Oct. 31, 1950 J. TEMPERLEY 2,528,189

APPARATUS FOR THE MANUFACTURE OF PAPER

Filed Nov. 27, 1945 2 Sheets-Sheet 1

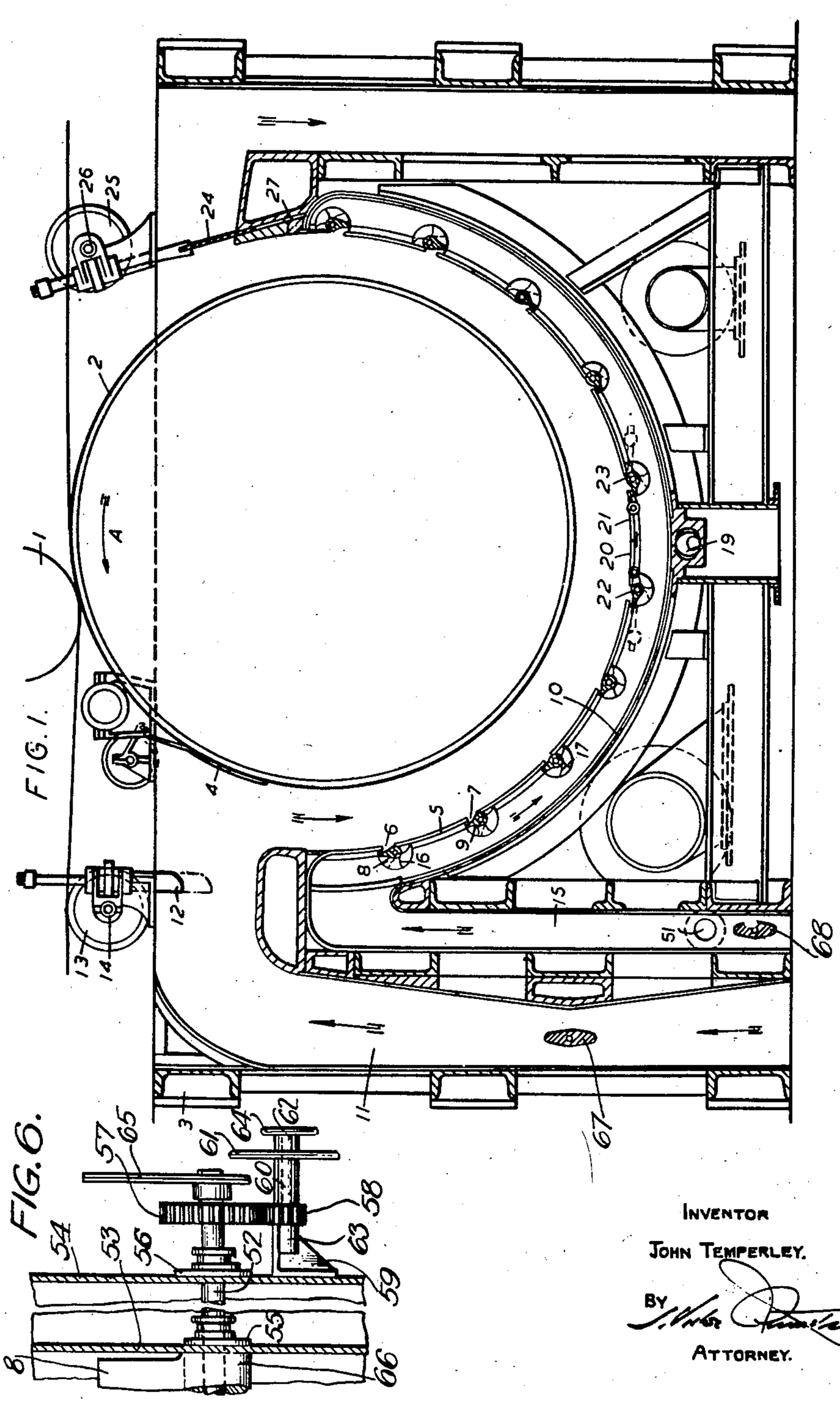

FIG. 1.

FIG. 6.

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FIG. 2.

