H. S. CHALFANT.

WOOD GRINDING MACHINE.

APPLICATION FILED SEPT. 28, 1911.

1,078,415. Patented Nov. 11, 1913.

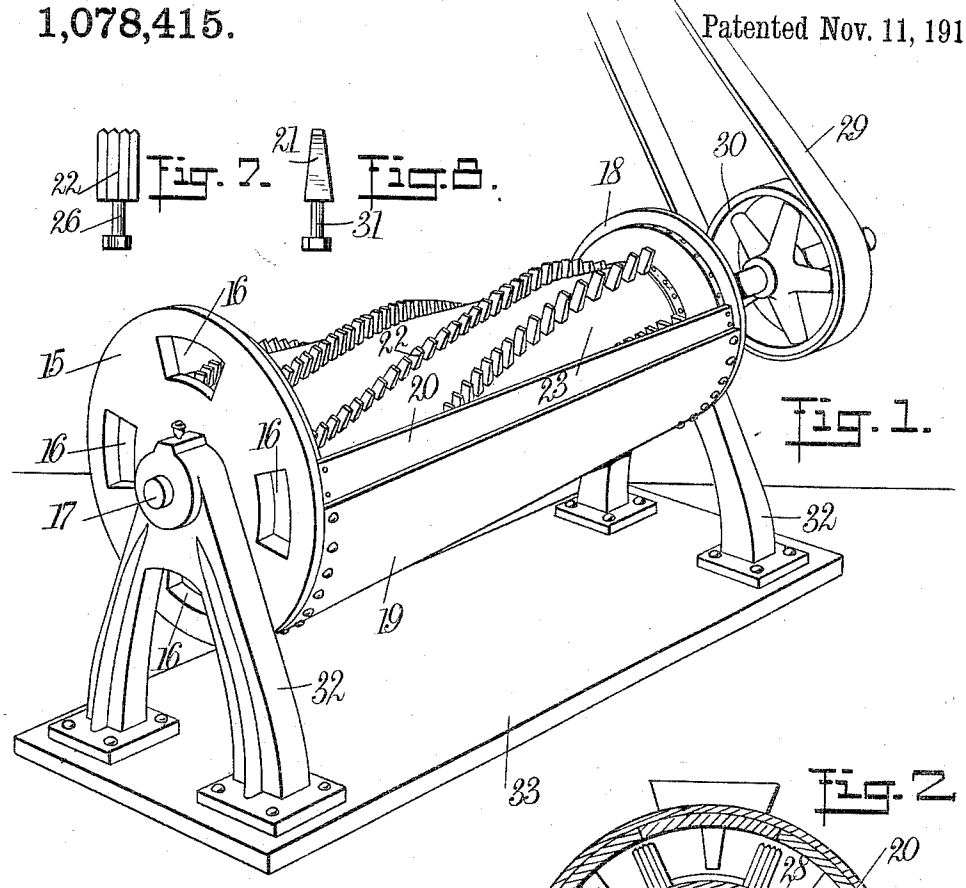

Fig. 1.

Fig. 7.

Fig. 8.

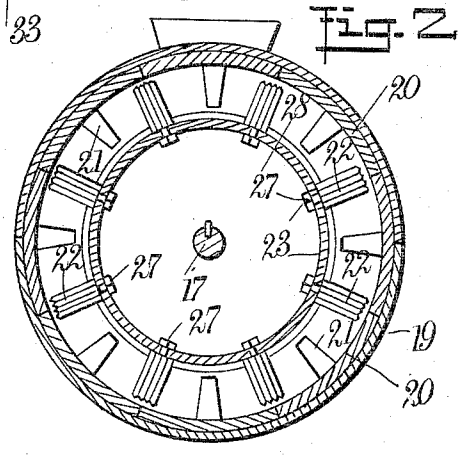

Fig. 2.

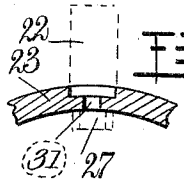

Fig. 4.

Fig. 3.

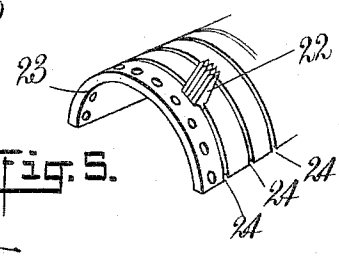

Fig. 5.

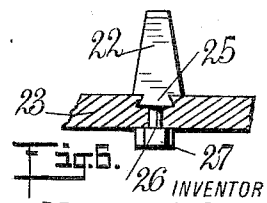

Fig. 6.

WITNESSES

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WOOD-GRINDING MACHINE.

1,078,415. Specification of Letters Patent. Patented Nov. 11, 1913.

Application filed September 28, 1911. Serial No. 651,762.

To all whom it may concern:

Be it known that I, HERMAN S. CHALFANT, a citizen of the United States, and a resident of Ballston Spa, in the county of Saratoga and State of New York, have invented a new and Improved Wood-Grinding Machine, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: To provide a machine of the character mentioned with removable teeth spaced apart and arranged in sets or series to pass in juxtaposed relation, the clearance between the passing teeth being such as to produce a shearing action on the wood bits fed thereto; to provide teeth for a machine of the character described removable to be readily replaced; to provide a machine of the character specified arranged to progressively increase the speed of the grinding members; and to provide grinding teeth the surfaces whereof are arranged to macerate the wood particles delivered therebetween.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a perspective view of a machine constructed and arranged in accordance with the present invention, a portion of the casing being removed; Fig. 2 is a cross section of the same; Fig. 3 is a detail view in perspective showing one of the fixed toothed plates of the machine; Fig. 4 is a detail view showing the manner of attaching the grinding teeth to the casing for the rotary drum; Fig. 5 is a detail view in perspective showing a fragment of the rotary drum; Fig. 6 is a detail view showing a fragment of the rotary drum and method of connecting the macerating teeth thereto; Fig. 7 is a detail view in side elevation of one of the macerating teeth employed in connection with the rotary drum; and Fig. 8 is a similar view of one of the teeth used in connection with the fixed casing.

