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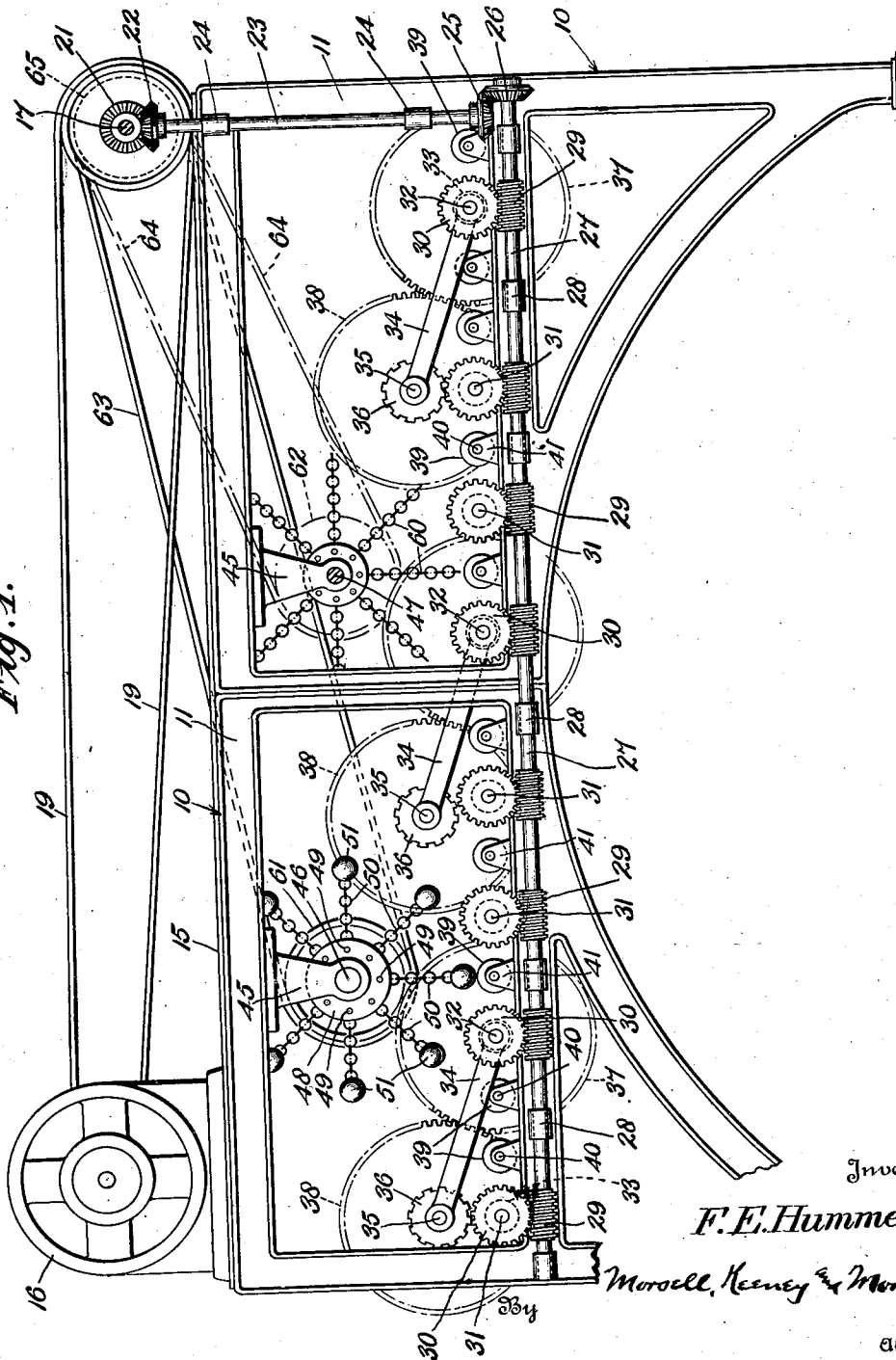
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BARKING APPARATUS

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Fig. 1.



