

(No Model.)

4 Sheets—Sheet 1.

C. S. GOODING.
REEL.

No. 534,955.

Patented Feb. 26, 1895.

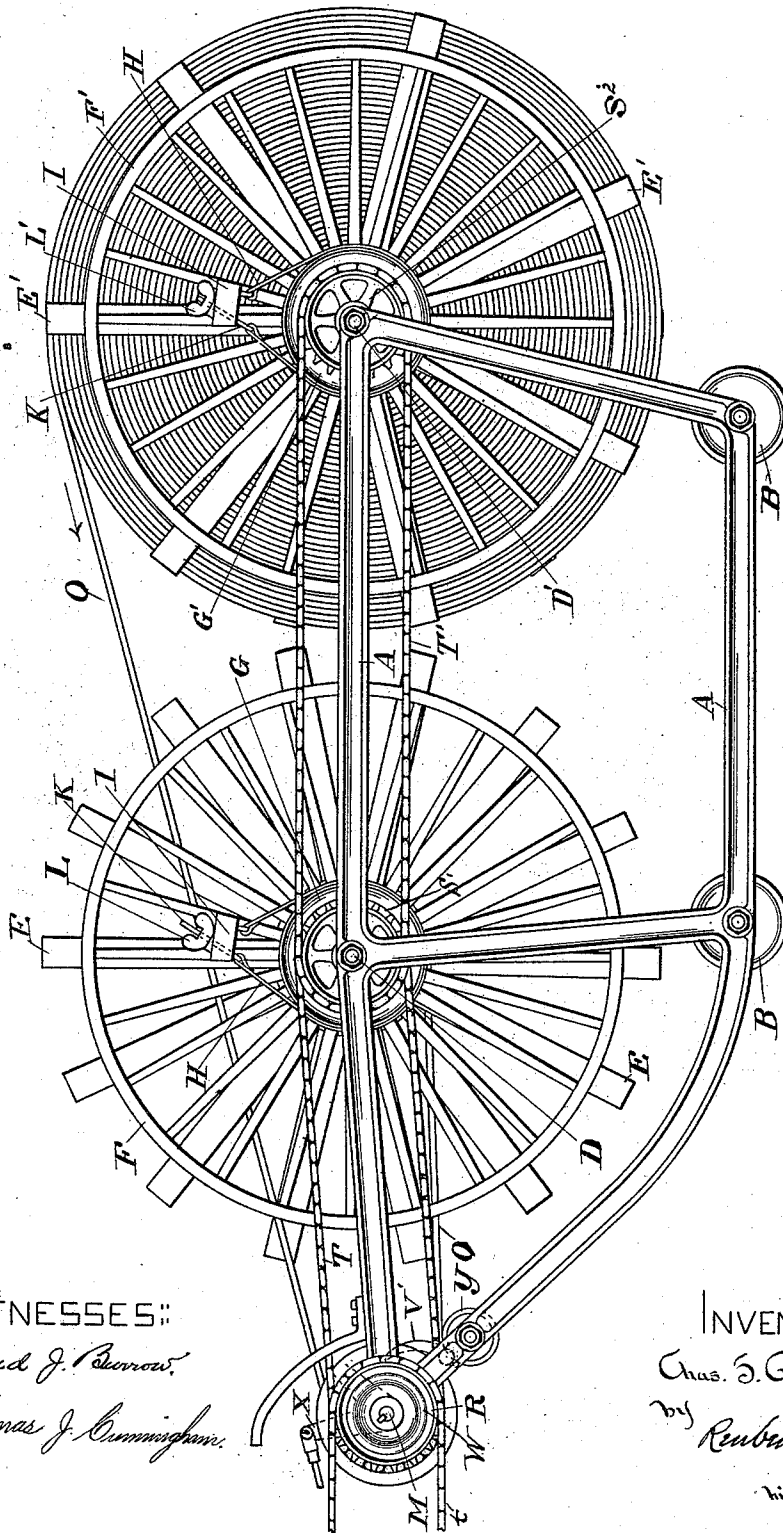


FIG. 1.

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Thomas J. Cunningham.

INVENTOR:

Chas. S. Gooding.

by *Ruben L. Roberts*

his Attorney.

(No Model.)

