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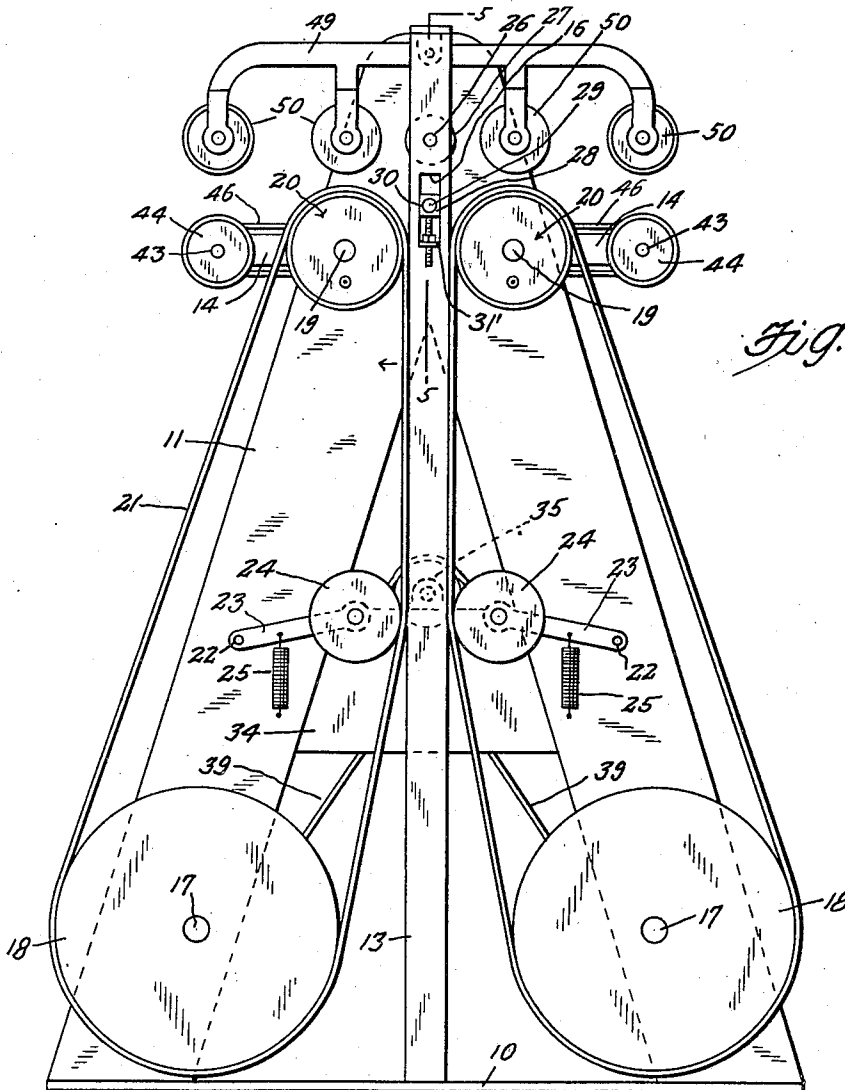
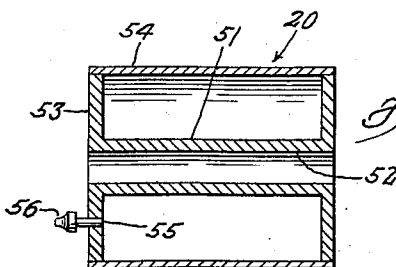
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2,424,044

