

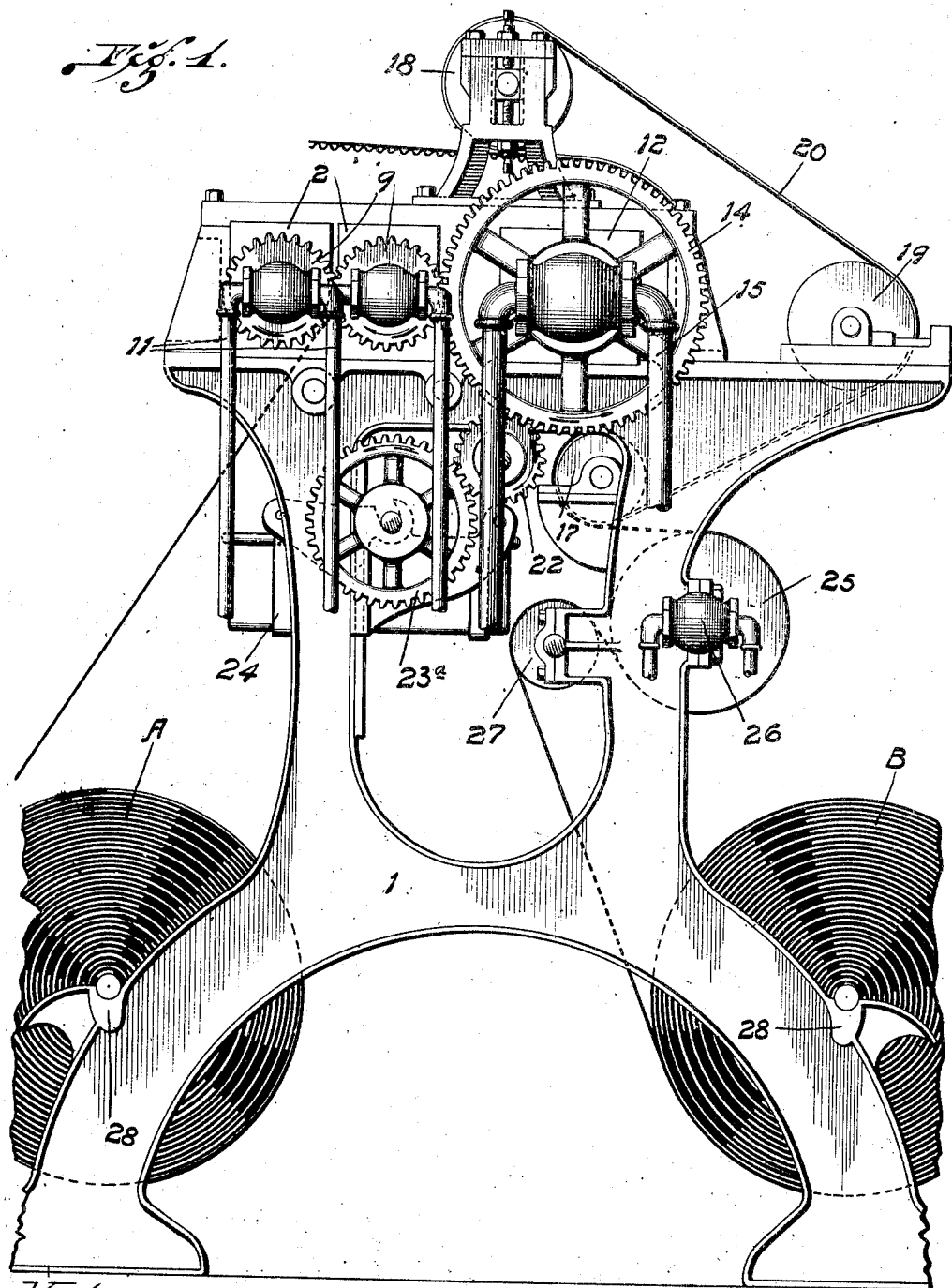
J. H. McPIKE, H. G. McPIKE, JR. & H. B. HARLOW.
CORRUGATED PAPER BOARD MACHINE.

APPLICATION FILED JAN. 10, 1910.

972,121.

Patented Oct. 4, 1910.

