Nov. 13, 1923. 1,474,153

B. W. KLEIN

MEANS FOR DETACHABLY CONNECTING AN OPERATING MEMBER TO A POWER DRIVEN SHAFT

Filed Oct. 16, 1922

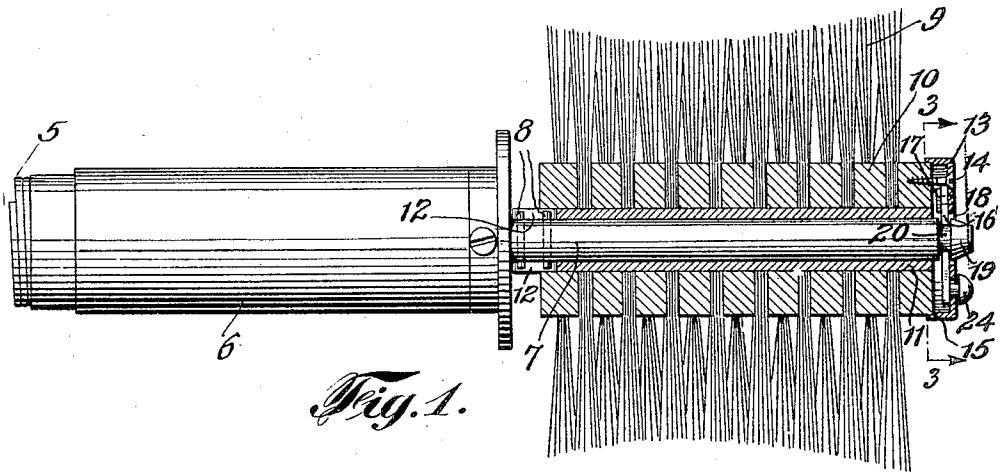


Fig. 1.

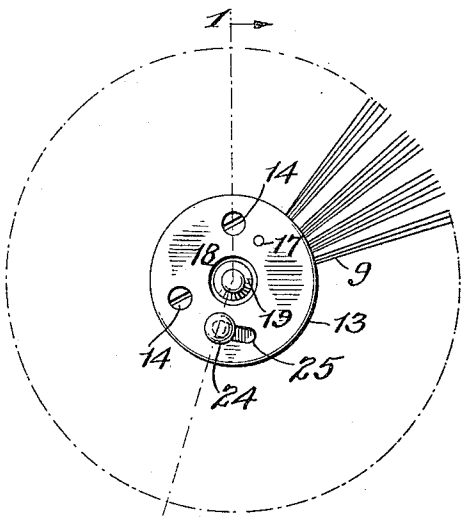


Fig. 2.

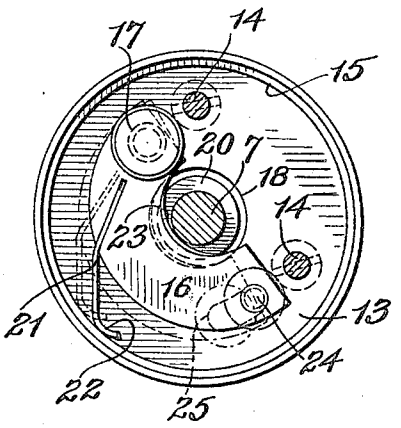


Fig. 3.

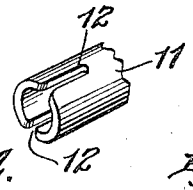


Fig. 4.

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UNITED STATES PATENT OFFICE.

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MEANS FOR DETACHABLY CONNECTING AN OPERATING MEMBER TO A POWER-DRIVEN SHAFT.

Application filed October 16, 1922. Serial No. 594,965.

To all whom it may concern:

Be it known that I, BENJAMIN W. KLEIN, a citizen of the United States, and resident of Mount Vernon, county of Westchester, and State of New York, have invented certain new and useful Improvements in Means for Detachably Connecting an Operating Member to a Power-Driven Shaft, of which the following is a specification.

This invention relates to improved means for detachably connecting an operating member to a power driven shaft and more particularly has for its primary object and purpose to provide simple and effective means for detachably connecting a polishing brush or other applicator to the end of a flexible shaft of a shoe polishing machine, such for instance as is illustrated in my prior application for patent filed March 3, 1922, Serial No. 540,923.

In the accompanying drawing, I have illustrated an embodiment of the invention wherein the flexible shaft is provided with a rigid axial extension at one of its ends and means to coact with the tubular core or sleeve of a brush body so as to prevent rotation of the brush upon said shaft. Upon one end of the brush body there is arranged a manually operable element to coact with the end of the shaft extension and hold the brush against longitudinal shifting movement.

With the above and other objects in view, the invention consists in the improved means for detachably mounting the brush or other operating tool upon the power shaft and in the form, construction and relative arrangement of the several parts as will be hereinafter more fully described, illustrated in the accompanying drawings and subsequently incorporated in the subjoined claims.

In the drawing wherein I have shown one practical construction of my invention and in which similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a longitudinal section through the brush showing the same in its applied position upon the driving shaft, said section being taken on the line 1—1 of Figure 2;

Figure 2 is an end elevation;

Figure 3 is a section taken on the line 3—3 of Figure 1; and

Figure 4 is a detail fragmentary perspective view of the tubular core of the brush body.

In the drawing, I have shown only a small portion of the flexible shaft 5 the end of which is enclosed by the hand hold 6. To this flexible shaft there is connected in any suitable manner, a rigid shaft extension 7 which projects beyond the hand hold 6 and is in coaxial relation therewith. Spaced pins 8 extend diametrically through the shaft extension 7 adjacent to the end of the hand hold and project slightly beyond the opposite sides of said shaft extension. The purpose of these pins will become apparent from the following description.

