Oct. 30, 1956 P. R. THOMASCO 2,768,481

BELT SANDER ATTACHMENT

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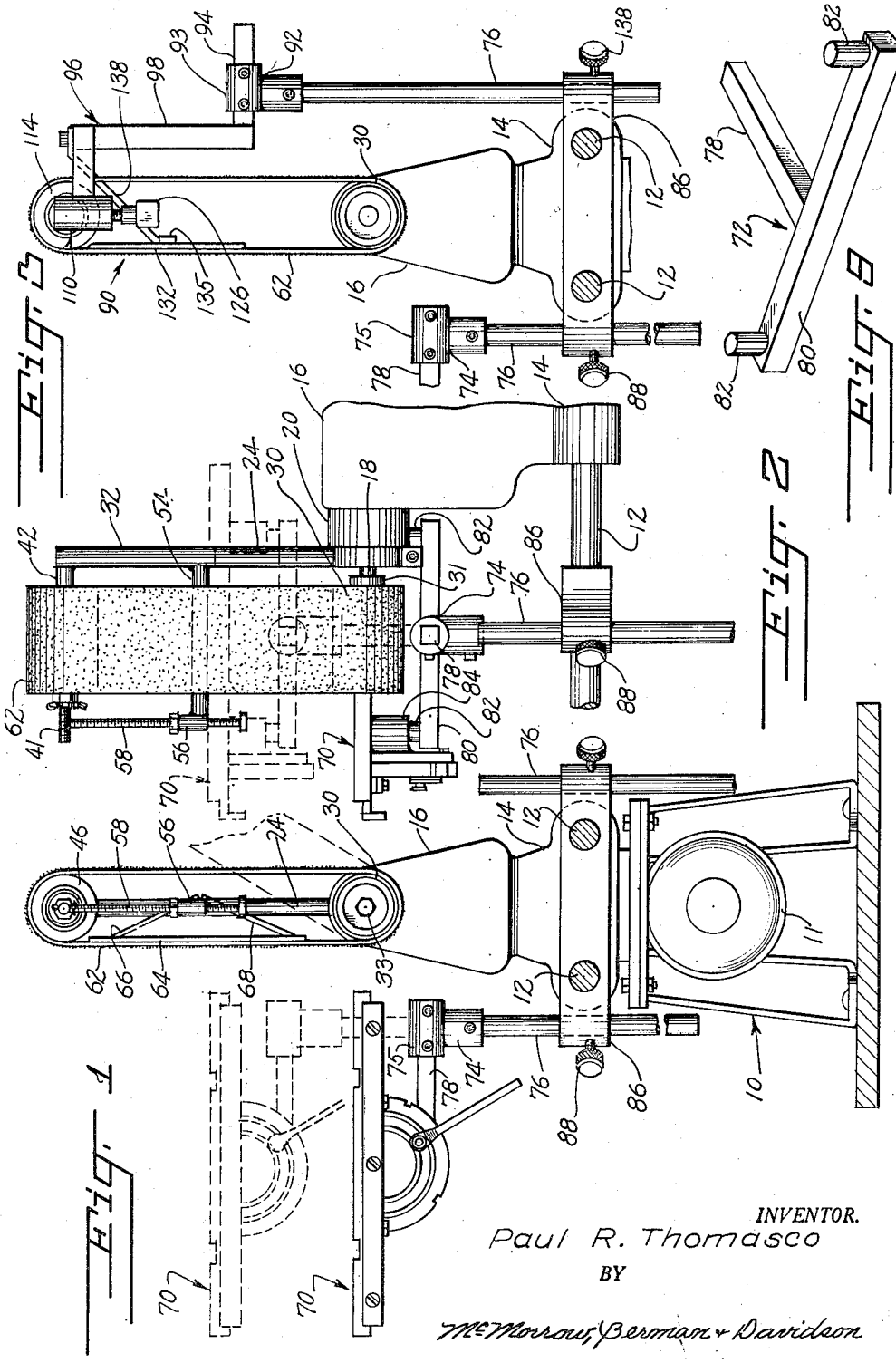