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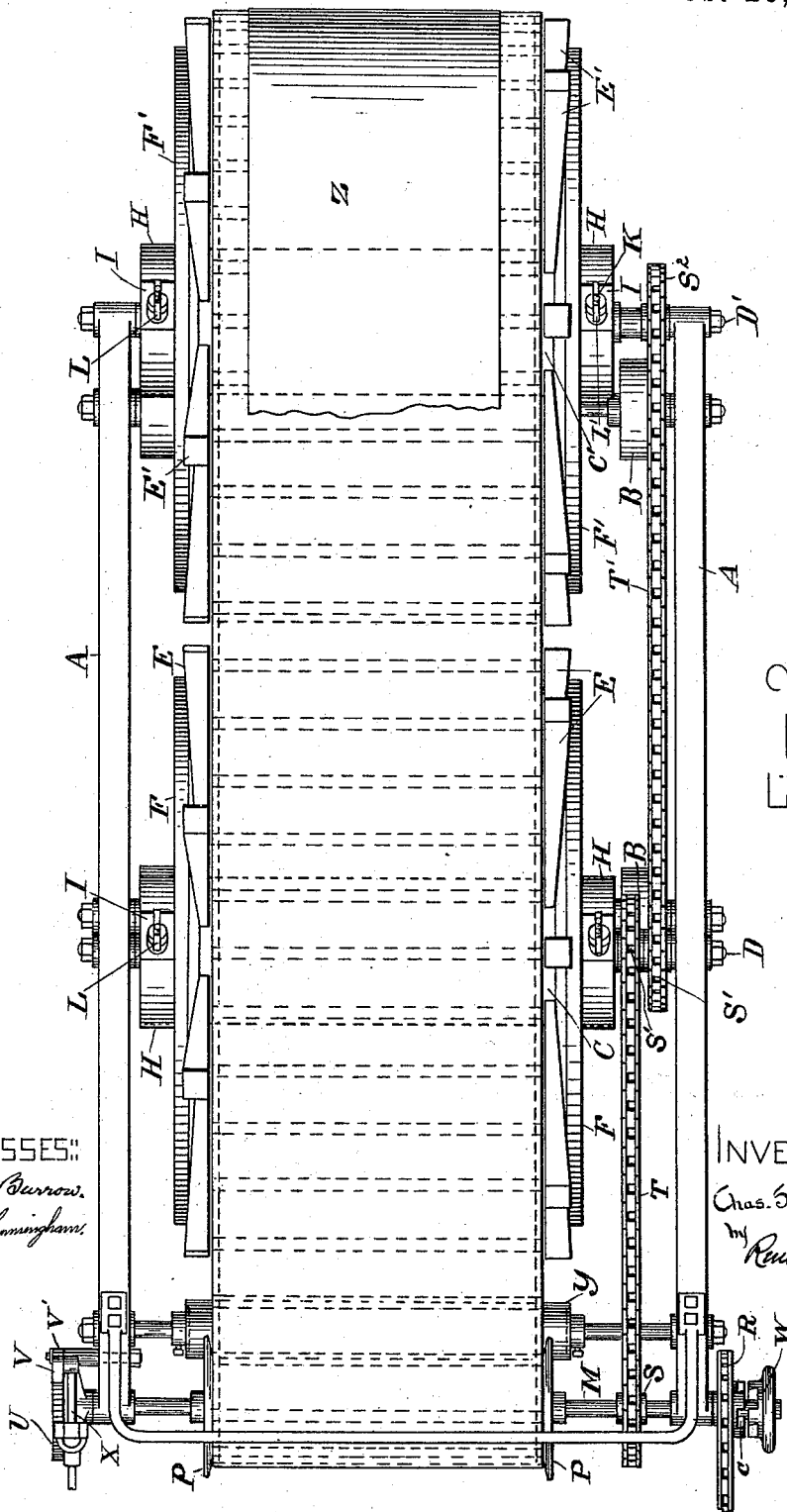


FIG. 2-

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(No Model.)

C. S. GOODING.
REEL.

4 Sheets—Sheet 3.

No. 534,955.

