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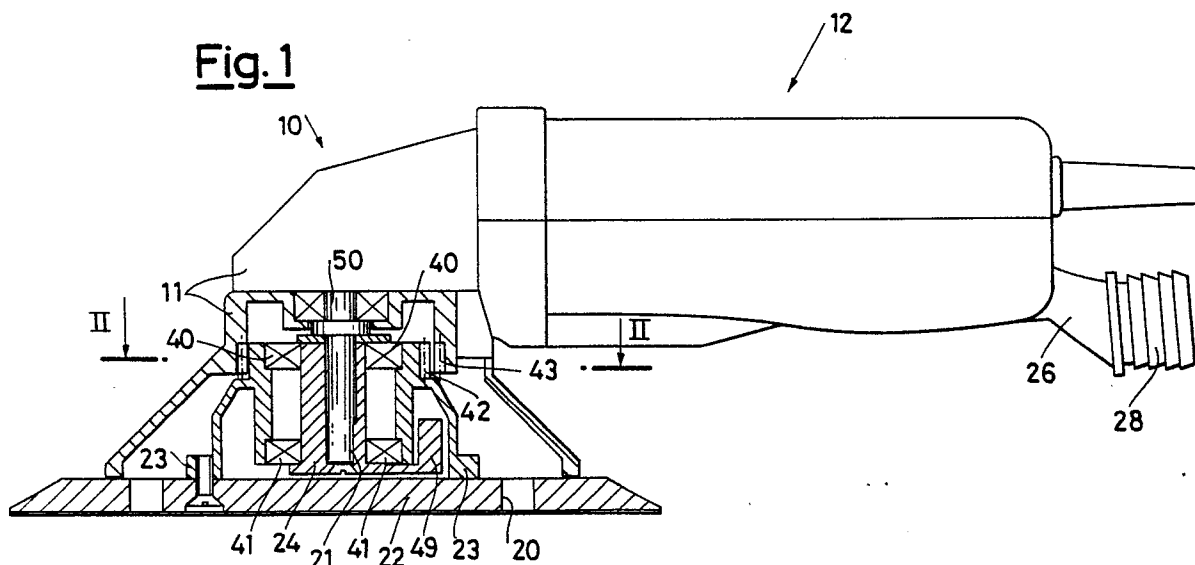

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Portable electric tool with balanced orbital movement.


 The portable electric tool comprises a driving shaft (50), an eccentric (24) rotated by the driving shaft (50), a turning support (23) for an operating element (22) mounted on said eccentric (24) and a counterweight (49) to balance the eccentric (24). The eccentric (24) and the counterweight (49) constitute a single piece which is mounted on an axial extension (21) of the driving shaft (50).



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"Portable electric tool with balanced orbital movement"

The present invention relates to a portable electrical tool and particularly but not exclusively an orbital sanding machine with orbital movement of the operative element.

Known portable electric tools have a driving shaft, an eccentric rotated by the driving shaft and an annular support for the operative element which following rotation of the eccentric performs an orbital movement with a circular trajectory around the axis of the driving shaft.

With the operative element support is usually made integral a toothed ring which by engaging with a corresponding toothed ring integral with the fixed body of the tool and having a different number of teeth adds to the aforesaid orbital motion a rotation around the axis of the eccentric to permit the operative element to follow composite noncircular orbits which allow better machining of the surface engaged.

In said tool there is provided a balancing device for the eccentric masses which consists of a counterweight fixed to the rotating eccentric.

The object of the present invention is to accomplish a portable electric tool with orbital movement in which the arrangement of the eccentric and the associated counterweight is particularly simple and economical.

In accordance with the invention said object is achieved with a portable electric tool comprising a driving shaft, an eccentric made to rotate by the driving shaft, a turning support for an operative element mounted in a turning manner on said first eccentric, a toothed ring fixed to said turning support and engaging with a fixed coplanar toothed ring and a counterweight characterized in that the eccentric and the counterweight comprise a single piece mounted on an axial extension of the driving shaft.

An example of a practical accomplishment of the present invention is illustrated for greater clarity in the annexed drawings wherein:

FIG. 1 shows a longitudinal section of an orbital sanding machine accomplished in accordance with the present invention,

FIG. 2 shows a cross section of said sanding machine along line II-II of FIG. 1, and

FIG. 3 shows a chart representing the orbits followed by the mass to be balanced.

The orbital sanding machine illustrated in the drawings is structurally formed of a working head 10 from which extends at right angles a handle 12 including an exhaust duct 26 for the dust arising from the work.

The duct 26 terminates with a saw-toothed connector 28 for a flexible exhaust tube designed

to convey the exhausted dust into a special collection container. Naturally to the connector 28 can also be directly applied a dust collection bag made of flexible material.

