Oct. 28, 1952 F. W. HORSTKOTTE 2,615,481

OSCILLATING MANIFOLD HYDRAULIC LOG BARKER

Filed Nov. 10, 1950 2 SHEETS—SHEET 1

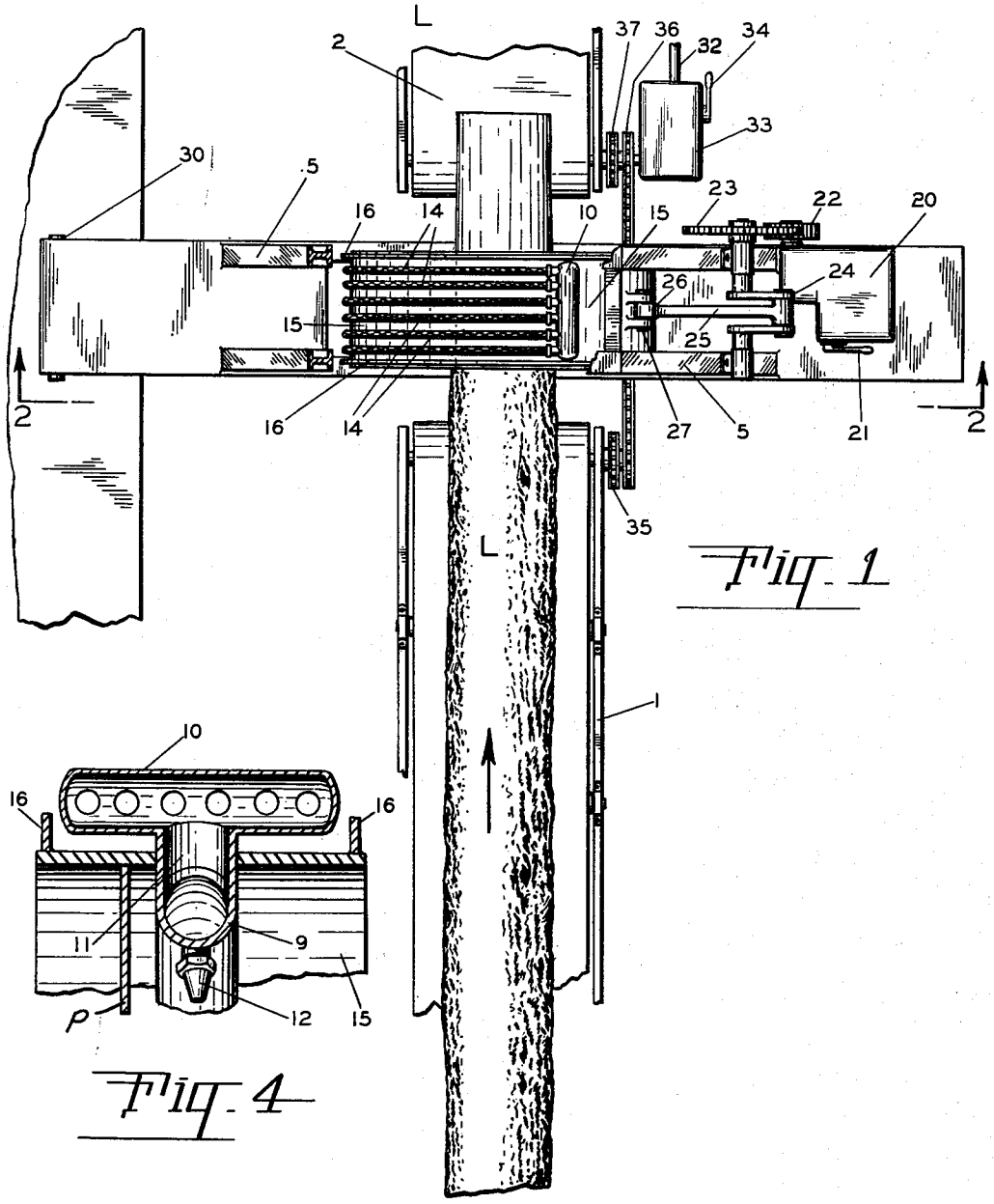


Fig. 1

Fig. 4

Inventor
FREDERICK W. HORSTKOTTE
By G. F. McDougall.
