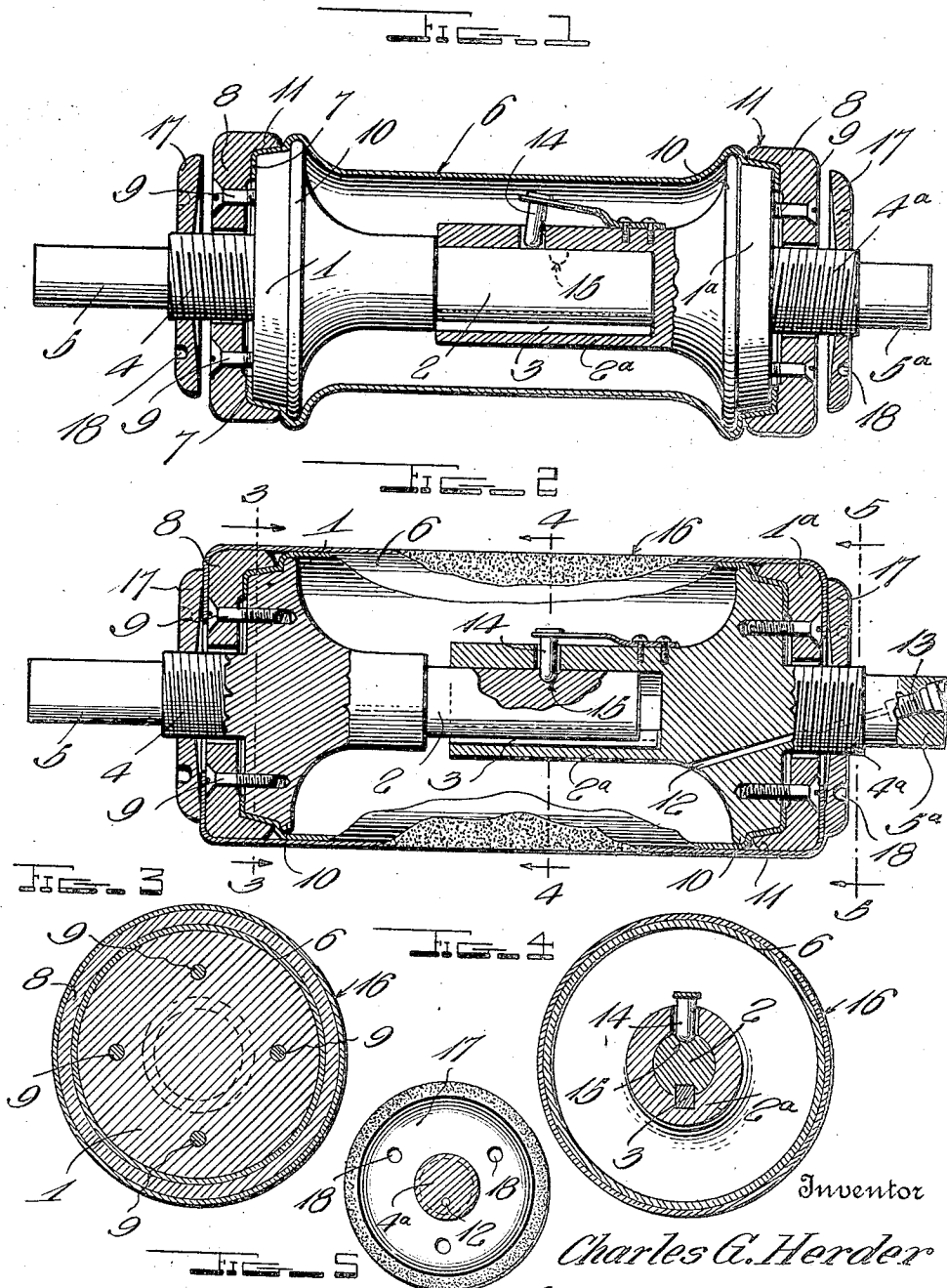


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C. G. HERDER.  
GRINDING OR POLISHING ROLLER.  
FILED OCT. 20, 1921.



Inventor

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## UNITED STATES PATENT OFFICE.

CHARLES G. HERDER, OF LOUISVILLE, KENTUCKY.

GRINDING OR POLISHING ROLLER.

Application filed October 20, 1921. Serial No. 509,161.

*To all whom it may concern:*

Be it known that I, CHARLES G. HERDER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Grinding or Polishing Rollers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in grinding and polishing rollers and more particularly to those in which the sheet of abrasive or polishing material is backed up by a pneumatic cushion instead of the usual padding.

In carrying out my invention, I provide a pair of axially aligned heads around which the ends of an inflated tube are secured and one object of my invention is to mount said heads so that they may move outwardly a pre-determined distance when the tube is inflated. By having the heads normally rather close together, the tube may be secured thereto much more easily than could otherwise be accomplished, and furthermore, it is advantageous to have the heads move outwardly when the tube is filled with air, so as to draw the sheet of polishing or grinding material to the desired degree of tightness.

A further object of the invention is to provide means for holding the two heads against any other relative movement after they have moved outwardly under air pressure to a pre-determined extent.

A still further object is to make novel provision for renewing the grinding or polishing sheet without disturbing the air cushion.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, the descriptive matter being supplemented by the accompanying drawings:

Figure 1 is a longitudinal sectional view, partly in elevation, showing my invention before the sheet of abrasive or polishing material is attached and the device inflated.

Figure 2 is a view similar to Fig. 1 but illustrating the tube inflated, the heads separated and the abrasive or polishing sheet secured and stretched in place.

