June 4, 1946. J. OCKFEN 2,401,500

LOG BARKER

Filed March 11, 1943 4 Sheets-Sheet 1

Fig. 1

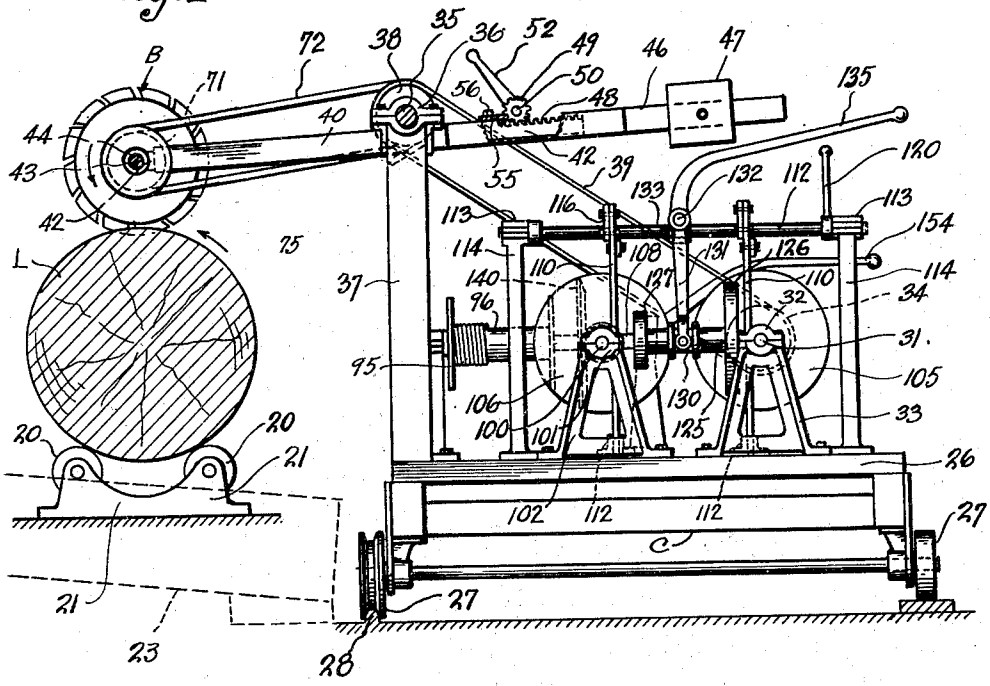
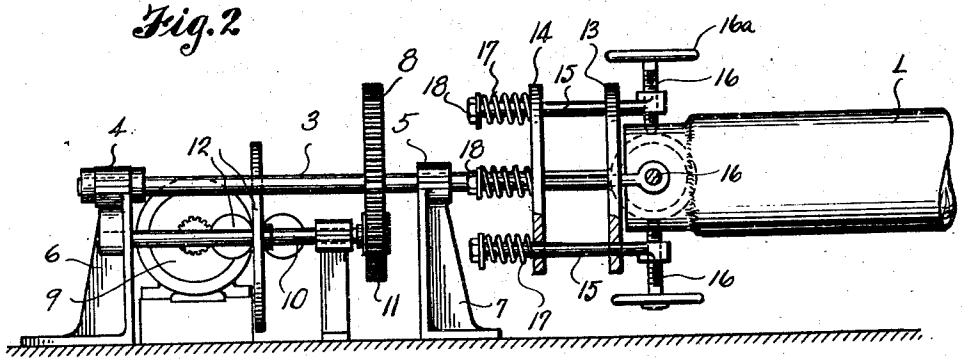


