April 24, 1945. J. R. HAYES ET AL 2,374,429

POLE FEEDING MECHANISM

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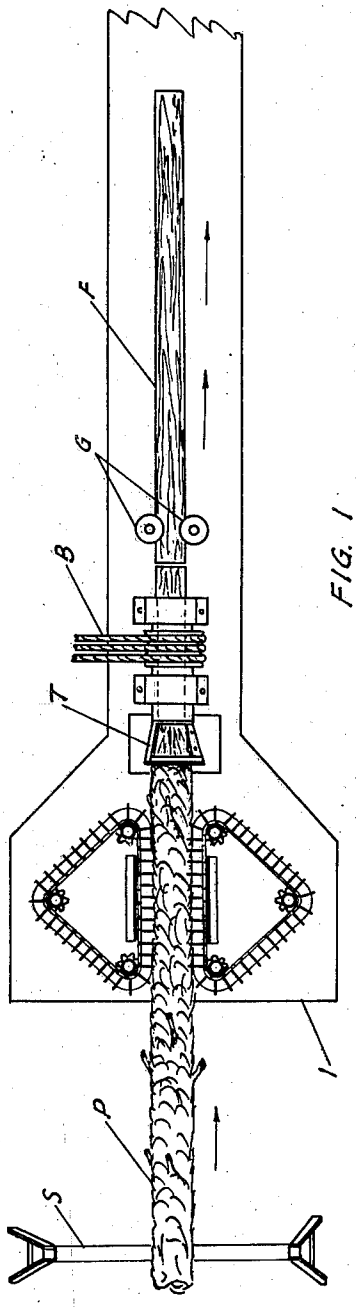


FIG. 1

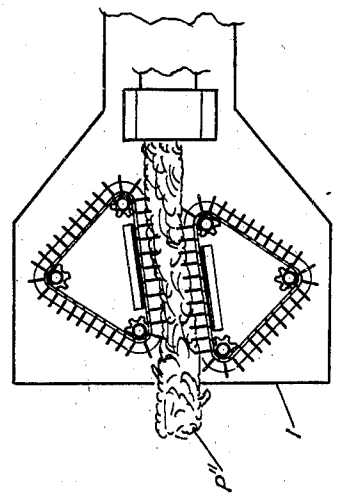


FIG. 7

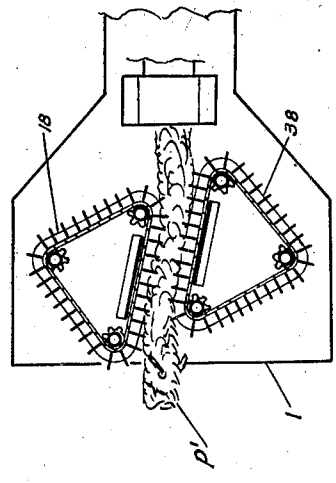


FIG. 6

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POLE FEEDING MECHANISM

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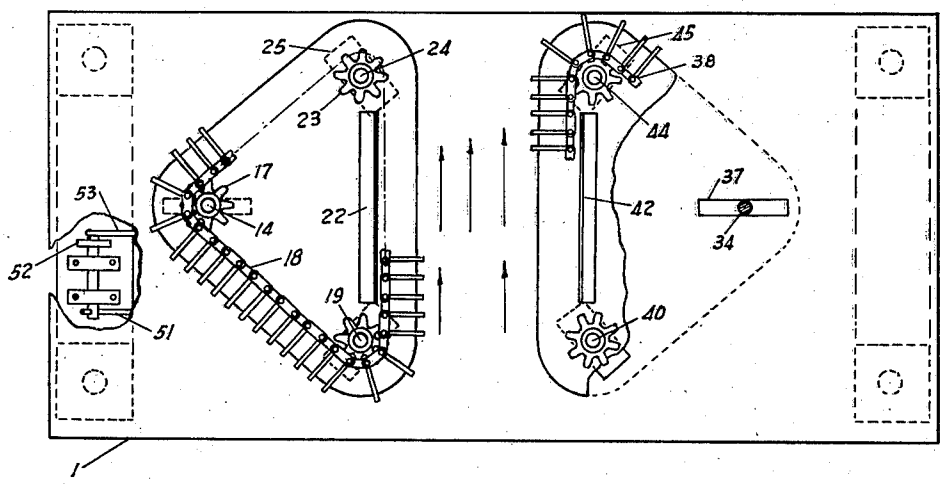