The present invention relates to improvements in wood grinding machines used by me in the manufacture of wood pulp according to the method disclosed in the application for Patent No. 618,841 filed by me April 4, 1911, to which cross reference is here made.

The grinder consists primarily of an outer stationary casing and an inner rotary drum. The casing and drum are separated to accommodate blocks or chunks of wood which are fed through a hopper between the inner wall of the said casing and the outer wall of the drum. Extended inward from the casing and outward from the drum are macerating teeth or blocks which in passing clear each other, leaving a space between for the product to pass. This clearance space is gradually reduced from the receiving to the delivery end of the grinder, the final approximation being that which grinds the wood to the degree of fineness desired.

The fixed casing, as seen in Fig. 1, is provided with a large head 15 in which are formed delivery openings 16. The head 15 is fixedly mounted on a standard 32. Similarly mounted on a second standard is a smaller head 18. The heads 15 and 18 are proportioned to size so that when the outer plates 19 are bolted or riveted to pass on the said heads the completed casing will form an elongated structure having a frusto-conical shape. As seen in Fig. 1 the casing is formed partly of inner plates 20, which plates are bolted or otherwise secured to the heads 15 and 18 and the rabbets formed to receive the same, as shown in the drawings. One of the plates 20 is best seen in Fig. 3 of the drawings, where the arrangement of the stationary teeth 21 is illustrated. The teeth 21 are formed from any suitable material, cast iron, steel, or other metal, and are wedge-shaped, as shown, having elongated and widened bases. The teeth 21 are elongated parallel with the teeth 22 set out from the rotary drum 23. The drum 23, as shown in Figs. 2 and 5 of the drawings, is preferably constructed from two metal half sections or plates. These sections are provided with a series of grooves 24, which, as shown in Fig. 6 of the drawings, are undercut to form overhanging walls. As seen in said Fig. 6 each of the teeth 22 is provided with a dowel or key 25, which key is shaped to fit within and slide within the grooves 24. The keys 25 are bored and tapped to receive the bolts 26 having the heads 27.

By means of this construction it will be observed that the placement of the teeth 22 is facilitated as the half sections of the drum 23 may be separated while the teeth 22 are being installed. To install the teeth 22 in the half sections of the drum 23 the keys 25 of each two are inserted in the grooves

24 and the tooth moved in position. The half sections are suitably perforated to govern the placement of the teeth 22. As the bore in each of the teeth 22 registers with one of the perforations in the said half sections, one of the bolts 26 is inserted through the perforation in the half section and inserted in the bore of the key 25 of the tooth 22. When the teeth 22 in both of the half sections are secured in position the half sections are united by being bolted or otherwise mounted upon the heads 28 provided to receive the said half sections. The heads 28 are fixedly secured to the driven shaft 17. The shaft 17 is driven by the belt 29 which engages the pulley 30. The belt 29 is driven from any suitable source of power.

As shown in Figs. 5 to 7 inclusive the sides and crown of the teeth 22 are grooved to form roughened surfaces for cutting or macerating the wood under treatment.

If in the operation of the machine when constructed as above described one of the teeth 22 becomes loosened and the bolt 26 drops away therefrom, the only result would be that the tooth would lose its position on the drum and float backward to the next succeeding tooth. This construction provides against serious damage to the machine which might arise from one of the teeth becoming loosened and jammed between the outer and inner surfaces of the drum and plate 20 respectively. If the teeth become worn, by removing the half sections of the drum 23 the said teeth 22 may be readily and quickly, and entirely or partially replaced.

By reason of the increased diameter of the delivery end of the drum 23 the rate of the speed of the teeth 22 thereon mounted is greater than the rate of the speed of the teeth mounted on the receiving and smaller end of the drum. The gradual increased speed operates to gradually increase the violence of action of the machine, insuring in this manner the reduction of any tough or refractory wood piece.

Each of the teeth 21 is held in position by means of a bolt 31. In the event of breakage or damage to any of the teeth 21 the machine may be stopped and the plates 19 and 20 be removed to expose the damaged tooth and to permit the replacement or repair thereof.

By shaping the teeth 22 with the grooved side, as seen best in Fig. 7 of the drawings, the edges of the groove operate to scrape the wood in passing and to more finely macerate the same before delivered through the openings 16.

The shaft 17 is supported in suitable bearings formed on the standards 32. The standards 32 are preferably mounted upon a base plate 33.

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

In a wood grinding machine of the character described, a rotary cylinder having a frusto-conical shape formed of half-sections structurally united, said cylinder being provided with a series of parallel undercut grooves extending around same; a plurality of abrasive teeth having holding extensions to pass under the overhang of said grooves; and means for rigidly securing said teeth in said grooves.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERMAN S. CHALFANT.

Witnesses:

FREDERICK H. BEACH,

HARVEY L. ROBINSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."