2 SHEETS—SHEET 1.



WITNESSES.
E. M. Huntington.
J. J. Janus

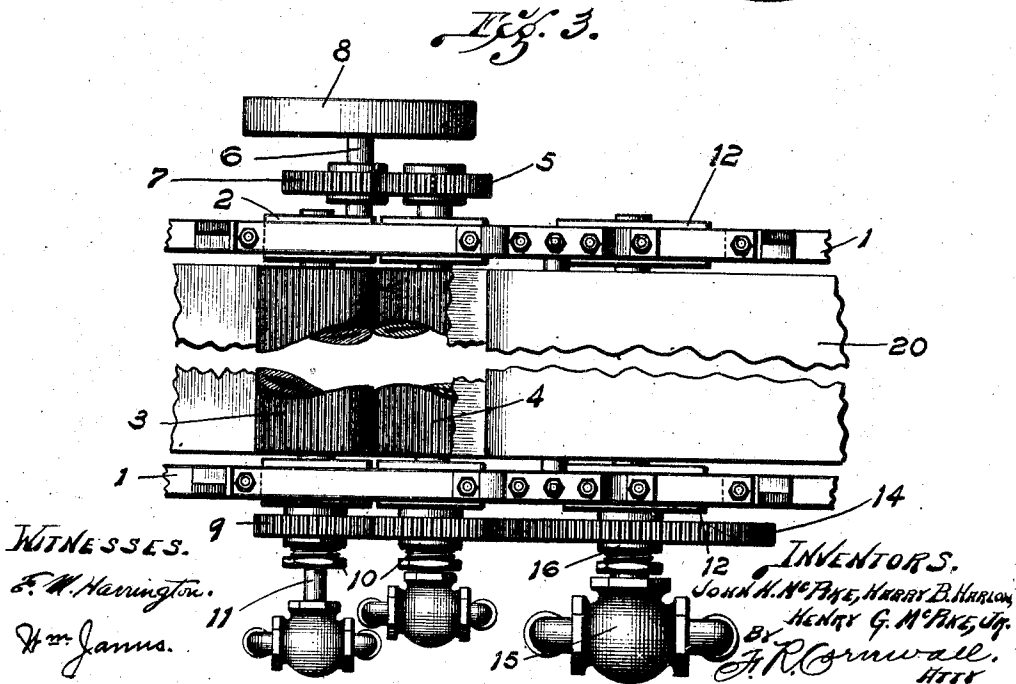
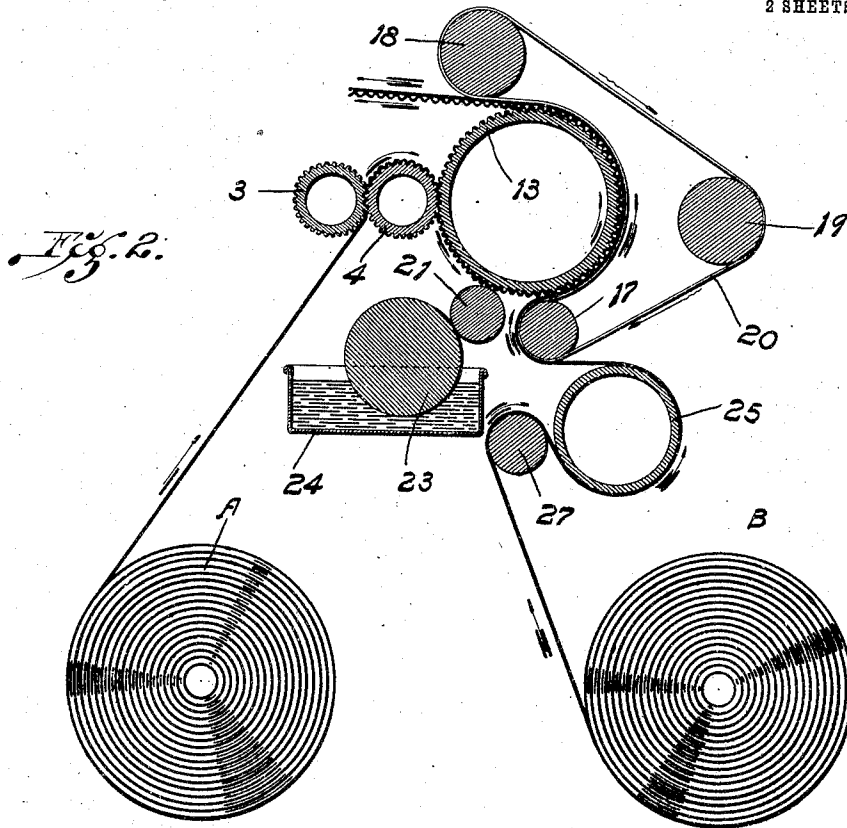
INVENTORS.
JOHN H. McPIKE, HARRY B. HARLOW,
HENRY G. McPIKE, JR.
BY A. R. Cornwall atty.

