March 5, 1940. J. S. RICHARDSON 2,192,240

SANDING MACHINE

Filed Feb. 1, 1937 2 Sheets-Sheet 1

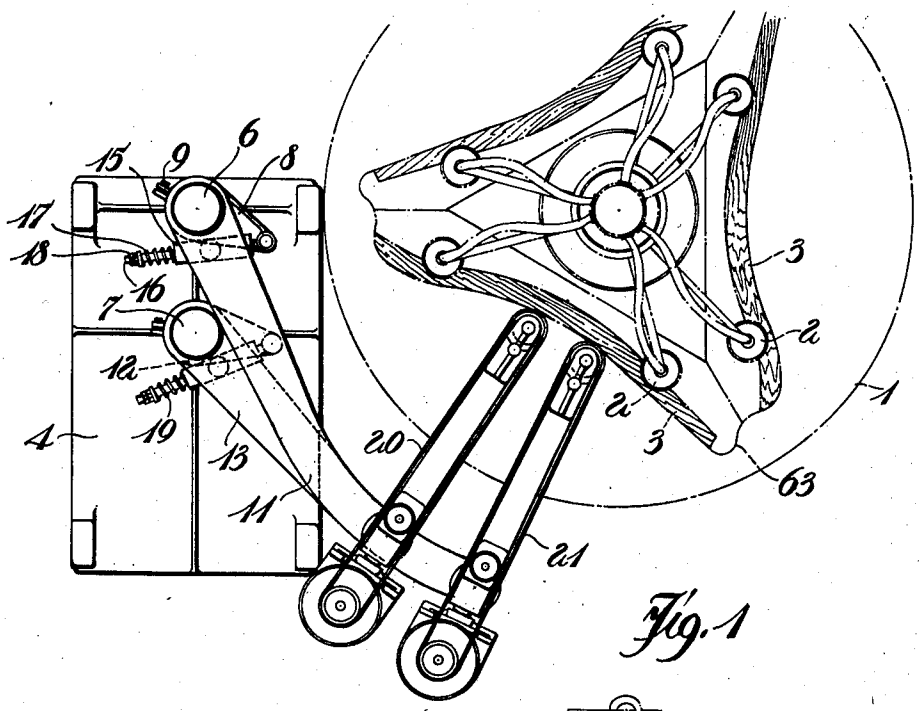


Fig. 1

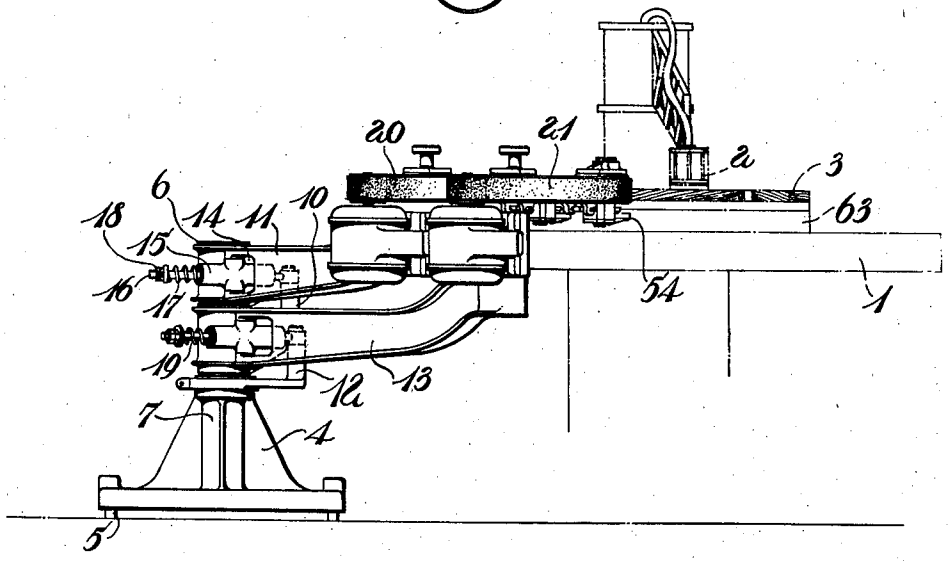


Fig. 2

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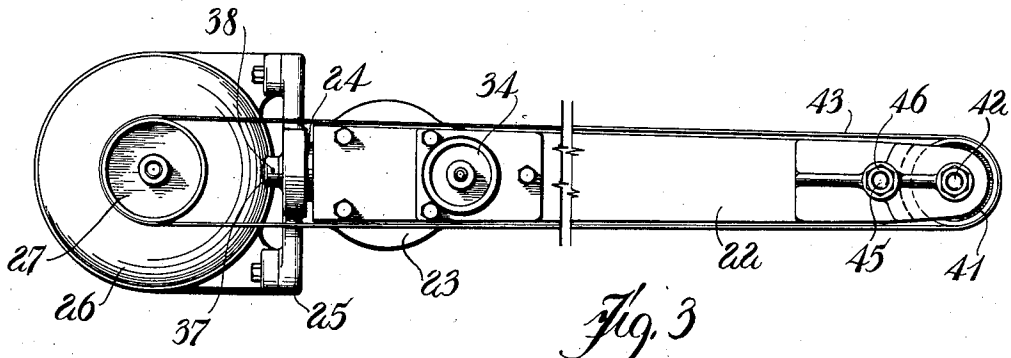


Fig. 3

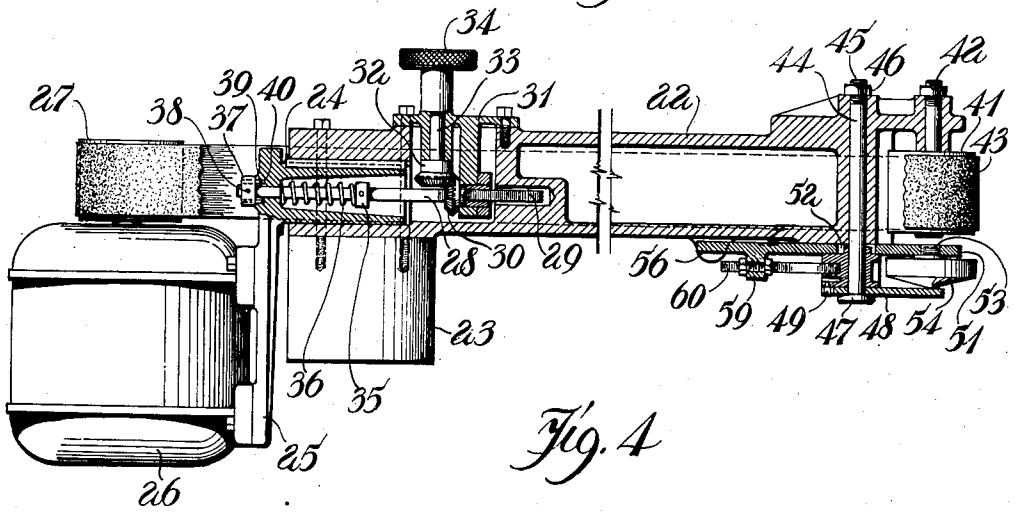


Fig. 4

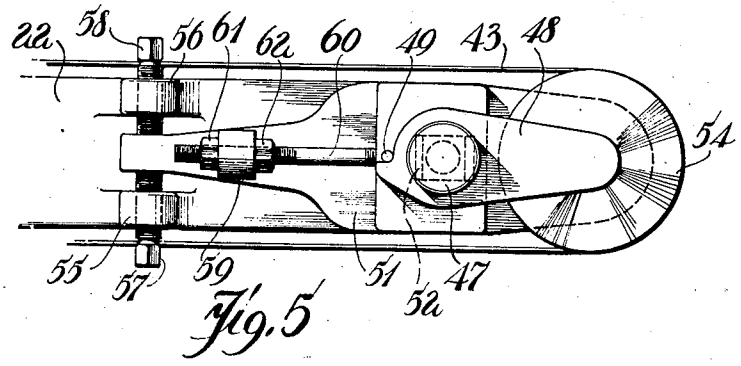


Fig. 5

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UNITED STATES PATENT OFFICE

2,192,240

SANDING MACHINE

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Application February 1, 1937, Serial No. 123,363

2 Claims. (Cl. 51—145)

My invention relates to improvements in sanding machines and the objects of my invention are, first, to provide a sanding mechanism capable of operating efficiently on curved or irregular shaped stock and, second, to provide such a mechanism which is capable of use in conjunction with forming machinery thus accomplishing the forming and sanding in one operation.

I accomplish these and other related objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the sanding mechanism showing its use in conjunction with forming mechanism; Figure 2, a side elevation thereof; Figure 3, a plan view of the sanding unit; Figure 4, a side view thereof, partly in section, and Figure 5, a bottom view of a portion of the sanding unit.

The machine is particularly advantageous for sanding stock which is passing through a forming machine without removing the stock from the forming machine and is illustrated in that connection.

