April 6, 1954 C. P. RHEES 2,674,071

GRINDING, POLISHING, AND FEATHEREDGING TOOL

Filed Oct. 6, 1952

Fig. 1.

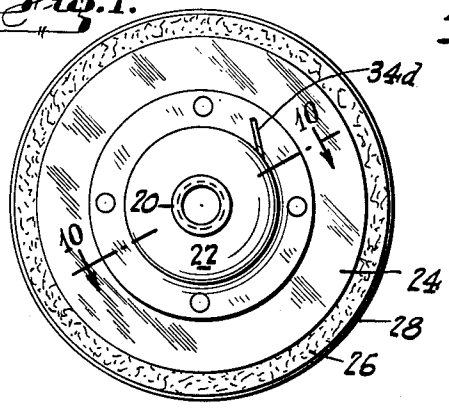


Fig. 2.

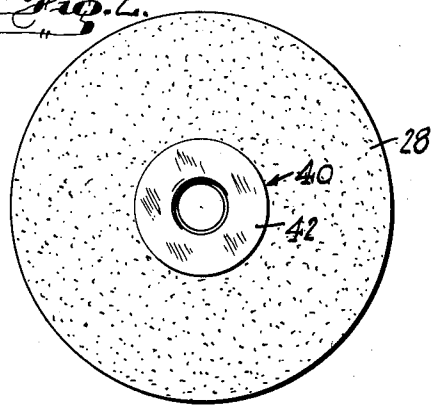


Fig. 3.

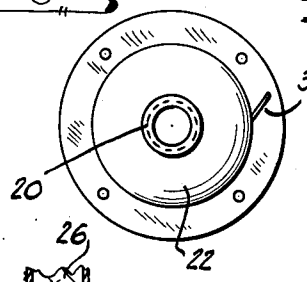


Fig. 4.

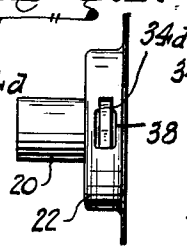
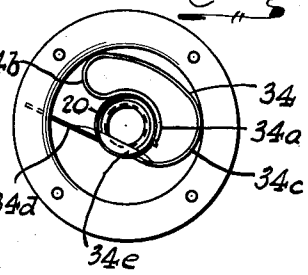


Fig. 5.



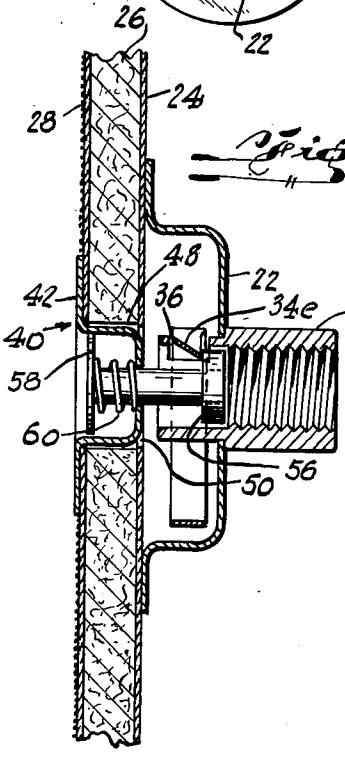
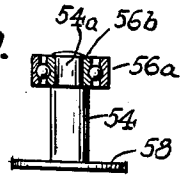


Fig. 10.



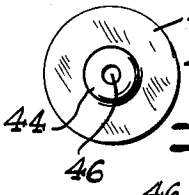
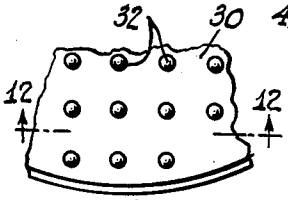


Fig. 6.

Fig. 13.



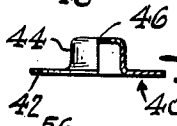


Fig. 7.

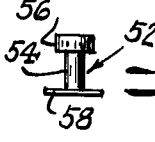


Fig. 8.

Fig. 11.



