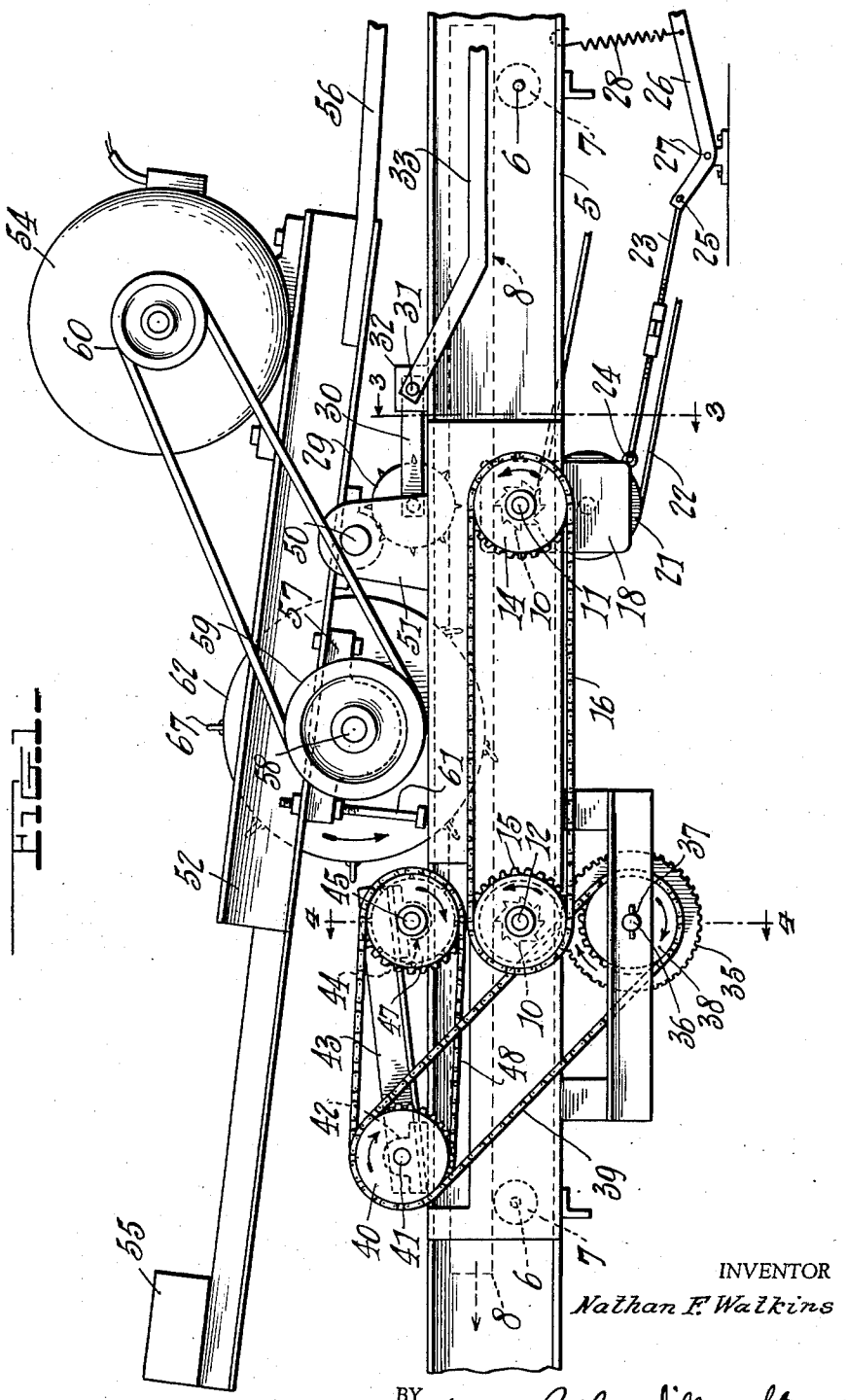
May 21, 1957 N. F. WATKINS 2,792,860

LOG-SLAB-DEBARKING APPARATUS

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LOG-SLAB-DEBARKING APPARATUS

