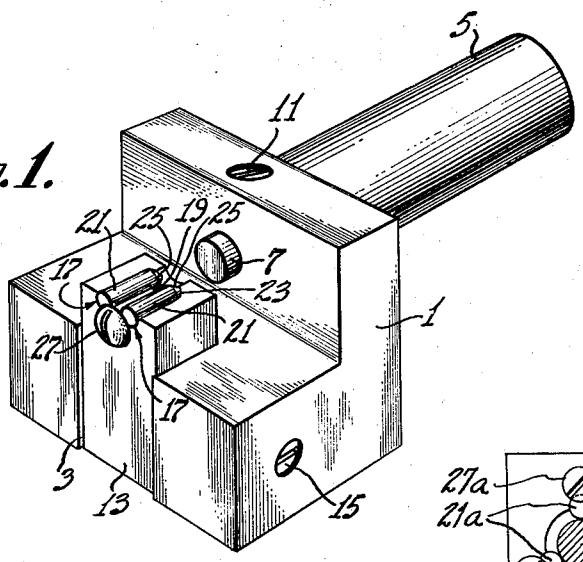
Sept. 9, 1952 S. O. SHUMAKER 2,609,592

WORK SUPPORTING ATTACHMENT FOR SCREW MACHINES AND THE LIKE

Filed March 7, 1950

Fig. 1.



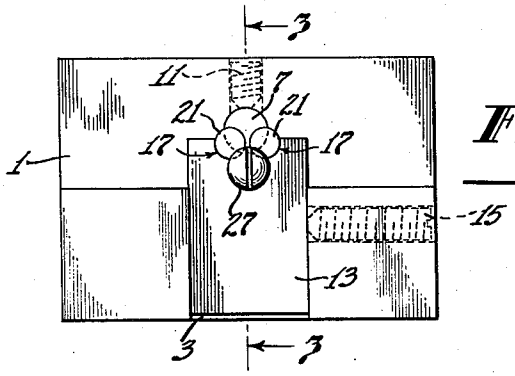


Fig. 2.

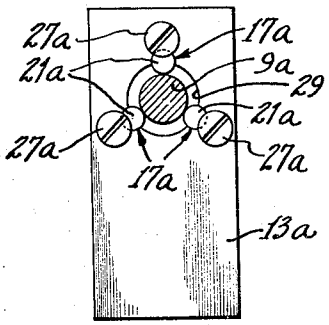


Fig. 5.

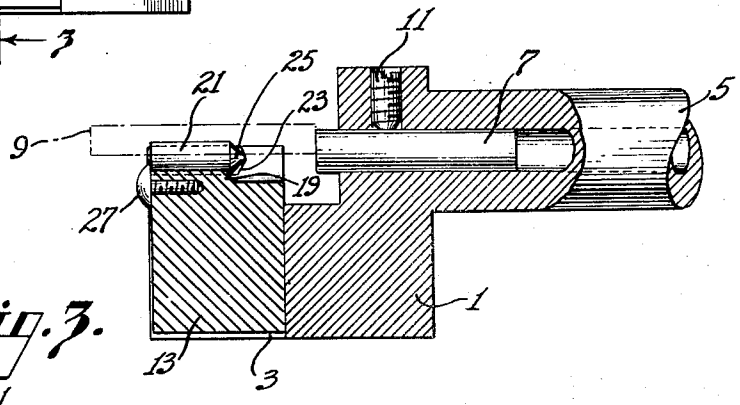


Fig. 3.

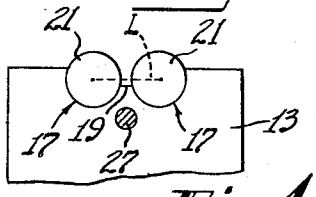


Fig. 4.

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WORK SUPPORTING ATTACHMENT FOR SCREW MACHINES AND THE LIKE

Samuel O. Shumaker, Merchantville, N. J.

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9 Claims. (Cl. 29—57)

1

This invention relates to work supporting attachments for screw machines and the like, and more particularly to a roller rest for supporting bar stock or stock of turned diameters while performing various operations thereon.