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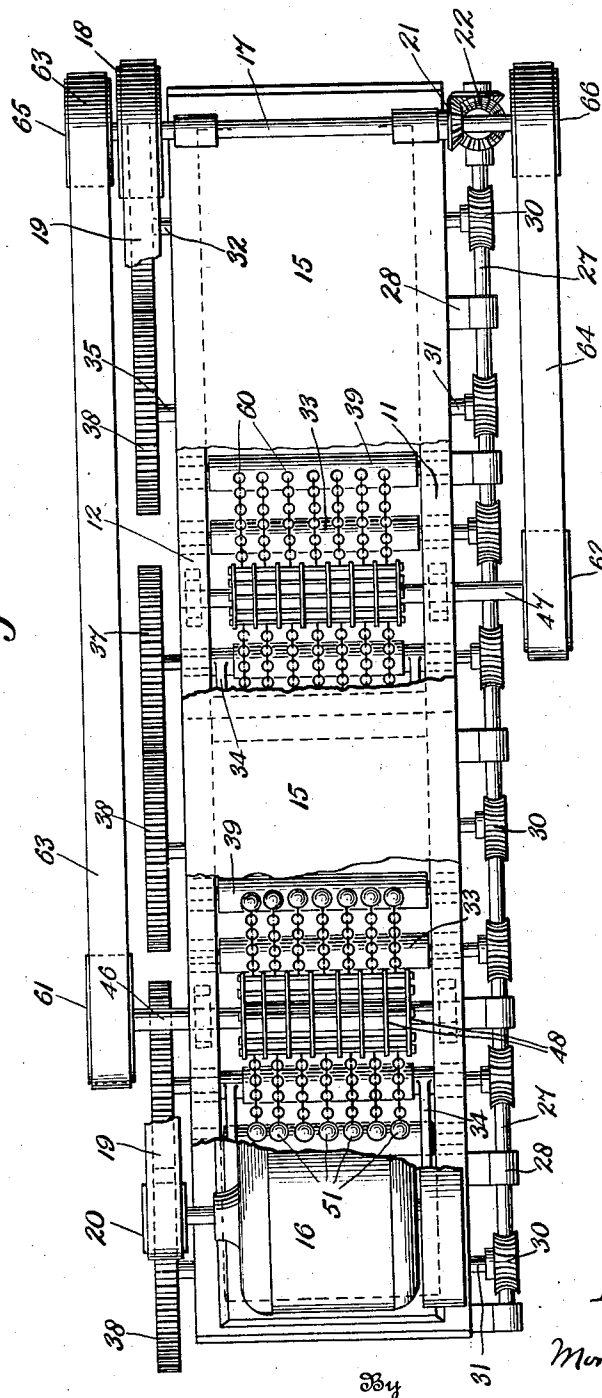
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Fig. 2.



