(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 027 663**
A2

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **80106505.3**

(51) Int. Cl.³: **B 25 F 1/00**

(22) Date of filing: **23.10.80**

(30) Priority: **23.10.79 IL 58534**

(43) Date of publication of application:
29.04.81 Bulletin 81/17

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(71) Applicant: **Danino, Abraham**
8 Granados Street
Ramat-Gan(IL)

(72) Inventor: **Danino, Abraham**
8 Granados Street
Ramat-Gan(IL)

(74) Representative: **Vossius.Vossius.Tauchner.Heunemann.Rauh**
Siebertstrasse 4 P.O. Box 86 07 67
D-8000 München 86(DE)

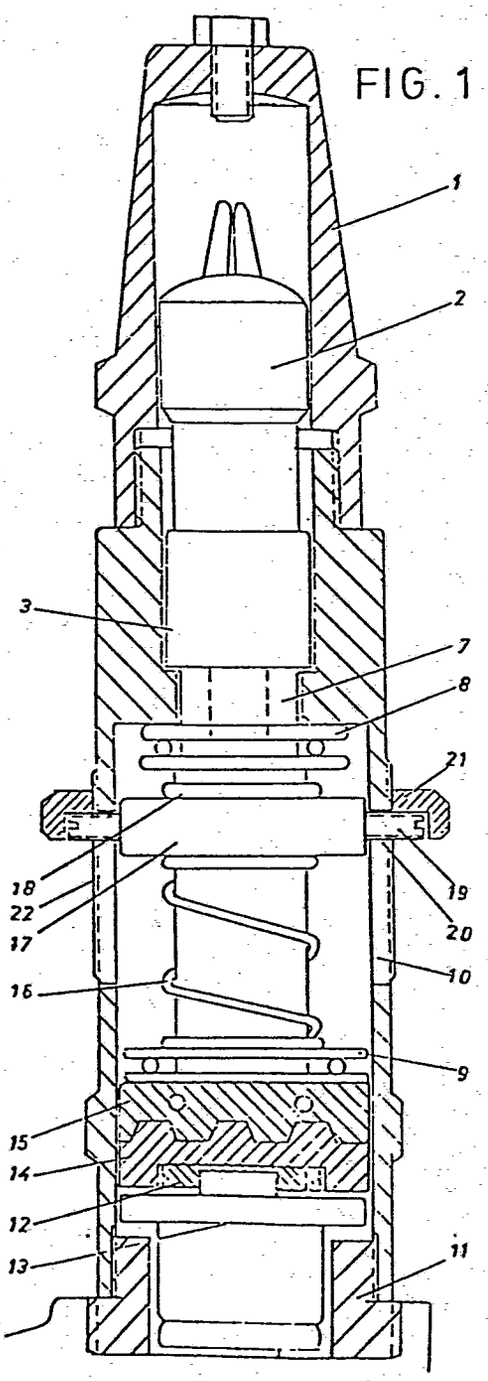
(54) **A multi-purpose tool with a two-directional motor.**

(57) A multi-purpose tool with a two-directional electric, hydraulic or pneumatic motor comprises a spindle (7) rotatably mounted in bearings (8,9) within a cylindrical housing (10), said spindle (7) being provided at its free end with means to receive a suitable operating tool, a clutch (14, 15) adapted to be controlled by a spring (16) which surrounds the spindle 7 and an adjustment ring (17) constituting a bearing surface for said spring (7). The ring (17) is loosely mounted on said spindle (7) and held thereon by a clamp-nut (21), threaded to engage with the outside of said housing (10). The adjustment ring (17) is provided with diametrically opposed set screws (19), pins, lugs or similar which extend through elongated slots (20) in said housing (10) and is fixed in position by the clamp-nut (21). Thus by rotating the clamp-nut (21) the force of spring (16) can be adjusted without dismantling the tool (Fig. 1).

EP 0 027 663 A2

./...

FIG. 1



VOSSIUS · VOSSIUS · TAUCHNER · HEUNEMANN · RAUH
PATENTANWÄLTE

SIEBERTSTRASSE 4 · 8000 MÜNCHEN 86 · PHONE: (089) 47 40 75
CABLE: BENZOLPATENT MÜNCHEN · TELEX 5-29 453 VOPAT D

0027663

Our Ref. P 838 EP

October 23, 1980

Abraham Danino

Ramat-Gan, Israel

" A Multi-Purpose Tool with a Two-Directional Motor "

Priority: October 23, 1979, Israel, No. 58 534

The present invention relates to a multi-purpose tool with a two-directional motor and designed for a variety of operations including installing rivets, nuts, screws, etc.

Rivets are generally installed using pneumatic tools specially constructed for this purpose which may be hand tools connected to a pneumatic source. Tools are also known to which attachments are connected for special operations and which incorporate

a clutch which is automatically released once the operation has been completed. The clutch is actuated by a spring which is set according to individual requirements.