Various forms of work supporting attachments have been provided heretofore for supporting, in screw machines, lathes, etc., the work on which such operations as turning, forming, knurling, thread rolling and so on are performed. Such attachments are usually of the so-called solid type and are formed with a stationary, V-shaped holder against which the work bears during the course of the operation performed thereon. Due to many well known disadvantages of such solid type work holders, it has been proposed to form work holders with rollers against which the work can be made to bear. The roller type work supports, or roller rests, as they are known, offer the advantages of avoiding freezing and of eliminating galling and marring of the work. However, conventional roller rests are provided with rollers which are carried on pins or shafts mounted in bearings on the work supporting units. In such constructions, there is a definite limit to the diameters to which the rollers can be reduced since they must be of a diameter considerably greater than their supporting pins or shafts. Moreover, if the roller supporting shafts or pins are made of small diameter, they are relatively weak and cannot withstand heavy loads. Thus, it is clear that conventional roller rest supports are inherently limited in their usefulness.

Now, it frequently happens that the diameter of the stock operated on is itself quite small—perhaps of the order of $\frac{3}{16}$'' or less. As the diameter of the work approaches the diameter of the supporting shafts of the rollers, it is apparent that the use of shaft supported, conventional rollers becomes impractical. Hence, for work of small diameter, resort has been had to the solid type rests with their attendant disadvantages.

The primary object of my invention is to provide an improved roller rest work supporting attachment for screw machines and the like which will be entirely free from the disadvantages of heretofore known attachments of this type.

More particularly, it is an object of my invention to provide an improved roller rest construction which will readily and effectively accommodate work of very small diameter.

Another object of my invention is to provide an improved roller rest construction which can be used efficiently in small places while permitting the maximum amount of room for lubrication and

2

for chip escape. This is a feature not found in prior art roller rest constructions.

Still another object of my invention is to provide an improved roller rest construction which will carry heavy loads without danger of breaking.

A further object of my invention is to provide an improved roller rest construction wherein the rollers can be made much longer than in prior constructions of this type, thereby affording longer work supporting contact for the work.

Still a further object of my invention is to provide an improved roller rest construction which can be manufactured at considerably less cost than roller rest constructions known heretofore.

It is also an object of my invention to provide an improved roller rest construction as aforesaid which is simple in construction, which has a long life, and which is highly efficient in use.

In accordance with my present invention, I provide the work supporting attachment with a roller block or support formed with roller seats in which the rollers rest and in which they are free to turn or roll. Thus, the conventional roller pins or shafts are entirely eliminated, and therefore the rollers themselves may be made of small diameter stock to accommodate work of small diameter. At the same time, the seats provide strong, firm supports for the rollers whereby the rollers can assume heavy loads without danger of breaking. In addition, because the rollers can be of very small diameter, the unit or attachment can be used efficiently in small spaces to which conventional roller rest work supports cannot be accommodated suitably for ready lubrication and removal of chips or other foreign matter.

The novel features of my invention, both as to its organization and method of operation, as well as additional objects and advantages thereof, will best be understood from the following description of one embodiment thereof, when read in connection with the accompanying drawing in which

Figure 1 is a perspective view of a work supporting attachment for screw machines or the like provided with one form of improved roller rest construction in accordance with my present invention,

Figure 2 is a front elevation of the attachment of Figure 1,

Figure 3 is a sectional view taken on the line 3—3 of Figure 2,

Figure 4 is an enlarged, fragmentary, front elevation of the roller block of Figures 1 to 3 showing the work supporting rollers in their respective seats and the roller confining screw partly in section, and

Figure 5 is a front elevation of another form of roller block according to my invention.

