Oct. 11, 1938. C. W. MORDEN 2,132,874

APPARATUS FOR MAKING UP BATCHES OF PAPER STOCK

Filed June 18, 1935 3 Sheets-Sheet 1

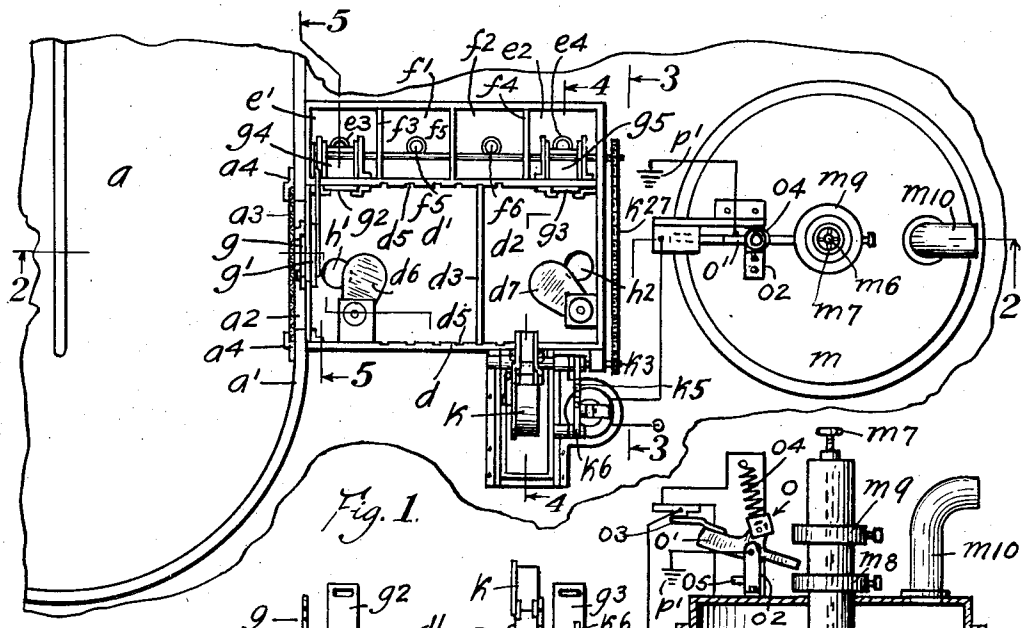

Fig. 1.

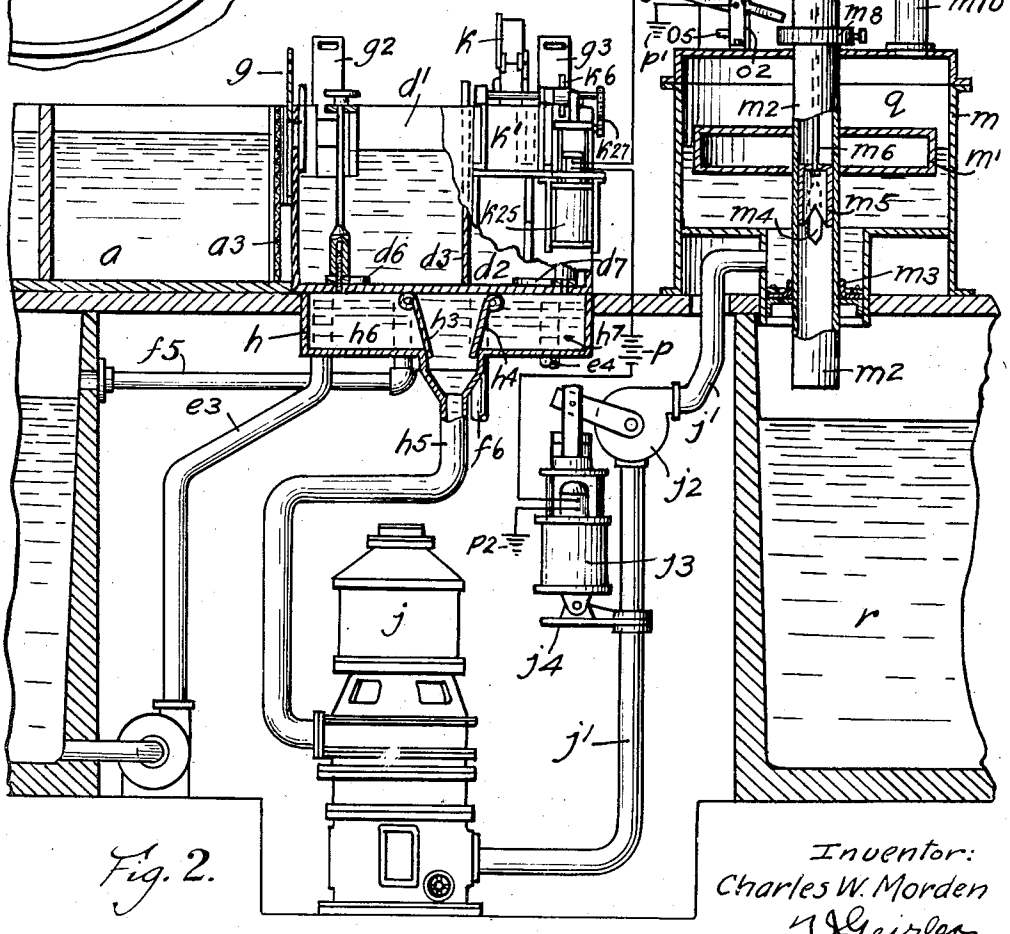

Fig. 2.

