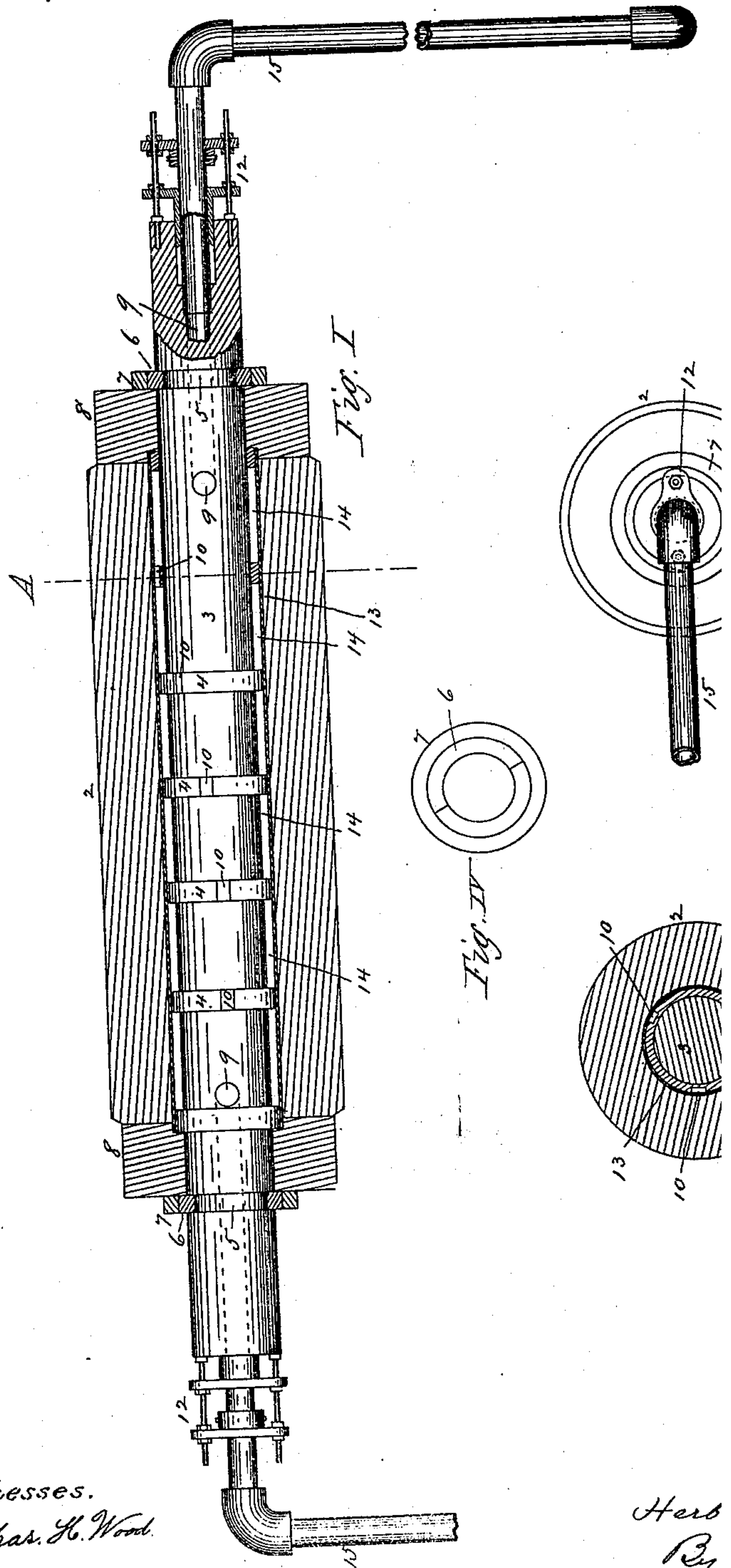


(No Model.)

H. J. FRINK.
PAPER CALENDER ROLL.

No. 285,476.

Patented Sep



Witnesses.
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Herb
By

UNITED STATES PATENT OFFICE.

HERBERT J. FRINK, OF CHICOPEE, MASSACHUSETTS.

PAPER CALENDER-ROLL.

SPECIFICATION forming part of Letters Patent No. 285,476, dated September 25, 1883.

Application filed July 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, HERBERT J. FRINK, of Chicopee, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Paper Calender-Rolls, of which the following is a specification.