Fig. 2



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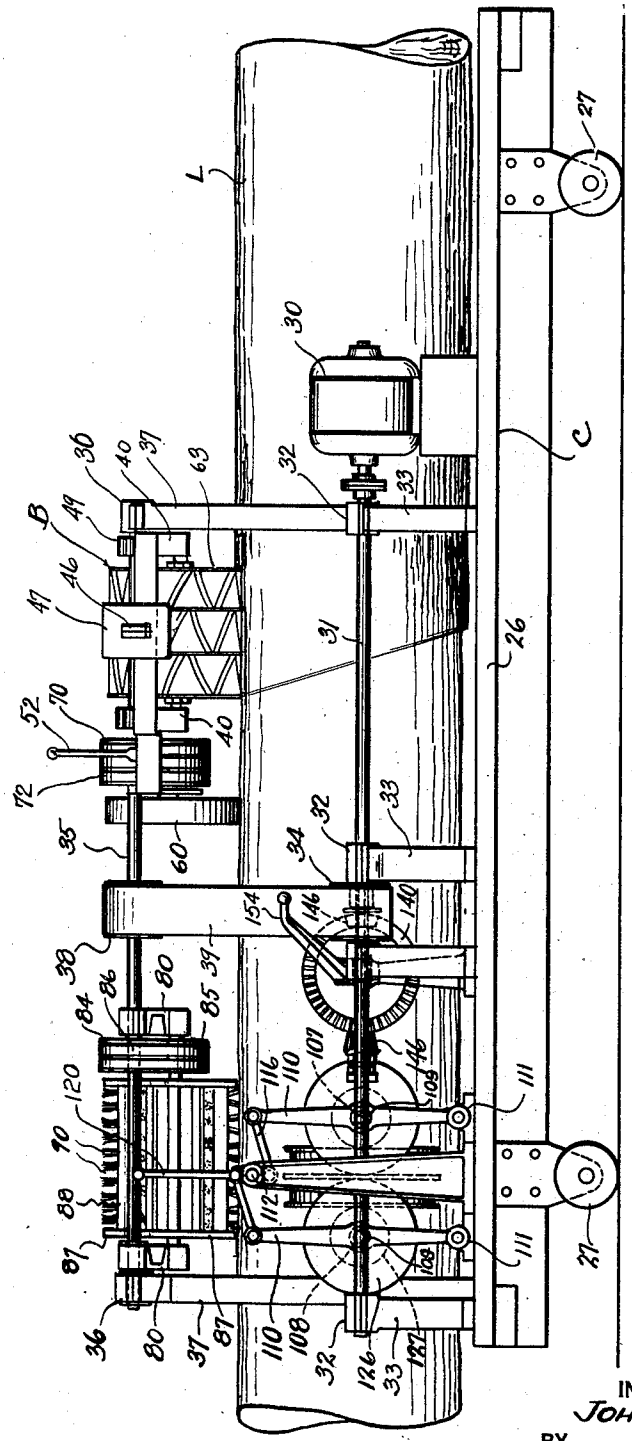


Fig. 3

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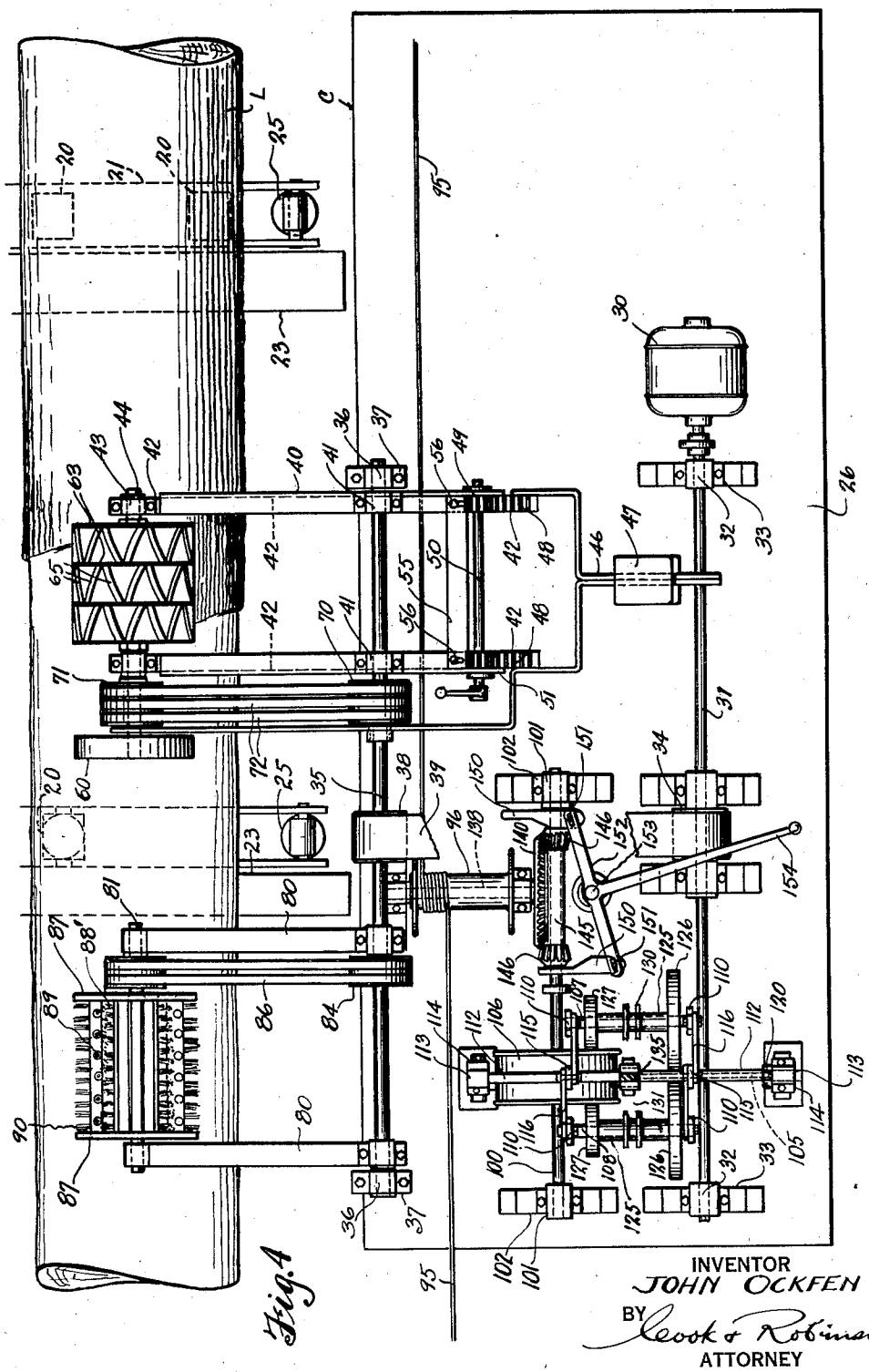


