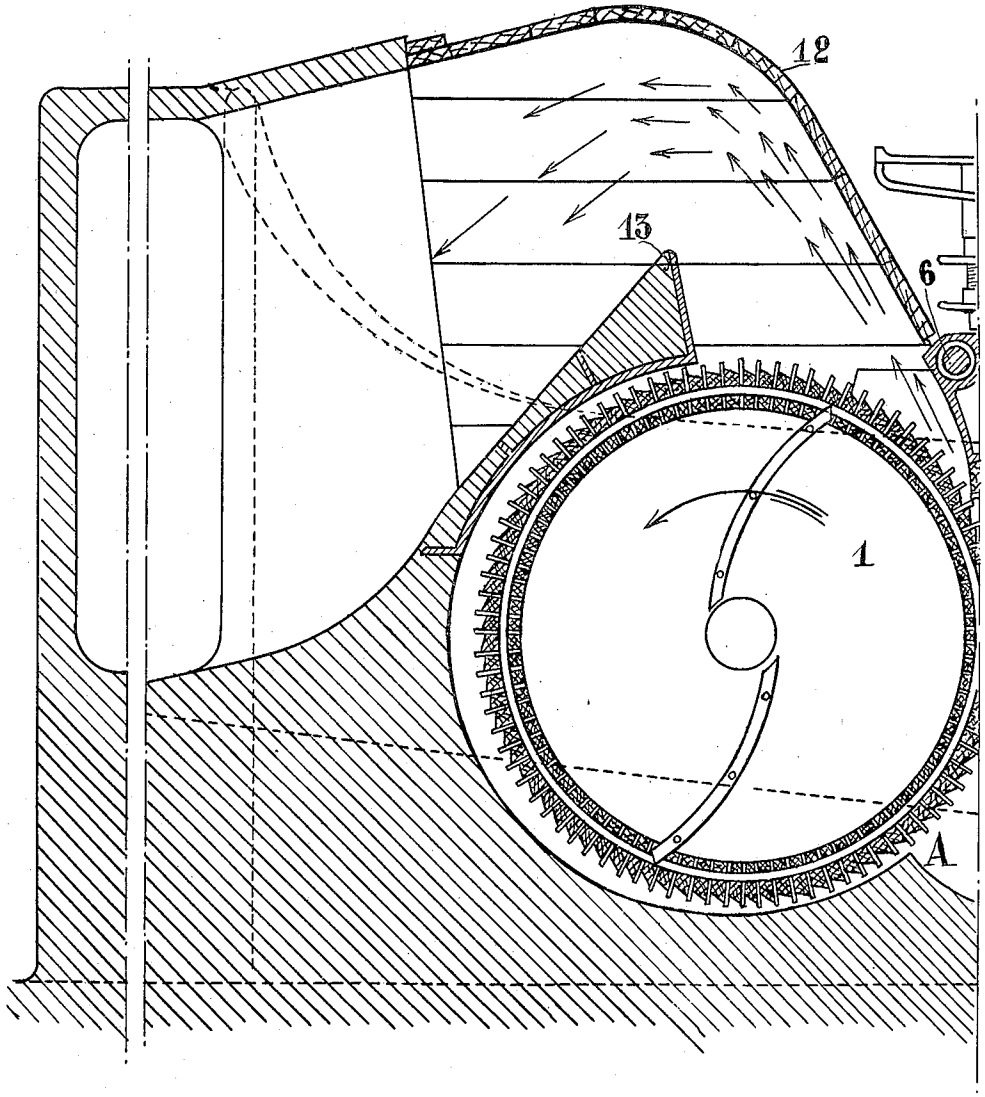
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BEATER FOR THE PAPER INDUSTRY

