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C. R. CRAWFORD

2,277,477

PAPER MANUFACTURE

Filed Aug. 17, 1939

Fig. 1.

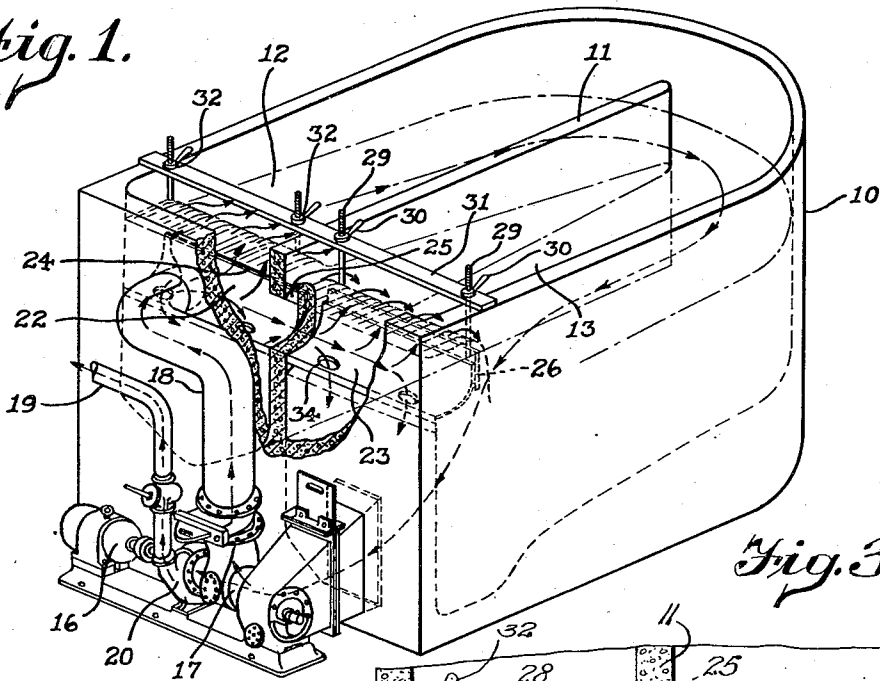


Fig. 3.

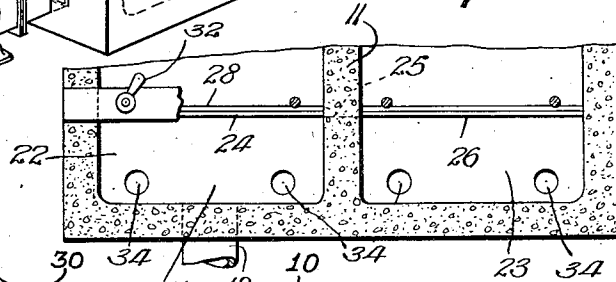
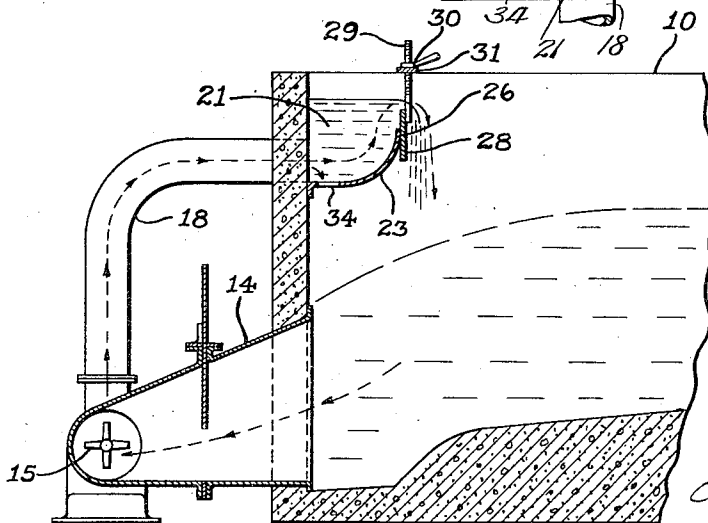


Fig. 2



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2 Claims. (Cl. 92—37)

This invention relates to apparatus for circulating and agitating paper stock.

One object of the invention is the provision of a tank or vat, in which paper stock is circulated from a supply end to a discharge end, the stock being returned or recirculated from the discharge end to a trough or chamber arranged to provide an evenly distributed flow or fall of stock onto the stock in the tank at the supply end of the tank.

Another object of the invention is the provision of a tank or a vat in which paper stock is circulated, the tank having a supply trough above the supply and discharge ends of the tank providing controllable overflow streams of stock to the supply end and to the discharge end of the tank.

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

Fig. 1 is a perspective view of a tank embodying the present invention, a portion of the wall structure being removed for purposes of illustration;

Fig. 2 is a vertical sectional view through the discharge end of the tank; and

Fig. 3 is the top plan view showing the end of the tank.