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APPARATUS FOR MAKING UP BATCHES OF PAPER STOCK

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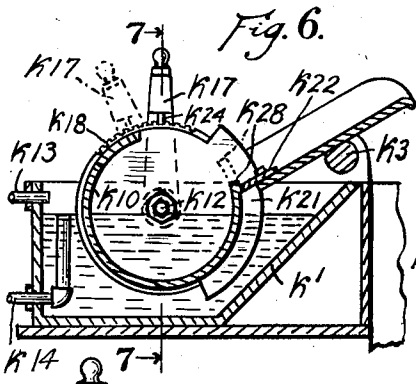

Fig. 6.

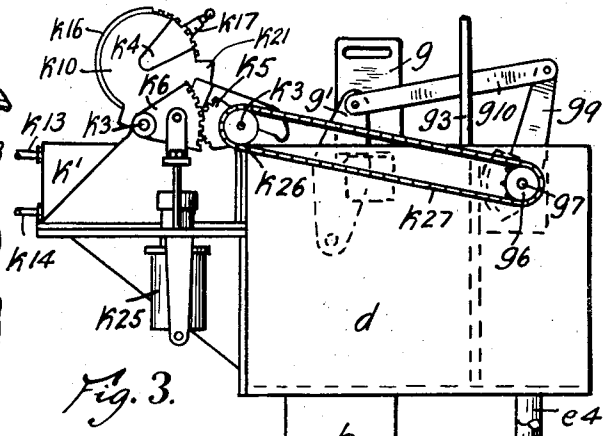

Fig. 3.

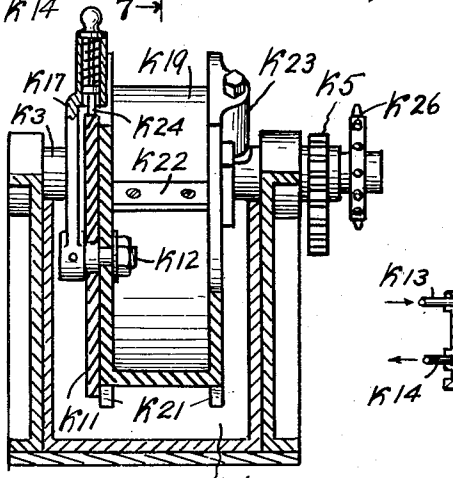

Fig. 7.

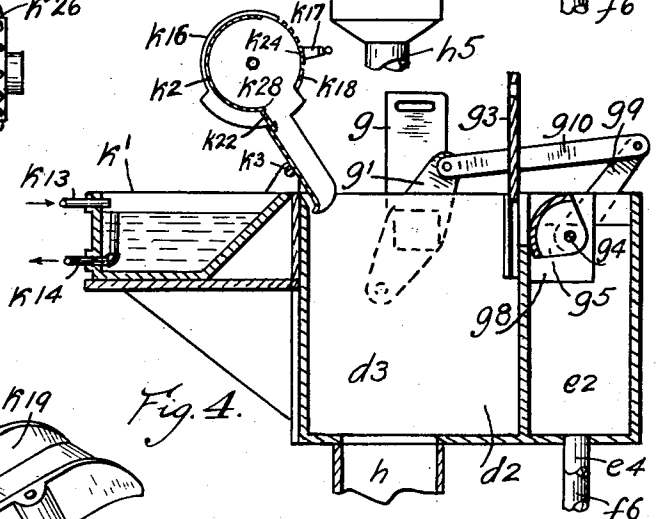

Fig. 4.

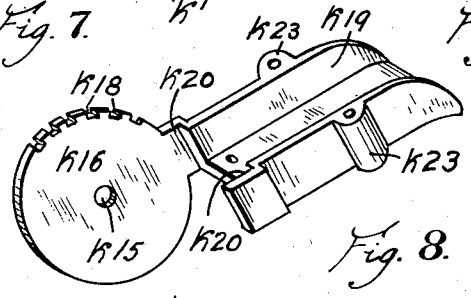

Fig. 8.

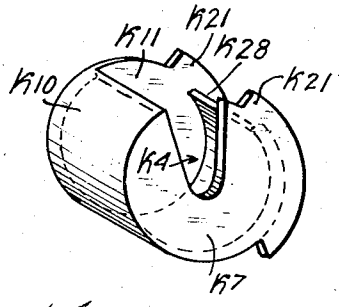

Fig. 9.

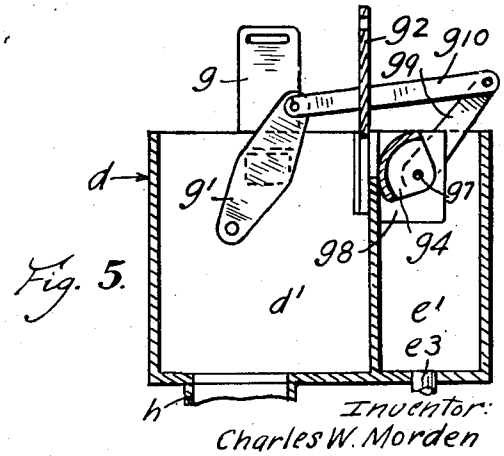

Fig. 5.