Attorney

Oct. 28, 1952 F. W. HORSTKOTTE 2,615,481

OSCILLATING MANIFOLD HYDRAULIC LOG BARKER

Filed Nov. 10, 1950 2 SHEETS—SHEET 2

Fig. 2

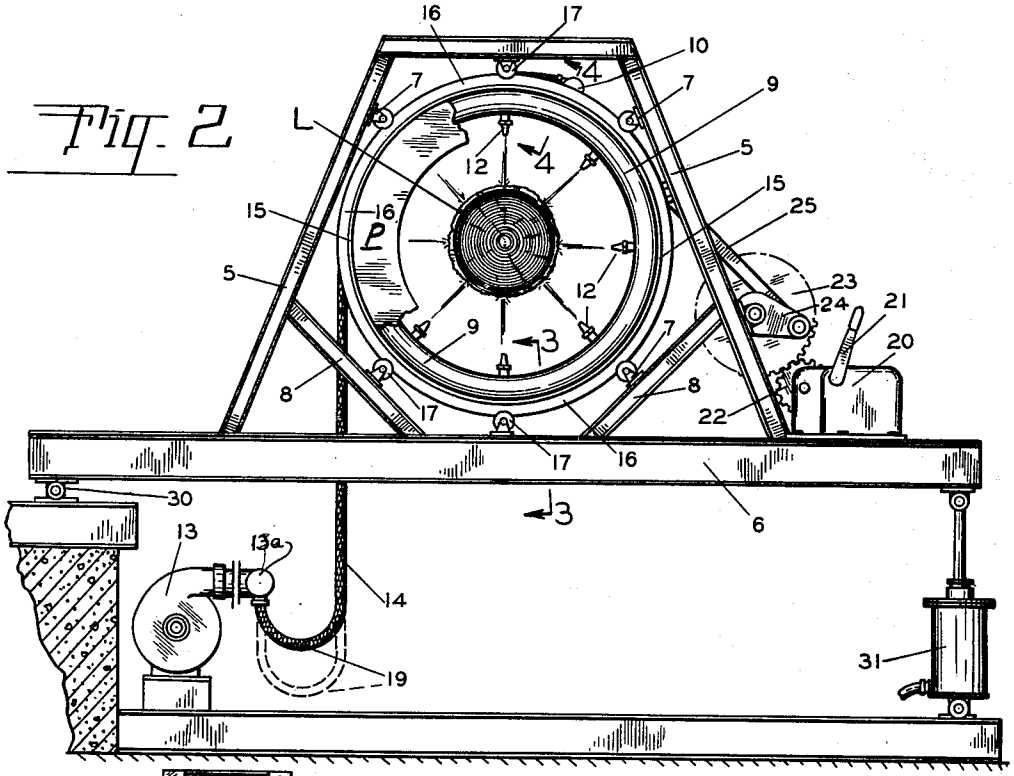
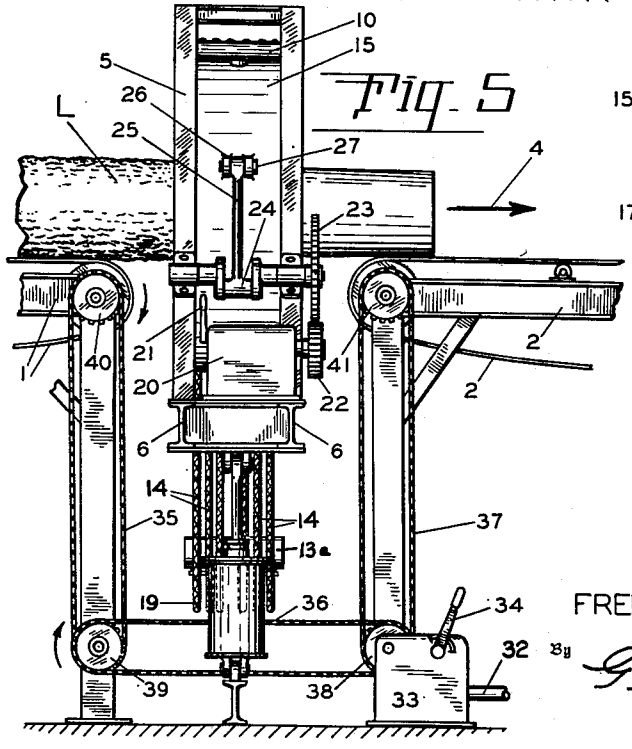


