Nov. 16, 1954 S. SPECK 2,694,277

GRINDING AND HONING TOOL

Filed March 4, 1953

Fig. 1.

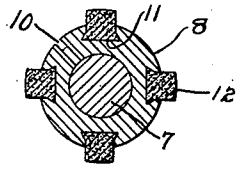


Fig. 4.

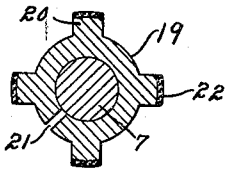


Fig. 2.

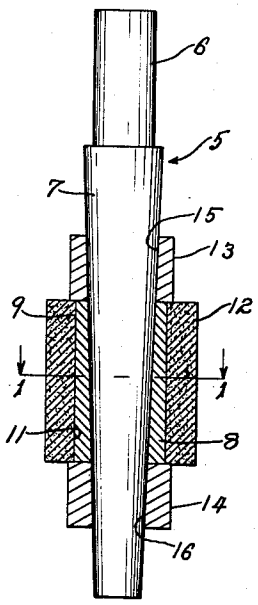


Fig. 6.

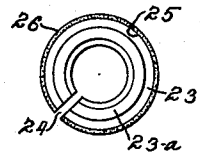


Fig. 5.

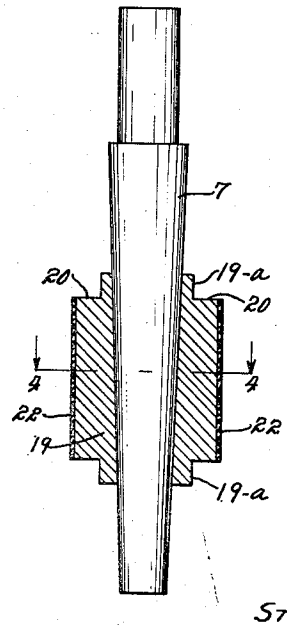


Fig. 7.

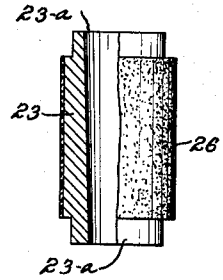
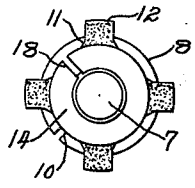


Fig. 3.



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GRINDING AND HONING TOOL

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Application March 4, 1953, Serial No. 340,337

2 Claims. (Cl. 51—184.3)

This invention relates to a grinding and honing tool and more particularly to a tool of the type which can be adjusted to grind or hone holes of different diameters.

It is an object of this invention to provide a grinding and honing tool which is simple in construction, inexpensive to produce and is easily adjusted to vary the diameter of the tool to extremely close dimensions.

A further object of the invention is the provision of such a tool having a shank on which different honing and grinding tools may be interchangeably mounted.

Further objects and advantages of the present invention will be more clearly understood from the following description and the accompanying drawings in which:

Fig. 1 is a sectional end view of my improved tool taken on line 1—1 of Fig. 2.

Fig. 2 is a side view of said tool partly in central vertical section.

Fig. 3 is an end view of said tool.

Fig. 4 is a sectional end view of a modified form of my invention taken on line 4—4 of Fig. 5.

Fig. 5 is a side view of said modified form, partly in central vertical section.

Fig. 6 is an end view showing a further modified form of my invention.

Fig. 7 is a side view thereof partly in central vertical section.

As shown in the drawings, a tool embodying my invention may include a shank 5 having a stem portion 6 and a tapered portion 7 which is adapted to receive different types of grinding or cutting heads.

