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## Description

This invention relates to a power operated screwdriver.

It is known to provide power operated screwdrivers with a vacuum connection to the front of the tool for picking up screws. In one known type of power operated screwdriver the vacuum is connected to the front of the tool using a flexible pipe and a banjo connector on the front of the tool. This has the disadvantage that the banjo connector and pipe obscure the view of the operator. In another known type of power screwdriver the vacuum is connected to the front of the tool through a clutch chamber of the tool. However, this has the disadvantage that any debris that is sucked up by the vacuum becomes jammed in the clutch mechanism.

Our British Patent Specification No. 1 339 657 describes a pneumatic screwdriver in which air is exhausted near the front end and the air flow is used to induce a negative pressure in a suction pick-up finder at the front end. The front air exhaust means obscure the operator's view and debris in the finder is entrained by the air flow and discharged over the work.

The power operated screwdriver known in the art comprises a casing, a motor mounted in the casing, a screwdriver bit holder mounted in the casing for rotation by the motor, a torque sensitive clutch interposed between the motor and the bit holder, a suction pick-up finder at a front end of the casing adjacent to the bit holder for picking up and locating a screw to be driven, and means for connecting a source of negative pressure to the finder, the said means comprising a gallery within the casing and extending rearwardly from a position adjacent to the front end of the casing and a duct or pipe which communicates with the rear end of the gallery and which is connectable to a source of negative pressure at or adjacent to the rear end of the casing. See CH—A—404 584 and a somewhat similar screwdriver described in SU—A—564—146, in both of which the front end of the duct or pipe is so close to the front end of the casing as to obscure the view of the operator.

CH—A—404 584 also discloses an arrangement in which, instead of an annular gallery, there is an axial gallery which extends to the rear end of the screwdriver through relatively rotating hollow members, so that debris sucked up can come into contact with moving parts of the screwdriver.

The power operated screwdriver of the present invention is characterised in that the gallery is annular or substantially annular, it is provided around the clutch and is defined by stationary parts of the screwdriver, the radially outer extent of the gallery being defined by an inner wall of the casing, the radially inner extent of the gallery being defined by a stationary sleeve around the clutch, and the rear end of the gallery being behind the rear end of the clutch.

The invention will now be more particularly described with reference to the accompanying drawing which is a schematic longitudinal section

through one embodiment of a power operated screwdriver according to the present invention.

Referring now to the drawing, the power operated screwdriver shown therein comprises an elongate tubular casing 10 accommodating in known manner a motor 11, which is preferably pneumatically operated but which may be electrically operated, a reduction gear box 12, a torque sensitive clutch 13, and a bit holder 14 rotatable by the motor 11 *via* the gearbox 12 and clutch 13, and supporting a replaceable screwdriver bit 9.

A suction pick-up finder sleeve 15 is mounted at the front end of the casing 10 for locating a screw 16 picked up by a negative pressure applied to the finder sleeve 15.

Negative pressure is communicated from a source thereof, e.g. a vacuum pump (not shown), to a chamber 17 at the front end of the casing 10, *via* a pipe 18 and an annular gallery 19. The annular gallery 19 surrounds the clutch 13 and is defined between the inner wall of the casing 10 and a sleeve 20. The sleeve 20 is supported at its front end on a bush 21 in which the bit holder 14 is rotatably mounted and at its rear end in an adaptor 22, and defines an outer casing of the clutch 13. The pipe 18 communicates with the gallery 19 and extends longitudinally within the casing 10 from a position adjacent to the rear end of the gallery 19 to a position adjacent to the rear end of the casing 10. However, this pipe 18 could be replaced by an elongate duct defined between inner and outer casing parts.

Because the gallery 19 is annular or at least substantially annular the effective mean increase in diameter of the front end of the casing 10 necessary to accommodate this gallery is small and consequently the operator's view of the front end of the screwdriver is not obscured. Moreover, any debris that is sucked up by the negative pressure is kept clear of those moving parts of the screwdriver which could become jammed by such debris.