FIG. 2

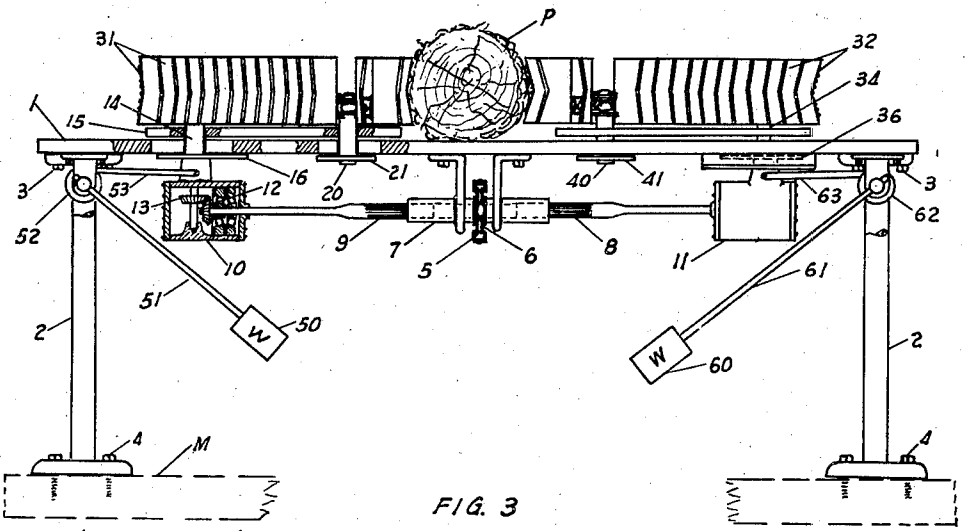


FIG. 3

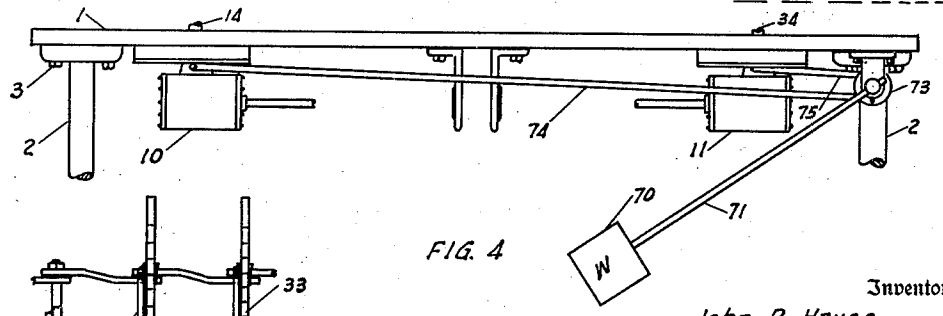


FIG. 4

FIG. 5

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POLE FEEDING MECHANISM

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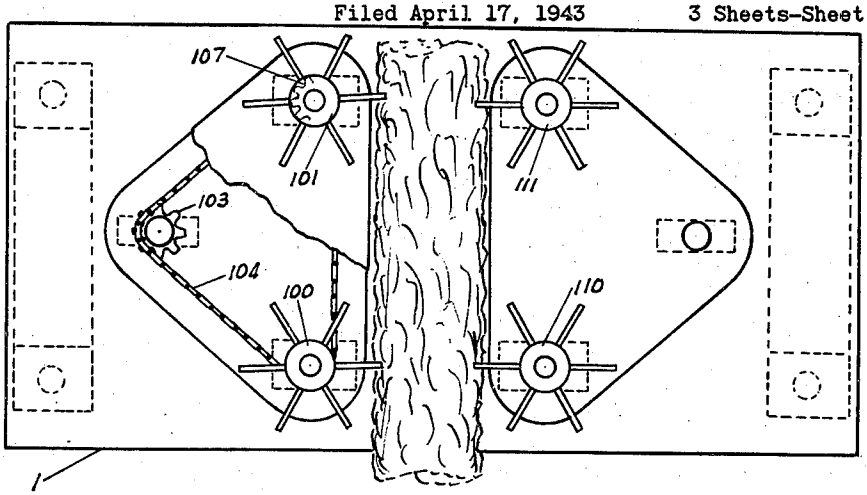