ENDLESS ABRASIVE BELT SANDING MACHINE

Filed Jan. 22, 1946

3 Sheets-Sheet 1



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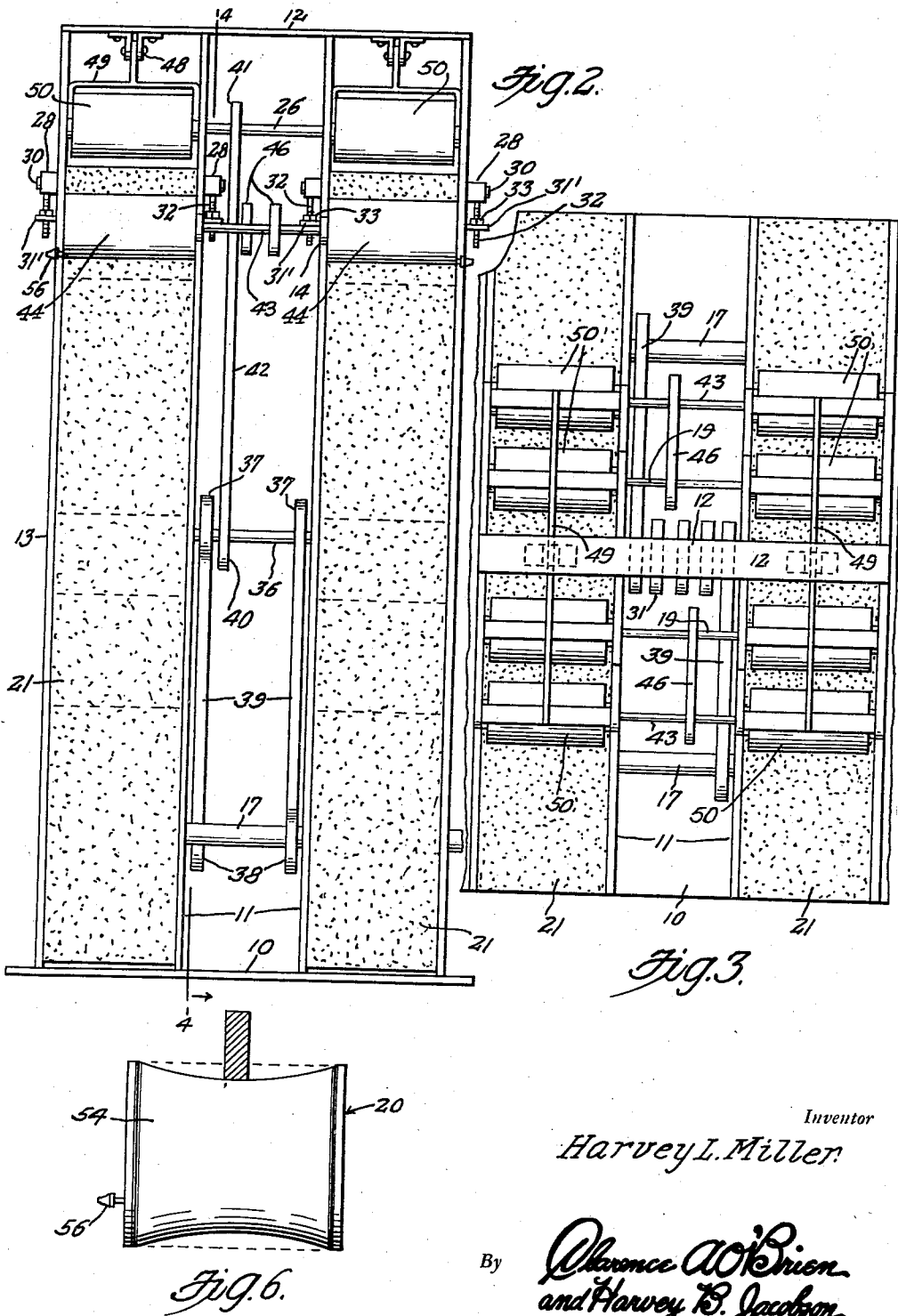
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ENDLESS ABRASIVE BELT SANDING MACHINE