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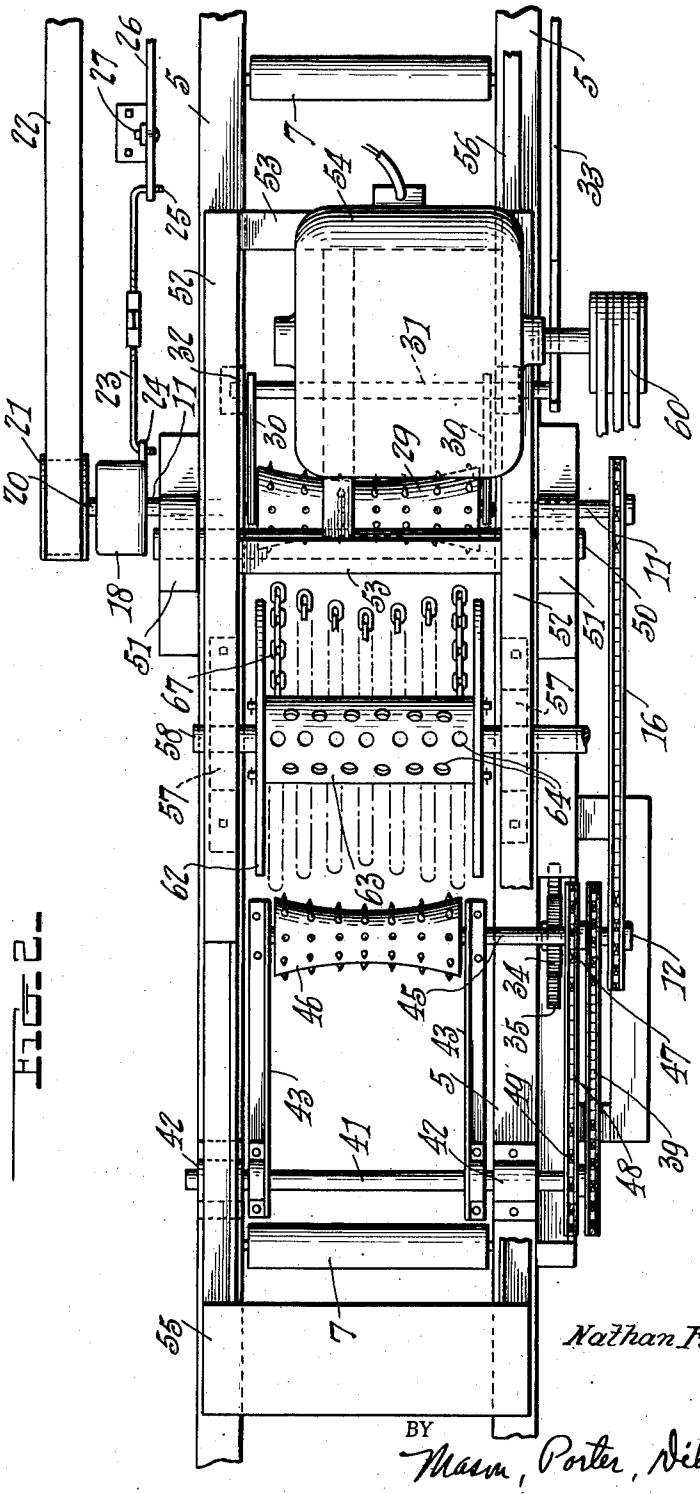


FIG. 2.

