C. W. SHARTLE.

PULP REDUCING APPARATUS.

APPLICATION FILED SEPT. 28, 1912.

1,091,899.

Patented Mar. 31, 1914.

2 SHEETS—SHEET 1.

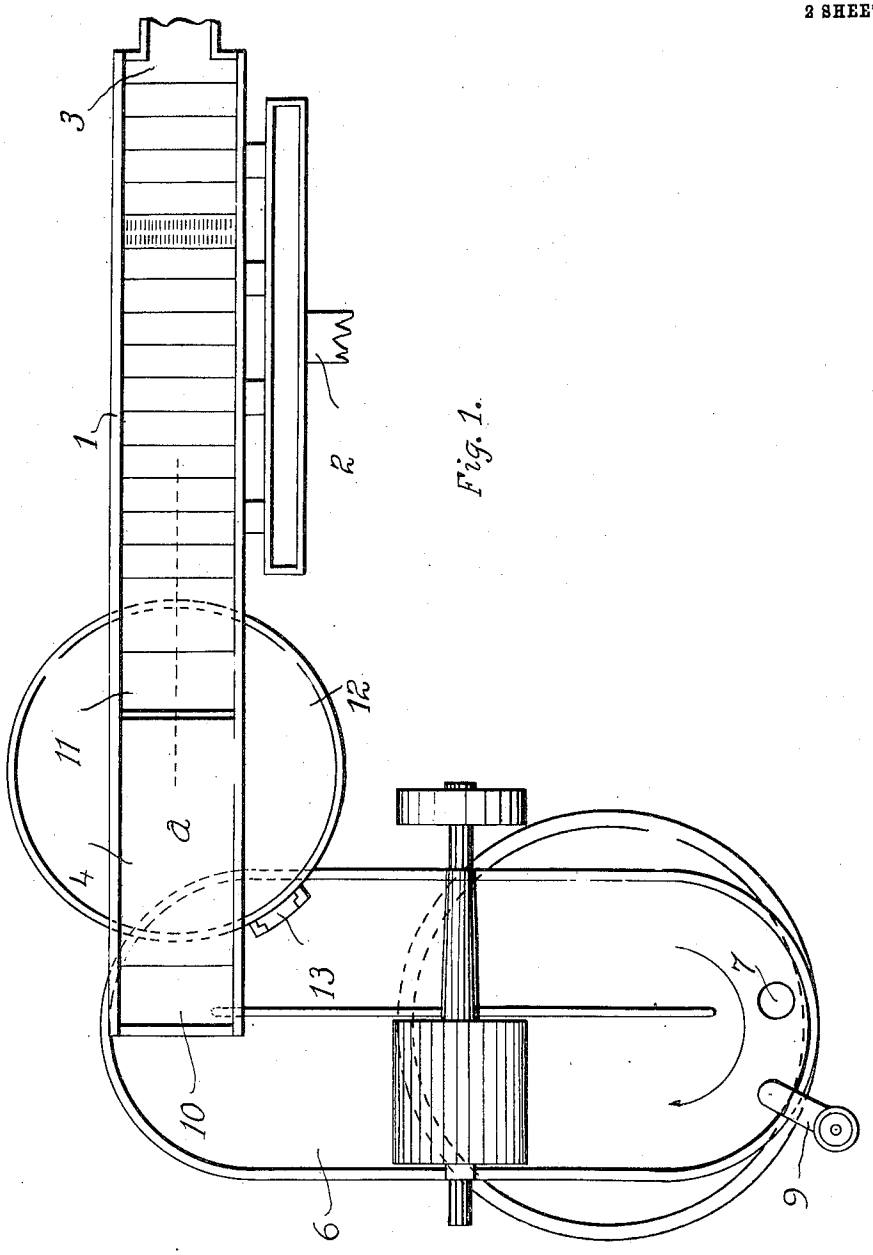


Fig. 1.

