

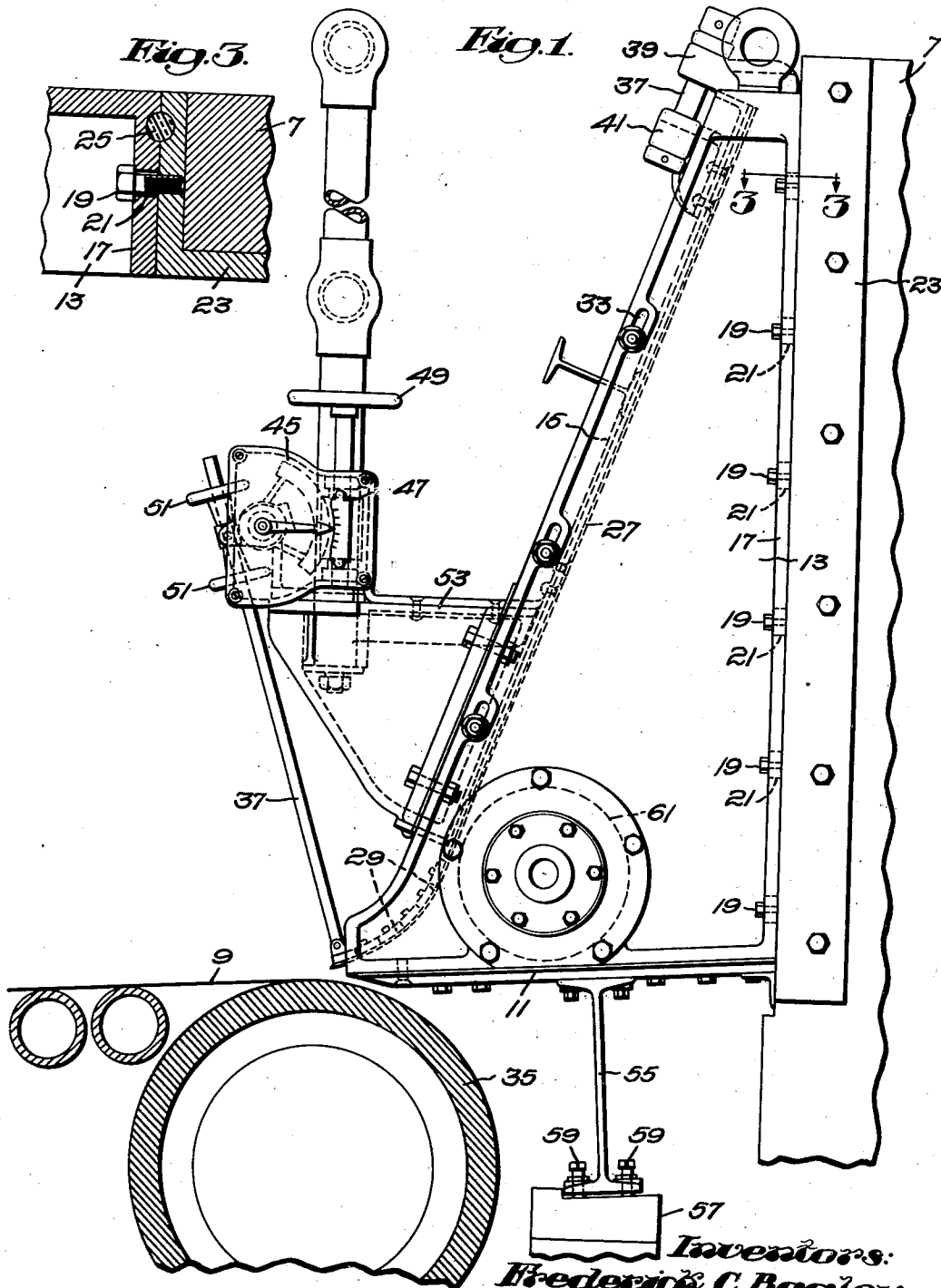
May 2, 1933.

