(No Model.)

N. D. INGRAM & G. H. MOORE.

CALENDER ROLL.

No. 516,490. Patented Mar. 13, 1894.

Fig. 1.

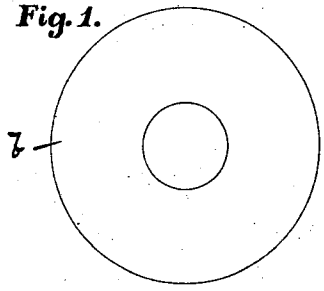


Fig. 2.

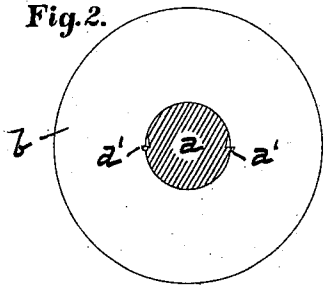


Fig. 3.

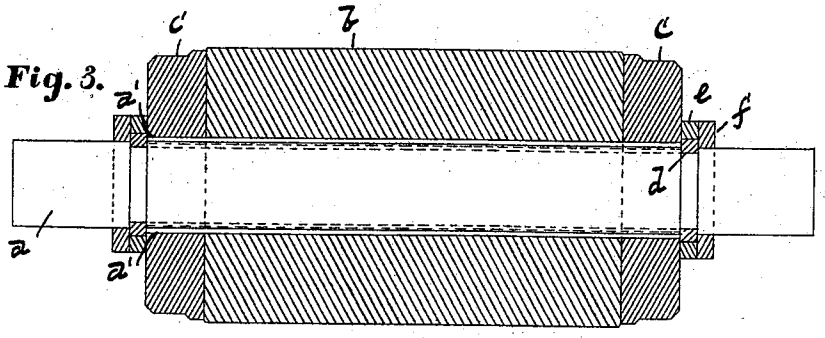
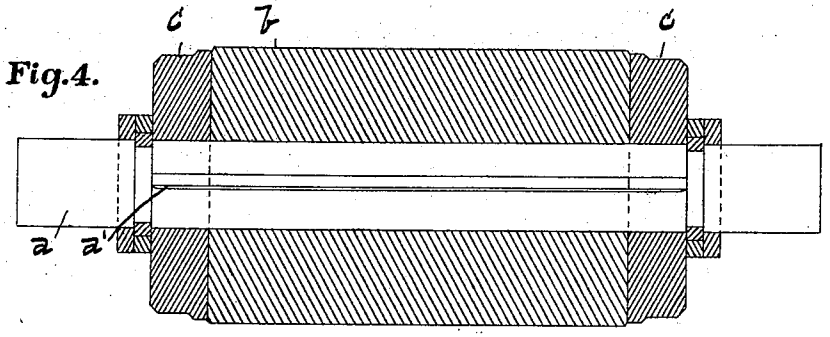


Fig. 4.



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CALENDER-ROLL.

SPECIFICATION forming part of Letters Patent No. 516,490, dated March 13, 1894.

Application filed April 2, 1892. Serial No. 427,472. (No model.)

To all whom it may concern:

Be it known that we, NATHAN D. INGRAM, of Holyoke, in the county of Hampden and State of Massachusetts, and GEORGE H. MOORE, of Norwich, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Calender-Rolls, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

Our invention relates to rolls for calendering paper and other fabrics, having especial reference to that class of rolls known as "paper rolls," composed of a metallic arbor having a covering thereon composed of preferably circular disks or sheets of paper having each a central opening to receive the arbor, which disks or sheets are applied to the arbor under great pressure and are held against lateral expansion by metallic heads secured upon and near each end of the arbor. The heavy pressure under which the rolls in the calendering machine operate has a tendency to cause the paper covering to turn upon the arbor, said turning rendering the rolls useless. It has heretofore been customary, to counteract such tendency, to employ a bevel sided spline-rod seated partly within the arbor and partly within the paper covering, in a longitudinal groove formed in the surface of the arbor and in a notch cut in each of the sheets of paper, to receive said rod. The use of such a spline-rod is fairly successful in preventing the paper from turning upon the arbor, but it is objectionable for the following reasons:—The necessity of forming the groove in the arbor and so fashioning the rod that it will accurately fit within the groove, and the necessity of cutting the notch in the sheet of paper to receive the spline rod, at a separate operation from that forming the central opening in the said sheets, very materially increase the cost of the roll. The spline rod also increases the weight of the roll, the increased weight being located at one side of the longitudinal axis of the arbor, so that the balance of the roll is disturbed to such an extent as to cause an uneven calendering of the surface of some grades of paper, and under great pressure the inclined or beveled sides of the spline rod do not prevent the sheets of paper from turning upon the arbor.

