Dec. 15, 1925. 1,565,652

F. S. KOCHENDORFER ET AL

TAPING MACHINE

Filed Aug. 31, 1922 4 Sheets-Sheet 1

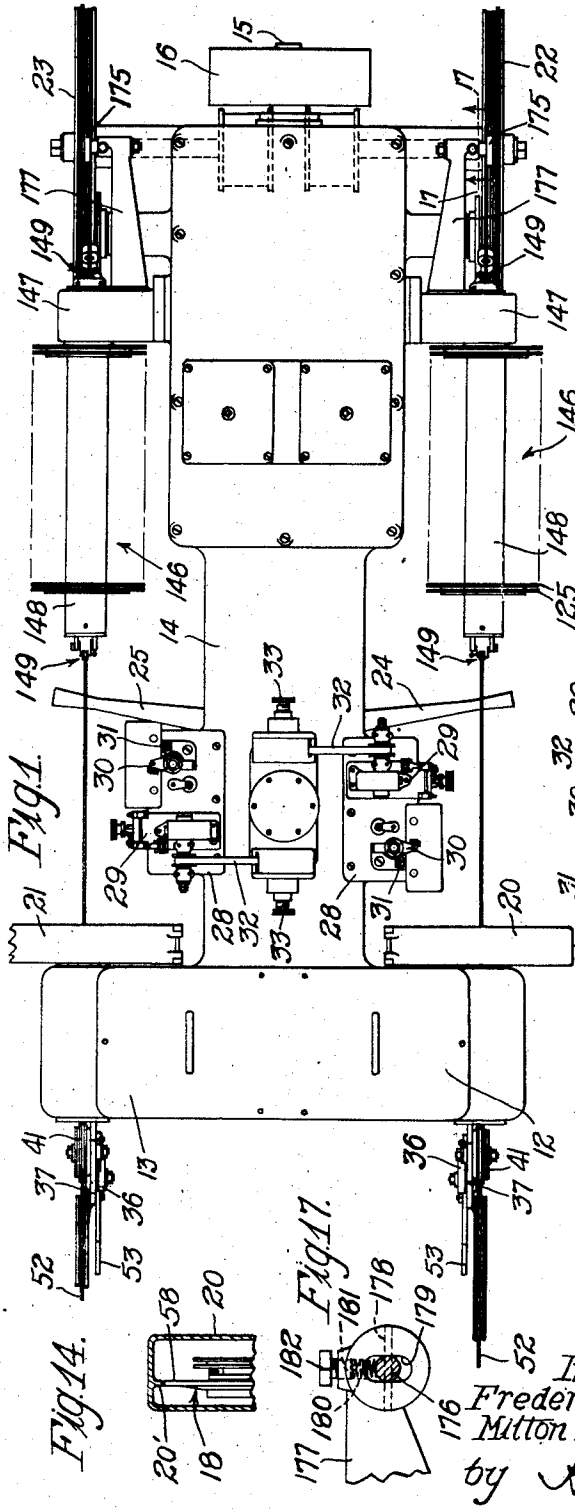


Fig. 1.

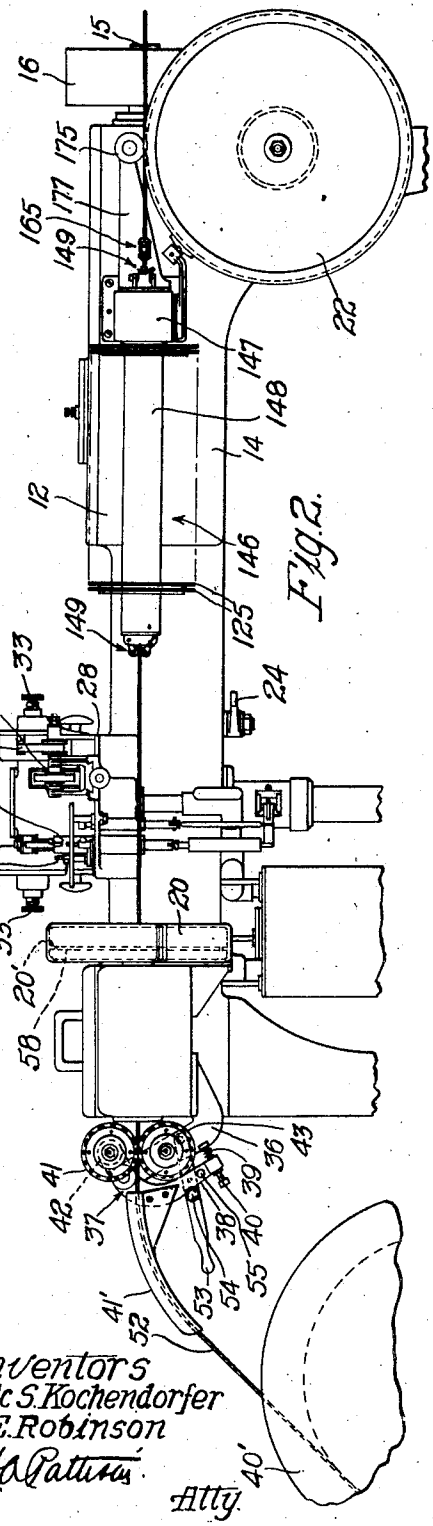


Fig. 2.

Fig. 14.

Fig. 17.

