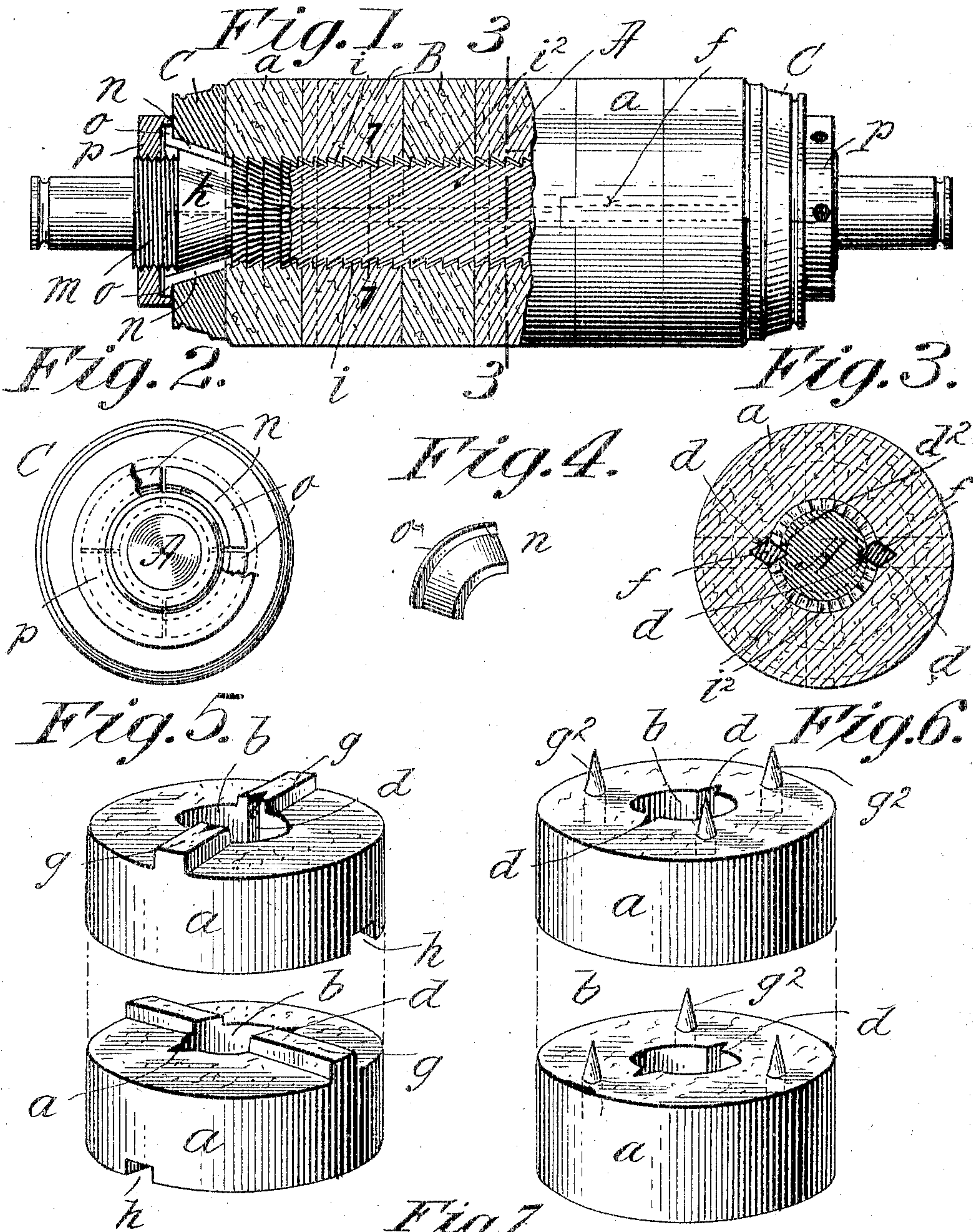


No. 776,796.