FIG. 8

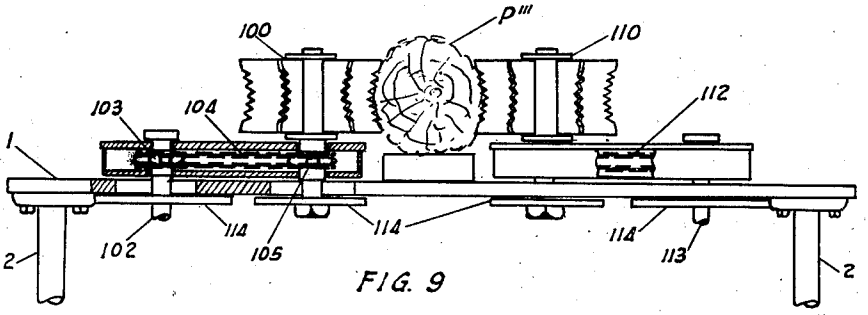


FIG. 9

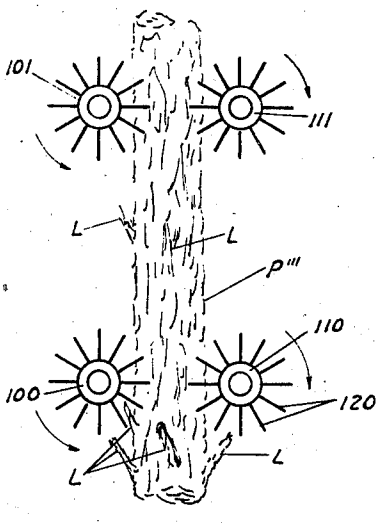


FIG. 11

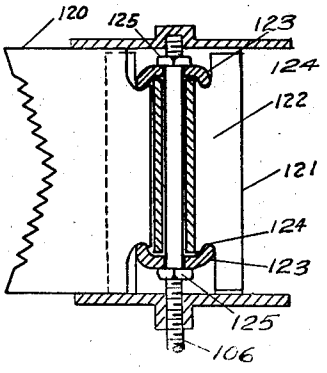


FIG. 10

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UNITED STATES PATENT OFFICE

2,374,429

POLE FEEDING MECHANISM

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Application April 17, 1943, Serial No. 483,502

5 Claims. (Cl. 144—248)

Our invention relates to feeding mechanisms and more specifically to pole feeding mechanisms for use with post sizing machines and other pole processing machines.

We are fully aware of the state of the art of feeder mechanisms used in the lumber industry to which our invention most nearly relates. These prior art feeding mechanisms serve well the purpose for which they were developed, that is the pushing of flat sided timbers. We discovered, however, that these prior art feeding mechanisms would not meet the demands of our special need, that of a machine capable of feeding small round logs into a sizing machine in the manufacture of fence posts and other poles. As many of the logs encountered in the manufacture of fence posts are crooked and have short limb sections left on them, the situation demanded not only the creation of a machine that would grip logs on their round bark surfaces but one that would also adjust itself to the curvature lengthwise and the condition of logs with limb sections.

An object of our invention is to provide a pole feeding mechanism that will grip the sides of a pole and move it progressively.

Another object of our invention is to provide a pole feeding mechanism that includes an adjusting feature to enable it to maintain its grip on a curved fence post while moving it progressively.

Another object of our invention is to provide a pole feeding mechanism suitable for the handling of logs with short limb sections left on and one adapted to strip the limb sections from the logs while the feeding mechanism moves them progressively.