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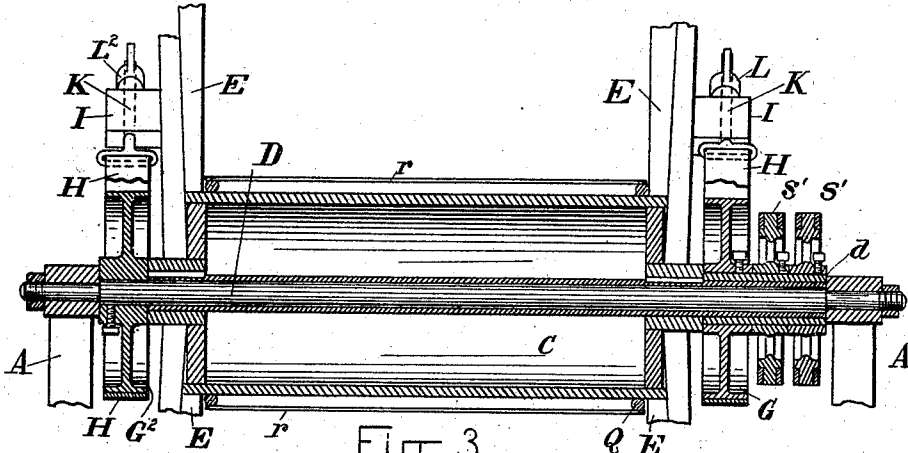


Fig. 3.

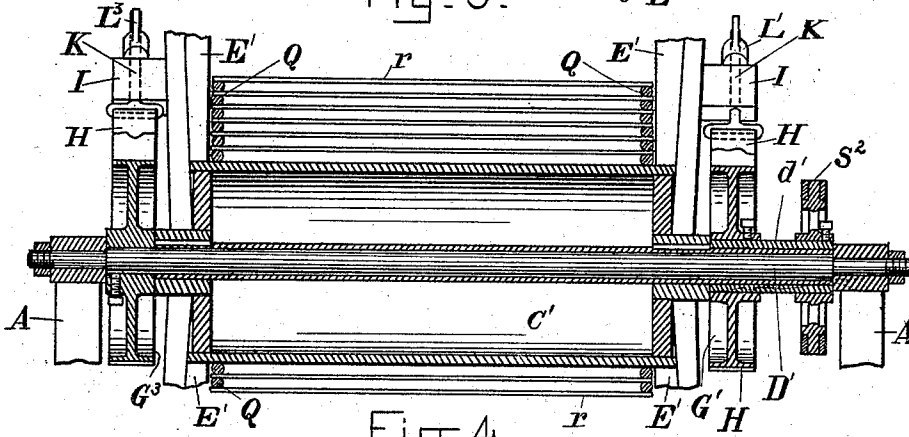


Fig. 4.

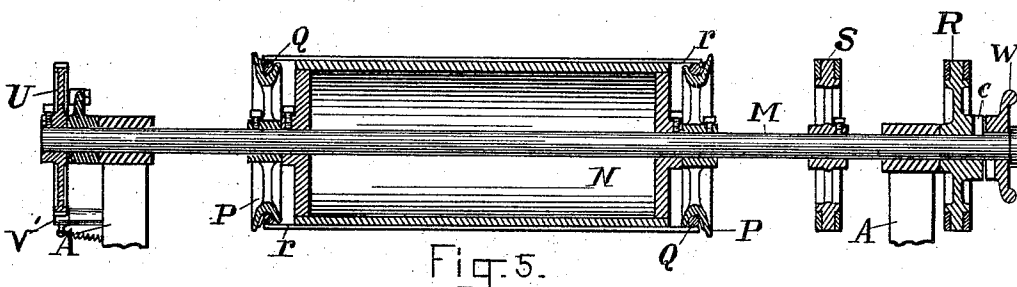


Fig. 5.

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(No Model.)

4 Sheets—Sheet 4.

C. S. GOODING.
REEL.

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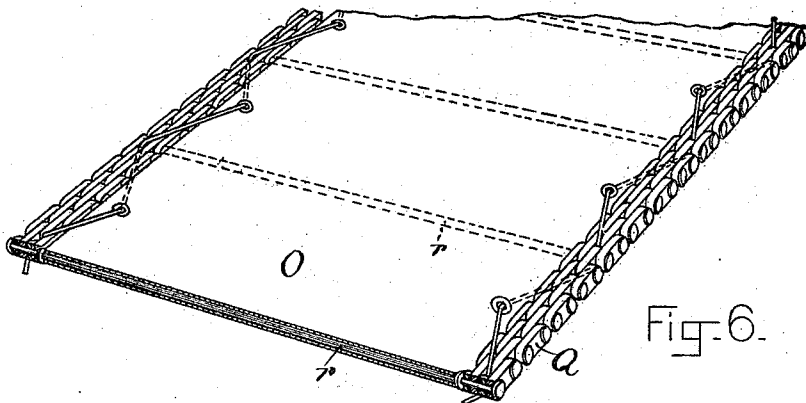


Fig. 6.