Fig. 4

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LOG BARKER

Filed March 11, 1943 4 Sheets-Sheet 4

Fig. 5

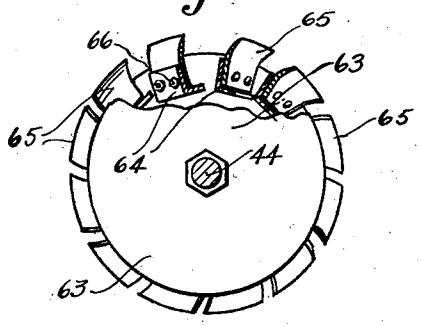


Fig. 6

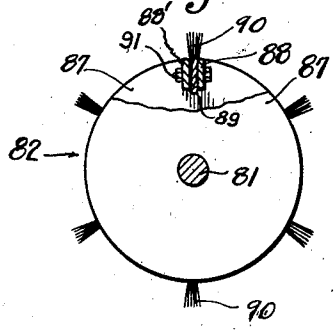


Fig. 7

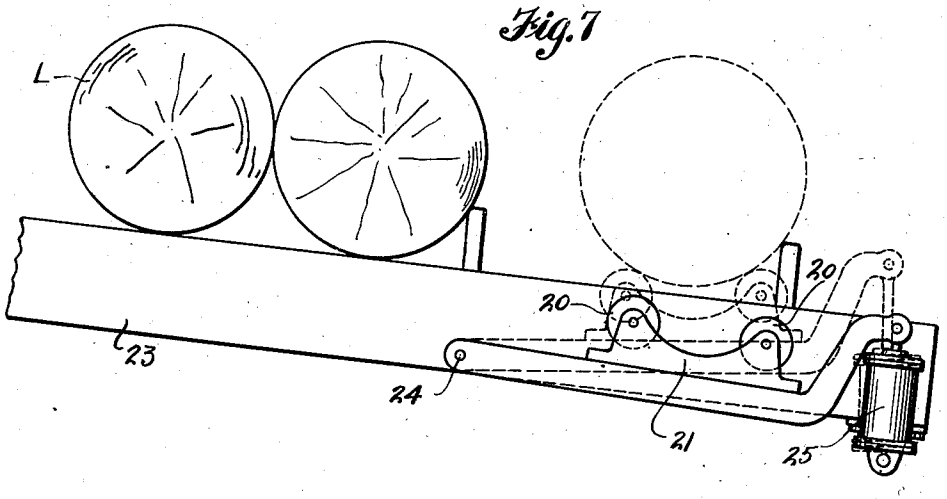
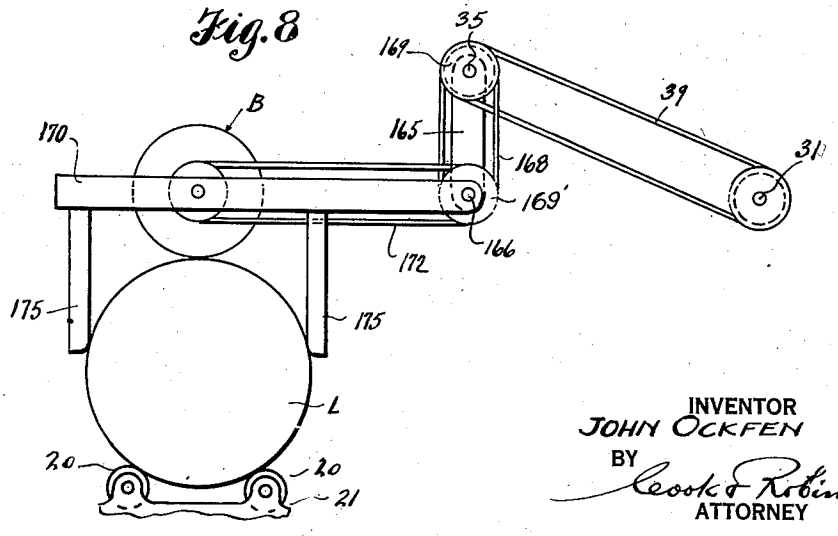


