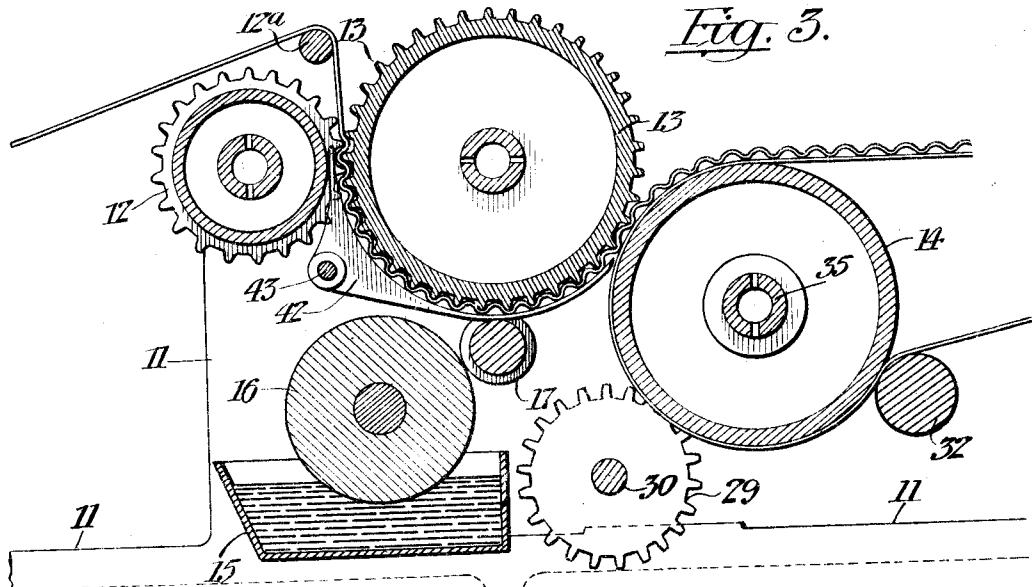
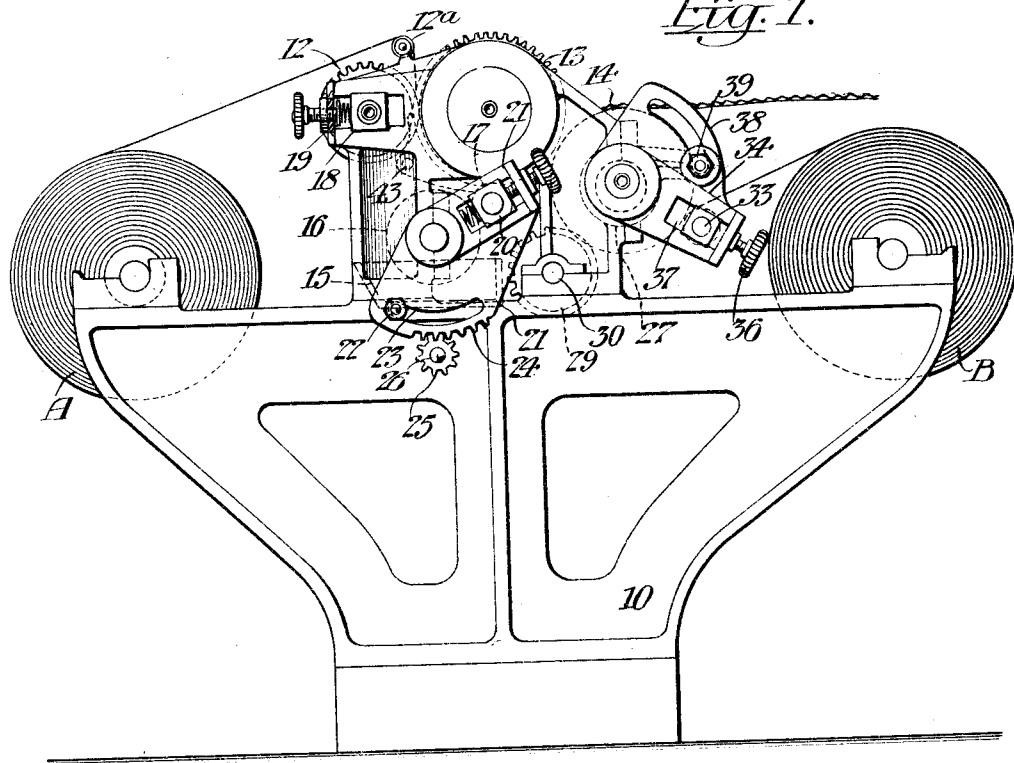