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FIG. 3

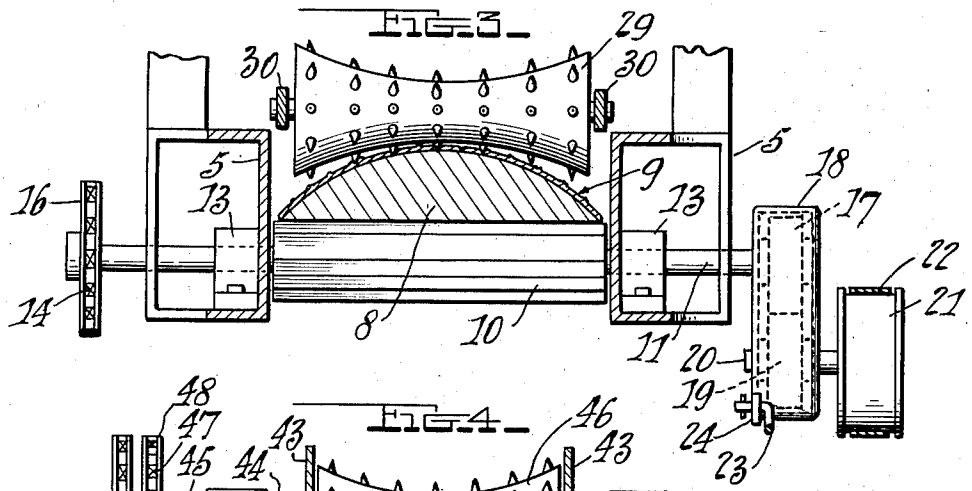



FIG. 4

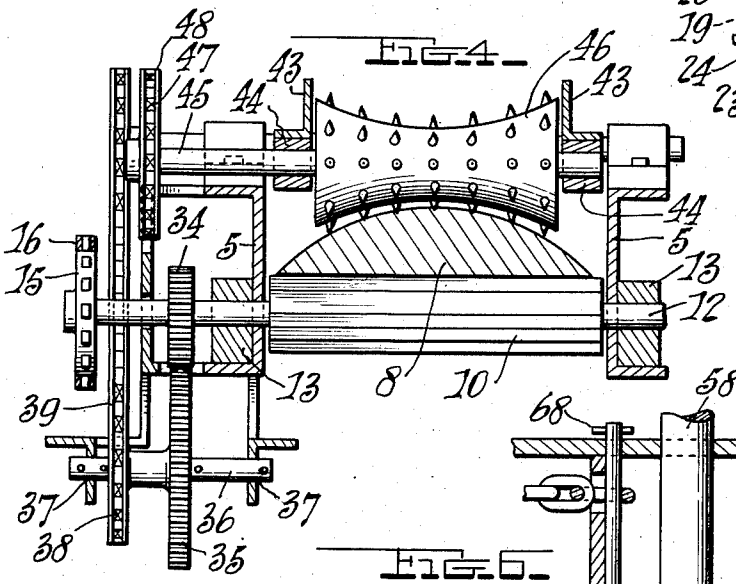



FIG. 6

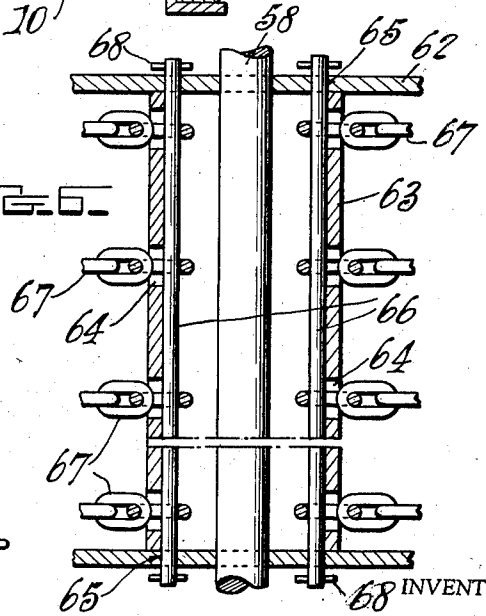
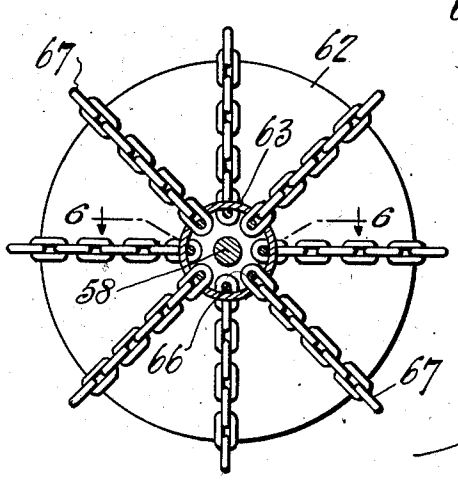



FIG. 5




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2,792,860

# LOG-SLAB-DEBARKING APPARATUS

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Application October 5, 1954, Serial No. 460,484

5 Claims. (Cl. 144—208)

The invention relates generally to bark-removing apparatus and primarily seeks to provide a novel and efficiently operable machine for debarking slabs which have been sawed off logs preparatory to the squaring up of the logs for subsequent reduction into dimensional lumber.