F. C. BAGLEY ET AL
PAPER MAKING MACHINE

1,906,355

Filed March 15, 1932

2 Sheets-Sheet 1



Inventors:
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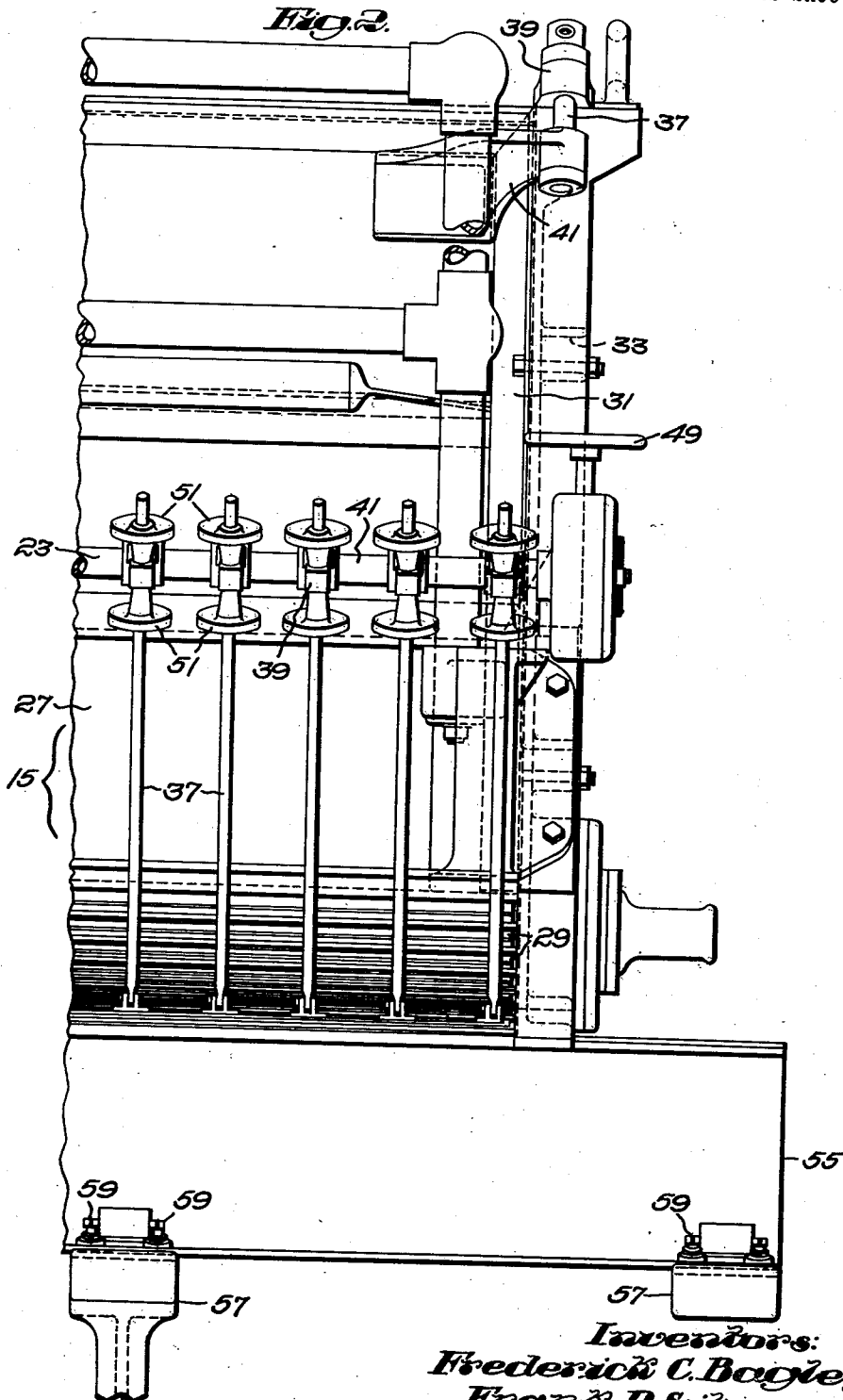
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UNITED STATES PATENT OFFICE

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PAPER-MAKING MACHINE

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This invention relates to paper-making machines of the Fourdrinier type and more particularly to the means whereby the pulp is discharged from the head box or flow box to the travelling wire, such mechanism being sometimes referred to as a slice. The object of the invention is to provide an improved construction whereby the flow of pulp to the wire may be accurately governed to give the best results and preferably one providing for making the proper adjustments while the machine is in operation so that the results of the adjustments may be visually observed.

Our invention will be well understood by reference to the following description taken in connection with the accompanying drawings, wherein:—

Fig. 1 shows the slice in side elevation;

Fig. 2 is a partial end elevation of the parts as seen from the left of Fig. 1; and

Fig. 3 is a sectional detail on the line 3—3 of Fig. 1.

