A. N. ANDERSEN.

PRODUCTION AND TREATMENT OF MECHANICAL WOOD PULP.

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1,068,092. Patented July 22, 1913.

Fig.1.

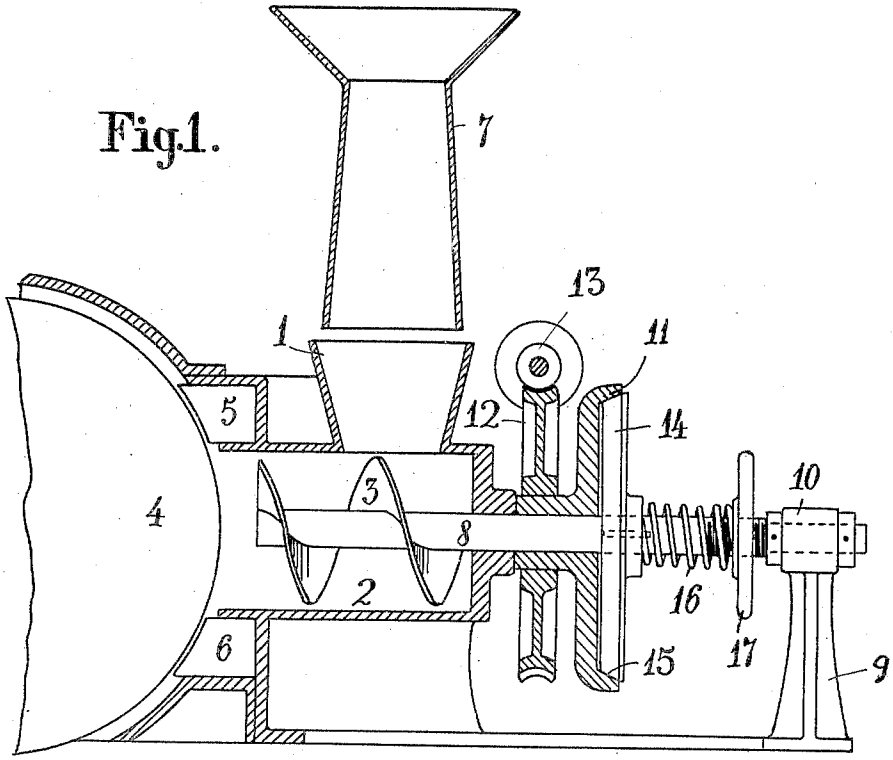
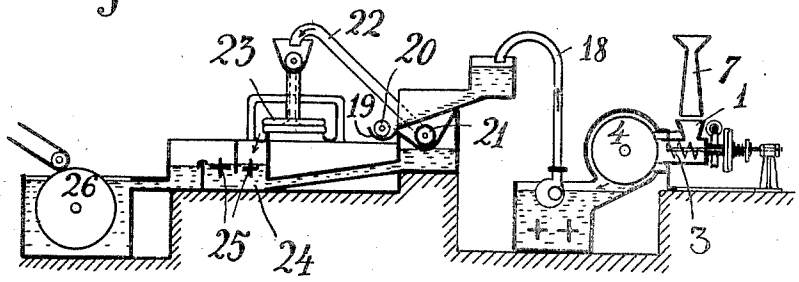


Fig.2.



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PRODUCTION AND TREATMENT OF MECHANICAL WOOD-PULP.

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To all whom it may concern:

Be it known that I, ANDERS NICOLAY ANDERSEN, a subject of the King of Norway, residing at Hougsund, Norway, have invented certain new and useful Improvements in the Production and Treatment of Mechanical Wood-Pulp; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to the production and treatment of mechanical wood pulp and has for its object certain improvements whereby a pulp of uniform quality is obtained.

The production of mechanical wood pulp, as is well known is effected by grinding decorticated logs of wood in lengths of $\frac{1}{3}$ to $\frac{1}{2}$ meters which are placed in the grinding apparatus in such a manner that the grinding takes place laterally of the log at right angles to the direction of the fibers. The wood to be ground is placed during the grinding operation in grinding boxes, in which it is held up against the grindstone with a suitable pressure under the influence of a piston. When the grinding box has been emptied, the piston has to be restored to its initial position and fresh wood filled into the boxes. This working method involves various inconveniences. Thus the putting out of work of the several grinding boxes, which is necessary at certain intervals, causes irregularities in the operation of the grinding apparatus and the compensation hereof necessitates adjusting devices of partly complicated and expensive construction. Further the use of wood in large pieces causes unevenness in the pulp obtained because the water supplied during the grinding operation will not be capable of producing a uniform moistening of the wood to be ground throughout the entire mass of the same.