Fig. 1

Fig. 2

Fig. 3

Fig. 4

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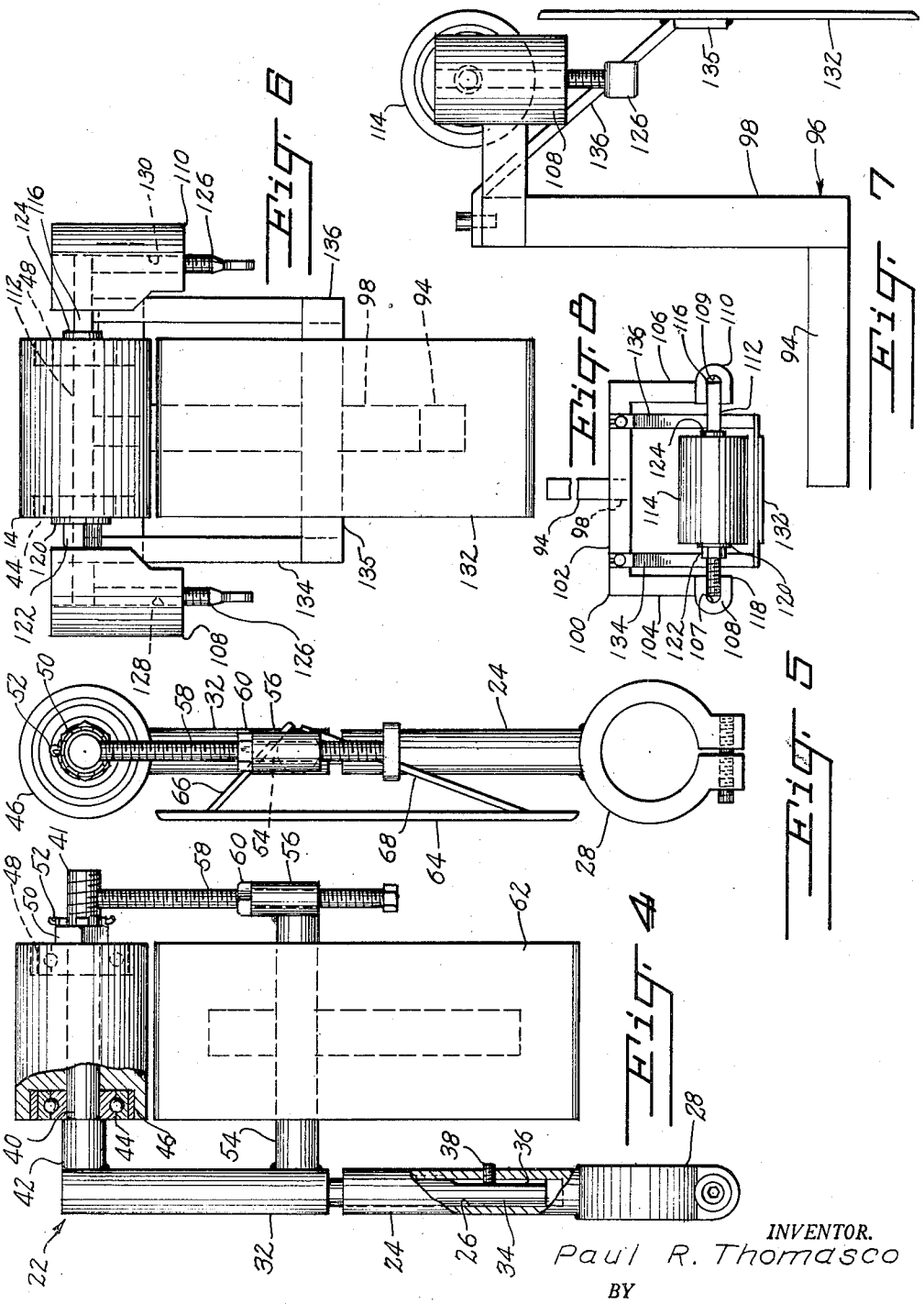


Fig. 6

Fig. 7

Fig. 8

Fig. 5

Fig. 4

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BELT SANDER ATTACHMENT

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6 Claims. (Cl. 51—135)

This invention relates to abrasive belt attachments and more particularly to a belt sander attachment for multi-purpose power tools.

It is an object of this invention to provide a belt sander attachment which may be readily and quickly applied to existing types of multi-purpose power tools such as those found in the home workshop.

