No. 695,787. Patented Mar. 18, 1902.

C. P. BROWN.

MACHINE FOR MAKING COMPOUND PAPER.

(Application filed July 6, 1901.)

(No Model.) 2 Sheets—Sheet 1.

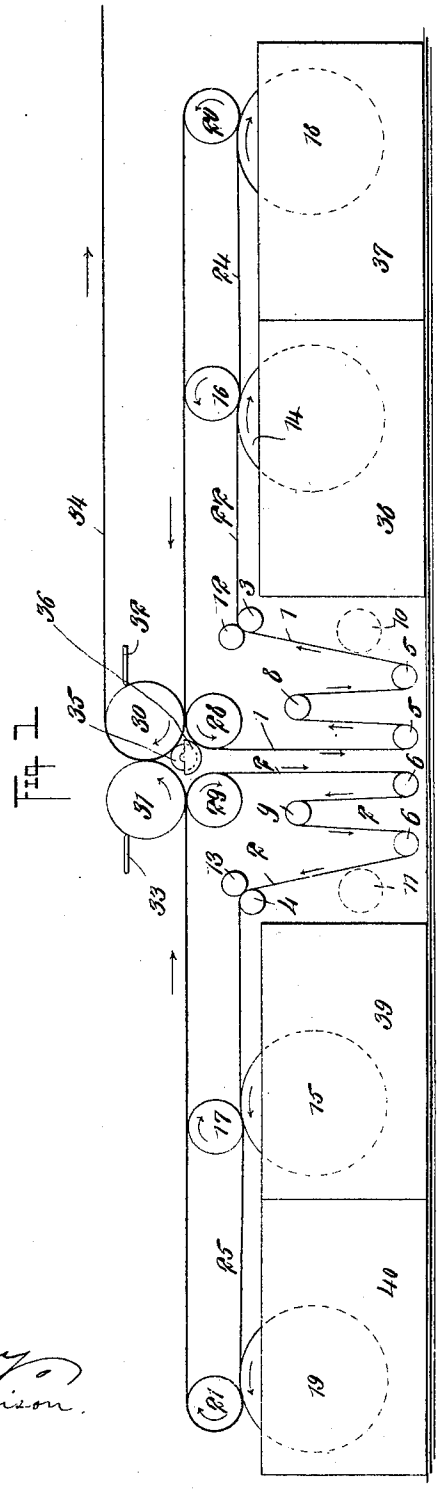


Fig. 1.

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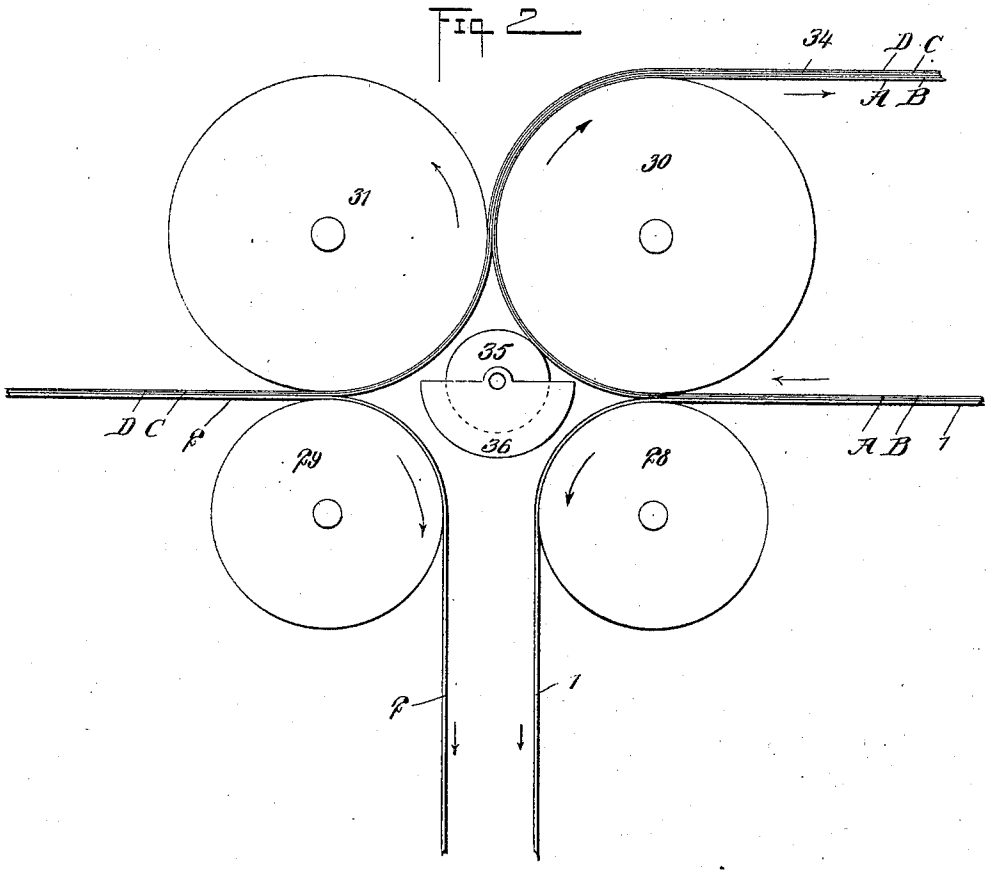
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(No Model.) 2 Sheets—Sheet 2.