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TAPING MACHINE

Filed Aug. 31, 1922 4 Sheets-Sheet 2

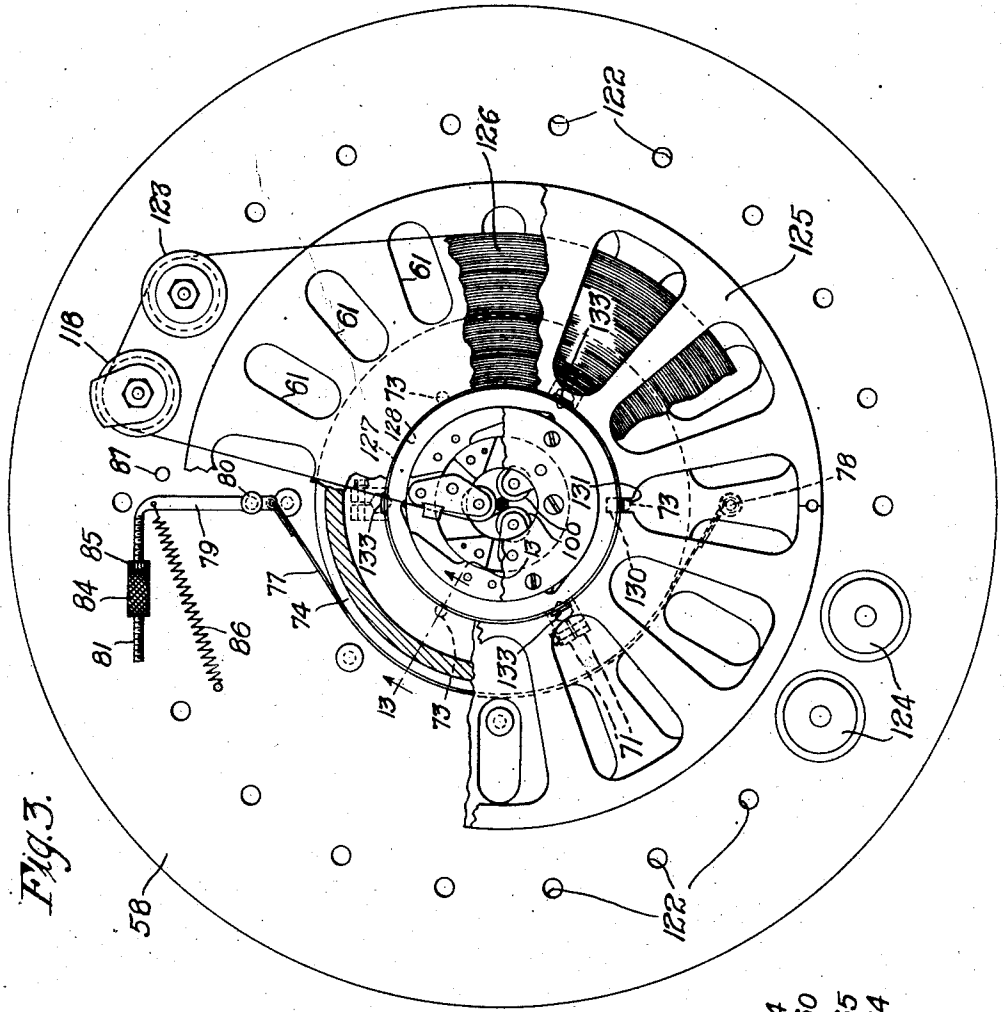


Fig. 3.

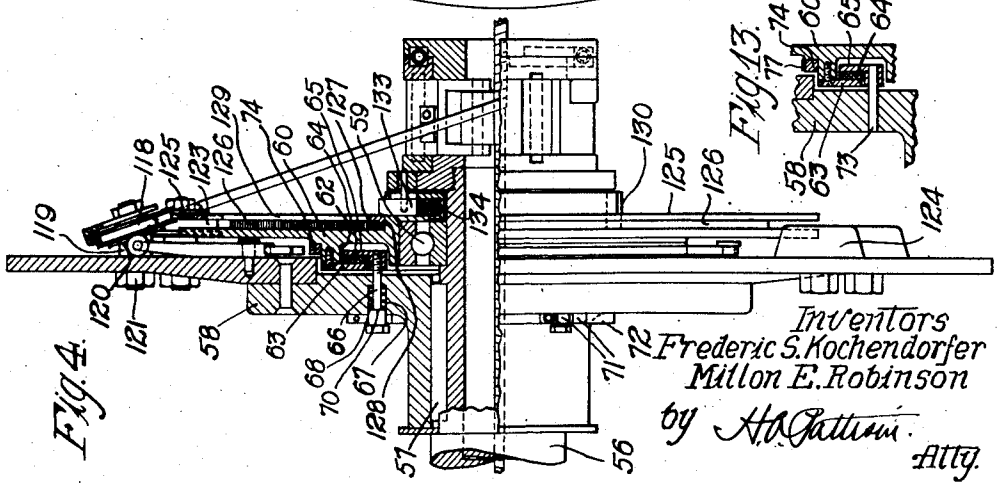


Fig. 4.

Fig. 13.