Figures 3, 4 and 5 are transverse sectional views as indicated by the lines 3-3, 4-4 and 5-5 of Fig. 2.

In the drawings above briefly described, the numerals 1 and 1<sup>a</sup> designate a pair of circular heads which are positioned in axial alignment, and as here shown, are provided with inner and outer shaft sections 2 and 2<sup>a</sup> respectively, said shaft sections being splined or keyed together as indicated at 3, so that while they may relatively slide to permit inward or outward movement of the heads 1 and 1<sup>a</sup>, no relative rotation of said heads and shaft sections is permitted. The outer ends of the heads 1 and 1<sup>a</sup> are provided with stubs 4 and 4<sup>a</sup>, one of which is provided with a smooth extension 5 for connection in any suitable manner with the arbor of a grinding or polishing machine. The stub 4<sup>a</sup> may well be provided with an extension 5<sup>a</sup> to travel in a supplemental bearing to prevent possible whipping of the device. With the heads 1 and 1<sup>a</sup> moved inwardly to the positions shown in Fig. 1, a rubber air tube 6 is applied thereto as shown in Fig. 1, the ends of the tube being positioned around the heads and turned inwardly at 7 upon the outer sides thereof, said inwardly turned ends being secured in place by means of clamping collars 8 which are secured to the heads by screws or the like 9. The heads 1 and 1<sup>a</sup> are preferably tapered to some extent as shown and provided with external ribs 10 at their larger ends, and the clamping collars are preferably formed with flared flanges 11 surrounding the tapered portions of the heads and engaging the end portions of the tube. This construction serves to more readily clamp the tube ends against the heads in a fluid tight manner.

While any desired means may be provided for inflating the tube 6, I prefer to form a port 12 through the head 1<sup>a</sup>, its stub 4<sup>a</sup> and extension 5<sup>a</sup>, the outer end of said port being equipped with an appropriate check valve 13 to which a pump or air line may be connected. When the tube is inflated, the air pressure forces the heads 1 and 1<sup>a</sup> to move outwardly away from each other as will be seen by comparing Figs. 1 and 2, and to lock the shaft sections 2 and 2<sup>a</sup> of said heads together, when this outward movement has taken place, I provide a spring-carried locking pin 14 on the outer shaft section receivable in a socket 15 in the inner section. The outward movement of the heads 1 and 1<sup>a</sup> is advantageous to draw the sheet of grinding or polishing material 16 taut and furthermore, it is much easier

to insert the heads 1 and 1<sup>a</sup> in the ends of the tube 6 and secure said ends to said heads, before any stretching of the tube is produced, since otherwise the ends of said tube would tend to withdraw from the heads before they could be tightly clamped in place.

The grinding or polishing sheet 16 is formed into a tube whose ends are slit and turned inwardly upon the outer faces of the collars or rings 8, said ends being clamped in position by clamping rings 17 threaded on the stubs 4 and 4<sup>a</sup>. These rings are preferably provided with sockets 18 to permit the use of a spanner for turning them. By preference, the rings 17 are not tightened to the maximum extent until after the tube 6 is inflated and the heads 1 and 1<sup>a</sup> have moved outwardly, substantially to the end of their travel. The rings 17 are then tightly threaded in place to hold the ends of the sheet 16 against slippage, so that the complete inflation of the tube 6 and maximum outward movement of the heads 1 and 1<sup>a</sup> will tightly stretch the sheet 16, so as to produce the most advantageous results. While this sheet preferably extends straight between the heads as seen in Fig. 2, it will be understood that by inflating the tube 6 to a greater extent, said tube and sheet may be outwardly bowed if this is desirable for any particular class of work. In all cases, the grinding or polishing sheet is backed up by an air cushion which gives much better results than the usual padding.

Since excellent results may be obtained with the construction and arrangement herein shown and described, this is taken as the preferred embodiment of the invention. However, I wish it to be understood that minor changes coming within the scope of the invention as claimed may be resorted to if desired.

I claim:

1. A device of the class described comprising a pair of axially alined heads relatively movable away from each other in the direction of their axis, an elastic tube having its ends secured around said heads in

an air tight manner, means for securing a sheet of grinding or polishing material to said heads around said tube, and means whereby said tube may be inflated and said heads thereby forced outwardly away from each other.

2. A device of the class described comprising a pair of axially alined heads relatively movable away from each other in the direction of their axis, an elastic tube having its ends secured around said heads in an air tight manner, means for securing a sheet of grinding or polishing material to said heads around said tube, means whereby said tube may be inflated and said heads thereby forced outwardly away from each other, and means for holding said heads in the relative positions to which they are forced.

3. A device of the class described comprising a pair of heads axially alined with each other and provided with telescoping shaft sections, an inflatable tube having its ends secured around said heads, inflation of said tube serving to force said heads outwardly away from each other, and co-acting latch means on said shaft sections for holding them against relative movement when said heads have moved outwardly to a predetermined extent.

4. A device of the class described comprising a pair of circular heads mounted in axial alinement and having central outwardly extending stubs, an inflatable tube having its ends positioned around said heads and turned inwardly upon the outer sides thereof, clamping rings surrounding said stubs and secured to said heads to clamp the tube in place, a sheet of abrasive or polishing material around said tube having its ends turned inwardly against the outer sides of said clamping rings, and other clamping rings threaded on said stubs to clamp the ends of said sheet against said first named rings.

In testimony whereof I have hereunto set my hand.

CHARLES G. HERDER.