

June 24, 1924.

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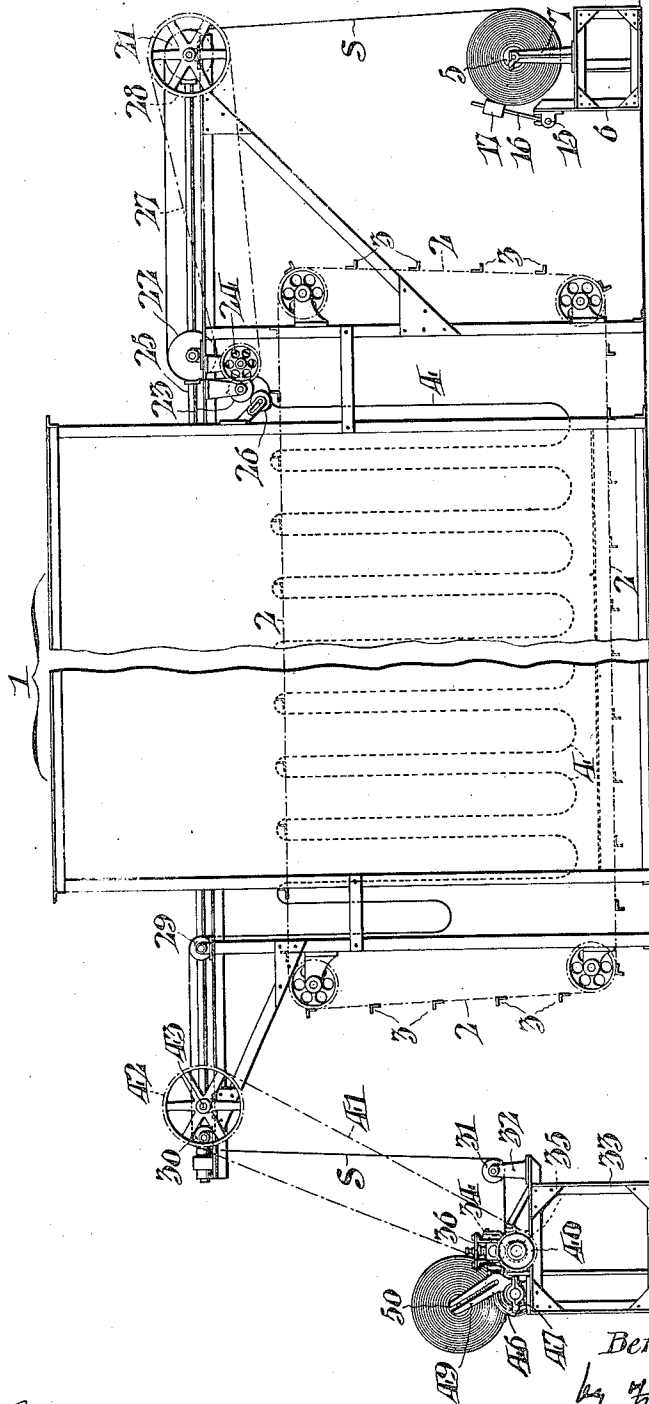
B. A. PARKES

FEEDING AND WINDING MACHINE

Filed March 18, 1919

5 Sheets-Sheet 1

FIG. 1.