Referring more particularly to the drawing, in which a preferred embodiment of the invention has been illustrated, 10 generally designates the enclosing wall of a stock handling tank adapted for the circulation of paper stock. As herein shown the tank may be used as a part of a pulping apparatus by supplying pulp lumps and water to the tank and circulating the same by gravity action around the vertical midfeather 11 from the supply end 12 to the discharge end 13 of the tank, the material then travelling through a downwardly tapering discharge passage 14 to a series of rotatable high speed beating blades 15 which are operated by an electric motor 16 or the like. The blades 15 act as an effective pulping means so that the stock which flows through the passage 14 will be shredded, beaten and whirled and then supplied to an impact impeller contained in the impeller casing 17 which acts to force the stock up through the pipe 18 for return to the tank. The tank may also be used as a color mixer or may be used as an agitating means to maintain the stock in a constant state of agitation until it is supplied by a centrifugal pump 20 through the take-off pipe 19 to additional refining means or to a paper making machine.

The stock that is returned through the upwardly extending pipe 18 enters a trough 21 which is arranged at a level considerably above that of the discharge passage 14. This trough extends across the tank above the material in the supply end and the discharge end and provides a chamber 22 extending the full width of the supply end, and an auxiliary chamber or passage 23 extending across the tank above the discharge end. The chamber 22 has an upwardly extending wall portion 24 over which the stock flows throughout the width of the supply end of the tank onto the stock in the tank, thus giving an even distribution of the stock supply to the tank, and causing a continuous intermixing action with the avoidance of stratification and unagitated areas. Since the stock falls from the chamber 22 onto the stock already in the tank any foam and floating stock at the supply end will be promptly submerged. If the tank is used for color diffusion the color will be promptly distributed to the entire body of stock at the supply end, and an effective blending action will take place at this point, the color diffusion being continued as the stock travels around the midfeather 11 and returns to the discharge passage 14.

The chamber 22 is in communication with the auxiliary chamber 23 which extends over the discharge end of the vat through the opening 25 in the midfeather. Stock overflows an upstanding wall portion 26 and falls onto the stock in the tank adjacent the tank outlet and thus submerges the foam and submerges any lighter or floating pieces of pulp so they may be more readily carried downwardly and enter the discharge passage 14. The fall over the wall portion 26 is distributed throughout the width of the discharge end of the vat.

The rate at which the recirculated stock is supplied over the wall portion 26 is controllable so that about 10% to 15% of the recirculated stock returned by pipe 18 can be bypassed over the wall portion 26 while the remainder is supplied over the overflow wall of the chamber 22 to the supply end of the vat and thus caused to recirculate around the midfeather by gravity action before it reaches the discharge passage. This action provides a thorough agitation and mixing action and prevents stratification. Preferably both the supply chamber 22 and the chamber or passage 23 are provided with adjustable boards or dams 28 guided for vertical sliding movement along the side or wall portion 26, the height of the dams being independently

controllable so as to give the desired rate of flow at the supply end and at the discharge end of the tank. As shown, the adjustable dam 28 arranged over the discharge end of the tank is connected to supporting rods 29 which may be raised or lowered by rotating the nuts 30 which bear against the carrying strap 31. Similar adjusting nuts 32 are provided for adjusting the height of the dam at the supply end of the vat.

Both the chamber 22 and the chamber 23 are provided with clean-out holes 34, of limited size, and arranged in the bottom walls of these chambers so that when the vat is to be cleaned the material in these chambers can drain completely into the vat. The flow through these holes 34 also gives a limited diffusing or mixing action during normal operation.

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 defined in the appended claims.

What is claimed is:

1. Paper stock handling apparatus of the character described comprising a tank having an end wall and a substantially vertical baffle extending from the end wall to a point spaced from the opposite end of the tank and providing for the circulation of stock in a path of substantially horse-shoe form from a supply zone at one side of the baffle to a discharge zone along side of the supply zone at the other side of the baffle, said tank having a horizontally extending trough at an elevated location extending from side to side of the tank and across the supply zone and the discharge zone, said trough having an adjustable

5 wall above the supply zone over which stock flows throughout substantially the entire width of the supply zone onto the stock in the tank and having a second adjustable wall over the discharge zone over which stock flows throughout substantially the entire width of the discharge zone onto the stock in the tank, and means for withdrawing stock from the discharge zone at one side of the baffle and forcing it up into said trough at the other side of the baffle.

10 2. Paper stock handling apparatus of the character described comprising a tank having an end wall and a substantially vertical baffle extending from the end wall to a point spaced from the opposite end of the tank and providing for the circulation of stock in a path of substantially horse-shoe form from a supply zone at one side of the baffle to a discharge zone along side of the supply zone at the other side of the baffle, said tank having a horizontally extending trough at an elevated location extending from side to side of the tank and across the supply zone and the discharge zone, said trough having an adjustable wall above the supply zone over which stock flows throughout substantially the entire width of the supply zone onto the stock in the tank and having a second adjustable wall over the discharge zone over which stock flows throughout substantially the entire width of the discharge zone onto the stock in the tank, and means for withdrawing stock from the discharge zone at one side of the baffle and forcing it up into said trough at the other side of the baffle, means for independently controlling the height of said adjustable walls, said trough having drain openings at the bottom portions thereof.

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