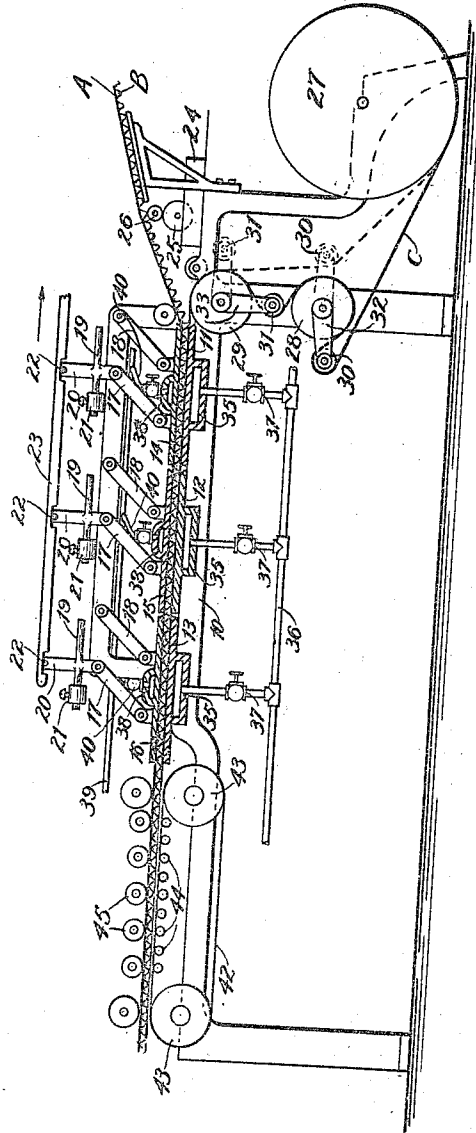


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MACHINE FOR MAKING DOUBLE FACED CORRUGATED PAPER.
APPLICATION FILED SEPT. 13, 1915.

1,179,941.

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MACHINE FOR MAKING DOUBLE-FACED CORRUGATED PAPER.

1,179,941

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SAMUEL M. LANGSTON, a citizen of the United States, and resident of Wenonah, in the county of Gloucester and State of New Jersey, have invented certain new and useful Improvements in Machines for Making Double-Faced Corrugated Paper, of which the following is a specification.

This invention relates to certain improvements in machines for making double-faced corrugated paper and more particularly to the means for applying the second facing sheet to a corrugated sheet which already has a facing sheet upon the opposite surface.

My invention resides primarily in the means employed for applying a yielding pressure to the final product in order to dry the adhesive and insure the desired smoothness of the outer or facing sheets.

In carrying out my invention, I provide a supporting platform or table over which the material passes and I press the material on to said platform or table by means of one or more pressure plates.

One main object of my invention is to so mount the pressure plate that it may yield as material of different thickness is passed thereunder and so that the degree of pressure exerted upon the material may be varied at will.

Other features will be pointed out more particularly hereinafter.

In the accompanying drawing, I have shown rather diagrammatically a side elevation of a machine constructed in accordance with my invention, a portion of the machine being shown in longitudinal section.

This machine involves only one embodiment of my invention, but various other forms may be designated within the spirit of my invention and without departing from the scope of the appended claims.

I have illustrated the machine as including a main frame 10 which supports a table or platform over which the material passes. This table or platform may be formed of a single continuous plate or sheet or it may be made up of separate sections. As illustrated I employ three sections 11, 12 and 13 arranged with their upper surfaces in the same plane and closely adjacent to each other. Above this table I provide yielding means for pressing the material toward the table. Such means includes a superposed plate held in parallelism with the platform and

movable in a direction having a vertical component. There may be any desired number of these plates or the plate may be made up of any desired number of sections. The sections may be connected together or they may be and preferably are capable of independent movement. As shown, the plate includes three sections 14, 15 and 16, each supported by two parallel links 17 and 18 from a superposed frame part. These links are preferably all of the same length and extend downwardly and toward the delivery end of the machine when the superposed plate sections rest directly upon the platform. The superposed plates are capable of moving in parallelism and in a direction having vertical and horizontal components. The plates will rest directly upon the material and they may be weighted or relieved of weight so as to apply the desired pressure. This means for varying the pressure may be of various different forms, but a very simple and efficient form involves the use of horizontally disposed arms 19 each rigidly connected to one of the links of an upper plate or plate section. As illustrated, each link 17 has an upwardly extending arm 20 carrying the corresponding horizontal arm 19 and upon each arm 19 is a weight 21. The weights are adjustable lengthwise of the arms 19 and may be mounted on either end, that is, upon either side of the arm 20. With the weights as shown in the drawing, that is, on the arm portions projecting toward the delivery end of the machine, they will tend to swing the arms 20 toward the delivery end and will thus tend to press the plate sections 14, 15 and 16 down on to the material. Their effectiveness may be varied by adjustment along the length, and by putting them on the opposite projecting portions of the arms 19 they will tend to counteract the weight of the plate sections and will tend to lift the latter off the material. Thus, the effective pressure exerted by the superposed plates may be either increased or decreased from normal at will, dependent upon the character of the material operated upon, the nature of the adhesive, the temperature, etc. The superposed plate sections are, as previously stated, independently movable and gradually increasing or decreasing pressures may be exerted on the plate sections toward the delivery end of the machine.