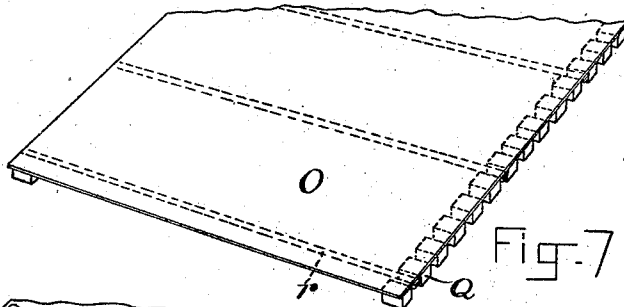


Fig. 7.

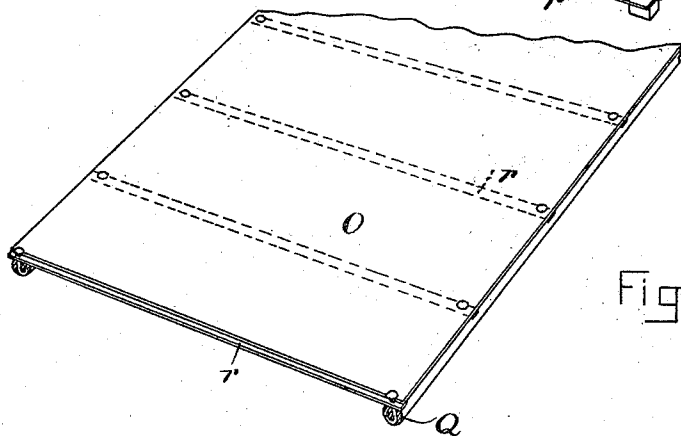


Fig. 8.

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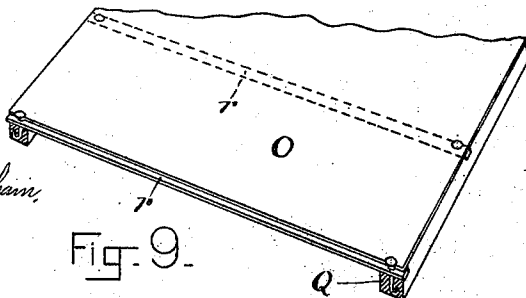


Fig. 9.

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UNITED STATES PATENT OFFICE.

CHARLES S. GOODING, OF BROOKLINE, ASSIGNOR TO ROBERT D. EVANS
AND JOHN S. LOCKWOOD, OF BOSTON, MASSACHUSETTS.

REEL.

SPECIFICATION forming part of Letters Patent No. 534,955, dated February 26, 1895.

Application filed December 12, 1894. Serial No. 531,612. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. GOODING, of Brookline, in the county of Norfolk and Commonwealth of Massachusetts, have invented certain Improvements in Reels, of which the following is a specification.

This invention relates to reels which are especially adapted for winding and supporting sheets of plastic material, such as unvulcanized india-rubber, so as to prevent the superposed layers from being injured or sticking together, and consists in improvements in the band or apron by which the plastic material is supported and in the means for driving the reels when winding or unwinding the apron. I find it convenient to make the reel double so that as the apron is unwound from one it will be wound upon the other.

In the drawings accompanying this specification, Figure 1, is an elevation of the reel viewed upon the side to which the driving mechanism is applied. Fig. 2, is a plan of the same. Fig. 3, is a vertical longitudinal section through the center of the drum of the forward reel or that nearest the driving pulleys, and of the sprocket and friction wheels upon the reel shaft, viewed from the front of the apparatus. Fig. 4, is a similar view of the rearward reel. Fig. 5, is a similar view of the driving cylinder and pulleys. Figs. 6 to 9 show different forms of strips attached to the edges of the apron to thicken it.

Referring to the drawings, A is the frame of the apparatus, supported upon wheels B, by which it may be conveniently moved about. The two reels consist respectively of drums C, C', which turn on the fixed shafts D, D'; the latter being supported and secured in suitable bearings in the frame A. A series of radial arms E, E', are attached to either end of the respective drums to serve as guides for the apron which is wound upon them. These arms may be further strengthened by annular strips F, F', provided with spokes like a wheel, secured in hubs upon the shafts D, D'. At one end of the respective drums C, C', are friction pulleys G, G', made fast to sleeves d, d', which are loose on the shafts D, D'. At the other end of said drums are friction pulleys G², G³, which are respectively made fast to the shafts D, D'. Around each of these pulleys

is a strap H, each end of which is secured to a lug or block I, attached to the outside of the radial arms E, E', or to the spokes of their strengthening strips, one end of each strap having a screw threaded rod K attached which passes through the lug and by means of a thumb nut L, on top of said lugs the straps H, can be tightened or loosened.

