(No Model.)

2 Sheets—Sheet 1.

B. HOLBROOK.

BARK CUTTER.

No. 453,398. Patented June 2, 1891.

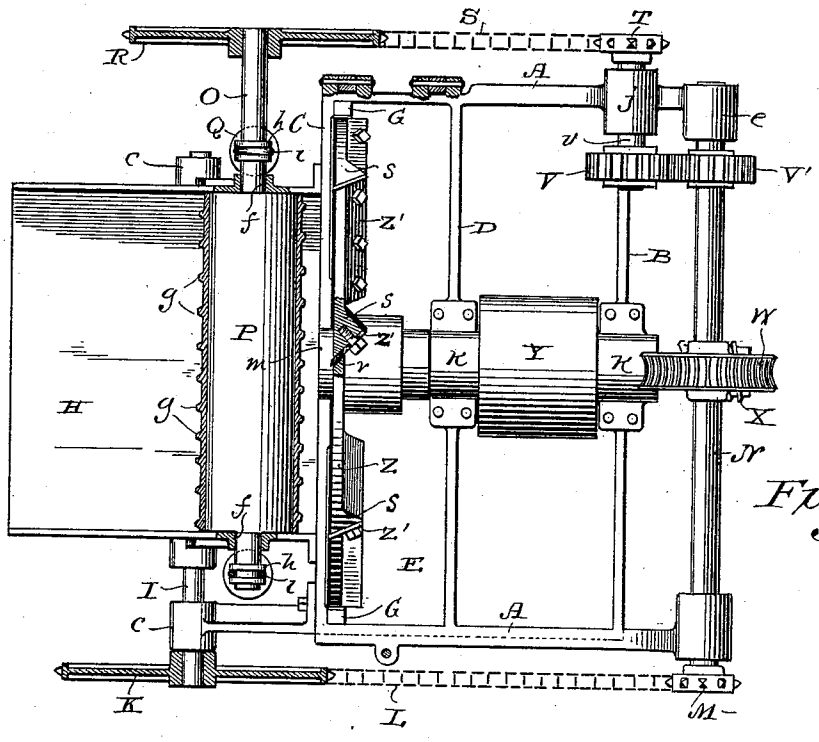


Fig. 1.

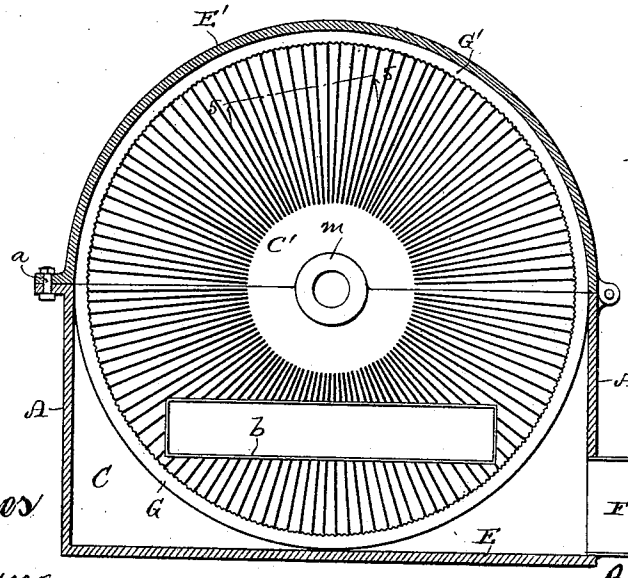


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

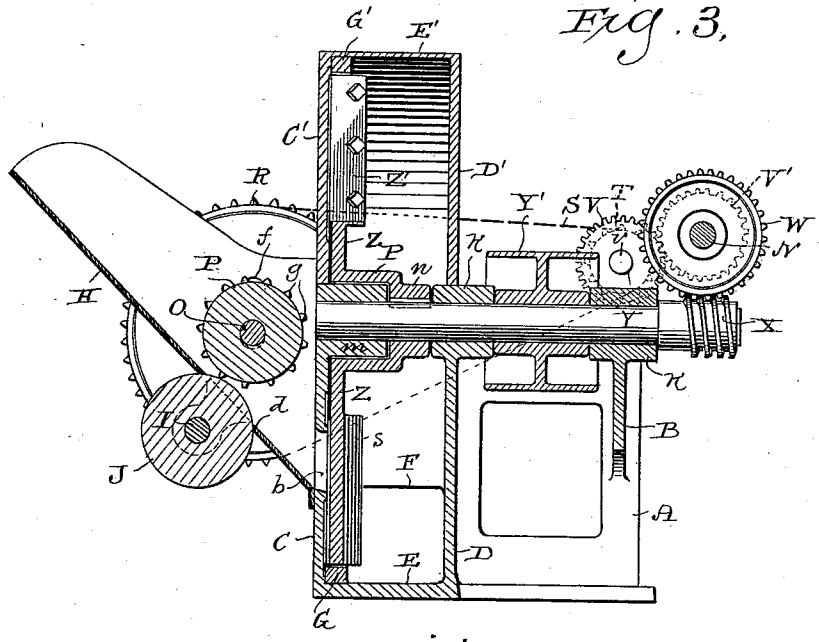


Fig. 4.