Now the present invention has for its object a process of producing mechanical wood pulp, by which said inconveniences are avoided. This is attained by chopping the wood to be ground into chips in a similar manner as is usual in cellulose factories, before it is supplied to the grinding apparatus. The wood thus split up is then by continually working feeding devices fed to the grinding apparatus and is forced by suitable devices up against the grindstone with a uniform and controllable pressure. The operation may by this process be made completely continuous and the stress on the grinding apparatus uniform, while at the same time a practically uniform moistening of the material to be ground and consequently uniformity of the product is attained. Moreover the result is attained that the wood to be ground can be subjected to a preparatory treatment before the grinding, for instance with boiling water or chemicals for softening the wood and extracting certain constituents, etc., thereby greatly facilitating the grinding operation and enabling the quality of the pulp to be controlled. To still further promote the uniformity of the pulp, also the treatment of the mass coming from the grinding apparatus is performed in a special manner.

In the processes commonly used the mass coming from the grinding apparatus is delivered to a sorting apparatus, in which the chips are collected and the coarser portion of the mass separated to be conducted through a refiner, the finer portion of the mass, which passes through the fine-meshed strainer, being conducted directly to the pulp machine. In contradistinction to this manner of treatment, according to the present invention the whole amount of mass, after being freed of chips, is passed through a disintegrating apparatus of suitable construction and from thence to the pulp machine.

In the accompanying drawings Figure 1 shows a longitudinal section of a grinding apparatus adapted for carrying out the present process, and Fig. 2 illustrates diagrammatically how to suitably arrange the apparatus necessary for carrying out the process.

In a feed cylinder 2 provided with a feed hopper 1 (Fig. 1) is arranged a screw conveyer 3 by means of which the chips fed through the hopper 1 are pressed up against the grindstone 4. The end of the cylinder 2 opening toward the grindstone, is inclosed by two stones 5 and 6 which are kept pressed up against the grindstone thereby preventing whole chips from passing with the grindstone out of the feed cylinder. The chips may suitably be conducted into the hopper 1 through a supply tube 7 widening toward its lower end.

The shaft 8 of the screw conveyer which

is journaled in the rear end wall of the feed cylinder and in a bearing 10 mounted on the machine frame 9, carries a disk 11 revolubly mounted on the shaft and which is connected by wheel 12 and worm 13 to the driving shaft of the apparatus. Beyond this revoluble disk 11 the shaft 8 carries another disk 14 mounted to slide longitudinally on the shaft but which is prevented from rotating on the same by means of a key and slot connection. Said disk 14 has an annular bevel face 15 to engage with a corresponding bevel face on the disk 11 and is held by a helical spring 16 with an elastic pressure up against the other disk. The pressure of the disks against each other may be adjusted by means of a hand-wheel 17. The above-described friction disk arrangement now enables the pressure with which the chips are pressed up against the grindstone, to be kept automatically constant. For if this pressure for some reason or other exceeds the maximum pressure given by the tension of the spring 16, the bevel faces of the friction disks (11, 14) will slide on each other so that the velocity of rotation of the screw conveyer will be reduced which will again prevent the pressure of the chips against the grindstone from being further increased.

From the grinding apparatus the mass is conducted through the pipe 18 to the strainer in which the coarse particles such as knots and the like are separated from the remaining mass and removed by a screw conveyer 20 provided in the chute 19. The strainer is preferably so adapted that the greater part of the water in which the mass has been suspended, is strained off simultaneously with the separation of the coarse and fine particles. The fine particles are delivered by a suitable conveyer 21, 22 to a disintegrating apparatus 23, which is so adapted as to enable the degree of fineness of the mass to be readily adjusted at pleasure. The mass that has been disintegrated is now conveyed to a receptacle 24 having a stirring device 25, in which receptacle the amount of water strained off from the fine particles is again added to the mass whereupon the same is conducted to the pulp machine 26.

The disintegration of the mass is suitably effected in an apparatus having horizontal rotating cast iron or steel disks. By adjusting the pressure between the grinding disks the degree of fineness of the mass can be controlled, and since the whole of the mass passes through the disintegrating apparatus, a far more uniform product is obtained in this manner than by the usual process in which several differently treated portions of the mass are supplied to the pulp machine.

I claim:

1. The process of manufacturing wood pulp which comprises cutting wood into chips, grinding the chips into small particles, suspending the ground particles in water, separating the fine particles and water from the coarser particles, and separating the fine particles from the water.

2. The process of manufacturing wood pulp which comprises cutting wood into chips, grinding the chips into small particles, suspending the ground particles in water, separating the fine particles and water from the coarser particles, separating the fine particles from the water, and disintergrating the fine separated particles.

3. The process of manufacturing wood pulp which comprises cutting wood into chips, grinding the chips into small particles, suspending the ground particles in water, separating the fine particles and water from the coarser particles, separating the fine particles from the water, disintegrating the fine separated particles, and mixing the disintegrated mass with the water separated from the fine particles.

4. The process of manufacturing wood pulp, which comprises chopping the wood to be ground into chips, grinding the chips into small particles, suspending the ground particles in water, straining the finer particles and water from the larger particles, straining the water from the finer particles, disintegrating the latter, mixing the disintegrated mass with the strained water, and removing the mixed mass to a pulp machine.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ANDERS NICOLAY ANDERSEN.

Witnesses:
HENRY BORDEWICH,
MARTIN GUTTORMSEN.