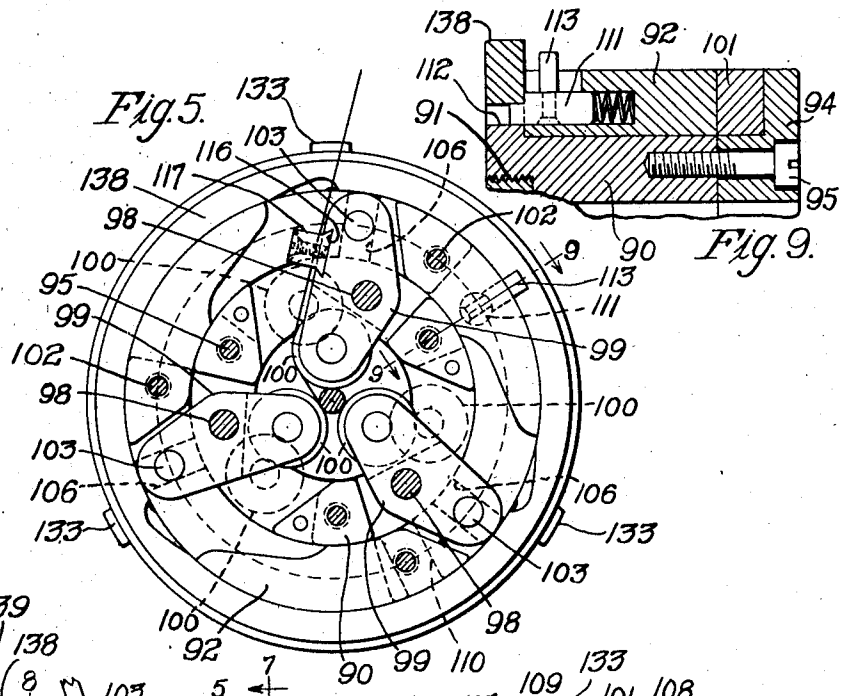
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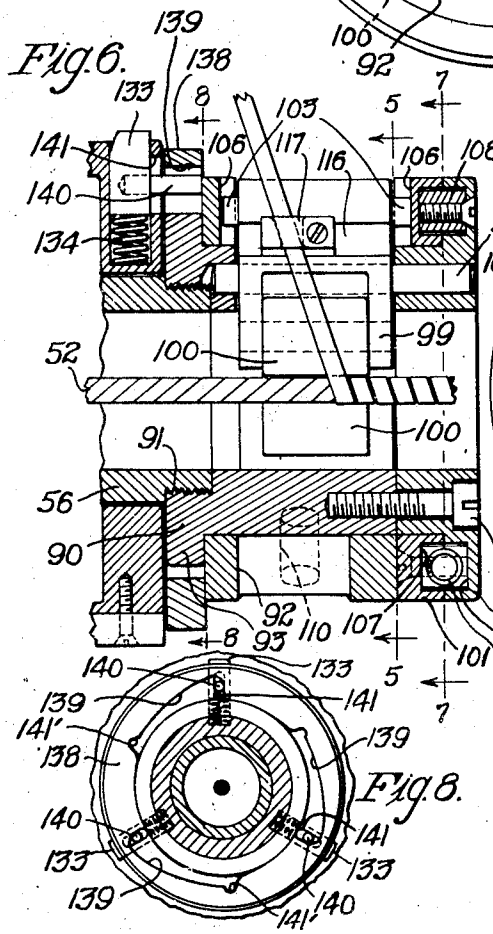
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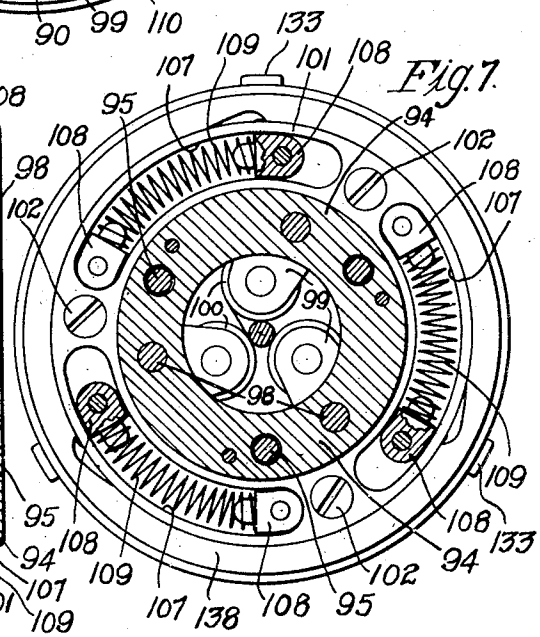
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TAPING MACHINE

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TAPING MACHINE

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Fig. 10.

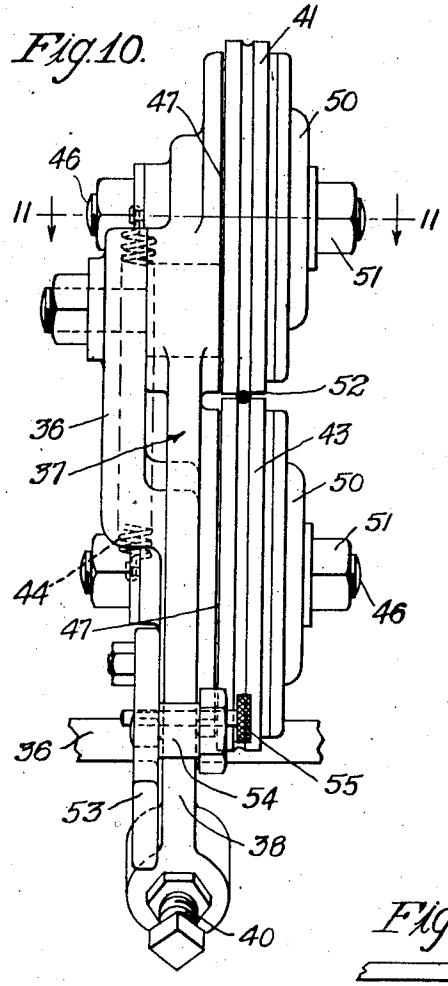


Fig. 12.

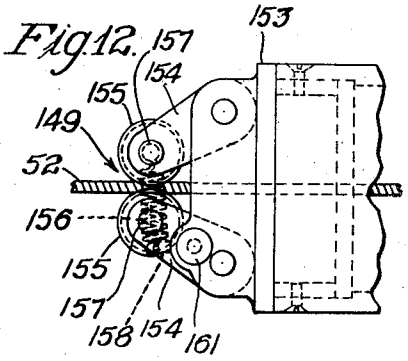


Fig. 11.

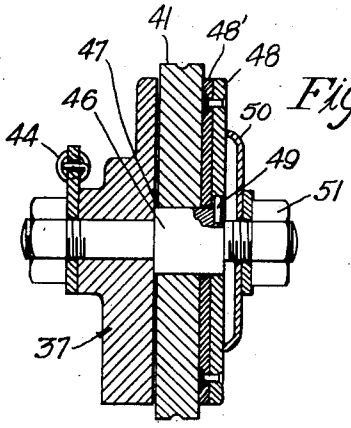


Fig. 18.

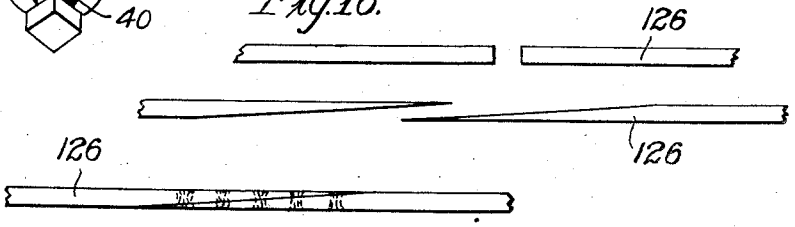


Fig. 15.

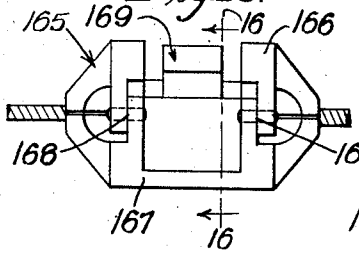
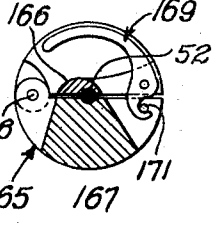


Fig. 16.



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UNITED STATES PATENT OFFICE.

FREDERIC SHIELDS KOCHENDORFER, OF RIVER FOREST, AND MILTON EARL ROBINSON, OF CHICAGO, ILLINOIS, ASSIGNORS TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TAPING MACHINE.

