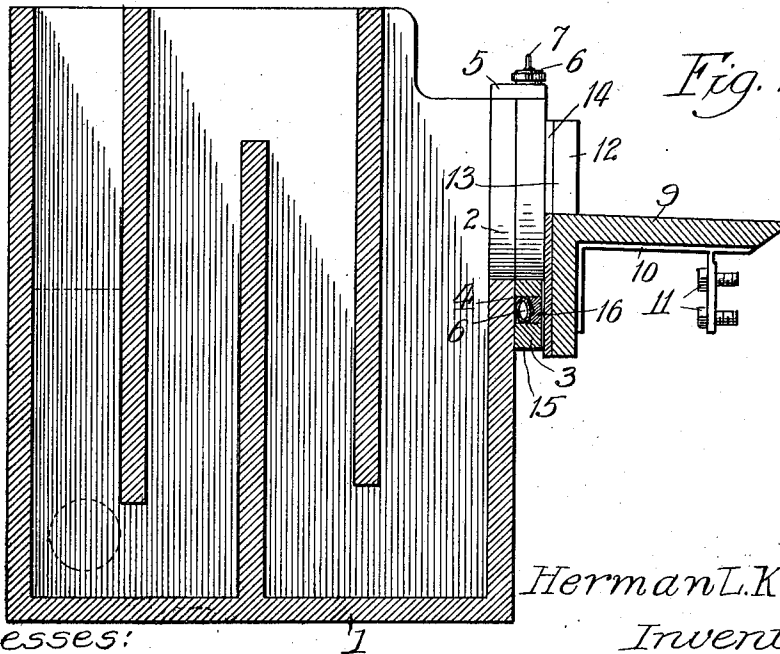
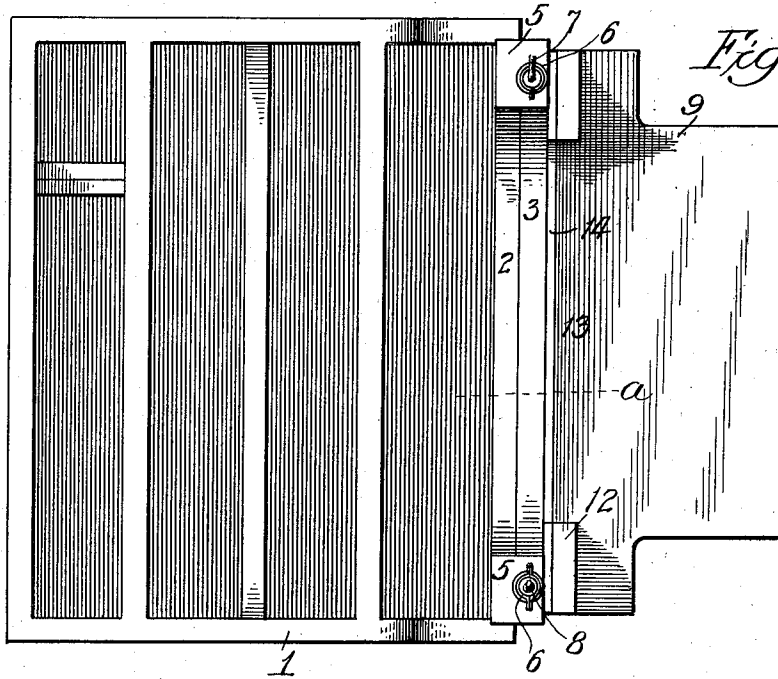


H. L. KUTTER.
PAPER MAKING MACHINE.
APPLICATION FILED MAR. 2, 1912.

1,028,573.

Patented June 4, 1912.

2 SHEETS—SHEET 1.



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by James W. See

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2 SHEETS-SHEET 2.

Fig. 4.