S. M. LANGSTON.
MACHINE FOR MAKING CORRUGATED PAPER.
APPLICATION FILED MAR. 1, 1915.

Patented June 13, 1916.
2 SHEETS—SHEET 1.

1,186,997.



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Thence Linsen

Inventor:
Samuel M. Langston
by his Attorney
C. F. Fairbank

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2 SHEETS—SHEET 2.

Fig. 2.

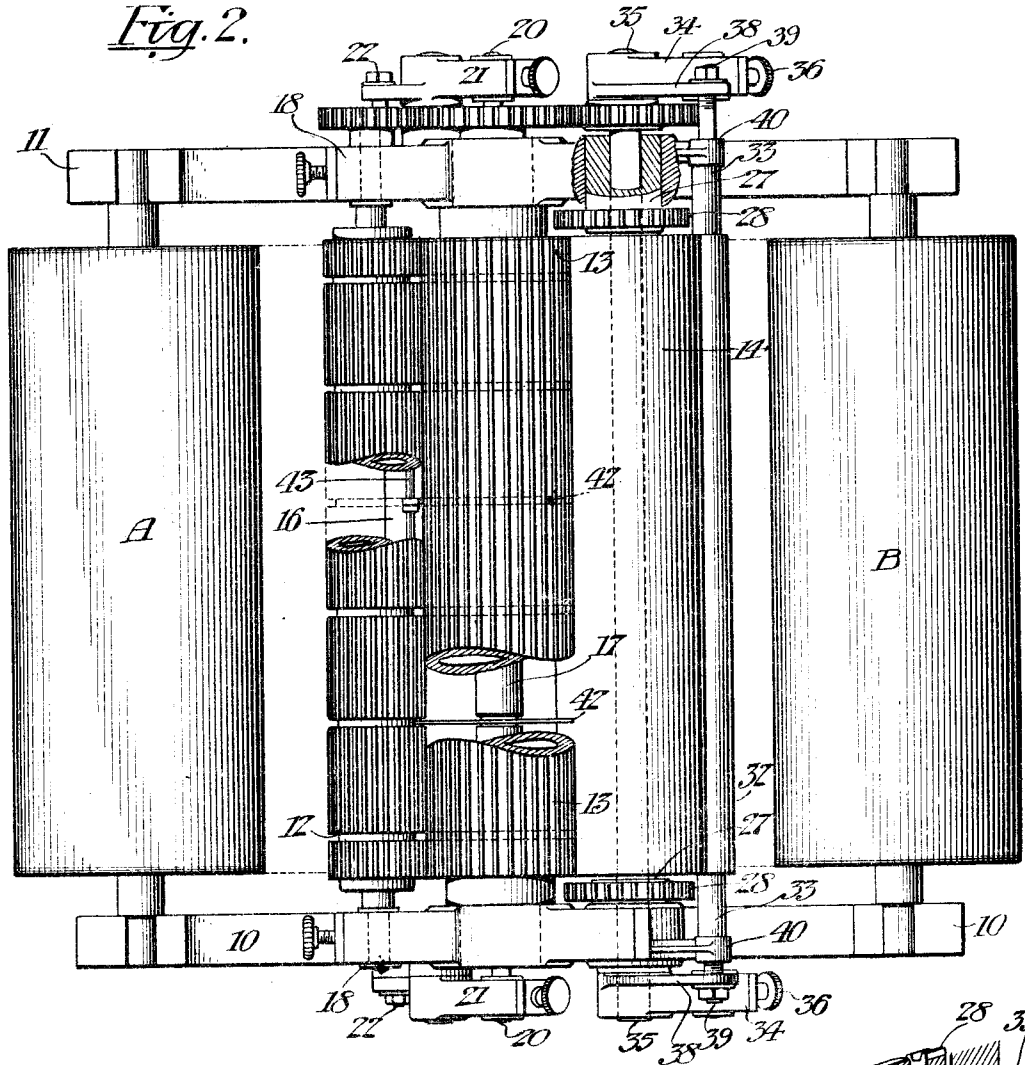
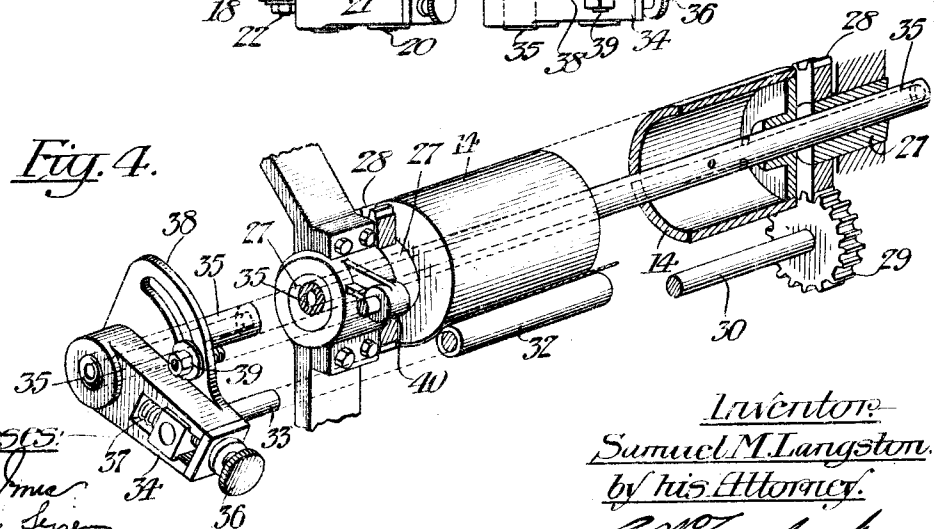