J. H. McPIKE, H. G. McPIKE, JR. & H. B. HARLOW.
 CORRUGATED PAPER BOARD MACHINE.
 APPLICATION FILED JAN. 10, 1910.

972,121.

Patented Oct. 4, 1910.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

JOHN H. McPIKE, HENRY G. McPIKE, JR., AND HARRY B. HARLOW, OF ALTON, ILLINOIS;
SAID HARLOW AND HENRY G. McPIKE, JR., ASSIGNORS TO SAID JOHN H. McPIKE.

CORRUGATED-PAPER-BOARD MACHINE.

972,121.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Application filed January 10, 1910. Serial No. 537,148.

To all whom it may concern:

Be it known that we, JOHN H. McPIKE, HENRY G. McPIKE, JR., and HARRY B. HARLOW, all citizens of the United States, residing at Alton, Illinois, have invented a certain new and useful Improvement in Corrugated-Paper-Board Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a machine of our improved construction. Fig. 2 is a diagrammatic sectional view showing the arrangement of the various rollers of our improved machine and also showing the paper passing through said machine. Fig. 3 is a plan view of the machine, parts being broken away.

Our invention relates to a machine particularly adapted for making corrugated packing board composed of two sheets of paper, one plain and one corrugated and commercially known as single faced corrugated paper.

The principal objects of our invention are to provide a simple compact machine which can be operated with little power and which will simultaneously heat and corrugate one sheet of paper, to provide means whereby the heated corrugated sheet is maintained in a heated condition while a suitable adhesive is applied to the tips of the corrugations on one surface, and to provide means whereby the heated corrugated sheet is firmly held while a second plain sheet of paper is brought into contact with the corrugated sheet and so held during the passage of the two sheets through the machine.

A further object of our invention is to provide means whereby the two sheets of paper are held in close contact with each other immediately after the adhesive has been applied to the corrugations of one sheet, and to provide means whereby the two sheets are thoroughly heated immediately after they are brought together, thus thoroughly drying and setting the adhesive and thereby doing away with auxiliary means for effecting the drying and setting operation.

A further object of our invention is to provide for the rapid drying of the adhesive used between the two sheets by thoroughly heating the sheet of plain paper and particularly the surface which contacts with the gummed surface of the corrugated paper, before the two sheets are brought together.

To the above purposes our invention consists in certain novel features of construction and arrangement of parts hereinafter more fully described and claimed.

Referring by numerals to the accompanying drawings, 1—1 designates the side frames of the machine which are united by suitable braces and which support the various rollers forming a part of the machine.

Journaled for rotation in suitable bearings 2 located on top of the side frame 1 are the trunnions of a pair of hollow corrugating rollers 3 and 4, the corrugations on the faces of which extend longitudinally and mesh with one another in order to produce the proper corrugations in one of the sheets of paper. The trunnion of the roller 4 is extended at the rear side of the machine and fixed on said extended end is a gear wheel 5.

Journaled in the frames 1 immediately below the pair of rollers 4, is a shaft 6 on which is fixed a gear wheel 7, which meshes with the gear wheel 5, and located on the end of this shaft 6 is a wheel or pulley 8 adapted to receive a belt or like driving means.

The trunnions of the rollers 3 and 4 on the front side of the machine are provided with meshing gear wheels 9, and leading to the interior of the rollers 3 and 4 through stuffing boxes 10 arranged in the ends of the trunnions on the front side of the machine, are pipes 11, which convey steam, hot water or the like utilized in heating the corrugating rollers 3 and 4.

Journaled in suitable bearings 12 on the tops of the frames 1 and immediately in front of the roller 4, are the trunnions of a large hollow roller 13, the surface of which is provided with corrugations which mesh with the corrugations of the roller 4. The trunnion of this large roller is extended on the front side of the machine, and fixed

thereon is a large gear wheel 14, which meshes with the gear wheel 9 on the trunnion of the roller 4. A pipe 15 extends through a suitable stuffing box 16 of this trunnion for the purpose of conveying fluid heating medium to the interior of the large roller 13.

