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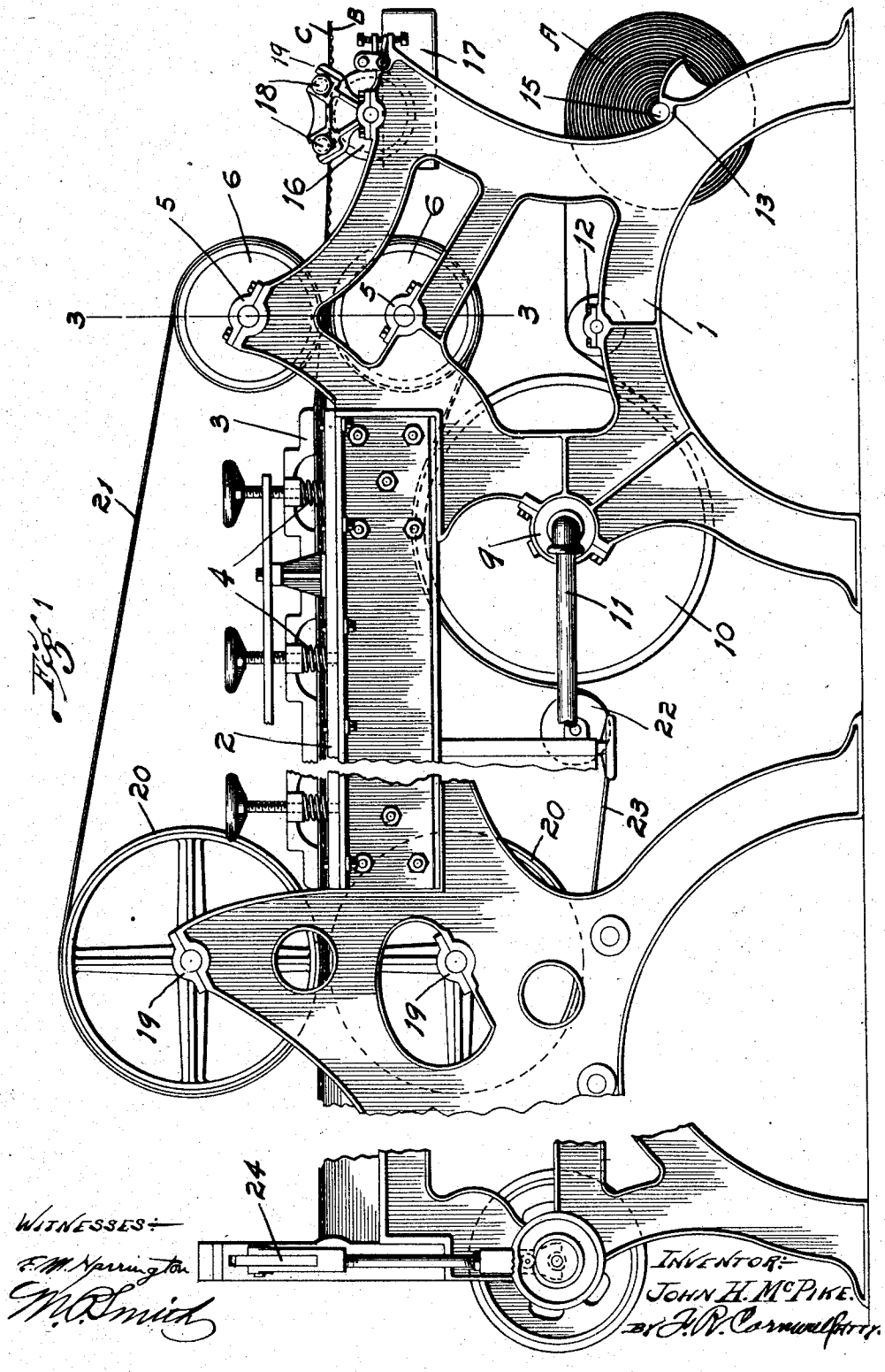
CORRUGATED PAPER BOARD MACHINE.

APPLICATION FILED AUG. 16, 1909.