The working head 10 comprises an external body 11, within which is housed a mechanism for transmission of the motion of the armature shaft of the motor (not shown) to a plate 22 having suction holes 20 on which is applied a sheet of abrasive paper (not shown).

More precisely the plate 22 is fixed to a flanged annular support 23 born in a turning manner through bearings 40, 41 by an eccentric hub 24 fixed to an axial extension 21 of a driving shaft 50 made to rotate by the armature shaft of the motor through a bevel gear pair (not shown). With the annular support 23 is made integral a toothed ring 42 which is engaged with a coplanar toothed ring 43 having a larger number of teeth and which is fixed to the body 11 of the working head 10 (FIGS. 1 and 2).

A counterweight 49 extends laterally from the lower end of the eccentric 24 forming therewith a single piece mounted on the axial extension 21 of the driving shaft 50. The counterweight 49 is made in such a manner as to balance axially and transversally the weight of the eccentric 24 and the mass supported thereby.

During operation the armature shaft transmits through a bevel gear pair the motion of the driving shaft 21 an orbital movement which engagement with the toothed rings 42, 43 (FIG. 2) combines with a rotation around the axis of the eccentric 24 to originate a composite movement which follows the orbit with successive arcs indicated by the letter A in FIG. 3.

Claims

1. Portable electric tool comprising a driving shaft (50), an eccentric (24) made to rotate by the driving shaft (50), a turning support (23) for an operating element (22) mounted in a turning manner on said eccentric (24), a toothed ring (42) fixed to said turning support (23) and engaging with a fixed coplanar toothed ring (43) and a counterweight (49) characterized in that said eccentric (24) and said counterweight (49) constitute a single piece mounted on an axial extension (21) of the driving shaft (50).

2. Tool in accordance with claim 1 characterized in that said counterweight (49) extends laterally from the lower end of said eccentric (24).

3. Tool in accordance with claim 1 characterized in that said operating element (22) consists of the plate of an orbital sanding machine.