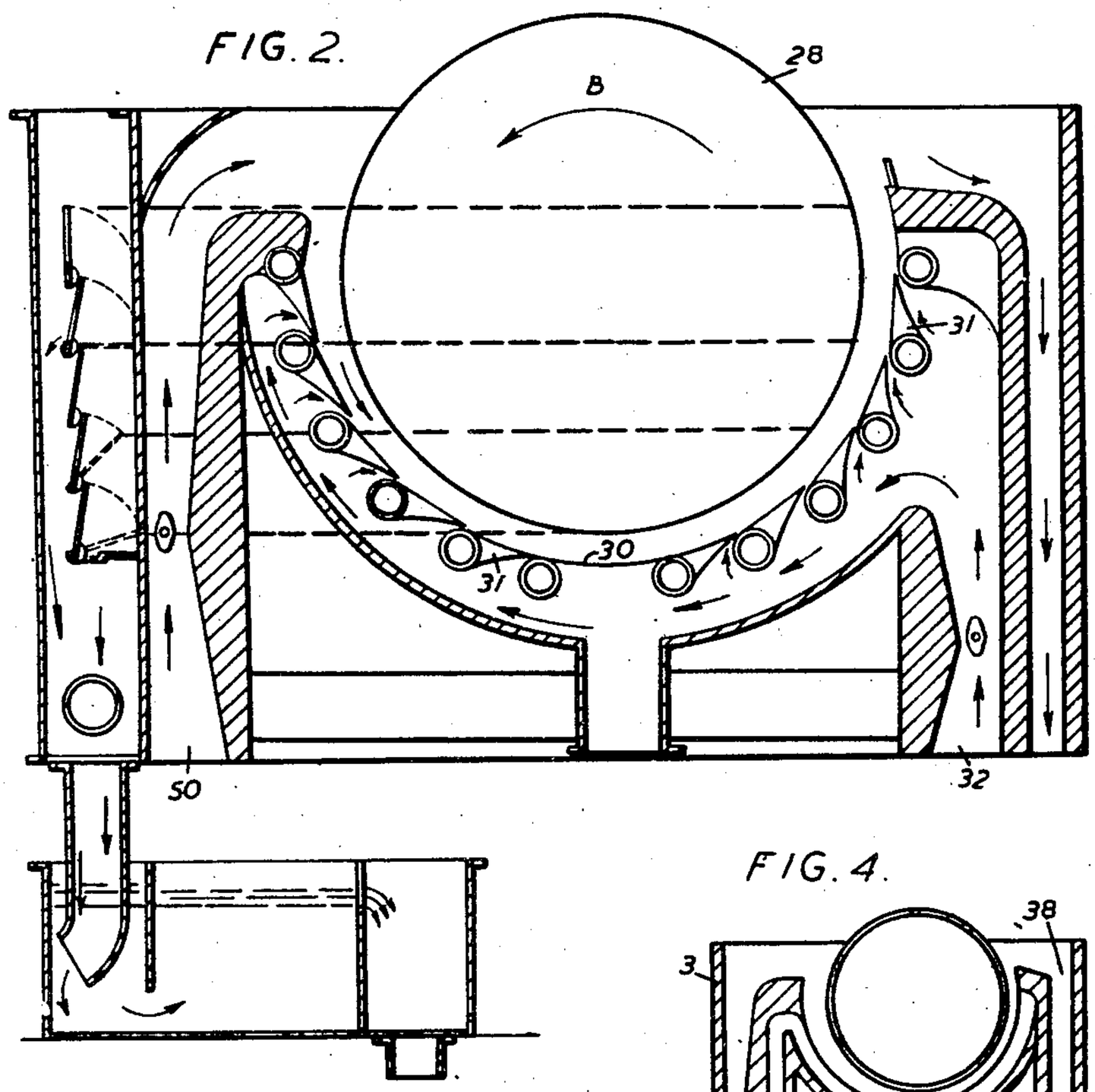


FIG. 4.

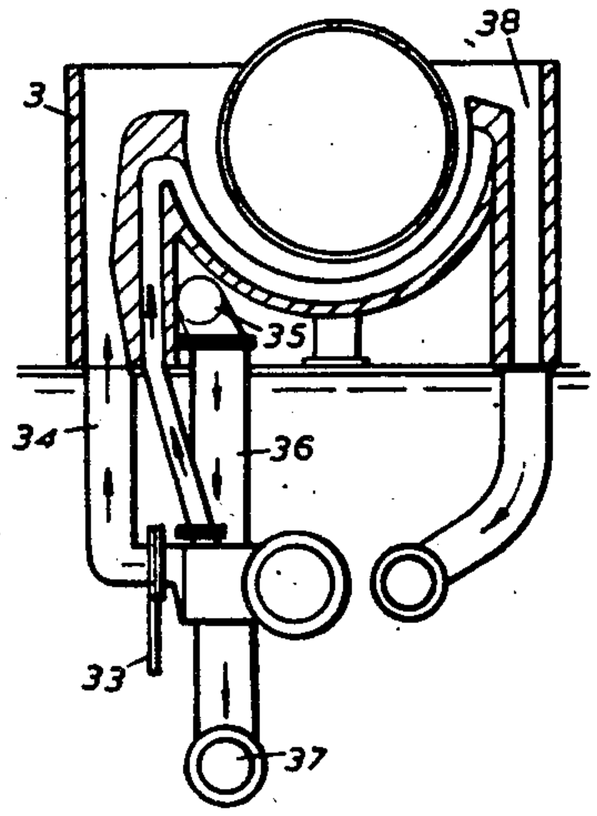


FIG. 3.