Referring to the drawings, we have there shown the head box or flow box 7 of a paper-making machine from which the pulp is discharged to the travelling wire 9 through the slice embodying the bottom apron 11 over which the pulp flows, the side plates 13 which confine it laterally and the upper apron 15, the lower edge of which is forwardly curved to define with the bottom apron 11 a narrow slot-like opening through which the pulp flows to the wire. The side plates 13 herein have secured thereto the two aprons and take the form of suitable castings having outwardly turned flanges 17 secured by means of the cap screws 19 passing through slots 21 in the flanges to the metal plates 23 bolted to the head box 7. As seen in Fig. 3, suitable packing 25 may be interposed between the flanges 17 and the plates 23.

The bottom apron 11 may be bolted as shown to the side plates. The front apron 15 comprises essentially a thin brass plate 27 which may be suitably reinforced as, for instance, by the lags 29 along its lower edge, which permit the lower portion of the plate to be flexed as hereinafter described, and by the side pieces 31 by means of which it may be bolted to the side plates through the elongated

diagonal slots 33 along the front edges of the latter. This upper apron is generally diagonally disposed, sloping forwardly and downwardly toward the wire 9 and its lower edge is curved forwardly and in use projects, as shown in Fig. 1, somewhat beyond the forward end of the bottom apron 11, yet desirably terminates somewhat to the rear of the center line of the breast roll 35 over which wire 9 passes, the bottom apron 11 in turn being positioned as nearly tangent to the uppermost point of this breast roll as is practical in view of the size of the parts and the necessary clearances.

Since the front apron is bolted through the slots 33, it may be moved bodily up and down as by means of the hoisting screws 37 interposed between suitable brackets 39 projecting from the side plates and the brackets 41 secured to the exterior face of the apron. In the example of the invention shown the movement is diagonal. It not only alters the size of the opening between the upper apron and the lower apron, but moves forwardly or rearwardly, as the case may be, the leading edge of the former. The adjustments in question are very small and there is sufficient play in the bolted connection and in the hoisting screw to permit, if desired, an angular movement of the front apron which will permit the lower edge thereof to be moved vertically without substantially altering the position of the leading edge relative to the leading edge of the bottom apron 11. When the position of the forward edge of the apron is changed by the diagonal adjustment to compensate for any attendant alteration of its vertical position, the lower edge may be flexed as a whole and we have herein (see Fig. 2) shown connected at suitable intervals along its lower edge the rods 37 connected to the pivoted blocks 39 on arms 41 carried by a rock shaft 43 which (see Fig. 1) may be moved by means of sector 45 on the end thereof cooperating with a worm 47 which may be turned by means of hand-wheel 49. In Fig. 1 we have shown suitable means for indicating the angular position of the rock shaft.

In order to permit local adjustment of the thickness of the sheet of stock which flows

out from the slice the edge of the upper apron may be flexed locally as well as a whole and for this purpose the rods 37 may be individually adjusted relative to the blocks 39 by means of suitable nuts 51 threaded thereon.

The means for flexing, whether as a whole or locally, the lower edge of the upper apron is carried as a whole by said apron to move therewith independently of relatively fixed parts of the machine, it being here shown as carried by a shelf-like structure 53 secured to the exterior forward face of said upper apron.

We also provide means whereby the slice may be positioned as a whole, for instance, properly to locate the lower apron 11 without disturbing its relation to the other parts. We have already explained that the cap screws 19 pass through slots in the flanges 21 of the side plates so that when the are slacked off the side plates can be moved relatively to the head box 7. To effect this movement and also to provide for angular adjustment of the lower plate the slice may be supported by the I beam 55 extending beneath the lower apron 11 and cooperating at suitable intervals transversely of the machine (see Fig. 2) with supports 57 with which it is engaged by means of the adjusting screws 59 passing through either flange of the I beam to engage the supports. By turning these screws the slice as a whole may be raised, levelled transversely or, by manipulation of the bolts through one flange differentially as regards those on the other, angularly positioned.

In the drawings we have shown the bottom apron 11 as parallel to the wire 9, which we consider the most desirable arrangement.

In Fig. 1 we show at 61 a distributor roll operating within the slice.

It will be seen that the means for properly positioning the slice and its elements, whether at 59, 37, 49 or 51, are all exteriorly exposed convenient for manipulation and are independent of other parts of the machine. The arrangement is such that any desired changes can be effected while the machine is in operation and their effect thus observed. The appearance of the sheet on the wire will to the skilled eye indicate whether the pulp is being properly supplied thereto. For instance, considering the width of the slot through which the discharge is made, although the lower edge of the upper apron be positioned by most careful measurements, irregularities may appear which may be readily observed in the sheet on the wire by its relative wetness and which will require correction by local flexing of the edge of the apron as by means of the adjustments at 51.