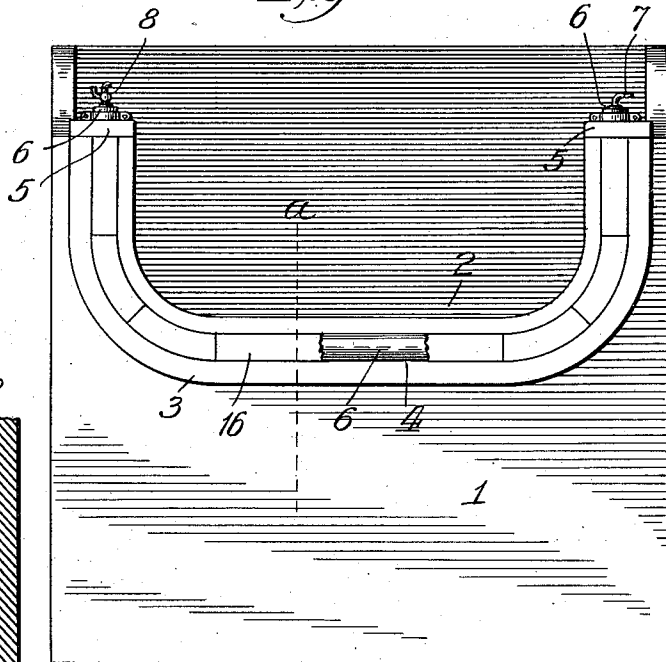


Fig. 3.

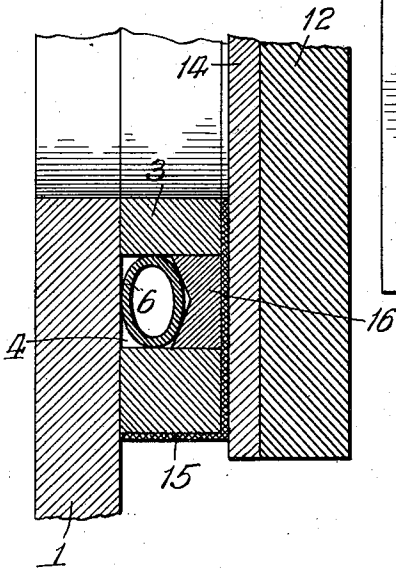
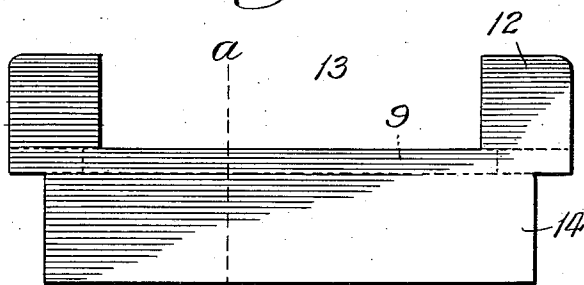


Fig. 5.



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UNITED STATES PATENT OFFICE.

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PAPER-MAKING MACHINE.

1,028,573.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed March 2, 1912. Serial No. 681,033.

To all whom it may concern:

Be it known that I, HERMAN L. KUTTER, a citizen of the United States, residing at Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Paper-Making Machines, of which the following is a specification.

This invention pertains to an improved system of construction for the juncture between the flow-box and the apron-board of Fourdrinier paper-making machines.

In all ordinary Fourdrinier machines the Fourdrinier part, including the wire, has a side shake, and the provision for delivery upon the shaking wire the pulp coming from the flow-box generally consists of an apron of flexible material supported by the flow-box and resting upon the wire at the breast-roll. The lateral as well as the vertical flexibility of the apron adequately compensates for the side shaking of the wire and the advanced end of the apron. In these ordinary Fourdrinier machines the vertical relationship of the breast-roll to the flow-box remains practically constant, and if there were a slight variation the vertical flexibility of the apron could compensate for it. But there is a type of Fourdrinier machine in which the breast-roll end of the Fourdrinier part is vertically adjustable, sometimes to a very considerable extent. See, for instance, the Kutter United States Patent No. 654651, of July 31st, 1900, and the Kutter Patent No. 993692, of May 30th, 1911. No ordinary arrangement of the flexible apron can satisfactorily take care of the wide range of adjustment in this Kutter type of Fourdrinier machine.