In the business of manufacturing fence posts of the round type, small sections of small sized timber ranging in size from about eight inches in diameter down to a minimum of about three inches in diameter called sapling stock are used. This stock is cut about six to eight feet long for fence posts. While most of the post stock gotten out by the timber men is straight and regular, some of the stock is crooked and some is delivered with short limb sections left on it overlooked by the timber men. Our feeding mechanism which we show illustrated in our accompanying drawings and explained in detail in our specification has been put into actual use in the manufacture of fence posts and has been found to successfully handle the three types of rough stock, the straight section of log, the crooked section of log, and sections of logs with limb sections retained.

It is to be understood, however, that our invention is not to be limited to its illustrated and explained use in the manufacture of fence posts, for it may be redesigned without departing from the scope of our invention to handle other types of timber, boards and the like.

In the drawings:

Figure 1 is a plan view of our pole feeding mechanism showing it in an operating position feeding a pole into a pole sizing machine.

Figure 2 is an enlarged plan view of our pole feeding mechanism.

Figure 3 is a broken elevation view of our pole feeding mechanism looking at the receiving side of the mechanism.

Figure 4 is an elevation view of an optional form of adjusting means usable in our pole feeding mechanism.

Figure 5 is an enlarged view of a portion of our pole feeding mechanism.

Figure 6 is a diagrammatic plan view of our pole feeding mechanism.

Figure 7 is another diagrammatic plan view of our pole feeding mechanism.

Figure 8 is a plan view of a modified form of our pole feeding mechanism.

Figure 9 is an elevation view of the modified form of our pole feeding mechanism illustrated in Figure 8.

Figure 10 is an enlarged view of a portion of the modified form of our pole feeding mechanism illustrated in Figure 8 and Figure 9 and,

Figure 11 is a diagrammatic plan view of our modified form of pole feeding mechanism illustrating its mode of operation.

Referring to Figure 1 of the drawings, numeral 1 designates generally a supporting plate member of our pole feeding mechanism over which a pole P is shown being advanced to a pole sizer T. The left hand end of the pole P is supported by a support roller S. The sizer T is turned by means of a belt B connected to a source of power not shown. At the right hand side of Figure 1 a finished pole F is shown in a position where it is about to leave a pair of gripping rollers G. We use letters to designate the illustrated mechanisms which form no part of our invention but serve to show its relationship to one type of machine with which it is used.

The supporting plate member 1 carrying the movable parts of our pole feeding mechanism is supported about waist high by means of two pairs of support legs 2 bolted to the supporting

plate member 1 by means of machine bolts 3 and fastened down to heavy sills M by means of lag bolts 4. Our pole feeding mechanism is propelled by a drive chain 5 connected to a source of power not shown. The drive chain 5 turns the driven sprocket 6 and the splined driving tube 7 to which it is keyed and into the ends of which the right hand splined driven shaft 8 and the left hand splined driven shaft 9 are slidably fitted. The left hand gear housing 10 is shown broken to show the driving gears. The arrangement of the driving gears inside the right hand gear housing 11 is a duplicate of the left hand arrangement in which numeral 12 designates the left hand driving sprocket and 13 designates the left hand driven sprocket. The left hand chain stud 14 is keyed to the left hand driven sprocket 13 and turns with it. The left hand chain stud 14 extends through a slot in the supporting plate member 1. This slot is made only slightly wider than the left hand chain stud 14 to permit the left hand chain stud 14 to move only lengthwise in the slot. The left hand chain stud 14 also extends through a hole in the left hand chain plate 15 which hole serves as a bearing for it to turn in.

A retaining plate 16 is rigidly fastened to the left hand chain stud 14 in position abutting the lower side of the supporting plate member 1 to prevent the left hand chain stud 14 from moving upwardly.

A pole chain driving sprocket 17 is keyed to the left hand chain stud 14 above the left hand chain plate 15 for the purpose of moving the left hand endless pole chain 18 around the driving sprocket 17, forward idling sprocket 19 on idling stud 20, by the guide 22 and around the rear idling sprocket 23 on the idling stud 24. The retaining plate 21 prevents the idling stud 20 from moving upwardly and the retaining plate 25 prevents the idling stud 24 from moving upwardly.

On the right hand side of our pole feeding mechanism the driving power is carried upwardly through the right hand chain stud 34 which extends through a slot only slightly wider than the chain stud 34. We employ a retaining plate 36 on the right hand chain stud 34 and a retaining plate 41 on the right forward idling stud 40 and a retaining plate 45 on the right rear idling stud 44.

