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A. N. RUSSELL

DRIVE FOR PAPER MAKING MACHINES

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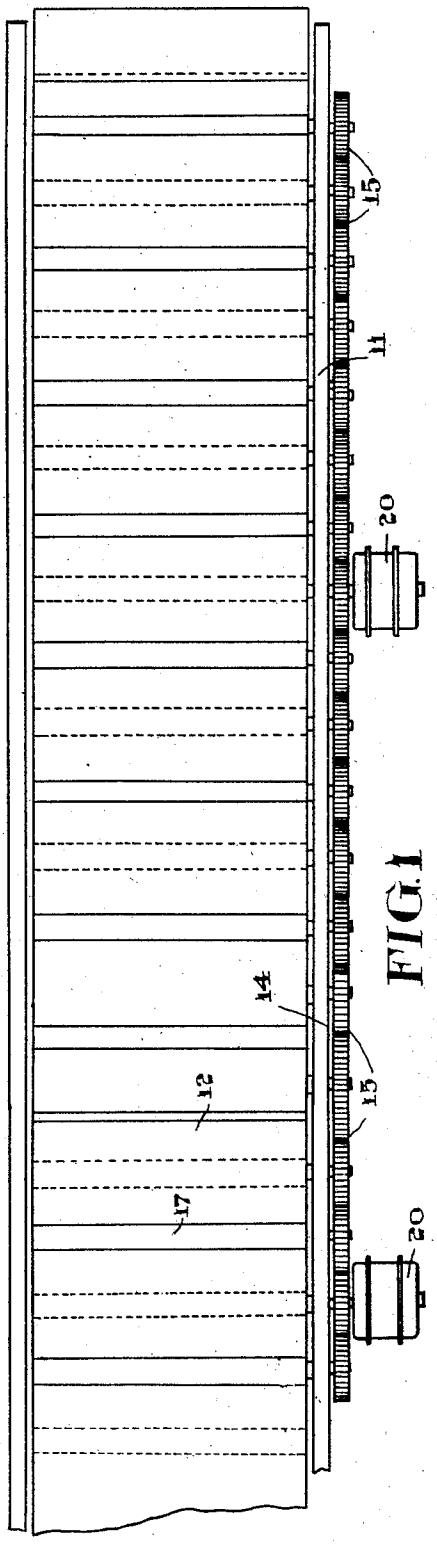


FIG. 1

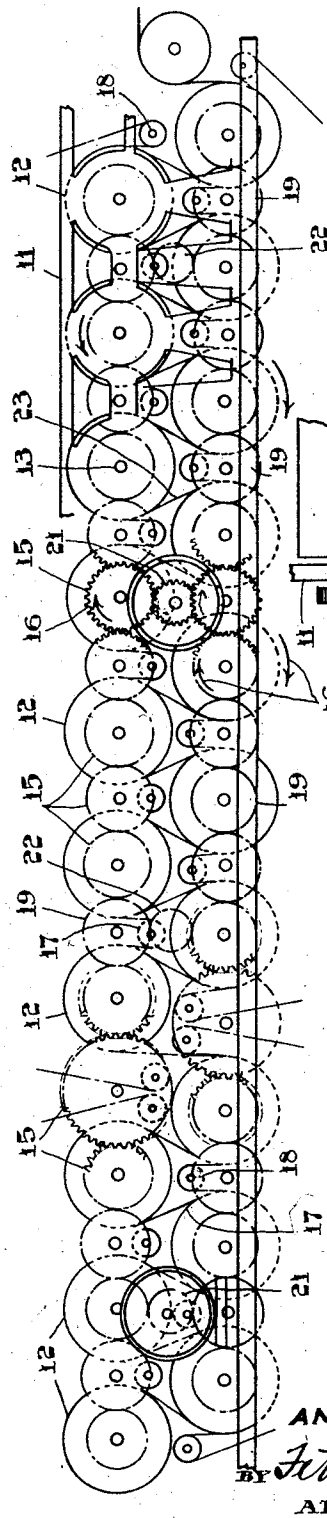


FIG. 2

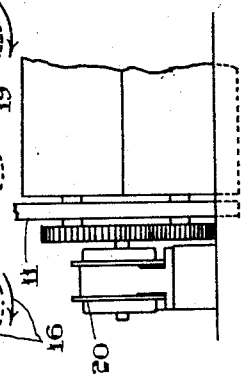


FIG. 3

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DRIVE FOR PAPER-MAKING MACHINES.

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This invention relates to new and useful improvements in driving mechanism for paper making machines, and in particular, to the drying section thereof, in which two rows of rolls are used, one above the other, and in which the paper passes alternately over one upper and under one lower roll as it travels through the machine, felts being used as a guiding means for the paper, and the object of the invention is to provide a mechanism which will drive the upper and lower rolls in unison, so that the travel of the paper therethrough will be constant from one end of the machine to the other.

Another object is to provide a simple, well-balanced driving mechanism which will allow easy access to the back side of the machine for repairs, and the like.

A further object is to provide a driving mechanism which will allow drying machines to be operated at high speeds by reducing the pitch line speeds of the gears, as usually arranged in machines of this class at present in use.

In my invention I provide a machine having a double row or rolls rotatably mounted on suitable supporting brackets. Secured to the ends of the roll supporting shafts or spindles, are the toothed wheels, the pitch line teeth of which are preferably made smaller in diameter than the outside diameter of the drier rolls, between each pair of roll driving toothed wheels. On each row is an idler toothed wheel which transmits motion from one roll to the other, so that they rotate in the same direction and at the same speed. The toothed driving pinions secured to the driving motor are so arranged that they drive one upper roll driving toothed wheel and one lower idler toothed wheel, or vice-versa.