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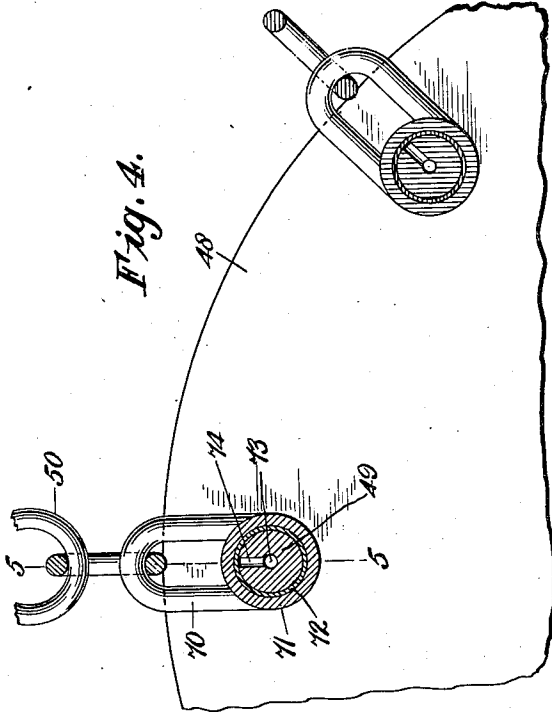
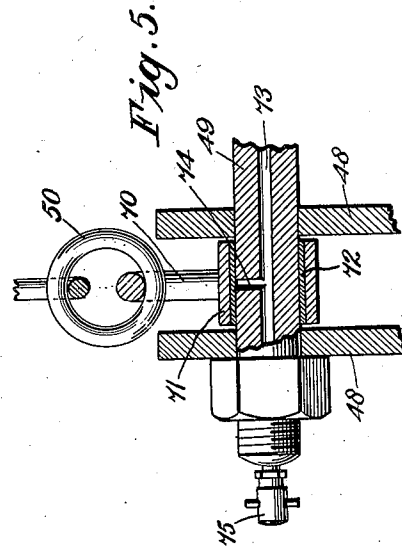
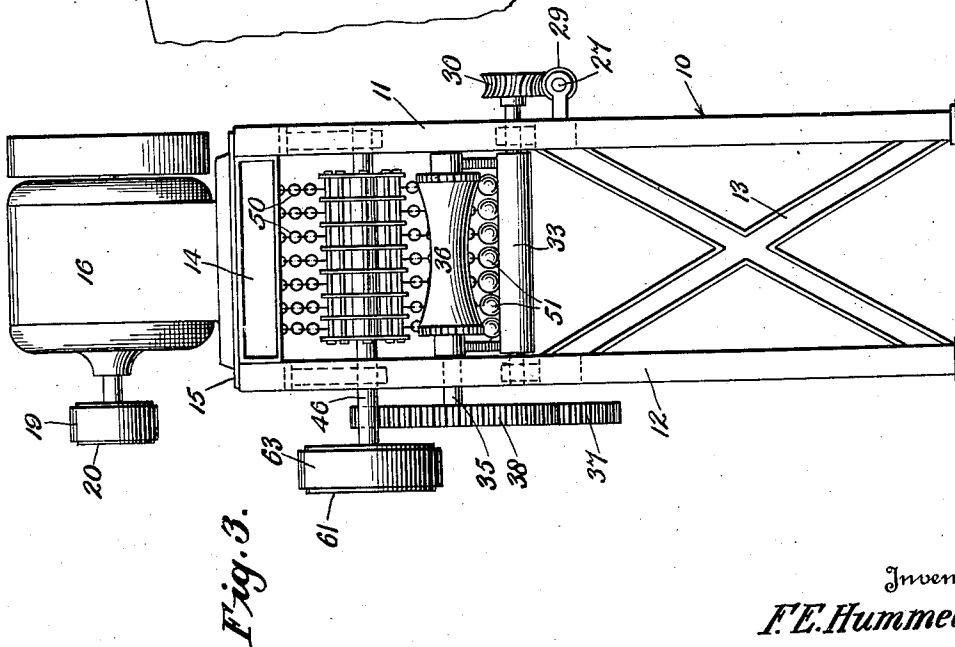
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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BARKING APPARATUS.

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This invention relates to barking apparatus, and more especially to a machine for removing the bark from logs and slabs, and has for one of its objects to provide a device of this character which will be simple in construction, comparatively inexpensive to manufacture, and more efficient in use than those which have been heretofore proposed.

The invention also consists in the novel method of loosening and removing the bark from slabs, logs, and the like, which consists in subjecting the said logs or slabs to a pounding action, whereby the bark is loosened from the fibres of the interior portions of the tree to such an extent as to entirely free the raw material from the outer coating of bark.

In ordinary saw mill practice, it is customary to first square a log, which means that the log is sawed lengthwise upon four sides, at substantially right angles to each other, so as to cause the lumber to assume a substantially square shape in cross section. The portions which are removed are commonly known as slabs, and of course comprise relatively long strips, curved on one side and straight on the other. These strips or slabs, of which four are secured from each log as a result of this method of sawing, contain an appreciable amount of wood fibre from the interior portion of the tree, which fibre is quite valuable for paper making purposes, providing it can be efficiently freed from the bark, which is attached to the outer curved portion of the slab.

These slabs are considered by the saw mill people as being more or less waste, and they are usually either burned or sold for fuel at a very small cost, so that if an efficient means can be devised whereby the bark can be removed from such slabs, they will constitute an excellent source of cheap material for paper making.

It is one of the primary objects, therefore, of the present invention to provide a method and apparatus whereby the bark may be readily and completely removed from such slabs in order that they may be used for this purpose, although it will be understood that both the process and the machine are equally applicable for use in debarking whole logs, if desired.

Barking machines have been heretofore devised for removing the bark from whole

logs, but so far as I am aware, they operate either upon the shaving principle in which a knife blade is caused to act upon the log to shave off the bark, or upon the drum principle in which the logs are cut into relatively short lengths and placed within a drum, where they are subjected to a tumbling action whereby the bark is ground from the body portion of the tree.