Fig. 4.



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UNITED STATES PATENT OFFICE.

SAMUEL M. LANGSTON, OF WENONAH, NEW JERSEY.

MACHINE FOR MAKING CORRUGATED PAPER.

1,186,997.

Specification of Letters Patent. Patented June 13, 1916.

Application filed March 1, 1915. Serial No. 11,258.

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 Corrugated Paper, of which the following is a specification.

This invention relates to certain improvements in machines for making corrugated paper and more particularly to a product including one sheet of corrugated paper and a facing sheet glued to the tops of the corrugations on one side thereof. This single faced corrugated paper may constitute the complete article of manufacture made by my improved machine or the product may pass on to another machine or to another part of the same machine and have a second facing sheet applied to the opposite surface thereof so as to make double faced corrugated paper.

My invention relates particularly to means for imparting to one sheet the desired corrugations and applying the second sheet thereto, and the main object of my invention is to reduce the time required for the passage of the material through the machine and to simplify and improve the parts so that satisfactory and successful results may be secured at a comparatively low cost. At the same time, I seek to render the machine adaptable to the treatment of sheets of various different thicknesses or other characteristics.

Reference is to be had to the accompanying drawings forming a part of this specification and in which similar reference characters indicate corresponding parts in the several views.

In these drawings, Figure 1 is an end view of a machine constructed in accordance with my invention; Fig. 2 is a top plan view thereof, portions being broken away; Fig. 3 is a vertical longitudinal section, and Fig. 4 is a perspective view of certain of the parts.

In these drawings, I have illustrated only one embodiment of my invention, but it is evident that various changes and modifications may be made within the spirit of my invention and without departing from the scope of the appended claims.

In this specific form, I employ main frame members 10 and 11 serving to support a pair of corrugating rollers 12 and 13, and a pressing roller 14 over which the sheets pass. I

have also shown this same frame as supporting at opposite ends two rolls A and B of material for forming the corrugated sheet and the facing sheet respectively, although of course these may be separately supported if desired. The main frame is also shown as supporting a receptacle 15 for the glue or other adhesive, preferably silicate of soda, and a roller 16 rotating in the adhesive. The three rollers 12, 13, and 14 are preferably in the form of hollow drums and their journals are so constructed that the steam may be delivered to the interior of each drum to heat the latter while the machine is in operation. I have not illustrated the pipe connections in detail as they form no part of my present invention.