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Fig.1

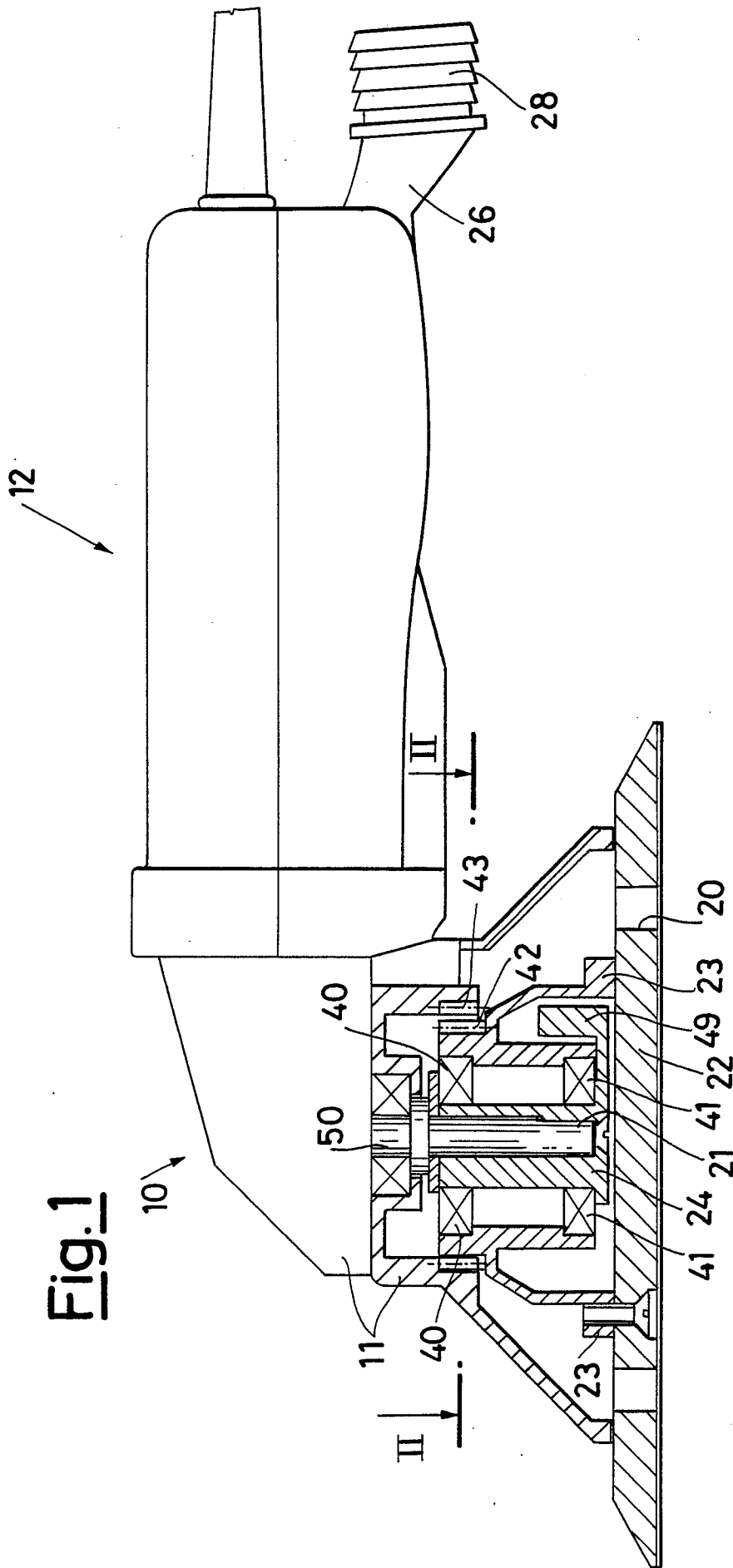
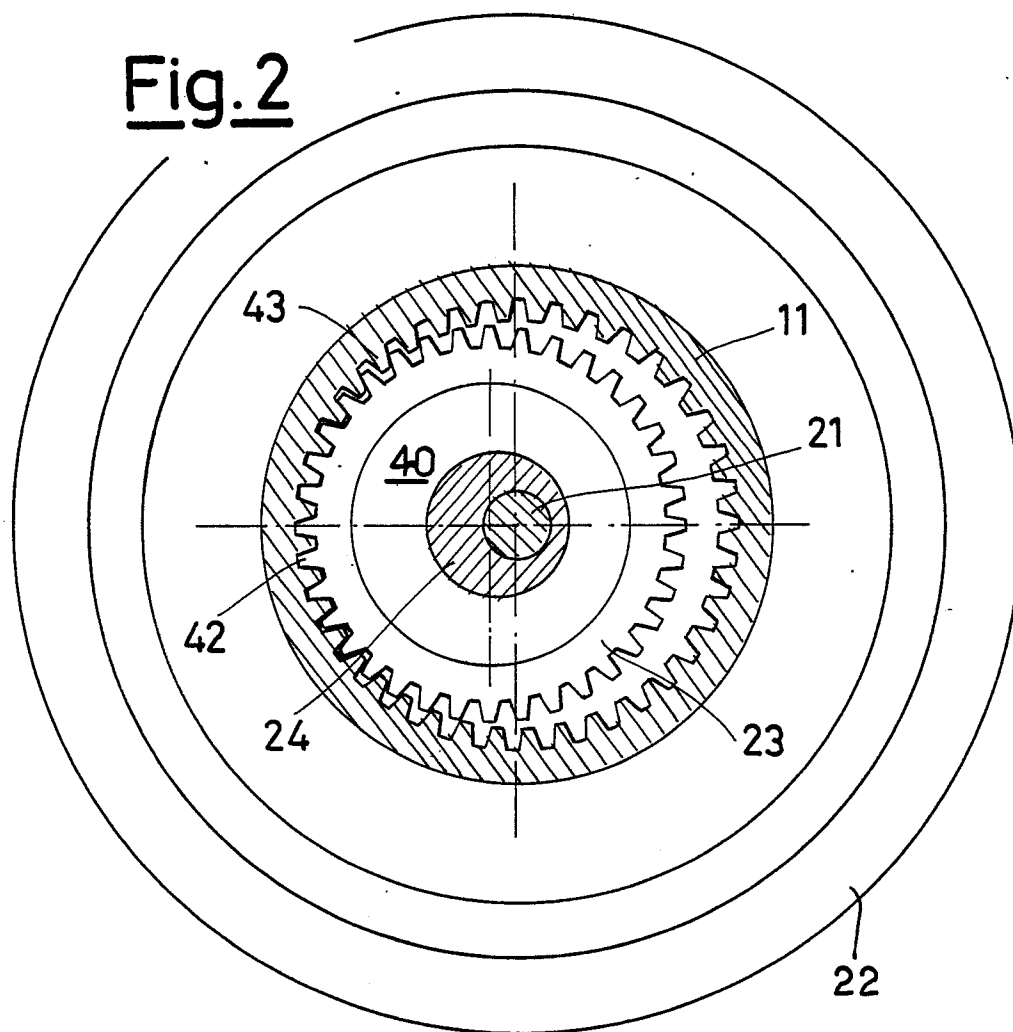


Fig.2**Fig.3**