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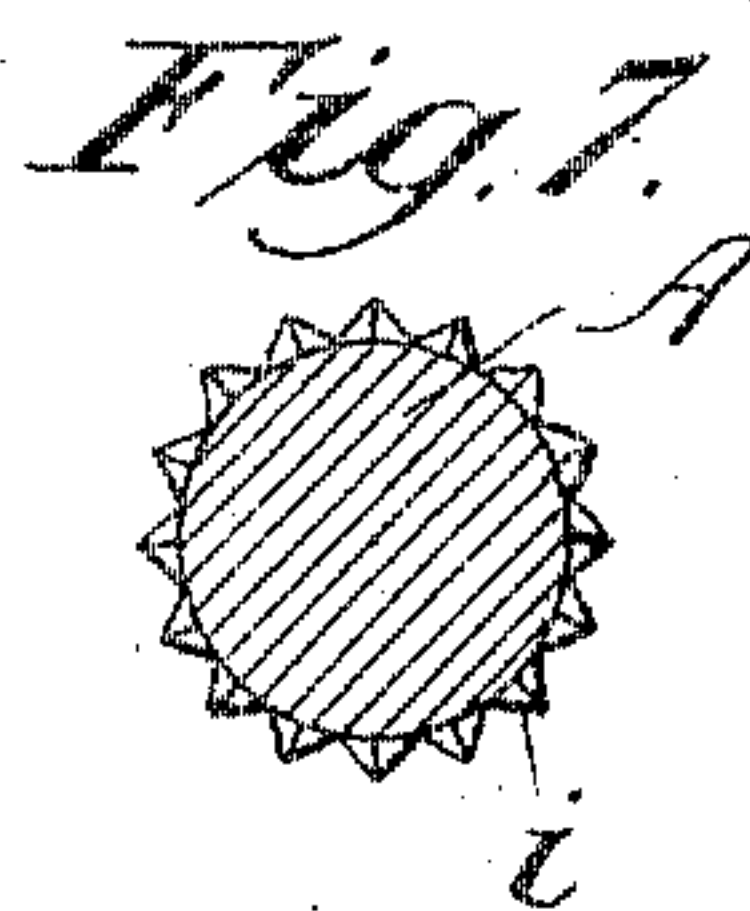
J. L. PERKINS.
CALENDERING ROLL.
APPLICATION FILED DEC. 23, 1903.

NO MODEL.



Witnesses:

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JOHN LEWIS PERKINS, OF HOLYOKE, MASSACHUSETTS.

CALENDERING-ROLL.

SPECIFICATION forming part of Letters Patent No. 776,796, dated December 6, 1904.

Application filed December 23, 1903. Serial No. 186,288. (No model.)

To all whom it may concern:

Be it known that I, JOHN LEWIS PERKINS, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Calendering-Rolls, of which the following is a full, clear, and exact description.

This invention relates to rolls for calendering-machines, and more particularly that class of rolls in which the body is constituted by a plurality of layers or sections of suitable non-metallic substance, such as fibrous cotton or paper either in compactly-compressed sheets or otherwise, or other suitable material.

The object of the present invention is to produce an improved built-up roll of the class stated which is practicable of construction and so interlocked, as the body-constituting sections thereof are related to each other and to the central mandrel or arbor thereof, that there can be no possibility of such sections or any of them rotating relatively to the arbor or each other.

The invention consists in the calendering-roll constituted and constructed all substantially as hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is substantially a central longitudinal sectional view of a calendering-roll as made within the present invention. Fig. 2 is an end view. Fig. 3 is a cross-sectional view on the line 2 2, Fig. 1. Fig. 4 is a perspective view of one of the head-securing segments. Fig. 5 is a perspective representation of two of the body-constituting sections, showing features provided thereto for the interlocking thereof. Fig. 6 is a similar view to Fig. 3, but showing provisions differing somewhat in detail from corresponding provisions in the preceding figure. Fig. 7 is a cross-sectional view of the arbor of the calendering-roll as taken on the line 7 7, Fig. 1.

In the drawings, A represents the central shaft, mandrel, or arbor of the roll, B the body, and C C are the opposite end heads.

As shown, the body of the roll is constituted by a plurality of cylindrical or plinth-shaped sections or "cheeses" *a a*, which advantageously may be constituted by fibrous uncard-

ed cotton compressed to a hard degree to the form shown, with axial openings *b* there-through and placed, subject to hard pressure, on the arbor and in such condition confined between the end heads C C, which are retained by suitable means. In practice the cylindrical or plinth-like sections or cheeses *a a* are produced individually about a mandrel and by the use of further appliances in a hydraulic press and rendered very hard and solid. Splineways *d d* are formed in the making up of the sections longitudinally within the boundary of the inner opening *a*, and a spline-way *d'*, as shown in Fig. 3, is formed in each opposite side of the arbor A, so that when the sections or cheeses are placed and retained under compression on the arbor and between the end heads, with the splineways at opposite sides thereof in longitudinal alinement, they and the arbor may receive the engagement therewith of the splines *f f*.

In order that rotational movement of the sectionally-composed body of the roll may be resisted not only by the oppositely-arranged arbor and body-section-engaging splines, but by further provisions whereby any centrifugal tendency of the body-constituting sections might result in rendering the splines, which necessarily are located comparatively near the axis of the roll, inadequate for the certainty of engagement desirable, the individual plinth-like sections *a a* may have at their end faces interlocking engagements, one with the next, as by forming them with transverse ribs *g* and grooves *h* to match the one into the other, and, as shown, the rib at one end face of a section is arranged angularly to the groove at the opposite end face, so that by alternation of the lines of interlocking of the contiguous end faces of the series of sections a most stable calender-roll body will be produced. As shown in Fig. 6, the sections may have pointed spurs *g'* projecting endwise a short distance from the end faces, the shanks of such spurs being embedded and anchored in the substance from which the section is composed, and in the uniting of the sections one against the next under hard hydraulic pressure the said spurs of the one section will penetrate into the next.