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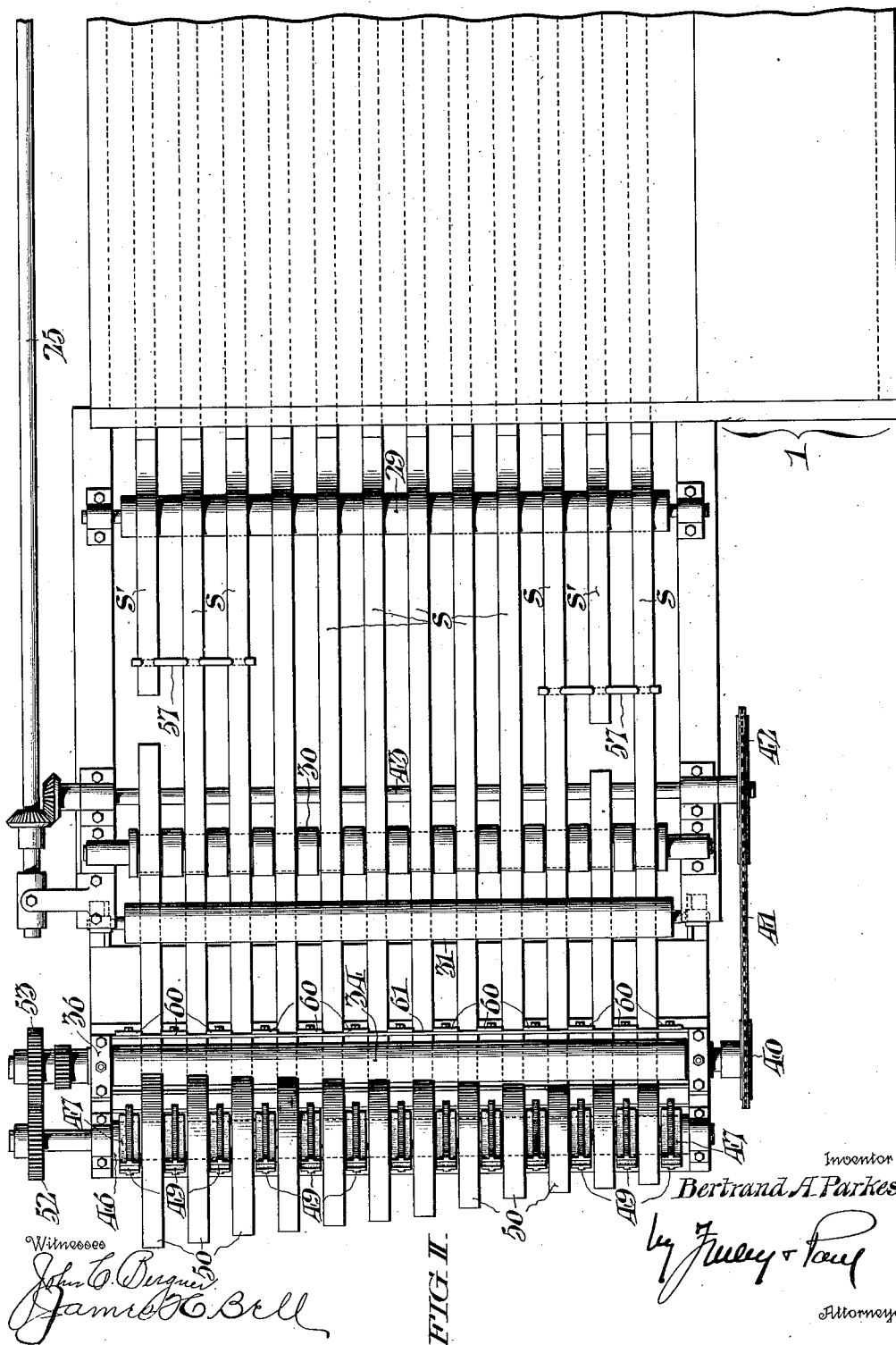
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