The right hand pole chain 38 functions in the same way as the left hand pole chain 18. It is driven by the right hand chain stud 34.

The purpose of the slots extended through the supporting plate member 1 mentioned above is to permit the right and left hand chain assemblies to move inwardly and outwardly over the supporting plate member 1 while permitting them to turn a limited distance allowed for by the wider slots through which the idling studs 19, 24, 40 and 44 extend. These motions of the chain assemblies permit them to assume the angular positions shown in Figure 6 and Figure 7 of the drawings. The right and left hand chain assemblies are urged inwardly by means of weights. The left hand chain assembly is urged inwardly by the left hand weight 50 attached to the end of the left weight arm 51 also attached to a rotatably mounted left hand throw disc 52. A left hand thrust rod 53 is pivoted to the left hand throw disc 52 a short distance out from its center of rotation. The left hand thrust rod 53 is also connected to the left hand gear housing 10.

The right hand chain assembly moving means is a duplicate of the above described left hand chain assembly moving means. In the right hand chain assembly moving means numeral 60 designates the right hand weight shown connected to the end of the right hand weight arm 61 which is connected to the right hand throw disc 62 which is connected to the right hand thrust rod 63.

To move the chain assemblies outwardly the left hand weight 50 and the right hand weight 60 must be lifted. In practice, however, one pole P after another is fed through our pole feeding mechanism so closely together that the chain assemblies are kept spread apart. The chain assemblies will open up of their own accord to take hold of a pole P because of the allowance made for such movement by the larger slots through which the idling studs extend.

The enlarged view (Fig. 5) of a section of pole chain is a section of the left hand pole chain 18, but it serves also as an illustration of the right hand pole chain 38 which is a duplicate of the left hand pole chain 18. The type of chain used is a propelling chain in common use in the lumber industry except for the V shaped cleats 31 which we fasten to the lugs 32 of the chain 18 in place of the usual wooden cleats attached to such lugs. We provide saw teeth 33 on the cleats 31 to better adapt them to grip the side of a pole P.

In Figure 4 we show an optional form of chain assembly moving device in which a single weight 70 is employed to move both the right hand and left hand chain assemblies toward each other. The weight 70 is attached to a weight arm 71 which is attached to a rotatable disc 73. On a diameter through the axis of rotation of the rotatable disc 73 at equal distances from the center of rotation both a pull rod 74 connected to the left hand gear housing 10 and a thrust rod 75 connected to the right hand gear housing 11 are attached. By this arrangement the weight 70 causes the pull rod 74 to pull the left hand gear housing 10 to the right while the right hand gear housing 11 is pushed to the left by the thrust rod 75.

This last described chain moving mechanism is easier to operate in that only one weight 70 need be lifted by the operator in order to move the chain mechanisms apart. However, it is not as good as the first described double weighted chain moving mechanism in that it does not permit independent movements of the separate chain mechanisms. Where straight poles P are being handled this objection is not serious, but where crooked poles P (Figs. 6, 7 and 11 respectively) or other ill shaped poles such as poles P', P'' and P''' are being handled the first described double weighted chain moving mechanism is superior.

The modification of our invention illustrated by Figure 8, Figure 9, Figure 10, and Figure 11 relates to a pole gripping means to be used in substitution for the left hand endless pole chain 18 and the right hand endless pole chain 38. It is to be understood that the same driving means heretofore described and the two chain moving mehcanisms heretofore described form parts of our modified pole feeding mechanism. In our modified pole feeding mechanism the driving power is carried up to the front left impeller wheel 100 and the rear left impeller wheel 101 by means of a driving chain 104 in mesh with a driving sprocket 103, the driven sprocket 105 attached to the front left impeller wheel 100 and the driven sprocket 107 attached to the rear left impeller wheel 101.

The right front impeller wheel 110 and the right rear impeller wheel 111 are driven by the right hand driving chain 112 which is moved by the right hand driving stud 113.