It is the object of this our invention to provide means whereby the paper covering can be positively locked against turning upon the arbor without the use of a spline-rod and without disturbing the balance of the roll upon its axis, the cost of manufacture of the roll being at the same time greatly decreased.

In accordance therewith our invention consists in a calender roll, comprising a cylindrical metallic arbor having two continuous integral flanges extended from end to end thereof and each provided with a cutting edge to cut into and displace a portion of the material of the cutting disks, the sides of said flanges which are turned toward each other extending at substantially right angles from the surface of the arbor, to prevent rotation of the disks thereon, combined with an outer covering consisting of a series of paper disks each having an arbor receiving opening, and forced thereon side by side, substantially as will be described.

Referring to the drawings, in which like letters designate like parts in the several figures, Figure 1, shows one of the circular disks or sheets which form the paper covering for the arbor. Fig. 2, is a cross section of the roll showing a disk in position thereon. Fig. 3 is a longitudinal section of the roll, the arbor being shown in elevation, and Fig. 4 is a similar view taken in a plane perpendicular to that shown in Fig. 3.

In the practice of our invention we provide the arbor *a* with two integral continuous flanges *a'* extending longitudinally thereon, and we prefer to form each of said flanges by making a shallow slit within the surface of the arbor, and then upsetting the metal at the outer side of said slit to cause the edge to project slightly beyond the circumferential surface of the arbor, as shown more clearly in Fig. 2, one edge of the flange thereby extending at substantially right angles from the surface of the arbor. Such operation can be performed very quickly and at slight cost, and we prefer to locate the flanges at diametrically opposite points on the arbor, as shown. The sharp projecting continuous edge of said

upsetting portions of the arbor forms a cutting edge, and the same being integral with the arbor it is unnecessary to cut notches in the edge of the circular arbor receiving opening in the disks or sheets *b* of paper to receive them, as they force themselves in the body of the paper as fast as the sheets are applied to the arbor, as represented in Fig. 2. The operation of cutting the notch in the sheets of paper to receive the spline rod, as heretofore practiced in the manufacture of such rolls, is thus obviated by us. The disks or sheets of paper hug the flanges *a'* closely and are positively locked against turning upon the arbor by the right angled sides of the flanges. Nothing is added to the weight of the roll, and its free balance upon its axis is not disturbed because we utilize an integral part of the arbor to form the flanges, and we are enabled thereby to produce a roll which will operate perfectly upon all grades of paper, at a greatly reduced cost in manufacture.

Referring to Fig. 2, it will be seen that the sides of the flanges *a'* which face toward each other are formed at substantially right angles to the surface of the arbor to prevent any rotation of the disks of paper thereupon in either direction.

While we prefer to form the flanges in the manner hereinbefore described yet it is obvious that an integral portion of the arbor can be made to project beyond the circumferential plane thereof in other ways. The flanges on the arbor may extend through the heads *c*, as shown in Figs. 3 and 4, the heads being provided with suitable recesses to receive them, or the flanges may terminate at the ends of the paper covering *b*, as may be desired, and the size of said flanges can be varied without departing from the spirit of our invention.

Any of the means usually employed for securing the heads *c* to the arbor can be utilized in connection with our invention, and we have herein shown rings or collars *d*, *e*, *f*, by which the heads are locked against lateral movement upon the arbor.

The method of building up the paper covering upon the arbor under pressure heretofore practiced, can be employed, but such operation is very much expedited by our invention, as the necessity for turning the sheets of paper to cause the notch therein to register with the spline rod, heretofore employed, is obviated.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The herein described calender roll, comprising a cylindrical metallic arbor having two continuous integral flanges extended from end to end thereof, and each provided with a cutting edge to cut into and displace a portion of the material of the covering disks, the sides of said flanges which are turned toward each other extending at substantially right angles from the center of the arbor to prevent rotation of the disks thereon, combined with an outer covering consisting of a series of paper disks, each having an arbor receiving opening, and forced thereon side by side, substantially as described.

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