It is a further object of this invention to provide a belt sander attachment of simple, yet rugged, construction capable of utilizing sanding belts of various sizes and which will cooperate with the table support of the multi-purpose power tools so that work can be sanded either in a straight line or at any desired angle, and by using the miter gauge on the table, any compound angle can be sanded.

Yet another object of this invention is to provide a belt sander attachment which may be readily aligned for accuracy of work and which will be driven by the power plant of the multi-purpose power tool to which it is to be attached.

Other objects and advantages will become apparent from a consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a front elevational view of a multi-purpose power tool with the attachment embodying the present invention applied thereto;

Figure 2 is a side elevational view thereof looking to the left of Figure 1;

Figure 3 is a front elevational view of a modified form of the belt sander attachment as applied to a multi-purpose power tool;

Figure 4 is a side elevational view partially broken away, of the belt sander attachment of Figure 1 as viewed from the left hand side thereof in Figure 1, and shown on a somewhat enlarged scale;

Figure 5 is an end elevational view looking to the left in Figure 4;

Figure 6 is a front elevational view of the modified form of the attachment shown in Figure 3, and shown on a somewhat enlarged scale;

Figure 7 is an end elevational view of the modified form of the attachment as viewed when looking to the left in Figure 6;

Figure 8 is a top elevational view of the modified form of the device, shown on a somewhat reduced scale and shown fragmentarily; and

Figure 9 is a perspective view of a support for the table of a multi-purpose power tool whereby the table may be employed in conjunction with the sanding disc.

With continued reference to the drawings, there is shown a multi-purpose power tool, generally indicated at 10, of a well known type and which includes a pair of spaced, parallel tubular ways or rails 12, upon which the carriage 14 of a head stock 16 may be slidably mounted for movement longitudinally thereof. The drive spindle 18 extends outwardly from the stock to the gauge collar 20.

With regard to the first form of the invention, as shown in Figures 1, 2, 4 and 5, it will be seen that the belt sander attachment, generally indicated at 22, comprises a tubular socket 24 of elongated form and provided with a central bore 26 opening to one end thereof. The socket or standard 24 carries at its outer end, remote from its open end, a split ring clamp 28 adapted to be secured about the gauge collar 20 and to the outer and thereof with the socket or standard 24 upstanding therefrom and with its center lying disposed perpendicularly to the axis of rotation of the drive spindle 18.

Onto the spindle 18 is secured a roller 30 for rotation therewith, so that the roller 30 may be considered to be the drive roller.

A support post 32 is provided with an extension 34 of reduced diameter and extending longitudinally therefrom at one end thereof. The extension 34 is adapted to be telescopically received within the bore 26 so that the axis of the socket or standard 24 and the axis of the post 32 are coincident. Adjacent the end of the extension 34 remote from the post 32, there is provided a flattened portion 36 to receive one end of a set screw 38 carried by the socket or standard 24 in a suitably threaded opening transversely therethrough, so that the height of the post 32 may be selectively adjusted and secured in the selectively adjusted position by tightening the set screw 38 against the flattened portion 36 of the extension 34.

A spindle 40 is carried by the support post 32 adjacent the upper end thereof and extends laterally therefrom in perpendicular relation thereto. The spindle 40 includes a stop shoulder 42 disposed between the post 32 and an anti-friction bearing 44 carried by the roller 46. The roller 46 is provided with an additional anti-friction bearing 48 adjacent the opposite end thereof remote from the end which the bearing 44 is disposed. Thus, the roller 46 is adapted to rotate about the spindle 40 as an axis. The end of the spindle 40 remote from the post 32 is externally threaded and receives thereon a stopnut 50 which may be screwed up against the bearing 48 so that the roller is maintained between the stopnut 50 and the stop shoulder 42 to prevent lateral movement of the roller. The stopnut 50 is maintained in a selectively adjusted position by a cotter pin 52.

A tubular arm 54 has one end thereof secured to the post 32, as by being welded thereto, adjacent the lower end thereof, or the end remote from the end from which the spindle 40 extends. The arm 54 is disposed in spaced parallel relation to the spindle 40 and extends to the same side of the post 32. The free end of the arm 54 has welded thereto a collar 56 so that the bore of the collar has its axis in perpendicular relation to the axis or center line of the arm 54.

