J. A. DE CEW & R. J. MARX.

BEATING ENGINE.

APPLICATION FILED MAR. 14, 1912.

1,067,227. Patented July 8, 1913.

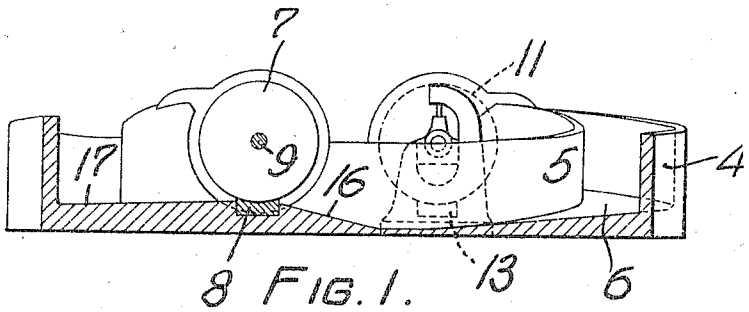


FIG. 1.

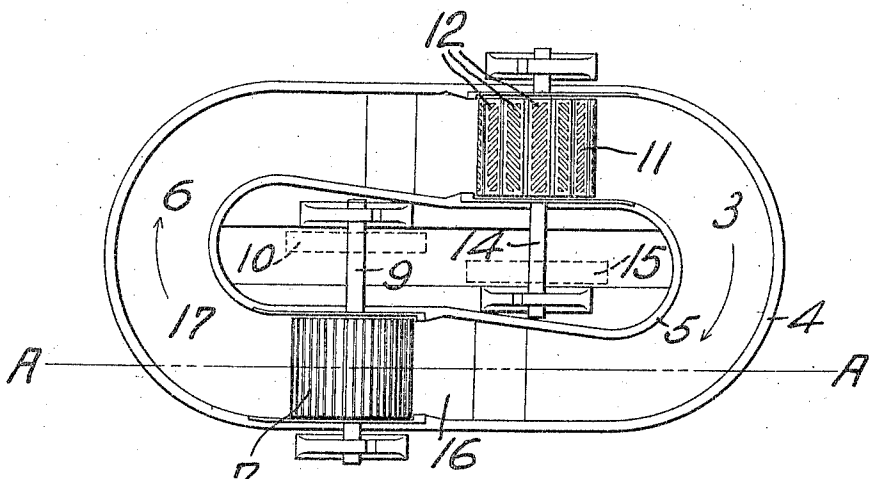


FIG. 2.

Witnesses
Stuart R. Wallace
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By Their Attorneys.

UNITED STATES PATENT OFFICE.

JUDSON A. DE CEW AND ROBERT J. MARX, OF MONTREAL, QUEBEC, CANADA; SAID DE CEW ASSIGNOR TO SAID MARX.

BEATING-ENGINE.

1,067,227. Specification of Letters Patent. Patented July 8, 1913.

Application filed March 14, 1912. Serial No. 683,915.

To all whom it may concern:

Be it known that we, JUDSON A. DE CEW and ROBERT J. MARX, both of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented new and useful Improvements in Beating-Engines, of which the following is a full, clear, and exact description.

This invention relates to a process of making paper pulp, and particularly to the method of treating pulp stock in the manufacture of news paper.

The main object of the invention is to produce a paper of increased strength and more uniform quality, and which will more readily retain the various fillers used in the manufacture of paper stock.

In the ordinary method of preparing pulp for the manufacture of news print, ground wood and sulfite fiber are mixed together in certain proportions in a suitable mixing device. The quality of the paper depends upon the condition of the stock as it comes from the mixer, and our invention is designed to so improve the process of treatment during the mixing operation as to produce a paper that will have a more even tearing strain, that will be considerably stronger and that will be greatly improved in finish and quality.

The invention consists essentially in treating the stock while in the mixing trough to alternate brushing and cutting actions by two sets of apparatus, which operate simultaneously and through which the stock passes. Ordinarily, the stock is subjected to the cutting action of the beater roll or rolls as it passes through the trough.

In our process, the ordinary steel or metal roll is arranged in one part of the trough, and a stone roll or crusher is arranged either in front of or behind the steel roll. The stock is passed through both sets of apparatus alternately, the stones serving the purpose of brushing the fiber bundles apart or splitting them into fibrillæ. The cutting action of the steel beater roll on the other hand makes the stock sufficiently free to allow for the high speed at which this kind of paper is made.

In the drawings which illustrate one form of apparatus used in connection with our process:—Figure 1 is a sectional elevation of a double beater trough on the line *a*—*a* of Fig. 2. Fig. 2 is a plan view of a double beater trough fitted with a stone and a steel roll.

In the drawings, 3 designates a suitable trough having outer vertical walls 4 and inner walls 5. The floor of the trough 6 between the inner and outer walls is inclined between the sets of rolls in such a manner that the stock passes more or less freely by gravity from one set of rolls to the other. On one side of the apparatus within the trough is located a steel roll 7 having longitudinal corrugations on its surface, which operate as knives or beaters for the paper stock. This steel roll coöperates with the steel bed plate 8, the stock being adapted to pass between the steel roll and bed plate. This roll is mounted on an axle 9, which is provided with a pulley 10 and is driven by belts or in any other suitable manner. On the opposite side of the trough is provided a stone roll 11 of basalt lava. This roll is usually built of a number of segments 12 built into a suitable core. This roll coöperates with a bed plate 13 of stone, the surfaces of the segments and bed plates being corrugated in herringbone order as shown. This roll is mounted on a shaft 14 provided with a driving pulley 15. It will be seen that the floor of the trough is inclined downwardly from the stone roll, to a point a short distance in front of the steel roll, where there is an upward inclination as indicated at 16. From the steel roll the floor is again inclined downwardly toward the stone roll, as indicated at 17, so that the stock will flow more or less freely between the rolls. The steel knives cut the fibers to the desired extent, while the action of the basalt lava stone rolls consists in drawing or brushing the fibers out into long and fine filaments. Each roll is adjustable independently of the other, so that this arrangement is adapted to treat the most divergent varieties of stuff. It will be seen that by adjusting first one roll and then the other the material may be alternately and successively subjected to varying degrees of pressure while passing beneath the roller. By this alternating treatment of the stock moving under the influence of the brushing devices and under the cutting apparatus, the fibers are the more finely separated and are more uniformly distributed in passing to the wire of the paper making machine, so that the tensile strength of the paper is approximately as great in one di-

rection as in another. This is a great advantage in making this particular quality of paper. By separating the individual fibers, the stock becomes more hydroscopic and more readily retains the various fillers that are commonly used. In short, the paper is greatly increased both in strength and in quality.

Having thus described our invention, what we claim is:—

1. In a beating engine, a receptacle having a bottom, outer and inner walls spaced apart to provide a raceway, a brushing and a beater roll arranged in the raceway, and on opposite sides of the inner wall, and means for driving each roll independently of the other.

2. In a beating engine, a receptacle having bottom, outer and inner walls spaced apart to provide a raceway and a mid-feather, the cross section of the raceway being less at the end of the mid-feather and widening as it approaches the roll, a brushing and a beater roll arranged in the raceway, and on opposite sides of the mid-feather, and means for driving each roll independently of the other.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

JUDSON A. DE CEW.
ROBERT J. MARX.

Witnesses:
STUART R. W. ALLEN,
G. M. MORELAND.