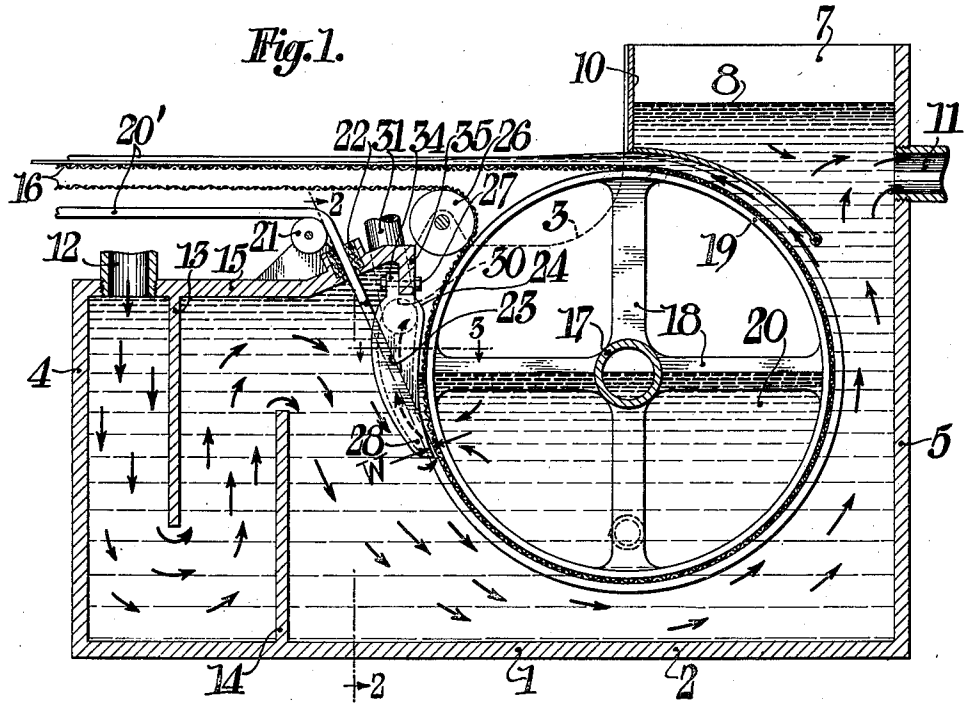
June 30, 1936. G. T. LANE ET AL 2,046,271

CONTROLLED LEAK FOR PAPER MAKING MACHINES

Filed Oct. 26, 1935

Fig. 1.



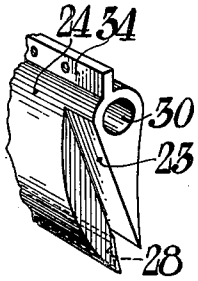


Fig. 4.

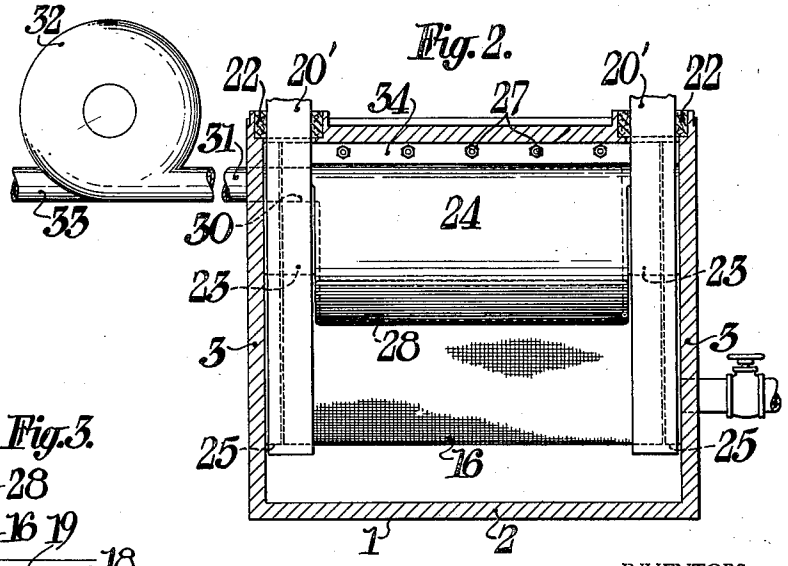


Fig. 2.

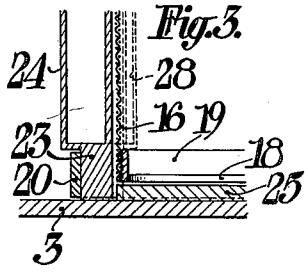


Fig. 3.