Fig. 9.

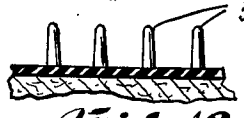


Fig. 12.

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GRINDING, POLISHING, AND FEATHEREDGING TOOL

Carm P. Rhees, Staten Island, N. Y.

Application October 6, 1952, Serial No. 313,211

3 Claims. (Cl. 51—197)

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This invention relates to a grinding, polishing, and feather-edging tool, and it constitutes an improvement over the invention which is disclosed and claimed in Patent No. 2,567,782, which was issued to me on September 11, 1951.

The tool which constitutes the subject matter hereof possesses all of the features and advantages of the tool which is disclosed and claimed in my said patent, and it performs all of the functions which said patented tool is capable of performing. The differences between the two tools reside in the locking means for holding the grinding, polishing and feather-edging discs in place. The present locking means constitutes a substantial and important advance over the locking means disclosed and claimed in said patent and over all prior forms of locking means known to the prior art.

It is the principal object of this invention to provide a locking means for tools of the character described, which is adjustable to the thickness of the working disc and its supporting pad or backing, which possesses a tensionally engaged, positive locking element, and which is readily unlocked to replace one working disc with another.

The locking means includes an annular flange which engages the working surface of the working disc and holds it flat against the pad or backing. This annular flange is provided with a centrally disposed recessed portion or well which performs several important functions. First of all, it encloses a good part of the locking mechanism so as to prevent it from projecting outwardly beyond the working plane of the working disc. In the second place, this recessed portion serves as a centering device to center the working disc on the pad or backing. In the third place, it serves as a vehicle for carrying some of the moving parts of the locking mechanism and for transmitting their clamping action through the annular flange to the working disc.

The locking means also includes a spring-urged stud which projects through the recessed portion of the annular flange. The spring means acts against said recessed portion and against a button on the outside of said stud to urge said stud axially outwardly. On the opposite or inner end of the stud is a shoulder which is engageable with a second locking element to lock the stud, and with it the recessed annular flange and the working disc in place on the tool. The second locking element last mentioned is on the tool itself and the interaction between said second locking element and the

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shoulder is very simple: when the shoulder is behind the second locking element, the locking mechanism is in locked condition; when the shoulder is in front of the second locking element, the locking mechanism is unlocked. The tension member above mentioned is the means of holding the shoulder in engagement with the second locking element when the shoulder is situated behind said second locking element.

The invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a back view of the operating head of a tool made in accordance with this invention.

Fig. 2 is a front view thereof, showing a sanding disc clamped thereon.

Fig. 3 is a back view of said operating head with the working disc and pad or backing removed therefrom.

Fig. 4 is a side view of the operating head as shown in Fig. 3.

Fig. 5 is a front or inside view of said operating head, with the working disc and pad or backing removed therefrom to expose the locking member which engages the shoulder of the locking stud to lock the working disc in place.

Fig. 6 is a back view of the recessed annular flange which clamps the working disc in place.

Fig. 7 is a side view, partly broken away and in section, of said recessed annular flange.

Fig. 8 is a side view of the locking stud of the locking mechanism.

Fig. 9 is an end view thereof.

Fig. 10 is a section through a tool made in accordance with this invention, showing the locking mechanism in locked position and showing a working disc clamped to the pad or backing.

Fig. 11 is a fragmentary view showing another type of resilient pad or backing which may be mounted on the tool herein described and claimed.

Fig. 12 is a sectional view on the line 12—12 of Fig. 11.

Fig. 13 is a view similar to Fig. 8 but showing a modification.