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APPARATUS FOR MAKING UP BATCHES OF PAPER STOCK

Filed June 18, 1935 3 Sheets-Sheet 3

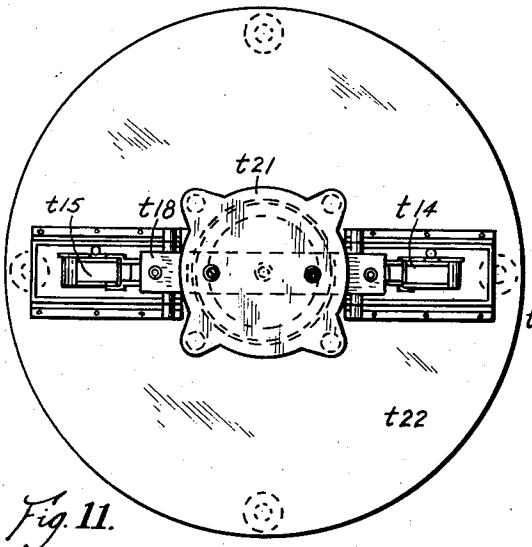


Fig. 11.

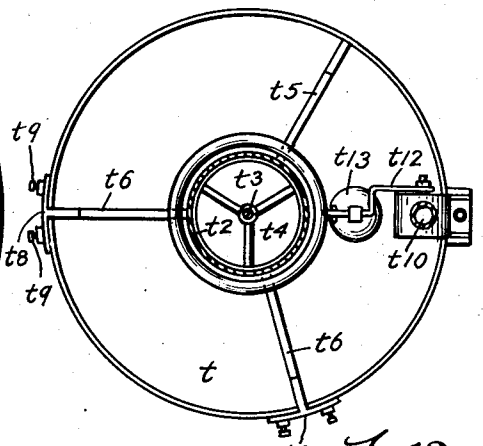


Fig. 12.

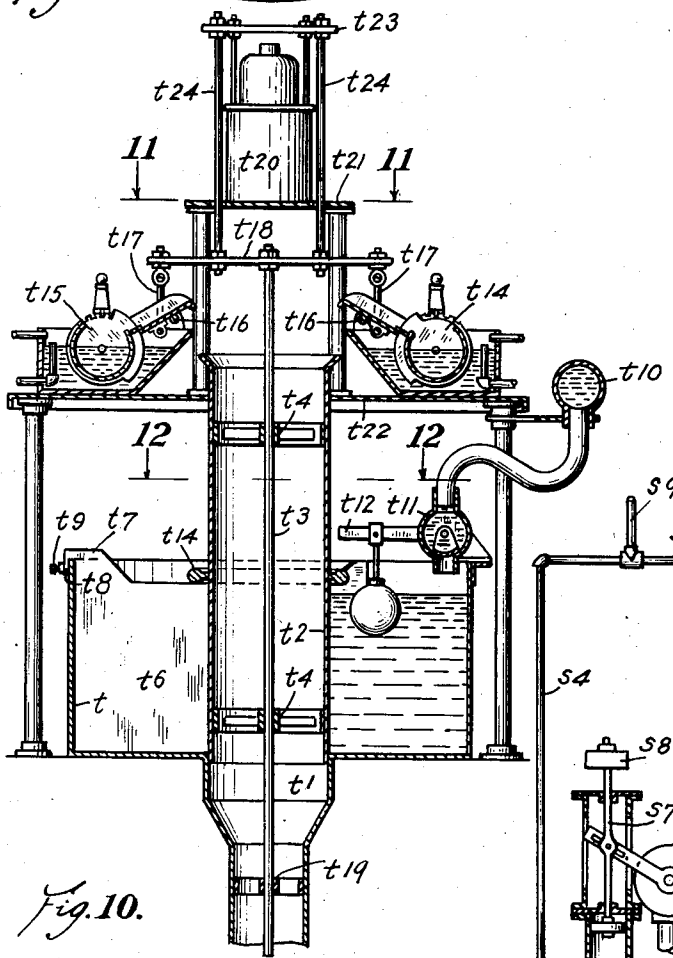
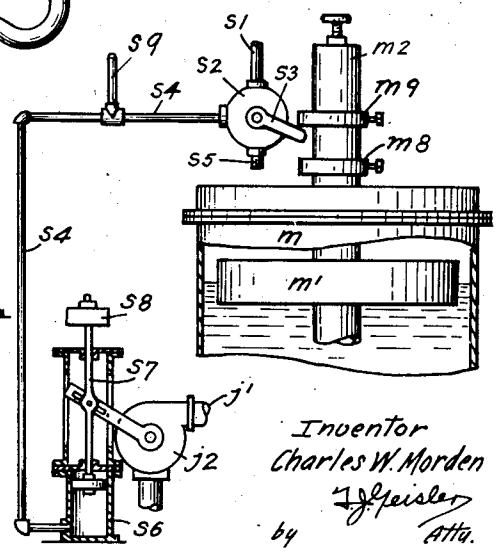


Fig. 10.

Fig. 13.



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Patented Oct. 11, 1938

2,132,874

UNITED STATES PATENT OFFICE

2,132,874

APPARATUS FOR MAKING UP BATCHES OF PAPER STOCK

Charles W. Morden, Portland, Oreg.