Application filed August 31, 1922. Serial No. 585,562.

To all whom it may concern:

Be it known that we, FREDERIC SHIELDS KOCHENDORFER and MILTON EARL ROBINSON, citizens of the United States, residing at River Forest and Chicago, respectively, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Taping Machines, of which the following is a full, clear, concise, and exact description.

This invention relates to taping machines, and more particularly to a machine for applying ribbon or tape spirally to a continuous core. The invention will perhaps find its widest application in connection with machines for applying metallic tape to signaling conductors.

One of the objects of the invention comprises the production of an improved serving head for applying a tape uniformly and smoothly and with a minimum amount of tension on the tape as it is served spirally around a core.

Another object resides in the provision of means for supplying a drag or tension to the core between the source of supply and the capstan for holding it taut while being served with the tape to produce a uniformly wrapped core.

A further object resides in the provision of means for guiding the tape from the serving head to the capstan with a minimum amount of vibration and for holding the tape which has been wound spirally on the core from uncoiling for a great distance, if the tape while being served to the core should break, or for other causes.

A still further object of this invention consists in the production of an improved taping machine which will be efficient in operation, conserving of floor space, and one in which a plurality of tape serving units mounted thereon are driven by a single driving means.

In the drawings illustrating one embodiment of the invention,

Fig. 1 is a plan view of a taping machine embodying the features of this invention;

Fig. 2 is a fragmentary side view thereof;

Fig. 3 is an enlarged fragmentary front view, partly in section, of the serving head;

Fig. 4 is a side view thereof partly in section;

Fig. 5 is a vertical section on the line 5—5 of Fig. 6, looking in the direction indicated by the arrows, and shows an enlarged view of the nozzle;

Fig. 6 is a vertical sectional view of the complete nozzle taken at right angles to Fig. 5;

Fig. 7 is a vertical section on the line 7—7 of Fig. 6, looking in the direction indicated by the arrows;

Fig. 8 is a section on a reduced scale on the line 8—8 of Fig. 6, looking in the direction indicated by the arrows, showing the means for operating the latches for holding the tape pad holder on the serving head;

Fig. 9 is a sectional view taken on the line 9—9 of Fig. 5 looking in the direction indicated by the arrows, showing the latch means for holding the nozzle rollers away from the core and illustrating the said means in an operated position;

Fig. 10 is an enlarged end view of the means positioned at the left-hand end of the machine for applying a drag or tension to the core while it is being served with tape;

Fig. 11 is a horizontal sectional view thereof on the line 11—11 of Fig. 10;

Fig. 12 is an enlarged side view of the means for holding the tape from uncoiling in case it breaks;

Fig. 13 is a sectional view taken on the line 13—13 of Fig. 3 looking in the direction indicated by the arrows, showing the driving connection between the serving head and the tape pad carrier mounted thereon;

Fig. 14 is an enlarged fragmentary sectional view through the serving head housing, the serving head being shown in elevation;

Fig. 15 shows a clamp used to hold the end of a broken tape upon the core while moving it back to be connected to the tape on the pad;

Fig. 16 is a vertical section thereof taken on the line 16—16 of Fig. 15;

Fig. 17 is an enlarged vertical sectional view taken on the line 17—17 of Fig. 1 looking in the direction indicated by the arrows, showing the means for pressing the roller into engagement with the served core on the capstan to prevent the core from uncoiling therefrom, and

Fig. 18 is a diagrammatic illustration showing metal tapes before and after the grinding and welding operations.

In the preferred form of the invention the taping machine consists of a single unitary frame, mounting a serving unit upon opposite sides thereof. Each unit comprises a serving head, a capstan, a tape pad magazine mounted on the front side of the frame, and means, mounted at one end of the frame, for applying a drag or tension on the core to hold it taut while being served. Carried upon the top of the frame and conveniently arranged with respect to the serving head are grinding, welding and annealing attachments for use in connecting the end of a tape pad, which has already been served on a core, to a new tape pad about to be served. A single main driving means is carried by the frame, and suitable driving connections, actuated by the main drive, are provided for driving each serving head and its respective capstan, together with another driving connection for its respective grinding attachment. To couple the driving connections of each head and its respective capstan with the main drive a clutch mechanism (not shown) is provided individual to each head and its respective capstan and a separate clutch mechanism is provided for each grinding attachment. Each clutch mechanism may be separately operated to stop or start its associated head, capstan, or grinding attachment without in any way affecting the clutch mechanisms associated with the other head and its capstan or grinding attachment.

As illustrated in the drawings, the complete machine comprises two units 12 and 13 positioned side by side and both carried upon a single supporting frame 14. A main driving shaft 15 driven by a pulley 16 enters the frame 14 at one end and between the two units 12 and 13 and drives serving heads 18 and 19, mounted at one end of the frame within the housings 20 and 21, and capstans 22 and 23 at the opposite end of the frame through suitable driving connections (not shown) carried within the frame. The driving connections for the heads and capstans are clutched to the main driving shaft 15 by operating the levers 24 and 25 in one direction, and when these levers are moved in the reverse direction they actuate a brake (not shown) to stop the machine quickly.

As each serving unit is identical in all its parts, the following description will be confined to the unit 12. Carried upon the top of the frame 14 by a plate 28 convenient to an operator who stands between the head 18 and the operating lever 24 are grinding, welding and annealing attachments 29, 30 and 31 respectively. The grinding and welding attachments are adapted to grind the ends of the tape and thereafter to weld together the ground ends as illustrated in Fig. 18. For a detailed description of these attachments and their operation reference may be had to co-pending applications, Serial No. 585,373, filed August 31, 1922, and Serial No. 585,559, filed August 31, 1922. The grinding attachment 29 is driven by a belt 32 driven in turn by suitable driving mechanism (not shown) connected to the main driving shaft, the starting and stopping of the grinding mechanism being controlled by a hand wheel 33.

In the manufacture of signaling conductors of the type for which this taping machine is designed it is very essential that the conductor or core to be served be held under tension along its length between a suitable supply and the capstan while the tape is being served thereto, so that it will be laid in evenly spaced spirals thereon.

Means is provided for putting a tension on the core along its length while it is being served with tape. This means will now be described.