In order to simultaneously raise all of the superposed plate sections and permit the

threading of the material therebeneath, any suitable means may be employed. As illustrated, each upwardly extending arm 20 has a pin 22 operating in a longitudinally extending slot or recess in a horizontal bar 23. The length of these grooves or recesses permits of the independent movement of the pressure plates during the normal operation of the machine while, by pulling on the bar 23 in the direction of the arrow, the pins 22 will engage with the ends of their respective recesses or slots and all of the pressure plates will be raised to the desired position above the platform.

The material delivered to the pressure plates includes a combined sheet made up of a facing sheet A and a corrugated sheet B, and a second facing sheet C freshly applied to the crowns of the corrugations of the sheet B opposite to the facing sheet A. The sheets A and B may be delivered in any suitable manner and any suitable means may be provided for applying adhesive to the crowns of the corrugations. In the drawing, I have shown an adhesive receptacle 24 having a roller 25 dipping into the adhesive and a second roller 26 operating to transfer the adhesive from the roller 25 to the crowns of the corrugations.

The second facing sheet may be taken from any suitable source of supply as for instance a roll 27. On its way from the roll to the adhesive covered corrugations of the sheet B, it is passed over combined heating and tension means which also embody certain features of my invention. As illustrated, I employ two drums 28 and 29 and two idler rollers 30 and 31. The roller 30 is carried by arms 32 mounted concentric with the axis of the drum 28 while the roller 31 is carried by arms 33 concentric with the upper drum 29. These arms may be swung to the position shown in dotted lines in the drawing so that the paper may pass from the roll 27 upwardly between the roller 30 and the drum 28 and thence between the roller 31 and the drum 29 and over the latter to the platform. This facilitates an easy threading of the machine. The drums are preferably internally heated as for instance by passing steam through the journals thereof and the arms 32 and 33 are normally swung to the position shown in solid lines in the drawing so that the facing sheet C is maintained in engagement with the peripheral surfaces of both the drums 28 and 29 for a considerable portion of said surfaces. Thus, the sheet C is heated before it reaches the platform and before it comes into contact with the adhesive coated corrugations of the middle sheet B.

The preliminary heating of the facing sheet C may, in some cases, be amply sufficient to cause the complete drying of the adhesive while the combined sheet is passing

beneath the pressure plates. If such be the case, it is not necessary to heat either the platform or the pressure plates. Preferably, I provide means whereby either the platform or the pressure plates may be heated if desired. As illustrated, each section of the platform has a steam box 35 to which steam may be delivered from a supply pipe 36 through separate valved connections 37. Thus, steam may be applied to only the first steam box or to the first two, or to all three as may be desired. The pressure plates may have steam boxes 38 to which steam may be supplied from a conduit 39 and independent valved connections 40. Thus, only the first pressure plate or any desired number of them may be heated.

Any suitable means whatsoever may be employed for continuously or intermittently drawing the material through the machine and beneath the pressure plates. This may include superposed belts having parallel runs or pairs of rollers, or any other means known in the trade. I have illustrated rather conventionally a feeding means which includes a belt 42 carried by drums 43 and having its upper run supported on a plurality of rollers 44. Resting upon the material and above the drums 43 and the belt, I may employ either a second belt or a plurality of rollers. These are preferably driven by suitable gearing so as to have a rate of surface travel substantially equal to that of the belt. This feeding means serves to pull the product from beneath the pressure plates and the latter, together with the supporting table or platform, operate to hold the facing sheet C in proper engagement with the corrugations of the sheet B while the adhesive is dried. As previously stated, the drying may be facilitated by heating the platform and the pressure plates, or I may rely entirely upon the internally heated drums 28 and 29, or may rely upon both.

One important advantage which I am able to secure by means of my machine is the avoiding of such waste as commonly results from the burning or excessive drying of the material in the machine when the latter is stopped. At the instant the feeding of material through my improved machine is interrupted, the pressure plates may instantly be raised out of engagement with the material and the arms 32 and 33 may be swung to the dotted line positions to entirely free the sheet C from the drum 28 and partially free it from the drum 29. By thus relieving the material from pressure and a large portion of the heat, the said material will not be injuriously affected if it be permitted to remain in the machine for a short time after the latter has been stopped.

