Dec. 11, 1951 J. PLESTER 2,578,371

TOOL FOR SHAVING DOWN LOCAL PROTUBERANCES

Filed Feb. 6, 1948 2 SHEETS—SHEET 1

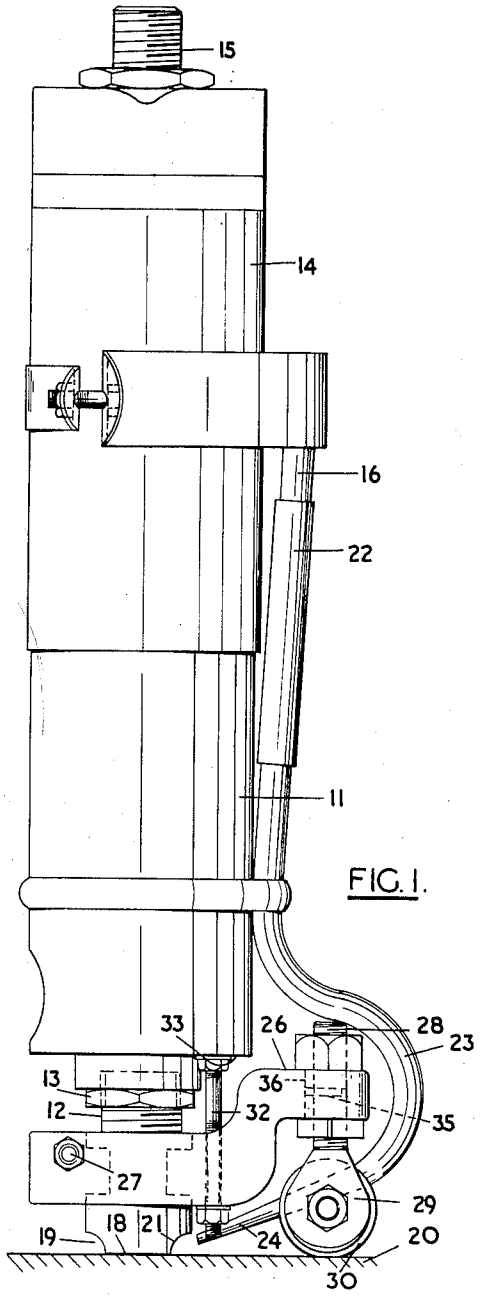


FIG. 1.

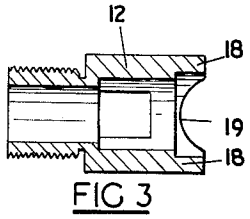


FIG 3

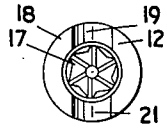
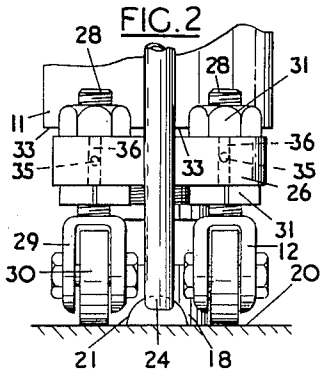


FIG. 4

FIG. 2



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TOOL FOR SHAVING DOWN LOCAL PROTUBERANCES

Filed Feb. 6, 1948 2 SHEETS—SHEET 2

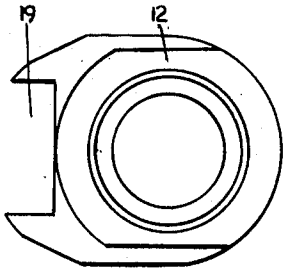


FIG. 7.

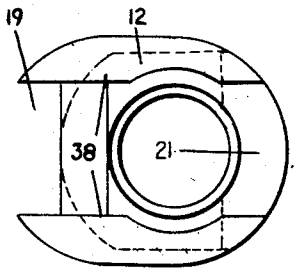


FIG. 8.

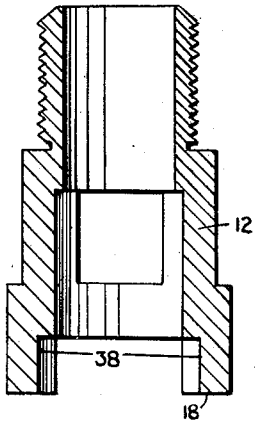


FIG. 6.

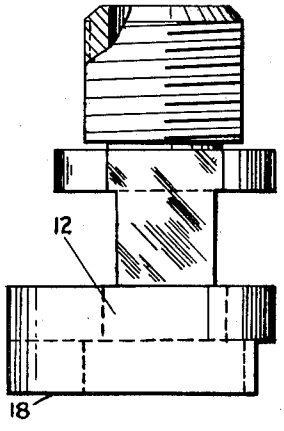


FIG. 5.

