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2 SHEETS—SHEET 1.



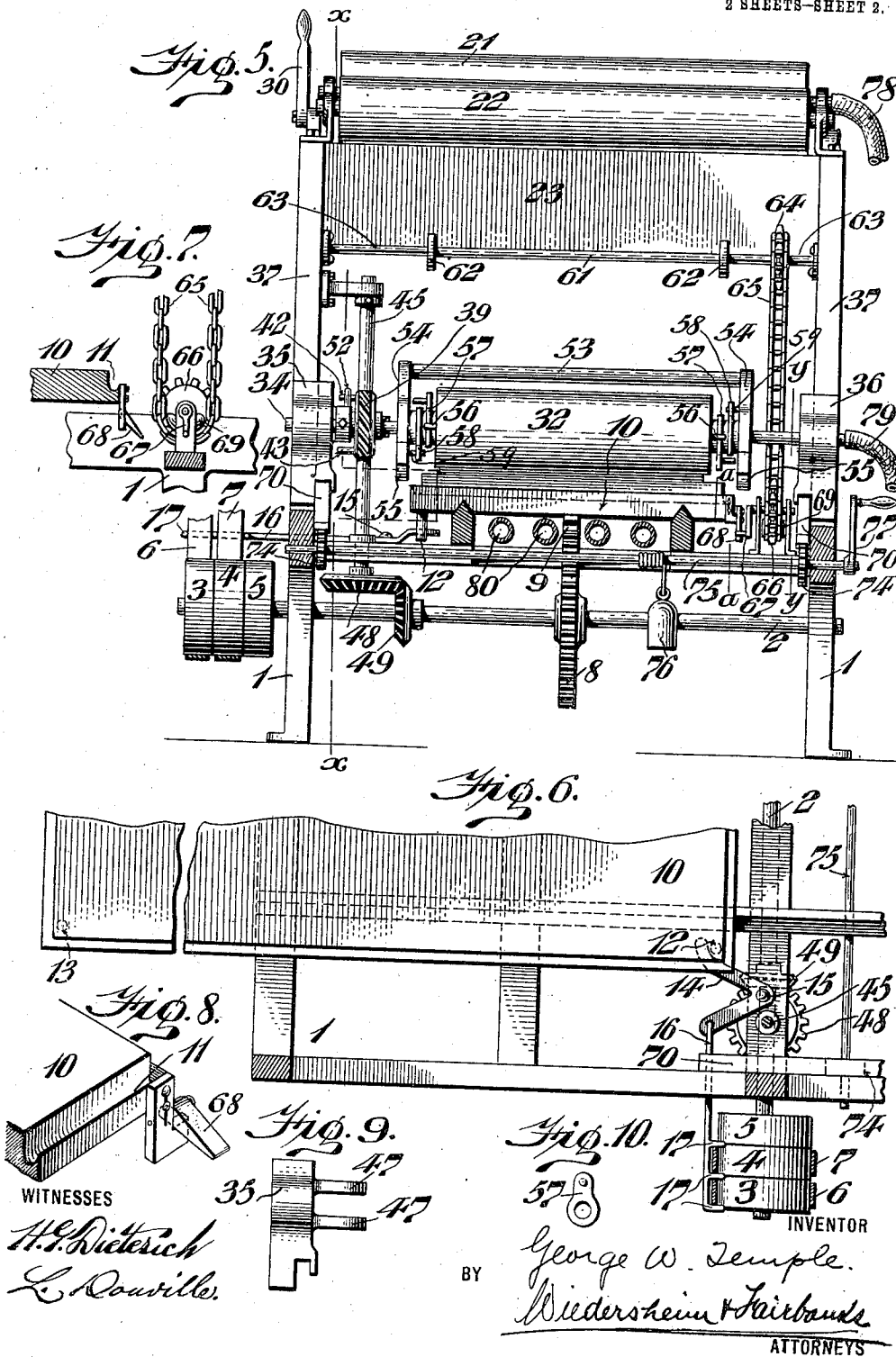
INVENTOR

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ATTORNEYS

995,736.

2 SHEETS--SHEET 2.



UNITED STATES PATENT OFFICE.

GEORGE W. TEMPLE, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR MANUFACTURING HARD FIBER IN FLAT FORM.

995,736.

Specification of Letters Patent. Patented June 20, 1911.

Application filed November 29, 1910. Serial No. 594,642.

