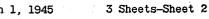


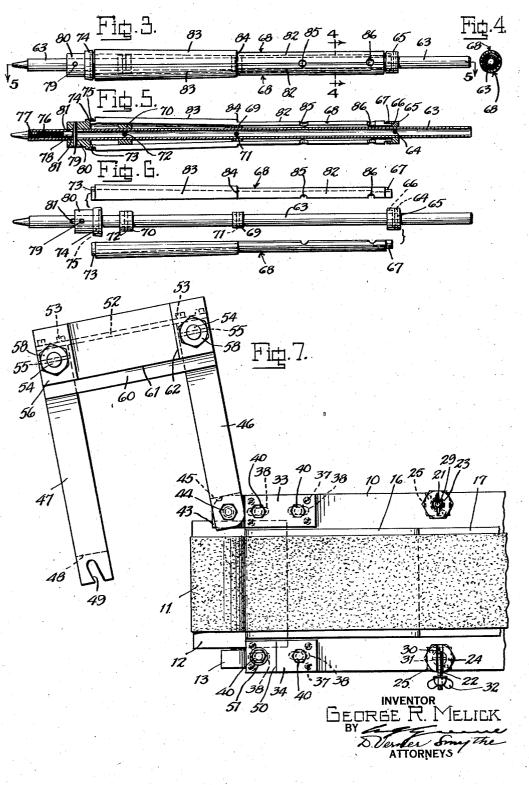
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SANDING MACHINE FIXTURE .

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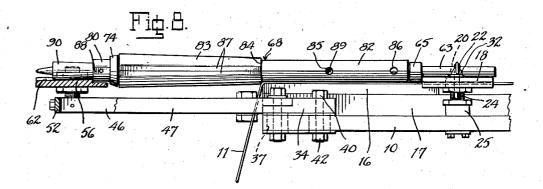


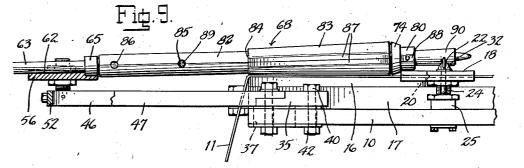
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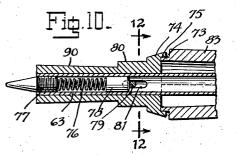
G. R. MELICK SANDING MACHINE FIXTURE

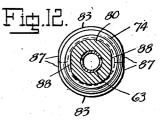


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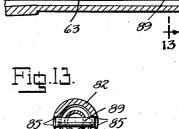


Fig.11.

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UNITED STATES PATENT OFFICE

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SANDING MACHINE FIXTURE

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19 Claims. (Cl. 51-135)

The present invention relates to a sanding machine fixture, particularly for use in a machine of the traveling belt type, and adapted for the longitudinal sanding of an elongated substantially cylindrical work piece. The fixture of the present disclosure is especially intended for the sanding of a predetermined length surface of a work piece, as for example the front or the rear hand guard portion of the barrel guard of a rifle. The particular type of guard contem- 10 plated includes a front substantially semi-cylindrical hand guard portion having clip recess cuts therein, and a rear hand guard portion of larger diameter and of tapered form and separated from the front portion by a shoulder, and it is 15 an object of the invention to provide a fixture whereby the sanding of the front guard portion may be carried out with extreme accuracy and uniformity for its full length, and without excessive sanding or mutilation of corner edges or 20 shoulder surfaces.

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It has been the practice heretofore to sand this type of barrel guard by reciprocating the guard back and forth upon the circumference of vantage that only a small portion of the guard was in contact with the sand paper at any one time, and consequently it required considerable skill by the operator in order that irregularities were not sanded into the guard. Another disadvantage was that the sander was such that it was impossible to reach the corners of the guard due to the diameter of the drum, so that additional work by hand was required. Additional disadvantages were that it was impossible 35 to maintain uniformity and the method was both slow and expensive.

It is proposed in the invention to provide a fixture for cooperation with a flat surfaced traverse of the sanding belt whereby the guard may 40 be rolled transversely of the direction of travel of the belt and maintained in such controlled relation therewith that uniform sanding results.

It is further proposed to provide a cushioned support for the flat traverse of the sanding belt 45 having a corner guide surface at its forward end over which the belt moves to form a relatively sharp angle, for the purpose of sanding the cylindrical surface of the guard up to the shoulder lation of the shoulder surface.