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3 Sheets-Sheet 2



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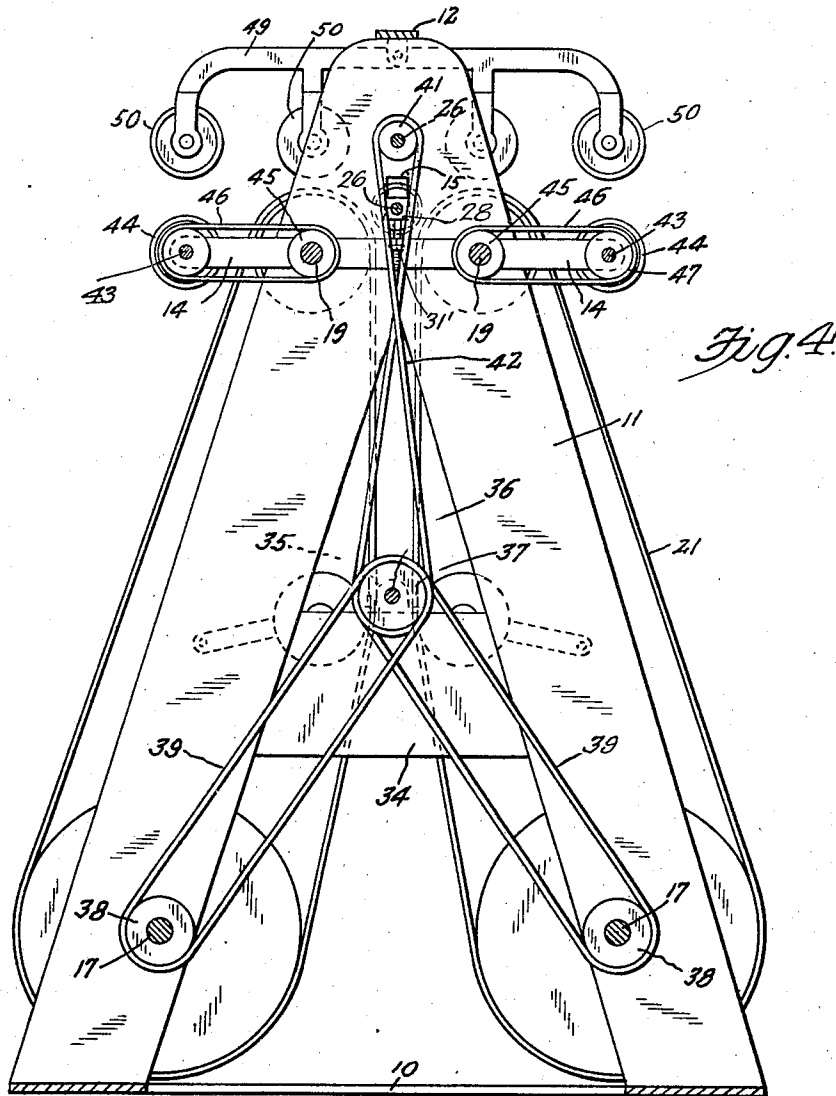
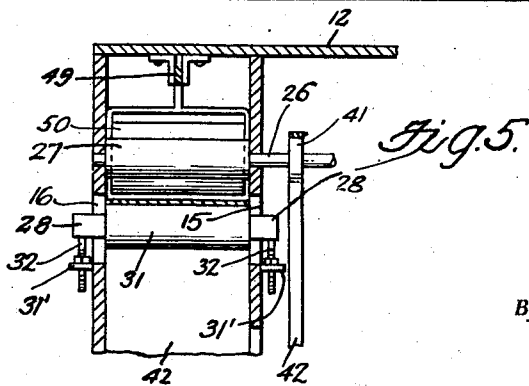
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UNITED STATES PATENT OFFICE

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ENDLESS ABRASIVE BELT SANDING MACHINE

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7 Claims. (Cl. 51-139)

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This invention relates to a sander and more particularly to a sanding device for finishing wooden pieces.

The primary object of the invention is to sand wooden articles such as chair legs, chair backs, seats and the like.

Another object is to sand shaped pieces such as bent or curved chair legs and backs, and automatically to feed them through the sanding device in such a manner as to avoid too long a contact with the sanding surface and thus prevent the formation of flats or irregular surfaces on the finished product.

Another object is to facilitate the rapid interchange of sanding belts so that a new belt may be readily substituted for one which has become worn or otherwise unfit for service.