To all whom it may concern:

Be it known that I, GEORGE W. TEMPLE, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Machine for Manufacturing Hard Fiber in Flat Form, of which the following is a specification.

My invention relates to a new and useful machine for manufacturing hard fiber in flat form and consists of means for suitably feeding the material in a flat condition to a reciprocating support, with suitable means for taking up or providing for the slack at each end of the movement of the table in order that there will be no inequalities in the finished product nor waste of the material.

It further consists in providing a novel feeding device which is automatically elevated as the material is fed to the reciprocating support and means for supporting the said feeding device.

It further consists of novel means for gripping the material in order to take up the slack.

It further consists of novel means for holding the feeding device in elevated position.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

Figure 1 represents a sectional view on line $x-x$, Fig. 5, showing the machine for manufacturing hard fiber in one form, embodying my invention. Fig. 2 represents, in elevation, a portion of the parts shown in Fig. 1, showing the same in a different position. Fig. 3 represents a sectional view on line $y-y$, Fig. 5, of a portion of the mechanism for supporting the feeding device. Fig. 4 represents a plan view in detached position, of the means employed for gripping the material. Fig. 5 represents a sectional view on line $z-z$, Fig. 1. Fig. 6 represents a plan view of a portion of the machine showing the device for shifting the belt in order to provide for the reciprocations of the table or support. Fig. 7 represents a sectional view on line $a-a$, Fig. 5. Fig. 8 represents a perspective view of one corner of the table or support showing a latch employed. Fig. 9 represents a side elevation of a guide employed, in detached position. Fig. 10 represents an elevation of a collar or tumbler employed, in detached position.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings: In the manufacture of hard fiber as heretofore employed, the material is wrapped upon a cylinder and chemically treated in order that the layers of the material will be suitably united to form the finished product. After the same is in proper condition, the material is cut in order to remove the same from the cylinder and as the material has hardened it will be in a curved condition. It is thus necessary in order to adapt the same for proper use, to flatten the material by any suitable means. This causes a "buckling" or separation of the layers of fiber from each other or renders the ends thereof unequal, which must thereafter be cut, so resulting in a loss of material and a considerable waste thereof.

My invention is designed to overcome these defects and to form the material initially flat so that none of the material is wasted and a perfect product results.

In the drawings I have shown one embodiment of my invention which will operate successfully in practice, but it will be evident that changes may be made in the construction, the arrangement of the parts may be varied and other instrumentalities may be employed which will come within the scope of the invention and I do not therefore desire to be limited in every instance to the exact form as herein shown and described, but desire to make such changes as may be necessary.

1 designates the frame of the machine, which may be of any suitable construction and which is adapted to support the various parts of the mechanism which are mounted thereupon in any suitable or desired manner. Suitably journaled in the frame 1 is the power shaft 2, to which power may be applied in any desired manner, in order that the said shaft may be rotated first in one direction and then in the other. In the present instance, I have shown the three pulleys 3, 4 and 5 for this purpose, in the present instance the pulley 4 being tight upon or connected with the shaft 2 and the other pulleys 3 and 5 being loose thereon.

6 and 7 designate belts, one of which is adapted to be actuated in one direction and the other in the other, and are so positioned with respect to each other that one or the

other will always be in engagement with the tight pulley so that by shifting these belts, by any suitable means, the shaft 2 will be rotated first in one direction and then in the other.