972,120. **Patented Oct. 4, 1910.**

2 SHEETS—SHEET 1.



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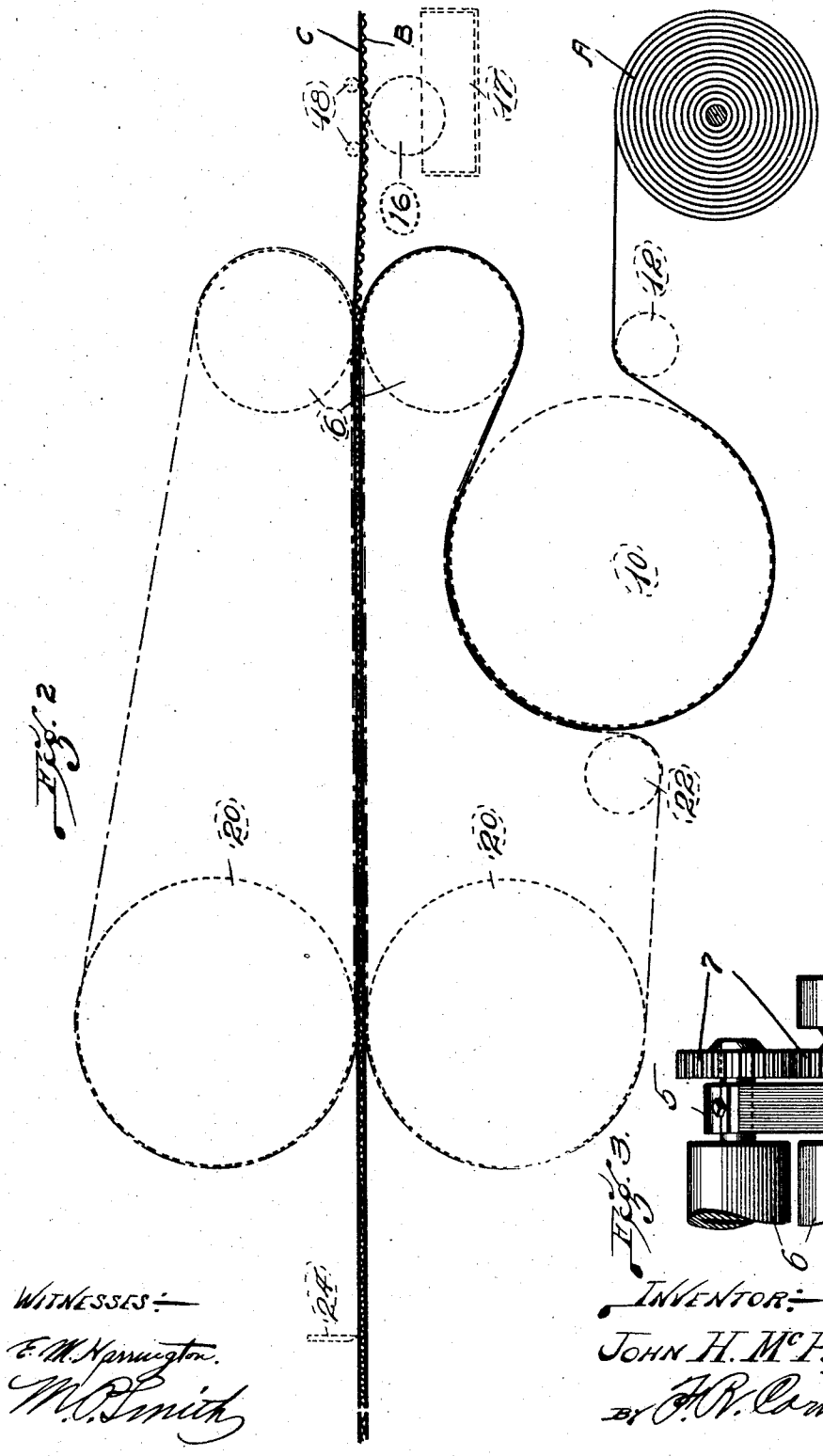

Fig. 2.

Fig. 3.

WITNESSES:—

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UNITED STATES PATENT OFFICE.

JOHN H. McPIKE, OF ALTON, ILLINOIS.

CORRUGATED-PAPER-BOARD MACHINE.

972,120. Specification of Letters Patent. **Patented Oct. 4, 1910.**

Application filed August 16, 1909. Serial No. 513,090.

To all whom it may concern:

Be it known that I, JOHN H. McPIKE, a citizen 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 my improved construction. Fig. 2 is a diagrammatic view illustrating the rolls and belts made use of in a machine of my improved construction. Fig. 3 is a detailed view illustrating the means employed for driving the machine.

My invention relates to a machine particularly adapted for making single and double faced corrugated paper board, said machine being also adapted for the manufacture of veneer and laminated paper board, fiber board, cloth, oil cloth, and the like.