Fig. 2



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MACHINE FOR MAKING COMPOUND PAPER.

SPECIFICATION forming part of Letters Patent No. 695,787, dated March 18, 1902.

Application filed July 6, 1901. Serial No. 67,261. (No model.)

To all whom it may concern:

Be it known that I, CURTIS PALMER BROWN, a citizen of the United States, and a resident of Comstocks Bridge, in the county of New London and State of Connecticut, have invented a new and Improved Machine for Making Compound Paper, of which the following is a full, clear, and exact description.

My invention relates to paper-machines, and more particularly to means for pasting together two webs of paper during the process of manufacture.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is a diagrammatic section of a paper-machine embodying my invention; and Fig. 2 is likewise a diagrammatic section, upon a little larger scale, showing the central parts of the same.

A pair of endless belts 1 2, made, preferably, of felt, are for the purpose of assisting in the formation of webs and for carrying the same mounted upon a series of rolls. 5 5 6 6 are stationary rolls, 8 9 are tighteners, and 10 and 11 are whippers. The rolls 3 4 12 13 constitute wringer-rolls, between which the respective belts or felts pass. From the wringer-rolls the belts or felts pass to the rolls 14, 15, 18, and 19, these rolls being molds of the usual kind. The molds are placed in vats 37, 38, 39, and 40 of the usual kind, and over each mold is a coucher 16, 17, 20, and 21. The pulp in the vats is taken up upon the surface of the molds and spread upon the under surface of the endless belts 1 2. Between the wringer-rolls 4 13 and the coucher 17 and also between the wringer-rolls 3 12 and the coucher 16 the pulp is applied by the mold to the under side of the belt and forms a thin sheet 24 25 upon the same, which adheres to the under side thereof. Similarly the molds 18 and 19 apply an additional layer of pulp to the under side of the thin sheets of pulp adhering to the belts, so as to make the same thicker. After passing outwardly from the molds 18 and 19 the belts have two thicknesses of paper-pulp, and as they pass upward over the couchers 20 21 and thence over the couchers 16 and 17 the belts approach each other, carrying the double layers of pulp toward each other. Arriving at the center of the apparatus the belts, together with the layers of pulp upon the top of the same, run over press-rolls 28 29, the belts turning downward and passing under rolls 5 6 in the center, while the double two layers of pulp, henceforth designated as "webs," split off from the respective surfaces of the belts and turn upward, uniting together between press-rolls 30 31 and passing to the right over the roller 30, as shown in Fig. 1. The lower surfaces of the webs when first split off or disengaged from the belts are unavoidably rough, because of the fact that they have been in immediate contact with the belts and while in contact were in a soft or plastic condition.

One object of my invention is to so arrange the webs that the rough surfaces thereof immediately after disengagement from the belts are rendered adjacent to each other and united, so as to face each other, thus completely concealing the roughness due to the print of the belts. When the webs pass between the rolls 30 and 31, not only are the rough surfaces hidden, but the two webs now unite, and the paper, which may be either thick or thin, as desired, is rendered smooth by the pressure of the rolls.