8 designates a gear suitably carried on the shaft 2 which is in mesh with a rack 9 carried by a table or support 10 which is guided or movably supported upon the frame 1 in any suitable manner, in order that the movement of the shaft 2, through the medium of the gear 8 and rack 9, will reciprocate the said support or table 10 backward and forward on the guides and beneath the feeding means. In the present instance, the table is supplied or provided with a groove or depression 11 adjacent the edges thereof which is adapted to receive the excess chemical or compounds, as will be hereinafter described. In order to provide for the shifting of the belts 6 and 7, I have here shown mounted upon the table, adjacent the opposite ends thereof, the pins 12 and 13, which are movable in the path of and adapted to engage with one arm of a bell crank lever 14, pivotally supported at 15, the opposite end of said bell crank lever being in engagement or connected with a rod or bar 16, having means for engagement with the belts 6 and 7, in the present instance said rod being provided with lugs or fingers 17 for this purpose. It will be understood as the table 10 reciprocates, that at the proper time one of the pins 12 or 13 reaches the arm of the bell crank lever 14 and will move the same in the direction in which the table 10 is moving. This movement of the lever 14 shifts the belts 6 and 7 and, as shown in Figs. 5 and 6, the belts being so shifted in order that the belt 6 is in engagement with the pulley 3 loose on the shaft 2 and the belt 7 is in engagement with the pulley 4, fixed upon the shaft 2. This will cause the belt 7 to actuate the pulley 4 and shaft 2 in order to cause the latter to rotate in a reverse direction and thus move the table 10 in the opposite direction from its position seen in said Fig. 6, this movement continuing until the pin 13 at the opposite end of the table 10 strikes the arm of the bell crank lever 14, which will reverse the position thereof, pulling over the belts 6 and 7 when the belt 7 will be in engagement with the pulley 5 loose upon the shaft 2, while the belt 6 is in engagement with the tight pulley 4, whereupon the rotation of the shaft 2 is reversed in order to cause the table 10 to move in the opposite direction until it again reaches the position seen in Fig. 6, when the pin 12 actuates the bell crank lever 14 to again reverse the movement of said table 10. Carried upon a suitable portion of the frame 1 above the reciprocating support or table 10, in the present instance, are brackets 18 which are suitably positioned and formed to receive and sup-

port a bar or roller 19 which carries a roll of the material 20, to be treated.

21 and 22 designate suitable rollers carried in a suitable manner upon the frame and 23 designates a tank suitably supported by the frame 1 with respect to the rollers 21 and 22 and which is adapted to receive the chemical compound or solution 24 with which the material 20 is treated in order to saturate the same and impregnate it with suitable material or chemicals in order that the same will be in condition to accomplish the result desired. Pivotally supported in the tank 23 is a gate 25, which is provided with bars 26 and also with the two bars 27, which act as scrapers and which are situated adjacent the upper end portion of the gate 25, it being understood that the material from the roller 19 is passed over the roller 21 beneath the bars 26 and between the scraper bars 27 and over the roller 22. It will be understood that the bars or scrapers 27 are so positioned with respect to each other in order to impart a squeezing or scraping action to the material as it passes between the same, in order that excess compound may be drained or removed from the material and fall back into the tank 23. By the above means it will be seen that the material which is passing beneath the bars 26, on the gate 25, will be caused to pass through the chemical compounds or solution 24 in the tank 23. I have mounted the shaft 28 at a suitable point on the frame 1, which is connected by toggle levers 29 with the gate 25 and I provide a handle 30 for rotating said shaft 28 in order to actuate the levers 29 in order to raise and lower the gate 25, should the same be necessary. In order to feed the material to the table 10 and fold the same properly in layers thereupon, in a flat condition after having been treated with the solution 24, I provide the two rolls 31 and 32, said rolls being carried upon the shafts 33 and 34, which are carried upon or supported by the sliding guide members 35 and 36 which are movably mounted and guided by a suitable portion of the frame 1, in the present instance, upon the uprights 37 and it will be understood that the said guide members 35 and 36 are suitably mounted upon the uprights 37 in order that the rolls 31 and 32 will contact with the upper surface of the table 10 when the same is empty and that the said rolls 31 and 32 and shafts 33 and 34, together with the guide members 35 and 36 and other parts of the feeding mechanism, will be raised as the material is fed to the table 10, so that the rolls 31 and 32 will always engage with the material to feed the same to the table.

In order to rotate the rolls 31 and 32 at the proper time and in the proper direction, depending upon the direction of movement

