March 13, 1934. C. R. CRAWFORD 1,950,713

PAPER MACHINERY

Filed Sept. 8, 1931

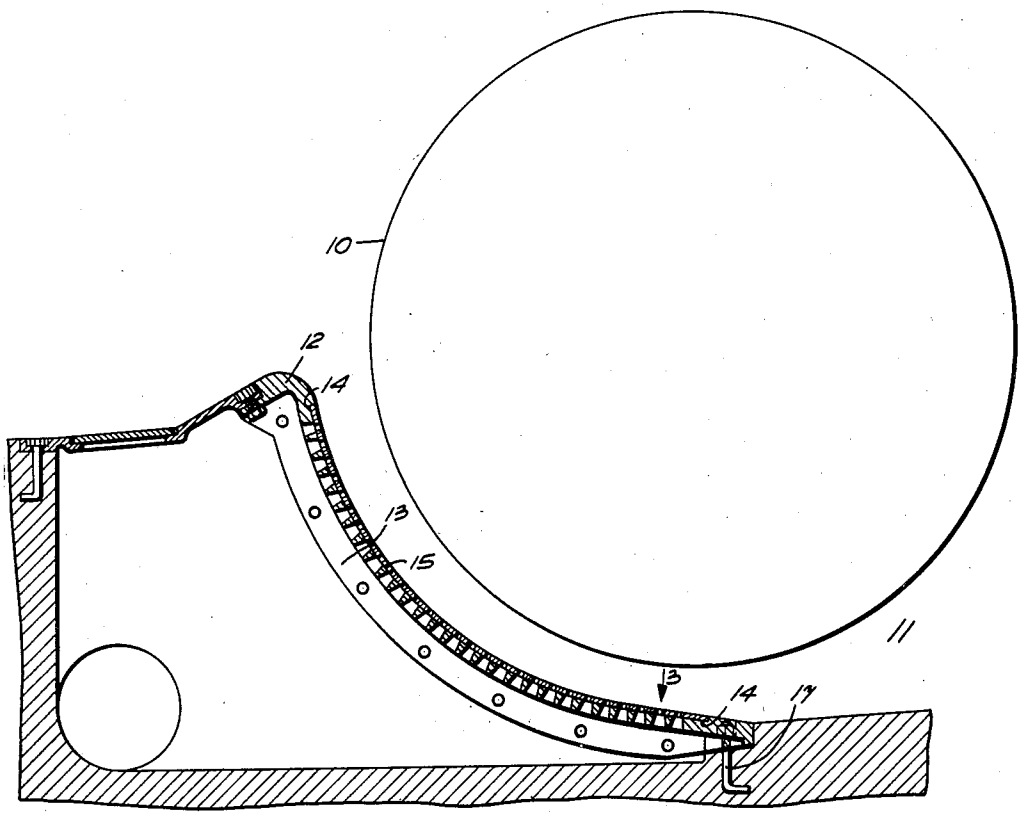


Fig. 1

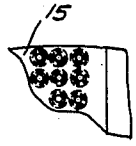


Fig. 3

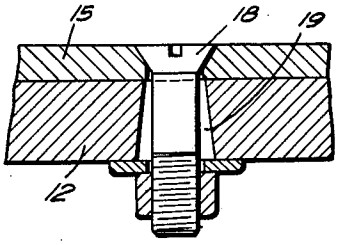


Fig. 2

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Patented Mar. 13, 1934 1,950,713

UNITED STATES PATENT OFFICE

1,950,713

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Application September 8, 1931, Serial No. 561,584

6 Claims. (Cl. 92—22)

This invention relates generally to engines for beating up pulping stock for use in the manufacture of paper, boxboard and like products and more particularly to apparatus of the character commonly termed beating or breaking engines embodying or employing a perforated backfall member for separating and withdrawing the stock as soon as it has been reduced to pulp or to a required size.

In such engines now commonly in use, this perforated backfall member consists of one heavy and solid piece of metal, perforated so as to permit the flow of the reduced stock, this member being rigidly fixed or mounted to the foundation and other parts of the apparatus. On account of the excessive wear on the operative face or surface of this backfall member due to friction and other causes in the operations of a beating engine as described, replacement is frequently necessary, such replacements requiring great expenditure of time and money. Likewise this replacement carries with it the necessity of removing the entire backfall member and installation of a completely new one. This replacement of a new backfall member is very troublesome as they are of large size and difficult to be made to fit accurately with the foundation on account of warping or other causes. Imperfect fit or misalignment of bolt connections, etc. of course result in great loss of time.

One of the principal objects of this invention is therefore to provide apparatus of this character that is of simple construction, efficient in operation and in which the parts subject to wear and tear may be easily, economically and quickly replaced.

Other objects and advantages of my invention will be apparent from the following description, the appended claims and the accompanying drawing, in which:

Figure 1 is a longitudinal vertical section of a part of a beating engine embodying this invention;

Figure 2 is a cross section detail showing means of attaching and holding the removable surface plate of the backfall member; and

Figure 3 is a fragmentary view of the removable plate looking in the direction of the arrow 3 of Fig. 1.

