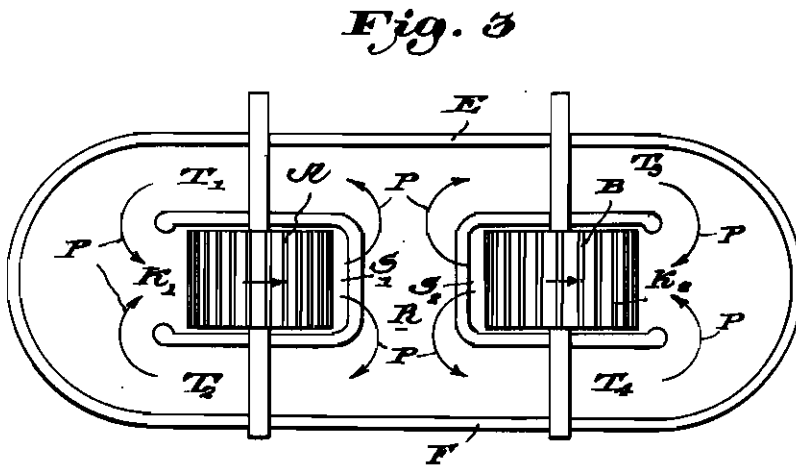
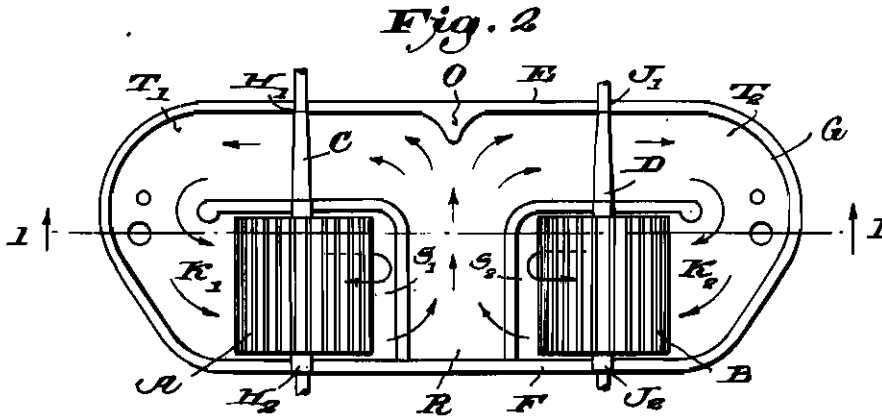
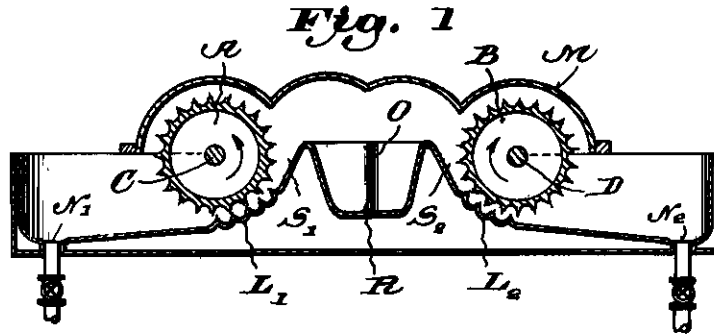


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BEATING ENGINE  
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Fig. 4