of the support or table 10, I have loosely mounted upon the shafts 33 and 34 the gears 38 and 39, said gear 38 having pins 40 and 41 thereon at suitable points, while the gear 39 is provided with pins 42 and 43 at suitable points thereon. Meshing with said gears 38 and 39 is a gear 44 which is connected with a shaft 45 in any suitable manner, in the present instance by a slot or keyway 46 which is of suitable length in the shaft 45, as will be apparent from Fig. 1, in order to provide or permit of the up and down movement of the gear 44, which is provided with a suitable feather or key seated in said slot 46, while retaining the same in engagement with said shaft 45. The gear 44 is journaled between two ears 47 carried by one of the guide members, in the present instance, guide member 35, in order that said gear may be raised and lowered with the rest of the feeding mechanism. The shaft 45 is provided with a beveled gear 48 which is in mesh with a beveled gear 49 carried by the power shaft 2, whereby reverse rotative movement will be imparted to the shaft 45, depending upon the movement of the power shaft 2, so that the gear 44 will be rotated first in one direction and then in the other at the proper time, causing a reverse rotation to the gears 38 and 39. Suitably mounted on the shafts 33 and 34 and connected therewith are collars 50, one of which is provided with a pin 51 adapted for engagement by either of the pins 40 or 41 on the gear 38 and the other collar 50 is provided with a pin 52 adapted for engagement by either of the pins 42 or 43 carried on the gear 39, it being understood that by these means I provide for a certain amount of lost motion, since as the gear 44 is rotated in one direction, depending upon the movement of the table 10, the gears 38 and 39 are rotated until one or the other of the pins 40 and 41 or the pins 42 and 43 contact with either of the pins 51 and 52, respectively, in order that movement will be imparted to the shafts 33 and 34 and so to the rolls 31 and 32.

53 designates rods or bars, one of each of which is suitably supported adjacent each of the rolls 31 and 32 and in the present instance the bars 53 are carried by the supports or arms 54 which are provided with weights or weighted portions 55 which are adapted to hold the bars 53 and return the same to their normal position, as seen in Fig. 5 and in position above the roll 32, as seen in Figs. 1 and 2, said arms being freely supported upon the shafts 33 and 34, respectively. Intermediate the rolls and the supports, that is the arms 54, for the rods 53, I provide means which is adapted at the proper time to engage with the supports 54 in order to throw down the rods 53 or move the same into the position seen with respect

to the rod 53, which is adjacent the roll 31 in Fig. 1. In the present instance, I have provided each of the rolls with pins 56, which are adapted to engage, after the rolls have moved a certain distance, or for example made one revolution, with a collar 57 which is also provided with a pin and said collar is thereby rotated until the pin thereon engages with a second collar 58, which is thus brought into rotation and which latter collar will finally engage with a pin 59 carried on the supports for the rod 53 for rotating the same and will so lower the proper rod 53 to cause the same to engage with the material at the end of the stroke or movement of the table 10. This will remove the material 20 from the roll 31 or 32, whichever it has been in engagement with and will cause a portion thereof to extend beyond the table or support 10 and so provide a slack in the material, which slack will be taken up and the material properly presented to be folded upon the table 10. In order to provide for the take-up of the slack, I have provided, in the present instance, two gripping members 60 and 61 which are suitably mounted in order to be rotated to grip the material and as here shown the members are mounted upon the disks 62, which are carried by a shaft 63 suitably journaled in the frame of the machine, in the present instance, in suitable journals on the uprights 37. The normal position of these gripping bars 60 and 61, is that seen in Fig. 1, with the material 20 passing freely therebetween. Mounted on the shaft 63 is a sprocket 64, around which passes a chain 65, which also passes around a sprocket 66, in order to provide for the proper rotation of the shaft 63 so as to reverse the position of the gripping bars and cause the same to engage the material 20, as in the position seen in Fig. 2. Connected with the sprocket 66 is a crank arm 67 which is engaged at the proper time by one of the pivoted latches 68, one of which is carried adjacent each end of the table 10 in order that as the table moves forwardly the crank 67 will be engaged by one of the latches 68 and will move up upon the same, thus imparting a suitable revolution to the sprocket 66, which will so actuate the chain 65 as to rotate the sprocket 64 and cause the gripping bars 60 and 61 to grip the material therebetween, pulling up the slack, and will place the material in position to be properly received upon the table at each reverse movement thereof, the relative movement of the material 20 being readily apparent from an examination of Figs. 1 and 2. After the crank has passed the latch 68 it will fall or be immediately lowered by any suitable means, in the present instance, by reason of the weight 69 carried by the sprocket 66, which will impart suitable movement to the chain 65 to rotate the

sprocket and cause the bars 60 and 61 to release the material and permit free feeding of the same, it being understood that as the latches 68 are pivoted the said latches can
 5 freely pass the crank 67 in one movement of the table but will cause it to engage therewith upon the return movement.