My present invention comprehends such a construction of the juncture between the flow-box and the Fourdrinier part as will provide for any of the side shaking motions in any Fourdrinier machine, and for such motions as well as for the vertical adjustments in Fourdrinier machines of the Kutter type. Instead of securing the apron-board to the flow-box so that it is stationary relative to the Fourdrinier part, as is usual, I secure the apron-board to the Fourdrinier part so that it may partake of all of the shaking motion and vertical adjustments of the Fourdrinier part, and I arrange for a sliding contact between the apron-board and the flow-box.

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

Figure 1 is a plan of the flow-box and apron-board exemplifying my invention: Fig. 2 a vertical section of the same in the plane of line *a* of Figs. 1, 4 and 5: Fig. 3 a vertical section through portions of the flow-box and apron-board in the plane of line *a* of Figs. 1, 4 and 5 on a scale much greater than that of the remaining figures: Fig. 4 a front elevation of the flow-box, portions of two packing-shoes being broken away, and the nosing-felt being omitted: Fig. 5 a rear elevation of the apron-board.

In the drawings:—1, indicates the flow-box, of not unusual construction, except as hereinafter explained: 2, the outflow notch in the front wall thereof, the corners of this notch being preferably formed with free curves as illustrated, thus avoiding real corners: 3, a flat-faced nosing projecting forwardly from the front wall of the flow-box and margining the sides and bottom of the outflow notch therein, the purpose of this nosing being to avoid the necessity of making the entire front wall of the flow-box of great thickness, and to provide for convenient reparation: 4, an open-fronted groove in the face of the nosing, this groove extending continuously from the top of one side of the nosing to the top of the opposite side: 5, roof-blocks at the tops of the sides of the notch in the flow-box, these roof-blocks projecting over the upper ends of the groove in the nosing and being provided with apertures over the upper ends of the groove: 6, a hose disposed in the groove and having its ends projecting up through the apertures in the roof-blocks: 7, an inlet connection secured to one end of the hose and adapted for communication with any suitable source of supply of water or air under pressure, this inlet connection being illustrated as an elbow secured to the end of the hose by means of an ordinary hose-clamp: 8, an outlet cock similarly secured to the opposite end of the hose: 9, the apron-board, the same being adapted to have its front edge project over the wire at the breast-roll as usual, the rear edge of this board coming against the front face of the nosing of the flow-box, this apron-board being, however, not secured in any manner

to the flow-box but, on the contrary, being secured to the Fourdrinier part so as to partake of its movements of shaking and of adjustment: 10, brackets secured below the apron-board to serve in securing the apron-board to the Fourdrinier part and in connecting the apron-board with a rear facing-board: 11, screws in these brackets, typifying means by which the apron-board may be secured to the Fourdrinier part: 12, a rear facing-board, forming part of the apron-board and seating against the face of the nosing of the flow-box, this facing-board extending some distance above the apron-board and extending such distance below the apron-board that it will always cover the groove in the nosing regardless of the vertical adjustment of the apron-board: 13, an outflow notch in the top of facing-board 12, the base of this board preferably corresponding with the upper surface of the apron-board and its side margins being somewhat inwardly of the side margins of the notch of the front wall of the flow-box: 14, a special renewable facing secured to the rear surface of facing-board 12, this renewable facing being formed of hard wood, preferably hard maple, and constituting the rear surface of the apron-board coming in contact with the nosing of the flow-box, this renewable surface being detachably secured to the rear facing-board 12, preferably by means of countersunk wood screws passing through the renewable facing and into the facing-board: 15, a facing-felt secured, as by tacking, to the front face of the nosing of the flow-box and covering the hose-groove therein: and 16, a packing-gland, preferably of hard maple, disposed in the front of the hose-groove in the nosing of the flow-box between the hose in the groove and the felt-facing of the nosing, this gland being formed, preferably, of a number of short sections abutting endwise.

