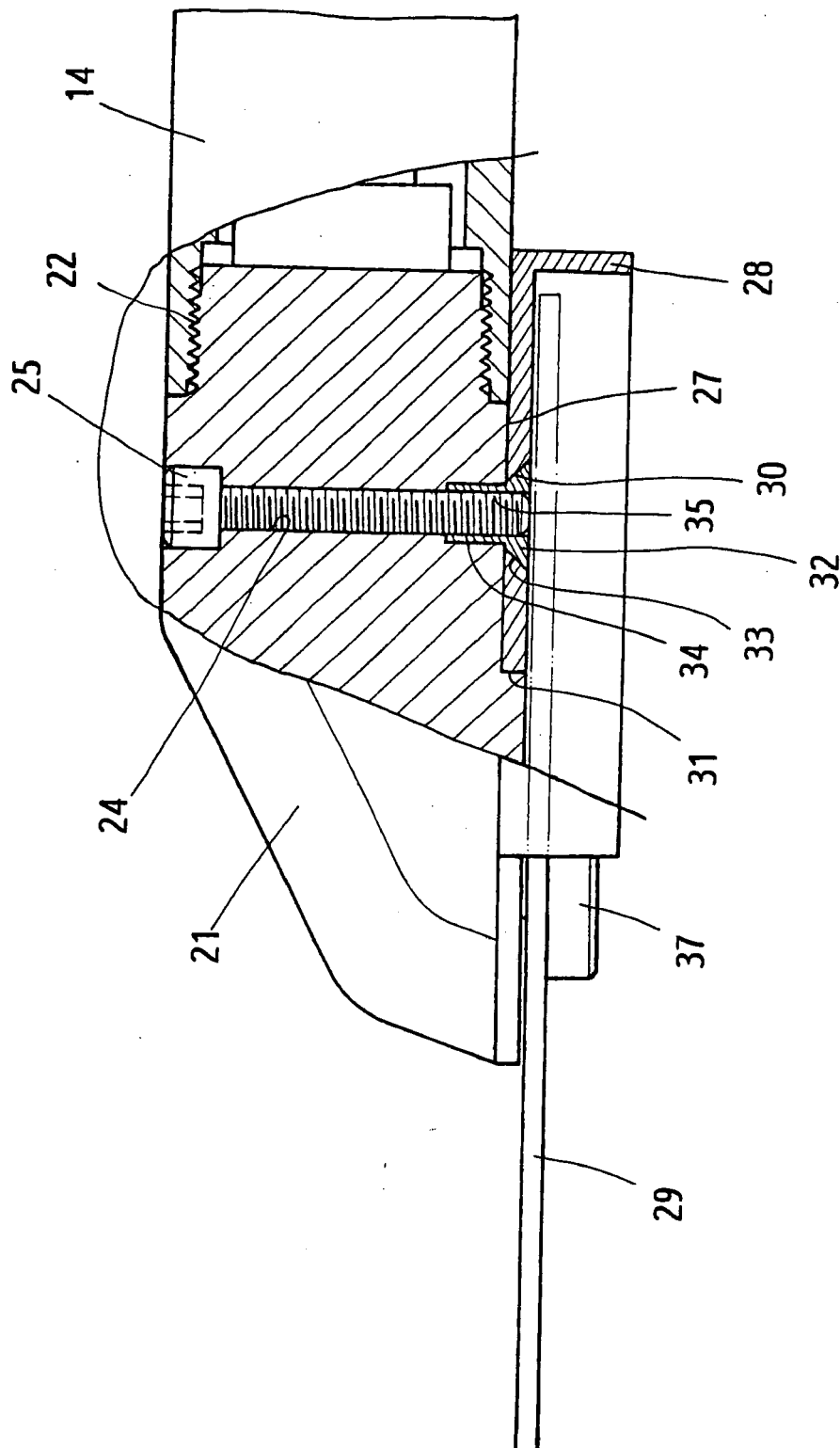


FIG. 7

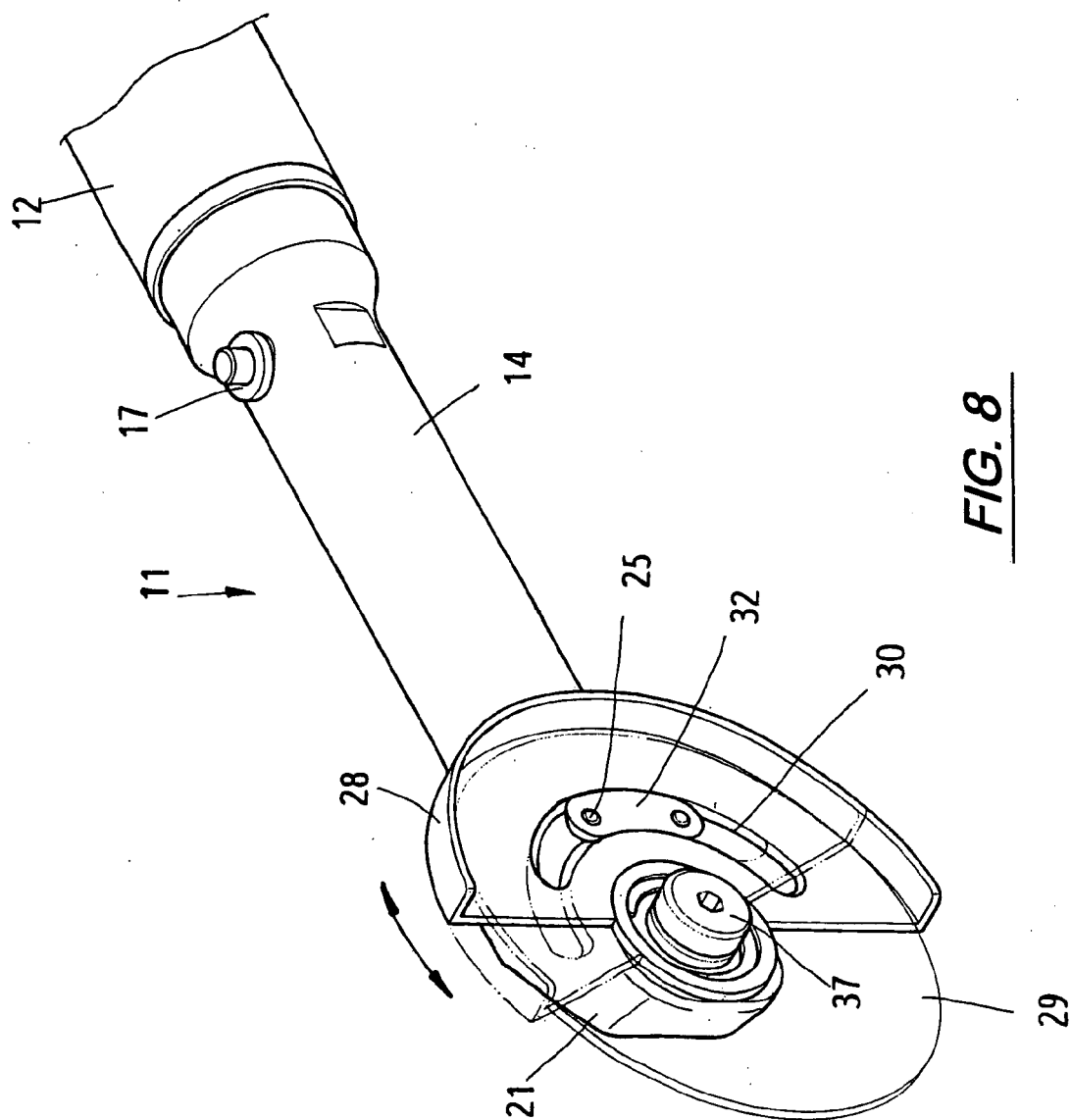


FIG. 8

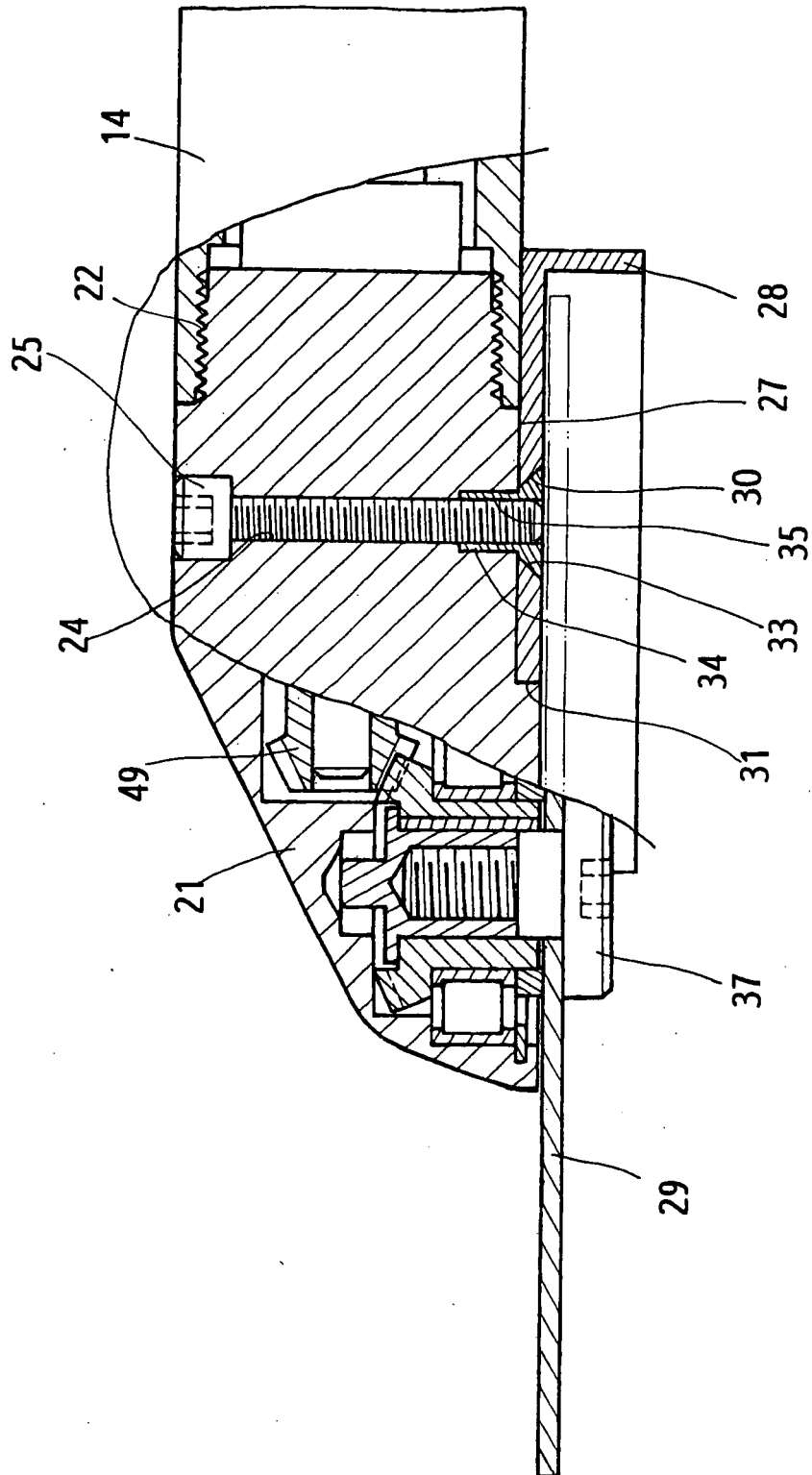


FIG. 9

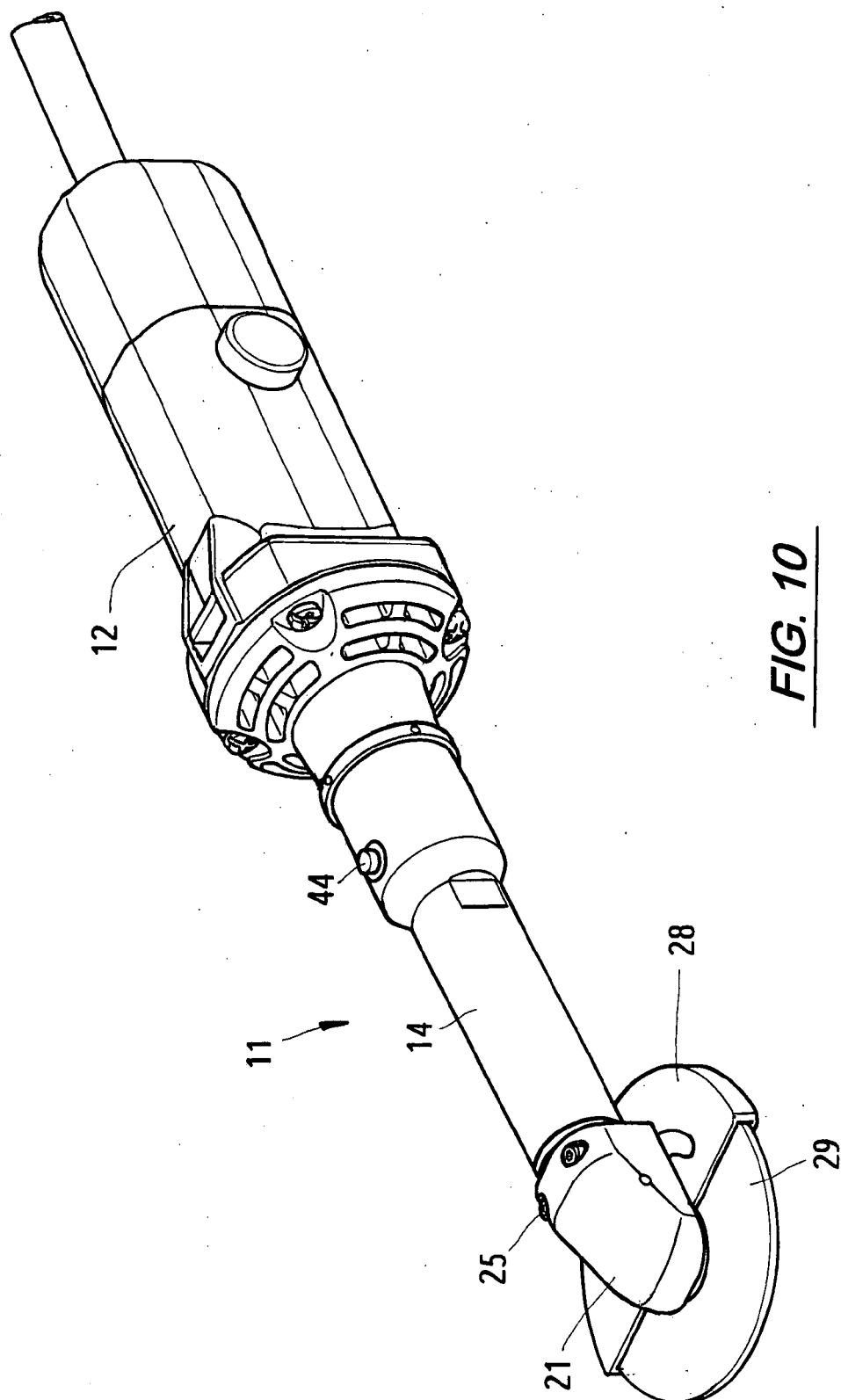


FIG. 10



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 00 0964

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 20 2004 006715 U1 (DOUBLE DYNASTY CO [TW]) 23 September 2004 (2004-09-23) * the whole document * -----	1-3	INV. B24B23/02
			TECHNICAL FIELDS SEARCHED (IPC)
			B24B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 June 2007	Examiner Eschbach, Dominique
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document 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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EPO FORM 1503 03/82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 00 0964

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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28-06-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202004006715 U1	23-09-2004	NONE	

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