Fig. 8



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UNITED STATES PATENT OFFICE

2,401,500

LOG BARKER

John Ockfen, Spanaway, Wash.

Application March 11, 1943, Serial No. 478,745

8 Claims. (Cl. 144—208)

1

This invention relates to machines of that kind known in the industry to which they belong as log peelers, or barkers, and it has reference more particularly to improvements in machines for the removal of bark from logs that are of considerable length and diameter, such, for example, those which are of the size and kind ordinarily used as telephone poles, or pilings, and for those various uses where it is desirable to have the bark removed from the log.

It is the principal object of the present invention to provide improved apparatus for the barking or peeling and subsequent cleaning of the barked surface of logs. Furthermore, to provide such an apparatus including means for the horizontal support and rotation of a log, and a mechanism coacting with the log supporting and rotating means that includes a rotatably driven bark removing cylinder, and brushes to operate on the log after the bark has been removed; these latter parts being mounted on a carriage supported for travel along the log at a predetermined rate, in accordance with the rate of rotation of the log, so that all bark will be removed and the surface of the log brushed clear as the carriage advances.

More specifically stated, the objects of the present invention reside in the provision of a barker or log peeler of the above stated character having improved means for the quick mounting, accurate support and rotation of the log, and improved details of construction in a rotary barker cylinder, together with novel means for controlling the rate of travel of the carriage in its advancement along the log for the barking operation and for a quick return to its initial or starting position.

Still further objects of the invention are to be found in the improved devices for supporting a log for removal of bark, and in the means for controlling the depth of operation of the barking cylinder, and provision for effecting adjustment of the barker cylinder to best accommodate it to the diameter of the particular log being worked on.

Other objects of the invention are to be found in the novel details of mechanism provided for control of rate and direction of travel of the carriage.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is an end view of the log barker or timber peeler embodied by the present invention; the log rotating means, the brush and depth gauge wheel being omitted in this view.

Fig. 2 is a side view of the log rotating means which is omitted from Fig. 1.

2

Fig. 3 is a side elevation of the carriage with barker cylinder, brush, driving and control mechanism as mounted thereon for operation on a log.

Fig. 4 is a plan or top view of the same parts.

Fig. 5 is an end view and partial sectional detail of the barker cylinder.

Fig. 6 is a similar view of the brush construction.

Fig. 7 is a detail showing the character and disposition of a log supporting cradle.

Fig. 8 is a sectional detail of an alternative form of construction for the support and driving of a barker cylinder.

Referring more in detail to the drawings—

In the several views, a log that is being barked, or peeled, is designated by reference character L, and the barking and brushing devices, together with their driving and control mechanisms, are shown as mounted upon the horizontal top, or platform of a carriage which is designated in its entirety by reference character C. The log L, as here shown, is supported horizontally and is adapted to be axially rotated by means best shown in Figs. 1 and 2, wherein 3 designates a horizontal shaft, supported for rotation in suitable bearings 4 and 5 at the upper ends of standards 6 and 7; the standards being spaced and in alinement with the log axis. The shaft 3 is adapted to be rotatably driven by means of a large gear wheel 8 that is fixed thereon, and the gear 8 may be driven by any suitable power mechanism. As here shown, the power mechanism for this purpose comprises an electric motor 9 having an operative driving connection with a countershaft 10 which is mounted in suitable supports, parallel with shaft 3 and, in turn, has a gear wheel 11 fixed thereon in operative mesh with the gear wheel 8. It is intended that a variable speed reduction gear mechanism shall be employed in this driving connection between the motor 9 and the shaft 3 whereby the shaft 3 will be caused to slowly rotate; such a reduction mechanism being designated at 12 in Fig. 2.