The apron-board having been firmly secured to the Fourdrinier part so as to partake of all of its movements of shaking or adjustment, the flow-box is to be given such position that the face of the nosing, as represented by its felt facing, will be in contact with the rear surface of the apron-board as represented by rear facing 14, it being understood, however, that the contact is not to be so close as to produce an undesired degree of friction between the apron-board and the flow-box as the former moves against the latter. It is not really necessary that there shall, at this stage of arrangement, be any actual contact between the apron-board and the flow-box. Fluid pressure is now to be admitted to the hose, the result being that the hose expands and forces the gland-sections forward and pushes the felt against the rear facing of the apron-board, thus forming a water-tight joint between the apron-

board and the flow-box, the packing of this joint being manifestly of such an elastic character as to compensate for any likely variations in the distance between the apron-board of the flow-box and any likely variations from true parallelism between the moving and non-moving surfaces. When the hose is to be relieved of pressure it may be done by opening cock 8. During the shaking motion of the apron-board, relative to the flow-box, the wear takes place between the felt and facing 14. The felt will, of course, be the first to wear out and this is easily renewable, and in course of time facing 14 will become affected by the wear and this is readily renewable. In the absence of gland-sections 16 there would be more or less destructive action on the front face of the hose, especially after the felt was worn through, but the gland-sections save the hose from any wearing action whatever. In Fig. 2 the apron-board is shown as at a height considerably above the base of the notch in the front wall of the flow-box, about as high as it will ever be adjusted, and the apron-board may go down with the breast-roll to any desired low level so long as the apron-board does not get below the hose-groove.

In the construction illustrated the hose-groove is disposed in the fixed member of the couple and, while the same general results would be attained if the hose-groove were in the rear face of the apron-board structure instead of in the front face of the flow-box structure, the latter plan presents practical advantages as regards the amount of weight to be dealt with in the shaking motions and in the adjustments, and in the convenience of maintaining fluid connection with the hose. It will, of course, be understood that the particular construction illustrated constitutes but a single exemplification of my invention, for I have sought only to set forth the principle of the invention and the best mode in which I at present contemplate embodying the principle.

I claim:—

1. A paper-making machine comprising, a flow-box having a vertical front wall having an outflow notch and constituting one member of a couple, an apron-board disposed in front of the flow-box and having a notched vertical rear facing disposed against the front wall of the flow-box and constituting the second member of the couple, a hose secured to the face of one member of the couple at the margins of the notch therein and coöperating with the face of the other member of the couple, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

2. A paper-making machine comprising, a flow-box having a vertical front wall having an outflow notch and constituting one mem-

ber of a couple, an apron-board disposed in front of the flow-box and having a notched vertical rear facing disposed against the front wall of the flow-box and constituting the second member of the couple, a hose secured to the face of one member of the couple of the margins of the notch therein and cooperating with the face of the other member of the couple, a packing-gland supported by the hose-supporting member in front of the hose, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

3. A paper-making machine comprising, a flow-box having a vertical front wall having an outflow notch and constituting one member of a couple, an apron-board disposed in front of the flow-box and having a notched vertical rear facing disposed against the front wall of the flow-box and constituting the second member of the couple, a hose secured to the face of one member of the couple at the margins of the notch therein and cooperating with the face of the other member of the couple, a felt facing carried by the hose-supporting member between the hose and the other member of the couple, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

4. A paper-making machine comprising, a flow-box having a vertical front wall having an outflow notch and constituting one member of a couple, an apron-board disposed in front of the flow-box and having a notched vertical rear facing disposed against the front wall of the flow-box and constituting the second member of the couple, a hose secured to the face of one member of the couple at the margins of the notch therein and cooperating with the face of the other member of the couple, a packing-gland formed of sections and disposed between the hose-supporting member and the other member of the couple, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

5. A paper-making machine comprising, a flow-box having a vertical front wall having an outflow notch and constituting one member of a couple, an apron-board disposed in front of the flow-box and having a notched vertical rear facing disposed against the front wall of the flow-box and constituting the second member of the couple, a hose secured to the face of one member of the couple at the margin of the notch therein and cooperating with the face of the other member of the couple; a packing-gland supported by the hose-supporting member of the couple, a felt facing carried by the hose-supporting member between the packing-gland and the other member of the couple, and means for permitting fluid pres-

sure to be maintained within the hose; combined substantially as set forth.