Fig. 5



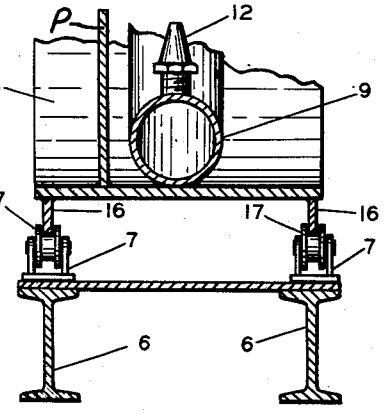


Fig. 3

Inventor
FREDERICK W. HORSTKOTTE
By G. F. McDougall
Attorney

Patented Oct. 28, 1952

2,615,481

UNITED STATES PATENT OFFICE

2,615,481

OSCILLATING MANIFOLD HYDRAULIC LOG BARKER

Frederick W. Horstkotte, Portland, Oreg.

Application November 10, 1950, Serial No. 194,961

8 Claims. (Cl. 144—208)

1

This invention is an oscillating manifold hydraulic log barker, the essential feature of which is a ring-like manifold through which logs are moved by conveyor means, the manifold including a plurality of equally spaced efflux nozzles spaced around the inside of the ring; the ring-like manifold oscillating while the log to be debarked passes through the manifold at a regulated speed chosen to produce best results, the manifold with the nozzles meanwhile oscillating.

It will be seen at once that the impact of the nozzle streams will be along a series of curves, joined at their ends, and that coverage of the log surface depends on the rapidity of the oscillation and the forward speed of the log.

It will also be apparent that spacing the nozzles around the inside of the manifold ring can be such that stream coverage from one nozzle will overlap that of other nozzles if desirable, and a surface irregularity that marks the place where a limb dropped off during growth of the log will be attacked from several directions, which is one of the objects of the invention.

As is well known, hydraulic debarking makes use of the hydraulic law that a stream striking a relatively flat surface turns into a flat body of water traveling outwards from the point of impact with small loss of energy and that it is this stream that enters between the log and its bark, forcing the latter off with almost explosive violence. However, energy stored in the flat stream is dissipated rapidly by rugosity and curvature of the log surface; hence close coverage of the surface to be debarked is imperative and it is the object of the present invention to improve the surface coverage by co-ordinating forward speed of the log with frequency of oscillation of the nozzle streams over its surface to the end that an optimum debarking result is achieved with a minimum of operating expense.

Another object is to produce a debarking structure that is inherently strong and not liable to failure due to the high pressures necessarily employed; that contains no packed joints that must move under the high pressure and, further, that requires a smaller capital investment than other hydraulic barkers of comparable efficiency and capacity, of which I have knowledge.

Another object well served by the disclosed structure is to supply water under a very high pressure, of the order of thirteen to fifteen hundred pounds per square inch, usually through hoses, as the disclosure shows. With the oscillating manifold ring, the hoses are required to withstand only a very small fraction of the flexure under high internal pressure, the destructive

2

force, and equally favorable hose conditions are not believed possible with any other type of machine.

I attain the objects stated and others that will be apparent to those skilled in the art, by the structure illustrated in the accompanying drawings and described in the specification, which is shown as my preferred structure at the present time; but is not intended as being limiting, the scope of the invention being ascertained by the claims.

In the drawings:

Fig. 1 is a plan view of the preferred embodiment of the machine with certain parts represented schematically;

Fig. 2 is a vertical sectional view taken on the plane 2—2 of Fig. 1;

Fig. 3 shows a section taken on the plane 3—3, Fig. 2;

Fig. 4 is a sectional view taken on the plane 4—4, Fig. 2, illustrating the hose manifolds, one of the important parts of the structure; and

Fig. 5 is a view of the structure shown in Fig. 2, viewed from the right hand side of the figure and schematically showing the log conveyors.

Describing the machine of the drawings in greater detail, a two part log conveyor, indicated by numerals 1 and 2, is shown schematically, and the drive will be understood to be present and adequate, it having been omitted since any suitable conveyor may be used. The conveyor parts 1 and 2 are made to run synchronously as to the log conveying upper surface 3 and the log is moved at a suitable regulated speed in the direction indicated by the arrow 4.

A barker frame 5 is supported on a structural beam 6, supporting the relatively stationary members of the frame 5 such as the braces 8 and the roller stands 7.

The purpose of the barker frame is to support a manifold 9, here shown as an extra heavy pipe bent to ring-like shape and provided with auxiliaries to be hereinafter described; though it may be a steel casting if preferred.