In order that in the building up of the calen-

der-roll on the mandrel by placing the sections *a* on the arbor and subjecting them to hydraulic compression toward the one end head each section by its elasticity will not be permitted to recoil or react away from the one end head during the cessation temporarily of the hydraulic pressure and while the next section is being brought to place, the arbor may be constructed with a multiplicity of encircling ratchet-shaped ribs *i*, (shown exaggerated in the sectional view Fig. 1,) the sharp edges of which engage the boundary of the inner opening in each section, holding the latter in its maximum compression not only during the construction of the roll, but at all times in the life thereof and measurably relieving the end heads and securing means therefor and enabling the employment of end heads and securing means, which are considerably lighter than those which have heretofore been employed in the corresponding situation. Moreover, the peripheral walls of the ratchet-shaped ribs may be individually grooved in lines trending longitudinally, whereby the inner walls of the annular sections will thus be further interlocked with the arbor, the compression to which the sections are subjected in building up the calendering-roll causing the substance at the internal boundaries of the sections to become embedded in the encircling grooves intermediately of the ribs and in the small longitudinal grooves or flutings therein.

The end heads *C* are provided with an outwardly-flaring circular opening and encircle an outwardly-expanding portion *k* of the arbor, which is of frusto-conical form, the arbor outside thereof being screw-threaded, as indicated at *m*. The dimensions of the part *k* and the flaring opening in the head *C* are such as to leave an annular flaring space for occupancy of the metal segments *n*, the several of which in their assemblage constitute a funnel-shaped fitting located between the inner wall of the opening in the head and the conical portion of the arbor, and the said segments have outer end flanges *o*, which overlap and engage the outer face of the head.

p represents a ring nut having an inner end flange to overlap outside of and conceal the segment-flanges *o*, the screw-threads in the circular opening through this nut screw-engaging on the threaded portion *m* of the arbor.

Any tendency of the sectionally-formed compressed roll-body to swell or expand in an endwise direction will be resisted by the heads, endwise motion to which latter is in turn resisted by the outwardly-expanding or funnel-shaped fitting, preferably made sectional, of the separable sections *n*, as shown.

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

1. A calendering-roll consisting of an arbor, having a series of ratchet-shaped encircling

ribs, a plurality of annular sections of compressed non-metallic material arranged about the arbor, and having the internal portions thereof engaged with said ribs and oppositely-located longitudinal splines engaging the arbor and the internal portions of said sections.

2. A calendering-roll consisting of an arbor having a series of ratchet-shaped encircling ribs, the encircling walls thereof being formed with longitudinally-ranging grooves, a plurality of annular compressed non-metallic sections, substantially as described, and the end heads.

3. A calendering-roll consisting of an arbor constructed with a series of encircling ratchet-shaped ribs having in the individual peripheral surfaces thereof, the longitudinally-ranging grooves, a series of annular sections of compressed cotton having in their ends ribs and grooves, and interlocked as described, the oppositely-located longitudinal splines engaging the arbor and opposite internal portions of the several compressed sections, the end heads and detachable confining means therefor, substantially as described.

4. A calendering-roll consisting of an arbor having oppositely-located splineways longitudinally therein and provided with the outwardly-expanding frusto-conical portion *k* and journal-bearing extremities, a plurality of plinth-like sections of compressed non-metallic material, surrounding the arbor, splines engaging the arbor and said sections, end heads having an outwardly-flaring opening therethrough, encircling the said arbor portion *k*, and a metallic funnel-shaped fitting engaged in the space between the portion *k* and the wall of the opening in the head and engaged by the internal wall of the head.

5. A calendering-roll consisting of an arbor having oppositely-located splineways longitudinally therein and provided with the outwardly-expanding frusto-conical portion *k*, the screw-threaded portion *m* and journal-bearing extremities, a plurality of plinth-like sections of compressed non-metallic material, surrounding the arbor, splines engaging the arbor and said sections, end heads having an outwardly-flaring opening therethrough, encircling the said arbor portion *k*, and a metallic funnel-shaped fitting constituted by the segments *n* having the outer end flanges *o*, engaged in the space between the portion *k* and the wall of the opening in the head, and the ring nut *p* screwing on the threaded portion of the arbor, and having an inner end flange overlying and concealing the said flanged segments.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

JOHN LEWIS PERKINS.

Witnesses:

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