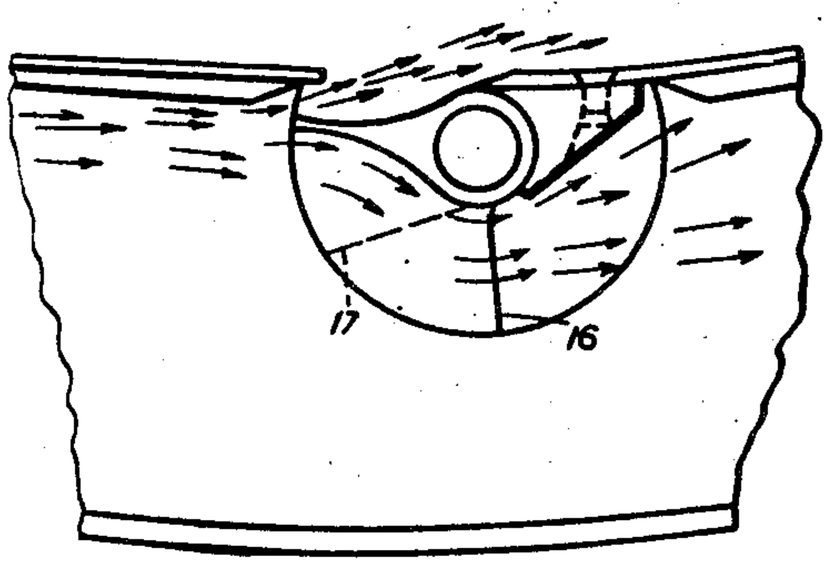
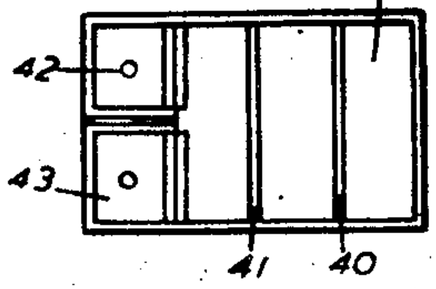


FIG. 5.



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APPARATUS FOR THE MANUFACTURE OF PAPER

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6 Claims. (Cl. 92—43)

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The present invention relates to improvements in methods and apparatus for the manufacture of paper, of the type in which paper pulp stock is fed on to the surface of a making wire, whilst this is in contact with a hollow perforate rotary drum immersed in a vat.

In paper making apparatus of this type it has been proposed to dispose a number of vat circle plates of equal or differing length to form a number of false floors or walls of equal or differing length along the periphery of the drum to lead in stock, backwater, or fresh water in a plurality of streams at spaced points on to the making wire lying on the periphery of the immersed portion of said drum.

It will be appreciated that the characteristics of paper or pulp obtained by deposition of paper fibre on to the making wire will depend on a number of factors including the relative speeds of the making wire and cf the stock flow, and that the rate of deposition will not be uniform throughout the immersed portion of the making wire by reason of the fact that as fibre becomes deposited on the wire it acts to hinder a further deposition as it blocks the meshes of the wire.

An object of the present invention is to provide controllable conditions of deposition of the stock on the wire throughout its immersed length and to provide means whereby the characteristics and amount of the deposition of the stock on the wire can be varied as desired substantially along the whole of the immersed area.

According to the present invention a main stream of paper pulp stock is passed to and around substantially the major portion of the immersed part of a rotary hollow perforate drum in a stock vat, whilst a number of streams of either paper pulp stock, backwater or freshwater, each individually adjustable in quantity, are fed into said main stream at a number of spaced points to affect the circle flow velocity around the making cylinder as the desired characteristics of the sheet may require.

The machine for carrying out the method of this invention comprises a hollow drum disposed in a vat and serving as a guide means for a continuous making wire passing over its surface, this vat having a false bottom floor spaced from its bottom wall and provided with a number of slices or valves controlling orifices in this false bottom floor.