It is also proposed to provide a fixture by means of which a predetermined length surface of a work piece, of tapered form, as for example. the rear hand guard portion of the barrel guard 55

2 of a rifle, may be sanded through engagement with a flat surfaced horizontal traverse of the sanding belt, and to this end it is proposed to provide inclined roller support means whereby the tapered surface is maintained in parallel contacting relation with the sanding belt. Another object is to provide a fixture for uniformly sanding a work piece of non-circular cross-section, and to this end it is proposed to provide roller means corresponding in cross-sectional shape to the work piece, and whereby the work piece is maintained in substantially uniform engaging relation with the sanding belt. The noncircular work piece may be, for example, the tapered rear end guard portion of a rifle barrel guard, which is of substantially semi-circular cross-section, but is provided at its sides adjacent the base surface with longitudinally extending flat surfaces.

A further object is to provide a guard supporting mandrel for cooperation with the fixture, and upon which a pair of substantially semi-circular cross-section guards may be mounted so as to form a complete substantially circular cross-seca pneumatic drum sander. This had the disad- 25 tion work piece, thus greatly facilitating and speeding up the sanding operation by sanding two guards at once.

Another object is to provide a fixture which is readily adjustable as to height, so as to accom-30 modate different diameters of work pieces, and also as to angularity, so as to accommodate work pieces which are of pronounced tapered or conical form, as distinguished from substantially cylindrical form, and which is also adjustable to variations in the length of the surface to be sanded, as well as to variations in the overall length of the work piece.

Another object is to provide a fixture which permits convenient access to the endless sanding belt of the machine for the purpose of removing and replacing it.

With the above and other objects in view, an embodiment of the invention is shown in the accompanying drawings, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawings:

Fig. 1 is a plan view of a sanding machine thereof and without excessive sanding or muti- 50 fixture, according to the invention, the same being shown mounted in relation to the platen of the sanding machine over which the traveling sanding belt moves.

Fig. 2 is a side elevation thereof.

Fig. 3 is a side elevation of the work piece

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supporting mandrel, showing the pair of work pieces assembled therewith.

Fig. 4 is a transverse sectional view, taken along the line 4-4 of Fig. 3.

Fig. 5 is a longitudinal sectional view, taken 5 along the line 5-5 of Fig. 3.

Fig. 6 is a side elevation of a work piece supporting mandrel, and showing the two work pieces in separated relation thereto.

Fig. 7 is a plan view showing the fixture in its 10 open position, for the purpose of removing and replacing the sanding belt.

Fig. 8 is a side elevation of a sanding machine fixture adapted for the sanding of both a cylindrical portion and a tapered portion of the work 15 piece, the cylindrical portion being shown in sanding position.

Fig. 9 is a side elevation showing the tapered portion of the work piece in sanding relation.

Fig. 10 is a longitudinal vertical sectional view. 20 on an enlarged scale, of one end of the work supporting mandrel.

Fig. 11 is a longitudinal vertical sectional view of an intermediate portion of the mandrel.

Fig. 12 is a transverse vertical sectional view, 25 taken along the line 12-12 of Fig. 10.

Fig. 13 is a transverse vertical sectional view, taken along the line 13-13 of Fig. 11.

Fig. 14 is an enlarged partial vertical sectional view showing the mounting of one of the retain- 30 ing screw studs.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, the belt sanding 35 machine with which the fixture of the present in_ vention is incorporated, comprises a horizontal platen 10 over which passes a horizontal traverse of the endless sanding belt 11 which is mounted upon a series of guide and drive pulleys, one of 40 these guide pulleys 12 being illustrated as carried upon a swinging arm support 13 adjustably secured upon a stud shaft 14 of the sanding machine frame 15. This adjustable pulley engages the inner surface of the sanding belt below the 45 forward end of the platen 10, and is adapted through angular adjustment to vary the angle at which the sanding belt extends from the pulley to the forward end of the platen, where it bends at a relatively sharp angle and then moves 50along a horizontal traverse in the direction of travel of the belt, indicated by the arrows. The sanding belt is supported at its horizontal work engaging portion preferably by a yieldable cushion support 16, mounted upon a block 17 secured 55 to the platen 10, the cushion support being in the form of a flat plate of sponge rubber or the like, preferably covered with canvas and friction tape, and coated with powdered graphite and machine oil to reduce friction of the belt moving over it to a minimum. The support 16 may, if desired, be a hard surface.

