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J. A. DANTINE
ROTARY POWER TOOL
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Fig. 3.

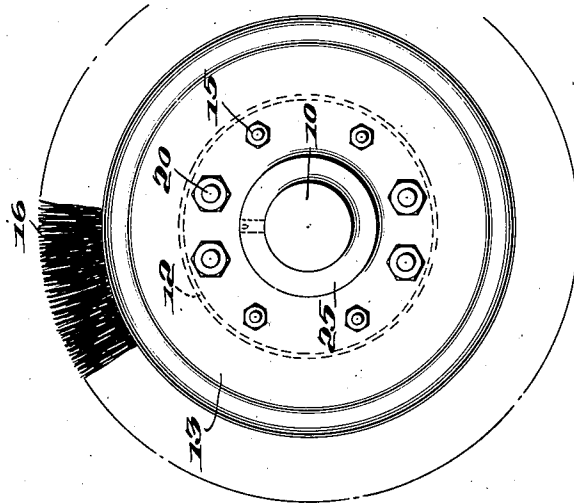


Fig. 2.

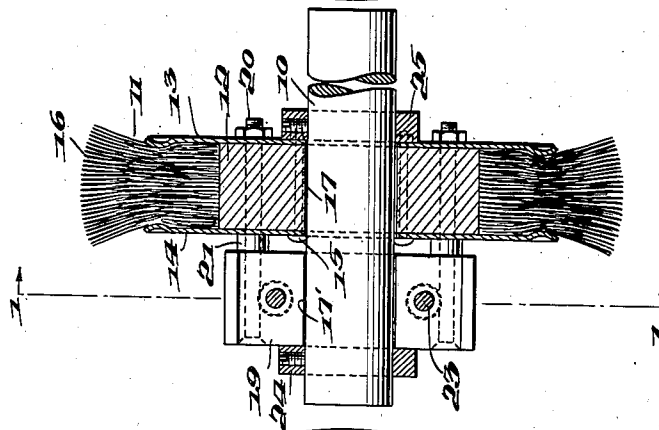
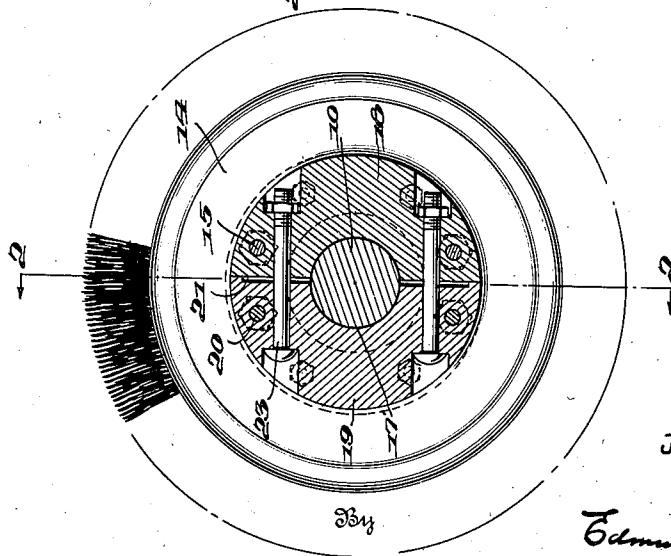


Fig. 1.



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ROTARY POWER TOOL

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4 Claims. (Cl. 51—190)

This invention relates to power driven rotary tools and is directed to a construction therefor which enables the tool speed to be controlled through the work operated upon. The invention is primarily intended for abrading, and polishing, wheels and brushes but rotary tools of other types can be constructed to embody the benefits of the invention.

One object of the invention is to provide a shaft-driven rotary tool wherein the operating speed of the tool may be varied relative to the shaft.

Another object of the invention is to provide a shaft driven rotary tool incorporating mechanism responsive to the contact pressure between the tool and work operated upon to vary the speed of rotation of the tool.

Still another object of the invention is to provide a shaft driven rotary tool embodying speed changing mechanism controlled by the contact pressure between the tool and work operated upon and enabling the tool to be driven by the shaft at different speeds.

A further object of the invention is to provide a shaft driven rotary tool incorporating simple speed reduction mechanism permitting the tool to be rotated at proper operating speed when the shaft is rotating faster than the desired operating speed.

A still further object of the invention is to provide a rotary tool-driving shaft assembly embodying a frictional driving connection operative to rotate the tool both at the same speed as the shaft and at speeds below the speed of the shaft.

Still another object of the invention is to operatively connect a rotary tool on its driving shaft in such manner that the operating speed of the tool may be changed without changing the speed of the shaft.