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UNITED STATES PATENT OFFICE

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TOOL FOR SHAVING DOWN LOCAL PROTUBERANCES

Joseph Plester, Coventry, England, assignor to Sir W. G. Armstrong Whitworth Aircraft Limited, Baginton, Coventry, England

Application February 6, 1948, Serial No. 6,756
In Great Britain June 23, 1947

1 Claim. (Cl. 90—12)

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This invention relates to a tool for shaving down local protuberances from a generally flat surface—for example, for shaving down the heads of rivets, in an aerofoil surface, which are countersunk and are intended to be flush fitted or proud to an extent of only a few thousandths of an inch.

British Patent Specification No. 571,130 discloses a tool which is very satisfactory for this purpose, but at times there are difficulties in maintaining the tool in a stable position during the shaving operation.

The main object of the present invention is to provide a satisfactory tool which will be very stable in use.

According to the invention, the tool body has a hollow operative end terminating with a flat extremity to which extends the end of a rotary face milling cutter disposed within the operative end, and the tool carries a pair of parallel wheels or the equivalent support which, with the said extremity, jointly provide a three point support for the tool on the generally flat surface with the extremity (and the face of the cutter) substantially fully in contact therewith. In addition, the flat extremity has a recess through which the protuberances can pass (to be engaged by the cutter) as the tool is traversed over the generally flat surface.

In the accompanying drawings:

Figure 1 is a side elevation of a tool according to the invention;

Figure 2 is a fragmentary rear elevation of the operative end of the tool, showing the wheel support;

Figure 3 is a longitudinal section of the operative end, and Figure 4 an underside plan thereof showing also one form of rotary milling cutter therein; and

Figures 5 to 8 show a preferred form of operative end for the tool, Figure 5 being a side elevation, Figure 6 a longitudinal section, and Figures 7 and 8 a top and underside plan, respectively.

Figures 1 to 4 show a tool body 11 having screwed into it an operative end 12 which is locked in position by means of a nut 13. Secured to the other end of the body is a pneumatic motor 14 having an inlet pipe 15 and an exhaust pipe 16, the motor driving a rotary face milling cutter 17 which extends along the hollow interior of the operative end 12 as far as the flat extremity 18 thereof. The extremity has in it a recess (for example, as shown at 19) through which the protuberances to be shaved can pass to engage the milling cutter when the tool is moved along the generally flat surface 20 with the flat extremity 18 substantially in full contact therewith. The extremity has, in addition, a second recess 21 diametrically-opposite the first, and in the present instance the exhaust pipe 16 is connected by a connection 22 to a curved pipe 23 the lower end 24 of which directs the exhaust through the recesses 21, 19 to blow off swarf, shavings and the like.

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In order to render the tool stable during the shaving operation there is mounted round the operative end 12 of the tool a bracket 26 which may be secured in position by means of a bolt 27 and which carries the spindles 28, 28 of forks 29, 29 in which wheels 30, 30 are journalled. The spindles 28, 28 are, it will be observed, adjustable within the bracket 26 independently of one another, lock nuts 31 being provided for securing them in an adjusted position, and the bracket 26 can be adjusted as a whole, for setting purposes, by means of a bolt 32 carried thereby and adapted to bear on the lower edge 33 of the body 11.

Independent adjustment of the spindles 28, 28 allows of setting the tool for use on a curved or other non-planar aerofoil or like surface when this should be necessary. The spindles are held against turning in the bracket 26 by means of cross-pins 35 engaged with vertical slots 36 in the brackets.

In Figures 5 to 8 the flat extremity 18 of the operative end 12 of the tool is elongated somewhat in the direction of travel of the tool, to provide a firmer support for the tool on the surface over which the tool is to be traversed. In fact, the said extremity is comprised of the ends to two side cheeks 38, 38 spaced from one another to provide the fore-and-aft recesses 19, 21, respectively.

What I claim as my invention and desire to secure by Letters Patent of the United States is:

A tool for shaving down local protuberances on a generally flat surface comprising a body, a motor supported by said body, a tubular surface contacting member supported by said body, a rotary face milling cutter driven by said motor and being within said surface contacting member, the latter surrounding said cutter, being of an internal diameter substantially that of a protuberance and terminating with a flat extremity which is substantially co-planar with said cutter, a bracket carried by said surface contacting member intermediate the ends thereof, and a pair of spaced coaxial wheels carried by said bracket for jointly providing with the flat extremity of said surface contacting member a three point support for the tool when on the generally flat surface with the flat extremity of

said surface contacting member and said cutter substantially fully in contact therewith, said surface contacting member having its flat contacting extremity relieved on a line bisecting said wheels through which protuberances can pass and be guided for engagement by said cutter as the tool is traversed over the generally flat surface.

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