The grinding, polishing and feather-edging tool which is herein claimed includes an internally threaded tubular fitting 20 which may be secured to the driving shaft of the tool in conventional manner. Secured to said tubular fitting, as by welding, is a deeply recessed disc 22. Secured to said recessed disc 22 is a second disc 24. This second disc may be made of stamped sheet metal and so may the recessed disc and the two may be spot-welded together, and constitute a bracket. It may be desired,

however, to make disc 24 out of a more flexible material, such as sheet plastics of the Micarta type of Westinghouse Electric Corporation or Formica of the Formica Insulation Company. In such case, disc 24 would be riveted or otherwise secured to the recessed disc 22. Cemented or otherwise secured to disc 24 is a pad or backing 26 which serves as a back support for working disc 28. This working disc may be of any conventional type, it may be an abrasive disc for sanding purposes or a rubber disc for polishing purposes or any other type of working disc which is conventionally used in connection with tools of this general character.

Figs. 11 and 12 illustrate the use of a rubber disc or backing 30 which may be substituted for the pad or backing 26. This disc is provided with a plurality of pointed projections 32 which are molded thereon, integrally therewith and furnishes a very resilient backing for working disc 28.

It will be noted in Figs. 5 and 10 that recessed disc 22 serves as a cup to accommodate a leaf spring 34. The inner end 34*a* of said leaf spring is curled partly around tubular fitting 20. The spring is then bent twice to form a pair of oppositely disposed bights 34*b* and 34*c* respectively. The opposite end 34*d* then extends through an opening 36 in the side of tubular fitting 20, and it then projects outwardly from said recessed or cupped disc 22 through an opening 38 formed in its side wall. The portion of the spring which extends into opening 36 in the tubular fitting 20 is biased or twisted to provide an angular or sloping portion 34*e*. This sloping portion participates in a camming action which will hereinafter be described, and it also presents a sharp locking edge for engagement with the locking shoulder which will also hereinafter be described.

The face plate which holds the working disc in place against the pad or backing is a deeply recessed or cupped disc 40 which comprises an annular flange portion 42 and a cup 44 which is disposed centrally thereof. A central opening 46 is formed in said cup portion 44. It will be noted in Fig. 10 that padding 26 is provided with a relatively large hole 48 formed centrally thereof. A corresponding hole 50 is formed in disc 24. It will be noted that cup portion 44 projects into both holes 48 and 50 and, of course, through a corresponding hole which is formed in the working disc. Annular flange 42 abuts the face or working surface of the working disc and it holds said working disc in place against the pad or backing 26.

A locking stud 52 is provided for inter-engaging the cupped disc 40 with locking element 34. This stud has a stem or shank portion 54, a shoulder portion 56 at one end and a flat disc or button portion 58 at the opposite end. Shank 54 extends through hole 46 in the cupped disc 40. A compression spring 60 is coiled about shank 54 and one end of it abuts disc 58 and the opposite end abuts cup portion 44 of cupped disc 40. The spring acts upon the locking stud to push it outwardly, that is, leftwardly as viewed in Fig. 10. It may be pushed manually inwardly by finger pressure against the button or disc end 58.

The shoulder portion 56 may be an anti-friction roller 56*a* having its inner race 56*b* secured to reduced end 54*a* of the stem, as seen in Fig. 13.

It will be noted in Fig. 10 that shoulder portion 56 of locking stud 52 is engageable with the inner edge (right edge as viewed in Fig. 10) of sloping portion 34*e* of locking spring 34. When

the locking stud is inserted into the outer end (left end as viewed in Fig. 10) of the tubular fitting 20, its shoulder portion 56 cams the sloping portion 34*e* of locking spring 34 out of its way so that it can reach its inner position in tubular fitting 20 as shown in Fig. 10. Once shoulder portion 56 clears the sloping portion 34*e* of the locking spring, said sloping portion springs back and locks behind said shoulder portion, thereby preventing dislodgment of said locking stud.

Spring tension is now provided between button end 58 of the locking stud and cup portion 44 of the recessed disc 40. Said recessed disc is urged inwardly (rightwardly as viewed in Fig. 10) and the locking stud is urged outwardly (leftwardly as viewed in Fig. 10). Consequently, flange portion 42 of recessed disc 40 bears against the face of the working disc 28 and the shoulder portion 56 bears against the locking spring 34. The effect is to clamp the working disc 28 against pad 26 and to lock shoulder portion 56 against the inner edge (right edge as viewed in Fig. 10) of the sloping portion 34*e* of the locking spring. It will be understood that the resilience of spring 60 will compensate or adjust for varying thicknesses in the working disc 28 and pad 26 so that the same clamping action will be had despite such variations.