The left hand driving stud 102 and the right hand driving stud 113 are both provided with retaining plates 114 and the idling studs on which the impeller wheels are mounted are also provided with retaining plates 114.

The vanes 120 of the impeller wheels serve similar function to the afore described cleats 31. The vanes 120 are held in slots 122 of the hub 121 of the front left impeller wheel 100 by means of cup shaped washers 123 the edges of which fit into grooves 124 in the vanes 120, as see Figure 10. The cup shaped washers 123 are held in place by means of clamping nuts 125 threadedly engaged to the idling stud 106. By means of this mode of assembly the vanes 120 may be readily removed and replaced. As the other impeller wheels are duplicates of the front left impeller wheel 100 just described, their detailed descriptions are omitted.

The vanes 120 make contact with the pole P and shove it the same as did the cleats 31. This modified form of pole feeding mechanism as shown in Figure 11 is especially adapted for the handling of sections of timber with limb sections left on in the rough trimming operations they receive in the forest. Where such poles P''' are handled they are fed into our modified pole feeding mechanism with the small end first, the reverse of the usual practice. We feed such poles P''' in this manner so that their limb fragments L will enter in between vanes 120 of the impeller wheels and be broken off by the vanes 120 as the pole P''' is moved along. If the first pair of impeller wheels, the front left impeller wheel 100 and the front right impeller wheel 110, do not break all of the limb fragments L off the pole P''', it may be turned a quarter of a turn to permit the back pair of impeller wheels, left rear impeller wheel 101 and the right rear impeller wheel 111 to complete the stripping operation.

While the preferred form of our pole feeding mechanism also functions as a stripping means, it is not as efficient in this respect as our modified form of pole feeding mechanism.

Having thus described our invention, we claim:

1. A pole feeding mechanism comprising a frame including a horizontally extended supporting plate, a pair of rotatable pole engaging means including base members slidably mounted on the said supporting plate in line with and opposed to each other, each of said pole engaging means including a driving sprocket and a driven sprocket mounted on studs rotatably mounted on each base member, each of said pole engaging means including a driving chain extending from the driving sprocket to the driven sprocket, the studs of the said driving sprockets being extended through longitudinal slots in the said supporting plate, driven pinions being mounted on the studs of the said driving sprockets below the said supporting plate, a pole engaging driving means adapted to drive both pole engaging means including a pair of horizontally extended driving shafts driving pinions mounted on ends of the driving shafts, said driving pinions being enmeshed with the said driven pinions to turn the same, said driving shafts being arranged in alignment with each other and having their opposed ends extended into a driving tube in splined relationship with the driving tube whereby to permit the driving shafts to move inwardly and outwardly of the driving tube while being turned by the driving tube, and a means for moving the pole engaging means to and from each other.

2. The device as claimed in claim 1 wherein the said driving chains are provided with pole engaging cleats having V-shaped openings adapting the cleats to grip rounded surfaces.

3. The device as claimed in claim 1 wherein impeller wheels are mounted on the said driven studs, said impeller wheels including radially extending impeller vanes having V shaped openings adapting the said vanes to grip rounded surfaces.

4. The device as claimed in claim 1 being provided with a pair of gear housings to enclose the driven pinions and the driving pinions and to provide bearings for the driving shafts and the driving pinions and wherein the means for moving the pole engaging means to and from each other comprises a pair of rotatable throw discs, each of said throw discs being provided with a rod pivoted to it at a short distance from its axis of rotation, each of said rods being connected to a gear housing, each of said throw discs having a weight arm extending from it along its side face in a non-vertical direction and weights fastened to the weight arms a substantial distance from the axis of rotation of the said discs.

5. The device as claimed in claim 1 being provided with a pair of gear housings to enclose the driven pinions and the driving pinions and to provide bearings for the driving shafts and the driving pinions and wherein the means for moving the pole engaging means to and from each other comprises a rotatable throw disc, a pair of rods pivotably mounted on a diameter of the said throw disc on opposite sides of the axis of rotation of the said throw disc, each of said rods being also connected to a gear housing, a weight arm extending from the said throw disc along one of its side faces in a non-vertical direction and a weight fastened to the weight arm a substantial distance from the axis of rotation of the said throw disc.

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