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Fig. 1



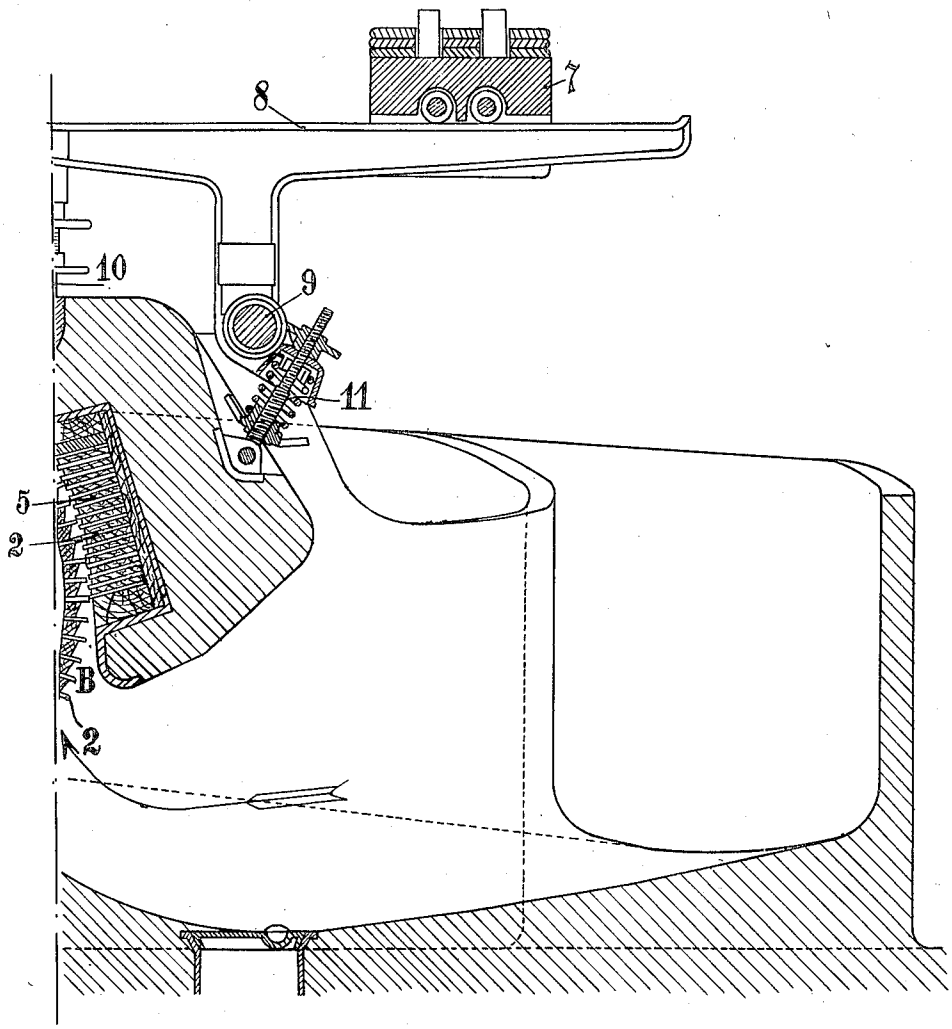
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Fig. 1a



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Fig. 4

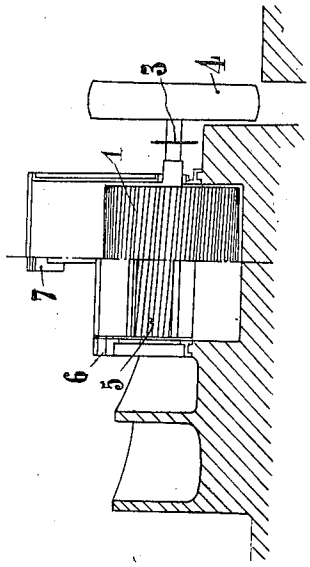
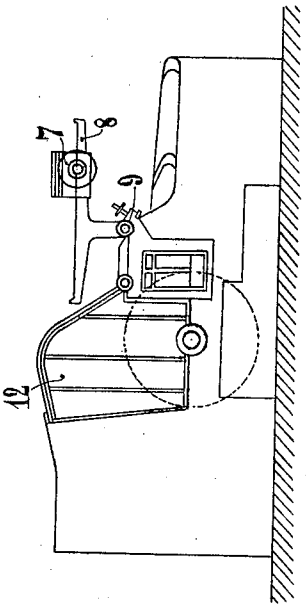


Fig. 2.



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Fig. 3

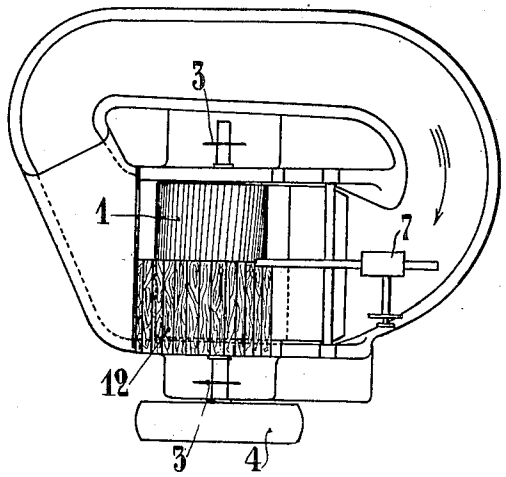
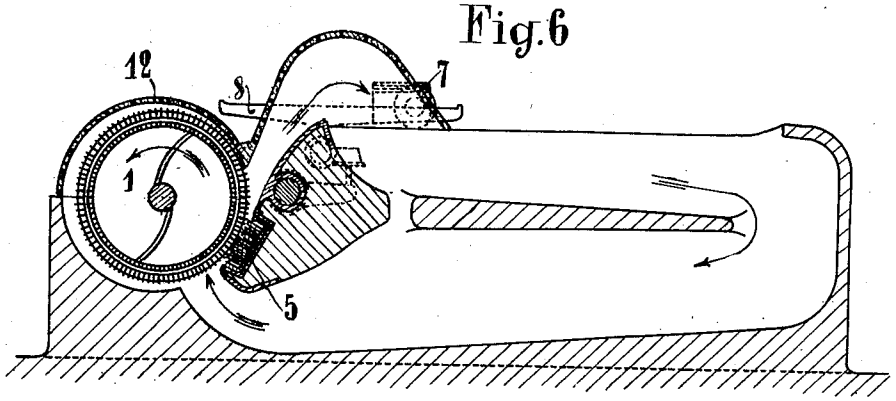