In the drawing I have illustrated a brush 9 such as may be employed for the purpose of polishing shoes, though it will be understood that the present invention is adaptable for use in connection with other applicators or tool elements to be employed for other purposes. The brush is provided with a cylindrical body 10, preferably of wood, in which the tufts of brush bristles are secured in any approved manner. This body 10 is provided with a central longitudinally extending tubular core or sleeve 11, said sleeve at one of its ends projecting beyond the end of the brush body and having longitudinally extending slots 12 in the opposite sides thereof.

Upon the other end of the brush body 10, a flanged metal cap 13 is secured, as by means of the screws 14, the flange of said cap being formed with an internal shoulder 15 abutting against the end of the brush body whereby the body wall of the cap may be positioned in spaced parallel relation to the end face of the body 10.

Upon the inner face of the body wall of the cap 13 a curved lever 16 is pivotally mounted at one of its ends upon the stud or pin 17 fixed in the cap wall. The end wall of the cap is centrally provided with an opening 18 through which the tapered frustro-conical end or terminal 19 of the shaft extension 7 is adapted to project. At the inner side of this tapered end of the shaft extension said shaft is provided with a continuous annular groove 20.

In the outer edge of the curved lever 16 one end of a leaf spring 21 is fixed, the free end of said spring being curved as at 22 and bearing against the marginal flange of the cap 13. This spring, therefore, normally acts to urge the pivoted lever 16

inwardly towards the shaft 7 whereby the inner curved edge 23 of said lever is engaged in the annular groove 20, thus locking the brush or other tool upon the shaft against axial shifting movement thereon. The projecting ends of the pins 8 engaging in the slots 12 of the sleeve or core 11 effectually prevent relative rotation of the brush upon said shaft.

The lever 16 at its other end is provided with a headed stud 24 movable in the slot 25 formed in the wall of the cap 13. By engaging the headed stud 24 with the finger, the lever 16 can be easily shifted against the action of the spring 21 and disengaged from the groove 20 so that the brush can be longitudinally withdrawn from the shaft 7.

From the above description, it will be seen that the holding or retaining means whereby the brush is detachably secured upon the end of the shaft for rotation therewith is exceedingly simple, the operating parts being completely housed and protected by the metal cap 13 so that they are not likely to be displaced or damaged by rough handling. In applying the brush upon the end of the shaft, the tapered peripheral face of the shaft end 19 coacts with the inner edge of the lever 16 and automatically forces said lever in an outward direction as the brush is moved inwardly on the shaft until the lever passes inwardly beyond the tapered end 19 of the shaft when it is immediately returned to its normal position by the spring 21 and engaged in the groove 20. The brush or other tool may be rotated at very high speeds without oscillating or otherwise moving from its position in coaxial relation with the power driven shaft so that there will be a steady application of pressure by the bristles of the brush upon the shoe.

I have herein shown and described one embodiment of the invention which I have found to be entirely satisfactory in practical use. Nevertheless it will be apparent that the device as herein disclosed is susceptible of embodiment in various other alternative structures and I accordingly reserve the privilege of adopting all such legitimate changes in the form, construction and relative arrangement of the several parts as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. In combination with an operating shaft having a tapering outer end, a tool adapted to be detachably engaged on said shaft and having a central core, said core and the shaft being provided with coacting means whereby the tool is held against relative rotation on the shaft, a cap fitted to the other end of the tool body and additonal manually manipulable means arranged between said cap and body adapted to coact with said shaft to prevent axial shifting movement of the tool on said shaft.

2. In combination with an operating shaft, a tool having a body and a central tubular core projecting beyond one end of the body, said projecting end of the core and said shaft having coacting means to prevent relative rotation of the tool on the shaft, and a manually manipulable lever mounted on the other end of the tool body, said shaft being provided with a circumferential groove to receive said lever whereby the tool is held against axial shifting movement on said shaft.

3. In combination with an operating shaft, a tool having a body and a tubular core extending centrally therethrough and projecting beyond one end of said body, said projecting end of the core having diametrically opposed slots, spaced pins projecting from opposite sides of the shaft for engagement in the respective slots to prevent rotation of the tool upon said shaft, a cap fixed to the other end of the tool body, and a spring pressed lever mounted within said cap, said shaft having an annular groove to receive said lever whereby the tool body is held against axial shifting movement on the shaft.

4. In combination with an operating shaft, a tool having a body and a tubular core extending centrally therethrough and projecting beyond one end of said body, said projecting end of the core having diametrically opposed slots, spaced pins projecting from opposite sides of the shaft for engagement in the respective slots to prevent rotation of the tool upon said shaft, a cap secured upon the other end of said tool body and having a central opening, the shaft terminating in a frustro-conical head adapted to extend through said opening and provided with an annular groove at the inner side of said head, a curved lever pivotally mounted at one of its ends within said cap, a spring normally urging said lever in one direction and yieldingly resisting movement of the lever upon engagement of the frustro-conical head with the inner edge of said lever and acting to return the lever to its normal position with its inner edge engaged in said annular groove whereby the tool is held against axial movement on the shaft, and means for manually operating said lever from the exterior of the cap whereby the lever may be disengaged from said groove and the tool detached from the shaft.

In testimony that I claim the foregoing as my invention, I have signed my name hereunder.

BENJAMIN W. KLEIN.