In converting round logs into square cross sections preparatory to processing the same into dimensional lumber it is necessary to remove from each log four bark-bearing slabs each defined by a flat surface and the convex bark-bearing surface. These slabs include much good wood which, when reduced to chips, can be employed in the production of paper, wall board and other products. Much wastage of this wood has been tolerated heretofore because of inability economically to remove the bark from the slabs so that the usable wood could be processed in the manner stated. A purpose of the present invention is to provide a simple and inexpensively constructed machine through which log slabs of the character stated may be rapidly fed, and which includes novel devices for rapidly and very efficiently removing the bark from the slabs.

An object of the invention is to provide an apparatus of the character stated wherein are included log-slab-feeding devices which can be controlled at the will of an operator to vary the feed rate, and which also includes provision for slippage in case of any tendency of the parts to jam, thereby to assure against damage to machine parts and injury to operators.

Another object of the invention is to provide an apparatus of the character stated wherein the log-slab-feeding devices have provision for automatically adapting themselves to variations in log-slab sizes and shapes.

A further object of the invention is to provide an apparatus of the character stated wherein the means for removing the bark from the log slabs comprises a rotary drum to which chain lengths are attached at one end only so that they will be thrown out by centrifugal force as the drum is rotated to provide flexible beaters which engage the bark-bearing surfaces of the log slabs and remove the bark therefrom.

A still further object of the invention is to provide an apparatus of the character stated wherein the log-slab bark-removing chain drum has its chains arranged in annularly staggered rows so that the chains in each succeeding row will strike the log slabs between positions contacted by the chains of the preceding row, thereby to assure a beating contact of the free ends of the chains against all bark-bearing surfaces of the slabs and the removal of all bark therefrom.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a side elevation illustrating the improved log-slab-debarking apparatus.



Figure 2 is a plan view illustrating the parts shown in Figure 1.

Figure 3 is an enlarged vertical cross section taken on the line 3—3 on Figure 1.

Figure 4 is an enlarged vertical cross section taken on the line 4—4 on Figure 1.

Figure 5 is an enlarged detail central vertical cross section taken through the beater drum.

Figure 6 is a further enlarged fragmentary horizontal section taken on the line 6—6 on Figure 5.

In the example of embodiment of the invention herein disclosed, the novel apparatus is shown as including a suitable frame structure having parallel side beams 5 providing bearings at 6 for a pair of transversely disposed, longitudinally spaced idler-supporting rollers 7 over which the slabs 8 can be rolled while having the bark 9 removed therefrom. Between the rollers 7 a pair of longitudinally spaced, toothed feed rolls 10 are supported on cross shafts 11 and 12 rotatably mounted in bearings 13 supported on the beams 5. A sprocket 14 is mounted on one end of the shaft 11 and a sprocket 15 is similarly mounted on the cross shaft 12, a chain 16 being passed over said sprocket to cause the shafts 11 and 12 to rotate in unison, and in a direction for feeding the log slabs longtiudinally in the direction of the arrow indicated on Figure 1.

At its end opposite the end on which the sprocket 14 is mounted the shaft 11 has a spur gear 17 fixed thereon within a speed reducer housing 18. Within the housing the gear 17 meshes with a spur gear 19 mounted on a cross shaft 20 supported in bearings provided in the housing. The shaft 20 carries a driver pulley 21 to which rotation is imparted from a power source not shown through a transmission belt 22. A longtiudinally adjustable thrust rod 23 is connected at one end as at 24 to the housing 18, and at its other end at 25 to an angled lever 26 which is pivotally supported at 27. It will be apparent by reference to Figure 1 that the lever 26 is constantly urged by an anchored spring 28 in a direction for holding the pulley 21 tightly in the bight of the driver belt 22. By manually adjusting the position of the lever 26 an operator can vary the pressure application of the pulley in the bight of the driver belt 22, and by this means can discontinue the rotation imparted to the feed rolls 10 or vary the speed of rotation thereof at will.