In transversely bridging relation to the sanding belt and in overlying relation to the rearward end portion of the cushion support 16 there 65 is provided a flat rectangular plate 18, its under side being recessed, as at 19, to provide a passage for the belt, and its end portions being provided with longitudinally extending slots 20-20, respectively engaged by screw stude 21 and 22 70mounted in hexagon headed screw posts 23 and 24 screwed into the threaded vertical passages of mounting blocks 25-25. These mounting blocks are secured upon the platen 10 at each side of the block 17 by means of bolts 25, en- 75

gaged in clamping plates 27 at the under side of the platen and projected upwardly through holes in the platen, their upper ends being screwed into the under side of the mounting blocks. The posts 23 and 24 are vertically adjustable in these mounting blocks, and are adapted to be secured in their vertically adjusted positions by means of lock nuts 28.

The screw stud 21 is fixed in the post 23 and is engaged at its upper end by a wing nut 29, which upon being tightened clamps one end of the plate 18. The screw stud 22 at the other end is pivotally connected in a transverse slot 30 in the upper end of the post 24 by means of a cross pin 31, so that upon removal of the plate this screw stud may be swung downwardly into a position below the upper end of the post 24, as shown in Fig. 7, for the purpose of providing a clear way for the transverse removal and replacement of the sanding belt 11, and as will hereinafter more fully appear. In its normal upright position the upper end of the screw stud 22 is engaged in the slot 20, and has engaged upon its upper end a wing nut 32, which upon being tightened clamps the plate 18 to the post 24. The slots 20 permit adjustment of the plate 18 longitudinally of the sanding belt.

At the forward end of the platen 10, there are mounted bearing blocks 33 and 34, the platen being provided at each side of the block 17 with mounting means therefor comprising plates 35 and 36 disposed at the upper and lower sides of the platen and secured together by means of screws 37, these plates each being provided with a pair of longitudinally aligned slots 38 registering with similar slots 39 in the platen. Bolts 40 are engaged through passages 41 in the bearing blocks 33 and 34 and through the slots 38 and 39, and are engaged at their lower ends by clamping nuts 42, this mounting permitting longitudinal adjustment of the bearing blocks with respect to the platen.

The bearing block 33 is provided at its forward end with a bracket extension 43 upon which is pivotally connected by means of a bolt 44 the rearward undercut end 45 cf one arm 46 of a U-shape outrigger frame, the other arm 47 of which is provided at its rearward undercut end 48 with a slot 49, concentric to the axis of the pivot bolt 44, and engaged with one of the bolts 40 cf the bearing block 34, the latter being provided with a recess 50 at its forward end, in which the undercut end 48 fits. A washer 51 is engaged beneath the head of the bolt 40 for clamping engagement with the end of the arm 47. The two arms 46 and 47 of the outrigger frame are connected at their forward ends by a cross bar 52 secured thereto by screws 53.

Upon the outer ends of the arms 46 and 47 of the outrigger frame there are respectively provided screw posts 54-54, fixedly secured by means of cross pins 55-55, and upon these posts there is engaged for vertical adjustment a rectangular plate 56 having holes 57 at each of its ends for engagement by the posts, vertically adjustable lock nuts 58 and 59 being engaged upon the posts above and below the plate for rigidly securing the plate to the posts and permitting relative vertical adjustment thereon. Along the inner edge of the plate there is provided a transversely extending recess portion 60, defined by a shoulder 61, and between this shoulder and the outer edge of the plate there is provided a downwardly and outwardly inclined recess 62, for a purpose hereinafter more fully referred to.

The plates 18 and 56 receive roller structures

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associated with the work holding fixture, which comprises a cylindrical tubular rod 63 of a length to extend through the work pieces and over the plates 18 and 56. The forward end portion of the rod rolls on the plate 18, and adjacent this portion there is secured to the rod by means of a cross pin 64 a collar 65, which is recessed at 66 to receive and snugly hold the forward tenon ends 67 of the two superposed work pieces 68-68. Suitably spaced along the line of the rod 63, to 10 form interior supports for the hollow work piece assembly are collars 69 and 70, secured by cross pins 71 and 72. The rear tenon ends 73 of the work pieces are held together, and the work pieces are urged into the recess 65 of the collar 15 65 by a slide collar 74, mounted upon the rod and provided in its face with a recessed pocket 75 for receiving the rear tenon ends 73, this collar being urged toward the work pieces by a spring 76 engaged in the rearward tubular end of the rod. This spring takes against an abutment plug 11 screwed into the end of the rod, and engages a plunger 78 which in turn engages a cross pin 79, secured in the cylindrical hub portion 80 of the slide collar 74 and extending transversely 25 through elongated slots 81 provided longitudinally in the rod.