In order to provide that the guide members 35 and 36 are held in proper position, I
 10 provide an automatically movable supporting member which will be actuated to engage the guide members 35 and 36 as they move upwardly and presenting a supporting surface thereto. In the present instance
 15 I have provided the movable members 70 movably supported by the frame 1 of the machine, the upper face of which is inclined as at 71, to engage with an inclined lower face 72 of the guide members 35 and
 20 36, said movable supporting members 70 having a rack 73 thereon which engages with a gear 74 carried on a shaft 75, which latter is provided with a weight 76 so connected with said shaft 75 that when there is no
 25 pressure on the members 70, that is to say, as the guide members 35 and 36 are moved upwardly, the weight will cause a rotation of the shaft 75 which will actuate the gear 74 to move the supporting members 70 inwardly in order to cause the inclined upper
 30 face 71 to engage and remain in engagement with the suitable face on the guide members 35 and 36. After the guide members have been elevated to their topmost position I have provided means for removing the supporting members 70 from beneath said guide
 35 members 35 and 36 and in the present instance I have shown a handle 77 for this purpose. In some instances it may be of advantage to provide a heating medium to the roller 21 and in the drawings I have shown
 40 a pipe 78 which is adapted to lead to a suitable source of heat supply and which communicates with the interior of the roller 21 and I may also desire to heat the material of the rolls 31 and 32 and I have shown pipe
 45 79 for this purpose.

If desired, I may employ a means for supplying a suitable amount of heat adjacent
 50 the table or support 10 and in Fig. 5, I have shown a plurality of steam pipes 80 situated beneath the table for this purpose, it being understood that the same are suitably connected with a heat supply. I have shown the
 55 latches 68 adjustably supported on the table 10 and I can provide for the proper movement by making the number of teeth on the small sprocket 64 in suitable relation to the number of teeth on the large sprocket 66, which will impart a sufficient throw to the
 60 chain 65 to impart a suitable amount of revolution to the sprocket 64.

The operation of the device is as follows:
 The chemical compounds or solution to
 65 which the material is to be treated is placed

in a tank 23 and the material 20 upon the roll 19 having been placed upon the yoke or supports 18 is fed over roller 21 beneath bars 26 and between the scraper 27 and so
 over the roller 22 down between the gripping bars 60 and 61 and into position to be
 70 engaged by one or the other of the rolls 31 and 32. Motion is imparted to the shaft 2 in order to impart movement to the table 10 and at the same time to the gear 44 in order
 75 to rotate both the rolls 31 and 32 in the proper direction. The end of the material, it will be understood, is so located, by hand at the beginning that, as stated it is in position to be engaged by the proper roll 31 or
 80 32. As the table 10 advances, the end of the material is situated between the table and one of the rolls, which latter imparts sufficient pressure which together with the chemicals in the material, will tend to hold
 85 the material upon the table while the continued forward movement of the table and the rotation of the proper roll will feed down the material from the roll 19, through the tank 23. When the movement of the
 90 table is reversed the other roll will feed the material to the table while the chemicals will cause the layers of material to adhere together. In this way the material is fed down from the tank 23 and is caused to be
 95 laid in layers flat upon the table 10, as seen in Fig. 1. When the table is in this position it will be understood that the same has just completed a stroke or travel in one direction and is in a position ready to be
 100 started upon its return movement, that is, in the direction indicated by the arrow in said Fig. 1, it being understood that the pin 12 on the table 10, shown in Fig. 6, has engaged with the elbow lever 14 in order to
 105 shift belts 6 and 7 in the proper position for this return movement. The shaft 2 will then be rotated in order to impart suitable movement to the gear 8 and through the rack 9 to move the table 10 in the direction
 110 indicated by the arrow. At the same time the gear 49 rotates gear 48 and thus the shaft 45 in order to rotate the gear 44 and thus the gears 38 and 39. By this movement the pin 41 is moved from its position,
 115 seen in Fig. 1, to cause the same to engage the right-hand side of the pin 51 while the pin 43 carried by the gear 39 will move around to engage with the right-hand side of the pin 52, immediately upon which motion
 120 will be imparted by means of these pins to the shafts 33 and 34 and as the gears are rotated, motion in a reverse direction is imparted to the shafts 33 and 34. It will be understood that the lost motion with respect
 125 to the rolls 31 and 32 as the table 10 begins a fresh stroke, is provided in order to allow the rolls 31 and 32 to remain stationary until the material 20 is substantially under the center of the roll about to be engaged and
 130