Still other features include means for governing the pressure of the sanding belt against the work and to provide a yielding surface for supporting the sanding belt which will to some degree conform to the shape of the surface of the work being sanded.

The above and other objects may be attained by employing this invention which embodies among its features a pair of closely spaced pressure rolls adapted to rotate in unison, an abrasive carried by the pressure rolls and a pair of feed rolls operable between the pressure rolls for gripping and moving a piece of work across said abrasive.

Other features include guide rolls cooperating with the feed rolls in holding the piece to be sanded against the abrasive on the pressure roll, and pneumatic means carried by the pressure roll to alter the pressure exerted by the abrasive against the piece being sanded.

Still other features include the substantially inverted V-shaped frame carrying near its apex at least one pair of closely spaced pressure rolls, drive rolls adjacent the lower ends of the legs of the frame, abrasive belts trained over each set of pressure and drive rolls, feed rolls between the pressure rolls for gripping and moving a piece of work to be sanded across the belt and means to drive the drive rolls and feed rolls in unison.

Still other features include guide rolls cooperating with the feed rolls in holding the piece to be sanded against the belt.

In the drawings:

Figure 1 is a side view in elevation of a sander embodying the features of this invention.

Figure 2 is a front view of the sander illustrated in Figure 1,

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Figure 3 is a top plan view of the sander illustrated in Figure 1.

Figure 4 is a transverse sectional view taken substantially along the line 4-4 of Figure 2,

Figure 5 is a fragmentary sectional view through the upper portion of the sander,

Figure 6 is a side view of one of the pressure rolls, and

Figure 7 is a longitudinal sectional view through Figure 6.

Referring to the drawings in detail my improved sanding machine comprises a base 10 provided intermediate its ends with a pair of upwardly extending inverted V-shaped standards 11 held in spaced parallel relation at their upper ends by a longitudinally extending bar 12. Supporting columns 13 connect the outer ends of the bar 12 with the base 10, and carried by the standards 11 are cross-arms 14 the purpose of which will more fully hereinafter appear. Formed in the standards 11 near their convergent ends are longitudinally extending slots 15 which align with similar longitudinally extending slots 16 formed in the columns 13.

Journaled in the legs of the standards 11 near their lower divergent ends are spaced parallel longitudinally extending drive shafts 17 which are substantially coextensive with the length of the base or bed 10 and carry at their outer ends driving pulleys or drums 18 for the sanding belt to be more fully hereinafter described. Journaled in the standards 11 near their upper ends are idler shafts 19 upon which pressure rolls designated generally 20 are mounted to turn. As illustrated these pressure rolls are arranged adjacent opposite ends of the shafts 19 on opposite sides of the standards 11 and cooperate with the driving rolls 18 in supporting belts 21 carrying the abrasive. Pivotaly mounted as at 22 on the outer side of each divergent leg of each standard 11 is a lever 23 supporting at its free end a tension roll 24 which is adapted to ride against the inner run of the belt 21 as will be readily understood upon reference to Figure 1. A retractile coil spring has one end connected to each lever 23 intermediate its end and the opposite end of each spring is anchored to the adjacent leg of the inverted V-shaped standard 11. It will thus be seen that the arms 23 are urged downwardly under the influence of the springs 25 so as to yieldingly urge their respective rollers 24 into contact with the belts 21 in order to maintain the belts under tension.