There are many drawbacks to these types of tools. In the first place, the latter tools cannot be used for installing rivets. Secondly, in order to adjust the spring pressure controlling the clutch the entire tool must be dismantled. Furthermore, these tools are suitable for rotary operations only. For the pneumatic tools a compressed air source must be available.

It is the object of the present invention to provide a tool which can be driven by a pneumatic electric or hydraulic motor, can be adjusted for any suitable spring pressure without dismantling it, and is multipurpose, i.e. can be used for any purpose which requires a two-directional motor and clutch means, such as for installing a blind nut or rivet by means of a device as described and claimed in the copending European patent application based on Israeli priority application No. 58 535 filed on October 23, 1979, the main claim of which reads: A device consisting of

a blind nut and drive head for mounting same, the nut comprising an internally threaded body whose outer wall merges at one end into a thin-walled cylinder, the drive head being adapted to be attached to the fixed part of any suitable tool and having an axially extending bore surrounded by an annular groove with a conical wall towards the center and a rounded bottom profile a spindle freely rotatable in both directions being housed within said bore and with a thread for engaging said nut.

The invention consists of a multi-purpose tool having a two-directional motor, comprising a spindle rotatably mounted in bearings within a cylindrical housing and having a clutch adapted to be controlled by a spring surrounding the spindle, said spindle being provided at its free end with means to receive a suitable operating tool, an adjustment ring constituting a bearing surface for said spring being loosely mounted on said spindle and held thereon by a clamp-nut threaded to engage with the outside of said housing.

The invention is illustrated, by way of example only, in the accompanying drawings in which:

Figure 1 is a longitudinal section of the tool attachment according to the invention for installing rivets, and

Figure 2 is a schematic cross section of part thereof.

The device according to the invention comprises the conventional rivet placing head 1, with the rivet holding chuck and pulling member 2 which is attached to the collet nut 3 housing the ejection spring 4 for the rivet, all as known per se. According to the invention the collet 3 is provided with a threaded shank 5 which is adapted to engage the internal thread 6 of a spindle 7. The chuck and collet move in a reciprocating axial direction to install the rivet (not shown), while spindle 7 is rotatable in either direction and thus inserts or withdraws the collet 3 by the engagement or disengagement of the thread. This is effected in that the spindle 7 is mounted in two bearings 8 and 9 housed in a cylindrical body 10 which is screwed at its bottom into a fixed part 11 of the machine or hand tool (not shown) and at its top has head 1 attached thereto, having a suitable axial bore to house collet 3. The bottom 12 of spindle 7 is keyed to a part 13 which transfers the rotation of the motor (not shown) to the spindle. A clutch 14 is mounted for continuous rota-

tion with the motor and is in engagement with a clutch 15 slidably fixed to the spindle for rotation therewith, the clutch 15 being in engangement with clutch 14 to transfer the rotation of the motor to the spindle. A spring 16 is wound around spindle 7 and bears at one end on bearing 9 and clutch 15 and on the other on an adjustment ring 17 loosely mounted on spindle 7 and held thereon by a spring clip 18. Two set screws 19, pins, lugs or similar, are provided in diametrically opposed positions on ring 17 and extend through diametrically opposed vertical slots 20 in housing 10. An annular clamp nut 21 fixes the position of set screws 19 and hence of adjustment ring 17, said nut having an internal screw thread which is adapted to be screwed onto thread 22 provided externally on housing 10. Thus it can be seen that by rotating part 21 more or less onto housing 10 the force of spring 16 can be adjusted, thereby determining the actuation of the clutch.

The motor (not shown) is a two-directional pneumatic or electric motor, i.e. the tool to which the attachment according to the invention may be connected can be a small power hand drill or similar.

In a preferred embodiment of the invention, the free end of spindle 7 has a depression 23

of hexagonal or any other desired profile so that instead of the rivet pulling head 2 the blind nut driving head described and claimed in the above mentioned co-pending European patent application or, for example, a tool such as a screw driver head whose shank is provided with a hexagonal body can be inserted into said depression 23, of the spindle 7, to be rotated thereby, the release of said nut driving head or tool being effected by the clutch 14, 15 at the end of the desired operation. It is, of course, understood that any other similar attachment may be connected to the spindle.

C L A I M S

1. A multi-purpose tool with a two-directional motor, comprising a spindle (7) rotatably mounted in bearings (8, 9) within a cylindrical housing (10), said spindle (7) being provided at its free end with means to receive a suitable operating tool, a clutch (14, 15) adapted to be controlled by a spring (16) which surrounds the spindle (7), and an adjustment ring (17) constituting a bearing surface for said spring (7), the ring (17) being loosely mounted on said spindle (7) and held thereon by a clamp-nut (21), threaded to engage with the outside of said housing (10).

2. A tool as claimed in claim 1, wherein said means at the free end of said spindle (7) are constituted by a threaded bore (6), the operating tool member (3) being provided with a threaded shank (5).