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The illustrated work piece is a barrel guard for a rifle and is formed of walnut or other suitable wood with the grain running longitudinally. The 30 part to be sanded by the fixture as illustrated in Figs. 1 to 6 is the front substantially semi-cylindrical hand guard surface 82, which is separated from the rear tapered hand guard surface 83 by a shoulder 84, the base surface of the guard being 35 in a flat diametric plane so that, when two of the guards are superposed in base-to-base relation, they form a work piece assembly in which the surface to be sanded is of substantially cylindrical form. In practice this surface may be 40 slightly tapered, the end adjacent the shoulder being of only slightly greater diameter than the forward end, and which slight taper will be compensated for by the cushion support of the sanding belt, as will presently more fully appear. In 45 case the surface to be sanded has a pronounced or high degree of taper this may be compensated for by relative height adjustment of the plates 18 and 56 to accommodate the surface to be sanded to the sanding belt. The surface 82 is provided 50 with semi-circular clip recess cuts 85 and 86, for the purpose of receiving the retaining clips for the assembly of the guard with the rifle, the edge corners formed between the walls of these recesses and the surface 82 being substantially right 55 angular and relatively sharp.

In operation, the work piece assembly is engaged with the supporting plates 18 and 56, as shown in Figs. 1 and 2, one end portion of the rod 63 engaging the plate 18 as a roller with the collar 60 65 in guiding engagement with the edge of the plate, while at the other end the cylindrical hub 89 of the collar 74 engages as a roller in the recess 60 of the plate 56, with the end of the hub in guiding engagement with the shoulder 61. The 65 bend of the sanding belt at the forward end of its flat traverse over the cushion support 16 is engaged in the corner formed by the shoulder 84 of the work piece, the longitudinal adjustability of the plate 18 permitting an exact disposition 70 of the shoulder in this relation. The longitudinal adjustability of the outrigger frame permits adjustment of the plate 56 to the exact length of the work piece, following the adjustment of the

plates 18 and 56 are suitably height adjusted, so that when the roller ends of the work piece assembly are pressed into rolling contact with the plates the yieldably supported sanding belt engages the work piece with the desired pressure to make the proper sanding cut. The work piece is rolled from one side to the other of the plates, as indicated by the arrows in Fig. 1, and thus the cylindrical surface is uniformly sanded, this operation being effectually carried out along the entire surface up to the shoulder 84, and without excessive sanding or mutilation of the shoulder or the edge surfaces adjacent the clip recess cuts 85 and 86 and the tenon end 67.

For the purpose of removal and replacement of the endless sanding belt, the plate 18 is disengaged, permitting the screw stud 22 to be swung into its horizontal position, as shown in Fig. 7. the bolt 40 retaining the outrigger frame is loosened, and the outrigger frame is swung into the open position, as shown, thereby providing a free way for the convenient removal and replacement of the sanding belt.

In Figs. 8 to 13, the fixture is illustrated as modified for the purpose of adapting it to the sanding of both the semi-cylindrical front hand guard portion and the tapered rear hand guard portion of the barrel guard. This tapered rear hand guard portion 83 is of substantially semi-circular cross-section, but is provided at its sides adjacent its flat base with flat strip portions 87, so that when two of the guards are assembled, as shown in Fig. 12, the cross-sectional shape is not circular but is slightly flat at diametrically opposed sides.

The hub 80 of the collar 74 is provided at opposed sides with flat surfaces 88, which correspond proportionately to the flat surfaces 87 of the guards, so that the cross-sectional shape of the hub corresponds proportionately to the crosssectional shape of the assembled guards, and, for the purpose of aligning the guards with the hub, the rod 63 is provided with a projecting positioning cross pin 89 which engages in the clip recess cuts 85 of the guard as shown in Figs. 11 and 12. Integrally formed with the hub 80 there is provided a roller extension 90 of outwardly divergent tapered or conical form, its angle of taper corresponding to the angle of taper of the surface of the rear hand guard portion 83 of the guard, and also corresponding to the angle of inclination of the recess surfaces 62 of the plate 56, the angle of inclination of this surface 62 being predetermined in connection with the particular design of the work piece to be sanded.

In operation the front hand guard portions 82 of the assembled guards are sanded as illustrated in Fig. 13, substantially in the same manner as illustrated and described with reference to the invention as shown in Figs. 1 to 6, except that the tapered roller extension 90 is in rolling engagement with the surface 52 while the hub 80 is out of rolling engagement with the surface 60, so that its non-circular cross-section roller surface does not effect the sanding of the circular cross-section front hand guard portions 82.