Arranged immediately below the large roller 13 is a roller 17, the trunnions of which are journaled for rotation in suitable bearings formed on the frames 1 and located immediately above said roller 13 is a roller 18, the ends of which are journaled in suitable bearings.

Journalled for rotation in suitable bearings on the frames 1 immediately to the right of the large roller 13, is a roller 19, and passing around the rollers 17, 18 and 19 and bearing upon the surface of the large roller 13 is an endless belt 20.

Journalled in suitable bearings immediately to the left of the roller 17 is a small paste applying roller 21, the surface of which is adapted to contact with the points of the corrugations on the outer surface of the corrugated sheet passing around the large roller 13. The trunnion on the front end of this roller 21 is provided with a pinion 22, which meshes with the gear wheel 14.

A paste feeding roller 23 has its trunnions mounted for rotation in suitable bearings on the frames 1, said feeding roller operating in a paste pot 24 and contacting with the paste applying roller 21. The trunnion on the front end of the roller 23 is provided with a gear wheel 23^a, which meshes with the pinion 22.

25 designates a large hollow roller having a smooth surface and the trunnions of said roller are journaled for rotation in suitable bearings formed on the frames 1 immediately below and to the right of the roller 17. A pipe 26 passes through a suitable stuffing box on the trunnion at the front end of this roller 25 for the purpose of delivering a suitable fluid heating medium to said roller.

Journalled for rotation in suitable bearings immediately to the left of the roller 25 is an idle roller 27.

The spindles or rods carrying the rolls of paper A and B for making up the corrugated board are journaled in suitable bearings 28 formed in the lower portion of the side frames 1.

During the operation of our improved machine a belt or the like applied to the pulley 8, drives the shaft 6 and by means of the meshing gear wheels 7 and 5 the roller 4 is driven. By means of the gear wheels 9 and 14 the rollers 3 and 13 are driven, and the paste applying roller 21 and the paste feeding roller 23 are driven by means of the gear wheel 23^a and pinion 22, which latter meshes with the gear wheel 14.

The rollers 17, 18 and 19 are all idle rollers and merely serve as a support for the endless belt 20, which is driven through friction with the paper passing around the roller 13.

The corrugating rollers 3 and 4, the large roller 13 and the roller 25 are heated to the proper degree by a suitable fluid heating medium, which is delivered to said rollers through the various pipes entering the trunnions of said rollers.

The web of the roll of paper A passes upward between the rollers 3 and 4 and is corrugated thereby, and after passing partially around the roller 4 passes between the rollers 4 and 13. Thus said web of paper is corrugated and at the same time heated, and as said paper remains in contact with the corrugated surfaces of the rollers 4 and 13 the corrugations become in a measure set owing to the pressure of the heated corrugating rollers. Immediately after the paper passes between the rollers 4 and 13 a suitable adhesive is applied to the tops of the corrugations on the outer surface of the paper by means of the roller 21, which receives the adhesive from the surface of the feed roller 23 operating in the paste pot 24. The web of the roll of paper B passes upward over the idle roller 27, thence around the roller 25, whereby said paper is heated and from thence around the roller 17 and the belt 20 operating thereon, and said web is thus brought into contact with the gummed surface of the corrugated sheet at a point immediately adjacent the point where the adhesive is applied to the corrugated sheet. The two sheets of paper now pass partially around the roller 13, and said sheets are held in close contact by means of the belt 20, and owing to the heating of both sheets prior to their coming in contact with one another and by reason of the heat within the roller 13, the adhesive will be very quickly and thoroughly dried by the time the two sheets pass out of the machine.

It will be noted in our improved machine that one sheet of paper is corrugated between a pair of heated rollers, and consequently, is thoroughly heated before receiving the adhesive. The plain sheet of paper is first heated and then brought into contact with the heated corrugated sheet and the two sheets are held in close contact during their passage around a large heated roller, thus giving the adhesive ample time to become dry and set. During the time the two sheets of paper are held in contact with one another, they are prevented from creeping, relative to one another, by reason of the pressure of the belt 20 against the plain sheet and by reason of the engagement of the corrugated sheet in the corrugations on the roller 20.

A machine of our improved construction

is comparatively simple, is very compact, and therefore occupies little floor space, can be operated with little power and produces a strong, smooth finished, single faced corrugated board.