The grinding head illustrated in Figs. 1 to 3, is in the form of a sleeve 8 having a tapered hole 9 therethrough. Said sleeve is slit, as at 10, to permit expansion and contraction thereof to vary its diameter. The exterior of the said sleeve 8 is provided with dove-tailed slots 11 which extend longitudinally of the sleeve and are adapted to receive grinding stones 12 therein as clearly shown in Fig. 1. The said stones are slidable in the slots 11 so as to permit removal and replacement thereof with similar stones when they become worn or when it is desired to change the diameter of the tool to a dimension which is beyond the limits of adjustment permitted by the expansion or contraction of the said sleeve.

In order to retain the stones 12 against undesired sliding movement within the slots 11, my invention further provides end collars 13 and 14 which also have tapered holes 15 and 16, respectively, which receive the tapered portion 7 of the shank and each of said collars is slit, as at 18, to permit them to expand and contract in the same manner as the sleeve 8.

When it is desired to use my improved tool for a grinding or honing operation, suitable stones 12 are inserted into the slots 11 of the sleeve 8. The said sleeve is then mounted upon the tapered portion 7 of the shank 5 and against the collar 13, which was previously placed on said shank, and the collar 14 is pushed over the end of the shank and against the end of the sleeve. The tool may be adjusted to vary the external diameter thereof by merely sliding the sleeve 8 upwardly or downwardly upon the shank and this may be done by simply striking the end of either of the collars 13 or 14 so as to slide the entire assembly into the desired position. The tool may thus be

quickly adjusted so as to grind or hone inside diameters of holes to extremely close tolerances.

When desired, a honing head such as shown in Figs. 4 and 5 may be used upon the same shank 5. This head is also in the form of a sleeve 19 and is preferably provided with ribs 20 which extend longitudinally of the sleeve and the said sleeve is slit, as at 21, to permit expansion and contraction thereof in the manner above described. Annular bosses 19–*a*—19–*a* are formed at the opposite ends of said sleeve and provide outwardly extending abutments which may be struck with a hammer or the like when it is desired to adjust the sleeve on the shank.

The exterior surfaces of the ribs 20 may be coated with a suitable abrasive material 22 which may be applied to the said surfaces in any suitable manner for providing a honing surface on the tool. The said head 19 may be adjusted in the same manner as the sleeve 8 with the exception that the collars 13 and 14 are not needed when the said sleeve 19 is used.

It will be noted that in the sleeve shown in Figs. 1 and 4, the grinding or honing surfaces are equally spaced around the sleeve so that the said tool is rendered self-centering during the operation thereof which will simplify the use of the tool and provide for a uniform contact between the operating surfaces of the tool and the inner surface of the hole in which the tool is used.

A modified form of honing head, as shown in Figs. 6 and 7, may also be used on the same shank. This head consists of a sleeve 23 which has a slit 24 and a continuous circumferential surface 25 that is coated with a layer of suitable abrasive material 26. The said sleeve 23 is also provided with annular bosses 23–*a*—23–*a* at its opposite ends and is adjustable for varying the external diameter thereof in the same manner as above described.

I claim:

1. A grinding and honing tool including a shank having a tapered portion, a head in the form of a sleeve having a tapered hole to receive said tapered portion and a slit to permit expansion and contraction of the sleeve upon being moved relatively to said shank, a plurality of grinding stones slidably mounted in slots extending longitudinally of said sleeve and a retaining collar mounted upon said shank against each end of the said sleeve, the said collars overlapping the slots in the sleeve to thereby retain the grinding stones therein and also being slit to permit movement of the collars with the sleeve relatively to the shank.

2. A grinding and honing tool including a shank having a tapered portion, a head in the form of a sleeve having a tapered hole fitting said tapered shank and a slit to permit expansion and contraction of the sleeve as it is moved longitudinally upon the shank, the said sleeve having longitudinally extending slots therein, a plurality of grinding stones mounted in said slot and slidable endwise of the sleeve, and a retaining collar mounted upon the tapered shank adjacent each end of the sleeve and overlapping the end of the slots therein to retain the grinding stones in said slots, the said collars and head being jointly movable upon the shank to thereby permit adjustment thereof for varying the external diameter of the head.

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