The feed roll 10 on the cross shaft 11 is opposed by an idling toothed presser roll 29 which is carried at the free ends of arms 30 secured on a rock shaft 31 in the manner clearly illustrated in Figures 1, 2 and 3 of the drawings. The shaft 31 is rockably supported at 32 on the beams 5 and has an actuater lever 33 secured thereon. The action of gravity constantly tends to hold the idling presser roll 29 against a log slab 8, 9 being fed in the manner illustrated in Figures 1 and 3, and by depressing the lever 33 an operator can readily lift the presser roll 29 out of its effective, log-slab-engaging position in order to facilitate introduction of a log slab into the apparatus.

The cross shaft 12 has a spur gear 34 secured thereon in the manner best illustrated in Figures 2 and 4 of the drawings, and this gear meshes with and drives a spur gear 35 secured on a cross shaft 36 which is rotatable in bearings 37 provided therefor on the machine framing. The shaft 36 has a sprocket 38 secured thereon and a chain 39 passes over said sprocket and over a sprocket 40 secured on the cross shaft 41 which is rotatably supported in bearings 42 provided therefor on the frame beams 5. In this manner rotation imparted to the cross shaft 12 through the chain 16 will be imparted to the cross shaft 36 through the gear couple 34, 35 and will in turn be transmitted to the cross shaft 41 through the sprocket and chain connections 38, 39, 40.

Support arms 43 are swingably mounted on the cross shaft 41 and carry bearings 44 at their free ends wherein a cross shaft 45 is rotatably mounted. The cross shaft 45 carries a toothed presser roll 46 which overlies the feed roll 10 on the cross shaft 12 and cooperates therewith in the same manner in which the previously described idling presser roll 29 cooperates with the underlying feed roll 10 on the cross shaft 11. A sprocket 47 is secured on the cross shaft 45 and is driven by a chain 48 passing thereover and over a sprocket 49 secured on the shaft 41. It will be apparent by reference to Figures 1, 2 and 4 that the arms 43 and the presser roll 46 carried thereby are free to swing upwardly and downwardly while engaging log slabs, the pressure roll 46 being positively driven all the while through the sprocket-and-chain connections 47, 48, 49.

A cross shaft 50 is mounted in bearings 51 on the frame beams 5 and rockably supports a frame composed of parallel side members 52 and traversing members 53. A motor 54 is carried at one end of the frame structure 52, 53, and a counterpoise 55 is carried at the opposite end of said frame structure. A hand lever 56 is attached to the frame structure 52, 53 so that an operator may manipulate said handle to conveniently rock the frame 52, 53 about its pivotal support on the cross shaft 50.

It will be apparent by reference to Figures 1 and 2 of the drawings that the side members 52 of the frame structure 52, 53 carry bearings 57, and these bearings rotatably support a cross shaft 58 having a pulley 59 secured thereon. Rotation is imparted to the pulley 59 and the shaft 58 through the belt-and-pulley connection 60 with the separate driving motor 54. An adjustable stop 61 depends from the rockable frame structure and is engageable wih a fixed portion of the underlying frame in the manner indicated in Figure 1 for limiting downward rocking movement of the frame structure 52, 53.

A flanged drum 62 is secured on the cross shaft 58 and includes a cylindrical hollow body portion 63. It will be apparent by reference to Figures 2, 5 and 6 that the drum body 63 is equipped with transversely arranged and annularly staggered rows of apertures 64. It will also be apparent by reference to Figures 5 and 6 that the end flanges of the drum are provided with aligned apertures 65 inwardly of and aligned with the axes of the apertures of each roll. Each set of aligned apertures 65 is adapted to removably receive a cross rod 66 inserted through the innermost end links of chains 67, said rod-impaled links being passed inwardly through the drum body apertures 64 in the manner clearly illustrated in Figures 5 and 6. The rods may be secured in their aperture mountings by removable cross pins 68.

When rapid rotation is imparted to the drum 62, 63 centrifugal force will throw the individual chains radially outward in the manner illustrated in Figures 2 and 5, and the chains are so selected and arranged as to lengths that when they are thus thrown out by centrifugal force the free ends of the chains in any given transverse row will describe a transverse arc as indicated in Figure 2 and approximately corresponding to the curvature of the bark-bearing surfaces of the log slabs to be contacted by said chains. By staggering the rows of chains in the manner illustrated in Figure 2, the free ends of the chains in each succeeding row will strike the log slabs at positions intermediately of the positions contacted by the chains of the preceding row thereby to assure a beating contact of the outer ends of the chains against all bark-bearing surfaces of the log slabs and the complete removal of all bark therefrom.