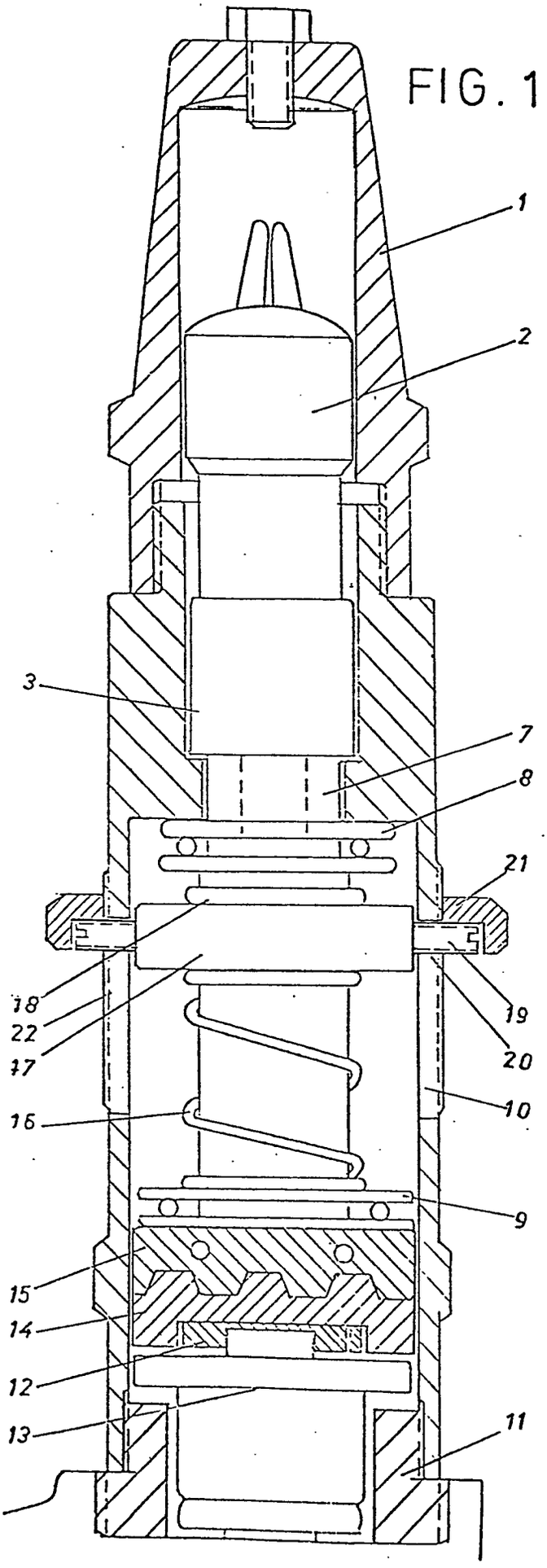
3. A tool as claimed in claim 1, wherein said means at the free end of said spindle (7) are constituted by a hexagonal depression (23), the shank of the said operating tool being provided with a hexagonal body.

4. A tool as claimed in any of claims 1 to 3, wherein said adjustment ring (17) is provided with diametrically opposed set screws (19), pins, lugs or similar which extend through elongated slots (20) in said housing (10).

5. A tool as claimed in any of claims 1 to 4, wherein said motor is electric, hydraulic or pneumatic.

0027663

FIG. 1



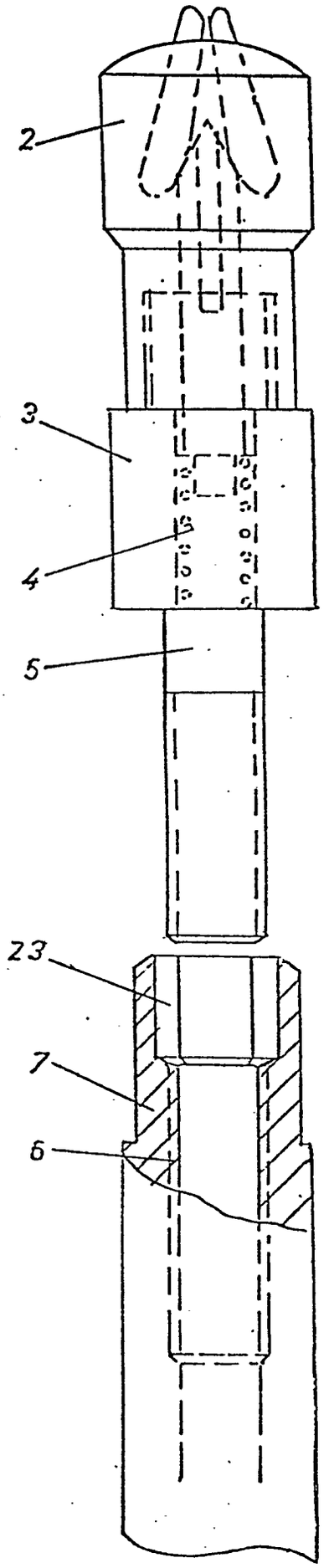


FIG. 2