The corrugating roller 13 is mounted in stationary bearings, while the corrugating roller 12 is mounted in sliding bearings 18 movable toward and from the axis of the corrugating roller 13. By mounting the two corrugating rollers side by side rather than by superposing them, the lower roller is relieved of the weight of the upper roller and therefore the rollers may, if desired, be pressed together with a pressure materially less than the weight of the roller. Coil springs 19 serve to press the axis of the roller 12 toward the axis of the roller 13 and the tension of each spring may be increased or decreased at will by adjusting screws having heads serving as seats for the outer ends of the springs. Considerable pressure may thus be applied to the paper as it passes between the two rollers. The springs seat the flanges of each roller at the bottoms of the grooves of the other so that the paper is pressed as it is being corrugated. The paper preferably passes from the roll A over a guide roller 12^a and thence downwardly between the two corrugating rollers and beneath the corrugating roller 13 where the adhesive is applied to the crowns of the corrugations.

The mechanism for transferring the adhesive to the crowns of the corrugations from the roller 16, rotating in the supply of adhesive, includes a transferring roller 17. This roller is mounted in bearings 20 which latter are slidable in brackets 21 pivoted on the main frame and swinging about the axis of the roller 16 as a center. The two brackets 21 upon opposite sides of the machines are normally held against movement by a clamping bolt 22 connected to the frame of the machine and extending through a curved slot

23 in the bracket. For simultaneously swinging the two brackets to the same extent so as to move the transferring roller 17 in parallelism, the two brackets may have gear teeth 24 disposed along an arc concentric to the axis of the roller 16 and each meshing with a pinion 25. The two pinions are on the same shaft 26 so that the two brackets may be swung simultaneously and to the same extent. This swinging of the brackets serves to move the adhesive transferring roller toward and from the corrugating roller 13 and enables it to be pressed against the grooves of the corrugations with the desired pressure.

As previously stated the bearings of the transferring roller 17 are radially movable in the brackets so that said roller may be adjusted toward and from the roller 16. The bearings 20 are shown as pressed radially in one direction, preferably outwardly, by coil springs and this motion is limited by adjusting screws. By the radial movement of the bearings of the roller 17 within the brackets and the swinging of the brackets about their own pivotal supports, the roller 17 may be held against both the adhesive roller 16 and the crowns of the corrugations so as to deliver the proper and regulated amount of adhesive. The smooth roller or drum 14 is also preferably adjustable toward and from the corrugating roller 13, but this adjusting means is preferably capable of much more delicate adjustment. As shown, I provide the bearings of the roller 14 with eccentric bearing sleeves 27 so that the axis of the roller may be adjusted to a limited extent by rotating the two sleeves simultaneously and to the same extent. For doing this, I preferably provide a gear wheel 28 whose axis may be concentric with the axis of the sleeve and which gear wheel 28 may mesh with a pinion 29, the two pinions being mounted upon opposite ends of a shaft 30. By rotating this shaft the two sleeves will be rotated simultaneously in the same direction and to the same extent and the drum or roller 14 will be adjusted to a limited extent toward and from the corrugating roller 13.

The paper from the roll B passes beneath the roller 14 and is pressed against the adhesive covered crowns of the corrugations in the paper along the line of tangency of the rollers 13 and 14. The adjustment of the roller 14 permits the plain sheet to be forced against the corrugated sheet with the desired pressure and permits of adjustments in accordance with the thickness of the paper being treated.

As previously stated, the roller 14 is preferably hollow and provided with connections whereby steam may be delivered thereto to heat the surface of the roller. I

so arrange the parts that the paper from the roll B engages with the surface of the roller 14 at some little distance from the point at which the plain sheet comes into engagement with the corrugated sheet. Thus the plain sheet is heated before the two sheets come together and the adhesive is more quickly dried.