Mounted on the supply end of the frame and at one side of the path taken by the core is an L-shaped bracket 36 (Fig. 2) pivotally supporting at its upper end a bell-crank lever 37 which extends above the path of the core. A downwardly extending arm 38 of the lever 37 is provided with a socket at its end in which rests one end of a compression spring 39, the other end thereof engaging a suitably formed lug on the bracket 36. An adjusting screw 40 is screw-threaded into the end wall of the socket and engages a suitable member (not shown) between its end and the spring 39. By turning the screw 40 the compression of the spring may be varied. A grooved pulley 41 is carried upon the short arm 42 of the lever 37 and directly therebelow in substantially vertical alinement and mounted on the bracket 36 is a second grooved pulley 43. A tension spring 44 (Fig. 10) suitably mounted between the axes of the pulleys tends to draw the pulley 41 downward. The pulleys 41 and 43 are each mounted in the same manner upon the lever 37 and bracket 36 respectively, this mounting comprising a stud 46 upon which the pulley is loosely mounted. The stud 46 (Fig. 11) is firmly secured in the bracket or lever and at one side rests against a spacer 47. The opposite side of the pulley is engaged by a washer 48 having a friction surface 48′, the washer being loose on the stud 46 but secured from turning thereon by a pin 49 secured in the stud 46 engaging a key-way formed in the washer 48. Outside of the friction washer on the stud is a cup-shaped spring washer 50. The end of the stud 46 is screw-threaded and projects through the friction washer 48 and the spring washer 50 and receives a nut 51 by which the pressure between the pulley and the friction washer 48 at one side and between the pulley and spacer 47, backed by the lever or bracket, may be regulated. A conductor or core 52 to be served is led from

a suitable supply and threaded between the grooves in the pulleys 41 and 43, and due to the action of the springs 39 and 44 holding the pulley 41 with the required pressure against the core 52 and the resistance of the pulleys 41 and 43 to turn upon the studs 46, due to the adjustment of the friction washers 48, the core is kept taut along its length as it is moved through the serving head 18 by the capstan 22. To thread the core 52 between the pulleys the bell-crank lever 37 is turned about its pivot counter clockwise and against the action of the springs 39 and 44 by moving downward a hand lever 53 pivotally mounted on the bracket 36, a suitable stud 54 carried on the lever 53 acting against the lever 37 to turn it. To hold the lever 37 against the action of the springs 39 and 44, a locking pin 55 is provided which is inserted in a suitable opening in the lever 53 after it has been moved to its extreme downward position. This movement of the lever will swing the pulley 41 away from the pulley 43, thereby allowing the core to be freely threaded therebetween.

Means is provided for guiding the core from a supply reel 40′ (Fig. 2) to the pulleys 41 and 43. This means also serves to maintain a substantially constant set tension on the core along its length. This means will now be described.

Mounted upon the lever 37 (Fig. 2) and below the pivot point thereof is a curved guide lever 41′ which is V-shaped in cross section. At times the core as it is drawn from the supply reel 40′ will catch or hold back due to its being wound unevenly upon the reel 40′, or to other causes. When this happens the tension on the core will momentarily become greater than the set tension provided by the pulleys 41 and 43. This will result in a movement of the guide lever, and the lever 37 secured thereto, counterclockwise about its pivot due to the resistance of the core to unreel freely from the reel 40′. This movement of the lever 37 will cause the pulley 41 to be moved away from the pulley 43, with the result that the resistance of the core to unreel from the reel will be the only appreciable tension on the core, and when this has been overcome, the pulley 41 will move back to the core and thereafter the normal set tension will be exerted on the core.

The construction and operation of the serving head 18 will now be described.

The serving head 18, as shown in Fig. 4, is carried upon a hollow shaft 56 suitably connected to the main driving shaft. Secured to the shaft 56 by a key 57 is a disk 58 and in front thereof and rotatable upon a ball bearing 59 carried upon the shaft 56 is a tape pad carrier 60 provided with a plurality of openings 61 in its face for lightening it. The rear face of the carrier 60 is provided with an annular shaped ridge 62 supporting a friction ring 63, the face of the latter being wider than that of the ridge 62 and extending toward the axis of the head. A second friction ring 64 is mounted adjacent the ring 63 and is supported by a metallic ring 65 carried by screws 66 mounted in the disk 58. The tension between the friction rings 63 and 64 may be regulated by adjusting the screws 66, three of which are provided spaced 120° apart (Fig. 4). The screws 66 pass through shouldered openings 67 in the disk 58 and are screw-threaded into the ring 65. Compression springs 68 positioned around the screws 66 and between a shoulder 70 formed thereon and a shoulder formed in the opening 67 function to provide a constant tension between the friction rings 63 and 64 at all times. Any wear on the friction surfaces of the rings is taken up by the springs 68. The screws 66 are held in their set positions by being suitably clamped between bifurcated sections 71 formed on a ring 72 (Fig. 3) which bears against the rear face of the disk 58.

Three pins 73 spaced 120° apart are mounted on the disk 58 (Figs. 3 and 13) and project into suitable openings provided in the supporting ring 65 midway between the screws 66 and at equal distances from the axis of the head. The pins 73 form the driving connection between the disk 58 and the supporting ring 65, thereby taking all strain off the adjusting screws 66.

Means for supplying a uniform and sensitive tension to the tape pad carrier 60 (to which a holder supporting the tape is attached, hereinafter described) in such a manner that it will readily respond to changes in the speed of the serving head, as when starting or stopping and thereby tending to prevent the breaking of the tape being served, will now be described.

Secured to a shoulder formed on the carrier 60 is a ring 74 of any suitable material forming a brake drum and engaging therewith is a flexible brake band 77 suitably secured at one end to a pin 78 (Figs. 3 and 4) secured in the disk 58 and at its other end to the short arm of a centrifugally operated lever 79 pivotally secured to the disk 58 at a point 80 diametrically opposite the pin 78. Upon a screw-threaded right angle extension 81 of the long arm of the lever 79 is threaded a weight 84 adapted to be held in a set position, after being adjusted, by a lock nut 85. A tension spring 86 with one end secured to the disk 58 and its other end to the long arm of the lever 79 functions to hold the brake band 77 with a certain degree of tension against the brake drum 74 when the serving head is stationary and acts to resist the action of centrifugal force to throw the weighted end of the lever 79 outward

when the head is revolving. With proper adjustment the brake band is automatically released from the brake drum just before the head reaches maximum speed. A stop pin 87 prevents the lever 79 from turning about its pivot 80 further than is necessary after the brake band has been released.