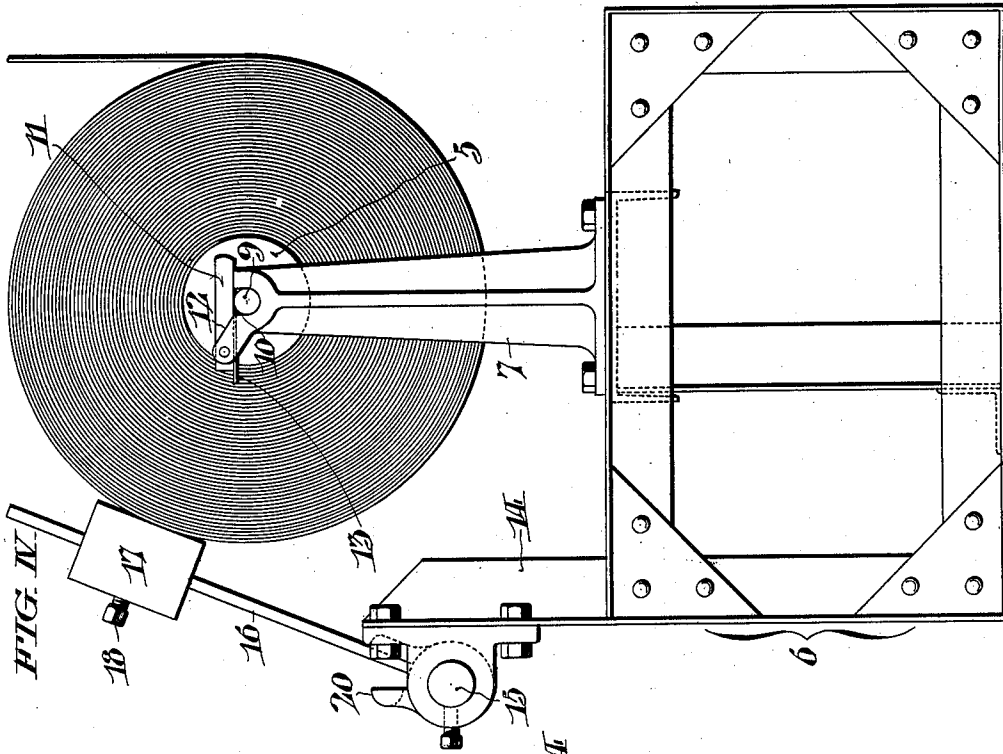
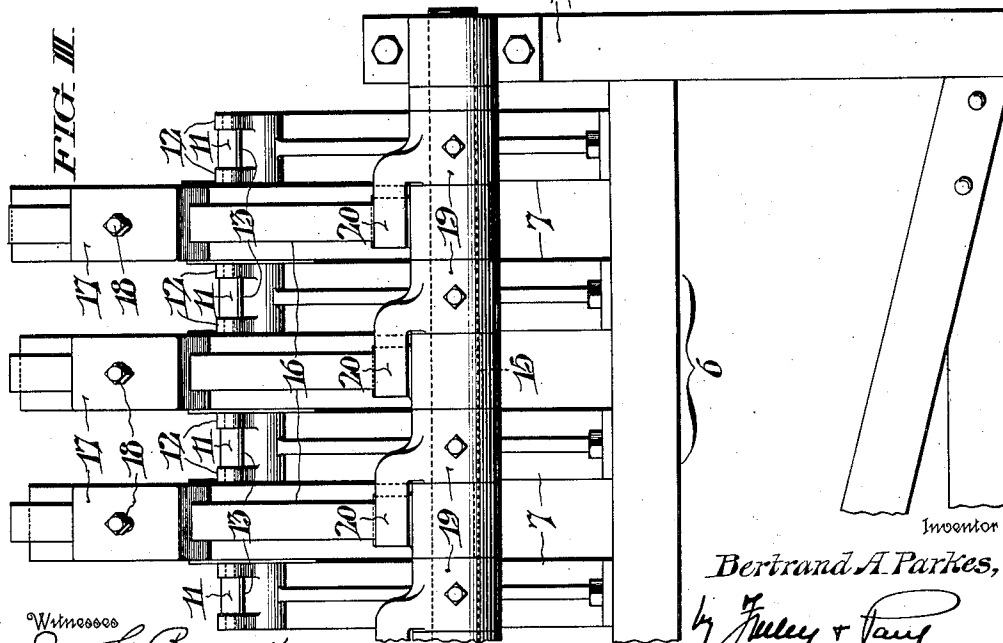
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Filed March 18, 1919