As one feature of my invention, I preferably so arrange the parts that the extent of this heating operation may be varied at will. To do this I vary the point at which the sheet comes into contact with the smooth drying roller 14. As shown, I provide a roller 32 parallel to the roller 14 and mounted on a shaft 33. This shaft, at its ends, is journaled in bearings which latter are mounted in brackets 34. The brackets are mounted on the shaft 35 of the roller 14 or concentric therewith, so that the brackets may be swung about the latter as a center. Thus, the roller 32 may be moved along the surface of the roller 14. The roller 32 is preferably adjustable toward and from the roller 14 by adjusting the bearings in the brackets. As shown, an adjustable set screw 36 limits the movement of the bearing in one direction and a coil spring 37 holds the bearing against said set screw. Each bracket has a slotted flange 38 through which a locking bolt 39 carried by an arm 40 on the main frame may extend. By means of these locking bolts, the brackets may be held in any adjusted position and the roller 32 may occupy either the position shown in Fig. 3 or may be swung down to a position beneath the roller 14.

The paper from the roll B passes over the roller 32 and beneath the roller 14 so that the position of the roller 32 controls the point at which the paper engages with the heating roller 14. In threading up the machine, the roller 32 may be dropped down to a position beneath the roller 14 and may be adjusted away from the latter so as to facilitate the passage of the paper therebetween.

It is desirable that the paper follow the contour of the lower side of the roller 13 and remain in proper engagement with the corrugating flanges of the latter while the paper passes from the interengaging corrugating means to the adhesive applying roller and thence from the adhesive applying roller to the roller 14. In order to insure this, I provide guiding means. As shown, the corrugating roller 12 and the adhesive applying roller 17 are each provided with a plurality of circumferential corrugations and a plurality of guiding fingers 42 are mounted on the transverse rod 43. Each finger has a portion projecting upwardly to a point adjacent to or slightly beyond the line of centers of the rollers 12 and 13 and also has a portion extending

through the corresponding groove of the adhesive applying roller and terminating slightly below the line of centers of the rollers 13 and 14. The upper surface of each finger is curved so as to hold the paper in engagement with the corrugations of the roller 13 from the point at which the said paper is corrugated to the point where the second sheet is applied.

10 As previously stated, various changes may be made in the construction and design of the various parts illustrated without departing from the spirit of my invention. In the accompanying drawings I have made no effort to show the corrugating flanges of the rollers of the best form, spacing and arrangement, as these constitute no portion of my present invention which is defined in the appended claims.

20 Having 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 series of three rollers, two of said rollers being corrugated and serving to corrugate a sheet of paper and the third roller being plain and serving to press a sheet of plain paper into engagement with the crowns of the corrugations of the first sheet, a pair of eccentric bearings at opposite ends of said plain roller and means for simultaneously rotating said bearings to adjust said plain roller toward and from one of said corrugating rollers.

2. A machine of the class described including a series of three rollers, two of said rollers being corrugated and serving to corrugate a sheet of paper and the third roller being plain and serving to press a sheet of plain paper into engagement with the crowns of the corrugations of the first sheet, a pair of eccentric bearings at opposite ends of said plain roller, and means for simultaneously rotating said bearings to adjust said plain roller toward and from one of said corrugating rollers, said means including gears rigid with said bearings, a transverse shaft and pinions on said shaft meshing with said gears.

3. A machine of the class described, including a series of rollers, two of said rollers being corrugated and serving to corrugate a sheet of paper, and the third roller being plain and serving to press a second sheet against the crowns of the corrugations on the first sheet as the latter leaves the second corrugating roller, means for resiliently pressing said corrugating rollers together, and adjustable means for varying the position of said plain roller in respect to the adjacent corrugating roller.

4. A machine of the class described, including a corrugating roller, a plain roller, means for adjusting said plain roller toward and from said corrugating roller,

means for delivering a sheet of plain paper into contact with said plain roller in advance of the line of tangency of said rollers, and means for varying the point at which said sheet contacts with said plain roller.

5. A machine of the class described, including a pair of rollers operating to press together two sheets of material, means for delivering one of said sheets into engagement with one of said rollers in advance of the line of tangency, and means for varying the point of delivery of the sheet into contact with said roller, said means including a guide roller adjustable circumferentially and radially of said last mentioned roller.