Witnesses:
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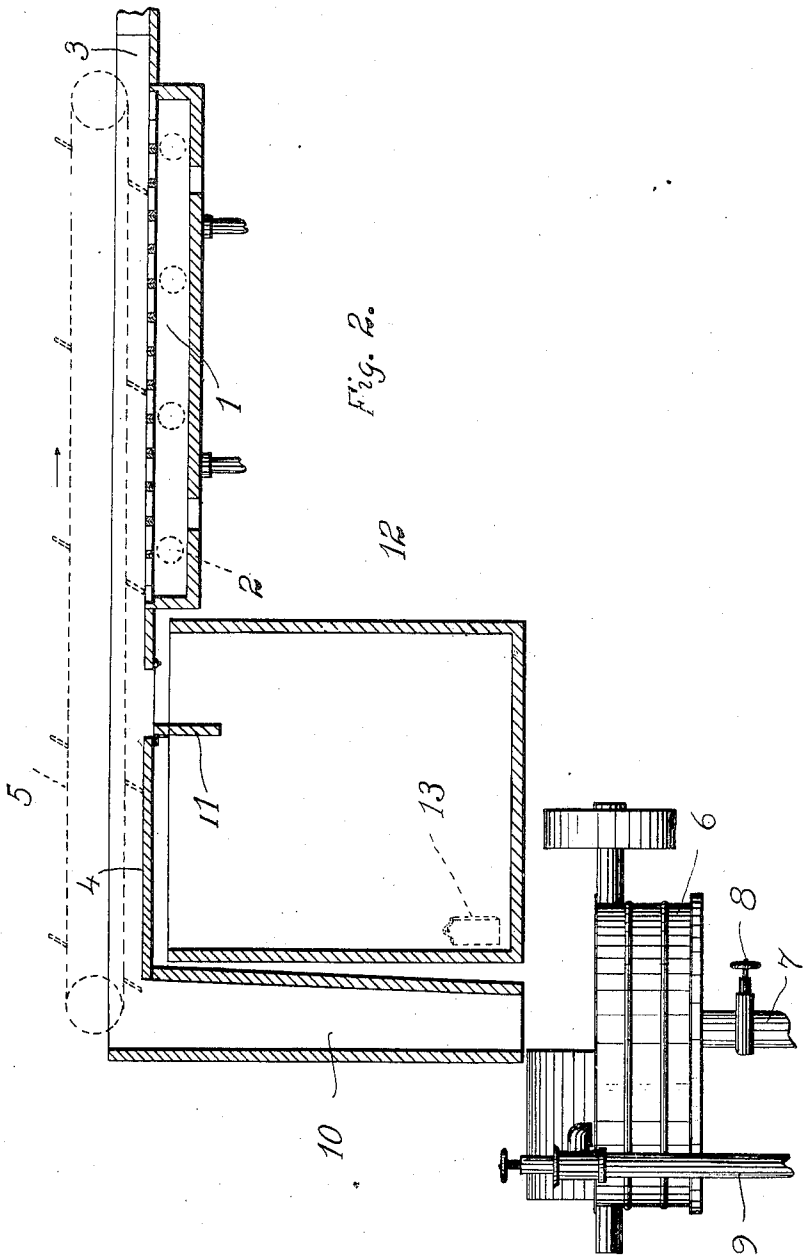


Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES WELLS SHARTLE, OF MIDDLETOWN, OHIO.

PULP-REDUCING APPARATUS.

1,091,899. Specification of Letters Patent. Patented Mar. 31, 1914.

Application filed September 28, 1912. Serial No. 722,804.

To all whom it may concern:

Be it known that I, CHARLES WELLS SHARTLE, a citizen of the United States, residing at Middletown, Butler county, Ohio, have invented certain new and useful Improvements in Pulp-Reducing Apparatus, of which the following is a specification.

In the manufacture of paper it is customary, by means of certain preliminary processes, to get the pulp into what might be called rough pulp condition requiring to be much further reduced to fit it for ultimate use. This rough pulp will generally contain more or less pulp of proper ultimate fineness. The properly fine pulp is separated from the rough pulp by a screening process carried on in screening machines of well known type.

My present invention pertains to a system of apparatus so organized that the screening machine may run with practical continuity, notwithstanding the fact that the rough pulp tailed away from the screening machine may require to be acted upon by reducing machinery working in a discontinuous manner.