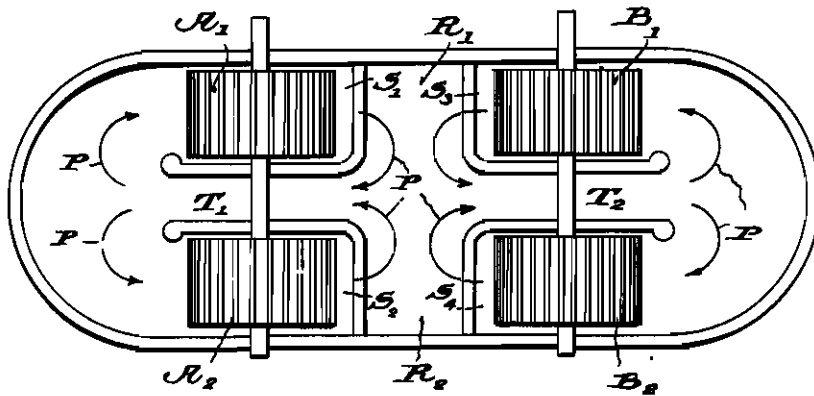


Fig. 5

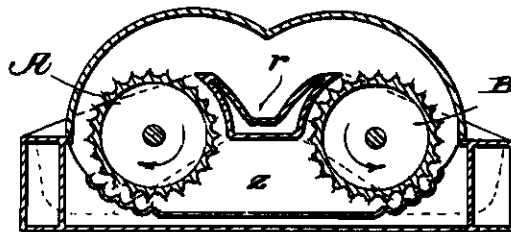
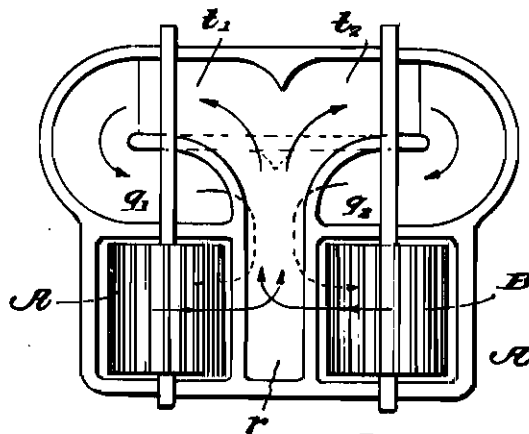


Fig. 6



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# ALIEN PROPERTY CUSTODIAN

## BEATING ENGINE

August Aeldert, Dusseldorf, Germany; vested in  
the Alien Property Custodian

Application filed April 3, 1941

This invention relates to improvements in beating engines or Hollanders used in the manufacture of paper and other materials for beating, refining, mixing and bleaching the pulp.

Such engines were hitherto usually provided with two or more rolls, but the desired increase of efficiency was not attained because in spite of a plurality of rolls only one stock-circuit was employed as in the well-known single-roll beating engines.

The object of my invention is to employ novel means by which the stuff contained in the beating tub is subdivided in two or more partial streams of which only one partial stream is allotted to each beater roll.

Another object of my invention is to provide novel means by which the quantity of stuff treated by each roll is conveyed to a common circuit-channel situated at a higher level than the bottom beneath the roll from which the whole of the stuff after being again subdivided into a number of partial streams may always descend and flow back again to the space before the single grinding rolls.

A further object of my invention is to procure a device the efficiency of which is considerably increased by each grinding roll being loaded only with a fraction of the stuff-stream.

A further object of my invention is to procure a device in which the grinding period is substantially decreased owing to the fact that instead of one single stuff-stream of great length a plurality of stuff-streams of shorter length are treated by the grinding rolls.

A further object of my invention is to procure a device in which the stuff-streams collected in a common receiving gutter are thoroughly mixed whereby all fibers and bundles of fibers are completely dislocated and an intimate mixture of the single fibers is obtained.

A further object of my invention is to procure a device in which by a complete mixture of the stuff, i. e. by avoiding any regularity in the distribution of the stuff between the shorter way across and the longer way along the walls of the tub a more uniform grinding of all particles of the stuff is obtained.

A further object of my invention is to provide a device the effect of which is increased by employing an enlarged grinding width which may be increased to any desired extent, the drawbacks otherwise connected therewith being avoided by a shorter central way and a longer peripheral way of the stuff.

A further object of my invention is to provide

a device requiring only a very small place whereby an increased efficiency of the whole plant on the same floor space is obtained.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

The invention will now be more fully explained with the aid of the accompanying drawings forming part of this application and in which

Fig. 1 is a cross-sectional side view of the apparatus according to the invention on the line I—I of Fig. 2.

Fig. 2 is a plan view of the apparatus shown in Fig. 1, the cover being removed;

Fig. 3 being a plan view similar to Fig. 2 shows a modification, and

Fig. 4 being likewise a plan view similar to figs. 2 or 3 shows still another modification.

Figs. 5 and 6 show in vertical cross-section and in plan view respectively the invention as applied to a so-called overthrow Hollander, the hood being omitted in Fig. 6.

In the modification illustrated in Figs. 1 and 2 A and B denote two oppositely rotating grinding rolls loosely mounted on the shafts C and D journaled in the longitudinal walls E and F of the grinding tub G at H<sub>1</sub>, H<sub>2</sub> and J<sub>1</sub>, J<sub>2</sub> respectively. In the middle between the two rolls A and B a channel R is provided into which the stuffs and half-stuffs are transported over the bridges or back-falls S<sub>1</sub> and S<sub>2</sub> respectively by the rotation of the grinding rolls A and B. The back-falls S<sub>1</sub> and S<sub>2</sub> are bent in the grinding tub at right angles so as to surround the rolls on two sides, one front face of each roll being adjacent to the wall F of the tub, the other front faces being open toward the channels T<sub>1</sub> and T<sub>2</sub> which communicate with the channel R.