5 Sheets-Sheet 3



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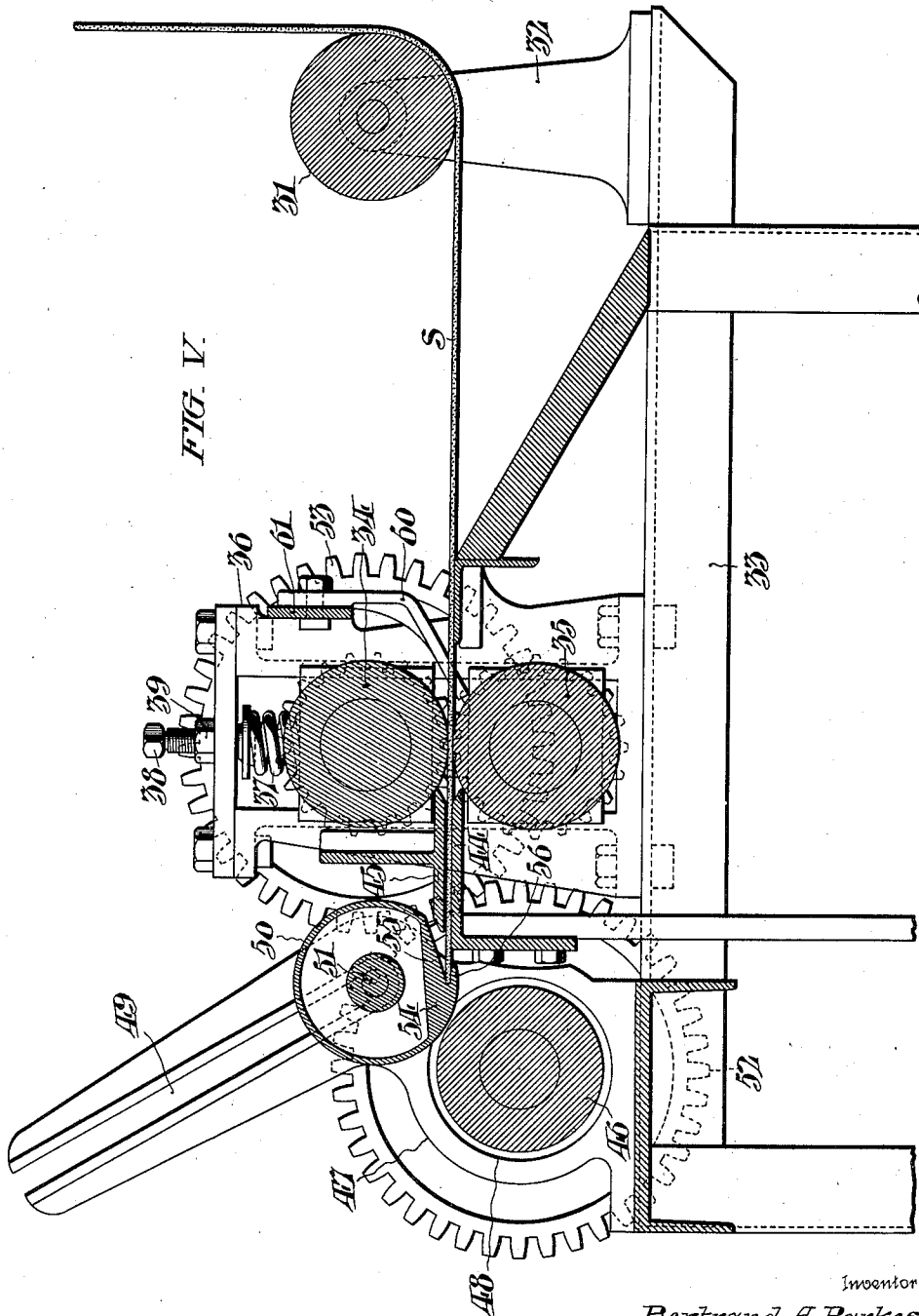
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FEEDING AND WINDING MACHINE

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5 Sheets-Sheet 4



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FEEDING AND WINDING MACHINE

Filed March 18, 1919

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FIG. VI.

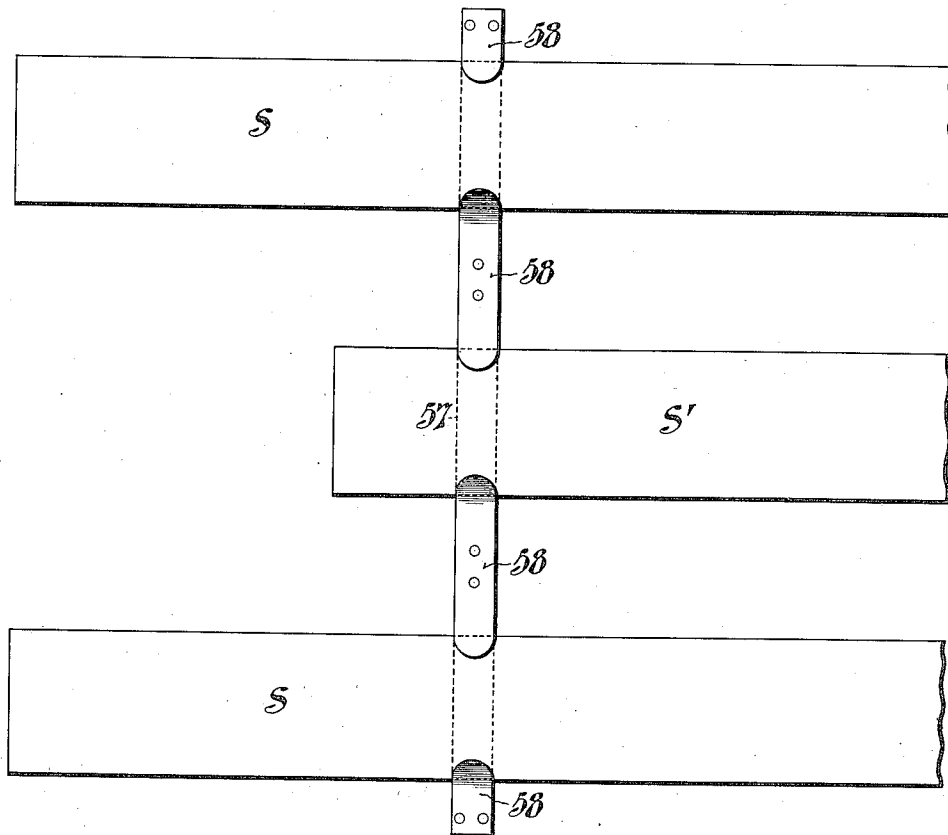


FIG. VII.