The bore of the collar 56 is internally threaded to threadingly receive a stud 58 which extends upwardly therethrough to have its end abut against the externally threaded end 41 of the spindle 40 to provide an adjustable support for the free or threaded end of the spindle. A lock nut 60 is carried on the stud 58 and is adapted to bear against the upper end of the collar 56 so that the stud 58 may be locked in a selected position of adjustment.

A sanding belt 62 is trained about the rollers 30 and 46. The proper degree of tautness on the abrasive belt 62 may be attained by selectively raising or lowering the support post 32 and securing it in the selected position by tightening the set screw 38 against the extension 34. The lock nut 60 may then be backed off and the support stud 58 turned through the collar 56 to the point where it is in abutting relation with the end 41 of the spindle 40 at which time the lock nut 60 may again be tightened against the upper end of the collar

56 to prevent accidental displacement of the adjusted setting of the support stud 58. Also, it will be noted that the stud 58, in addition to its function as a support for the free end of the spindle 40, may be employed to compensate for any variations in the parallelism between the axis of the spindle 40 and the axis of the roller 30, the axis of the roller 30 being in extension of the power spindle 18. Thus, true running of the abrasive belt 62 will be assured.

A guide and backing plate 64 is supported by a pair of divergent brace members 66 and 68 secured adjacent their convergent ends to the arm 54 so that the guiding and backing plate 64 will contact the inner surface of the belt 62 as it travels about the rollers.

It will also be apparent that in order to replace or repair the roller 46, the removal of this roller from the spindle 40 may be easily accomplished by merely removing the cotter pin 52, unscrewing the stop nut 50 from the spindle after moving the stud 58 downwardly to a point where it will clear the periphery of the roller, and then merely slide the roller off the spindle.

In order to most effectively use the belt sanding attachment 22, the tiltable table, generally indicated at 70, normally provided with the multi-purpose power tool 10, is supported at the side of the endless sanding belt 62 to which the backing and guiding plate 64 is disposed, by the use of the table support adapter, generally indicated at 72 (see Figure 9).

As clearly shown in Figures 1 and 2, a T-collar 74 is secured by a set screw at the top of one of the table rods 76 disposed to the side of the head stock 16 to which the guiding and backing plate 64 extends. The shank 78 of the T-shaped adapter 72 is received in the cross head 75 of the T-collar 74 so as to extend outwardly therefrom to the side thereof remote from the head stock 16 and secured in a selected position of adjustment by a pair of set screws carried by the cross head. The cross bar 80 of the adapter 72 is provided adjacent opposite ends with upstanding pins 82 which are adapted to be received in the bores provided in depending spaced bosses 84 carried by the lower surface of the table 70 whereby the table 70 is supported upon the table rod 76 by the use of the adapter 72.

Also, it will be noted that the table rod 76 may be adjusted vertically through a vertical bore provided adjacent the end of the carriage 86 adapted to ride along the rails or ways 12, and maintained in the selected position of vertical adjustment by a knurl-headed securing screw 83. Thus, the table 70 may be raised from the solid line position shown in Figures 1 and 2 to the broken line position shown in these figures.

Thus, a work piece may be supported to be fed against the belt 62 as the belt is driven in a closed path by action of the drive roller 30 in response to the rotational power delivered from the motor 11 provided with the power tool 10. The table may be tilted and maintained in any desired angular relation to the horizontal, by a well known means, so that the angular surface may be sanded and by the use of a miter gauge (not shown) commonly provided with a table of this type, a compound angle may be sanded.

With regard to the modified form of the invention, shown in Figures 3, 6, 7 and 8, the belt sanding attachment is generally indicated at 90. As in the case of the attachment 22, the table 70 is supported for adjustment in a vertical rectilinear path upon one of the table rods 76 by he use of the T-collar 74 and the table support adapter 72.

The other one of the table rods is similarly carried by the carriage 86 for vertical adjustment in a rectilinear path and has a T-support collar 92 secured on its upper end by a set screw with the cross head 93 disposed with its central bore perpendicular to the center line of the table rod 76. The collar 92 is part of the attachment 90.

The laterally extending rod 94 of an upper roller support bracket, generally indicated at 96, is received in the bore of the cross head 93 and is slidably adjustable therethrough with a pair of set screws carried by the cross head operative to maintain the rod in a selected position of adjustment.