Both of these previous methods are open to the objection that owing to the irregularities occurring in tree trunks and branches, that some of the valuable wood fibre is necessarily lost, either in the shaving of the logs or in the action of the barking drums, since it is obviously impossible to set a knife so that it will automatically take care of such irregularities which occur on the surfaces of the logs. In like manner, in the barking drum process, the high parts of the logs will be debarked first where the low places will not be touched, and if the barking action is continued long enough to remove the bark from these low places, then portions of the valuable wood pulp fibres on the high places will also be ground off and lost.

Another serious objection to using the barking drum process is the fact that the constant pounding "brooms" and shreds the ends of the logs to such an extent that when the log reaches the chipper a good deal of wood on each end chips up into coarse sawdust instead of into good chips.

With the above and other objects in view which will appear as the description proceeds, the invention consists in the novel steps and combinations of steps constituting the method and in the novel details of construction and combinations of parts constituting the apparatus, all as will be more fully hereinafter described and particularly pointed out in the appended claims.

Referring to the accompanying drawings in which like numerals designate like parts in all the views;

Figure 1 is a side elevational view of a barking apparatus constructed in accordance with the present invention, suitable for carrying out the process constituting a portion thereof;

Fig. 2 is a top plan view, partly broken away, of the parts shown in Fig. 1;

Fig. 3 is an end elevational view of the parts shown in Fig. 1, as viewed from the left of the said figure;

Fig. 4 is an enlarged fragmentary sectional view, of one of the barking members; and,

Fig. 5 is a vertical sectional view, partly in elevation, taken approximately on the plane indicated by the line 5—5 in Fig. 4.

Referring more especially to the said drawings, the numeral 10 indicates generally a suitable framework comprising the spaced side members, 11 and 12, which are maintained in spaced relation by suitable end members, 13 and 14, as will be clear from Figs. 1 and 3. The upper surface of the said frame 10 carries a plate or cover member 15, which bridges the members 11 and 12, and upon the said cover member adjacent one end of the frame 10, there is provided an electric motor or other suitable source of power 16, which serves to furnish power for the various operating parts.

At the opposite end of the frame to the said motor 16, there is suitably journaled a horizontal transverse shaft 17, which is provided with a pulley 18, around which passes a belt 19, which also engages the pulley 20 upon the shaft of the motor 16, whereby power will be transmitted from the said motor to the shaft 17.

The said shaft 17 is also provided with a bevelled gear 21, see Figs. 1 and 2, which meshes with a companion gear 22 carried by a vertical shaft 23 suitably journaled as at 24 upon the frame member 11, and the said shaft member 23 carries at its lower end a bevelled gear 25 which meshes with a companion gear 26, carried by the horizontal longitudinally extending shaft 27, journaled in suitable bearings 28, upon the frame member 11. The said shaft 27 is provided with a plurality of worms 29, each of which meshes with a companion worm gear 30, rigidly carried by the transversely extending shafts 31 and 32. The said shafts 31 and 32 are journaled in suitable bearings carried by the frame members 11 and 12, and they are provided with suitable transversely extending supporting rolls 33, as will be clear from the drawings.

Each of the shafts 32 is provided with a pair of spaced arms 34, one end of which is journaled upon the said shafts 32, while the other end of the said arms journally mounts a transverse shaft 35, which carries a feed roll 36. The shafts 32 are also each provided with the enlarged gear wheels 37, which mesh with companion gears 38, carried by the shafts 35, so that the said feed rolls 36 may be positively driven, as will be readily understood.

It will be noted that the construction thus described provides a feeding means for moving the logs or slabs longitudinally through the machine, which means is adapted to automatically accommodate itself to slabs of different sizes, since owing to the fact that the feed rolls are pivoted upon the shafts

32 through their supporting arms 34, they are free to rise and fall about said shafts 32 to receive the slabs of different thicknesses. Furthermore, due to the fact that the shafts 35 and feed rolls 36 thus pivotally move about the shafts 32, the gears 37 and 38 will always remain in mesh without binding, thereby insuring a constant positive drive of the feed rolls 36.