My present invention will be readily understood from the following description taken in connection with the accompanying drawings in which:—

Figure 1. is a plan of a pulp-reducing apparatus exemplifying my invention, and Fig. 2 is a vertical longitudinal section of the same in the plane of line *a* of Fig. 1.

In the drawings:—1, indicates a pulp-screening machine of usual type; 2, the outlet therefrom for the pulp which is of such degree of fineness as to have passed through the screen-plates; 3, the head of the screen, onto which is to be delivered, by any suitable means, the rough pulp of such degree of wetness as is suitable for the screening operation; 4, the tail of the screen, onto which is to pass the rough pulp which is of such coarseness as to be unable to pass through the screen-plates; 5, an endless series of drag-blades of known construction arranged to drag the pulp over the screen-plates from the head to the tail of the screen; 6, a beating engine of known type, adapted to receive the rough pulp tailed off from the screen and, by operating upon that pulp after a proper length of time, to reduce it to proper degree of fineness, this beating engine being adapted to receive the tailings from the screen, the illustration showing the beating engine as being located upon a lower level than the screen, as on a lower floor of a mill, so that the tailings from the screen may flow to the beating engine by gravity; 7, a discharge pipe through which the beating engine may be emptied of its contents; 8, a gate in this discharge pipe; 9, a water supply pipe to deliver into the beating engine such water as may be needed in the pulp therein to fit it for proper action by the beating engine; 10, a chute adapted to deliver the tailings of the screen to the beating engine where gravity is depended upon to effect the delivery, as in the particular case illustrated; 11, a trap door in the tail of the screen between the terminal end of the screen and the terminal end of screen tail 4, this trap door being preferably located very near the terminal end of the screen; 12, a tank disposed between trap door 11 and the beating engine and having, preferably, a volume considerably in excess of that of the beating engine; and 13, a valve disposed at the base of the tank and adapted to permit the discharge of the contents of the tank or a portion thereof into the beating engine.

In the operation of the apparatus, in the particular form illustrated, the rough pulp, of proper wetness, goes onto the head of the screen and is dragged over the same by the drag-blades. Pulp of proper fineness passes through the screen-plates and out through the outlet 2 for utilization or for further treatment if need be. Trap door 11 being closed, the drag-blades drag tailward, the pulp too coarse to pass through the screen-plates, this coarse stuff passing off of the tail and thence into the beating engine through chute 10. As the pulp, in passing over the screen has not only parted with much of the finely reduced pulp but also a large quantity of the water carried by the pulp delivered to the screen, the pulp delivered to the beating engine is not sufficiently wet for beating operation. To make up for this deficiency a proper amount of water is admitted to the beating engine through supply pipe 9 and the described operation is continued until the beating engine is properly filled, it being understood, of course, that the beating engine is in motion and exercising its reducing function upon the pulp while the pulp is being delivered into it.

The beating engine having been properly filled with pulp and properly supplied with

water, trap door 11 is to be opened, whereupon the pulp, tailed from the screen, goes into tank 13 instead of into the beating engine, it being understood that valve 13 is closed. The beating engine operates upon the pulp within it until the same is reduced to the proper degree of fineness whereupon gate 8 is to be opened and the reduced pulp discharged through pipe 7 to some proper point for utilization or for further treatment if need be. In the meantime the screen has been tailing into the tank, and, when the beating engine has been emptied and gate 8 again closed, then valve 13 is to be opened and the contents of the tank or a sufficient quantity of the contents go into the beating engine to be acted upon by it in the same manner as it acted upon the tailings received by it directly from the screen. If there is a sufficient quantity of pulp within the tank to properly fill the beating engine then, after the transfer, valve 13 may be closed and the tailings from the screen may continue to go to the tank through the trap door. If there be an insufficient quantity of pulp in the tank to properly fill the beating engine then the quantity in the beating engine may be added to by tailings passing through the trap door and through the tank or, the trap door being closed, by tailings going to the beating engine through chute 10, or, in case of an insufficiency of pulp in the tank, the trap door may be closed and the beating engine may receive pulp simultaneously from the tank and from chute 10.