The principal object of my invention is to construct a simple inexpensive machine wherein one sheet of paper board or the like is first heated and then immediately applied to a second sheet, one surface of which has a suitable adhesive applied thereto and both sheets being held in close contact with one another during their passage through the machine, thus giving the adhesive time to dry and become set. Such construction provides for the elimination of auxiliary means for drying the adhesive after the two sheets are brought into contact with one another, and as said sheets travel in a straight line for a considerable distance after being brought into contact with one another, there is absolutely no tendency of one sheet to "creep" relative to the other sheet while the adhesive is becoming dry and set.

In a number of machines of the character to which my invention pertains and now in general use, the two sheets of cardboard or the like are heated after the adhesive is applied and said sheets pass around and between rollers while in a heated condition, and I have found in practice that such procedure produces unsatisfactory results owing to the tendency of one sheet to creep relative to the other during the passage around and between the rollers.

I purpose to overcome the objection just noted, by heating one sheet before it is brought into contact with the opposite sheet and to subject the two sheets to the yielding pressure of an ironing plate which firmly holds the two sheets together during the time required for the adhesive to dry and become set, thus producing a very strong smooth finished board.

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

In the following description and drawings, I have shown and described a machine particularly adapted for applying a plain sheet of paper board to a single faced corrugated sheet, but it will be readily understood that the machine is applicable for forming laminated sheets of any thin material.

The body of my improved machine comprises a pair of side frames 1 which support a bed plate 2 over which the finished corrugated paper board passes. Positioned immediately above said bed plate is an ironing plate 3, which is supported upon springs 4 interposed between the bed plate and lugs formed on the ends of said ironing plate. Journaled in suitable bearings 5 adjacent the right-hand end of the frame of the machine is a pair of rolls 6 of equal diameter and the trunnions of said rolls are extended through the bearings at one end and fixed on said extended trunnion are meshing gear-wheels 7 and fixed upon one of said trunnions is a belt-wheel 8. Thus the rolls are simultaneously driven at the same rate of speed.

Arranged for rotation in bearings 9 below and to the left of the rolls 6 are the trunnions of a large hollow roll 10 which is adapted to be heated by means of steam or like heating medium which is introduced through a pipe 11 leading through a stuffing box in one of the bearings 9. Located in the right-hand end of the frame immediately to the right of the hollow roll 10 is a small roll 12 and formed in the frame to the right of said roll 12 are bearings 13 adapted to receive a spindle 15 on which is wound the continuous sheet A of paper board which is to be applied to the corrugated sheet. The trunnions of a paste-applying roll 16 are arranged for rotation in suitable bearings to the right of the rolls 6, which paste roll operates in a paste pot 17, and loosely mounted in bearings above the paste-applying roll is a pair of pressure rolls 18 ar-

ranged for rotation in bearings 19; adjacent the left end of the machine is a pair of large rolls 20 and passing around the upper one of said rolls 20 to the upper one of the rolls 6 is a belt 21 which travels against the under side of the ironing plate 3. Located immediately to the left of the roll 10 is a small idle roll 22 and passing around the lower one of the rolls 20, beneath the side roll 22, over the heated roll 10, around the lower one of the rolls 6 and over the bed plate 2 is a belt 23.

Arranged at the left-hand end of the machine and operated in any suitable manner is a knife or cutter 24 which is utilized for cutting the finished corrugated paper board into sections of suitable length.

When my improved machine is in operation, a roll of plain paper A is arranged on the spindle 15 and the web of said roll is threaded over the roll 12, around the roll 10, beneath the belt operating thereon, and around the roll 6 to a point between the pair of rolls 6. The corrugated sheet B of paper board, carrying the single facing C of plain paper board, is fed to the machine beneath the pressure rolls 18 with the corrugated sheet B underneath, and thus the under side of said corrugated sheet is brought into contact with the surface of the paste roll 16, and as the corrugated sheet is drawn into the machine paste is applied to the tops of the corrugations of the sheet B. Steam or like heating medium is delivered to the interior of the roll 10 through the pipe 11 for the purpose of heating said roll, and thus the web of plain paper A becomes thoroughly heated for the reason that it is held tightly against the periphery of said roll during its travel thereupon and in such heated condition the plain sheet is carried into contact with the gummed surface of the corrugated sheet B, the point of contact being between the pair of rolls 6. From this point of contact, the joined sheets of paper board are carried by the belts 21 and 23 over the bed plate 2 and beneath the ironing plate 3. This ironing plate applies yielding pressure to the paper board during its passage over the bed plate and during this time the paste becomes thoroughly dry and set, which drying operation is accelerated owing to the heated condition of the sheet A. The finished sheet of double-faced corrugated board passes from between the rollers 20 and is fed to the knife or cutting member 24 which is intermittently operated in any suitable manner, thus cutting the sheets into sections of suitable length.