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CONTROLLED LEAK FOR PAPER MAKING MACHINES

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Application October 26, 1935, Serial No. 46,954

12 Claims. (Cl. 92—43)

This invention relates to paper making machines, and, more particularly, to paper making machines of the type in which a making wire passes around a cylinder in a stuff box and receives a layer of fibers therein. One object of our invention is to provide a stuff box with a means for definitely controlling the leakage of stuff at the point where the making wire enters the pool of stuff. Another object of our invention is to provide a dam which lies close to but which does not touch the making wire passing into the stuff box so that undue wear on the making wire is definitely eliminated and friction is correspondingly reduced. Another object of our invention is to provide a means for controlling the leakage of stuff from the stuff box at the point where the making wire enters the pool of stuff, said means also including an arrangement by which any small particles adhering to the making wire are removed from the wire immediately before the wire passes into the pool of stuff. Another object of our invention is to provide a device of a class described with a leakage control which is permanent in that it does not have to be adjusted or replaced regardless of the extent of use and other objects will appear from the following specification, the novel features being particularly pointed out in the claims at the end thereof.

Our invention is particularly adapted for use on paper making machines of the type shown in our copending application, Serial No. 699,776, filed November 25, 1933. Reference may be had to this application for a more detailed description of the complete paper making machine, although we have described in the present application all parts of said machine which are necessary for a complete understanding of our present invention.

Coming now to the drawing wherein like reference characters denote like parts throughout,

Figure 1 is a sectional view through a stuff box constructed with and embodying a preferred form of our invention, certain parts being shown on a somewhat exaggerated scale to better illustrate the invention,

Figure 2 is a line on section 2—2 of Fig. 1,

Figure 3 is a fragmentary sectional view on line 3—3 of Fig. 1,

Figure 4 is a detail perspective view of the end of the control leak dam.

As a typical example of our invention we have shown it as applied to a simple type of stuff box designated broadly as 1. This stuff box may consist of a bottom wall 2, side walls 3 and end walls 4 and 5. It should be noted that end wall 5 is somewhat higher than wall 4 and that the side walls 3 are increased in height as shown at 7 so that the upper surface 8 of the pool of stuff contained in the box may, if desired, be raised considerably above the top of the cylinder 9 which is revolvably mounted in the stuff box. If desired, a slice 10 may be used to control the level of the stuff in the stuff box and we prefer to provide an outlet or overflow 11.

The stuff may enter the stuff box through an inlet 12 and may then pass around the baffles 13 and 14 through a more or less tortuous channel, baffle 13 extending downwardly from a top wall 15 and baffle 14 extending upwardly from the bottom wall 2. The particular shape of the channel through which the stuff flows is not important, but we prefer to have the stuff thoroughly mixed and to flow it in the same direction that the cylinder 9 may turn and preferably at least a portion of the stuff should move at substantially the same surface speed as that of the making wire 16 which passes around the cylinder 9.

The cylinder 9 may be of known construction and may have a hub 17 from which a series of spokes 18 extend outwardly to support rims 19. The hub 17 is tubular in shape and may be open on the inside of the cylinder so that white water 20 which passes into the cylinder through the making wire 16 may create pressure such as a certain amount of vacuum as the white water is withdrawn so that the fibers may be rapidly laid upon the making wire.

The width of the sheet is determined by the deckel straps 20' which may pass over guide rollers 21 through a suitable water seal 22 into the stuff chest. After passing into the stuff chest, the deckel straps rest on a flat edge or face 23 on the edges of a dam member designated broadly as 24 and then pass about the periphery of the cylinder laying on top of the making wire 16 which passes around the cylinder and overlapping slightly the edges 25 of the circular flanges which are affixed to the walls 3 of the stuff chest and which with the deckel straps 20 form a substantially water-tight seal between the interior of the drum 9 and the stuff chest.

In order to prevent stuff from leaking out between that part of the stuff chest 1 that the making wire 16 enters, we provide a dam indicated broadly as 24. The making wire 16 passes over the guide rollers 26 and from that point follows the periphery of the drum 9 downwardly into the stuff. The dam 24 is provided with a

flange 34 which may be bolted as at 27 to a downwardly extending flange 35 on the top 15 of the stuff chest. The dam 24, as indicated best in Fig. 2, extends across between the side walls 3 and is provided with a pair of surfaces 23 against which the deckel straps 20 may press. The dam 24 is of a hollow construction and is provided with a flat slot or nozzle 28 adapted to rest close to, but out of contact with, the making wire 16.

This is best shown in Fig. 1 wherein the nozzle 28 is spaced from the making wire 16 a distance W which for the purpose of illustration may be 1/8 of an inch, as we have found this spacing entirely satisfactory. It is to be understood, however, that this spacing may be altered to suit the consistency of the stock or other conditions and that it is given to illustrate our invention only.