We claim:

1. In a machine of the class described, a pair of rollers for simultaneously heating and corrugating a sheet of thin material, a drying roller arranged for operation immediately adjacent one of the corrugating rollers for receiving the sheet after the same is corrugated, the surface of which drying roller is corrugated, and means for holding the sheet against the periphery of the corrugated drying roller.

2. In a machine of the class described, a pair of rollers for simultaneously heating and corrugating a sheet of thin material, a drying roller arranged for operation immediately adjacent one of the corrugating rollers for receiving the sheet after the same is corrugated, the surface of which drying roller is corrugated, and a belt adapted to hold the material against the periphery of the corrugated drying roller.

3. In a machine of the class described, a pair of rollers for simultaneously heating and corrugating a sheet of thin material, a corrugated drying roller which receives the sheet from one of the corrugating rollers, means for holding the sheet of material against the periphery of the corrugated drying roller, means whereby an adhesive is applied to the tips of the corrugations of the sheet as it passes onto the corrugated drying roller, and means whereby a plain sheet of thin material is held in contact with the gummed surface of the corrugated sheet during its passage around the corrugated drying roller.

4. In a machine of the class described, a pair of heated rollers having corrugated surfaces for simultaneously heating and corrugating a sheet of thin material, a drying roller adapted to receive the corrugated sheet as the same leaves the heating and corrugating rollers, means for applying an adhesive to the tips of the corrugations of said sheet while the same is on the drying roller, means for holding a sheet of plain thin material in contact with the gummed surface of the corrugated sheet during its passage around the drying roller and means whereby said plain sheet is heated before it is brought into contact with the corrugated sheet.

5. In a machine of the class described, a drying roller having a corrugated surface adapted to receive a corrugated sheet of thin material, means whereby the corrugated sheet is heated before it is brought into contact with the drying roller, means whereby an adhesive is applied to the tips of the corrugations of said corrugated sheet while the same is on the drying roller, and means for

bringing a heated sheet of plain thin material into contact with the gummed surface of the corrugated sheet and holding both of said sheets against the drying roller.

6. In a machine of the class described, rollers adapted to corrugate a sheet of thin material, means whereby said rollers are heated, a drying roller adapted to receive the sheet of corrugated material from the corrugating rollers, means whereby said drying roller is heated, means whereby an adhesive is applied to the tips of the corrugations of the corrugated sheet while the same is on the drying roller, means whereby a plain sheet of thin material is heated and brought into contact with the gummed surface of the corrugated sheet and means whereby the two sheets are held in close contact with one another and with the drying roller during their travel upon said roller.

7. In a machine of the class described, a drying roller, means whereby a corrugated sheet of thin material and a plain sheet of thin material are held in contact with one another and with the surface of the drying roller and means whereby both the sheets of paper are heated prior to their contact with each other and with the heating roller.

8. In a machine of the class described, a drying roller, means whereby a corrugated sheet of thin material and a plain sheet of thin material are held in contact with one another and with the surface of the drying roller, means whereby both the sheets of paper are heated prior to their contact with each other and with the heating roller and means whereby an adhesive is applied to one of the sheets before the same comes in contact with the other.

9. In a machine of the class described, a heating roller having a corrugated surface, means whereby a corrugated sheet of thin material and a plain sheet of thin material are held in contact with the corrugated surface of the heating roller, means whereby one of the sheets is heated and corrugated before coming in contact with the drying roller and means whereby the other sheet is heated before coming in contact with the corrugated sheet.

10. In a machine of the class described, a drying roller, means whereby a corrugated sheet and a plain sheet of material are held in contact with each other and with the surface of the drying roller, means whereby both sheets are heated before coming into contact with one another and with the drying roller, and means whereby an adhesive is applied to one of the sheets before coming into contact with the other sheet.

11. In a machine of the class described, a drying roller, means whereby two sheets of thin material are held in contact with one another and with the surface of the drying roller, means whereby one of the sheets is

simultaneously heated and corrugated before coming into contact with the drying roller, means whereby the opposite sheet is heated before coming into contact with the corrugated sheet and means whereby an adhesive is applied to the surface of one of the sheets before said sheets are brought into contact with one another.

In testimony whereof, we hereunto affix

our signatures in the presence of two witnesses, this 5th day of January, 1910.

JOHN H. McPIKE.
HENRY G. McPIKE, JR.
HARRY B. HARLOW.

Witnesses:

H. G. McPIKE,
ROSE RIELLEY.