The object of my invention is to provide one or more internal annular chambers in the interior of a paper calender-roll, through which to force water to prevent the paper or material of which the roll is composed from being burned or injured by heating, and to keep the journal-bearings at as uniform temperature as possible, and I accomplish this by the mechanism substantially as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure I is a sectional view of a calender-roll made according to my invention, at a plane on the line of its axis, with the extreme end of the shaft in section, showing the application of a stuffing-box thereto. Fig. II is an end view of the same. Fig. III is a transverse section of the same at line A of Fig. I. Fig. IV is a side view of the retaining-collars at each end of the roll.

In the drawings, 3 represents the main shaft, of suitable size to withstand the great pressure to which it is subjected, in which, near each end, is made an annular groove, 5, into one of which are fitted two half-collars, 6, with preferably a little space between its ends, and another collar, 7, is shrunk onto these two half-collars 6, which keeps them solid and firm in their groove. A retaining-head, 8, is then fitted snugly and firmly onto the shaft 3 and against the retaining-collar 6, and a series of rings, 4, are then shrunk onto the shaft 3 at suitable distances from each other, each ring, except that at each end, having a recess in it, or perforation, extending through it transversely, as shown at 10, the end ring 4 being fitted snugly against the head 8. An orifice, 9, is made in each end of the shaft at its axis, and another one is made from the side just inside of the first ring 4, which communicates with the orifice 9, made at the axis of the shaft; and a tube, 13, is either forced onto the rings 4 or shrunk thereon, so as to fit the exterior of the rings snugly, to give the tube a firm and solid bearing against each ring, the

space between the tube and the shaft thus forming one or more annular chambers or compartments—if more than one, communicating with each other through the transverse perforation or cavity in the dividing rings or collars 4. After the tube 13 is fitted properly in place, the paper or other substance, 2, is forced upon the tube 13 and against the fixed head 8 by hydraulic pressure, and the other head 8 is then forced into place against the roll 2, and the other end half-collars 6 are placed in their groove 5, and the collar 7 is shrunk thereon, so that the heads 8, tube 13, and roll 2 are solidly in place, with the annular chambers or compartments 14 inside the tube and between the rings 4. If the roll is to be made very short for special purposes, there may be but one of these annular chambers, the orifice 9 at each end of the shaft opening into the same chamber; but if the roll is to be longer, there may be several of these annular chambers or compartments, with the orifice 9 at each end of the shaft opening into the end chamber or compartment. The exterior surface of the roll 2 is then turned off and finished, and a pipe, 15, is connected with the orifice 9 in each end of the shaft 3 with any ordinary and well-known packing or stuffing box attachment, as shown at 12, so that the roll may revolve and the pipe remain stationary, and the joint where the two are connected may be water-tight.

As paper calender-rolls are ordinarily constructed, the great pressure to which they are subjected, together with the speed at which they revolve, operate to heat their bearings, as well as the rolls themselves, and they are often completely ruined from this cause, the heat being so intense as to burn and destroy the paper or material of which the rolls are composed, especially near their ends. When constructed as above described, however, I am enabled to avoid all trouble from this cause, as, when the rolls are in use, I introduce a constant stream of cold water through the pipe 15 at one end, the water passing in through the orifice 9 in one end of the shaft into the first chamber or compartment 14, and passing from one chamber to the next, through the recess or perforation 10 in each ring 4, and so on out through the orifice 9 in the opposite

end of the shaft; and this constant flow of water through the annular chambers, 14, between the tube and its shaft, keeps the whole of the roll 2 perfectly cool, so that it or its bearings never become heated to any appreciable or injurious extent. As this introduction of water into the roll operates to keep its journal-bearings at a more uniform degree of temperature, it follows that the frictional bearing of the journals is also more uniform, inasmuch as there is little or no expansion of the metal of the journals, and no consequent increase of friction.

It is evident that instead of securing or shrinking the rings 4 onto the shaft 3 the latter may be turned down, leaving a series of annular projections or collars, having substantially the same form as the rings 4, without departing from the invention in the least.

Having thus described my invention, what I claim as new is—

1. A paper calender-roll provided with one or more internal annular chambers or compartments, and with an orifice extending in at the axis of its journals and communicating

with said annular chamber or chambers, whereby a cooling-liquid may be forced through said annular chambers to keep the roll and its bearings cool, substantially as described.

2. The combination, in a paper calender-roll, of a shaft provided with fixed retaining-heads, one near each end, a series of annular collars or rings provided with transverse apertures and fixed to said shaft, a tube snugly fitted to said collars or rings, and adapted to receive the material of which the exterior portion of the roll is composed, with an orifice or passage-way extending into the journal at each end and communicating with the space between said shaft and said tube, whereby one or more internal annular chambers are formed within the roll, to permit the passage of water through said roll, substantially as and for the purpose described.

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Witnesses:

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