In the operation of the serving head the braking force between the brake band 77 and the brake drum 74 on the carrier 60 decreases as the speed of the winding head increases, due to the action of centrifugal force, the braking force being greatest when the head is traveling at its minimum speed.

A circumferential rib or fin 20′ is formed on the inside of the housing (Figs. 2 and 14). The fin 20′ serves as a guard for the tape to prevent it from becoming entangled at the opposite side of the disk 58, if it should uncoil or break.

The end of the shaft 56 projects outside of the carrier 60 and has secured thereto a roller device or nozzle for laying the tape flat on the core as it is served thereto. This device comprises a supporting housing 90 (Fig. 6) secured to the shaft 56 by a left-hand thread indicated at 91 to prevent it from turning loose when the serving head revolves, which movement is in a right-hand direction. A roller bracket carrier 92 is rotatably mounted upon the housing 90 between a flange 93 thereon and a cover 94 secured to the housing 90 by screws 95. Three pins 98—98, 120° apart and each pivotally supporting a roller bracket 99 carrying a roller 100, are supported at one end in the housing 90 and at their other end in the cover 94. Between the carrier 92 and the cover 94 is a cover member 101 in the form of a ring secured to the carrier 92 by screws 102. The roller bracket 99 is pivoted intermediate its length and to one side of a line drawn between its ends, the inside end carrying the roller 100 and the outside end equipped with a pin 103 projecting at each side into slots 106 (Figs. 5 and 6) formed in the carrier 92 and its cover 101. The surfaces of the covers 101 and 94 which are in sliding engagement (Fig 6) are each formed with complementary depressions 107 spaced 120° apart. Secured within each of the pockets formed by the depressions 107 are two spring holders 108, one secured at one end of the depression 107 in the cover 101, and the other in the opposite end of the pocket in the depression 107 of the cover 94. Mounted between each pair of holders is a compression spring 109. Due to the compression in the springs 109, the roller brackets 99 are normally held in the position shown in Fig. 5 with the rollers 100 resting against the tape on the core. To release the rollers from their engagement with the core a suitable pin or stylus is inserted in an opening 110 provided in the carrier 92, as indicated in dotted outline in Figs. 5 and 6, and thereafter the carrier is revolved on the housing 90 clock-wise. Due to the roller brackets being pivoted in the housing 90 and the pins 103 engaging the slots 106 in the carrier 92, the three rollers 100 will be rotated clockwise about their pivots 98 and away from the core to be taped, when the carrier is revolved as described above. The position of the rollers after being moved is indicated in dotted outline in Fig. 5. A spring pressed latch 111 is suitably mounted in the carrier 92 (Figs. 5 and 9) and after moving the rollers to the dotted line position, the latch springs into an opening 112 in the housing 90, thereby holding the carrier 92 from moving back to its normal position. A handle 113 is provided on the latch 111 to draw it out of the opening 112, and when the latch is free of the opening the rollers will move back and engage the core due to the action of the springs 109.

One of the roller brackets 99 is provided with a dovetail slot 116 in its face which extends parallel to the axis of the core to be taped and adjustably mounted therein is a tape guide 117. A guide pulley 118 (Figs. 3 and 4) is mounted upon the face of the disk 58 near the periphery thereof and freely rotatable upon a stud 119 provided with a face 120 cut on an angle. This guide and the pulley 118 functions to lead the tape to the core at the desired angle. The stud 119 is secured to the disk 58 by a bolt and nut 121, and by loosening the nut the stud may be turned with the bolt, thereby causing the pulley to guide the tape 126 at a different angle, the guide 117 being also moved in the slot 116 to guide the tape to the core at the same angle as the pulley.

A plurality of radially disposed and equally spaced holes 122—122 are provided in the face of the disk 58 for locating the pulley 118 and a second pulley 123 adjacent thereto over which the tape 126 is guided before it is guided by the pulley 118. Counter weights 124 are mounted on the disk 58 at points diametrically opposite the pulleys 118 and 123 or at other positions afforded by the openings 122 to properly balance the serving head.

The action of centrifugal force tending to turn the roller brackets 99 about their pivots 98 clockwise when the head is revolving and thereby moving the rollers 100 away from the core is counteracted to a large extent by the circularly arranged springs 109 acting against the outside ends of the roller brackets 99 to turn them counter-clockwise.

A tape pad holder 125 (Figs. 3 and 4) holding a supply of tape 126 and provided with a hub 127 fits over a hub-like portion 128 formed on the tape pad carrier 60 with the tape between the disk portion on the

carrier 60 and the pad holder 125. The pad holder is formed with a plurality of openings 129—129, through which the amount of tape on the holder may be observed while the machine is stationary or in operation, so that the operator, at all times, may know when the tape supply on the holder is about to be exhausted. These openings also serve to lighten the holder. The pad holder 125 is secured to the carrier 60 to turn therewith by a key 130 suitably secured in the hub-like portion 128 of the carrier entering a key-way 131 formed in the hub 127 of the pad holder. The pad holder 125 forms the subject-matter of co-pending application, Serial No. 585,558, filed August 31, 1922, reference to which may be had for a more detailed description thereof.

Means is provided for preventing the pad holder from moving horizontally off the hub-like portion 128 on the carrier 60 when the machine is operating. This means will now be described.

Mounted in suitable depressions formed in the hub portion 128 of the carrier 60 and outside of the pad holder 125 are three radially disposed latches 133—133 spaced 120° apart (Figs. 4 and 8). The latches 133—133 are each forced outwardly by a spring 134 positioned below the latch and within the depression in the hub portion 128. A cam ring 138 is positioned between the vertical face of the hub portion 128 and the rear vertical face of the roller bracket carrier 92 and rotatably mounted upon the peripheral flange 93 of the housing 90. (Figs. 8 and 6.) The cam ring 138 is provided with three internal cam surfaces 139—139, one for each latch 133, and are each engaged by a pin 140 secured in the latch 133 which project through a suitable radial slot 141 formed in the vertical face of the hub portion 128. The cam ring 138, as illustrated in Fig. 8, is shown in its normal position in which the pins 140 engage the cam surfaces at their low points. The peripheral surface of the cam ring is preferably knurled so that it may be easily rotated, and by turning it clockwise the pins 140 will be moved inward toward the axis of the serving head, thereby drawing the latches 133 below the hub 127 of the pad holder 125; thereafter the pad holder may be moved horizontally off of the hub portion 128 of the carrier 60. The cam surfaces on the cam ring at their high points are provided with notches 141′—141′ into which the pins 140 enter when the cam ring is at the end of its movement clockwise, thereby holding the latches 133 in an unlatched position. After mounting a pad holder on the hub portion 128, the latches are moved to their locking position by turning the cam ring counter-clockwise, which will move the pins 140 free from the notches 141′ and allow the latches to move outward and beyond the hub 127 in the pad holder.