As illustrating a preferred embodiment of the invention, there is disclosed in the drawing the outline of the roll or drum, 10, of a beating engine of the ordinary or conventional construction rotatably mounted in the tank, 11, on the apparatus with a perforated backfall member, 12, provided adjacent the upwardly moving side of the roll, 10. The beater roll has blades or knives projecting from its surface and by its motion causes a flow or circulation of the water and stock in the tank which moves over the perforated backfall member, the pulp or stock in required size falling or being forced by centrifugal action through the perforations into a receptacle or portion of the tank from which it can be carried by suitable means to the stuff chest or other paper machines for further treatment. In the drawing, the backfall member comprises the body portion, 13, preferably having a recess therein as indicated at 14, into which is fitted a removable surface plate, 15, the whole member being of a concave shape mounted so as to extend upwardly and adjacent to the outer surface of the roll or drum with suitable clearance space between and with the outer end of the backfall member even with, above or below the horizontal center line of said roll from where it follows downwardly at a decreasing distance to the bottom of the tank, 11, of the apparatus. The body portion of the backfall member is securely fastened or mounted to the foundation and bottom of the tank by means of anchor bolts, 17, or other suitable means.

The backfall member, 12, instead of being of convenient unitary construction is so arranged as to permit the curved part that cooperates with the beater roll to be readily replaced when worn as shown. The removable surface plate is preferably fitted into the recess, 15, of the body portion and made fast by screws, 18, or equivalent means. These screws go through suitably located passages, 19, in the body portion, 13, and serve to prevent the removable surface plate from sliding or moving out of its normal position which may be recessed in the body portion so that its upper surface is flush with the upper surface of the body portion though the surface plate may be bolted on top of the body member without the recess. Preferably both the body portion and the removable surface plate are perforated, these perforations being so located that the holes in the surface plate which are preferably rather small register with the larger and similarly arranged holes in the body portion when the surface plate is in operative position. Both the body portion, 13, and the removable plate, 15, are preferably of rolled steel, the plate, 15, being rather thin as compared with the heavy and rigid body portion, 13, on which it is supported in surface contact therewith throughout substantially the entire area of the surface plate, though the body portion may be constructed of welded rolled steel.

In practice the backfall member wears out making replacement necessary. To accomplish such replacement in accordance with the present invention it is only necessary to remove the screws, 18, and withdraw the worn out or damaged plate from the body portion and replace it with a new one. The heavy body portion may be permanently secured to its mountings to prevent or check vibrations, as the replacement of a removable surface plate can be effected without in any way disturbing the mountings of the heavy body portion. Removable surface plates are made in replaceable units so that an additional or auxiliary plate may be readily kept on hand or in stock for replacement purposes. Thus when that portion of the backfall member that is subject to constant wear becomes unserviceable it can be removed and a new surface plate very quickly installed in position requiring only a minimum of shut down time, and a minimum of labor and expense. This attachment of a new surface plate can be very quickly accomplished as such a plate is comparatively light and thin and much smaller in size than the entire backfall, so any errors in attachment hole arrangement, and any irregularities of form due to warping or other causes are of practically no consequence, although such errors or irregularities in a large and heavy unitary backfall member of prior constructions would be a vey serious matter.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus and that changes may be made therein without departing from the scope of the invention which is described in the appended claims.

What I claim is:

1. In a beater engine, a perforated backfall member of the character described, comprising a curved body portion having spaced holes therein, a separate surface plate portion supported thereupon and having holes the spacing of which corresponds to the hole spacing of the body portion, said plate portion being removable by movement in an upward direction from said body portion while the body portion is in place, and means detachably connecting the said plate portion upon said body portion.

2. A perforated backfall member of the character described, comprising a recessed body portion and a separate surface plate portion supported thereupon and removable upwardly therefrom while the body portion is in place, said plate portion having inter-locking or surface engagement with the recess of the body portion, and a detachable connection for said plate and body portions.

3. In a beater engine, a perforated backfall member of the character described, comprising a heavy metal body portion and a separate readily removable relatively light metal surface plate portion having inter-locking engagement with said body portion and means detachably connecting said plate portion to said body portion.

4. In a beater engine, a perforated backfall member of the character described, comprising a permanently positioned body-portion, a readily removable surface plate portion having cooperating inter-fitting and inter-locking means whereby said portions may be assembled in operative position with the upper surface of the plate portion flush with the upper surface of the body portion and means for detachably connecting said portions in said operative positions.

5. A perforated backfall member of the character described comprising a rigid body portion having positioning means at its edges and having a curved side defined by a continuous but recessed limiting portion and a central portion depressed below the upper surface of the limiting portion and provided with rows of holes, and a separate readily detachable plate portion fitting within the recess of and resting on the upper surface of said central portion and flush with the upper surface of the limiting portion, said plate portion having rows of holes spaced in accordance with the spacing of the holes in the body portion and means detachably connecting the plate portion to the body portion.

6. A beater engine backfall of the character described adapted for cooperation with a beater roll comprising a permanently positioned relatively heavy body portion the central part of which is perforate, and a relatively light surface plate portion having spaced holes throughout substantially its entire extent, said surface plate portion constituting the upper wear surface of the backfall and means for detachably connecting said surface plate portion to said body portion so it can be readily disconnected and removed therefrom.

CLIFF R. CRAWFORD.