In the drawings the numeral 1 indicates the feeding mechanism of a forming machine, in this instance the rotary table of an automatic shaper, provided with clamps 2 for retaining the stock 3 in position to be operated upon. The clamps 2 may be of any of the well known forms of pneumatic, hydraulic or lever operated clamps, preferably, though not necessarily, designed to release the stock automatically at a certain point after all operations have been performed on it. Mechanism for this purpose being well known in the art in connection with automatic shapers and other forming mechanism, it is not specifically illustrated or described herein.

It will be understood that before the stock reaches the point where it is operated upon by the sanding mechanism disclosed herein it has already been formed by suitable forming or shaping mechanism not illustrated or described herein.

The sanding mechanism proper is mounted on the base 4 which is preferably provided with wheels or rollers 5 so that it may be positioned adjacent the forming machine or moved out of the way if not needed or may be used alternately in connection with more than one forming machine.

The base 4 is provided with the vertically extending post 6 and, since it is desirable to use more than one sanding unit in order that the stock may be sanded first coarse and then fine, I prefer to provide the base with a second similar post 7 so that two sanding units may be mounted thereon as shown in Figures 1 and 2.

It will be understood that one of these units may be eliminated if desired or that three or even more may be mounted in a similar manner if desired.

The post 6 is provided with a split collar 8 which is clamped thereon by the bolt 9, thus permitting adjustment pivotally around the post yet clamping securely in any chosen position of adjustment.

The collar 8 is provided with the upwardly and vertically extending extension 10 for a purpose hereinafter set forth.

The arm 11 is pivotally mounted on the post 6 above the collar 8.

The post 7 is provided with a collar 12, similar to the collar 8 and has the arm 13 pivotally mounted thereon. As will be seen from Figure 2, the post 7 is shorter than the post 6 so that the arm 13 is mounted lower than the arm 11 whereby the arms, with their attached units, are permitted to pivot independently of each other and to be swung, one over the other, without interference.

The arm 11 is apertured at 14 and the sleeve 15 is pivotally mounted therein. An eye bolt 16 is pivotally mounted on the extension 10 and extends through the sleeve 15. A spring 17 bears, at one extremity, against the sleeve 15 and, at the other extremity, against the nut 18 which has threaded connection with the bolt 16.

Thus the arm 11 is continuously urged inwardly to force the unit against the stock by the pressure of the spring 17 yet is free to pivot and move outwardly against the pressure of the spring whenever the contour of the stock makes such movement necessary.

The arm 13 is provided with a similar spring unit 19.

It will be understood that the spring 17 may, if desired, be replaced by a pneumatic cylinder or other equivalent.

Sanding units, designated generally by the numbers 20 and 21, are mounted, respectively, on the arms 11 and 13.

Each of said units comprises a frame 22 provided with an extension 23 for attachment to the arm 11.

The frame 22 is cylindrically bored at one extremity to receive the cylindrical extension 24 of the motor bracket 25 to which is attached the motor 26 together with its pulley 27.

The extension 24 is provided with a cylindrical bore adapted to permit passage therethrough of

the shaft 28. The bracket 25 is thus slidably mounted on the shaft 28 as well as in the frame 22.

The shaft 28 is threaded at 29 and the bevel gear 30 has threaded connection therewith, the gear 30 bearing against the insert 31 on one side and meshing with the bevel gear 32 on the opposite side thus preventing lateral movement of the gear 30.

The gear 32 is attached to the shaft 33 which is provided with the hand wheel 34. Thus rotation of the wheel 34 causes corresponding rotation of the gear 30 which, the gear 30 not being free to move laterally, causes a lateral movement of the shaft 28.

The shaft 28 is provided, intermediate its extremities, with the spring stop collar 35, preferably formed integral with the shaft. A spring 36 is positioned around the shaft 28 bearing, at one extremity, on the extension 24 and, at the other extremity, on the spring stop collar 35.

The shaft 28 is also provided with the set collar 37 attached to the shaft by means of a set screw 38 and adapted to bear against the surface of the bracket 25 opposite the extension 24. The collar 37 is provided with one or more pins 39 adapted to fit in bores 40 in the bracket 24 thus preventing the shaft 28 from rotating.

Thus the position of the motor 26 may be varied within desirable limits by rotating the hand wheel 34 causing lateral movement of the shaft 28 which is transmitted to the bracket 25 either through the spring 36 or the collar 37, depending upon the direction of rotation of the wheel, and causing inward or outward movement of the bracket 25 and motor 26.

Thus the motor is practically spring mounted and is free to move slightly when necessary to relieve undue strain yet is returned to its original position by the spring upon cessation of the unusual strain.