A tape pad holder magazine 146 (Figs. 1 and 2) is mounted upon the frame 14 by a bracket 147 and comprises a tube 148, the diameter of which is substantially the same as the opening in the hub 127 of the tape pad holder 125. A sufficient number of loaded tape pad holders 125 are positioned upon the tube 148 before the machine is started for taping whatever length of core is to be served at once.

As the tape on each pad holder is exhausted the holder is removed. To permit the removal of an empty pad holder, each holder is cut at one point from its periphery to its center whereby it may be slipped over the taped core. A loaded pad holder may be moved from the magazine along the core and locked in position on the serving head.

Means are provided for guiding the tape from the serving head to the capstan and also for holding the tape which has been wound spirally on the core from uncoiling after the machine has been brought to a stop, if the tape while being served to the core should break. These means will now be described.

Mounted upon the left-hand end of the tube 148 and central therewith and also upon the bracket 147 are roller guides 149 (Figs. 1, 2, and 12) for guiding the served core in a straight line from the nozzle of the serving head to the capstan. Both guides 149 are identical in construction, with one turned 90° from the other, therefore the following description will be confined to the one mounted at the left-hand end of the tube 148. The setting of the guides 149 90° apart tends to reduce vibration on the core as it is drawn through the machine and served with tape. The left-hand guide serves to hold the tape, if it should break while being served, from uncoiling or loosening for a greater distance than from the point of the break in the tape to its engagement with the guide 149. In like manner the other rolls 149 serve to hold the tape from uncoiling, in case it breaks, beyond the said rolls. Each guide 149 comprises a shouldered disk-shaped support 153 (Fig. 12) suitably secured to the end of the tube 148, and pivotally mounted thereon upon suitable bearings are two roller brackets 154 each carrying a grooved roller 155 at their free ends. The rollers 155 engage the served core at diametrically opposite points and are held under tension against the served core by a tension spring 156 suitably secured at one side of the roller brackets 154. The spring 156 is secured at one end to a shaft 157 upon which the rollers 155 turn and at its other end to a pin 158 secured to the support 153 at a point below the normal position of the axis of the lower roller. The

lower roller is normally secured in a set position to hold the served core in a straight line by a pin 161 passing through the roller bracket bearing and entering a hole in the roller bracket. To release the pressure between the rollers, the pin 161 is withdrawn from the hole in the lower roller bracket, after which the lower roller will be free from the core. In case the tape breaks while being served and the machine is immediately stopped, the rollers will prevent the uncoiling or loosening of the tape on the core from a point between the rollers and the capstan.

When the tape breaks and the operator does not bring the machine to a stop quick enough, the break in the tape will pass through the roller guides and the tube 148. When this happens it is necessary to move the core back to be connected to the tape on the pad holder 125 carried on the head. To hold the end of the tape from uncoiling further while passing back through the roller guides and the tube, a clamp 165 (Figs. 2, 15 and 16) is provided. The clamp 165 comprises two members 166 and 167 hinged together at 168 and forming a circular shaped body with cone-shaped ends when clamped around the core as shown in the drawings. Suitable depressions are formed in the members 166 and 167 for receiving the wrapped core. A latch 169 pivotally mounted on the member 166 and provided with a suitable cam surface on its engaging end engages a pin 171 secured in the member 167. When the clamp is mounted on the wrapped core, the latch 169 is within the diameter of the members 166 and 167. When the clamp has been properly mounted on the core the guide rollers are separated as described heretofore and the core is moved back, the clamp thereon freely passing through the guide rollers 149, tube 148, and serving nozzle of the taping head.

A roller 175 (Figs. 1 and 2) preferably made of rubber, is held with sufficient pressure against the first three coils of wrapped core on the capstan to prevent the core from bowing up after leaving the roller guide 149. The bowing up of the core causes it to loosen and uncoil on the capstan, with the result that the core slips on the capstan. The roller 175 is suitably mounted to rotate freely upon the end of a shaft 176 (Fig. 17) supported from an arm 177 secured to the bracket 147. The shaft 176 is pivoted at its end opposite the roller 175 on a pin 178 secured in the arm 177. Formed in the arm 177 is a vertically disposed opening 179 for the shaft 176 to move in; also formed in the top surface of the arm 177 is an opening 180 within which is a compression spring 181 resting against the shaft 176. The spring is held under compression against the shaft 176 by a screw 182 screw-threaded into the upper end of the opening 180.

What is claimed is:

1. In a serving mechanism, a rotatable serving head, a carrier rotatable with said serving head and adapted to support a supply of serving material, a brake band engaging said carrier, and tensioning means for said brake band responsive to the action of centrifugal force whereby the pressure of the brake band upon the carrier decreases with the increase of speed of rotation of said serving head.

2. In a serving mechanism, a rotatable serving head, provided with a friction surface, a member carrying a supply of serving material and frictionally driven thereby, means for applying a constant tension between said head and said carrier, a brake band engaging said carrier, and tensioning means for said brake band responsive to the action of centrifugal force, whereby the pressure of the brake band upon the carrier decreases with increase in speed of rotation of said serving head.

3. In a serving mechanism, a rotatable serving head, a serving material supply holder attachable to said head, means for securing said holder from moving off the head, said means comprising a plurality of latching devices, and means associated with the serving head for simultaneously operating said latching devices.

4. In a serving mechanism, a rotatable serving head, a serving material supply holder attachable to said head, means for securing said holder from moving off the head, said means comprising a plurality of radially disposed latching devices carried upon the head and engaging said holder, and means associated with said head for operating simultaneously said latching devices.

5. In a machine for serving strand material spirally to a core, a serving head, a capstan for drawing the served core through said serving head, and means for applying a tension to the core along its length during the serving of the strand thereon, said means engaging the core at a point between the supply end of the core and said serving head.