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UNITED STATES PATENT OFFICE.

BERTRAND A. PARKES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE PHILADELPHIA DRYING MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

FEEDING AND WINDING MACHINE.

Application filed March 18, 1919. Serial No. 283,294.

To all whom it may concern:

Be it known that I, BERTRAND A. PARKES, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Feeding and Winding Machines, whereof the following is a specification, reference being had to the accompanying drawings.

The invention relates more particularly to a machine of the above character, for feeding, incidentally drying, and winding into rolls, strips of cork, asbestos, canvas, paper, or other materials, which are relatively thick and not readily confined in rolled condition. Certain features of my invention are also applicable to the handling of strip material, irrespective of the particular object or treatment to which the handling may be incidental.

An object of the invention is to provide means for controlling the material as it is led from the delivering roll, to the drying machine, so that it will be delivered thereto uniformly as required.

A further object of the invention is to provide means for winding the strips, after they leave the drying machine, which means include devices for simultaneously winding a plurality of strips into independent rolls, and which means also include devices whereby the strip itself controls the starting of the winding of the roll.

A further object of the invention is to provide means for winding the strips into relatively tight rolls.

These and other objects will in part be obvious, and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention, Fig. I, is a side elevation of a complete feeding, drying and winding apparatus.

Fig. II, is an enlarged detail showing the winding and feeding mechanism in plan view.

Fig. III, is an enlarged detail showing in side elevation the delivering rolls, the means for controlling the same, and the supporting frame therefor.

Fig. IV, is an end view of the same.

Fig. V, is an enlarged vertical sectional view through the feeding and winding mechanism.

Fig. VI, is a detail showing in plan a device for attaching an end of a strip to other strips, for the purpose of starting a new strip into the machine.

Fig. VII, is a longitudinal section of the same.

The invention consists generally in providing a drying apparatus, through which the strips are fed from delivering rolls, supported for independent movement, so that a plurality of strips may be simultaneously fed to the drying apparatus. The winding apparatus is also particularly adapted for simultaneous operation upon a plurality of strips of material, such as cork, asbestos, canvas, paper or other materials, of considerable thickness, and which are not readily handled in roll form.

The material to be dried is delivered from rolls as above noted, and means is provided for placing a tension on these rolls, which tension increases as the diameter of the rolls decrease, and the tendency of the closer wound material to straighten out, increases.

The strips are led from the drying apparatus through feeding rolls, which force the strips between guide plates, so that they are caused to engage and set into operation the receiving rolls, on which the strips are to be wound. As soon as these rolls are started, a winding mechanism which consists of a driving roll, having surface contact with the material being wound, operates to turn the rolls to wind the material thereon. The surface speed of these receiving rolls, is slightly greater than the surface speed of the feed rolls, and this slight difference between the surface speed of the winding roll and the material, causes a tight winding of the material on the receiving rolls.

Referring more in detail to the drawings, the improved apparatus illustrating one embodiment of the invention, consists of a drying chamber 1, which may be suitably supplied with a circulation of heated air, for drying the material as it is slowly passed therethrough. An endless conveyer 2, is

provided with cross supporting poles 3, and the material to be dried is hung in loop form, on these poles, as indicated at 4. The strips to be dried are led to the drying chamber from delivering rolls 5. These delivering rolls are mounted in a frame 6, which is provided with spaced standards 7. Each delivering roll consists of a center disk having trunnions 9, and the strips of material are wound on these rolls. The standard, at the upper end thereof, is formed with a socket 10, which is closed by a cap 11. The cap 11, is pivoted to a suitable protecting lug 12, projecting from the standard 7, and a leaf spring 13, normally operates to hold the cap in position to close the socket 10, as shown in Fig. IV. The cap may be quickly raised to vertical position, and the square end thereof, resting against the spring in this position, will hold the cap raised, and thus permit the insertion of a new roll. The trunnions 9, extend only a short distance from the central disk of the rolls, and therefore one standard serves as a bearing for the two adjacent rolls.