Extending longitudinally through the frame

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adjacent the convergent upper ends of the legs of the inverted V-shaped standards 11, in spaced relation to the shafts 19 is a longitudinally extending shaft 26 carrying a feed roll 27 which preferably comprises a cylindrical body attached to the shaft 26 and covered with a relatively heavy yieldable traction surface such as rubber or the like, it being understood that each such roll 27 resembles substantially the rubber covered rolls of an ordinary clothes wringer. Mounted for vertical sliding movement in each longitudinal slot 16 is a block 28 formed with an opening 29 for the reception of a shaft 30 carrying a feed roller 31 which cooperates with the driven feed roller 27 in guiding and feeding work across the pressure rolls 20 when the device is in use. It will be understood that the shafts 30 while aligning axially are arranged to extend parallel to the shaft 26 and are mounted for independent adjustment on opposite sides of the machine in the following manner. Extending outwardly from the outer side of each column, and inwardly from the inner side of each standard 11 adjacent the lower end of each slot 29 is a bracket 31' which is pierced to receive a threaded stud 32 the upper end of which bears against the underside of its respective block 28 as will be readily understood upon reference to Figure 2. An adjusting nut 33 is threaded on each stud 32 and bears against its respective bracket 31' so that the feed rolls 31 may be advanced toward or retracted from the cooperating feed rolls 27. It will thus be seen that the pressure exerted by the feed rolls 27 and 31 may be governed to suit the demand of the work being processed.

In order to establish proper driving connection between the various parts I provide a cross-member 34 which extends between the divergent legs of each standard 11 intermediate their upper and lower ends, and mounted on each cross-member is a suitable journal bearing 35 in which a power shaft 36 is journaled. This power shaft is adapted to be driven in any suitable manner as by an electric motor (not shown), and attached to the power shaft adjacent opposite ends are pulleys 37 which have driving connection with pulleys 38 attached to opposite drive shafts 17 through the medium of drive belts 39. A drive pulley 40 is carried by the power shaft 36 and has driving connection with a drive pulley 41 carried by the shaft 26 through the medium of a drive belt 42. It will thus be seen that when the power shaft 36 is driven the drive shafts 17 and the shaft 26 of the feed roll 27 will be driven in unison and the pressure rolls will be driven by means of the abrasive carrying belts 21 so that their respective shafts 19 will rotate in unison.

Mounted for rotation adjacent opposite ends of the cross-arm 14 are drive shafts 43 which extend for a distance substantially equal to the length of the shafts 19, and supported adjacent opposite ends of the shafts 43 are guide rolls 44. A drive pulley 45 is mounted on each shaft 19 adjacent the inner faces of the standards 11 and each drive pulley 45 has driving connection through the medium of a belt 46 with a drive pulley 47 for its respective shaft 43. It will thus be seen that as the pressure rolls 20 are rotated their respective guide rolls 44 will be driven.

Supported in suitable brackets 48 depending from the cross-member 12 substantially midway between the standards 11 and columns 13 are yokes 49 in which are supported spaced guide rollers 50 which cooperate with the guide rollers 44 and the pressure rolls 20 in directing a

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piece of work in proper position across the abrasive surface of the belts 21.

Each pressure roll 20 comprises a tubular core member 51 having an axial bore 52 for the reception of its respective shaft 19, and formed at each end of the core 51 is an outwardly extending flange or annulus 53 having sealed to its periphery against atmosphere a flexible and extensible tube or cylinder 54 formed of a suitable airtight composition such as rubber. Formed in one of the flanges 53 of each roll 20 is an internally screw-threaded opening 55 for the reception of a valve stem 56 of the type conventionally employed in pneumatic tires. It will thus be seen that the roll 20 may be inflated to the desired degree in order to exert a regulated pressure against the sanding belt 21 operating over the periphery thereof, and consequently the pressure exerted by the pressure rolls 20 against the work may be governed.

In operation it will be understood that with the power shaft 36 set in motion the drive shafts 17 will drive their respective belts 21 and the feed rolls 27 will also be driven in unison with the drive rolls 18. Work is then fed across the guide rolls 44 and into the space between the feed rolls 27 and 31 where it will be automatically gripped by the feed rolls and fed across the rapidly moving abrasive surfaces of the belts 21 beneath the guide rolls 50. The rolls 44 cooperate with the feed rolls 27 and 31 in feeding the work through the device and preventing the formation of irregular surfaces due to remaining under the influence of the sanding or abrasive belts 21 for too long a period of time. Due to the cantilever support of the drive rolls 18, the pressure rolls 20 and the tension rolls 44 it is obvious that the belts 21 may be readily removed and replaced with a minimum loss of time and machine production.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

What I claim is:

1. In a sander a frame representing in cross-section a substantially inverted V, at least one pair of closely spaced pressure rolls carried by the frame near its apex, at least one drive roll adjacent the lower end of each leg of the frame, an abrasive belt trained over each pressure roll and each drive roll, means to drive the drive rolls in unison and a pair of feed rolls between the pressure rolls for gripping and moving a piece to be sanded across the belts in a direction perpendicular to the axes of the rolls.