The channel R and the channels T<sub>1</sub> and T<sub>2</sub> annexed thereto at both sides behind the rolls A and B are provided with a steep slope so that the material conveyed by the rolls over the back-falls S<sub>1</sub> and S<sub>2</sub> into the channel R continuously flows downwards by gravity until it reaches the ingresses K<sub>1</sub> and K<sub>2</sub> of the rolls A, B, whence the material is again sucked up by the rolls A, B, and transported anew into the channel R, whereupon the circulation of the stuff separately for each of the rolls is repeated. To facilitate the division of the stream in the channel R in two separate streams flowing to the lateral channels T<sub>1</sub> and T<sub>2</sub> respectively a partition O projecting into channel R is provided.

During the circulation of the stuff in two dis-

tinct circuits the stuff is ground and has in this way sufficient time for mixing thoroughly so that after sufficient duration the material to be ground is obtained in the desired state.

The grinding rolls A and B are of usual construction and have in most cases a corrugated surface as indicated in the drawings. Beneath the rolls at the bottom part of the back-falls S<sub>1</sub> and S<sub>2</sub> the bed plates L<sub>1</sub> and L<sub>2</sub> are arranged which are provided in the well known manner with grooves on the side turned toward the rolls, whereby they co-operate with the corrugated surfaces of the rolls and comminute the material in the desired manner. The rolls A, B and the channel R are above the tub covered by a hood M. At both sides of the tub at the lowest point of the channels of circulation outlet openings N<sub>1</sub> and N<sub>2</sub> are arranged which ordinarily may be kept closed by valves or cocks.

In the modification shown in Fig. 3 the grinding rolls A and B are arranged at equal distances from the lateral walls E and F and are surrounded by U-shaped back-falls S<sub>1</sub> and S<sub>2</sub> so that the channel R between both rolls is open at both sides. Each roll is enabled to lie in two partial streams, as shown by the arrows P.

In this modification the channel R is sloping bilaterally, four channels of circulation T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub>, likewise sloping, adjoining the channel R. Each two partial streams T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>, T<sub>4</sub> unite before the rolls at K<sub>1</sub> and K<sub>2</sub> and then re-enter jointly the rolls.

The mode of operation differs from that of the modification shown in Figs. 1 and 2 by four partial streams being provided instead of two.

In the modification shown in Fig. 4 likewise four partial streams are provided as indicated by arrows P. In this case, however, the partial streams are produced by four rolls A<sub>1</sub>, A<sub>2</sub>, B<sub>1</sub>, B<sub>2</sub> each of which is confined toward the middle of the tub by back-falls S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub>, S<sub>4</sub>. By the back-falls S<sub>1</sub> and S<sub>3</sub> the overthrow channel R<sub>1</sub> is formed, and by the back-falls S<sub>2</sub>, S<sub>4</sub> is formed a second overthrow channel R<sub>2</sub>, both of them sloping toward the middle of the tub. The partial streams T<sub>1</sub> and T<sub>2</sub> are situated between the rolls A<sub>1</sub>, A<sub>2</sub> and B<sub>1</sub>, B<sub>2</sub> respectively, or between

the corresponding parts of the rectangularly bent back-falls S<sub>1</sub>, S<sub>2</sub> and S<sub>3</sub>, S<sub>4</sub> respectively.

In the middle of the tub the streams coming from the channels R<sub>1</sub> and R<sub>2</sub> are divided and flow off by pairs to the right or left hand respectively through the channels T<sub>1</sub> and T<sub>2</sub>. At the front sides of the tub the partial streams are again divided and each pair of partial streams is again returned to the rolls A<sub>1</sub>, A<sub>2</sub> or B<sub>1</sub>, B<sub>2</sub> respectively.

The construction of the above-described beating engines or Hollanders permits of different modes of operation. The grinding rolls may be constructed from different materials, for instance, the one with metal bars and the other may be made of stone or the like. Furthermore the two grinding rolls may be made to work with different grinding pressure, one of them serving, in some cases, only as a stuff accelerator.

The invention may also be advantageously applied to the so-called overthrow hollanders in which the stuff is projected over the top of the grinding roll. This modification is shown, by way of example, in Figs. 5 and 6.

The two grinding rolls A and B are rotated in opposite directions. Each of these rolls throws the stuff over its top into the common gutter  $\gamma$ . From this gutter are branched off to the right and to the left hand the stuff circulation channels  $t_1$  and  $t_2$  leading with a steep slope from the gutter  $\gamma$  to the return channels  $q_1$  and  $q_2$  by which the stuff is conducted into the space  $z$  below the gutter  $\gamma$  whence it is skimmed off by the grinding rolls for repeated grinding and subsequent circulation.

Without departing from the principles of the present invention, I may return only part of the stuff to the gutter or into the channels of circulation by projecting it over the top of the roll, whereas the other part of the stuff may be projected forward by the rolls into the flow-off channel or channels.

The essential feature of the beating engine according to the present invention is in any case the construction with separate stuff streams, each single stream being always supplied to its proper roll.

AUGUST AELDERT.