Fixed on that end of the shaft 3 that is nearer the log L in Fig. 2, are parallel, spaced disks 13 and 14 of substantial diameter. Mounted slidably in these disks, parallel with the shaft 10 and at equally spaced intervals thereabout, are shafts 15, each of which, at the end thereof which extends through and beyond the disk 14 mounts a threaded clamp screw 16. These screws are radial of the axis of rotation of the shaft 3 and are pointed at their inner ends for a better holding contact with the end portion of a log that may be located between the screws, as in Fig. 2. Turning wheels 16a are provided at the outer ends of the screws to facilitate their use and operation.

Located about the inner end portions of the four shafts 15 are coiled springs 17 that are held

under compression between the disk 14 and nuts 18 that are threaded onto the shaft ends. These springs operate to retract the shafts 15 to locate the screws close to the disk 14 when the screws are not engaged with a log, but yield to permit the shafts to be extended, after a log has been rolled to a position ready for mounting, so that the inner ends of the screws may be engaged with and forced into the log end thus to center it relative to the shaft 3 and to support it for rotation by the driven shaft 3. This provision for the retraction and extension of the shafts 15 is quite desirable since it is not easy or practical to move a heavy log endwise for mounting by the holding screws.

Provision is here made for the support of the log, after rotation, at various intervals along its length. These supports comprise cradles of the kind shown in Fig. 7; each cradle having a pair of spaced rollers 20—20, parallel with the log and revolubly mounted in a base 21. Preferably, logs would be rolled to position for mounting in the machine on inclined bunks 23 in parallel, spaced relationship, as shown in Fig. 4, and the cradle bases 21 are extended along the bunks, in position for support of the log while being barked. One end of each base is supported by a fixed pivot bolt 24 and the other end is supported adjustably by a hydraulic jack 25. The jack may be adjusted to raise the base and cause the rollers 20—20 to cradle a log and to lift it clear of the supporting bunks 23 for rotation. It is intended that a log shall be supported only on one of these cradles at a time, and that they by selectively applying a hydraulic pressure medium to their jacks 25 shall be brought into supporting contact with the log successively and accordingly as the barker cylinder advances along the log, thus to reduce or eliminate as much as possible any radial sweep of the log in the vicinity of the barker cylinder that might result from the log being warped.

The carriage C comprises the horizontal platform 26 which is supported by a frame structure equipped at its four corners with wheels 27. The wheels at one longitudinal side of the carriage are flanged for travel on a supporting guide rail 28, thus to cause the carriage to travel along a definite course in a direction parallel with the log as supported for barking. On the platform is an electric motor 30, operatively connected to drive a line shaft 31 that extends horizontally and lengthwise of the carriage; this shaft being revolubly supported in bearings 32 on standards 33 that are fixed on the platform 26. Reduction gearing of suitable kind may be interposed between the motor and the shaft 31 if this is found desirable. At one place on the driven shaft, a belt pulley 34 is fixed for a purpose presently to be explained.

Mounted on the carriage platform, lengthwise thereof and at the side thereof that is nearer the log, is a drive shaft 35, supported in bearings 36 at the upper ends of standards 37 that are fixed to the platform, as noted best in Figs. 1 and 4. On the shaft 35, a belt pulley 38 is fixed, and a belt 39 operates about this pulley and about the pulley 34 on shaft 31 to drive the shaft 35.

Swingingly supported from the shaft 35 in a manner whereby to permit oscillation thereon in a plane that is perpendicular to the shaft, is a frame structure which carries the barker cylinder which is designated in its entirety by reference character B. This frame comprises parallel opposite side beams 40—40. Fixed on these beams, at locations intermediate their ends, are bearings 41 through which the shaft 35 is extended. The two beams 40—40 are channel irons disposed with their open sides facing each other. Contained within the channels, for endwise adjustment, are extension bars 42—42. These bars have end portions extended somewhat beyond those ends of the channel beams that overlie the log, and equipped with alined bearings 43 in which a supporting and driving shaft 44 for the barker cylinder B is revolubly contained.