Additional table or supporting rolls 39 may be provided intermediate the driven table rolls 33, as shown, the said rolls 39 being carried by shafts 40 journaled in bearings 41 mounted upon the frame members, 11 and 12.

Suitably journaled upon the frame 10, as by the bearing blocks 45, are the transversely extending shafts, 46 and 47. These shafts, as will be clear from Figs. 1 and 3, are positioned somewhat above the table rolls and they carry the barking members, which constitute the essence of the present invention, as will now be described.

Referring first to the shaft 46, appearing adjacent the left hand end of Fig. 1, it will be noted that it carries a plurality of spaced discs 48, which discs are interconnected adjacent their peripheries by the transversely extending rods 49. As here shown, there are eight of these rods 49 which are equidistantly spaced about the circumference of the discs, and each rod carries between each pair of discs a chain member 50 which is freely mounted with respect to the said rod for rotation thereon, so that it may be subject to the influence of centrifugal action as the shaft 46 and discs 48 are rotated.

Each chain member, which is preferably composed of round links, as shown, in order to equalize and reduce wear, is provided at its other end with a weight or ball 51, which is also, of course, subject to centrifugal action, as the parts are revolved. The relations of the said chains and balls with the other parts are so designed and constructed that the balls at their lowest point of travel just clear the tops of the table rolls 39, so that when a log or slab is in position upon the said table logs and the balls are rotated, they will be successively brought into contact with the surface of the said log or slab, with a great deal of force, thereby subjecting the barked portion of the wood to a pounding action. This action in actual practice has been found quite efficient for loosening the bark from the wood fibre, which carries it, so that as the logs or slabs are continuously fed from the left to the right of the machine, as viewed in Fig. 1, they are subjected to a successive pounding action of the various balls 51 carried by the chains 50, until the bark is loosened to such an extent that it will drop off of the log or slab.

In many instances it is only necessary

to subject the slab to the action of one of these pounding members, but in order to make sure that all of the bark is removed and to clean up any small portions which may remain clinging to the slab, I prefer to provide a second member carried by the shaft 47 which may be similar in every respect to the first pounding member carried by the shaft 46.

In some cases it may be desirable to omit the balls, such as 51, from the ends of the chains 60 of the second pounding member, as is indicated in the drawings, and to only subject the log or slab to the action of the ends of the chains themselves. In other cases it may be necessary to utilize balls upon the ends of the said chains 60 while in some instances it may be possible to dispense with the balls upon both of the pounding members and to completely remove the bark by merely pounding the slabs with the chains alone.

In order to rotate the shafts 46 and 47, they are provided, respectively, with suitable pulleys 61 and 62, around which pass belts, 63 and 64, which are driven from companion pulleys 65 and 66, carried by the shaft 17, above described.

The parts are so designed, constructed, and assembled that the shafts 46 and 47 are revolved, when the motor is operating, at a speed of approximately from 1500 to 1800 R. P. M. while the positively driven table rolls 33 and the feed rolls 36 are constantly rotated to continually feed the logs or slabs from left to right, as viewed in Fig. 1, to subject them to the pounding action of the barking members.

Any suitable lubricating system may be employed, but I have shown in Figs. 4 and 5 one means by which lubrication may be effectively accomplished. This consists in providing the last link 70 of the chain 50 with a rigid laterally extending collar 71 which surrounds the rod or shaft 49, a suitable anti-friction sleeve 72 being interposed between the two. The rods 49 are provided with longitudinally extending lubricant passages 73 and with transversely extending passages 74 communicating therewith and leading to each of the anti-friction sleeves 72, as will be clear from these figures. The ends of the rods 49 may be provided with suitable valved nipples 75 for connection to the well known high pressure grease gun, or to any other suitable lubricant applying member, whereby lubricants may be forced into the passages 73 and 74 at suitable intervals to provide sufficient lubrication for the bearing surfaces.

In actual use a machine constructed in accordance with the present invention has been found very efficient for removing all of the bark from lumber slabs, leaving them in a very clean condition and suitable for

immediate treatment for paper making purposes without further debarking operations. Furthermore, the machine is adapted to operate continuously, thereby greatly increasing the amount of lumber which may be debarked within a given time and except for periods when it is necessary to supply lubricant, it may run without stopping.