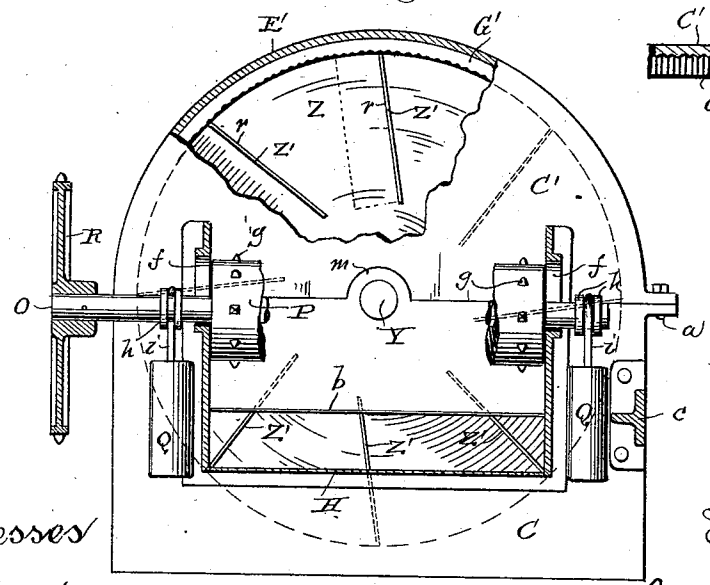
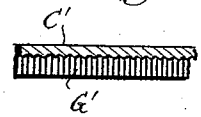


Fig. 5



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UNITED STATES PATENT OFFICE.

BYRON HOLBROOK, OF MILWAUKEE, WISCONSIN.

BARK-CUTTER.

SPECIFICATION forming part of Letters Patent No. 453,398, dated June 2, 1891.

Application filed December 13, 1890. Serial No. 374,609. (No model.)

To all whom it may concern:

Be it known that I, BYRON HOLBROOK, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Bark-Cutters; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention consists in certain peculiarities of construction and combination of parts to be hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a plan view of my machine, partly in horizontal section; Fig. 2, an elevation of a disk and ring that form part of the machine, the adjacent casing being shown in vertical transverse section; Fig. 3, a vertical longitudinal section of said machine; Fig. 4, a front elevation of the same, certain of the parts being broken away; and Fig. 5, a detail section on line 5 5 of Fig. 2.

Referring by letter to the drawings, A represents the sides of my machine, these sides being connected at the rear by a brace B and at the front by parallel walls C D, the latter being joined by a bottom piece E to form the lower section of a casing having an outlet F, that is best illustrated in Figs. 2 and 3. Hinged to one side of the machine is the upper section of the casing above described, this latter section of said casing being shown as comprising semicircular walls C′ D′, joined by a top piece E′, as best illustrated in Fig. 3, In its normal position the upper section of the casing is secured to the lower section by a bolt *a* or other suitable clamping device, as best illustrated in Fig. 4.

Secured to the sections of the casing and arranged to fit snugly against the inner sides of their front walls are the halves G G′ of a ring that is preferably formed with transverse corrugations upon its inner face, and within this ring said walls of the casing-sections are radially corrugated, as best illustrated in Fig. 2.

The front wall C of the lower section of the casing is provided with an opening *b*, and bolted or otherwise secured to the outer side of said wall is a trough H, set at an acute angle, the latter being preferably one of forty-five degrees, as shown in Fig. 3.

In bearings *c* I support the shaft I of a lower feed-roller J, that extends through an opening *d* in the bottom of the trough H, and fast on one end of this shaft is a sprocket-wheel K, connected by a link belt L with a similar wheel M, fast on another shaft N, having bearings *e* at the rear of the machine-frame, as best illustrated in Fig. 1, said sprocket-wheels being of different diameters, for the purpose to be hereinafter described.

The sides of the feed-trough H are provided with vertical slots *f*, and arranged in these slots is the shaft O of an upper feed-roller P, the latter being preferably provided with teeth *g* or otherwise roughened to improve its grip upon the bark.

As best illustrated in Fig. 4, the shaft O of the upper feed-roller P is provided with grooved collars *h*, engaged by links *i*, extended from the upper ends of weights Q, and as said shaft has its bearings in the vertical slots *f* in the sides of the feed-trough H said weighted roller is free to rise and fall to suit the thickness of bark fed to the machine.

Fast on one end of the shaft O is a sprocket-wheel R, connected by a link belt S with a similar wheel T on a short shaft U, that has its bearings *j* on one side of the machine and is provided with a gear-wheel V in mesh with a like wheel V′ of corresponding diameter on the shaft N, said sprocket-wheels, like the ones K M, being of different diameters.