Referring more particularly to the drawing, wherein like reference characters designate corresponding parts throughout, there is shown, in Figures 1 to 3, a roller rest work supporting attachment having a body portion 1 of L-shaped form provided with a channel or groove 3 in its front face and with a shank 5 which extends rearwardly from its rear face. The shank 5, by means of which the attachment can be secured to any suitable machine of the type mentioned heretofore, may be centrally bored for slidable reception therein of a stop member 7 against which a workpiece 9, such as a rod or the like, may abut, as clearly shown in Figure 3. The stop member 7 may be adjusted to any desired position on the body 1 and releasably locked therein by a set screw 11, or it may be removed, when not needed, to permit a long piece of work to extend into or through the bore in the shank 5.

Slidably and removably received within the channel 3 is a roller block 13 which is mounted in the channel 3 for adjustment longitudinally therealong. A set screw 15 releasably locks the block 13 in any desired position of adjustment in the channel 3. The upper end of the block 3 (i. e., the one most proximate to the shank 5 and its stop member 7) is provided with a pair of closely adjacent, cylindrical seats 17 separated by a slight ridge 19. Rotatably supported by each of the seats 17 is a cylindrical work engaging roller 21, the rollers having substantially the same diameter as the seats so as to fit snugly therein but being free to rotate on the seats 17 and to have the work 9 bear against them for support. The rollers 21 may be made of hard steel, "Carboloy," or any other suitable hard material. The seats 17 may extend entirely through the block 13, if desired. However, they are preferably made to extend only partly through the block 13, or a distance short of the thickness thereof. This permits forming on the rear portion of the block 13 conical seats 23 in which cone tips 25 on the rollers 21 are received to minimize end friction and insure accurate alignment of the rollers.

The seats 17 and the rollers 21 are preferably made on the same diameter. The spacing between the seats 17, the width of the ridge 19 and the diameter of the rollers 21 may be selected with due regard for the diameter of the work 9 which is to be operated on. In practice, I have used a roller rest construction as above described to successfully accommodate work having a diameter of as little as $\frac{1}{32}$ inch. For this purpose, I have used rollers having a diameter of approximately $\frac{1}{32}$ inch. This is entirely feasible with my improved roller rest construction because the rollers 21 do not depend on pins or shafts for their support, but are supported by and roll or turn on their respective seats 17. To prevent accidental endwise displacement of the rollers from their seats, a screw 27 having a large head is threaded into the block 13 below the ridge 19 in a location such that the screw head will engage the front ends of the rollers 21 to releasably confine the rollers in their seats without, however, substantially impairing their freedom to rotate on the seats 17.

As best seen from Figures 2 and 4, each seat 17, in the particular modification illustrated, extends over an arc of about 185°. While this arc may be greater than 185°, as circumstances may require, an arc of at least 185° is preferred in

order to give the rollers adequate support and to prevent lateral displacement of the rollers. The rollers are inserted into the seats 17 endwise from the front face of the block 13. Preferably, although not necessarily, the ridge 19 should extend up between the rollers 21 to a point below a horizontal line L connecting the centers of the rollers. This permits diposing the rollers very close to each other so that small diameter work can be readily accommodated thereon.

The attachment can be mounted on a screw machine, lathe, or the like by placing the shank 5 in the turret or tool slide thereof. The stop member 7 may then be adjusted on the body 1 to the desired position to control the distance the stock is to be fed, and the block 13 may be adjusted along the channel 13 to bring the rollers 21 into desired relation with the work 9, or into predetermined relation with the member 7. Thereafter, the block 13 is locked in position and a forming or other suitable operation is performed on the work.

In the form of my invention shown in Figure 5, the roller block 13*a* is provided with an opening 29 in the body thereof for reception of the work. Circumferentially around the opening 29, the block 13*a* is provided with a plurality of cylindrical seats 17*a* which communicate with the opening 29 and in which cylindrical rollers 21*a* are seated, each roller 21*a* being confined in its seat 17*a* by a screw 27*a* as described above. When the rollers 21*a* are placed in their respective seats, they extend somewhat into the work receiving opening 29 by reason of the fact that each seat 17*a* extends over an arc of less than 360°. Thus, the portions of the rollers 21*a* within the opening 29 define a circle of a diameter less than that of the opening 29 and equal substantially to that of the work 9*a* to be received in the opening 29 whereby the work will engage the rollers tangentially. The same advantages of thhe firm support for the rollers 21*a* and ability to assume heavy loads are afforded by the roller rest construction of Figure 5 as are afforded by the construction of Figures 1 to 4.