In the drawings which illustrate one form of my invention;

Figure 1 is a plan view of the paper making machine;

Figure 2 is a side elevation of the paper making machine.

Figure 3 is a partial end elevation of the machine shown in Figures 1 and 2.

Referring more particularly to the drawings, 11 designates the side frames of the machine, and 12 the drying rolls which are secured to the spindles 13, rotatably mounted in the frame. The spindles extend beyond the faces 14 of the frame and secured to each of said extensions, are the roll driving toothed gear wheels 15. There are preferably two horizontally disposed parallel rows of drier rolls arranged one above the other, and their direction of rotation is shown by the arrows 16. Between each pair of upper and also between each pair of lower rolls, are the felt carrying or guide rolls 17. The paper passes into the machine from one end thereof and is carried alternately under one lower and over one upper roller, as it passes through the machine. To accomplish the above results, the rolls are arranged in zig-zag fashion. Rotatably mounted on pins 18 secured to the side frames and positioned midway between each pair of rolls, are the idler gear toothed wheels 19. The arrangement of idlers is shown in Figure 2, that is the idlers in the top row are positioned directly above the toothed driving gears secured to the spindles supporting the lower rolls, while the idlers in the bottom row are positioned directly below the toothed gear wheels driving the top drier rolls. The main driving means for the machine consists of a plurality of motors 20, having toothed pinions 21 secured to or mounted on an extension of the armature shaft, and said pinions are so mounted that they drive an idler toothed wheel of the bottom row and a roll driving toothed wheel of the top gear. It will be seen readily, though not shown, that the motor pinions may be so mounted that they will drive one toothed idler wheel in the upper row and one toothed roll driving wheel in the lower roll. Balancing idler wheels 22 may be rotatably mounted between a toothed wheel in the upper and a toothed wheel of the lower roll. The teeth of the balancing wheels are of the same pitch as the teeth of the idler wheels and the toothed roll driving gears.

In operation, the motor drives the upper and lower rolls in the direction indicated by the arrows, so that the paper sheet designated by the numeral 23, moves from right to left in the machine, shown in Figure 2. It will be seen that all parts of the machine are accessible and that there are no longitudinally disposed driving elements which would interfere with handling of the paper on the back side during its travel through the machine. The roll driving wheels are preferably made smaller in diameter than the diameter of the rolls so that the speed of the machine may be increased without in-

creasing the pitch line speed of the gears at present in use on machines of this class. The device is very simple in construction and evenly balanced, as the method of connecting the motors through the gears prevents one motor from running at a faster speed than the adjacent motor. This balancing of the gearing prevents breakage of the paper as it passes through the machine, as the speed of travel of the paper remains constant, a very desirable feature in machines of this class.

The unobstructed side allows easy access to the machine so that when starting the machine or clearing same after a break has been made in the paper through any unforeseen circumstances, such as flaws in the paper sheet, the paper may be safely handled. The gearing being small in diameter compared with the standard gears, may be easily enclosed by casings (not shown) thus making running conditions much safer for the operators.

Having thus described my invention, what I claim is:—

1. In a paper making machine having two horizontally disposed rows of drier rolls arranged in zig-zag relationship throughout the length of the machine, spindles for supporting each of said rolls, said spindles being rotatably mounted in the frames of the machine, toothed gear wheels secured to each of the spindles, idler toothed gear wheels between each pair of upper roll driving geared wheels, idler toothed gear wheels between each pair of lower roll driving gear wheels, a plurality of electrically operated driving elements at spaced intervals throughout the length of the machine, each element being adapted to drive an upper geared wheel and a lower geared wheel, and balancing idler wheels at spaced intervals throughout the length of the machine, each balancing idler being adapted to gear with one upper and one lower gear wheel.

2. In a paper making machine having two horizontally disposed parallel rows of drier rolls arranged in zig-zag relationship to one another, and mounted on spindles rotatably mounted on the drier frame, a driving mechanism therefor comprising toothed gear wheels each secured to a roll supporting spindle and forming a roll driving means, an idler toothed gear wheel between each pair of upper roll driving gear wheels, an idler toothed gear wheel between each pair of bottom roll driving gears, a plurality of motors arranged in spaced relationship throughout the length of the machine, toothed gear pinions secured to and driven by said motors, said pinions being each adapted to gear with an idler wheel in one row and a roll driving gear wheel in the other row, and balancing idler toothed gear wheels arranged in spaced relationship throughout the length of the machine, said balancing idlers being each rotatably secured to the frame of the machine, and adapted to gear with an idler toothed wheel in one row and with a roll driving toothed wheel in the other row.

3. A paper making machine including upper and lower rows of rolls carried by spindles journalled in the side frames of the machine, said spindles being projected at one end beyond said side frames, upper and lower rows of roll gears fixed to the projecting ends of said spindles, upper and lower rows of idler gears arranged between and meshing with the roll gears of each row, said idler gears being mounted on pins carried by said side frames intermediate said spindles, and a plurality of motors, each including a drive pinion meshing with an idler gear of one row of gears and a roll spindle gear of the remaining row of gears.

In witness whereof, I have hereunto set my hand.

ANDREW N. RUSSELL.