Thus it will be seen how I have constructed a simple, inexpensive machine which applies a plain sheet of paper board to a corrugated sheet and the paste or adhesive used for uniting the two paper board sheets being caused to quickly dry and become set, owing to the heating of the plain paper board sheet before it is brought into contact with the corrugated sheet.

The finished or laminated sheet travels in a straight line through the machine after the individual sheets are brought together, during which time said sheets are brought together, and are subjected to the pressure of the ironing plate and thus all tendency of one sheet to creep relative to the other, is eliminated and a smooth finished product is the result.

Having thus described my invention, what I claim is:

1. In a machine of the class described, means for applying adhesive to one side of a corrugated sheet, a heating roller around which a plain sheet passes, a belt engaging against the heating roller whereby the plain sheet is pressed against the surface of said roller and a second belt coöperating with the first mentioned belt whereby the plain sheet is forced into contact with the gummed surface of the corrugated sheet and caused to pass through the machine therewith.

2. In a machine of the class described, a frame, a heating roll journaled therein, a pair of feed rolls journaled in the frame, endless carriers operating on said rollers one of which endless carriers bears against the heating roll, a paste roll arranged for operation in front of the feed rolls, a bed plate on the frame, and an ironing plate yieldingly mounted above the bed plate.

3. In a machine of the class described, a frame, a pair of feed rolls arranged for rotation therein, belts passing around the pair of feed rolls, a bed plate over which the belts travel, an ironing plate yieldingly mounted above the bed plate, a heating roll journaled in the frame against which one belt engages, and a paste-applying roll journaled in the frame in front of one pair of feed rolls.

4. In a machine of the class described, a pair of feed rolls, endless carriers operating on said rolls, a gumming roll adjacent the feed rolls over which a sheet of corrugated paper board passes, and a heating roll adjacent the feed rolls around which a plain sheet of paper board passes, which sheet of plain paper board is brought into contact with the sheet of corrugated paper board between the feed rolls.

5. In a machine of the class described, a pair of feed rolls, endless carriers operating on said feed rolls, a gumming roll adjacent the feed rolls over which a sheet of corrugated paper board passes, a heating roll adjacent the feed rolls around which a plain sheet of paper board passes, which sheet of plain paper board is brought into contact with the sheet of corrugated paper board between the feed rolls, and yielding pressure means adapted to engage the two sheets of

paper board after the same passes between the feed rolls.

6. In a machine of the class described, a frame, a bed plate thereon, an ironing plate yieldingly mounted above the bed plate, pairs of feed rolls journaled in the frame at the ends of the bed plate and ironing plate, belts passing around the pairs of feed rolls and operating between the bed plate and the ironing plate, a heating roller bearing against one of the belts for heating a plain sheet of paper board and means for gumming a corrugated sheet of paper board and delivering the same to one of the pairs of feed rolls.

7. In a machine of the class described, a pair of feed rolls, endless carriers operating on said feed rolls, means whereby an adhesive is applied to a sheet of paper as it passes to the feed rolls, a heating roller, and means whereby a sheet of paper is held in contact with the surface of said heating roller and delivered to the feed rolls.

8. In a machine of the class described, means for applying adhesive to one side of a sheet of paper, a heating roller around which a second sheet of paper passes, an endless carrier bearing against the surface of the heating roller, and a second endless conveyer coöperating with the first mentioned endless conveyer for holding the two sheets of paper in contact with one another during their passage through the machine.

9. In a machine of the class described, a pair of feed rolls, endless carriers operating thereon, means adjacent the feed rolls for applying adhesive to a sheet of paper as it passes between the feed rolls, and a heating roll adjacent the feed rolls around which a sheet of paper passes which last mentioned sheet of paper is brought into contact with the first mentioned sheet between the feed rolls.

10. In a machine of the class described, a series of four rollers arranged in pairs, belts passing around the pairs of rollers for conveying the paper board through the machine and a heating roller against which one of the belts engage during operation.

11. In a machine of the class described, a bed plate, an ironing plate arranged above the bed plate, endless conveyers operating between the bed plate, and the ironing plate, and a heating roller against which one of the endless conveyers engages during operation.

12. In a machine of the class described, a pair of endless carriers for holding two sheets of paper board in close contact with each other during their passage through the machine, means whereby an adhesive is applied to the surface of one of the sheets before it is engaged by the endless carriers, and means for heating that surface of the second sheet of paper which is brought into contact with the gummed surface of the first sheet prior to the passage of the two sheets of paper between the endless carriers.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this thirteenth day of August 1909.

JOHN H. McPIKE.

Witnesses:
LENORE CLARK,
ALMA GEBHART.