From the foregoing description, it will be apparent that I have provided an improved roller rest construction which is strong and durable, which can accommodate work of very small diameter, which itself occupies but little space, and which readily lends itself to facile lubrication and chip clearance. Although I have shown and described but two embodiments of my invention, it will undoubtedly be apparent to those skilled in the art that many other modifications, as well as various changes in the ones herein described, are possible within the spirit of my invention. For example, the block 13 may be made in two or more relatively adjustable parts, each having a roller seat therein, and each having associated with it a separate confining element corresponding to the screw 27. Other changes within the spirit of my invention will, no doubt, readily suggest themselves to those skilled in the art. I therefore desire that the foregoing shall be taken as illustrative and not as limiting.

I claim as my invention:

1. A work supporting attachment for screw machines and the like, said attachment comprising a roller block having at least one seat in one end thereof, and a roller rotatably carried in said seat, said seat extending into said block a distance short of the thickness of said block and terminating in a second seat angularly related to said first

named seat, one end of said roller also engaging said second seat.

2. A work supporting attachment for screw machines and the like, said attachment comprising a roller block having a first pair of closely adjacent seats in one end thereof, and a roller rotatably supported on each of said seats, said first pair of seats extending into said block a distance short of the thickness thereof and terminating each in a second seat angularly related to their respective first named seats, and said rollers each having an end engaging a separate one of said second seats.

3. A work supporting attachment according to claim 2 wherein said first named seats and said rollers have cylindrical curvature.

4. A work supporting attachment according to claim 2 wherein said first named seats and said rollers have cylindrical curvature of substantially the same diameter whereby said rollers fit snugly in their respective seats.

5. A work supporting attachment according to claim 4 wherein said first named seats extend over an arc of at least 185°.

6. A work supporting attachment for screw machines or the like, said attachment comprising a roller block having a pair of closely adjacent seats in one end thereof separated by a ridge, and a roller rotatably supported on each of said seats, said ridge extending in between said rollers a distance short of a line connecting the centers of said rollers whereby said rollers, when disposed in said seats, will lie in closely adjacent relation.

7. A work supporting attachment for screw machines and the like, said attachment comprising a roller block having a first pair of seats in one end thereof, a roller rotatably carried in each of said seats for free rotation therein, said first pair of seats extending into said block a distance short of the thickness thereof and terminating each in a second seat angularly related to their respective first named seats, said rollers each having an end engaging a separate one of said second seats, and means confining said rollers in their respective seats against accidental removal therefrom but without substantially impairing the freedom of said rollers to rotate on said first named seats.

8. A work supporting attachment for screw machines and the like, said attachment comprising a body portion provided with a channel, a roller block slidably received in said channel for adjustment therealong, means for releasably locking said block in any desired position of adjustment in said channel, said block having a first pair of seats therein, a roller rotatably carried in each of said seats, said first pair of seats extending into said block a distance short of the thickness thereof and terminating each in a second seat angularly related to their respective first named seats, said rollers each having an end engaging a separate one of said second seats, and means confining said rollers in their respective seats against accidental removal therefrom but without substantially impairing their freedom to rotate on said first named seats.

9. A work supporting attachment for screw machines and the like, said attachment comprising a body portion provided with a channel in the front face thereof and having a rearwardly extending shank for mounting in said machines, a roller block slidably received in said channel for adjustment therealong, means for releasably locking said block in any desired position of adjustment in said channel, said block having a pair of seats therein at the end thereof which is most proximate to said shank, a roller rotatably carried in each of said seats, and means confining said rollers in their respective seats against accidental removal therefrom but without substantially impairing their freedom to rotate on said seats, said shank including a stop member against which a workpiece bearing on said rollers can abut, and said block being adjustable in said channel to permit bringing said rollers into predetermined relation with said stop member.

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