Fig. 6



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Fig.5

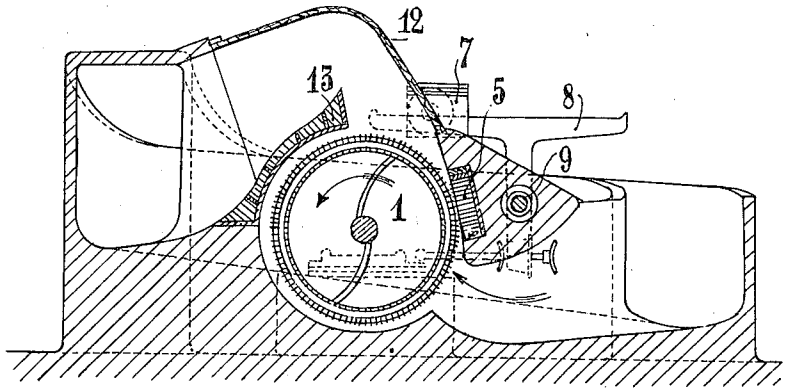
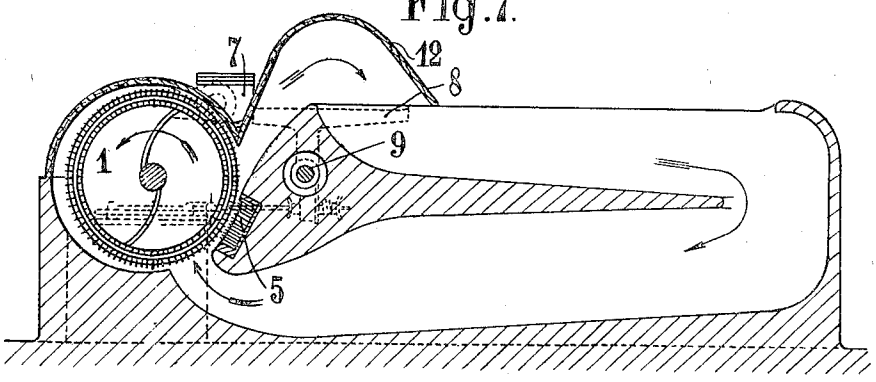


Fig.7.



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Patented Sept. 5, 1933 1,925,922

UNITED STATES PATENT OFFICE

1,925,922

BEATER FOR THE PAPER INDUSTRY

Edouard Héry, Paris, France

Application October 1, 1930, Serial No. 485,762, and in Germany October 4, 1929

1 Claim. (Cl. 92—24)

This invention relates to apparatus for triturating, dividing, shortening, hydrating—or according to paper-making terminology, beating and refining—such fibers as are suitable for the production of paper and cardboard, and to similar apparatus.

These devices or "beaters" consist essentially of a cylinder which usually is provided with metal bars or with blocks of various materials and a similarly equipped "bed plate". Both the cylinder and the bed plate are arranged in a "vat" (made of metal, wood, brickwork, concrete, or the like) which is a kind of endless channel in which there flows a stream of water charged with the material to be worked upon. The latter is shortened, broomed, triturated, crushed, laminated, refined, etc., between the revolving cylinder and the bed plate, said members being pressed against each other by any suitable mechanism.

From the viewpoint of the pressing mechanism, beaters may be divided into two classes:—

In one of these, the bed plate is stationary while the revolving cylinder is pressed against the same with greater or less force.

In the apparatus of the other class which, practically, comprise only beaters of the Thorsen type according to the United States Patent No. 1,457,865 dated January 5, 1923, the movable member is the bed plate which is urged with greater or less pressure towards a cylinder revolving in stationary bearings.

In apparatus as constructed up to the present, in whatever class they may belong, the density of the stuff to be treated—which from the viewpoint of the quality of paper to be obtained must generally be increased—is usually limited by:—

1—The circulation of the pulp which is the more difficult to maintain as the density of the pulp is greater;

2—The dabbling of the cylinder in the pulp, which uselessly consumes a power which is the greater as the pulp is thicker. This results in the beater being a low-efficiency engine.