While one form of the invention has been illustrated and described, it will be obvious that those skilled in the art may vary the precise steps and combinations of steps constituting the process, as well as the precise arrangement of parts constituting the apparatus, without departing from the spirit of the invention, and therefore it is not wished to be limited to the above disclosure except as may be required by the accompanying claims.

What is claimed is:

1. The method of removing bark from logs, slabs, and the like, which consists in subjecting said bark to the pounding action of a flexible member.

2. The method of removing bark from logs, slabs, and the like, which consists in subjecting the bark-carrying portions of the raw material to the pounding action of a centrifugally influenced flexible member sufficient to loosen said bark from the inner wood fibers.

3. The continuous method of removing bark from logs, slabs, and the like, which consists in continuously subjecting successive portions of them to the pounding action of a revolving weight.

4. The continuous method of removing bark from logs, slabs, and the like, which consists in continuously subjecting successive bark-carrying portions of them to the pounding action of rapidly revolving centrifugally influenced weights.

5. A barking apparatus for logs, slabs, and the like, comprising a revoluble member adapted to engage and pound the bark-carrying surfaces of said logs or slabs; and means for feeding positively said logs or slabs to said member.

6. A barking apparatus for logs, slabs, and the like, comprising a revoluble member adapted to engage and pound the bark-carrying surfaces of said logs or slabs; and means for continuously feeding said logs or slabs to said member.

7. A barking apparatus for logs, slabs and the like, comprising a rotatable shaft; a plurality of flexible members carried by said shaft, adapted to engage and pound said logs or slabs as said shaft is rotated; and means for positively feeding said logs or slabs to said pounding members.

8. A barking apparatus for logs, slabs and the like, comprising a rotatable shaft; a plurality of circumferentially spaced flexible

members carried by said shaft, adapted to assume substantially radial positions under the influence of centrifugal force, whereby their end portions may be caused to engage and pound said logs or slabs as said shaft is rotated; and means for feeding positively said logs or slabs to said pounding members.

9. A barking apparatus for logs, slabs and the like, comprising a rotatable shaft; a plurality of circumferentially spaced flexible members carried by said shaft, adapted to assume substantially radial positions under the influence of centrifugal force, whereby their end portions may be caused to engage and pound said logs or slabs as said shaft is rotated; and means for continuously feeding said logs or slabs to said pounding members.

10. A barking apparatus for logs, slabs, and the like, comprising a rotatable shaft; a plurality of circumferentially spaced flexible members carried by said shaft, adapted to assume substantially radial positions under the influence of centrifugal force, whereby by their end portions may be caused to engage and pound said logs or slabs as said shaft is rotated; and means for continuously feeding said logs or slabs longitudinally to said pounding members.

11. A barking apparatus for logs, slabs and the like, comprising a rotatable shaft; a plurality of flexible members carried by said shaft; weight members carried by said flexible members, adapted to engage and pound said logs or slabs as said shaft is rotated; and means for feeding said logs or slabs to said pounding members.

12. A barking apparatus for logs, slabs and the like, comprising a rotatable shaft;

a plurality of chains, each attached at one end to said shaft, the other ends thereof being free and adapted to engage and pound the surfaces of said logs or slabs as said shaft is rotated; and means for feeding said logs or slabs to said chains.

13. A barking apparatus for logs, slabs and the like, comprising a rotatable shaft; a plurality of chains, each attached at one end to said shaft, in circumferentially spaced relation, the other ends thereof being free and adapted to engage and pound the surfaces of said logs or slabs as said shaft is rotated; and means for continuously feeding said logs or slabs to said chains.

14. A barking apparatus for logs, slabs and the like, comprising a rotatable shaft; a plurality of chains, each attached at one end to said shaft, the other ends thereof being free and provided with weight members adapted to engage and pound the surfaces of said logs or slabs as said shaft is rotated; and means for feeding said logs or slabs to said weights.

15. A barking apparatus for logs, slabs and the like comprising a rotatable shaft; a plurality of discs rigidly carried by said shaft; arcuately spaced rods carried by said discs parallel to and spaced from said shaft; a plurality of chains pivotally mounted at one end on each of said rods, the other end portions of said chains being adapted under the influence of centrifugal force to engage and pound said logs or slabs as said shaft is rotated; and means for continuously feeding said logs or slabs to said chains.

In testimony whereof, I affix my signature.

FREDERICK E. HUMMEL.