Certain forms of construction are illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation of one form of machine of the type in which the cylinder mould or making wire is displaced in a similar direction to the inflow of paper pulp stock,

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Fig. 2 is a similar view of a machine in which the cylinder mould or making wire is displaced in the opposite direction to the inflow of paper stock,

Fig. 3 is a detail of one of the control slices or valves,

Fig. 4 is an end view of the feed pump arrangement,

Fig. 5 is a plan view of the screen mixing box, and

Fig. 6 is a sectional view of a means for adjusting one of the control slices or valves.

In the preferred form and common with board machines, the cylinder mould is a hollow perforate drum 2 covered with wire and immersed in a vat 3 and rotating in the direction of the arrow A, the wire being in some cases partly shrouded by a mould apron 4 which is adjustable in the degree of partial cover. Alternatively a continuout making wire may be arranged to pass over suitable guide rolls on to the reticulous surface of the hollow perforate drum 2.

The vat 3 is provided with a false bottom floor 5 interrupted at a number of spaced points 6, 7 . . . to form openings controlled by slice valves 8, 9 . . . extending on one side only of their pivots and disposed in the spaces between the false bottom floor 5 and the bottom wall 10 of the vat.

Pulp stock fed by a pump or head box passes up the main stock inlet conduit 11 and under an adjustable stock inlet dam 12 adjustable by worm and worm wheel gearing 13 by means of a handle on the shaft 14 and thence down over the mould apron 4 on to the making wire supported by the drum 2 in the usual manner of such paper forming apparatus.

Subsidiary streams of pulp stock are fed from the same or a separate pump or head box up a subsidiary stock supply conduit 15 and down into the space between the false bottom floor 5 and the bottom wall 10 of the vat, to emerge therefrom through the openings 6, 7 . . . tangentially to the flow of pulp stock in the space between the false bottom wall 5 and the making wire on the drum 2.

Figure 1 shows valve means 67 in the main inlet passage 11 and additional valve means 68 in the subsidiary stock inlet passage 15. These valve means afford a control of the main stock supply to the passage adjacent the rotating drum and the subsidiary stock supply into the passage between the walls 5 and 10 so that the rate of de-

posit of the stock on the making wire can be more accurately controlled.

Each one of the slices 8, 9 . . . are adjustable and extend right across the width of the vat to be supported at spaced intervals by fins 16, 17, extending laterally from longitudinal partition walls dividing up the area across the vat into a plurality of peripheral cells to further ensure evenness of flow of the stock in the space between the false bottom floor 5 and the wall 10 of the vat.

The adjustment means for the slices are shown in Fig. 6 where the particular means for slice 8 are shown by way of example. The spindle 52 extends across the vat and along the length of the slice hub 66. The operating end of the spindle passes through a double wall 53, 54, of the vat, glands 55, 56 being used for sealing purposes. On the outermost end of the spindle a gear wheel 57 is fixed which meshes with a pinion 58. The pinion 58 is supported by means of an angle 59 and a hollow spindle 60 having a hand wheel 61 thereon. The spindle 60 is rotatable about a further spindle 62 which may be adapted to screw into a lug 63 on angle 59, after which it is riveted up. The other end of spindle 62 is screwed to receive hand wheel 64, which may be slacked off whilst the slices are adjusted by means of hand wheel 61, after which it is relocked, the spindle 60 being gripped between the face of lug 63 and the face of the locking hand wheel 64. If desired, an indicator 65 may be fixed to spindle 52 so as to rotate with and indicate the inclination of slice 8. Identical independent adjustment means are provided on each of the slices 8, 9 . . .

It will be preferred that the slices or valves are of the streamlined form shown in Fig. 3, so that the auxiliary streams enter the main stream substantially tangentially to this and with the minimum of disturbance and causation of eddies.

A dump valve 19 of any usual form may be provided in the bottom wall 10 of the vat, which may act in cooperation with dumping doors 20, 21, hinged about the spindles for the two lowermost slice valves 22, 23, respectively.

Overflow from the vat 3 can be controlled by an overflow slice 24 operated by worm and worm wheel gearing 25 from the shaft 26, and the blanked off end of the space between the inner false floor 5 and the outer wall 10 of the vat may be provided with a water seal led thereto by passage 27 from a water supply under pressure generally, and when the subsidiary control is not required. Water is normally also passed under minimum pressure to the underside of the overflow slice to maintain the pocket formed by this slice blade clear of stock.

In the arrangement of Fig. 2, the perforate drum 28 rotates in the direction of the arrow B, whilst paper stock flows in to the space between the making wire and a false floor 30 of the vat in an opposite direction thereto, this false floor being interrupted at a number of points similar to the arrangement described with reference to Fig. 1, the gaps being controlled by slice valves 31, also similar to the slices 8, 9 . . . so that a number of auxiliary streams of stock from supply conduit 32 of stock coming from the supply conduit 50, can be led into the main stream. The felted layer is preferably removed from the roll 28 by a continuous felt running between this mould roll 28 and a top couching roll.