This invention has for its objects:—

1—To minimize the dabbling of the cylinder in the pulp and thereby to save the power consumed in useless contact of the cylinder with the pulp to be treated;

2—To provide for the circulation of the liquid mass merely through the momentum of the pulp as it comes out of the rubbing surfaces and thereby to save the power usually consumed by the cylinder as an elevator, while at the same time sufficiently raising the liquid mass—merely through the said momentum—to ensure a vigorous mixing and an intense circulation of the same even where the consistency of the stuff to be treated in the diluting water is increased to unusual proportions; and as a result,

3—To benefit generally by treating pulps of unusual density.

An embodiment of the invention in a Thorsen beater as described in the above mentioned Patent No. 1,457,865 is shown in the drawings appended hereto wherein:—

Figures 1 and 1*a* taken together constitute a vertical cross sectional view partly in elevation of the cylinder and bed plate.

Figure 2 is an elevational view of the beater as seen from outside the tub.

Figure 3 is a plan view of the beater.

Figure 4 is a cross sectional view towards the cylinder and bed plate.

Figure 5 shows that the improvements embodying this invention are likewise applicable to mills of the first class, i. e. in which the base plate is stationary.

Figures 6 and 7 show modifications of the above principles in which the pulp instead of being thrown over the cylinder is thrown over the bed plate holder.

Figure 6 relates to mills with a movable bed plate, and Figure 7 to those with a stationary bed plate.

This invention also applies to multiple cylinder beaters.

The apparatus embodying this invention consists essentially of a cylinder 1 provided with bars 2, mounted in stationary bearings 3 and driven through a pulley 4 by means of a belt, or directly by any suitable prime mover.

Pressed in a controllable manner against the surface of the cylinder and concentrically arranged therewith is a bed plate 5 provided with bars 2 and adapted to freely oscillate about the axis of rotation 6. (The bed plate may be supported in any other suitable manner as by links, parallelograms, slides and the like.)

The bed plate is pressed against the cylinder by means of a counterweight 7 movable on the lever 8 adapted to oscillate about the axis 9. When the counterweight is at one end of the lever, the pressure is maximum while when it is at the other end it will cause the bed plate to move away from the cylinder. Such movement is limited by an abutment 10. The lever 8 transmits the pressure to the bed plate support with or without a springy connection 11.

In the construction of the Thorsen beaters as show in the drawings appended to the United States Patent No. 1,457,865, the bed plate is arranged in such position that the pulp jet—the path of which depends on the centrifugal force, the linear speed of the cylinder and gravity—will splash upon the cover or hood, fall back upon the cylinder, rebound onto the hood, then again onto the cylinder, and so on, in which it displays a tendency in spite of the deflector to get into the circular space behind the cylinder. This results in a dabbling of the cylinder in the said space, which in turn involves a braking action and a power consumption.

In addition, this braking action generates heat which is transferred to the pulp, whereby the same will often be rendered unfit for a satisfactory paper production.

In the novel arrangement embodying this invention the path of the pulp, which is changed as the same attains the cylinder by reason of the rotary motion imparted to the latter—contrawise to the usual direction, and the position of the base plate 5 are so combined with the shape of the hood 12 and the position and height of the backfall 13 that the pulp as it comes out of the rubbing surfaces will be thrown over the cylinder and the fall arranged thereon into the top portion of the return channel, any contact with either the cylinder, the hood or any other part of the beater being avoided during such path of the stuff.

Thus, the movement of the liquid mass over the cylinder and the fall arranged thereon is provided for by the mere momentum of the mass as it comes out of the points of contact, viz.: the cylinder and bed plate.

The second peculiarity of this arrangement is that the pulp is raised without an additional power consumption to such height that a powerful mixing and an intense circulation shall be ensured with a pulp of unusual density.

The third characteristic of the arrangement according to the invention is the combination of the part of the pulp (which is changed as the same attains the cylinder by reason of the rotary motion imparted to the latter—contrawise to the usual direction) with the raised bottom of the feed channel and the position of the bed plate to limit the dabbling of the cylinder in the pulp to the arc strictly necessary to allow the spaces between the bars to fill with pulp. This minimum portion of the periphery of the cylinder is marked A, B, in the above mentioned drawings.

I claim:

In a beating machine for paper pulp of the class described and comprising in combination an endless channel, a transversally disposed rotating cylinder in said channel and provided with spaced blades, a bed plate mounted for cooperating with the cylinder, said bed plate being disposed on the side of said cylinder where the pulp is delivered, an oscillating member supporting the bed plate, a hood the inner curvature of which is outside the trajectory followed by the pulp projected by the cylinder when it leaves the bed plate, the bottom of the channel being raised at its inlet in front of the cylinder to ensure proper filling of the cylinder blades with the pulp, and the bottom of same channel on the rear of the cylinder being substantially at the same level than the center of the said cylinder.

EDOUARD HÉRY.