The main frame 6, which may be of any suitable construction, carries an upwardly projecting bracket 14, in which is fixed a rod 15. Arms 16, are loosely journaled on this rod, and these arms are spaced so as to lie in the plane of each delivering roll. Each arm carries an adjustable weight 17, secured thereto by a set screw 18. A collar 19, is secured on the rod 15, adjacent to each arm, and said collar is provided with a laterally projecting stop lug 20. When the arm 16, is turned so as to rest against the stop lug 20, the weight will be held in vertical position, out of contact with the roll. When, however, the arm 16, is turned to the position indicated in Fig. IV, it will bear on the delivering roll, and place a tension thereon.

Pressure of this arm or weight against the roll will increase in proportion to the decrease of the layers of the material on the roll. The tendency of the material to spring out or unroll itself as the diameter of the roll decreases, will therefore be proportionately resisted, so as to maintain an even tension on the material during the entire unwinding operation.

It will be understood that there are a plurality of delivering rolls, and the several strips unwound therefrom are led over rolls provided with spaced grooves, so as to keep the strips properly separated, during the passage through the drying chamber 1.

The strips pass over a guiding roll 21, and thence over a guiding roll 22, to feeding rollers 23, and 24. The guiding roll 22, is driven by a gear connection with the main driving mechanism, which includes the shaft 25, extending along the side of the drying apparatus, as shown in Fig. II. The feed-

ing rolls 23, and 24, feed the strips in loops between the poles 3, 3, on the conveyer 2. This conveyer is continuously operated and a clamping roll 26, serves to hold the strips in the formation of the loops and also determines the length of the same. The feed roller 24, is driven by a chain 27, from a sprocket wheel 28, which turns with the guide roll 21, and this guide roll 21, is geared to the shaft 25.

After the strips have passed through the drying apparatus, they are led over a guiding roll 29, and thence over a guiding roll 30. The guiding roll 30, is formed with spaced grooves, which engage the strips and hold the strips spaced laterally relative to each other. After leaving the roll 30, the strips pass under a guide roll 31. Neither of the rolls 29, 30, or 31, are positively driven. The guiding roll 31, is mounted on a bracket 32, carried by the supporting frame 33, of the winding mechanism. This winding mechanism is shown in an enlarged section in Fig. V, of the drawings. It consists of two feed rolls 34, and 35, which are mounted in suitable bearings carried by the brackets 36, one at each side of the supporting frame 33, of the winding mechanism. The bearings supporting the roll 34, are slidably mounted in the brackets 36, and springs 37, pressing against these bearings, hold the rolls in gripping contact with the strips which are to be fed thereto. The tension of the springs 37, may be readily adjusted by screws 38, which are held in their adjusted positions by locking nuts 39. The feed rolls 34, and 35, are each provided with gears which mesh so that the rotation of one roll is positively conveyed to the other. The lower feed roll carries a sprocket wheel 40, which is driven by a chain 41, from a sprocket wheel 42, carried by the supporting bracket attached to the drying apparatus, which supports the conveyer, and the guiding rolls at the delivering end of the drying apparatus. A countershaft 43, supports said sprocket wheel 42, and is geared to the shaft 25, see Fig. II.

The strip of material indicated at S, in Fig. V, after leaving the feed rolls 34, and 35, passes over a supporting plate 44, and underneath the upper guiding plate 45, which is adjustably attached to the brackets carrying the feed rolls.

A driving roll 46, is mounted in suitable bearings carried by the supporting frame 33. A series of brackets 47, having openings 48, through which the driving roll extends, are spaced along said driving roll, so that there is a bracket 47, between each pair of strips, and a bracket 47, outside of each of the extreme outer strips. Each bracket is formed with an inclined slot 49. Each strip is wound on a separate receiving disk-like or short roll 50, and each roll 50 has a cen-

tral supporting rod 51, which extends laterally from the roll and forms trunnions adapted to engage the slot 49, in the adjacent bracket 47, and at each side of the roll.

5 The driving roll 46, carries a gear 52, which meshes with a gear 53, on the feed roll 34, (see Figs. II and V.), so that the driving roll is positively driven with the feed rolls 34, and 35. The receiving roll 50, when at 10 the lower end of the slots 49, is held slightly out of contact with the driving roll, and each roll is hollow and formed with a weighted section 54, which causes the roll to rotate so as to normally stand in the position indicated in Fig. V. This weighted 15 section is cut away as at 55, so as to form a recess, with an overhanging lip 56. The weighted section 54, positions this receiving roll, so that the strip as it passes between the guide plates 44, and 45, will enter the 20 recess and engage above the lip 56. The feed of the rolls 34, and 35, forcing the strip along will cause the receiving roll to turn after the end of the strip engages said recess, and as soon as the strip is wound onto 25 said disk, so as to be engaged by the driving roll 46, the driving roll will then take up the feed of the roll 50, and turn the same, winding the strip thereon. As the material 30 accumulates on the receiving roll 50, and its diameter increases, the supporting trunnions therefor will move up the slots 49, and the roll will be wound wholly through the contact of the driving roll 46, with the 35 surface of the material. The driving roll 46, is of slightly greater diameter than the feed roll 34, or may be so driven as to have a slightly greater surface speed than said feed roll. This latter through the slipping 40 action of this driving roll surface on the material, causes the roll formed on the roll 50, to be tightly wound thereon.