Upon the shaft M is a roller N to support the apron O, as it passes from the drum C to the drum C' when the plastic material is being received from the machine which produces it, and from the drum C' back to the drum C when the plastic material is being delivered to the cutting or other machine which is to operate upon it.

Upon the shaft M, at each end of the roller N, are grooved pulleys P, which receive ropes, chains, or other flexible strips Q attached to each edge of the said apron O, and thereby pull the apron from the reel from which it is being unwound. Loose upon the shaft M, is a driving pulley preferably a sprocket wheel R, provided with clutch teeth c, upon the outer end of its hub, and facing said clutch teeth is a clutch wheel W, upon the end of the shaft M which is caused to revolve with it by means of a spline and groove. The wheel R is driven by a sprocket chain t, running to another such wheel driven by the machine which is producing the sheet of plastic material, for instance a rubber calendering machine, and when it is desired to operate the reel the clutch W, is pushed into engagement with the wheel R. Secured upon the shaft M, is a sprocket wheel S. Upon the sleeve d, are other sprocket wheels S', S', and upon the sleeve d', a sprocket wheel S². A sprocket chain T, runs over the wheel S and one of the wheels S', while a chain T' runs over the other wheel S' and the wheel S². Thus when the driving pulleys P, are turned by the rotation of the shaft M, the several sprocket wheels S, S', S², also will be turned, through their connection by the sprocket chains T, T'. Upon the end of the shaft M, opposite to the clutch W, is a ratchet wheel U with which a pawl V engages. The pawl V is pivoted in one arm of a bell-crank lever X, which has a bearing upon the shaft M. The other arm of the lever X is connected by a rod with a crank or tilting lever oper-

ated by the machine which is to cut up or otherwise operate upon the strip of plastic material. As the crank lever X is tilted forward and backward, the driving pulleys P and roller N, will be regularly and intermittently turned, and thus deliver the same amount of material at each forward stroke, and by means of a stop-pawl V' which engages with the ratchet U the apron is prevented from slackening at each backward movement of the pawl V.

Y is a roll intended to hold the apron O up to the pulleys P, in order to give a uniform bearing of the ropes Q upon the pulleys P, at every state of the winding of the apron upon the drum C.

In Fig. 2, Z indicates the end of a strip of material which is wound upon the drum C', each convolution of which is between two laps of the apron O.

The operation of the reel is as follows: Referring to Fig. 2, when it is desired to wind the plastic material upon the reel, the end is brought forward and laid upon the apron O, and secured thereon over the roller N. The clutch W, is then pushed forward so as to engage with the teeth c, of the wheel R; which being given motion through the belt or chain t, will cause the shaft M and pulleys P, P, to rotate, and thus draw the apron from the drum C, and through the chains T, T', upon the wheels S, S', S², wind it with the sheet of plastic material upon the reel C'. During this operation the thumb nut L should be turned outward on the screw K so as to loosen the strap H around the friction pulley G, while the strap around the pulley G² at the opposite end of the reel C should be tightened; the strap around the pulley G' should be tightened and that around G³ loosened. The wheels S, S', S² and the driving pulleys P, P, all being of the same diameter will rotate at the same rate of speed. The friction pulley G', being upon the same sleeve d', as the wheel S², will rotate at the same speed with that wheel and by reason of the strap tightened around the pulley G', the rotation of that pulley will tend to turn the drum C', of the reel at the same rate of speed, and wind the apron O, with the plastic material, upon it. As the apron is wound upon the drum C', the diameter increases, and consequently the periphery of this enlarged drum if unimpeded would constantly increase in speed, but the pulleys P, P, have a constant rate of speed and pull the apron from the drum C, no more rapidly at one time than at another, and therefore the apron will be held back, and the peripheral speed of the drum with the accumulated layers of apron will be the same as the peripheral speed of the pulleys P, P, and by regulating the friction of the strap upon the pulley G', it will slip sufficiently to compensate for the difference in the normal speed between the periphery of the pulleys P, P, and the roll of apron upon the drum C'. The pulley G', tending constantly to increase the

speed at which the apron is wound thereon and the pulleys P, P, delivering it at a uniform speed, the apron will always be held in tension. By tightening the strap around the pulley G², sufficient friction may be produced to prevent the apron from unwinding from the drum C faster than it is drawn off, by the pulleys P, P.