it is at this time that the pin 43 on the gear 39 will strike the right-hand side (in the position seen in the figures) of the pin 52, causing the collar 50 and shaft 34 and the roll 32 to revolve, moving in the same direction as the table 10. The same movement or operation takes place on the opposite side when the table 10 reverses its movement in the opposite direction. If the rolls 31 and 32 should commence to turn as soon as the table reverses its movement, the material, being adhesive, would cling to the surface of the rolls and would be pulled and stretched causing an uneven fold of the material 20 upon the table 10. As the shaft 33 is rotated the pin 59 on the support 54, will be released from its engagement with the collar 58, whereupon the weight 55 on the support will elevate the rod 53, removing it from engagement with the material 20, that is, from its position seen in Fig. 1. At the same time the forward movement of the table 10 causes the latch 68 at that end of the table to engage with the crank 67 and so will rotate the sprocket 66 and through the medium of the chain 65 will rotate the sprocket 64, which will impart a suitable amount of revolution to the disks 62, causing the bars 60 and 61 to grip the material, elevating the same in order to take up the slack, occasioned by the engagement of the rod 53 with the material 20 and will move the material over adjacent the roll 32, the bars being in the position seen in Fig. 2. As soon as the crank 67 passes the latch 68, the said crank will fall and the chain 65 will be actuated by the weight 69, so that the bars 60 and 61 will be caused to return to the position seen in Fig. 1, releasing the material and causing the same to be engaged by the roll 32 which is rotating in the proper direction, to press the same down upon the top of the layer of material which has already been fed to the table 10. In the meantime, as the roll 32 rotates the pin 56 carried thereby will, say after one revolution of the roll, engage with the collar 57, which will thus be carried around with the roll 32, say until another revolution has been completed, when it engages with the next collar 58 which will thus be carried after another revolution of the roll 32, at which time the pin 59 will be engaged and will cause the bar 53 of the roll 32 to be immediately lowered, engaging with the material 20, removing the same from engagement with the said roll 32 and pressing the same downwardly into a like position as that seen in Fig. 1 only upon the opposite end of the table, at which time the pin 13 engages the bell crank lever 14, shifting the belts causing the table to move in the other direction when a like operation of the parts takes place.

It will be understood that as the material is fed to the table and piled up thereon, that

the rolls 31 and 32 and the operating parts connected thereto will be automatically raised and be in position to always move upon the top surface of the layers on the table and as the guide members 35 and 36 are elevated it will be understood that the movable supporting members 70 will be automatically forced inward in order to act as a suitable support for the guide members 35 and 36 and prevent any undue strain thereupon.

As previously stated, it will be understood that the scraping member 27 removes the excess compound or solution from the material 20 to be treated and that the gutter or groove in the table 10 will receive any excess compound from the material and the same can be collected and returned to the tank 23 for reuse.

From the above it will be seen that I have provided means for automatically feeding the treated material to a reciprocating support in order that the same will be fed flat and will be pressed upon the table in a flat condition in layers and I have provided means for taking up the slack in such a manner that the material will always be fed flat without wasting of the same and in an even condition in order that substantially the entire product resulting from the use of this machine will be practical and capable of use.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a device of the character stated, a support, means for reciprocating the same in a horizontal plane, a pair of feed rolls which are adapted to rest on the material as the same is fed to the support, and one of which is adapted to feed the material to the support in one direction of its travel and the other of which is adapted to feed the material to the support in the other direction of its travel, and means for positively driving said rolls.

2. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls, one of which is adapted to feed the material to the support in one direction of its travel and the other of which is adapted to feed the material to the support in the other direction of its travel, and means suitably actuated for presenting the material at the proper time to one or the other of said rolls.

3. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls, one of which is adapted to feed the material to the support in one direction of its travel and the other of which is adapted to feed the material to the support in the other direction of its travel, and means suitably actuated for forming a slack in the material at the end of the travel of said support in each direction.

4. In a device of the character stated, a

support, means for reciprocating the same, a pair of feed rolls, one of which is adapted to feed material to the support in one direction of its travel and the other of which is adapted to feed the material to the support in the other direction of its travel, means suitably actuated for forming a slack in the material, and means suitably actuated for taking up the slack and for directing the material first to one roll and then to the other.

5. In a device of the character stated, a support, means for reciprocating the same, feed rolls, means for movably supporting said rolls, whereby the same are raised as the material is fed upon said support, means suitably actuated for rotating said rolls, said rotating means being adapted to rise and lower with said rolls, and means in engagement with said roll supporting means for assisting in holding the same in its different positions.