Application June 18, 1935, Serial No. 27,225

12 Claims. (Cl. 92—46)

My invention relates primarily to paper making, and one of the principal objects of my invention is to provide a method and apparatus for making up batches of paper stock comprising various ingredients, controlled by a single automatic flow controlling device; functioning to provide time intervals for the making up, in a primary receptacle, of successive batches of the particular type of paper stock, each batch composed of relatively proportioned amounts of ingredients; further causing the delivery of the resulting batches successively into a receiving receptacle; and finally causing the discharge from the latter in a continuous, constant flow into a stuff chest, or other part of a paper making system; the cooperative action of said devices being arranged so that the rate of delivery from the batch make-up element of my device into said receiving receptacle is greater than that of the rate of the discharge from the latter.

A further object of my invention is to provide simple efficient means for feeding into and automatically proportioning the desired ingredients in the primary receptacle of my apparatus, and to proportion relatively the different types of pulp in such primary receptacle.

A further object of my invention is to provide an apparatus for the purpose mentioned adapted to be combined with the usual beater tub of the paper mill so that a part of the pulp can be automatically supplied from said beater tub.

A further object of my invention is to provide automatic means for delivering coloring matter, size, clay and other desired ingredients in predetermined quantities automatically into each batch of paper stock produced.

A further object of my invention is to cause the delivery of different types of pulp into the primary receptacle or make-up element of my apparatus to be effected by the level of the contents in said primary receptacle, so that the feed into the latter will stop in response to a predetermined rise in the level of the contents of said primary receptacle.

A further object of my invention is to provide a control for the transfer of material from said make-up receptacle to said receiving receptacle operable by means of a float in said receiving receptacle, said float operating said control in response to the rise and fall of said float to predetermined levels attained by the material in said receiving receptacle, thus interrupting delivery from the make-up receptacle into the receiving receptacle when the latter is filled to a predetermined high level, and permitting further filling of the receiving receptacle when emptied to a predetermined low level, during the continuous discharge therefrom, the discharge being at a lesser rate than the rate of transfer of material from the batch make-up receptacle to the receiving receptacle.

A further object of my invention is to provide a control for the discharge from the receiving receptacle of my apparatus into the paper making system, whereby a steady and substantially continuous, constant rate of flow from the receiving receptacle is maintained, and to effect such result by providing an outlet carried by said float by which the said outlet is thus at all times located a constant depth below the level of the contents of the receiving receptacle, thus causing said flow to be discharged from the receiving receptacle at constant pressure.

A further object of my invention is to provide means whereby the volume discharged from said outlet of the receiving receptacle may be definitely varied by a gate controlling said outlet.

A still further object of my invention is to provide a simple device readily maintained in order and comprising elements cooperatively combined for carrying my said method and the various steps thereof into practice, controlling the operation of my apparatus as a whole by said control of the discharge from the receiving receptacle element of my apparatus.

The above enumerated objects and incidental features of my invention I attain by the method and apparatus hereinafter fully described with reference to the accompanying drawings, and hereinafter claimed.

In the drawings:

Fig. 1 is a partial top or plan view, partly diagrammatic, of my apparatus;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1 looking in the direction indicated by the arrows, a part of my apparatus in Fig. 2 being shown diagrammatically;

Fig. 3 is a fragmentary view of part of my apparatus taken on the line 3—3 of Fig. 1, looking in the direction indicated by the arrows;

Fig. 4 is a fragmentary vertical section on the line 4—4 of Fig. 1;

Fig. 5 is a similar section on the line 5—5 of Fig. 1;

Fig. 6 is a sectional view, on a larger scale, of the dipper element shown on the left in Fig. 4, but with the dipper in the lowered position;

Fig. 7 is a vertical section, on still larger scale, taken on the line 7—7 of Fig. 6;

Figs. 8 and 9 are views in perspective of parts

of the dipper element shown in Figs. 4, 6 and 7;

Fig. 10 shows, in vertical section, an optional construction for my primary receptacle;

Fig. 11 is a plan view looking down from the line 11—11 of Fig. 10;

Fig. 12 is a horizontal section on the line 12—12 of Fig. 10; and

Fig. 13 is a fragmentary view illustrating the possibility of substituting compressed air means for electrical means in the operation of certain parts of my device.

Referring to Figs. 1 and 2, *a* indicates a common type of beater tub. Connected to the beater tub *a* is my primary receptacle and feeder. This comprises a feeder box *d*, divided into two compartments *d'* and *d2* by the movable partition *d3*. Stuff boxes *e'* and *e2* empty into the two compartments of the feeder box *d*, and over-flow boxes *f'* and *f2* take care of the over-flow from the stuff boxes *e'* and *e2*, respectively.

A portion of the wall *a'* of the beater tub *a* adjacent my feeder box *d* is cut away as at *a2* and a screen *a3* is secured on the inner face of the wall *a'* by guides *a4* and so arranged that it may be slipped into position or removed when desired. This screen *a3* may be made of wire mesh, or may consist of a perforated metal plate. The flow of stock from beater tub *a* into the feeder box *d* is controlled by a manually operated gate *g* and by an automatic shutter *g'* (see Fig. 5), the operation of which will be described later. When the level of the stock in the feeder box *d* attains the same elevation as that of the stock in the beater tub *a*, or when the gate *g* or shutter *g'* is closed, the rotation of the pulp in the beater tub *a* past the inner face of the screen *a3* will tend to dislodge any particles of pulp which may have become attached to the screen during the passage of the pulp into the feeder box, due to the fact that flow thru the screen ceases. Thus the inner face of the screen is automatically kept clear.

