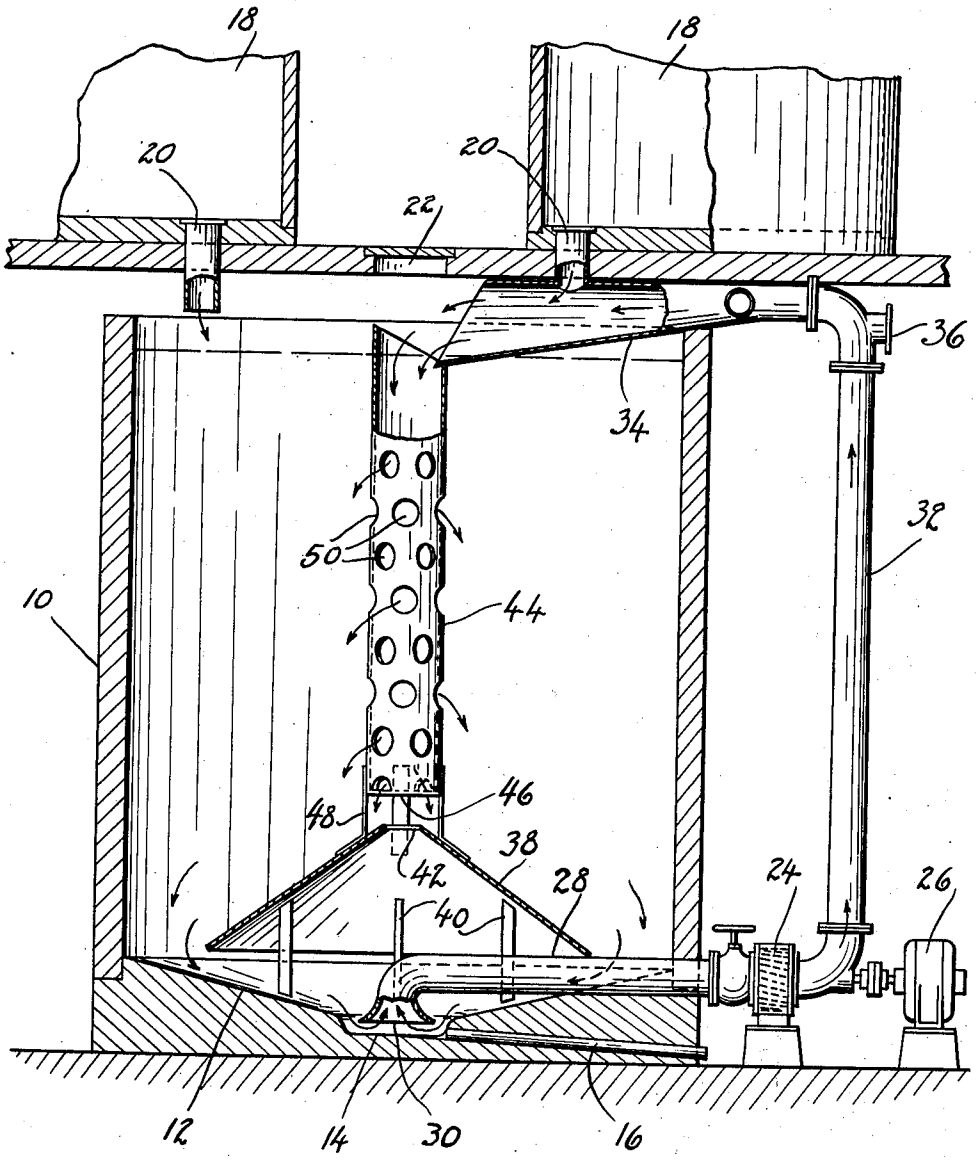
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PULP STOCK AGITATING APPARATUS

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PULP STOCK AGITATING APPARATUS

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5 Claims. (Cl. 92—37)

My invention relates to improvements in pulp stock agitating apparatus.