It is understood that the rolls 50, are simultaneously operated by the one driving 45 roll, and as soon as a strip is presented to a receiving roll, the same starts into action, as above noted.

When it is desired to insert a new strip after one of the delivering rolls has been 50 exhausted, a new roll may be readily placed in the supporting standards therefor, and the end of the new strip indicated at S', in Fig. VI, is joined to the other continuous strips, indicated at S, by a retaining clip 57. 55 This retaining clip 57, consists of a flexible metal backing piece to which are riveted the yielding fingers 58. The strips engage underneath these fingers, and are clamped thereby, against the main backing piece of 60 the clip. This clamping of the new strip to strips passing through the machine carries along the new strip through the drying apparatus and feed guide rolls, until the end of the strip reaches the feed rolls 34, and 35. 65 Stripper fingers 60, are attached to a cross

bar 61, carried by the brackets 36, and there is a stripper finger 60, between each pair of the strips. When the new strip S', reaches the feed rolls, the end of the strip projects sufficiently beyond the holding clip to be 70 engaged by the feed rolls before the clip strikes the strippers 60. The strippers 60, striking the clips will remove the same from the strips of material, and as the end of the new strip is now engaged by the feed rolls 75 34, and 35, it will be drawn through the drying apparatus in the usual manner. These clips may be used either as shown in Fig. VI, i. e. a new strip between two strips already passing through the machine or as 80 shown at the top of Fig. II, wherein the clip is anchored to two adjacent strips already passing through the machine.

The operation of the device will be obvious from the above description. The ma- 85 terial to be dried is wound on rolls, which are placed in the receiving brackets therefor. The ends of the strips are carried from the delivering rolls, over suitable guiding rolls, and thence formed into loops, and 90 passed through a drying apparatus for drying and conditioning the material, after which they are passed over suitable guide rolls to feeding rolls, which positively grip 95 and feed the strips through guiding plates to the receiving rolls, on which the rolls are formed. The strips automatically start into action the receiving rolls, whereupon the driving roll, engages the material and winds it on these receiving rolls to form the 100 material into tightly wound rolls.

From the above description it will be apparent that I have provided a new process of feeding, drying and winding relatively 105 heavy strips of material which consists in feeding a plurality of strips simultaneously through a drying apparatus and subsequently winding the strips into separate rolls by a winding device which is so constructed that the strips set the respective winding 110 rolls into operation. Furthermore, by my new process of feeding, drying and winding strips a new strip may be started through the drying apparatus through the aid of an adjacent strip which is passing through said 115 apparatus.

It is obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention, as set 120 forth in the appended claims.

Having thus described my invention, I claim:

1. A treating and winding apparatus, including feed rolls for positively engaging 125 and feeding the strips to be treated and wound, an individual sectionally weighted receiving roll for each strip upon which the treated strips are wound, and a driving roll common to all the receiving rolls for simul- 130

taneously winding the strips thereon by frictional contact with said strips.

2. A winding apparatus, including feed rolls for positively engaging and feeding strips to be wound, a receiving roll for each strip, and means set into operation by the strip itself, for operating the receiving roll for winding the strip thereon.

3. A winding apparatus comprising feed rolls for positively engaging and feeding strips to be wound, a receiving roll for each strip having means to hold the strip end thereagainst when fed thereto by said rolls, and means operating through the strip as it lies against the roll periphery for rotating the roll to wind the strip thereon.

4. A winding apparatus comprising feed rolls for positively engaging and feeding a plurality of strips to be wound, corresponding independently rotatable receiving rolls for the strips having means to hold the strip ends thereagainst when fed thereto by said rolls, and a common winding roll for said rolls adapted to engage the strips as they lie against their peripheries and wind them upon the rolls.