The two stuff boxes *e'* and *e2* are connected with the feeder box *d* by manually operated gates *g2* and *g3*, respectively, and by automatic valves *g4* and *g5*, respectively, (see Figs. 4 and 5). The stock or other materials or ingredients to be intermixed are delivered to the stuff boxes *e'* and *e2* from sources of supply thru pipes *e3* and *e4* connected with the bottom of the stuff boxes. Any over-flow from the stuff box *e'* passes into the box *f'* over the partition *f3* which is understood to be slightly lower than the other three walls of the stuff box *e'*; and similarly the over-flow from stuff box *e2* takes place over the partition *f4* into the box *f2*. The pipe *f5* connects the bottom of box *f'* with the source supplying stuff box *e'*; and a similar pipe *f6* connects the bottom of box *f2* with the source supplying stuff box *e2*, thus returning the over-flow to said source.

The partition *d3* is made movable, being supported in one of the pairs of guideways *d5*, and thus may be arranged so as to determine the relative amounts of pulp the compartments *d'* and *d2* of the feeder box *d* shall contain.

A hopper *h* is located beneath the feeder box *d* and is connected with the feeder box by the circular openings *h'* and *h2* located in the bottom of the compartments *d'* and *d2* respectively. A pipe *h5* connects the hopper *h* with a pulp treating unit *j*, which is constructed and operates in the manner described in my Patent No. 1,915,862, issued June 27, 1933. Check valves *h3* and *h4* divide the hopper *h* into chambers *h6* and *h7* and prevent any backflow from the pipe *h5* or from one chamber into the other. The openings *h'* and *h2* are controlled by the manually operated valves *d6* and *d7*, respectively. Since the two compartments *d'* and *d2* of the feeder box *d* may be of different size and thus contain different volumes of material, and also since the two kinds of material contained in these two compartments may have different flow characteristics it may be necessary to adjust the size of the openings *h'* and *h2* connecting the compartments of the feeder box with the hopper *h* in order that the same relative level may be constantly maintained in both compartments *d'* and *d2* of the feeder box, as the stock flows therefrom.

k denotes a metering unit attached to the feeder box *d* in order to furnish a predetermined quantity of color, size, clay solution, alum, or other ingredients for each batch of stock which is being mixed. This metering unit consists of a tank *k'* (see Figs. 3, 4 and 6), in which the color or other ingredient is contained, and a dipper *k2* rigidly attached to a shaft *k3*. The tank *k'* is supplied by a pipe *k13* (Fig. 4) and is also provided with an overflow pipe *k14* to return surplus material to the source. The dipper *k2* consists of a hollow cylindrical vessel *k10*, as shown in Fig. 9, one side wall *k7* of which is provided with a slot or opening *k4*. The other side wall *k11* is made with a centrally located external projecting stub axle *k12* (see Fig. 7), extending through a central hole *k15* in the circular plate *k16*, and to have a crank or handle *k17* rigidly attached at its end. The circular plate *k16* has notches *k18* at the top (Fig. 8) and the handle *k17* is provided with a latch *k24* for engaging the notches *k18*. The circular plate *k16* is made integral with a spout *k19* as shown in Fig. 8, and the sides of the spout are made with recesses *k20* to accommodate and fit over the flanges *k21* on the walls of the cylindrical vessel *k10*. Thus movement of the handle *k17* causes the cylindrical vessel *k10* to turn with respect to the circular plate *k16* and trough *k19*, and the latch *k24* engaging the notches *k18* holds the said vessel in the desired relative position. The position of the outlet lip *k28* of the cylindrical vessel *k10* with respect to the trough *k19* determines the amount of material which will be spilled into the trough as the dipper is raised. A plate *k22* (Fig. 6), screwed to the bottom of the trough *k19*, fits against the outside cylindrical surface of the vessel *k10* and forms the connection between the vessel and the trough bottom. The sides of the trough *k19* are made with ears *k23* thru which bolts are inserted firmly attaching the trough and dipper to the shaft *k3*.

As shown by Figs. 3 and 7, on one end of the shaft *k3* is rigidly mounted a gear segment *k5* engaging a similar gear segment *k6* pivoted at *k9*. An electrically operated thrustor unit *k25*, pivotly mounted on a supporting bracket, is connected to the gear segment *k6*, and this thrustor when energized causes the gear segment *k6* and with it the gear segment *k5* to rotate and consequently to cause the dipper *k2* to be lifted into discharging position with each upward thrust of the electrical thrustor unit *k25*. When the latter is de-energized the weight of the dipper will cause it to drop back into the tank *k'*.

On the end of the shaft *k3* is rigidly mounted a sprocket wheel *k26*, connected by sprocket chain *k27* to a similar sprocket wheel *g6*, the latter being rigidly mounted on the end of shaft *g7* operating the valves *g4* and *g5*. The valves *g4* and *g5* are curved plates attached to end walls which consti-

tute circular sectors and which are rigidly mounted on the shaft *g7*. The valves *g4* and *g5* move within pairs of walls *g8* bracketed on the wall of the feeder box *d* within the stuff boxes *e'* and *e2*. At the other end of the shaft *g7* is mounted a crank arm *g9* which is connected by a link *g10* to the shutter *g'*. Thus the raising of the dipper *k2* by the energizing of the thrustor *k25* will also cause the valves *g4* and *g5* and the shutter *g'* to close.