6. A paper-making machine comprising, a flow-box having a vertical front wall having an outflow notch and constituting one member of a couple, an apron-board disposed in front of the flow-box and having a notched vertical rear facing disposed against the front wall of the flow-box and constituting the second member of the couple, a separably attached rear surface for said facing, a hose secured to the face of the first member of the couple at the margins of the notch therein and cooperating with the face of the second member of the couple, and means for permitting fluid pressure to be maintained within the hose; combined substantially as set forth.

7. A paper-making machine comprising, a flow-box having a notched front wall provided with a forwardly open groove at its margin, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the front of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the apron-board, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

8. A paper-making machine comprising, a flow-box having a notched front wall provided with a forwardly open groove at its margin, the sides and base of the notch and also the sides and base of the groove being joined by curves, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the front of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the apron-board, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

9. A paper-making machine comprising, a flow-box having a notched front wall provided with a forwardly open groove at its margin, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the front of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the apron-board, a felt facing supported by the flow-box between the hose and the rear facing of the apron-board and closing said groove, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

10. A paper-making machine comprising, a flow-box having a notched front wall provided with a forwardly open groove at its margin, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the front of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the

apron-board, a packing-gland disposed in said groove in front of the hose between the hose and the rear facing of the apron-board, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

11. A paper-making machine comprising, a flow-box having a notched front wall provided with a forwardly open groove at its margin, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the front of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the apron-board, a packing-gland formed of endwise abutting sections disposed in said groove between the hose and the rear facing of the apron-board, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

12. A paper-making machine comprising, a flow-box having a notched front wall provided with a forwardly open groove at its margin, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the front of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the apron-board, a packing-gland disposed in said groove in front of the hose, a felt facing carried by the flow-box in front of the packing-gland, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

13. A paper-making machine comprising, a flow-box having a notched front wall provided with a forwardly open groove at its margin, perforated roof blocks over the upper ends of the groove, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the front of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the apron-board and having its ends supported in said roof-blocks, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

14. A paper-making machine comprising, a flow-box having a notched front wall provided with a forwardly open groove at its margin, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the front of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the apron-board, means connected with one end of the hose for permitting fluid pressure to be maintained within the hose, and a cock at the opposite end of the hose, combined substantially as set forth.

15. A paper-making machine comprising,

a flow-box having a notched front wall provided with a nosing at the margin of the notch and having a forwardly open groove in the face of the nosing, an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the grooved front of the nosing of the flow-box, a hose disposed in said groove and cooperating with the rear facing of the apron-board, and means for permitting fluid pressure to be maintained within the hose, combined substantially as set forth.

16. A paper-making machine comprising, a flow-box provided in its front wall with an outflow notch having rounded corners, a nosing secured to the front face of the front wall of the flowbox and margining the notch therein and provided with a forwardly open groove around the margin of the notch, perforated roof-blocks over the upper ends of the groove, a hose disposed in said groove and having its ends supported in the perforations of the roof-blocks, means at one end of the hose for permitting fluid pressure to be maintained within the hose, a cock at the opposite end of the hose, a packing-gland disposed in the groove in front of the hose and formed of endwise abutting sections, a felt facing on the face of the nosing in front of the packing-gland, and an apron-board disposed in front of the flow-box and having a notched rear facing cooperating with the felt facing, combined substantially as set forth.

17. A paper-making machine comprising, a flowbox provided in its front wall with an outflow notch having rounded corners, a nosing secured to the front face of the front wall of the flowbox and margining the notch therein and provided with a forwardly open groove around the margin of the notch, perforated roof-blocks over the upper ends of the groove, a hose disposed in said groove and having its ends supported in the perforations of the roof-blocks, means at one end of the hose for permitting fluid pressure to be maintained within the hose, a cock at the opposite end of the hose, a packing-gland disposed in the groove in front of the hose and formed of endwise abutting sections, a felt facing on the face of the nosing in front of the packing-gland, and an apron-board disposed in front of the flowbox and having a notched rear facing-board cooperating with the felt on the face of the nosing, and a separable facing secured to the rear surface of the facing-board between the facing-board and the felt, combined substantially as set forth.

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