A pulley 41 is mounted upon a suitable bearing on the spindle bolt 42 which is positioned, as shown, at the extremity of the frame 22 opposite the motor 26.

A sanding belt 43, of suitable abrasive material, passes over pulleys 27 and 41 and is thus driven by the motor 26 which is adjusted by means of the hand wheel 34 until the belt is tight on the pulleys.

A clamp bolt 44 extends through the frame 22 adjacent the pulley 41 and is threaded at 45 to receive the nut 46. At its opposite extremity the bolt 44 is provided with the flange 47 adapted to engage the clamp 48 which is pivotally mounted thereon. A screw 49 restricts the pivoting of the clamp 48 in one direction.

A reaction member is also mounted on the bolt 44 and a bearing plate 51 is clamped between the reaction member and the frame 22 by the bolt 44, the bearing plate being apertured at 52 to allow the bolt 44 to pass therethrough. It will be noted, as seen in Figure 4, that the aperture 52 is considerably larger than necessary to permit the passage of the bolt 44.

A ball or other suitable bearing 53 is threadedly or otherwise attached to the bearing plate 51 as shown in Figure 2 and a guide wheel 54 is mounted thereon. The guide wheel 54 is preferably frictionally mounted on the bearing 53 so as to be readily removed and is held in place by the clamp 48, the guide wheel being cone shaped on the bottom so as to bear on the clamp at only a single point. The guide wheel may thus be readily interchanged for one of a different diameter by loosening the nut 45, partially rotating the clamp 48, removing the guide wheel, replacing it with another wheel, rotating the clamp to its original position and tightening the nut 46.

The frame 22 is provided with a pair of lugs 55 and 56 in which are threaded bolts 57 and 58 which bear against opposite sides of the bearing plate 51 as shown in Figure 5. By turning one bolt in and the other out the bearing plate can be rotated about the bolt 44 and thus adjusted with respect to the pulley 41.

A further adjustment is provided by a lug 59 on the bearing plate 51 which is provided with a bore through which the rod 60 passes. The rod 60 is attached, at one extremity, to the reaction member 50 and, at the other extremity, is threaded to receive the nuts 61 and 62 which bear against opposite sides of the lug 59. It will thus be seen that, by adjustment of the nuts 61 and 62, the bearing plate, together with the guide wheel 54 may be moved in or out, the aperture 52 being, as above stated, larger than the bolt 44 to permit such movement. Either this adjustment or the pivotal adjustment by means of bolts 57 and 58 may be made without disturbing any other adjustment.

In operation the guide wheel 54 bears against a form 63 on which the stock 3 is placed and which is shaped to the form desired on the finished stock. The guide wheel is adjusted to allow the sanding belt 43 sufficient bearing against the stock to perform the sanding operation yet prevents it from cutting into the stock and, since the guide wheel follows the form 63, the stock is sanded in the proper shape.

When the sanding belt loses its bearing on the stock, due to wear or other cause, it may be adjusted by the nuts 61 and 62 or by removing the guide wheel 54 and replacing it with one of smaller diameter.

It will be understood that instead of a wheel the element 54 may be a curved bar or other device which will pass over the stock without too much friction.

It will thus be seen that I have provided a sanding machine which will properly and automatically sand stock of any shape and which may be used in conjunction with a forming machine to sand the stock before it is released from the clamping mechanism.

It will be understood that the disclosure herein is for the purpose of illustration only and that many changes in the specific details disclosed herein may be made without departing from the spirit of my invention therefore I do not limit myself to the specific form disclosed herein but claim all mechanisms within the scope of the appended claims.

I claim:

1. Sanding mechanism comprising, in combination, a base; a frame pivotally mounted thereon, driving means mounted on said frame, a pulley mounted on said driving means, a second pulley mounted on said frame, a sanding belt passing over both of said pulleys, a guide wheel mounted adjacent said second mentioned pulley, means for adjusting the position of said guide wheel relative to said second mentioned pulley, a rotary table, means positioned on said table for clamping stock thereto, and a form mounted on said rotary table, said guide wheel bearing against said form and said sanding belt bearing against said stock at the point of its passage over said second-mentioned pulley.

2. Sanding mechanism comprising, in combination, a frame, driving means mounted on said frame, a pulley mounted on said driving means, a second pulley mounted on said frame, a sanding belt passing over said pulleys, a bearing plate pivotally mounted on said frame, a bearing on said plate, a guide wheel adapted to be positioned on said bearing, screw threaded means adapted to engage said plate and to effect a pivotal adjustment thereof and screw threaded means adapted to provide adjustment of said plate longitudinally of said frame.

JAIRUS S. RICHARDSON.