Pulp stock is largely water. The pulp wood fibers are carried in the water. In storing the stock prior to its fabrication into paper it is desirable to maintain a constant and uniform consistency of the pulp stock in order that when withdrawn from storage for paper fabrication it will be of a uniform character.

An object of my invention is to provide improved apparatus including the pulp storage chest or tank for agitating the pulp stock whereby the dispersion of the pulp wood fibers through the liquid will be kept uniform and constant.

Another object is to provide improved apparatus of the character set forth which is readily applicable without appreciable reconstruction to existing pulp storage tanks or chests.

A meritorious feature of my improved apparatus is the embodiment therein of means adapted to de-aerate the pulp stock to facilitate its recirculation by the pump.

In the recirculation of pulp stock by the pump through the storage chest it frequently happens that considerable air is entrained in the stock and this air interferes with the functioning of the pump. Improved means is here provided for de-aerating the pulp stock during its passage through the tank and for minimizing the tendency to entrain air upon its discharge from the pump into the tank during its recirculation.

The above objects and others together with various meritorious features and advantages will more fully appear from the following description, appended claims, and accompanying drawing, wherein:

The figure of the drawing illustrates a sectional view through a pulp stock storage tank of the vertical type wherein the pump together with its intake and outlet is shown in elevation.

In the drawing the pulp stock storage chest or tank is indicated as 10. It may be formed of concrete or other material suitable for the purpose. It is provided with a downwardly sloping concave floor 12 having a sump 14 arranged centrally thereof. A small drain 16, controlled by a valve mechanism not shown leads from this sump. This drain is for the purpose of draining off water used in the flushing or cleaning out of the tank preparatory to filling the same with pulp stock of a different character from that theretofore stored in the tank. Beater chests 18 superimpose the tank and are provided with outlets 20 leading thereinto. Outlet 20 from one beater chest is here shown as leading into the outlet of the pump mechanism hereinafter described. The top of the chest may be provided with a manhole 22 fitted with a cover and provided for the purpose of washing out the chest.

To accomplish recirculation of the pulp stock and maintain its uniform consistency while in storage in the chest I provide a pump 24 which may be suitably driven by motor 26. This pump has an intake 28 terminating in an inverted end portion 30 surmounting the sump 14 to draw pulp stock from this lowermost central portion of the tank. The pump is of a character suitable for this type of work and is adapted to deliver a large quantity of material at a low head. Pumps of the centrifugal or axial flow type are commonly em oyed. The pump may be provided with an outlet not shown for the forward delivery of the pulp stock in the manufacture of paper or an additional pump may be provided to withdraw pulp stock from the chest for use in the manufacture of paper, which additional pump might communicate directly with the interior of the chest or through the pump discharge 32. My invention resides in the structure which has to do with the agitation of the pulp stock within the chest and its re-circulation therethrough and the maintenance of a uniform consistency thereof rather than to the forward movement of the pulp stock from the chest to another unit in the system.

The pump has an outlet 32 which terminates in a horizontally extending portion of increasing diameter 34. This flaring outlet is disposed to discharge into the upper portion of the tank substantially at the center thereof. Additional beaters not shown might communicate with this flaring outlet as at 36.

Surmounting the sump and pump intake is a dome-shaped baffle 38 held spaced above the floor of the tank by supports 40. This baffle extends outwardly toward the wall of the tank so that the pulp stock flows thereover and underneath the margin thereof to the pump intake. The pulp stock moving downwardly through the tank is directed outwardly toward the side wall thereof on all sides so that the formation of dead spots within the tank at the juncture of the side wall and floor is prevented and a constant uniform movement of the pulp stock is produced. The baffle is provided with a pulp aperture 42 at its apex through which pulp stock or water may be caused to flow to prevent the clogging up of the material underneath the baffle.

Surmounting the dome-shaped baffle is a vertical standpipe 44 which is provided with a bot-

tom portion 46 and is carried upon standards or other supports 48. These standards are spaced apart so that pulp stock may recirculate therethrough over the top of the baffle. The standpipe is provided with a plurality of relatively large apertures 50 and is disposed directly underneath the discharge outlet for the pump. The pulp stock level within the tank is maintained preferably slightly below the top of the standpipe. The discharge from the pump is directly into the standpipe and the pulp stock flows out through the apertures 50 in the standpipe or overflows the top of the standpipe and flows down the sides of the standpipe. The pulp stock is withdrawn by the pump intake after it has passed over the baffle and underneath the margin thereof into the sump 14.