My pulp treating unit *j* includes a frustro-conical rotor in a similar shaped shell and a pump runner which produces a pumping action.

The pipe *j'* leads from the treating unit *j* to the electrically operated valve *j2* and thence to the stock flow controller *q*. The valve *j2* is operated by an electrical thrustor *j3* pivotly mounted on bracket *j4*. The stock flow controller *q* comprises a tank *m* in which is a float *m'* which carries a tube *m2*, the lower end of which projects thru the packing *m3* at the bottom of the tank *m*, and the upper end of which projects thru the top of the tank and thus slides up and down as the float *m'* rises and falls. The tube *m2* has an opening *m4*, which constitutes the outlet from the tank *m* and such opening is controlled by a cylindrical gate *m5* having a V-shaped recess at its lower end. The gate *m5* is attached to and manually adjustable by a rod *m6*, slidably mounted in the top of the tube *m2* and movable up and down by means of a hand wheel *m7* threaded on it. A pair of collars *m8* and *m9* are fastened by set screws on the tube *m2* and adapted to engage an end of the bar *o'* of the electric trip switch *o*.

The electric trip switch *o* comprises the bar *o'* pivoted in brackets *o2*, a contact finger *o3*, a compression spring *o4*, and a bumper *o5*. The switch *o* connects a source of electrical energy *p* with the ground wire *p'*, the other ground contact being shown at *p2*. Within the circuit *p* are the electrical thrustors *k25* and *j3*. *m10* is a vent pipe in the top of the tank *m*. The rise and fall of the level of the liquid in the tank *m* cause the float *m'* and therewith the tube *m2* to move up and down. When the float *m'* rises the lower collar *m8* by engaging the end of the bar *o'*, will cause the switch *o* to be opened. Similarly, the dropping of the float *m'* and tube *m2* will cause the upper collar *m9* to engage the end of the bar *o'* and cause the switch *o* to close, as shown in Fig. 2. The closing of switch *o* causes the electrical thrustor *k25* to lift the dipper *k2* to its discharge position and to close valves *g4* and *g5* and shutter *g'*, and simultaneously causes the electric thrustor *j3* to open valve *j2*, permitting the stock to be pumped into the tank *m* from the treating unit *j*.

The operation of my device is as follows: The stock to be mixed is permitted to enter from the beater tub *a* or from the stuff box *e'* into the compartment *d'* of the feeder box *d*, and the other stock or other ingredient to be mixed with the composite batch of paper stock is permitted to enter the compartment *d2* from the stuff box *e2*, the relative amounts entering the feeder box *d* being determined by the relative capacities of the compartments *d'* and *d2*. The amount of coloring matter or other materials to be added to the paper stock thru the metering unit *k* is determined by the position of the cylindrical vessel *k10* controlled by the handle *k17*. The regulating valves *d6* and *d7*, which are provided to regulate the flow from the compartments *d'* and *d2* of the feeder box *d*, permit the contents of the feeder box to pass into the hopper *h*, thru the check valves *h3* and *h4* and thence thru the pipe *h5* to the beater unit *j*. When the circuit of the electric thrustor *j3* is closed the valve *j2* is opened and the mixture from the beater unit *j* is delivered into the tank *m*. When the opening of the outlet *m4* of the discharge tube *m2* of the tank has been manually adjusted by the gate *m5*, the composite mixture of paper stock flows at a uniform predetermined rate into the stock flow line of the paper making system. When the paper stock in the tank *m* rises to a predetermined high level thus elevating the float *m'* and therewith the tube *m2* and the collar *m8*, the trip switch *o* will be opened by engagement with said collar *m8* opening the circuit *p*, de-energizing the electric thrustor *j3*, causing it to drop because of its own weight and thereby causing the valve *j2* to close. Further stock is then prevented from passing into the tank *m* until the level of the stock in the tank *m* has been lowered to a predetermined low. With the opening of the switch *o*, the dipper *k* will drop back into the tank *k'* preparatory to metering another dipper load of coloring material or other ingredients to be mixed with the stock in the feeder box *d*. When the float *m'* is lowered sufficiently by the fall in the level of the stock in the tank *m* the closing of trip switch *o* will cause the dipper *k* to be raised and pour its contents into the batch in the feeder box *d*, and simultaneously the valve *j2* will be opened and again allow stock to be delivered to the tank *m*. During all this process a continuous flow of the mixed stock from the tank *m* thru the outlet *m4* is maintained, and due to the fact that the outlet *m4* in the tube *m2* carried by the float *m'* is always maintained at the same depth below the level of the stock in the tank *m*, there will be a constant head in the tank *m* above the outlet *m4* and a flow at a constant rate from said outlet *m4* into the stock chest *r*.