The invention will be understood from the illustrative embodiment thereof in the accompanying drawing now to be described. In such drawing:

Fig. 1 illustrates a shaft driven burnishing brush embodying the invention taken on the line 1—1 of Fig. 2;

Fig. 2 is a view of the same rotary tool taken on line 2—2 of Fig. 1; and

Fig. 3 is an end view showing the right end of the construction of Fig. 2.

In the embodiment illustrated, 10 indicates a driving shaft which, as usual, will be operated by an electric motor or any other suitable source of power. The rotary tool of the present embodi-

ment comprises a burnishing brush 11 such as used in shoe making and repairing, but within the scope of the invention it will be understood that abrading discs and cylinders for various purposes, fabric buffers, and other types of rotary tools may also be constructed according to the invention.

The brush illustrated includes a hub 12 of any suitable material and metallic side plates 13 and 14 held together by bolts 15 and adapted to secure the brush bristles 16.

Hub 12 has a central bore 17 loosely fitting shaft 10 so as to be capable of rotation independently thereof. Driving connection between the brush and shaft 10 is made through a variable speed driving mechanism which functions to rotate the brush at the same speed as the shaft 10, or at slower speeds. Such mechanism embodies a friction type clutch constituted and adjusted so as to partially slip or not relative to the shaft 10 in dependency on the contact pressure between the brush and the work, and operating to drive the brush from the shaft at shaft speed or at a reduced speed which diminishes as the working pressure increases. No reduction gear is required, nor need the speed of the shaft be changed.

The variable speed driving connection includes a split collar of wood or other suitable material having a bore 17' adapted to frictionally embrace shaft 10. Such collar is here formed in two halves 18 and 19, each secured to hub 12 of the brush by bolts 20. As shown in Figure 2, spacing washers 21 may be interposed between the collar halves and plate 14 of the brush.

The opposing radial faces of collar halves 18 and 19 will preferably contact only adjacent the outer periphery of the collar. The faces of one of the collars may be cut away to provide recesses 21. Extending between the collar halves are securing bolts 23, the same being so positioned as to extend through the recessed portion of the opposing radial faces of the collar halves. By tightening up bolts 23 a tight gripping frictional engagement can be brought about between bore 17' of the collar and shaft 10. For purposes of the invention the adjustment will be such that when the brush is running free and/or engages work operated upon only with a light contact the collar will not slip but rotate the brush at the same speed as shaft 10. When, however, the contact pressure is increased, as by pressing the work against the periphery of the brush with greater force, the adjustment of the collar is such as to undergo a slight slippage rela-

tive to the shaft so that while the brush is still rotated at a suitable operating speed, it will run more slowly than the shaft speed. By further increase in the contact pressure the rotary speed of the brush may be still further reduced relative to the shaft.

Since, according to the invention, neither the rotary tool nor the variable speed frictional device just referred to have any positive connection with driving shaft 10, it may be found desirable to provide means for holding the tool against accidental axial movement of the tool along the shaft during operation. As illustrative, I have shown a pair of stops comprising collars 24 and 25 anchored to shaft 10 by suitable set screws and being arranged at the opposite ends of the frictional collar-brush assembly.

It will be evident to those skilled in the art that the interposition of a variable speed drive between the power shaft and the tool has a number of benefits. In the first place, the entire assembly can be manufactured very economically. Again, it is possible to drive a rotary tool at the required operating speed when the shaft speed is higher than desired. In changing speed the operator need not remove either his hands or his eyes from the work. Also, since the speed of the tool is adjusted through contact thereof with the work, the operator can readily decrease and increase the speed of the tool quickly and to whatever extent he desires.

It will be understood that the embodiment of the invention herein explained is to be taken merely as illustrative and that the scope of the invention is to be adjusted from the appended claims.

I claim:

1. A rotary power tool of the class described comprising a driving shaft, a rotary tool, a collar frictionally engaging the periphery of the shaft secured to and supporting the tool, said collar being operative to rotate the tool at variable speeds relative to the shaft in dependency on the contact pressure between the operating surface of the tool and work operated upon.

2. A rotary power tool of the class described comprising a driving shaft, a rotary tool, and variable speed driving means interconnecting the shaft and tool including a split collar on the shaft supporting the tool, and means for adjusting the collar to frictional driving connection with the shaft, whereby the tool may be driven from the shaft through the collar at a slower speed than the shaft speed.

3. A rotary power tool of the class described comprising a driving shaft, a rotary tool, variable speed friction driving means for the tool comprising a collar frictionally engaging the periphery of the shaft, said collar being secured to and supporting the tool, and stop means on the shaft for preventing axial movement of the tool along the shaft.

4. A rotary power tool of the class described comprising a driving shaft, a rotary tool, said tool having a central opening loosely receiving the shaft for rotation at speeds independently of the speed of the driving shaft, and driving mechanism through which the tool is driven by the shaft embracing and frictionally engaging the shaft and secured to one side of the rotary tool.

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