5. A winding apparatus comprising feed rolls for positively engaging and feeding a strip to be wound, a receiving roll having means to hold the strip end thereagainst and mounted for rotation in upwardly extending ways, and a winding roll adapted to engage the strip as it lies against the periphery of the roll and wind it thereon, contact of the strip with said winding roll being maintained by the action of gravity on the roll, and said ways permitting bodily upward movement of the roll to accommodate successive layers thereon.

6. A winding apparatus, including feed rolls for positively engaging and feeding the strips to be wound, a receiving roll for each strip, said roll having a weighted section, a receiving recess for the end of the strip, adjacent said weighted section, and a driving roll normally out of contact with the rolls and operating to engage the strips, and wind the same on said rolls, after said rolls have been started.

7. A winding apparatus, including a supporting frame, feed rolls mounted on said frame, means for yieldingly pressing said feed rolls into contact with the strips, a driving roll, a receiving roll for each strip, said receiving roll having a recess to receive the end of the strip, and guide plates between the feeding rolls and the rolls for guiding the ends of the strips into the recesses in the receiving rolls.

8. A winding apparatus, including a supporting frame, feed rolls mounted thereon, means for yieldingly pressing said feed rolls into contact with the strips, a driving roll, a receiving roll for each strip, a plurality of spaced brackets for supporting and guid-

ing said receiving rolls and permitting them to move along the brackets as the material accumulates thereon, and means for automatically connecting the ends of the strips to the receiving rolls.

9. A winding apparatus for strip material, including a supporting frame, feed rolls mounted thereon, means for yieldingly pressing said feed rolls into contact with the strips, a receiving roll for each strip of material, a driving roll, a plurality of spaced brackets for supporting and guiding the receiving rolls so that said rolls may move along the brackets as the material accumulates thereon, means for automatically connecting the ends of the strips to the receiving rolls, and guiding plates located between the winding roll and the feed rolls for guiding the ends of the strips to the receiving rolls.

10. A winding apparatus, including a supporting frame, feed rolls mounted thereon, a driving roll means for positively driving said feed rolls, and said driving roll, receiving rolls, and means supporting said receiving rolls so that the driving roll engages the material on the rolls and turns the same to wind the material thereon, said driving roll having a greater surface speed than the feed rolls.

11. A winding apparatus, including a supporting frame, feed rolls, means for positively driving said feed rolls, a winding device associated with said feed rolls, having means for simultaneously winding a plurality of strips, a holding clip for joining the end of a strip to other strips, passing through the apparatus, and strippers adjacent the feeding rolls, for removing said clips from the material, after the end of a strip has been caught by the feeding rolls.

12. An apparatus for delivering strip material from a roll, comprising means for drawing off and feeding the strip material, means for supporting the roll, and means for producing on the strips as drawn off by said last mentioned means a gradually increasing tension by resisting unwinding of the roll to an increasing degree as the diameter thereof decreases.

13. An apparatus of the character described for delivering strip material from a roll, comprising means for drawing off and feeding the strip material, and a gravity fall weighted lever mounted in proximity to the roll with the weight thereof engaging said roll so as to act as a friction brake, the fulcrum of said lever being so located with respect to the roll that the gravitational braking effect of the weight increases proportionately as the diameter of the roll decreases.

14. An apparatus of the character described, comprising means for forming strips in loops and for afterward winding the

strips, means for supporting the strips in rolls and delivering the same to the loop forming means, and gravity fall means for producing on the winding strips so delivered a steadily increasing tension by resisting unwinding of the roll to an increasing degree as the diameter of the roll decreases.

15. A winding apparatus for winding simultaneously a plurality of strips including a normally stationary receiving roll for each strip to be wound, a winding roll common to all of said rolls, each disc including means whereby the insertion of the strip connects the roll to the winding roll.

16. A winding apparatus for winding simultaneously a plurality of strips including a roll for each strip to be wound, a driving roll common to said rolls, means for supporting said rolls whereby the same may be held out of contact with the driving roll a distance slightly less than the thickness of the material to be wound so that the roll may be rotated through contact of the material with the driving roll, said supporting means for the roll permitting said roll to

move away from the driving roll as the diameter of the wound roll increases.

17. A process of the character described for treating and winding relatively heavy strips of material consisting in feeding a plurality of strips simultaneously through a treating apparatus, separately winding each strip, and utilizing the strips for setting the respective winding devices into operation.

18. A process of the character described for treating and winding relatively heavy strips of material consisting in feeding a plurality of strips simultaneously through a treating apparatus, separately winding each strip, and utilizing the adjacent strip for carrying along and starting a new strip.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this twelfth day of March 1919.

BERTRAND A. PARKES.

Witnesses:

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E. L. FULLERTON.