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

1. A machine of the class described, including a supporting platform, a plurality of independent pressure plates arranged in succession and adapted to rest upon the material as the latter passes over said platform, and means permitting the independent movement of said pressure plates upwardly and toward the delivery end of the machine.
2. A machine of the class described, including a supporting platform, a plurality of independent pressure plates arranged in succession and adapted to rest upon the material as the latter passes over said platform, means permitting the independent movement of said pressure plates upwardly and toward the delivery end of the machine, and means for simultaneously raising all of said plates.
3. A machine of the class described, including a supporting platform, a plurality of independent pressure plates arranged in succession and adapted to rest upon the material as the latter passes over said platform, means permitting the independent movement of said pressure plates upwardly and toward the delivery end of the machine, and means for heating said platform.
4. A machine of the class described, including a supporting platform, a plurality of independent pressure plates arranged in succession and adapted to rest upon the material as the latter passes over said platform, means permitting the independent movement of said pressure plates upwardly and toward the delivery end of the machine, and means for heating said pressure plates.
5. A machine of the class described, including a supporting platform, a plurality of independent pressure plates arranged in succession and adapted to rest upon the material as the latter passes over said platform, means permitting the independent movement of said pressure plates upwardly and toward the delivery end of the machine, means for heating said platform, and means for heating said pressure plates.
6. A machine of the class described including a support for the material, a superposed pressure plate, a pair of parallel links controlling the movement of said pressure plate, and means for varying the effective pressure exerted by the latter.
7. A machine of the class described including a support for the material, a superposed pressure plate, a pair of parallel links controlling the movement of said pressure plate, and a weight adjustable in respect to said links for varying the effective pressure exerted by the latter.
8. A machine of the class described including a support for the material, a superposed pressure plate, a pair of parallel links controlling the movement of said pressure plate, an arm connected to one of said links extending substantially horizontally in respect thereto, and a weight adjustable along the length of said arm.
9. A machine of the class described, including a support for the material, a pressure plate adapted to rest upon the material, a pair of parallel links connected to said pressure plate and extending downwardly and toward the delivery end of the machine to permit the upward and forward movement of said pressure plate, and a weight connected to one of said links and adjustable to increase or decrease the effective pressure of said plate.
10. A machine of the class described, including means for heating a facing strip, means for applying adhesive to the crowns of the corrugations of a single faced strip, a support over which the combined sheet may pass, a pressure plate for yieldingly holding the combined sheet into engagement with said support, and feeding means for causing the movement of said combined sheet over said support and beneath said pressure plate.
11. A machine of the class described, including a heated drum, a roller adjustable circumferentially of said drum to vary the extent of the peripheral surface of said drum with which a facing sheet may engage, means for bringing a corrugated sheet into engagement with said facing sheet, a heated table over which the combined sheet may pass, a yielding pressure plate for engagement with the material as the latter passes over said table, and means for raising said pressure plate upwardly out of engagement with the material.
12. A machine of the class described, including a heated drum, a roller adjustable circumferentially of said drum to vary the extent of the peripheral surface of said drum with which a facing sheet may engage, means for bringing a corrugated sheet into engagement with said facing sheet and holding them in engagement with one another as they are drawn through the machine.
13. A machine for making double faced corrugated paper including a support for the material, a plurality of independent pressure plates arranged in succession adapted to rest upon the material as it passes over said platform, and a separate pair of links connected to each pressure plate and permitting a movement of each plate independently of the other plates and upwardly and in the direction of travel of the material.
14. A machine of the class described, including a support for the material, a plurality of independent pressure plates arranged in succession and adapted to rest upon the material as the latter passes over said support, and means for rendering the

effective pressure of each plate greater or less than the normal pressure resulting from the weight of the plate.

15 15. A machine of the class described including a support for the material, a plurality of pressure plates arranged in succession and adapted to rest upon the material as the latter passes over said support, and separate guiding means for each plate 10 for holding it in parallelism with said support and permitting a movement upwardly and in the direction of movement of the material of slightly varying thickness passing therebeneath.

15 16. A machine for making double faced corrugated paper including means for applying adhesive to the crowns of the corrugations of a single faced corrugated sheet, means for delivering a facing sheet to the 20 adhesive covered crowns, a support over which the combined sheet passes and engaging with said facing sheet, a plurality of independent pressure plates arranged in succession and adapted to rest upon the 25 combined sheet as the latter passes over said support, and guiding means for each plate permitting of the independent movement of said plates upwardly as irregularities in the

thickness of the combined sheet pass therebeneath.

17. A machine for making double faced 30 corrugated paper including means for applying adhesive to the crowns of the corrugations of a single faced corrugated sheet, means for delivering a facing sheet to the 35 adhesive covered crowns, a support over which the combined sheet passes and engaging with said facing sheet, a plurality of independent pressure plates arranged in succession and adapted to rest upon the com- 40 bined sheet as the latter passes over said support, guiding means for each plate permitting of the independent movement of said plates upwardly as irregularities in the thickness of the combined sheet pass there- 45 beneath, and means for simultaneously raising all of said plates out of engagement with said combined sheet.

Signed at Camden in the county of Camden and State of New Jersey this 7th day of 50 September, A. D. 1915.

SAMUEL M. LANGSTON.

Witnesses:

HARRY J. GREEVE,
M. TEITCHMAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."