The support bracket 96 includes a vertical column 98, one end of which is welded to one end of the rod 94 adjacent the head stock 16 and extends upwardly therefrom and substantially perpendicularly thereto. The column 98 carries at its upper end a U-shaped bearing support member 100 with the member 100 being secured thereto at a midpoint location of its bight 102 and having the outwardly extending, spaced parallel legs 104 and 106 thereof extending laterally therefrom and perpendicularly thereto in a direction away from the collar 92.

A bearing block 108 is welded to the free end of the leg 104, and a similar bearing block 110 is similarly welded to the free end of the leg 106 so that the roller shaft 112 may be rotatably supported adjacent opposite ends in the respective bearing blocks and extending therebetween.

The roller shaft or spindle 112 has one end 116 thereof preferably squared so as to be received in the opening 109 in the bearing block 110 to prevent rotation of the shaft, while the other end of the roller shaft 112 is externally threaded as at 118 which is received in the bearing opening 107. The roller 114, similar in all respects to the roller 46, is mounted on the shaft 112 for rotation about the shaft as an axis. A stop washer 120 is placed in abutting relation to the anti-friction bearing included in the construction of the roller 114 and maintained in abutting relation thereto by a stop nut 22 carried on the threaded end 118 of the shaft. The other anifricion bearing in the roller 114 is maintained in place by a stop collar 124 formed on the shaft 112 so that the roller 114 is maintained between the stop washer 120 and the stop collar 124 thus preventing the lateral movement thereof.

Each of the bearing blocks 108 and 110 is provided with an internally threaded bore opening into the lower end thereof and into the respective bearing openings with an adjusting screw 126 threadingly received in the respective bores 128 and 130 in the bearing blocks 108 and 110, so that the ends of the adjusting screws 126 will engage adjacent opposite ends of the roller shaft 112 so that the axis of rotation of the roller 114 may be maintained in parallelism with the axis of the lower roller 30. A backing and guiding plate 132 carries a pair of support arms 134 and 136 secured at one end to the bight 102 of the bearing support member 100 in spaced relation and extending downwardly and outwardly therefrom with the other end of each of the arms welded to the rear surface of the plate 132. Thus, the plate 132 is disposed in a vertical position and adapted to have the back of the sanding or abrasive belt 62 in contact therewith.

To apply the sanding belt 62 to the attachment 90, the endless belt is placed about the upper and lower rollers, and the table rod 76 on which the support bracket 96 is mounted will be raised to a position where the belt 62 is sufficiently taut about the rollers 30 and 114, and maintained in the selected adjusted position by a knurl-headed securing screw 138 carried by the opposite side of the carriage 86 to which the table 70 is supported.

In operation, the attachment 90 will function similarly to the attachment 22 with regard to the use of the table 70 and also with respect to the manner in which the belt 62 is driven from the drive roller 30.

It will be noted in connection with the supporting arms 134 and 136 that a cross piece 135 extends between the free ends thereof and the plate 132 is carried by the cross piece 135, so that while it may be considered that the supporting arms 134 and 136 carry the backing and guiding plate 132, it will be apparent that the plate is actually secured, as by welding, to the cross piece

135 extending between the free ends of the support arms 134 and 136 remote from the ends secured to the bight 102.

To maintain the roller 30 against displacement there is provided a stop collar 31 on the drive or power spindle 18 and a nut 33 threaded on the terminal end of the spindle 18 so that the roller 30 is maintained between the stop collar 31 and the nut 33.

From the foregoing, it will be apparent that there has been provided in a multi-purpose power tool of the type having a headstock and a drive spindle extending therefrom, a belt sanding attachment which comprises a lower roller 30 carried by the drive spindle for rotation therewith, an upstanding roller support structure (common to both forms of the invention), carried by the power tool for vertical adjustment, an upper roller carried by the structure for rotation about an axis parallel to the axis of rotation of the lower roller, and an endless sanding belt trained about the rollers and adapted to be driven in a closed path by the lower roller, and a guiding and backing plate carried by the structure to contact the inner surface of the belt as it moves in its closed path.