To free the working disc 28 from the tool which is hereinabove described, all that need be done is to disengage the locking stud 52 from the locking spring 34. This may be done by manually moving the outwardly projecting end 34*d* of said locking spring in counterclockwise direction as viewed in Fig. 5 so as to disengage the sloping portion 34*e* of said spring from shoulder portion 56 of the locking stud.

The foregoing is illustrative of a preferred form of this invention, and it will clearly be understood that this preferred form may be modified and other forms may be provided within the broad spirit of the invention and the broad scope of the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A grinding, polishing and feather-edging tool comprising a tubular fitting which is attachable to a drive shaft, a bracket on said tubular fitting, a backing on said bracket, said backing having a hole axially aligned with said tubular fitting, a cupped disc having a center cup portion and an annular flange portion which extends outwardly from said cup portion, said cup portion being disposed within the hole in the backing, said flange portion being disposed against only said backing to clamp a working disc against said backing only, said cup portion having a hole formed therein in concentric relation to the hole in the backing, a locking stud projecting through the hole in the cup portion and the hole in the backing and into said tubular fitting, a button portion on the outer end of said locking stud, a compression spring between said button and said cup portion to urge said stud outwardly and the cupped disc inwardly and against said backing, a locking member on the inner end of said stud and a second locking member on said tubular fitting, said locking members being interengageable with each other to lock said locking stud to said tubular fitting.

2. A grinding, polishing and feather-edging tool comprising a tubular fitting which is attachable to a drive shaft, a bracket on said tubular fitting, a backing on said bracket, said backing

having a hole axially aligned with said tubular fitting, a cupped disc having a center cup portion and an annular flange portion which extends outwardly from said cup portion, said cup portion being disposed within the hole in the backing, said flange portion being disposed against said backing to clamp a working disc against said backing, said cup portion having a hole formed therein in concentric relation to the hole in the backing, a locking stud projecting through the hole in the cup portion and the hole in the backing and into said tubular fitting, a button portion on the outer end of said locking stud, a compression spring between said button and said cup portion to urge said stud outwardly and the cupped disc inwardly and against said backing, a locking member on the inner end of said stud and a second locking member on said tubular fitting, said locking members being inter-engageable with each other to lock said locking stud to said tubular fitting, said locking member comprising a locking spring which is mounted on the outside of said tubular fitting, within the bracket on said fitting, said tubular fitting having an opening formed in its side wall through which a portion of said locking spring extends for engagement with the locking member on the inner end of the locking stud.

3. A grinding, polishing and feather-edging tool comprising a tubular fitting which is attachable to a drive shaft, a bracket on said tubular fitting, a backing on said bracket, said backing having a hole axially aligned with said tubular fitting, a cupped disc having a center cup portion and an annular flange portion which extends outwardly from said cup portion, said cup portion being disposed within the hole in the backing, said flange portion being disposed against said backing to clamp a working disc against said backing, said cup portion having a hole formed therein in concentric relation to the hole in the backing, a locking stud projecting through the hole in the cup portion and the hole in the backing and into said tubular fitting, a button portion on the outer end of said locking stud, a compression spring between said button and said cup portion to urge said stud outwardly and the cupped disc inwardly and against said backing, a locking member on the inner end of said stud and a second locking member on said tubular fitting, said locking members being inter-engageable with each other to lock said locking stud to said tubular fitting, said locking member comprising a locking spring which is mounted on the outside of said tubular fitting, within the bracket on said fitting, said tubular fitting having an opening formed in its side wall through which a portion of said locking spring extends for engagement with the locking member on the inner end of the locking stud, said inwardly extending portion of said locking spring being biased relative to the locking stud to enable the locking member on the inner end of said locking stud to cam said inwardly extending portion of the locking spring out of the way when said locking stud is inserted into said tubular fitting.

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