It will be apparent from the foregoing description that my invention consists in interposing between the screen and the beating engine or reducing mechanism a storage receptacle and in providing means for interrupting the discharge of the screen directly to the beating engine and causing the same to discharge into said storage receptacle, and further providing the storage receptacle with means for causing the desired portion of its contents to be discharged into the beating receptacle, thus enabling the screen to be operated continuously regardless of the amount of material being fed over the same. If there is but a small amount of waste or coarse material being discharged from the screen, which can be taken care of by the beating engine, the screen is allowed to discharge directly to the beating engine. However, if the amount of coarse material is such as to exceed the capacity of the beating engine it is discharged into the storage receptacle and thence into the beating engine when the latter is ready to receive it. In this manner the screen operates continuously and where the amount of coarse material is sufficient the beating engine can operate at its full capacity practically continuously because as soon as it has been emptied it can immediately be refilled from the storage receptacle without waiting for the slower process of filling it directly from the screen.

I wish it to be understood that I do not desire to be limited to the details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:—

1. Pulp-reducing apparatus comprising, a horizontal screen adapted to receive rough pulp at its head end, an outlet for the passage away from the screen of such water and fine pulp as may have passed through the plates of the screen, a series of drag-blades arranged to drag the material along over the screen and toward its tail, a beating engine arranged to receive the material passing over the tail of the screen and to beat the received material to proper fineness, a gated outlet to permit of the beating engine being emptied after its contents are properly beaten, and means to receive the tailings from the screen after the beating engine has been properly filled from the tail of the screen, combined substantially as set forth.

2. Pulp-reducing apparatus comprising, a horizontal screen adapted to receive rough pulp at its head end, an outlet for the passage away from the screen of such water and fine pulp as may have passed through the plates of the screen, a series of drag-blades arranged to drag the material along over the screen and toward its tail, a beating engine arranged to receive the material passing over the tail of the screen and to beat the received material to proper fineness, a gated outlet to permit of the beating engine being emptied after its contents are properly beaten, a tank, a doored passageway leading from the tail of the screen to the tank, and a valve in the base of the tank to permit the passage of pulp from the tank to the beating engine, combined substantially as set forth.

3. Pulp-reducing apparatus comprising, a horizontal screen adapted to receive rough pulp at its head end, an outlet for the passage away from the screen of such water and fine pulp as may have passed through the plates of the screen, a series of drag-blades arranged to drag material along over the screen and toward its tail, a beating engine arranged to receive the material passing over the tail of the screen and to beat the received material to proper fineness, a chute leading from the tail of the screen to the beating engine, a tank disposed below a tail portion of the screen, a doored passage at the tail of the screen between the screen-plates and said chute and adapted to deliver tailings from the screen into the

tank, and a valve passage leading from the base of the tank to the beating engine, combined substantially as set forth.

4. In pulp-reducing apparatus, the combination of a screen for separating fine pulp from coarse pulp, means for passing pulp across the screen, beating engine for treating the waste pulp incidental to the screening process, direct means for conveying such waste pulp from the screen to said beating engine, and indirect means for conveying waste pulp from the screen to said beating engine comprising a tank having a gated inlet by which the waste pulp may have ingress from said screen to the tank and a gated outlet by which said waste pulp may have egress from the tank into said beating engine.

5. In pulp-reducing apparatus, the combination of a beating engine, a screen, a discharge outlet for screened pulp, means for dragging pulp across the screen, a passage for tailings leading from the screen to the beating engine, a storage tank intermediate the screen and the beating engine, a movable gate for delivering tailings from the screen to the tank, and a movable gate for delivering tailings from the tank to the beating engine.

6. The combination, with reducing mechanism, a screen for separating fine pulp from coarse pulp, said screen being arranged to discharge directly into said reducing mechanism, of a storage receptacle interposed between said screen and said reducing mechanism, means for interrupting the discharge of pulp from said screen directly to said reducing mechanism and causing said pulp to be discharged directly into said receptacle, and means to discharge pulp from said receptacle into said reducing mechanism.

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