In both forms of the attachment, the upper roller is carried by an upper roller shaft, in the case of the attachment 22 this upper roller shaft being defined by the spindle 40 about which the upper roller rotates as an axis, and adjusting means carried by the support structure and operatively contacting the shaft for maintaining the shaft in parallelism with the drive spindle.

The principal difference between the two forms of the sanding belt attachment resides in the specific structure of the upper roller support structure, which in the case of the attachment 22 is carried by the gauge collar 20 of the power tool while in the case of the attachment 90, the support structure is adjustably carried by the carriage 86 of the power tool 10. In both forms, the support structures are adjustable longitudinally of the support post or rod upon which they are carried.

While there is shown and described the preferred embodiment of the invention, it is to be understood that the structure is susceptible to change and modification within the practicability of the invention and therefore should be limited only by the scope of the claims appended hereto.

What is claimed is:

1. In a multi-purpose power tool of the type having a headstock and a drive spindle extending from the headstock, a belt sanding attachment comprising a lower roller carried by the drive spindle for rotation therewith, an upstanding upper roller support structure carried by the power tool for vertical adjustment, an upper roller carried by said structure for rotation about an axis parallel to the axis of rotation of said lower roller, an endless sanding belt trained about said rollers and adapted to be driven in a closed path by said lower roller, a gauge collar carried by said spindle adjacent its free end, said support structure including an upstanding socket, a clamp carried by said socket adapted to releasably grip said collar, a support post having an extension of reduced diameter projecting longitudinally from one end thereof to be slidably received in said socket, a spindle defining the upper roller shaft extending from said post adjacent the upper end thereof, and about which said upper roller revolves, and securing means carried by said socket to lock said extension in a selected position within said socket.

2. In a multi-purpose power tool of the type having a headstock and a drive spindle extending from the headstock, a belt sanding attachment comprising a lower roller carried by the drive spindle for rotation therewith, an upstanding upper roller support structure carried by the power tool for vertical adjustment, an upper roller carried by said structure for rotation about an axis parallel to the axis of rotation of said lower roller, an endless sanding belt trained about said rollers and adapted to be driven in a closed path by said lower roller, a gauge collar carried by said spindle adjacent its free end, said support structure including an upstanding socket, a clamp carried by said socket adapted to releasably grip said collar, a support post having an extension of reduced diameter projecting longitudinally from one end thereof to be slidably received in said socket, a spindle defining the upper roller shaft extending from said post adjacent the upper end thereof, and about which said upper roller revolves, and securing means carried by said socket to lock said extension in a selected position within said socket, an arm carried by said post and extending laterally therefrom adjacent said one end thereof in spaced relation to and extending to the same side as said spindle, a pair of divergent brace members carried by said arm adjacent the convergent ends thereof, a guiding and backing plate carried by the divergent ends of said support members to contact the inner surface of said belt.

3. In a multi-purpose power tool of the type having a headstock and a drive spindle extending from the headstock, a belt sanding attachment comprising a lower roller carried by the drive spindle for rotation therewith, an upstanding upper roller support structure carried by the power tool for vertical adjustment, an upper roller carried by said structure for rotation about an axis parallel to the axis of rotation of said lower roller, an endless sanding belt trained about said rollers and adapted to be driven in a closed path by said lower roller, a gauge collar carried by said spindle adjacent its free end, said support structure including an upstanding socket, a clamp carried by said socket adapted to releasably grip said collar, a support post having an extension of reduced diameter projecting longitudinally from one end thereof to be slidably received in said socket, a spindle defining the upper roller shaft extending from said post adjacent the upper end thereof, and about which said upper roller revolves, and securing means carried by said socket to lock said extension in a selected position within said socket, the tubular collar having a threaded bore longitudinally therethrough carried by said arm with the axis of said collar arranged perpendicular to the axis of said arm and spaced outwardly of the end of said arm remote from said post, an externally screw-threaded stud threadedly received in upstanding position in said bore for movement therethrough upon rotation, the upper end of said stud abutting the end of said upper roller shaft remote from said post to define an adjustable support for said upper roller shaft.