2. In a sander a frame representing in cross-section a substantially inverted V, at least one pair of closely spaced pressure rolls carried by the frame near its apex, at least one drive roll adjacent the lower end of each leg of the frame, an abrasive belt trained over each pressure roll and each drive roll, means to drive the drive rolls in unison, a pair of feed rolls between the pressure rolls for gripping and moving a piece to be sanded across the belts in a direction perpendicular to the axes of the rolls and guide rolls cooperating with the feed rolls in holding the piece to be sanded against the belts.

3. In a sander a frame representing in cross-section a substantially inverted V, at least one pair of closely spaced pressure rolls carried by the frame near its apex, at least one drive roll

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adjacent the lower end of each leg of the frame, an abrasive belt trained over each pressure roll and each drive roll, means to drive the drive rolls in unison, a pair of feed rolls between the pressure rolls for gripping and moving a piece to be sanded across the belts in a direction perpendicular to the axes of the rolls and pneumatic means carried by the pressure rolls to alter the pressure exerted by the belts against the piece to be sanded.

4. In a sander a frame representing in cross-section a substantially inverted V, at least one pair of closely spaced pressure rolls carried by the frame near its apex, at least one drive roll adjacent the lower end of each leg of the frame, an abrasive belt trained over each pressure roll and each drive roll, means to drive the drive rolls in unison, a pair of feed rolls between the pressure rolls for gripping and moving a piece to be sanded across the belts in a direction perpendicular to the axes of the rolls, guide rolls cooperating with the feed rolls in holding the piece to be sanded against the belts and pneumatic means carried by the pressure rolls to alter the pressure of the belts against the piece to be sanded.

5. In a sander a frame comprising a pair of longitudinally spaced parallel inverted V-shaped standards, a pair of spaced parallel drive shafts extending through the legs of the standards near their lower ends, a drive roll on each end of each drive shaft, a pair of spaced parallel shafts extending through the legs of the standards near their upper convergent ends, a pressure roll mounted on each end of each last mentioned shaft, a pair of vertically spaced feed rolls between the pressure rolls, an abrasive carrying belt trained over each pair of drive rolls and feed rolls at each end of the sander and means to drive the drive shafts and feed rolls in unison.

6. In a sander a frame comprising a pair of longitudinally spaced parallel inverted V-shaped standards, a pair of spaced parallel drive shafts extending through the legs of the standards near their lower ends, a drive roll on each end of each drive shaft, a pair of spaced parallel shafts extending through the legs of the standards near

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their upper convergent ends, a pressure roll mounted on each end of each last mentioned shaft, a pair of vertically spaced feed rolls between the pressure rolls, an abrasive carrying belt trained over each pair of drive rolls and feed rolls at each end of the sander, guide rolls cooperating with the feed rolls in holding a piece to be sanded against the abrasive belts and means to drive the drive shafts, the feed rolls and certain of the guide rolls in unison.

7. In a sander a frame comprising a pair of longitudinally spaced parallel inverted V-shaped standards, a pair of spaced parallel drive shafts extending through the legs of the standards near their lower ends, a drive roll on each end of each drive shaft, a pair of spaced parallel shafts extending through the legs of the standards near their upper convergent ends, a pressure roll mounted on each end of each last mentioned shaft, a pair of vertically spaced feed rolls between the pressure rolls, an abrasive carrying belt trained over each pair of drive rolls and feed rolls at each end of the sander, a power shaft carried by the standards intermediate their ends, drive pulleys on the power shaft having driving connection with the drive shafts and the shafts carrying the feed rolls and means for transmitting driving power to the power shaft.

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