In place of the electric circuit *p*, with switch *o*, and electric thrustors *k25* and *j3*, other means, for example a system of compressed air units, may be substituted. Such means is illustrated in Fig. 13, in which *s1* indicates a pipe conveying air under pressure from any suitable source, and *s2* is a valve operated by the arm *s3*, so that when arm *s3* is in the lowered position shown in Fig. 13, the compressed air will pass from pipe *s1* into pipe *s4*, the vent *s5* being closed, but when the arm *s3* is in raised position, the compressed air will be prevented from passing out of pipe *s1* and the vent *s5* will be opened. *s6* is a compressed air cylinder operating the valve *j2* controlling the flow of stock thru the pipe *j'* (see Fig. 2). The compressed air entering cylinder *s6* causes the rod *s7* to be moved upward, opening the valve *j2*. A branch pipe *s9* joining pipe *s4* connects with a cylinder similar to *s6*, but not shown, substituted in place of the electric thrustor *k25*. As indicated in Fig. 13, the arm *s3* is engaged by the collars *m8* and *m9* on the tube *m2* carried by the float *m'* in the tank *m*; the lowering of the level in the tank *m* causing the collar *m9* to move the arm *s3* to the lowered position already described.

When the level in tank *m* rises sufficiently, the collar *m8* will move the arm *s3* to raised position, shutting off the air from pipe *s1* and opening the vent *s5*. The weight *s8* will cause cylinder *s6* to close and therewith the valve *j2*.

In Figs. 10, 11 and 12 I show an optional modified form of primary receptacle for my device, and differently arranged means for delivering the de-

sired pulp into such primary receptacle. In this modified form the primary receptacle *t* is circular in shape with a centrally located circular outlet *t'*. A tube *t2*, rigidly attached to a rod *t3* by means of spiders *t4*, is adapted to have its bottom end fit into said outlet *t'*, thus shutting off the outlet from the primary receptacle *t*, and preventing intermixing of the pulps in the radially partitioned sections of the primary receptacle, but permitting entrance to said outlet to be opened and the contents of the radially partitioned sections to pass into said outlet by the raising of the tube *t2*. The primary receptacle *t* is provided with radial partitions of which one, *t5*, is fixed and the others, *t6*, are made movable, extending towards the center from the outer cylindrical wall and provided on their inner edges with suitable packing, which bears against the outside of the tube *t2* and, while forming a sufficiently tight connection therewith, permits the tube *t2* to slide up and down with respect to said radial partitions. The adjustable partitions *t6* have a lip *t7* extending over the top of the outside wall of the primary receptacle *t* and ending in a flange *t8* which, by means of set screws *t9*, causes the end of the radial partition to be clamped rigidly to the wall of the receptacle *t*.

A pipe *t10*, leading from some source from which it is desired to deliver pulp into one of the compartments of the primary receptacle, is connected to the valve *t11* controlling the discharge into the primary receptacle. The valve *t11* is operated by the arm *t12* which carries the float *t13*, the purpose of which is to cause the valve *t11* to close when the pulp has reached a sufficient level in the compartment of the primary receptacle. A ring *t14* is rigidly fastened on the outside of the tube *t2* and is adapted to engage the end of the arm *t12* when the tube *t2* is raised, thus preventing the opening of the valve *t11* when the tube is raised and the primary receptacle is discharging thru the outlet *t1*. It is to be understood that other compartments of the primary receptacle may be supplied by similar means as desired.

t14 and *t15* represent the metering units for furnishing color, size, clay solution, or other ingredients for each batch of stock as previously described. These dippers in these metering units are pivoted at *t16* and are attached to the rods *t17* which in turn are pivotally attached to bar *t18*. The raising of the bar *t18* will cause the dippers to be lifted and to discharge their contents into the top of the tube *t2*. The rod *t3*, on which tube *t2* is supported is also attached to bar *t18*. The bottom end of rod *t3* slides in a guideway provided in the center of the spider *t19*. *t20* is an electric thrustor (or compressed air cylinder as previously described) supported on a base *t21* which in turn is supported on the plate *t22* covering the primary receptacle. The pushing upward of the bar *t23* of the thrustor unit causes the bar *t18*, with which it is connected by rods *t24*, to be lifted. Lifting of the bar *t18* causes the tube *t2* to be raised, allowing the compartments of the primary receptacle to discharge thru the outlet *t'*, and causes the dippers *t14* and *t15* to be raised and to discharge their contents thru the tube *t2* and outlet *t'*.

I claim:

1. In an apparatus of the character described for making up batches of flowable material, a batch make-up receptacle, a receiving receptacle, means for transferring the contents of said make-up receptacle to said receiving receptacle, a float in said receiving receptacle, a vertical pipe carried by said float thru which said receiving receptacle discharges, an inlet orifice in said pipe located a predetermined distance below said float, whereby said receiving receptacle will discharge thru said orifice in said pipe at constant pressure.

2. The combination described by claim 1 including manual means for varying the size of the inlet orifice of the discharge pipe.

3. In an apparatus of the character described for making up batches of flowable material, a batch make-up receptacle, means for supplying material to such receptacle, means controlling the delivery into said make-up receptacle, a receiving receptacle, means including a pump for transferring the contents of said make-up receptacle to said receiving receptacle, a control included in said transferring means, a float in said receiving receptacle, said float actuating the control in said transferring means, a vertical pipe carried by said float thru which said receiving receptacle discharges, an inlet orifice in said pipe located a predetermined distance below said float, whereby said receiving receptacle will discharge thru said orifice in said pipe at constant pressure.