While the teeth on the presser rolls 29 and 46 are shown as arranged in transversely aligned rows, it is to be understood that these teeth may be spirally arranged, or arranged in any other pattern found desirable.

By mounting the presser rolls 29 and 46 on free-swinging arm supports, they are not only free to press against the log slabs by gravity action and efficiently hold them against the feed rolls 10, but they are also free to follow variations in the contour of the surfaces of the traveling log slabs engaged thereby.

The variable-feed drive provided by the parts 17, 19, 21, 22 not only enables the operator to change the rate of feed at will, but also acts as a safety device. In case a slab gets jammed in the machine, the belt 22 slips, and no injury results to the machine or any operator or bystander. The anchored spring 28 provides enough tension on the feed belt for normal feeding operation, and in case of any abnormal load, this tension is overcome and the feed stops.

It is found that the positioning of the beater drum above or opposed to and between the feed rolls 10 assures very efficient operation of the debarking chains 67, and by providing the separate motor 54 and cooperatively arranging the same with the counterpoise 55 and the drum shaft 58 as indicated in Figure 1, the whole beater-drum-supporting and driver assembly can be moved upwardly and downwardly about its supporting shaft 50 with great facility.

The disclosed apparatus operates with great efficiency in removing all bark from the rapidly traveling log slabs 8, and it is a simple matter to then subject the debark slabs to the operation of a chipping machine for converting the wood into carload lots of chips which can be shipped to the various paper manufacturing companies economically and with great facility.

While one form of the invention has been shown for purposes of illustration, it is to be clearly understood that various changes in the details of construction and arrangement of parts may be made without departing from the function and scope of the invention as defined in the appended claims.

I claim:

1. In a log-slab-debarking apparatus, a frame structure providing a longitudinal feedway along which log slabs may be fed in the direction of their length and with their bark-bearing surfaces exposed upwardly, a pair of longitudinally spaced and rough-surfaced feed rolls rotatably supported on the frame structure with their axes traversing the feedway and their rough surfaces disposed to engage a downwardly exposed flat surface of an overriding log slab, means for driving the feed rolls to feed an overriding log slab, means for yieldably pressing a traveling slab against the rolls, a rotary drum rotatable about an axis traversing the feedway and disposed opposite and between the rolls, means for rotating the drum, beater means on the drum and engageable with a bark-bearing surface of a traveling log slab for removing bark therefrom, a pivotally mounted frame supporting the rotary drum, stop means for determining the effective position of the frame with the drum presented for effective engagement with a traveling log slab, a separate motor for driving the drum mounted on the drum-supporting frame endwise of the pivotal mounting thereof in one direction, a counterweight mounted on the drum-supporting frame endwise of the pivotal mounting thereof in the other direction, and manually operable means for moving the frame away from said effective position.

2. In a log-slab-debarking apparatus, a frame structure providing a longitudinal feedway along which log slabs may be fed in the direction of their length and with their bark-bearing surfaces exposed upwardly, a pair of longitudinally spaced and rough-surfaced feed rolls rotatably supported on the frame structure with their axes traversing the feedway and their rough surfaces disposed to engage a downwardly exposed flat surface of an overriding log slab, means for driving the feed rolls to feed an overriding log slab, means for yieldably pressing a traveling slab against the rolls, a rotary drum rotatable about an axis traversing the feedway and disposed opposite and between the rolls, means for rotating the drum, beater means on the drum and engageable with a bark-bearing surface of a traveling log slab for removing bark

therefrom, a pivotally mounted frame supporting the rotary drum, stop means for determining the effective position of the frame with the drum presented for effective engagement with a traveling log slab, a separate motor for driving the drum mounted on the drum-supporting frame endwise of the pivotal mounting thereof in one direction, a counterweight mounted on the drum-supporting frame endwise of the pivotal mounting thereof in the other direction, and a hand lever secured to and projecting endwise from the pivotally mounted frame and manually operable to change the position of said frame and the drum thereon.