6. A machine of the class described, including a pair of rollers operating to press together two sheets of material, means for delivering one of said sheets into engagement with one of said rollers in advance of the line of tangency, and means for varying the point of delivery of the sheet into contact with said roller, said means including a guide roller adjustable radially of said last mentioned roller.

7. A machine of the class described, including a pair of corrugating rollers, one of said rollers having circumferential grooves, an adhesive applying roller also having circumferential grooves, and a plurality of guide fingers extending along the periphery of the other corrugating roller and through the circumferential grooves of the first mentioned roller and the adhesive applying roller.

8. A machine of the class described, including a pair of corrugating rollers, one of said rollers having circumferential grooves, an adhesive applying roller also having circumferential grooves, a plurality of guide fingers extending along the periphery of the other corrugating roller and through the circumferential grooves of the first mentioned roller and the adhesive applying roller, and means for adjusting said adhesive applying roller toward and from the second mentioned corrugating roller.

9. A machine of the class described, including a pair of corrugating rollers, one of said rollers having circumferential grooves, an adhesive applying roller also having circumferential grooves, and a plurality of guide fingers supported intermediate of their ends extending along the periphery of the other corrugating roller and through the circumferential grooves of the first mentioned roller and the adhesive applying roller.

10. A machine of the class described, including a pair of corrugating rollers, one of said rollers having circumferential grooves, an adhesive applying roller also having circumferential grooves, and a plurality of substantially rigid, curved guide fingers extending along the periphery of the other corru-

gating roller and through the circumferential grooves of the first mentioned roller and the adhesive applying roller.

11. A machine for making corrugated paper, including a main corrugating roller and two rollers coöperating therewith, one of said last mentioned rollers having teeth meshing with said first mentioned roller to corrugate one sheet, springs for pressing said last mentioned roller against said first mentioned roller in a direction having a material horizontal component, and means for varying the tension of said springs, the other of said second mentioned rollers being plain and operating to press a second sheet to one corrugated sheet while the latter is on said first mentioned roller.

12. A machine for making corrugated paper including a corrugating roller, a second corrugating roller at one side of said first mentioned roller and coacting therewith to corrugate a sheet, springs for pressing said last mentioned roller in a substantially horizontal direction toward the other, means for varying the tension of said springs, an adhesive applying roller beneath said first mentioned roller, and a plain roller approximately diametrically opposed to said spring pressed roller for applying a sheet to the adhesive covered crowns of the corrugations of the first sheet while the latter is on said first mentioned roller.

13. A machine for making corrugated paper including a corrugating roller, a second corrugating roller at one side of said first mentioned roller and coacting therewith to corrugate a sheet, springs for pressing said last mentioned roller in a substantially horizontal direction toward the other, means for varying the tension of said springs, an adhesive applying roller beneath said first mentioned roller, a plain roller for applying

a sheet to the adhesive covered crowns of the corrugations of the first sheet while the latter is on said first mentioned roller, and means for adjusting said plain roller toward and from said first mentioned roller.

14. A machine for making corrugated paper including a corrugating roller, an adhesive coated roller adjacent thereto but spaced therefrom and an adhesive transferring roller adjustable circumferentially of said second mentioned roller toward and from said corrugating roller.

15. A machine for making corrugated paper including a corrugating roller, an adhesive coated roller adjacent thereto but spaced therefrom, an adhesive transferring roller adjustable toward and from said second mentioned roller and circumferentially of said second mentioned roller toward and from said corrugating roller, said adhesive transferring roller having circumferential corrugations, and a plurality of members extending through said corrugations for retaining a sheet in engagement with said corrugating roller at opposite sides of said adhesive transferring roller.

16. A machine for making corrugated paper, including a corrugating roller, an adhesive coated roller adjacent thereto but spaced therefrom, an adhesive transferring roller adjustable circumferentially of said second mentioned roller toward and from said corrugating roller, and means for adjusting one of said adhesive rollers toward and from the other.

Signed at New York city in the county of New York and State of New York this 25th day of February A. D. 1915.

SAMUEL M. LANGSTON.

Witnesses:

CLAIR W. FAIRBANK,
FLORENCE LEVIEN.

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