6. In a device of the character stated, a support, means for reciprocating the same, feed rolls, means for movably supporting said rolls, whereby the same are raised as the material is fed upon said support, means suitably actuated for rotating said rolls, said rotating means being adapted to rise and lower with said rolls, means in engagement with said roll supporting means for assisting in holding the same in its different positions, and means for automatically moving said last mentioned means as the roll supporting means are elevated.

7. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls, one of which is adapted to feed the material to the support in one direction of its travel and the other of which is adapted to feed the material to the support in the other direction of its travel, a gear for each of said rolls suitably actuated, and means for connecting each of said gears with its respective roll at the proper time for imparting rotary motion thereto.

8. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears, means intermediate each gear and its roll, whereby said gears actuate said rolls at the proper time and means for supporting said rolls, gears and said gear actuating means, whereby the same are raised as the material is fed to the support.

9. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears first in one direction and then in the other, depend-

ing upon the direction of movement of said support, means intermediate a gear and its respective roll whereby said gears actuate said rolls in a corresponding direction depending upon the direction of movement of said support, and means adjacent each roll adapted to be actuated to engage the material, to remove the same from the respective rolls.

10. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears first in one direction and then in the other, depending upon the direction of movement of said support, means intermediate a gear and its roll whereby said gears actuate said rolls at the proper time, a bar supported adjacent each of said rolls, and means intermediate each roll and each bar whereby a bar is actuated at the end of the travel of said support in each direction for causing said bar to engage with the material and form a slack therein.

11. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to the said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears first in one direction and then in the other, depending upon the direction of movement of said support, means intermediate a gear and its roll whereby said gears actuate said rolls at the proper time, a bar supported adjacent each of said rolls, means intermediate each roll and each bar whereby a bar is actuated at the end of the travel of said support in each direction for causing a bar to engage with the material to form a slack therein, and means for removing the bar from engagement with the material, as the support begins its movement.

12. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears first in one direction and then in the other, depending upon the direction of movement of said support, means intermediate a gear and its roll whereby said gears actuate said rolls at the proper time, a bar supported adjacent each of said rolls, means intermediate each roll and each bar whereby a bar is actuated at the end of the travel of said support in each direction for causing a bar to engage with the material to form a slack therein, and means for taking up said slack and for directing the material from one roll to a position adjacent the opposite roll.

13. In a device of the character stated, a

support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears first in one direction and then in the other, depending upon the direction of movement of said support, means intermediate a gear and its roll whereby said gears actuate said rolls at the proper time, a bar supported adjacent each of said rolls, means intermediate each roll and each bar whereby a bar is actuated at the end of the travel of said support in each direction for causing a bar to engage with the material and form a slack therein, and gripping bars suitably actuated for engaging the material to take up the slack and for directing the material from one roll to a position adjacent the opposite roll in order that the same may be suitably fed upon said support.

14. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears first in one direction and then in the other, depending upon the direction of movement of said support, means intermediate a gear and its roll whereby said gears actuate said rolls at the proper time, a bar supported adjacent each of said rolls, means intermediate each roll and each bar whereby a bar is actuated at the end of the travel of said support in each direction for causing a bar to engage with the material and form a slack therein, and gripping bars adapted to engage the material for taking up the slack and for directing the material from one roll to a position adjacent the opposite roll, and means operated by the support for actuating said gripping bars.

15. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to the said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears first in one direction and then in the other, depending upon the direction of movement of said support, means intermediate a gear and its roll whereby said gears actuate said rolls at the proper time, a bar supported adjacent each of said rolls, means intermediate each roll and each bar whereby a bar is actuated at the end of the travel of said support in each direction for causing a bar to engage with the material and form a slack therein, gripping bars between which the material is fed and normally permitting free passage thereof, and means operated by the table for actuating said bars for causing the same to grip the material to take up said

slack and to direct the material from one roll to a position adjacent the opposite roll, said actuating means returning the gripping bars to their normal position when the forward end of the support is adjacent said opposite feed roll.

16. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls suitably supported with respect to the said reciprocating support, a gear for each of said rolls and independent of the same, means for rotating said gears first in one direction and then in the other, depending upon the direction of movement of said support, means intermediate a gear and its roll whereby said gears actuate said rolls at the proper time, a bar supported adjacent each of said rolls, means intermediate each roll and each bar whereby a bar is actuated at the end of the travel of said support in each direction for causing said bar to engage with the material and form a slack therein, gripping bars suitably supported and between which the material is fed and normally permitting free passage therebetween, sprockets suitably supported or connected and one of which is in suitable connection with said gripping bars, a latch carried adjacent each end of said support adapted to operate one of said sprockets for actuating said gripping bars to engage the material for taking up slack and for directing the same from one roll to a position adjacent the opposite roll, and means for returning the gripping bars to their normal position after said latch has passed said sprocket.

17. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls, one of which is adapted to feed the material to the support in one direction of its travel and the other of which is adapted to feed the material to the support in the other direction of its travel, means suitably mounted adjacent each of said feed rolls for forming a slack in the material, at the end of the travel of said support in each direction, and means intermediate said rolls and said slack forming means for actuating the latter at the proper time.

18. In a device of the character stated, a support, means for reciprocating the same, a pair of feed rolls, one of which is adapted to feed the material to the support in one direction of its travel and the other of which is adapted to feed the material to the support in the other direction of its travel, means suitably mounted adjacent each of said feed rolls for forming a slack in the material at the end of the travel of said support in each direction, and a plurality of collars adapted to be successively locked together as the rolls rotate in order that a slack forming means will be actuated at the

end of the travel of said support in each direction.

19. In a device of the character stated, a table, means for actuating the same, means
5 actuated by the movement of said table for reversing the feed in order that the table will be reversed, a pair of feed rolls suitably supported, means for rotating the same, said rotating means being adapted to reverse as
10 the table is reversed in order that the rolls will be rotated in opposite directions depending upon the direction of movement of said table, a bar supported adjacent each of said rolls, means actuated by the rotation of
15 said rolls for moving said bars to cause the same to engage with the material and to form a slack therein at the end of the travel of said table in each direction, means for actuating each of said bars for removing the
20 same from engagement with the material as the table begins its forward movement, gripping bars, and means actuated by the table for operating said gripping bars to engage the material to take up said slack and directing
25 the material from one roll to a position adjacent the opposite roll in order that the same will be properly engaged thereby and fed upon the table.

20. In a device of the character stated, a
30 support, means for reciprocating the same, a pair of feed rolls, one of which is adapted to engage with the material in one direction of the travel of the support and the other of which is adapted to engage the material
35 in the other direction of the travel of the support and means suitably actuated for properly presenting the material to be engaged by one or the other of said rolls at the proper time.

40 21. In a device of the character stated, a support, means for reciprocating the same, a pair of rolls, one of which is adapted to engage with the material in one direction of the travel of the support and the other of
45 which is adapted to engage the material in the other direction of the travel of the support, means suitably actuated for properly presenting the material to be engaged by one or the other of said rolls at the proper time,
50 and means adjacent each roll adapted to be actuated to engage the material, to remove

the same from engagement with the respective roll.

22. In a device of the character stated, a support, means for reciprocating the same, a
55 pair of feed rolls, one of which is adapted to engage with the material in one direction of the travel of the support and the other of which is adapted to engage the material in the other direction of the travel of the support, means suitably actuated for properly
60 presenting the material to be engaged by one or the other of said rolls at the proper time, means adjacent each roll adapted to be actuated to engage the material, to remove the same from engagement with the
65 respective roll, and means for releasing said engaging means from the material as the support begins its movement.

23. In a device of the character stated, a
70 support, means for reciprocating the same, a pair of feed rolls, one of which is adapted to engage the material in one direction of the travel of the support and the other of which is adapted to engage the material in
75 the other direction of the travel of the support, and a bar supported adjacent each roll, one of which is adapted to be actuated at the end of the travel of said support in each direction for causing said bar to en-
80 gage the material to remove the same from engagement with the respective roll.

24. In a device of the character stated, a support, means for reciprocating the same, a
85 pair of feed rolls, one of which is adapted to engage the material in one direction of the travel of the support and the other of which is adapted to engage the material in the other direction of the travel of the support; a bar supported adjacent each roll,
90 one of which is adapted to be actuated at the end of the travel of said support in each direction for causing said bar to engage the material to remove the same from engagement with the respective roll and gripping
95 bars suitably actuated for properly presenting the material to be engaged by one or the other of said rolls, at the proper time.

GEORGE W. TEMPLE.

Witnesses:

CLYDE A. TEMPLE,
EARL R. TEMPLE.