It will normally be preferred to control the

main stock supply independently of the auxiliary stock supply, which may for instance be effected by means of an adjustable sluice valve 33 (Fig. 4) controlling passage through the main stock supply conduit 34, white water to the pump passing from the usual outlet 35 at the base of the vat 3 to the downtake pipe 36 and thence by conduit 37 to the backwater, whilst overflow stock is led past the adjustable overflow slice 24 down the overflow conduit 38 to this inlet pipe 37.

Alternatively a screen discharge and circulating stock mixing box as shown in plan view Fig. 5, may be used in which pulp is fed up through a common inlet conduit 39 and thence over a dam 40 and thence under an adjustable underflow dam 41 to outflow conduit 42, 43, respectively, for the main and auxiliary stock streams connected, for instance, to stock inlets 11, 15, respectively.

Water may be passed into the main stock inlet at 51 when desired.

The invention has been described with reference to forward flow submerged mould vats, but is obviously equally applicable to contraflow mould vats, that is to say where the main stock stream is directed on to the mould drum in a direction reversely to its rotation.

I declare that what I claim is:

1. A paper making machine comprising a vat, a hollow drum having a reticulate surface rotatably mounted in said vat, a main stock inlet for said vat located adjacent one side thereof and spaced transversely of the axis of rotation of said drum, an independent, separate subsidiary stock inlet located adjacent said main stock inlet, an overflow outlet located adjacent the side of said vat opposite to the said main stock inlet, said vat having a wall spaced from the bottom thereof and from said drum defining a pair of passages concentric with said drum, one of said passages connecting said main stock inlet and said overflow outlet and extending immediately adjacent said drum, said wall having a plurality of openings therein and independently controlled valves controlling each of said openings, the other of said pair of passages connecting said subsidiary stock inlet with said one of said passages throughout substantially the entire length thereof through each of said openings.

2. A paper making machine comprising a vat, a hollow drum having a reticulate surface rotatably mounted in said vat, a main stock inlet for said vat located adjacent one side thereof and spaced transversely of the axis of rotation of said drum, an overflow outlet located adjacent the side of said vat opposite said main stock inlet, said vat having a wall spaced from the bottom thereof and from said drum defining a pair of passages concentric with said drum and extending along substantially the entire submerged surface of said drum, one of said passages connecting said main stock inlet and said overflow outlet and extending immediately adjacent said drum, said wall having a plurality of openings therein and valves controlling each of said openings, an independent, separate subsidiary stock inlet adjacent one side of said vat and spaced laterally of the axis of rotation of said drum, the other of said pair of passages connecting said subsidiary stock inlet with said one of said passages throughout substantially the entire length thereof through each of said openings.

3. A paper making machine comprising a vat, a hollow drum having a reticulate surface rotatably mounted in said vat, a main stock inlet for said vat located adjacent one side thereof and spaced

transversely of the axis of rotation of said drum, an independent, separate subsidiary stock inlet located adjacent the side of said vat opposite to said one side thereof, an overflow outlet located adjacent the side of said vat opposite to said main stock inlet, said vat having a wall spaced from the bottom thereof and from said drum defining a pair of passages on either side thereof concentric with said drum, one of said passages connecting said main stock inlet and said overflow outlet and extending immediately adjacent said drum, said wall having a plurality of openings therein and independently controlled valves controlling each of said openings, the other of said pair of passages connecting said subsidiary stock inlet with said one of said passages throughout substantially the entire length thereof through each of said openings.

4. The device as described in claim 1 in which valve means is provided for separate control of said main stock inlet and said subsidiary stock inlet.

5. The device as described in claim 2 in which valve means is provided for separate control of said main stock inlet and said subsidiary stock inlet.

6. The device as described in claim 3 in which

valve means is provided for separate control of said main stock inlet and said subsidiary stock inlet.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
312,390	Seiberling	Feb. 17, 1885
1,211,229	Pruyn et al.	Jan. 12, 1917
1,708,724	Haug	Apr. 9, 1929
1,766,000	Parker	June 24, 1930
1,771,600	Yoder	July 29, 1930
1,869,148	Holcomb	July 26, 1932
2,001,208	Minskey et al.	May 14, 1935
2,036,168	Engert et al.	Mar. 31, 1936
2,402,063	Malkin	June 11, 1946

FOREIGN PATENTS

Number	Country	Date
573,893	Germany	Apr. 6, 1933
575,387	Germany	Apr. 27, 1933
634,716	Germany	Sept. 2, 1938