4. In an apparatus of the character described for making up batches of flowable material, a batch make-up receptacle, means for supplying material to such receptacle, means controlling the delivery into said make-up receptacle, a receiving receptacle, means for transferring the contents of said make-up receptacle to said receiving receptacle and a valve controlling such transfer, an electrically actuated means operating said valve, a float in said receiving receptacle, said float carrying a tripping element for a switch in the electric circuit of said electrically actuated means, a vertical pipe carried by said float thru which said receiving receptacle discharges, an inlet orifice in said pipe located a predetermined distance below said float, whereby said receiving receptacle will discharge thru said orifice in said pipe at constant pressure.

5. The combination described by claim 4 including manual means for varying the size of the inlet orifice of the discharge pipe.

6. In an apparatus of the character described including a make-up receptacle for making up paper stock comprising various ingredients, a means for introducing measured quantities of material into said make-up receptacle, said means comprising a rockable member including a spout, a dipper carried by said rockable member and discharging into said spout, a supply tank into which said dipper is lowered, said dipper having a filling and drainage slot in one side, and said dipper being adjustable on said rockable member so as to vary the discharge therefrom, from a partial to the complete emptying thereof, and means for controlling the movement of said rockable member.

7. In an apparatus of the character described for making up batches of flowable material, a batch make-up receptacle provided with a movable partition dividing the same into compartments of variable capacities, means for supplying material to such receptacle, means controlling the delivery into said make-up receptacle, means for introducing measured quantities of supplemental material into said make-up receptacle, a receiving receptacle having an outlet, means for transferring the contents of said make-up receptacle to said receiving receptacle, a control included in said transferring means, a float in

said receiving receptacle, said float actuating the control in said transferring means, said means for introducing measured quantities of supplemental material into said make-up receptacle comprising a rockable member including a spout, a dipper carried by said rockable member and discharging into said spout, a supply tank into which said dipper is lowered, said dipper having a filling and drainage slot in one side, and said dipper being adjustable on said rockable member so as to vary the discharge therefrom from a proportional to the complete emptying thereof, the operation of said means for introducing measured quantities of supplemental material being controlled by the movement of said float.

8. In an apparatus of the character described comprising a composite batch make-up element composed of a plurality of compartments, a plurality of means for supplying material to said compartments, respectively, a receiving receptacle, means for intermittently transferring the contents of said make-up element to said receiving receptacle, said receiving receptacle having continuous discharge, but at a lesser rate than the rate of transfer of material thereto from said make-up element, a control for said transferring means, and a control for said material supplying means, a float in said receiving receptacle, said float operating said controls, respectively, in response to the rise and fall of said float to predetermined levels attained by the material in said receiving receptacle, being adapted to interrupt the supply of material to said compartments, and simultaneously permit transfer of material from said make-up element to said receiving receptacle, when the latter is emptied to a predetermined low level, and to interrupt the transfer of material from said make-up element to the receiving receptacle, and simultaneously cause further supplying of said compartments, when the receiving receptacle is filled to a predetermined high level.

9. In an apparatus of the character described, a batch make-up element, a beater having an outlet into said batch make-up element thru which material may enter the make-up element when the level of material in said make-up element is below the level of material in said beater, a screen covering said outlet, a receiving receptacle, means for intermittently transferring the contents of said make-up element to said receiving receptacle, thus lowering the level of the material contained in said make-up element, and permitting flow of material thereinto from said beater, said receiving receptacle having a continuous discharge, the rate of filling of the make-up element from beater, and the rate of transfer from make-up element to receiving receptacle being greater than the rate of the discharge from the receiving receptacle, a control for said transferring means, a float in said receiving receptacle, said float operating said control in response to the rise and fall of said float to predetermined levels attained by the material in said receiving receptacle, thus interrupting delivery from the make-up element into the receiving receptacle when the latter is filled to a predetermined high level, and permitting further filling of the receiving receptacle when emptied to a predetermined low level; the filing of make-up element from beater occurring during the interval the material in receiving receptacle falls from its predetermined high to low level, and the filling up of said make-up element being timed to occur during a lesser period than said interval, thus causing the building up of the level in the make-up element to that of the material in the beater, and preventing flow thru said screen from the beater into the make-up element, whereby the continued rotation of the material in the beater tends to dislodge the particles of material adhering to said screen.

10. The combination described by claim 8 with adjustable means for varying the size of said compartments in said batch make-up element, whereby to control the proportioning of the amounts of the ingredients in each batch of said flowable material.

11. An apparatus of the character described, comprising a batch make-up receptacle, automatic means for supplying material to said make-up receptacle, a receiving receptacle, means for intermittently transferring batches of material from said make-up receptacle to said receiving receptacle, a control in said transferring means, a float in said receiving receptacle, a discharge pipe for said receiving receptacle, said discharge pipe carried by said float, an inlet orifice in said pipe located a predetermined distance below said float, said float operating said control in response to the rise and fall of said float to predetermined levels, thus interrupting delivery from the make-up receptacle into the receiving receptacle when the latter is filled to a predetermined high level, and permitting further filling of the receiving receptacle when the receiving receptacle has been emptied to a predetermined low level, the discharge from said receiving receptacle being at a lesser rate than the rate of transfer of material from the batch make-up receptacle to the receiving receptacle.

12. The combination described by claim 11 with the addition of means for adjusting the size of said inlet orifice.

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