In order to sand the tapered rear hand guard portions 83, the position of the work piece is reversed, as shown in Fig. 9, and the plate 18 and the outrigger frame supporting the plate 56 are lorgitudinally adjusted with respect to the platen and the sanding belt, so that the length of the guard portions 83 is in engagement with the sanding belt and the hub 80 is in engagement with the forward edge portion of the plate 18 with the shoulder of the collar 74 in guiding enwork piece in relation to the sanding belt. The 75 gagement with the forward surface of the plate

18. The cylindrical roller end of the rod 63 projecting beyond the collar 65 engages in parallel relation with the inclined surface 62, with the shoulder of the collar 65 in guiding engagement with the shoulder 61 of the plate 55. The man-5 drel is thus inclined at an angle to correspond to the angle of taper of the rear guard portion 83, and hence the surface of the rear guard portion is in parallel engagement with the horizontal traverse of the sanding belt 11. The guard is 10 rolled transversely from side to side, and as the flat portions 88 of the hub 80 come into rolling engagement with the plate 18 the guard is slightly lowered in its engagement with the sanding belt so that the flat surfaces 87 of the guard are sanded 15uniformly with the sanding of the cylindrical surfaces.

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The form of the invention illustrated in the drawing and described herein is typical and illustrative only, and it is evident that the invention 20 is capable of embodiments in other forms, all falling within the scope of the appended claims, which are to be broadly construed.

What is claimed is:

1. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, and work piece supporting roller means adapted to have a work piece supported between them and engageable with said guides for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt.

2. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair 40 of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, at least one of said guides bridging said sanding belt, and work piece supporting roller means adapted to have 45 a work piece supported between them and engageable with said guides for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt.

3. In an apparatus for sanding articles in- 50 cluding a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel 55 direction of said sanding belt, at least one of said guides bridging said sanding belt, vertically adjustable mounting means supporting said belt bridging guide at each side of said sanding belt, and work piece supporting roller means adapted 60 to have a work piece supported between them and engageable with said guides for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt.

4. In an apparatus for sanding articles in-65 cluding a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel 70 direction of said sanding belt, at least one of said guides bridging said sanding belt, vertically adjustable mounting means supporting said belt bridging guide at each side of said sanding belt, means cooperating between said belt bridging 75

guide and said mounting means for longitudinal adjustment of said belt bridging guide, and work piece supporting roller means adapted to have a work piece supported between them and engageable with said guides for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt.

5. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, at least one of said guides bridging said sanding belt and having longitudinal slots in its end portions at each side of said sanding belt, vertically adjustable screw studs, engaged in said slots, and retaining nuts engaged on said studs, at least one of said screw studs being pivotally mounted to permit it to swing below the level of said sanding belt, and work piece supporting roller means adapted to have a work piece supported between them and engageable with said guides for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt.

6. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, vertically and longitudinally adjustable mounting means supporting said guides for vertical and longitudinal adjustment relatively to each other and to said sanding belt, and work piece supporting roller means adapted to have a work piece supported between them and engageable with said guides for transverse rolling movement thereon with the 40 work piece longitudinally engageable with said sanding belt.

7. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable upwardly over its forward end and in a horizontal direction longitudinally thereover; the combination therewith of a fixture adapted to be mounted on the platen comprising a transverse roller supporting guide plate bridging said sanding belt rearwardly of the forward end of said platen, an outrigger frame supported upon said platen and extending forwardly therefrom, a transverse roller supporting guide plate supported on said outrigger frame, and work piece supporting roller means adapted to have a work piece supported between them and engageable with said guide plates for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt.

8. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable upwardly over its forward end and in a horizontal direction longitudinally thereover; the combination therewith of a sanding machine fixture adapted to be mounted on the platen comprising a transverse roller supporting guide plate bridging said sanding belt rearwardly of the forward end of said platen, an outrigger frame supported upon said platen and extending 70 forwardly therefrom, a vertically adjustable transverse roller supporting guide plate supported on said outrigger frame, and work piece supporting roller means adapted to have a work piece supported between them and engageable with said guide plates for transverse rolling

movement thereon with the work piece longitudinally engageable with said sanding belt.

9. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable upwardly over its forward end and 5 in a horizontal direction longitudinally thereover; the combination therewith of a fixture adapted to be mounted on the platen comprising a transverse roller supporting guide plate bridging said sanding belt rearwardly of the for- 10 ward end of said platen, an outrigger frame mounted for longitudinal adjustment movement upon said platen and extending forwardly therefrom, a transverse roller supporting guide plate supported upon said outrigger frame, and work 15 piece supporting roller means adapted to have a work piece supported between them and engageable with said guide plates for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt.

10. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable upwardly over its forward end and in a horizontal direction longitudinally thereover; the combination therewith of a fixture 25 adapted to be mounted on said platen comprising a transverse roller supporting guide plate bridging said sanding belt rearwardly of the forward end of said platen, an outrigger frame pivotally mounted at one side of said platen and extending forwardly therefrom, releasable retaining means securing said outrigger frame to the other side of said platen, said outrigger frame adapted to be swung to an open position to provide a clear way for the transverse removal and 35 replacement of said sanding belt, a transverse roller supporting guide plate supported upon said outrigger frame, and work piece supporting roller means adapted to have a work piece supported between them and engageable with said guide 40 plates for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt.

11. In an apparatus for sanding articles including a sanding belt platen and a sanding 45 belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, and a work piece 50 supporting mandrel rod longitudinally bridging said guides and having roller means at its ends engaged with said guides for transverse rolling movement thereon.

12. In an apparatus for sanding articles in- 55 cluding a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel $_{60}$ direction of said sanding belt, a work piece supporting mandrel rod longitudinally bridging said guides and having roller means at its ends engaged with said guides for transverse rolling movement thereon, and a pair of work piece re- 65 taining collars on said mandrel rod adapted to engage the ends of a work piece assembly.

13. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the com- 70 bination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, a work piece sup-

guides and having roller means at its ends engaged with said guides for transverse rolling movement thereon, and a pair of work piece retaining collars on said mandrel rod adapted to engage the ends of a work piece assembly, at least one of said collars being spring pressed toward the other collar.

14. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, a work piece supporting mandrel rod longitudinally bridging said guides and having roller means at its ends engaged with said guides for transverse rolling movement thereon, a pair of retaining collars on said mandrel rod adapted to engage the ends of 20 a hollow work piece assembly, and supporting collar means on said mandrel between said retaining collars engageable in the hollow of said work piece assembly.

15. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable in a horizontal direction longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, at least one of said guides having a longitudinally inclined guide surface corresponding in inclination to the angle of taper of a tapered part of a work piece, and work piece supporting roller means adapted to have a tapered work piece supported between them and engageable with said guides for transverse rolling movement thereon with the tapered work piece longitudinally engageable with said sanding belt, at least one of said roller means being cylindrical and engageable in parallel relation with said inclined guide surface.

16. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable in a horizontal direction longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, at least one of said guides having a longitudinally inclined guide surface corresponding in inclination to the angle of taper of a tapered part of a work piece, and work piece supporting roller means adapted to have a work piece including a tapered part and a cylindrical part supported between them and engageable with said guides for transverse rolling movement thereon with the cylindrical part work piece longitudinally engageable with said sanding belt, at least one of said roller means being tapered at an angle corresponding to the inclination of said inclined guide surface and engageable therewith with its longitudinal axis parallel to said horizontal sanding belt.

17. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the combination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, at least one of said guides bridging said sanding belt, and work piece supporting roller means adapted to have a non-circular cross-section work piece supported porting mandrel rod longitudinally bridging said 75 between them and engageable with said guides

for transverse rolling movement thereon with the work piece longitudinally engageable with said sanding belt, at least one of said roller means having a non-circular cross-sectional shape corresponding proportionately to the cross-sectional 5 shape of said work piece.

18. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the comphination therewith of; a fixture comprising a pair 10 a of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, and work piece supporting roller means adapted to have a pair of base-to-base substantially semi-circular crossform a substantially cylindrical work piece assembly, said roller means being engageable with said guides for transverse rolling movement thereon with the work piece assembly longitudinally engageable with said sanding belt.

19. In an apparatus for sanding articles including a sanding belt platen and a sanding belt movable longitudinally thereover; the com-

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bination therewith of; a fixture comprising a pair of transverse roller supporting guides spaced relatively to each other longitudinally of the travel direction of said sanding belt, and work piece supporting roller means adapted to have a pair of base-to-base substantially semi-circular crosssection rifle barrel guards supported between them to form a substantially cylindrical work piece assembly, said roller means being engageable with said guides for transverse rolling movement thereon with the work piece assembly lon-

gitudinally engageable with said sanding belt. GEORGE R. MELLCK.

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