The discharge of the pulp stock into and through the standpipe produces a de-aeration of the stock as the air bubbles arise along the surface of the standpipe and discharge through the top of the pulp stock. The discharge of the pulp stock into the standpipe itself also tends to minimize the tendency to entrain any substantial quantity of air as is the case with its discharge directly into the top of a tank having a relatively large surface area. The outflow of pulp stock through the apertures 50 in the standpipe also produces a de-aeration of the stock. With this type of a structure the de-aeration is carried forwardly to the point that the pump will function effectively at all times for a maximum discharge as desired. The de-aeration is continued by the flow of pulp stock over the baffle and the outflow of pulp stock from the standpipe in all directions toward the side wall of the tank and its flow outwardly over the baffle toward the side wall of the tank produces a uniform and homogeneous mixture the constant uniform character of which is maintained by the circulation through the tank.

What I claim:

1. In pulp agitating apparatus, a pulp storage tank, a standpipe supported within the tank and provided with a plurality of apertures through its wall adapted to discharge the contents of the standpipe therethrough into the tank, a pump having its intake communicating with the bottom of the tank and having its outlet adapted to discharge into the top of said standpipe, an upwardly convex baffle surmounting said pump intake spaced above the floor of the tank at its margin and provided at its apex with an inlet aperture disposed underneath the lower end of the standpipe but of less diameter than the interior diameter of the standpipe, said standpipe supported with its lower end spaced above said inlet aperture through the baffle and with its upper end positioned adjacent to the top of the tank.

2. In pulp agitating apparatus, a pulp storage tank, a standpipe supported within the tank and provided with a plurality of apertures through its wall adapted to discharge the contents of the standpipe into the tank, said standpipe spaced above the floor of the tank and having a skirt flaring downwardly and outwardly from adjacent to the bottom of the standpipe toward the side wall of the tank and terminating spaced above the floor of the tank, a pump having its intake communicating with the interior of the tank underneath said skirt and having its outlet discharging into the top of said standpipe.

3. In pulp agitating apparatus, a pulp storage tank, a standpipe supported within the tank spaced above the floor thereof and provided with a plurality of outlets through its wall adapted to discharge the contents of the standpipe into the tank, and upwardly convex shield disposed below said standpipe and extending outwardly toward the wall of the tank on all sides substantially beyond the standpipe and adapted to direct the contents of the standpipe discharged through said outlets toward the side wall of the tank, said shield spaced at its margin above the floor of the tank, a pump having its intake communicating with the interior of the tank below said shield and having its outlet discharging into the top of the standpipe.

4. In pulp agitating apparatus, a pulp storage tank having a sump in its floor, a pump having its intake communicating with said sump, a dome-shaped baffle surmounting in spaced relationship said sump and pump intake and extending downwardly and outwardly toward the side wall of the tank, a standpipe supported by and extending upwardly from the apex of the baffle and provided with a plurality of apertures through its wall to discharge the contents of the standpipe into the tank above said baffle, said pump having its outlet discharging into the upper end of the standpipe.

5. In pulp agitating apparatus, a pulp storage tank having a floor sloping on all sides toward its center, a pump having its intake adjacent to the center of the floor of the tank, a dome-shaped baffle surmounting the pump intake and the floor of the tank adjacent thereto and flaring downwardly and outwardly from its apex toward the side wall of the tank on all sides, said baffle spaced on its margin above the floor of the tank and having outlets through its apex to admit pulp therethrough to the space underneath said baffle, a standpipe extending upwardly from the apex of the baffle to approximately the top of the tank and having its bottom spaced above said baffle and having its side wall provided with a plurality of apertures for the discharge of its contents into the tank, said pump having its outlet discharging into the top of said standpipe.

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