As will be seen in Fig. 4, the barker carrying frame is underslung from the shaft 35 and one end thereof extends laterally of the carriage and overlies the log to be barked, as shown in Fig. 1. The inner end of the frame has an extension arm 46 fixed thereto on which a counter-weight 47 is mounted for adjustment therealong to overcome, to any desired extent, the down pressure of the barker cylinder on the log.

For the purpose of making adjustment in the effective length of the frame laterally of the carriage, whereby to best accommodate the barker cylinder B to the size of log being worked on, the bars 42—42 may be extended or retracted in their mounting channel beams relative to the log. Along their inner end portions, the bars have rack teeth 48 in their top surfaces, with which gear wheels 49, keyed on a cross shaft 50, mesh. The shaft 50 is supported from the channel beams 40—40 by plate brackets 51 fixed thereto. On one end of shaft 50 is a lever arm 52 whereby it may be rotatably adjusted, thereby to turn the gears 49 and thus adjust the bars 42—42 inwardly or outwardly as necessary to dispose the barker cylinder directly above the axis of the log. A flat bar 55 is supported across the frame upon the beams 40 and this is adapted to be adjusted to bring an edge into locking contact with the teeth of gears 49 to retain any adjustment of the bars. Set screws 56, extended through the bar ends, may be tightened in the supports to retain an adjustment.

Revoluble on one end of shaft 44 is a flat tired wheel 60, adapted to roll upon the barked surface of a log. This wheel is of the same diameter as the barker cylinder and serves as a limiting stop whereby to determine the depth to which the bark surface is removed from the log.

The barker cylinder B is mounted on the shaft 44 between the outer ends of the extension bars 42 and 42. The barker comprises a plurality, here shown to be four, of spaced disks 63, all of the same diameter and all fixed solidly on the shaft. Extended between the peripheral portions of adjacent disks, and in a spiral direction relative to the axis, are angle bars 64. These bars as arranged between adjacent disks are in zig-zag relationship and have their side flanges arranged to serve as mountings for the barker blades 65 which are fixed to the bars by bolts 66. The blade edges are slightly forwardly curved to engage the bark surface of the log as the cylinder rotates.

It will be noted by reference to Fig. 4, that the barking blades 65, as extended between adjacent disks 63, are in zig-zag arrangement by reason of successive bars being inclined in opposite directions. This arrangement of bars balances opposite end thrusts on the cylinder when in operation.

Mounted on the shafts 35 and 44 are belt pulleys 70 and 71 about which belts 72 operate to drive the barker cylinder.

In most operations, it is desirable that the log,

after being barked, should be brushed free and clean of slivers or loose fibers. For this purpose, I have suspended a second frame from the drive shaft 35 with one end thereof overlying the log. The frame comprises parallel beams 80—80, joined across their outer ends by a shaft 81 on which a rotary brush 82 is revolubly mounted. The brush is equipped at one end with a pulley 83 alined with a pulley 84 on shaft 35, and belts 86 operate about the pulleys to drive the brush.

The brush as here constructed comprises spaced disks 87 connected by flat bars 88. Brushes are formed by bending short lengths of wire rope 89 into U-form and clamping these between bars 88 and overlying bars 88' and securing by bolts 91. The ends of the rope piece are raveled out to form the brushes 90.

For the purpose of slowly advancing the carriage along the log for the removal of the bark by the action of the rotatably driven barker B and brush, I have provided a cable 95 that is wound about a drum 96 that is securely mounted on the carriage. The drum axis is transversely of the carriage and the cable extends lengthwise of the carriage and its opposite end portions are extended from the carriage and are fixed to posts, not shown, at the limits of travel of the carriage so that by rotating the drum in opposite directions, opposite end portions of the cable will be wound in and paid out and the carriage will be moved accordingly.

The driving means for the drum 96 comprises the following mechanism: Mounted on the carriage, parallel with line shaft 31 is a shaft 100, revoluble in bearings 101 at the upper ends of supporting standards 102 that are fixed on the carriage. Fixed on shaft 31 is a friction disk 105. Likewise, coaxially fixed on shaft 100 is a friction drum 106, of a diameter corresponding to that of the disk 105. The drum and disk are disposed on their respective shafts in the same vertical plane, and supported parallel with and at opposite sides of this plane and at the same horizontal level are shafts 107 and 108. These two shafts are fixed at their opposite ends in bearing 109 formed medially of the ends of vertically extending levers 110. These four levers are pivotally mounted at their lower ends in blocks 111 fixed to the platform. As will be understood by reference to Fig. 3, corresponding levers 110 at opposite sides of the plane of the disk and drum may be swung toward or from each other. To control this swinging adjustment, I provide a central shaft 112, rotatably mounted above the disk and drum in bearings 113 at the upper ends of standards 114 fixed on the platform. Fixed on the shaft 112 are vertical levers 115, and links 116 connect the upper and lower ends of these levers with the upper ends of the vertical levers 110. A hand lever 120 is fixed to shaft 112 to rotatably adjust it in opposite directions, thus to cause an adjustment of the shafts 107 and 108 toward or from each other.