As above explained, the dam 24 is hollow so that an opening extends up on the inside of the dam from the slot 28 to the top of the dam across which there is a tubular opening 30 to which there may be attached a pipe 31, this pipe leading out through a side wall 3 of the stuff chest and being connected to a vacuum pump 32 so that exhaust material may pass out from the dam 24 through the outlet pipe 33. We have found that by providing a dam 24 which does not stop all of the stuff from leaking through between the dam and the making wire has many advantages over a dam which prevents leakage. In the first place, the making wires 16 are, of course, very expensive and any pressure against the making wire tends to shorten its life. This is particularly true where considerable pressure is built up in the stuff chest as by having a vacuum or partial vacuum inside of the drum. Secondly, any pressure, as by flexible dam member against the making wire, creates considerable friction since the pressure of the stuff over a relatively wide machine (as for instance a 100 inch machine) is quite considerable. Thus, more power is required to operate the machine.

When we space a heavy fixed dam member, as described above, a short distance W from the making wire the small quantity of stuff, which tends to leak through this opening, is immediately withdrawn through the nozzle 28 by the suction created by the pump 32. It is to be understood that the width of the slot in the nozzle 28 has considerably greater capacity than the slot W between the nozzle and the making wire and consequently the pump 32 withdraws all leakage which occurs as above described.

There is, however, another and a very useful feature in having the nozzle 28 of a reasonable large capacity because this nozzle then draws white water directly through the making wire 16 from the interior of the drum 9 so that this white water not only washes off any fibers or dirt which may have accumulated on the making wire 16 just prior to the making wire passing into the stuff chest 1, but in addition, this white water helps dilute the small amount of stuff which leaks between the dam and the cylinder and thus carry it off more readily.

From the above description it will be seen that we actually provide a controlled leak at the point where the making wire passes beneath the surface of the stuff. Thus the dam member can be made of heavy materials as, for instance, by casting and can be accurately finished to the proper shape so that the space between the wire and the dam will remain constant. This has material advantages since it is possible to set the dam in place and to leave it without any adjustment and there is no wear on either the dam or the making wire.

The operation of our preferred dam is as follows: The making wire 16 passes around the guide roll 26 into contact with the periphery 9 of the drum and passes down into the stuff box past our controlled leak which is formed by spacing the dam member 24 from the making wire 16. The small amount of leakage is immediately removed by the suction pump 32 and with it a small quantity of the white water 20 in the cylinder is drawn out because of the suction. This causes the white water to flow through the periphery of the cylinder 9 and through the making wire 16 so that the wire is effectively washed off just before it enters the pool of stuff. Passing around through the stuff the fibers are laid rapidly on the making wire due to the hydrostatic head or to the difference in pressure between the inside of the cylinder and the outside which is surrounded by stuff. As the making wire leaves the cylinder a layer of paper passes out with the wire in a wet state, the wire draining off or being drawn off as by suction as is customary with such machines. Any small particles of paper which may stick to the wire are removed by the white water passing through the wire as the wire passes the nozzle 28. Consequently, paper is formed on a perfectly clean wire.

We have described and illustrated a preferred embodiment of our invention simplifying the showing as much as possible to facilitate understanding the invention. It is obvious that various forms of structure may be used without departing from our invention as defined in the following claims.

What we claim is:

1. In a paper making machine, the combination with a stuff box, of a cylinder mounted therein, a making wire passing around the cylinder and means for controlling the flow of stuff in the stuff box relatively to the making wire including a dam spaced from the making wire, said dam including means for drawing off stuff leaking between the dam and the wire.

2. In a paper making machine, the combination with a stuff box, of a cylinder mounted therein, a making wire passing around the cylinder and means for controlling the flow of stuff in the stuff box relatively to the making wire including a dam spaced from the making wire a predetermined distance whereby a predetermined amount of leakage may occur through the space between the dam and wire, and means, having a capacity in excess of the predetermined leakage, adapted to withdraw the leakage from between the dam and wire.

3. In a paper making machine, the combination with a stuff box, of a cylinder mounted therein, a making wire passing around the cylinder and means for controlling the flow of stuff in the stuff box relatively to the making wire including a dam spaced from the making wire, said dam including a hollow member extending across the stuff box and having a nozzle of greater width than the space between the dam and wire, and suction means applied to said nozzle for withdrawing the leakage.

