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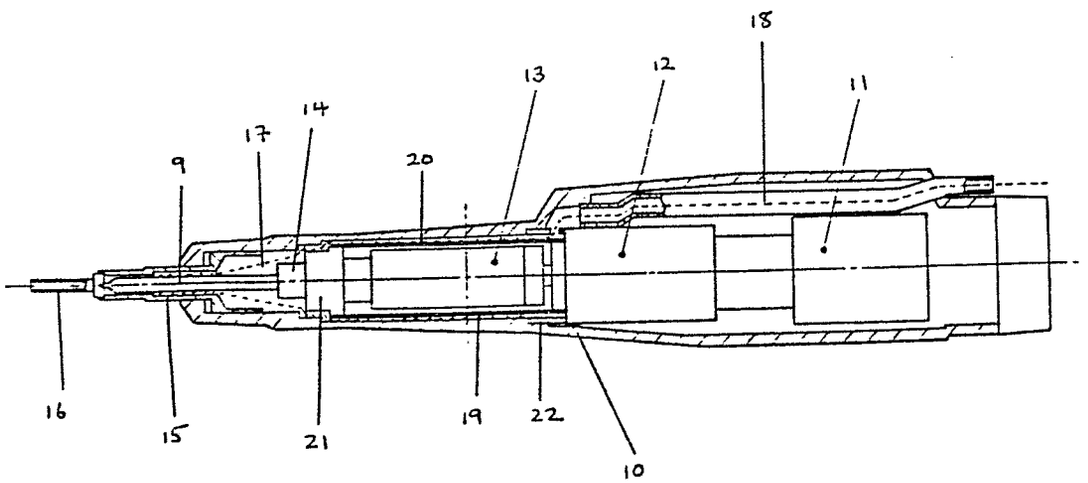
(71) Applicant: **DESOUTTER, LIMITED**
319, Edgware Road
Colindale London NW9 6ND(GB)

(72) Inventor: **Saunders, Roger Robert**
2 radlett Road
Watford Hertfordshire(GB)

(74) Representative: **Godwin, Edgar James et al,**
MARKS & CLERK 57-60 Lincoln's Inn Fields
London, WC2A 3LS(GB)

(54) A power operated screwdriver.

(57) The screwdriver comprises a casing (10) accommodating a motor (11) and a bit holder (14) rotatable by the motor. A suction pick-up finder sleeve (15) is mounted at the front end of the casing for picking up and locating screws to be driven. A negative pressure is applied to the finder sleeve *via* a delivery path which is provided within the casing and which includes an annular gallery (19) preferably provided around a torque sensitive clutch (13) of the screwdriver.



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"A POWER OPERATED SCREWDRIVER"

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.

According to the invention there is provided a power operated screwdriver comprising a casing, a motor mounted in the casing, a screwdriver bit holder mounted

in the casing for rotation by the motor, 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 an annular or substantially annular gallery within the casing and extending rearwardly from a position adjacent to the front end of the casing and a pipe or duct 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.

Preferred and/or optional features of the invention are set forth in claims 2-6.

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.

The above embodiment is given by way of example only and many modifications are possible without departing from the scope of the invention. For example, the invention could be applied to a stall torque motor which would not have a torque sensitive clutch.

CLAIMS:

1. A power operated screwdriver comprising a casing, a motor mounted in the casing, a screwdriver bit holder mounted in the casing for rotation by the motor, 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, said means comprising an annular or substantially annular gallery within the casing and extending rearwardly from a position adjacent to the front end of the casing and a pipe or duct 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.

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

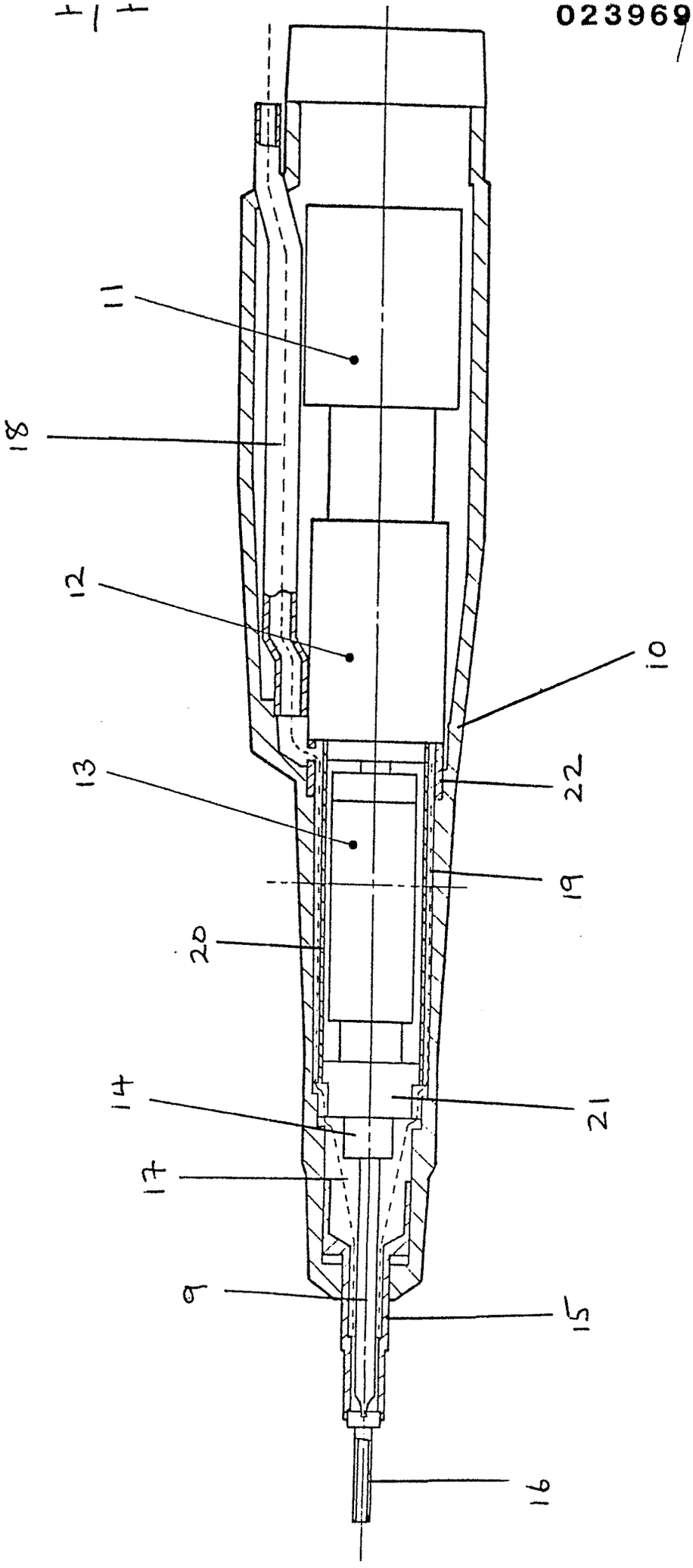
3. The screwdriver of claim 1 or claim 2, wherein a torque sensitive clutch is interposed between the motor and the bit holder and wherein the gallery is provided around the clutch.

4. The screwdriver of any one of the preceding claims, wherein the radially outer extent of the gallery is defined by an inner wall of the casing.

5. The screwdriver of any one of the preceding claims, wherein the radially inner extent of the gallery is defined by a stationary sleeve.

6. The screwdriver of any one of the preceding claims, wherein a gearbox is interposed between the motor and the bit holder.

7. A power operated screwdriver substantially as hereinbefore described with reference to the accompanying drawing.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