## Claims

1. A power operated screwdriver comprising a casing (10), a motor (11) mounted in the casing (10), a screwdriver bit holder (14) mounted in the casing (10) for rotation by the motor (11), a torque sensitive clutch (13) interposed between the motor (11) and the bit holder (14), a suction pick-up finder (15) at a front end of the casing (10) adjacent to the bit holder (14) for picking up and locating a screw (16) to be driven, and means for connecting a source of negative pressure to the finder (15), the said means comprising a gallery (19) within the casing (10) and extending rearwardly from a position adjacent to the front end of the casing (10) and a duct or pipe (18) which communicates with the rear end of the gallery (19) and which is connectable to a source of negative pressure at or adjacent to the rear end of the casing (10), characterised in that the gallery (19) is annular or substantially annular, it is

provided around the clutch (13) and is defined by stationary parts of the screwdriver, the radially outer extent of the gallery being defined by an inner wall of the casing (10), the radially inner extent of the gallery being defined by a stationary sleeve (20) around the clutch (13), and the rear end of the gallery (19) being behind the rear end of the clutch (13).

2. The screwdriver of claim 1, wherein the duct or pipe (18) extends within the casing.

3. The screwdriver of claim 1 or 2, wherein a gearbox (12) is interposed between the motor (11) and the clutch (13).

#### Patentansprüche

1. Kraftangetriebener Schraubenzieher mit einem Gehäuse (10), einem in diesem Gehäuse (10) angebrachten Motor (11), einem im Gehäuse (10) angebrachten und durch den Motor (11) drehbaren Schraubenziehereinsatz-Halter (14), einer zwischen dem Motor (11) und dem Einsatz-Halter (14) eingesetzten Drehmoment-Kupplung (13), einer Saug-Aufnahme-Führung (15) am Vorderende des Gehäuses (10), angrenzend an den Einsatz-Halter (14), zum Aufnehmen und Festhalten einer anzutreibenden Schraube (16), und Einrichtungen zum Verbinden der Führung (15) mit einer Unterdruck-Quelle, wobei diese Einrichtungen einen Gang (19) im Gehäuse (10), welcher sich von einer Stelle nahe dem Vorderende des Gehäuses (10) nach hinten erstreckt, sowie eine Leitung oder ein Rohr (18) umfassen, welche(s) mit dem hinteren Ende des Ganges (19) in Verbindung steht und am hinteren Ende des Gehäuses (10) oder hinter diesem Ende mit einer Unterdruck-Quelle verbindbar ist, dadurch gekennzeichnet, daß der Gang (19) ringförmig oder im wesentlichen ringförmig und um die Kupplung (13) herum angeordnet und durch feststehende Teile des Schraubenziehers gebildet ist, wobei der radial äußere Teil des Ganges durch eine innere Wandung des Gehäuses (10), der radial innere Teil des Ganges durch eine feststehende Buchse (20) um die Kupplung (13) gebildet ist und das hintere Ende des

Ganges (19) hinter dem Hinterende der Kupplung (13) liegt.

2. Schraubenzieher nach Anspruch 1, bei welchem die Leitung oder das Rohr (18) innerhalb des Gehäuses verläuft.

3. Schraubenzieher nach Anspruch 1 oder 2, bei welchem ein Getriebe (12) zwischen dem Motor (11) und der Kupplung (13) eingesetzt ist.

#### Revendications

1. Visseuse motorisée comprenant enveloppe (10), un moteur (11) monté dans l'enveloppe (10), un support d'embout (14) monté dans l'enveloppe (10) pour rotation par le moteur (11), un embrayage sensible au couple (13) placé entre le moteur (11) et le support d'embout (14), un dispositif de guidage à saisie par aspiration (15) à une extrémité avant de l'enveloppe (10) adjacent au support d'embout (14) pour saisir et placer une vis (16) à entraîner, et un moyen pour relier une source de vide au dispositif de guidage (15), ledit moyen comprenant un passage (19) au sein de l'enveloppe (10) et s'étendant vers l'arrière à partir d'une position adjacente à l'extrémité avant de l'enveloppe (10) et un conduit ou tuyau (18) qui communique avec l'extrémité arrière du passage (19) et qui peut être relié à une source de vide à l'extrémité arrière de l'enveloppe (10) ou adjacente à cette extrémité arrière caractérisée en ce que le passage (19) est annulaire ou sensiblement annulaire, en ce qu'il est prévu autour de l'embrayage (13) et est formé par les pièces fixes de la visseuse, la limite externe radialement du passage étant formée par une paroi interne de l'enveloppe (10), la limite interne radialement du passage étant formée par un manchon fixe (20) autour de l'embrayage (13), et l'extrémité arrière du passage (19) se trouvent derrière l'extrémité arrière de l'embrayage (13).

2. Visseuse selon la revendication 1, dans laquelle le conduit ou tuyau (18) s'étend dans l'enveloppe.

3. Visseuse selon la revendication 1 ou 2, dans laquelle un engrenage (12) est placé entre le moteur (11) et l'embrayage (13).

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