When the apron with the plastic material is wound upon the reel as illustrated in Fig. 1, the convolutions of rope or other flexible strips Q, guided by the radial arms E, will rest one upon the other and leave a space between each two laps of the apron as shown in Fig. 4, in which helical space the plastic material is contained, and by means of the rods r, the apron will be prevented from wrinkling or sagging between the arms E.

When it is desired to unwind the apron from the reel C', so as to deliver the material to be cut up or otherwise operated upon, and to wind the apron back upon the reel C, the strap around the pulley G³, is tightened to serve as a brake upon the reel C', and the strap upon the pulley G', is loosened; the strap upon the pulley G, is tightened and the strap upon the pulley G² is loosened. Then power being applied to the crank lever X, the pawl V, engaging the ratchet wheel U, will intermittently turn the shaft M and pulleys P in a direction opposite to that in which they turned when winding the material upon the reel C', and a definite amount of the apron will be thus pulled off from that reel, at each stroke of the crank lever X, the friction of the strap around the pulley G³ preventing the reel from moving in the interval between such strokes. At the same time the pulley G being intermittently turned by the wheel S' and the chain T, the friction of the strap around the pulley G will turn the reel C and wind the apron upon it again, as fast as it is delivered by the pulleys P; the material being removed as the apron is unwound from the reel C'. As in the case of winding the apron upon the reel C', so in winding it back onto the reel C, the difference in peripheral speed of the pulleys P, P, and the roll of apron upon the reel C, is compensated for by the slipping of the strap around the pulley G.

The apron may be wound upon the respective drums in the opposite direction to that shown in Figs. 1 and 2, but in that case the apron would pass beneath the reels when being run from one to the other, and the apron with the material would be wound upon the forward drum or that nearest the driving pulleys; also by omitting the driving pulleys P and roller N, the reel may be successfully operated by hand, by means of a crank or by taking hold of the guides E, E', and serve the same beneficial purpose of supporting a long strip of plastic material without danger of injuring it or of having its superposed layers stick together.

I have employed various forms of strips to thicken the edges of the apron for the purpose

of forming the chamber for the plastic material when wound upon the reel. In Fig. 6, is illustrated a band made up of links of leather or other material; in Fig. 7, blocks of wood fastened at short intervals to the two edges of the apron. In Fig. 8 a rope is used, and in Fig. 9 a strip of india-rubber rectangular in cross-section. The most economical form is the rope shown in Fig. 8, and it is also entirely satisfactory in practical use.

I claim—

1. The combination of a pair of reels, an apron to be wound thereon one end of which is attached to each reel, and mechanism to pull said apron in either direction over which the apron runs when passing from one reel to the other, for the purpose described.

2. In a reel the combination of two drums with radial guides at their ends, a flexible apron each end of which is attached to one of said drums and which is provided with a thickening strip at each edge, and an adjustable friction brake to control the movement of each drum when the apron is being unwound therefrom.

3. In a reel, the combination of a pair of drums, a flexible apron having a thickening strip at each edge, and one of its ends attached to each drum, radial guides for said apron at the ends of the drums, an adjustable friction brake to control the movement of each drum when the apron is being unwound therefrom and a friction clutch to engage and turn each drum when the apron is being wound thereon.

4. In a reel, the combination of a pair of

drums, a flexible apron having a thickening strip at each edge, and one of its ends attached to each drum, radial guides for said apron at the ends of the drums, an adjustable friction brake to control the movement of each drum when the apron is being unwound therefrom, a friction clutch to engage and turn each drum when the apron is being wound thereon, and a driving roll over which the apron runs when passing from one drum to the other, and which is adapted to pull said apron in either direction substantially as described.

5. In a reel the combination of a pair of drums, a flexible apron having thickened edges, and one of its ends attached to each drum, guides at the ends of the drums to hold the edges of the apron directly superposed when wound thereon, driving pulleys over which the apron runs when passing from one reel to the other, which pulleys are adapted to receive the thickened edges of the apron, and thereby pull it from either reel as desired.

6. In a reel for holding strips of plastic material the combination of an apron having thickened edges, and a pair of rollers with apron guides at each end, upon which to wind said apron, whereby when the apron is wound upon either roller, a helical chamber will be formed for said material between said thickened edges within the convolutions of the apron.

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