Revolubly mounted on and slidable along the shafts 107 and 108, are tubular sleeves 125, each equipped at its opposite ends, respectively, with friction wheels 126 and 127 which engage, respectively, with the adjacent side surfaces of disk 105 and drum 106, thus to cause the drum to be rotatably driven by the disk 105. In Figs. 3 and 4, it is shown that the wheels 127 are substantially smaller than wheels 126; therefore, there is a speed reduction through which the shaft 100 will be caused to rotate at a slower rate

than shaft 31. A variation in this reduction of speed may be obtained by shifting the sleeves 125 endwise, and this is here accomplished by means best seen in Fig. 1, wherein it is shown that each sleeve is equipped with a central shifting collar 130, having rotary and pivotal connection with the lower end of a rocker arm 131. The arms 131 for the two sleeves are fixed to a pivot shaft 132 carried in a bearing 133 mounted on the supporting shaft 112. A lever, or handle 135 is fixed to shaft 132 and extends to a position accessible to an operator. By upward or downward swinging of the handle 135, the sleeves 125 will be shifted accordingly and thus move the friction wheels toward or from the center axis of the drum and disk to vary the driving speed of the shaft 100 as desired, thus to cause slower or faster advancement of the barker along the log.

The cable drum is supported and driven by a shaft 138 that is revoluble in fixed supports and at one end is equipped with a driving bevel gear 140. On shaft 100, a sleeve 145 is keyed for limited longitudinal shifting, and on the opposite ends of this sleeve, bevel gears 146—146 are fixed. These are so spaced as to adapt them to be selectively engaged with the gear wheel 140 at diametrically opposite sides to determine the direction of rotation of the drum and consequently the direction of travel of the carriage.

The sleeve 145 is shifted and is held in either of its adjusted positions by the action of tapered slides 150 arranged at the outside of the two gears and alternately shiftable into and from holding position by reason of having pivotal connections as at 151, with opposite ends of a rocker lever 152. Lever 152 is centrally pivoted on a support 153 and has a lever or handle 154 extended to a position easily accessible to an operator. Movement of the handle in one direction causes one of the slides to engage the outer end of the hub of a gear 146 and to push that gear into mesh with the gear wheel 140 and to disengage the other gear wheel 146. The swinging of the lever to its opposite position reverses the position of the gears, and consequently changes the direction in which the drum is rotated and the carriage moved.

In Fig. 8, I have illustrated an alternative arrangement of parts for the support of the barker cylinder and means whereby the barker cylinder is retained centered relative to the log. In this arrangement, paired links 165 are pivotally suspended from the drive shaft 35, and at their lower ends, these links revolubly support a shaft 166. Shaft 166 is revolubly driven by means of a belt 168 operating over pulleys 169 and 169' fixed on the shafts 35 and 166 respectively. A horizontal frame 170 overlies the log, and this is pivotally mounted at one end upon the shaft 166. The frame 170 mounts the barker cylinder B therein and the cylinder is driven by means of a belt 172 which operates about pulleys on the shaft 166 and on the drive shaft of the barker.

Extending downwardly from the frame 170 are legs 175 which are designed to engage with the opposite sides of the log being worked upon. One of these legs is adjustable along the frame so that the spacing between legs may be varied as needed to fit logs of different diameter.

It will be understood by reference to Fig. 8 that even though the log be warped or curved as it rotates, it will cause the barker to be centered thereover at all times.

Assuming that the device is so constructed, its

use for the barking and cleaning of a log would be as follows:

Logs would be moved into place by rolling them down the inclined bunks 23 and by lifting them clear of the bunks by the jacking up of the roller cradles 21. With one end of the log supported by a roller cradle, the other end of the log is then secured between the clamp screws of the rotating device as illustrated in Fig. 2. The rotating device is then set in motion; it being understood that if the log is warped, the roller cradle used at any time for the support of the log will be that which will cause the least amount of circular motion of the log at the location of the barker.