4. In a paper making machine, the combination with a stuff box including bottom, side and end walls, of a cylinder revolvably mounted in said box and substantially engaging the side walls thereof, a making wire passing around the cylinder and to and from the box, means for pre-

venting the escape of stuff from the box at the place where the wire passes into the stuff comprising a hollow dam including an apertured wall lying close to but out of contact with the wire permitting predetermined stuff leakage therebetween, and means for creating a suction in the hollow dam through the apertured wall to withdraw the leakage, said dam extending across the stuff box and having a substantially fluid tight connection therewith.

5. In a paper making machine, the combination with a stuff box including bottom, side and end walls, of a cylinder revolvably mounted in said box and substantially engaging the side walls thereof, a making wire passing around the cylinder and to and from the box, means for preventing the escape of stuff from the box of the place where the wire passes into the stuff comprising a hollow dam including an apertured wall lying close to but out of contact with the wire permitting predetermined stuff leakage therebetween, and means for creating a suction in the hollow dam through the apertured wall to withdraw the leakage, the aperture in the dam having a much greater capacity than the capacity of the opening between the dam and the wire whereby all leakage therebetween may be withdrawn.

6. In a paper making machine, the combination with a stuff box adapted to contain a pool of stuff, of a foraminous cylinder rotatably mounted therein, a making wire passing around and to and from the stuff box, means for introducing the making wire into the stuff box below the level of stock therein comprising a dam consisting of a hollow member extending across the stuff box adjacent the screen but spaced therefrom a predetermined distance, and means for removing all of the stuff leaking between the hollow member and the screen said means also drawing white water through the foraminous cylinder and screen to clean the latter immediately before it enters the pool of stuff.

7. In a paper making machine, the combination with a stuff box having bottom, side and end walls adapted to contain a pool of stuff, of a foraminous cylinder revolvably mounted therein below the level of the pool of stuff the ends of the cylinder being sealed against the side walls of the box and being adapted to receive white water through the foraminous walls thereof, a making wire passing to and from the box and around the cylinder beneath the surface of the stuff, means for preventing stuff from leaking from the box when the screen enters the stuff comprising a rigid hollow member, means for creating a suction therein, said hollow member including a hollow nozzle slotted at the end and having the end spaced from the wire a slight distance permitting a small predetermined leakage therethrough the suction through the hollow nozzle being adapted to remove said leakage together with a quantity of white water passing through the cylinder and wire at the dam, whereby leakage is prevented and the making wire may be cleaned as it enters the stuff.

8. In a paper making machine, the combination with a stuff box including a plurality of walls and adapted to contain a pool of stuff, of a cylinder revolvably mounted therein and adapted to contain white water, a making wire passing around the cylinder and into and from the pool of stuff, a hollow dam member mounted in the stuff box, adjacent the making wire passing into the stuff adapted to partially seal the wire to prevent material stuff leakage, and means included in the dam for removing the stuff passing through the partial seal.

9. In a paper making machine, the combination with a stuff box including a plurality of walls and adapted to contain a pool of stuff, of a cylinder revolvably mounted therein and adapted to contain white water, a making wire passing around the cylinder and into and from the pool of stuff, a hollow dam member mounted in the stuff box adjacent the making wire passing into the stuff adapted to control the leakage therethrough, suction means associated with the hollow dam to remove said controlled leakage, said removal being facilitated by white water passing through the making wire adjacent the dam.

10. In a paper making machine, the combination with a stuff box including a plurality of walls and adapted to contain a pool of stuff, of a cylinder revolvably mounted therein and adapted to contain white water, a making wire passing around the cylinder and into and from the pool of stuff, a hollow dam member mounted in the stuff box adjacent the making wire passing into the stuff adapted to partially seal the wire to prevent material stuff leakage, and means included in the dam for causing white water from the cylinder to pass through the making wire and into the hollow dam.

11. In a paper making machine, the combination with a stuff box including a plurality of walls and adapted to contain a pool of stuff, of a cylinder revolvably mounted therein and adapted to contain white water, a making wire passing around the cylinder and into and from the pool of stuff, a hollow dam member mounted in the stuff box adjacent the making wire passing into the stuff adapted to control the leakage therethrough, ends on the dam forming runways, deckel straps passing over said runways onto the making wire, and suction means associated with the dam to control the leakage therethrough.

12. In a paper making machine, the combination with a stuff box including a plurality of walls and adapted to contain a pool of stuff, of a cylinder revolvably mounted therein and adapted to contain white water, a making wire passing around the cylinder and into and from the pool of stuff, a hollow dam member mounted in the stuff box adjacent the making wire passing into the stuff adapted to control the leakage therethrough, ends on the hollow dam having runways and adapted to contact with the sides of the stuff box, deckel straps passing into the stuff box across said runways, and suction means for removing the leakage past the dam and deckel straps.

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