4. In a multi-purpose power tool of the type having a headstock and a drive spindle extending from the headstock, a belt sanding attachment comprising a lower roller carried by the drive spindle for rotation therewith, an upstanding upper roller support structure carried by the power tool for vertical adjustment, an upper roller carried by said structure for rotation about an axis parallel to the axis of rotation of said lower roller, an endless sanding belt trained about said rollers and adapted to be driven in a closed path by said lower roller, a gauge collar carried by said spindle adjacent its free end, said support structure including an upstanding socket, a clamp carried by said socket adapted to releasably grip said collar, a support post having an extension of reduced diameter projecting longitudinally from one end thereof to be slidably received in said socket, a spindle defining the upper roller shaft extending from said post adjacent the upper end thereof, and about which said upper roller revolves, and securing means carried by said socket to lock said extension in a selected position within said socket, the tubular collar having a threaded bore longitudinally therethrough carried by said arm with the axis of said collar arranged perpendicular to the axis of said arm and spaced outwardly of the end of said arm remote from said post, an externally screw-threaded stud threadedly received in up-

standing position in said bore for movement therethrough upon rotation, the upper end of said stud abutting the end of said upper roller shaft remote from said post to define an adjustable support for said upper roller shaft, and a lock means on said stud engaging the upper end of said collar to secure said stud in a selected position of adjustment relative to said collar and to said upper roller shaft.

5. In a multi-purpose power tool of the type having a headstock and a drive spindle extending from the headstock, a belt sanding attachment comprising a lower roller carried by the drive spindle for rotation therewith, an upstanding upper roller support structure carried by the power tool for vertical adjustment, an upper roller carried by said structure for rotation about an axis parallel to the axis of rotation of said lower roller, an endless sanding belt trained about said rollers and adapted to be driven in a closed path by said lower roller, a gauge collar carried by said spindle adjacent its free end, said support structure including an upstanding socket, a clamp carried by said socket adapted to releasably grip said collar, a support post having an extension of reduced diameter projecting longitudinally from one end thereof to be slidably received in said socket, a spindle defining the upper roller shaft extending from said post adjacent the upper end thereof, and about which said upper roller revolves, and securing means carried by said socket to lock said extension in a selected position within said socket, an arm carried by said post and extending laterally therefrom adjacent said one end thereof in spaced relation to and extending to the same side as said spindle, a pair of divergent brace members carried by said arm adjacent the convergent ends thereof, a guiding and backing plate carried by the divergent ends of said support members to contact the inner surface of said belt, the tubular collar having a threaded bore longitudinally therethrough carried by said arm with the axis of said collar arranged perpendicular to the axis of said arm and spaced outwardly of the end of said arm remote from said post, an externally screw-threaded stud threadedly received in upstanding position in said bore for movement therethrough upon rotation, the upper end of said stud abutting the end of said upper roller shaft remote from said post to define an adjustable support for said upper roller shaft.

6. In a multi-purpose power tool of the type having a headstock and a drive spindle extending from the headstock, a belt sanding attachment comprising a lower roller carried by the drive spindle for rotation therewith, an upstanding upper roller support structure carried by the

power tool for vertical adjustment, an upper roller carried by said structure for rotation about an axis parallel to the axis of rotation of said lower roller, an endless sanding belt trained about said rollers and adapted to be driven in a closed path by said lower roller, a gauge collar carried by said spindle adjacent its free end, said support structure including an upstanding socket, a clamp carried by said socket adapted to releasably grip said collar, a support post having an extension of reduced diameter projecting longitudinally from one end thereof to be slidably received in said socket, a spindle defining the upper roller shaft extending from said post adjacent the upper end thereof, and about which said upper roller revolves, and securing means carried by said socket to lock said extension in a selected position within said socket, an arm carried by said post and extending laterally therefrom adjacent said one end thereof in spaced relation to and extending to the same side as said spindle, a pair of divergent brace members carried by said arm adjacent the convergent ends thereof, a guiding and backing plate carried by the divergent ends of said support members to contact the inner surface of said belt, the tubular collar having a threaded bore longitudinally therethrough carried by said arm with the axis of said collar arranged perpendicular to the axis of said arm and spaced outwardly of the end of said arm remote from said post, an externally screw-threaded stud threadedly received in upstanding position in said bore for movement therethrough upon rotation, the upper end of said stud abutting the end of said upper roller shaft remote from said post to define an adjustable support for said upper roller shaft, and a lock means on said stud engaging the upper end of said collar to secure said stud in a selected position of adjustment relative to said collar and to said upper roller shaft.

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