We are aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes

thereof, and we therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

We claim:

1. In combination with the pulp head-box and travelling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising as a unitary structure a bottom apron over which the pulp flows, side plates and a top apron received between them and means accessible from the exterior for bodily vertically adjusting said discharge means as a unit.

2. In combination with the pulp head-box and travelling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising as a unitary structure a bottom apron over which the pulp flows, side plates and a top apron received between them and means accessible from the exterior for bodily vertically and angularly adjusting said discharge means as a unit.

3. In combination with the pulp head-box and travelling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising as a unitary structure a bottom apron over which the pulp flows, side plates and a top apron received between them having a forwardly projecting lip and having means accessible from the exterior for adjusting the top apron relatively to the other parts, and means accessible from the exterior for bodily vertically adjusting said discharge means as a unit.

4. In combination with the pulp head-box and travelling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising as a unitary structure a bottom apron over which the pulp flows, side plates and a top apron received between them having a forwardly projecting lip and having means accessible from the exterior for adjusting the top apron relatively to the other parts, said top apron carrying means whereby its lower edge may be flexed, and means accessible from the exterior for bodily vertically adjusting said discharge means as a unit.

5. In combination with the pulp head-box and travelling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising the lower apron, side plates and upper apron diagonally disposed and having its lower end projecting forwardly to define in cooperation with the forward end of the lower apron a discharge opening to the wire, said top apron being movable bodily in said diagonal direction to advance its leading edge.

6. In combination with the pulp head-box and travelling wire of a paper-making ma-

chine, the means for discharging pulp from the box to the wire comprising the lower apron, side plates and upper apron diagonally disposed and having its lower end projecting forwardly to define in cooperation with the forward end of the lower apron a discharge opening to the wire, said top apron being movable bodily in said diagonal direction to advance its leading edge, and means for flexing the lower end of the apron to raise and lower said leading edge.

7. In combination with the pulp head-box and traveling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising the lower apron, side plates and upper apron having its lower end forwardly directed to define in cooperation with the lower apron a slot-like opening through which the pulp passes, said upper apron being mounted to provide for variation of the depth of said opening while maintaining the longitudinal position of the forward edge thereof and likewise having provision for altering the longitudinal position of said forward edge while maintaining its vertical position, and means carried bodily by said apron for locally flexing said edge across its width.

8. In combination with the pulp head-box and travelling wire of a paper-making machine, the wire being trained about a breast roll adjacent the head-box, the means for discharging pulp to the wire comprising the lower apron disposed approximately tangent to the breast roll, its edge lying rearwardly of the center thereof, side plates and an upper apron having its lower portion forwardly directed to define with the lower apron a slot-like opening through which the pulp passes, the lower edge projecting forwardly of the edge of the lower apron but terminating rearwardly of the center of the breast roll.

9. In combination with the pulp head-box and travelling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising the lower apron, side plates and upper apron diagonally disposed in a downwardly and forwardly sloping direction and having its lower end projecting forwardly to define in cooperation with the forward end of the lower apron a discharge opening to the wire, said top apron being movable bodily in said diagonal direction to advance its leading edge, and tensioning means extending in a downwardly and rearwardly sloping direction attached to the lower edge of the apron for effecting a compensating flexure thereof.

10. In combination with the pulp head-box and travelling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising the lower apron, side plates and upper apron having its lower end projecting forwardly

to define in cooperation with the forward end of the lower apron a discharge opening to the wire, and means accessible from the exterior for manipulating said upper apron to adjust the position of the forward edge thereof in a longitudinal direction relatively to the lower apron.

11. In combination with the pulp head-box and travelling wire of a paper-making machine, the means for discharging pulp from the box to the wire comprising the lower apron, side plates and upper apron having its lower end projecting forwardly to define in cooperation with the forward end of the lower apron a discharge opening to the wire, means for adjusting vertically the position of said lower apron relatively to the travelling wire, and means accessible from the exterior for manipulating said upper apron to adjust the position of the forward edge thereof in a longitudinal direction relatively to the lower apron.

In testimony whereof, we have signed our names to this specification.

F. C. BAGLEY.

FRANK P. SILVER.

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