The manifold 9 will have a hollow interior as shown in Figs. 3 and 4, the interior being in communication with the interior of a hose manifold 10 as shown in Fig. 4 and made integral to withstand the high pressures mentioned, preferably by a welded connection 11. Spaced within the ring-like manifold 9 are a plurality of nozzles 12 that direct high velocity streams of water against a log L to remove the bark, as is quite well known in the art, the water being supplied by suitable means such as a multi-stage pump 13 through a plurality of hoses 14, the hoses being partially

wrapped around a drum-like cover 15 as shown, and of which the annular roller engaging flanges 16 form parts.

The drum-like cover 15 may be more conveniently rolled into shape if inwardly stiffened as by a plate P, welded inside.

The pump 13 as shown in Fig. 2, is entirely schematic and forms no part of the invention. If used it would be located elsewhere and only a stationary delivery manifold 13a would be at the location shown.

Rollers 17, which constitute the support for the drum-like cover 15, are formed with grooved perimeters which engage the perimeters of the flanges 16, making the ring-like manifold 9 which is secured as by welding to the inside of the drum-like cover 15, movable in rotary oscillation, to bring the bark of the log within the influence of hydraulic nozzles 12, as the log L is controllably and concurrently moved forward and oscillated, as it is moved axially through the open passageway provided by this construction, as shown in Figs. 1 and 5.

Water carrying a high energy content supplied by the pump 13, or other suitable means, is to be conveyed from a stationary supply means to an oscillating energy application means, through a plurality of nozzles, 12; and to avoid the weaknesses of a swivel, packed joint or other apparatus difficult to keep tight under the pressures involved, I interpose a plurality of strong, relatively small diameter hoses between the stationary manifold 13a and the oscillating nozzle manifold 9. To avoid the joints mentioned, I string the hoses in side by side relationship, from the stationary pressure source to the manifold by providing a drum-like cover 15 for the manifold 9 upon which the hoses wrap and unwrap as the manifold-cover structure oscillates, the hoses having sufficient length to accommodate the motion without longitudinal stress due to the motion.

Oscillation of the manifold 9 and its attached parts is supplied with power from a motor 20 which has a built in speed changer and reverse gear (preferably), a lever 21 indicating that it can be manually controlled. The drive from the motor 20 is shown to be a pinion 22, intermeshed with a gear 23, since scarcely enough space was available on the sheet to show a sprocket and chain transmission, which is preferred. Either arrangement of transmission will turn a crankshaft 24 and operate a connecting rod 25 which is operably connected to the oscillating manifold 9 by a wrist 26 and a wrist pin 27.

It will be obvious that as the log L is carried through the ring-like manifold 9, the plural nozzles supplied with high pressure water will each make a separate track on the surface of the log and as the ring oscillates and the log moves forward from left to right, those tracks will be sinusoidal and the spacing of the sinusoid curves will be a function of the related speeds of the conveyors carrying the log and the motor which oscillates the ring-like manifold with its nozzles.

Adjustment of the debarking machine to seasonal conditions (as when the bark is comparatively free in the spring, due to sap starting, or tight during later months), requires varying oscillations per unit of log length traversing the ring-like manifold. These variations can be made with the machine running, by manipulation of levers 21 or 34, or both, in any order, as a result of observation of results.

To center the log for barking the different sizes, I mount the beam 6 on a hinge 30, raising or lowering the opposite end of the frame by a hydraulic cylinder 31, a well known expedient.

My advance in the art of hydraulic log barking machines resides chiefly in mounting the ring-like manifold for oscillation with means for varying the speed of oscillation with respect to forward feed of the log, which as a major incident allows hoses to be used for water supply in a much more favorable position for endurance, as I believe, and also permits better apparatus for coverage of the nozzle streams over the face of the log.

To achieve optimum results, the log conveyor parts 1 and 2 must be driven at synchronous speed at all times, and the direction of movement must be reversible and manually variable in speed.

This is illustrated diagrammatically in Fig. 5, by a power input shaft 32, a gear box 33 and a hand control lever 34, which by virtue of a driving sprocket 38, by chains 35, 36 and 37, and by driven sprockets 39, 40 and 41, enable an operator to fulfill the speed, control and directional requirements. It is to be understood that the elements mentioned have no relationship to a design drawing, which the art needs no instructions to adequately provide.