The barker is then brought into position at that end of the log which is mounted in the driving chuck, and it is preferred that the barker supporting swing frame be adjusted in length so that the barker will directly overlie the log as shown in Fig. 1. The motor 30 then operates through the line shaft 31 and belt 39 to drive shaft 35 and the belt connection 72 between the shaft 35, and shaft 44 drives the barker cylinder.

It will be understood that the depth of the cutting action of the barker cylinder will be limited by the wheel 60 coming into contact with the log surface. The wheel 60 revolves freely on the log as it rotates.

While the barker is in action, the driving connection betwen the shaft 31 and shaft 100 causes the latter to be rotated at a selected speed as determined by the setting of the friction wheels 126 and 127; it being understood that when these wheels are in contact with their respective friction surfaces of the disk 105 and drum 106, they will drive the latter, which in turn drives the shaft 100. To discontinue drive at any time it is only necessary to rotate the shaft 112 by the action of lever arm 120 to disengage the friction wheels 126 from the disk 105. The drum 96 is driven from the shaft 100 and in rotating in opposite directions, will cause travel of the carriage in opposite directions, and it is to be understood that for the barking operation, the travel of the carriage would be relatively slow, while upon a return action it brings the carriage back to initial position. This travel may be made relatively fast upon shifting the friction disks 126 farther from the shafts 31.

The brush may be used if desired for the cleaning of all loose fibers or splinters from the surface of the log.

With the device so constructed, it is apparent that relatively large logs may be easily handled and barked with speed and efficiency.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is:

1. In a log barker of the character described, a log supporting and rotating means comprising a cradle arranged for supporting one end portion of a log for axial rotation of the log thereon, a rotatably mounted shaft axially alined with the log at its other end, means for rotating said shaft, guides fixed to the shaft end, and extension shafts mounted by the said guides and extendible beyond the shaft end for receiving the end of a log between them and means at the ends of said shafts to engage the log for its support and for its rotation on the cradle.

2. In a log barker of the character described, a log supporting and rotating means comprising cradling rolls for the support of a log thereon for axial rotation, a drive shaft axially alined with the log at one end thereof, means for rotating the said drive shaft, guides fixed in spaced relationship to the shaft end, a plurality of extension shafts slidable in said guides parallel with the drive shaft and equally spaced therefrom, with ends extended beyond the shaft end to receive the end of the log between them, and log centering and holding devices mounted by the extension shafts.

3. A log supporting and rotating means as recited in claim 2 wherein springs are associated with said extension shafts to yieldingly retain them in their retracted positions and which yield for extending the shafts for mounting of the log end between them.

4. A log supporting and rotating means as recited in claim 2 wherein springs are associated with said extension shafts to yieldingly retain them in their retracted positions and which yield for extending the shafts for mounting the log end between them, and wherein the means for driving the shaft includes a variable speed transmission mechanism.

5. In a log peeling mechanism, a plurality of inclined bunks for the rolling of logs to position thereon, means for supporting a log at one end when brought to position and for axially rotating the log, a set of cradling rolls associated with each of the inclined bunks, a carrier for each set of rolls, and power devices for selectively moving the carriers to lift the sets of cradling rolls into position for support of the log thereon for rotation.

6. In a log peeling mechanism, in combination, a traveling carriage, a log barking means operatively mounted on the carriage and movable thereby along a log, a plurality of bunks for the rolling of logs to position for barking thereon, means for supporting a log at one end, when rolled to position, and for rotating the log for the removal of bark by the barking means as the carriage advances the latter along the log, and a log cradling means associated with each of the bunks and comprising a movable frame, a set of cradling rolls mounted in the frame, and means for lifting the frame to move its rolls from a position permitting the log to rest on the bunk, to a position for lifting it clear of the bunk for its axial rotation on the rolls.

7. In a log peeler, in combination, devices for supporting and for axially rotating a log, a carriage movable parallel with a log as supported by said devices, a driven shaft mounted on the carriage; a frame pivoted on the shaft and extended to opposite sides thereof, extension means slidable in the frame at one end, a barker cylinder mounted by the extension means for operation on a log supported by the said devices, means at the other end of the frame for counterbalancing the weight of the barker cylinder, means for adjusting and securing the extension means, and means for driving the barker cylinder.

8. In a log peeler, a barker cylinder comprising a mounting and driving shaft, three or more disks of like diameter fixed in spaced relationship on said shaft coaxial thereof, and a succession of bark chipping knives extended across each of the spaces between disks in spirally inclined direction and having their cutting edges extended beyond the disk edges; the knives in each space being arranged in zig-zag fashion.

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