Between the rolls 30 31 is a paste-box 36, preferably of brass, and in the same is journaled a roll 35, also preferably of brass. This roll may be about five inches in diameter, if desired, and of course all of the parts can be proportioned to suit the needs and tastes of the manufacturer. This roll 35 is positively driven in contact with the roll 30, and paste being placed in the box in contact with this roller the movement of the roll serves to spread the paste upon the web which surrounds the roll 30, the paste being applied, of course, to the rough surface of said web, which has just been disengaged from the belt 2, as above explained. The paste being placed upon this rough surface enables a larger quantity of paste to be applied, so that the subsequent adhesion between the two webs is thus greatly increased. In other words, the volume of paste which can be successively applied and retained is greater upon the rough surface than it would be upon the smooth surface, and at the same time the rough surface is effectually disposed of, being

hidden in the center of the uniform paper. The paste thus applied to the rough surface acts as a kind of "filler," so to speak, all irregularities in the thickness of the paper being avoided. In other words, little depressions, even if they be microscopic in size, are filled with the paste, so that for all practical purposes the paper is rendered smooth upon the surfaces which have been disengaged from the belt, and this is done before the webs are united and the paper finally made.

32 and 33 are doctors, which play upon the rolls 30 31. They have the usual office of doctors in machinery of this kind; but their work is greatly lessened because of the fact that as the two webs unite into a paper which is carried immediately off from the rollers there is little or no liability of pieces of the pulp or of partially-formed paper adhering to these rolls 30 and 31, and consequently there is little work to be done by these doctors.

A great advantage gained by my invention is the fact that webs of partially-formed paper do not have to be handled before being united, and therefore the loss of time due to such handling and the liability of mutilating the delicate webs is thereby avoided. The abolition of the so-called "felt-marks" upon the paper is a great consideration, because paper which might otherwise be smooth is often rendered rough by these marks caused by the contact of the belt. The sheet of paper made with the aid of my device is absolutely free from felt-marks on both sides. The liability of forming "pick-ups" is greatly lessened, if not altogether avoided. Light sheets as well as heavy sheets can be made with this apparatus. Indeed, there is no reason why paper cannot be made as thin as the so-called "tissue-paper" and yet be made upon this principle practically free from felt-marks.

Referring more particularly to Fig. 2, it will be seen that upon the respective belts 1 2 as they pass over the rolls 28 and 29 there are two webs B A and C D. Where these webs pass upward between the rolls 30 and 31 and are pasted by the roll 35 and pass upward to the right from the roller 30, there are four webs arranged in the order A B C D not being supported by any belt, as the belts turn downward over the rolls 28 and 29. The belts are not needed for supporting the united webs A B C D, (designated altogether as 34,) and for the reason that by this time they now comprise four webs and are comparatively dry, thus forming a paper of considerable strength able to support its own weight. From this point the paper is disposed of in any usual manner.

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

1. A pasting device for paper-machines, comprising a plurality of press-rolls arranged in the form of a hollow square, and a paste-roll located in said square.

2. A pasting device, comprising means for disengaging webs of soft unfinished paper from belts carrying the same, and for bending said webs outward from said belts in such manner that the particular surfaces disengaged from the belts are rendered mutually contiguous, and means for pressing said webs together so that the particular surfaces disengaged from the belts are hidden and are secured together.

3. A pasting device, comprising means for disengaging webs of soft unfinished paper from belts carrying the same, and for bending said webs outward from said belts in such manner that the particular surfaces disengaged from the belts are rendered mutually contiguous, a roll for applying an adhesive substance to one of said contiguous surfaces, and means for pressing said webs together so that the particular surfaces disengaged from the belts are hidden and are also secured together by said adhesive substance.

4. An apparatus of the kind described, comprising a plurality of rolls for forming webs of unfinished paper, a pair of endless belts for receiving and carrying said webs while soft, means for disengaging said webs from said belts, a roll for applying paste to one of said webs upon the particular surface thereof disengaged from a belt, and rolls for pressing said webs together into one sheet of paper, the arrangement of said belts and rolls being such that when the webs move into engagement and are pasted together, the adjacent surfaces thereof are the particular surfaces disengaged from the belts.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CURTIS PALMER BROWN.

Witnesses:

EARLE WAYNE BROWN,

EDWARD L. WILCOX.