3. In a log-slab-debarking apparatus, a frame structure providing a longitudinal feedway along which log slabs may be fed in the direction of their length and with their bark-bearing surfaces exposed upwardly, a pair of longitudinally spaced and rough-surfaced feed rolls rotatably supported on the frame structure with their axes traversing the feedway and their rough surfaces disposed to engage a downwardly exposed flat surface of an overriding log slab, means for driving the feed rolls to feed an overriding log slab, means for yieldably pressing a traveling slab against the rolls, a rotary drum rotatable about an axis traversing the feedway and disposed opposite and between the rolls, means for rotating the drum, beater means on the drum and engageable with a bark-bearing surface of a traveling log slab for removing bark therefrom, said feed-roll-driving means including a gear couple composed of spur gears mounted on parallel shafts within a housing swingable about one of the shafts and a pulley mounted on another of said shafts and engaged in the bight of a driving belt, and there being included manually operable means for swinging the housing to engage the pulley in variable degrees of frictional driving contact with said belt bight.

4. In a log-slab-debarking apparatus, a frame structure providing a longitudinal feedway along which log slabs may be fed in the direction of their lengths and with their bark-bearing surfaces exposed upwardly, a pair of longitudinally spaced and rough-surfaced feed rolls rotatably supported on the frame structure with their axes traversing the feedway and their rough surfaces disposed to engage a downwardly exposed flat surface of an overriding log slab, means for driving the feed rolls to feed an overriding log slab, means for yieldably pressing a traveling slab against the rolls, a rotary drum rotatable about an axis traversing the feedway and disposed opposite and between the rolls, means for rotating the drum, beater means on the drum and engageable with a bark-bearing surface of a traveling log slab for removing bark therefrom, a pivotally mounted frame supporting the rotary drum, stop means for determining the effective position of the frame with the drum presented for effective engagement with a traveling log slab, a separate motor for driving the drum mounted on the drum-supporting frame endwise of the pivotal mounting thereof in one direction, a counterweight mounted on the drum-supporting frame endwise of the pivotal mounting thereof in the other direction, and a hand lever secured to and projecting endwise from the pivotally mounted frame and manually



operable to change the position of said frame and the drum thereon, said beater means comprising free ended chains secured at their inner ends only to a cylindrical body portion of the drum so that the outer free ends can be thrown by centrifugal force against bark-bearing surfaces of a traveling log slab and graded and arranged as to length across the drum body portion so that end portions at the free ends will conform generally to the transverse curvature of such bark-bearing surfaces of a log slab.

5. In a log-slab-debarking apparatus, a frame structure providing a longitudinal feedway along which log slabs may be fed in the direction of their length and with their bark-bearing surfaces exposed upwardly, a pair of longitudinally spaced and rough-surfaced feed rolls rotatably supported on the frame structure with their axes traversing the feedway and their rough surfaces disposed to engage a downwardly exposed flat surface of an overriding log slab, means for driving the feed rolls to feed an overriding log slab, means for yieldably pressing a traveling slab against the rolls, a rotary drum rotatable about an axis traversing the feedway and disposed opposite and between the rolls, means for rotating the drum, beater means on the drum and engageable with a bark-bearing surface of a traveling log slab for removing bark therefrom, a pivotally mounted frame supporting the rotary drum, stop means for determining the effective position of the frame with the drum presented for effective engagement with a traveling log slab, a separate motor for driving the drum mounted on the drum-supporting frame endwise of the pivotal mounting thereof in one direction, a counterweight mounted on the drum-supporting frame endwise of the pivotal mounting thereof in the other direction, and a hand lever secured to and projecting endwise from the pivotally mounted frame and manually operable to change the position of said frame and the drum thereon, said means for yieldably pressing a log slab against the feed rolls comprising a toothed presser roll engageable with a log slab directly over each feed roll and swing-frame means supporting each presser roll so that it can swing by gravity action toward the underlying feed roll, sprocket-and-chain means being included for driving that presser roll disposed beyond the drum in the direction of movement of slabs being fed, and there also being included manually operable lever means for lifting that presser roll disposed in advance of said drum.


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