The shaft N is centrally provided with a worm-wheel W in mesh with a worm X on the rear end of another shaft Y, having a driving-pulley Y′ thereon and supported in bearings *k* on the machine-frame and another bearing *m*, extended rearward from the front wall C of the lower casing-section above described.

Fast on the shaft Y is a rearwardly-extended hub *n* of a disk Z, this hub being enlarged, as shown at *p*, to fit around the bearing *m*, that extends rearward from the front wall C of the lower section of the casing by which the disk is inclosed. The diameter and arrangement of the disk Z are such that it comes within the ring formed by the sections G G′ and close to the corrugations on the inner side of the front wall of the casing, and at

certain intervals said disk is provided with tangential slots *r*, that extend to its periphery and serve as throats for knives Z′, bolted or otherwise detachably connected to wings *s* on the rear side of the aforesaid disk, these wings being extended as far outward as the disk-slots and having their knife-faces at any suitable angle, but preferably one of forty-five degrees, as shown in Fig. 1.

Particular attention is called to the fact that the knives Z′ are not only at an angle to the disk and tangent to the hub of the same, but that they extend outward to the periphery of said disk, and thus terminate close to the adjacent ring.

In the operation of the machine the disk Z, being fast on the drive-shaft Y, is rotated at a very high speed, and as this speed is too high for the feed-rollers it is greatly reduced by means of the worm-gear W X, connecting said shaft and the one N geared to the shafts of said feed-rollers. The speed of the feed-rollers is further reduced because of the increased diameter of their sprocket-wheels K R on their shafts being of greater diameter than those M T on the shafts N U, the latter being connected by the gear-wheels V V′ in order to give the upper feed-roller P a rotation reverse to that of the one J opposed thereto. Bark fed to the trough H is caught between the feed-rollers and fed to the opening *b* in the lower section of the disk-casing to come in the path of the knives Z′ as the latter pass said opening. By the peculiar set of the knives Z′ on the disk, as above described, they strike the bark at an angle and shear down across the opening *b* in the casing until the line of center of said disk is passed, after which they shear in the reverse direction, this double movement of said knives passing said opening being clearly illustrated in Fig. 4. The knives being in rotation and passing the bark-opening in the casing, as just described, I obtain a draw and shear cut at the same time, and thereby increase the effectiveness of the machine. The clean cuttings of the bark pass through the slots *r* in the knife-disk into the casing, and the wings *s* on the back of this disk being equivalent to the blades of a rotary fan a blast is created in the casing and said bark-cuttings blown through the outlet F clear of the machine. Any pieces of bark that may get in between the disk and front wall of the casing are retarded by the corrugations of the latter and acted upon by the knives in their travel, the latter, as before stated, being extended to the periphery of said disk, whereby such pieces of bark are opposed to said knives clear out to the ring that surrounds the aforesaid disk. The ring serves also as a guard to prevent any uncut pieces of bark from working back into the air-chamber in rear of the disk; but, said ring being corrugated upon its inner face, dust or fine particles from the bark are allowed to find their way into said air-space.

By means of the cutter above described I obtain a better disintegration of bark than is ordinarily the case, and the product being leached there is considerable gain of strength in the extract.

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

1. In a bark-cutter, the combination of a rotary disk carrying knives at an angle to its plane, tangent to its hub, and extended to its periphery, a surface opposing the knives, and a stationary ring encircling the disk adjacent to said surface, substantially as set forth.

2. In a bark-cutter, the combination of a rotary disk carrying knives at an angle to its plane, tangent to its hub, and extended to its periphery, a corrugated surface opposing the knives, and a stationary ring encircling the disk adjacent to said surface and having transverse corrugations upon its inner face, substantially as set forth.

3. In a bark-cutter, the combination of a rotary disk carrying knives at an angle to its plane, tangent to its hub, and extended to its periphery, a surface opposing the disk and provided with an opening, a feed mechanism arranged at an angle to said opening, and a stationary ring encircling the disk adjacent to said surface, substantially as set forth.

4. In a bark-cutter, the combination of a casing, a slotted rotary disk arranged therein and provided with rearwardly-extended wings, knives secured to the wings to extend through the disk-slots and to the periphery of the disk, a surface opposed to the knives, and a stationary ring encircling said disk adjacent to said surface, substantially as set forth.

5. In a bark-cutter, the combination of a casing, a rotary disk arranged therein and having tangential slots extended to its periphery, wings on the rear of the disk adjacent to the slots and also extended to the periphery of said disk, knives secured to the wings to extend through the disk-slots the whole length of the same, a surface opposed to the knives, and a stationary ring encircling the aforesaid disk adjacent to said surface, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

BYRON HOLBROOK.

Witnesses:
N. E. OLIPHANT,
WM. KLUG.