Having disclosed my invention so that those familiar with the art to which it appertains can make and use it, what I claim as new and desire to secure by Letters Patent, is:

1. A hydraulic log barker comprising a frame, a ring-like high pressure nozzle manifold mounted within a drum-like cover for oscillation within said frame, means to oscillate said manifold and its cover, a plurality of hoses for supplying water to the interior of said manifold, said hoses being mounted in side by side relationship on the external periphery of said drum-like cover, said hoses being connected through said cover to said manifold, and a relatively fixed common water supply for the opposite ends of said hoses to which they are operatively joined, whereby said hoses wrap and unwrap from said cover as the same oscillates with the manifold.

2. A hydraulic log barker having in combination therewith a ring-like water manifold, said manifold mounted for oscillation, means for oscillating the same about a log passing through said manifold, a drum-like cover mounted on said manifold, a hose manifold mounted on the cover adjacent the peripheral surface of the cover and in communication with the interior of said ring-like manifold, flexible hose means for conveying water to said hose manifold, said flexible hose means being connected to said hose manifold so as to wrap and unwrap on the peripheral surface of said cover as said manifold oscillates, and a relatively stationary primary water supply means, said flexible hose means having a loop portion connected to said water supply means in order to reduce stress on said flexible hose means.

3. A hydraulic log barking machine comprising a hollow ring shaped nozzle manifold mounted for oscillation, means for oscillating said ring manifold, a drum-like cover for said ring manifold, hydraulic barking nozzles spaced around the inside of said ring manifold and directed generally toward the axis of the ring, a hydraulic supply means for said nozzle manifold comprising in part a plurality of hoses on the perimeter of said cover, and means for connecting said hoses solidly to said nozzle manifold.

4. A hydraulic log barking machine comprising a ring-like manifold mounted for oscillation, a

plurality of nozzles inside of said manifold so set that the streams therefrom will be directed against the perimeter of a log that traverses said ring manifold, a drum-like cover for said manifold, a hose connection mounted on the perimeter of said cover, hoses connected to said hose connection in side by side relationship so as to roll up and unroll as the cover oscillates, a stationary high pressure water supply for said hoses, and means for oscillating said manifold and cover.

5. The combination as claimed in claim 4 and including a connection between intake ends of said hoses and said water supply means that permits the hoses to fall into catenary loops as the hoses roll off from said oscillating cover.

6. A hydraulic barking machine for logs, comprising in combination, a drum-like hose reel mounted for oscillation, a nozzle manifold means made rigid inside thereof, a plurality of spaced nozzles distributed on said manifold, positioned to direct their streams toward a common center, a plurality of water supply hoses mounted on the periphery of said drum-like hose reel in side by side relationship, with their delivery ends operatively connected to said nozzle manifold, a relatively fixed water supply means for said hoses spaced from said drum-like hose reel to which the receiving ends of said hoses are operatively connected, said hoses having such overall length that their delivery ends can reel onto and off from said drum-like hose reel without tautening the hoses.

7. Water supply means for an oscillating nozzle carrier in a hydraulic log barker, comprising a fixed water supply device, a plurality of delivery hoses manifolded thereto with the hoses free to drape therefrom in catenary loops, an oscillating nozzle carrier, a drum-like hose carrier adjacent thereto and mounted to oscillate with said nozzle carrier, and manifold means to connect the delivery ends of said delivery hoses to said nozzle carrier, so that they normally wrap and upwrap from said drum-like hose carrier as said drum-like hose carrier oscillates.

8. A hydraulic log barker having in combination therewith a ring-like water manifold, said manifold mounted for oscillation, means for oscillating the same about a log passing through said manifold, barking nozzles mounted on said manifold so as to direct jets of water against a passing log, a drum-like cover mounted on said manifold, a hose manifold mounted on said cover adjacent its peripheral surface, flexible hose means for conveying water to said hose manifold, said flexible hose means being connected to said hose manifold so as to wrap and unwrap on said cover as said manifold oscillates, a relatively stationary water supply means, and said hose means being connected to said water supply by a loop connection.

F. W. HORSTKOTTE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
794,399	Erxleben	July 11, 1905
2,393,978	Edwards et al.	Feb. 5, 1946
2,422,757	Swift	June 24, 1947
2,501,848	Johnson	Mar. 28, 1950
2,547,826	Kirschner	Apr. 3, 1951