6. In a machine for serving tape spirally to a core, a serving head, a capstan for drawing the wrapped core through said serving head, and means for applying a tension to the core along its length during the serving of the tape thereto, said means comprising frictionally retarded rotatable members adapted to engage the core at a point between the supply end of the core and said serving head.

7. In a machine for serving a strand spirally to a core, a serving head, means for drawing the served core through said serv-

ing head, and means for preventing the strand serving from uncoiling in case the said serving should break while being served.

8. In a machine for serving a strand spirally to a core, a serving head, means for drawing the served core through said serving head, and means for preventing the strand serving from uncoiling in case the said serving should break while being served, said means comprising frictional members engaging the periphery of the wrapped core, said means being positioned between the serving head and the drawing means.

9. In a machine for serving metallic tape spirally to a core, a serving head, a capstan for drawing the wrapped core through said serving head, and means for holding the tape from uncoiling in case the tape, while being served should break, said means comprising spring pressed rollers positioned between said head and capstan and engaging the periphery of the wrapped core at opposite points.

10. In a mechanism for serving tape spirally to a core, a rotatable serving head, a tape supply holder carried by said head, a serving device rotatable with said head, a plurality of rollers carried by said serving device for guiding the tape on to the core, said rollers being so located as to support the core and insure its traveling in a straight line at the point of application of the tape, and means associated with said serving device for moving said rollers in unison away from the core.

11. In a mechanism for serving strand material spirally to a core, a rotatable serving head, a strand supply holder carried by said head, a plurality of rollers for guiding the strand material onto the core, said rollers being so located as to support the core at the point of application of the strand serving, and adjustable guide means associated with one of said rollers for varying the angle at which the strand serving is applied to the core.

12. In a mechanism for serving tape spirally to a core, a rotatable serving head, a tape supply holder carried by said head, a serving device rotatable with said head, a plurality of rollers carried by said serving device for guiding the tape onto the core, said rollers being so located as to support the core at the point of application of the tape, and adjustable guide means associated with one of said rollers for varying the angle at which the tape is applied to the core.

13. In a serving mechanism, a rotatable serving head including a plate, and a member carrying a supply of serving material attachable to said head, said member having a wall parallel with the plate of the serving head, said member having an opening through which the amount of material carried by the member may be observed.

14. In a serving mechanism, a rotatable serving head, a member carrying a supply of serving material attachable to said head, said member having a wall parallel with the serving head and spaced therefrom a distance at least wide enough to accommodate the width of the serving material.

15. In a serving mechanism, a rotatable serving head, a member carrying a supply of serving material attachable to said head, said member having a wall parallel with the serving head and spaced therefrom a distance at least wide enough to accommodate the width of the serving material, said wall having an opening through which the amount of material carried by said member may be observed.

16. In a serving mechanism, a rotatable serving head, drawing means spaced therefrom, a plurality of members each adapted to support a supply of serving material, a tube supporting said members located between the serving head and drawing means and through which the served core passes to said drawing means.

17. In a serving mechanism a rotatable serving head, a capstan spaced therefrom, a plurality of members each carrying a supply of serving material, a tube supporting said members located between the serving head and capstan and through which the wrapped core passes to the said capstan.

18. In a serving mechanism, a vertically disposed serving head, a capstan spaced therefrom, a plurality of members each carrying a supply of serving material, a horizontally disposed tube supporting said members, said tube located between the serving head and capstan and through which the wrapped core passes to the said capstan.

19. In a serving mechanism, a vertically disposed serving head, a capstan spaced therefrom, a plurality of members each carrying a supply of serving material, a horizontally disposed tube supporting said members, said tube located between the serving head and capstan and through which the wrapped core passes to the said capstan and means mounted adjacent the end of the tube for holding the served material from uncoiling in case the material should break while being served.

20. In a serving mechanism, a vertically disposed serving head, a capstan spaced therefrom, a plurality of members each carrying a supply of serving material, a horizontally disposed tube supporting said members, said tube located between the serving head and capstan and through which the wrapped core passes to the said capstan and means mounted adjacent each end of the tube for holding the served material from uncoiling within the tube in case the material should break while being served.

21. In a mechanism for serving strand ma-

terial to a core, a rotatable serving head, a magazine containing a plurality of members each carrying a supply of serving material and each of said members attachable to the serving head, said magazine spaced from the serving head, and means for joining the end of the strand on the wrapped core to the end of the strand carried by the adjacent member on the magazine.

22. In a mechanism for serving metallic tape to a core, a rotatable serving head, a magazine containing a plurality of members each carrying a supply of tape, each of said members attachable to the serving head, said magazine spaced from the serving head, and means for joining the end of the tape on the wrapped core to the end of the tape carried by the adjacent member on the magazine, said joining means located between the serving head and said magazine.

23. In a mechanism for serving a strand on a core, a rotary serving head, a capstan for drawing the served core through the serving head, and a roller engaging the served core on the capstan to prevent the core uncoiling therefrom.

24. In a mechanism for serving a metallic tape to a core, a rotary serving head, a capstan for drawing the served core through the serving head, and a roller engaging the served core on the capstan to prevent the core uncoiling therefrom.

25. In a mechanism for serving tape spirally to a core, a rotatable serving head, a tape supply holder carried by said head, a serving device rotatable with said head, a plurality of spring pressed rollers carried by said serving device for guiding the tape onto the core, and means for simultaneously releasing the spring pressure on said rolls.

26. In a mechanism for serving a metallic tape loading material upon a signalling conductor, a rotatable serving head provided with a friction surface, a member carrying a supply of tape and friction driven thereby, the friction contact being set to exert a minimum tension on the tape, and a brake device for said carrier responsive to centrifugal force whereby the braking action thereof decreases with increase in speed of rotation of said serving head.

27. In a mechanism for serving metallic tape on a metallic core, a rotatable serving head, a supply of tape carried thereby and rotated therewith in such manner that the tape is wrapped on the core with a minimum amount of tension exerted on the tape, and spring pressed rolls rotatable with the serving head, said rolls engaging the tape for wrapping it around the core.

28. In a serving mechanism, a rotatable serving head, a member carrying a supply of serving material, means for applying a constant tension between said member and said carrier, a brake band supported by said member and engaging said carrier, and tensioning means for said brake band responsive to the action of centrifugal force whereby the pressure of the brake band upon the carrier decreases with the increase of speed of rotation of said serving head.

29. In a machine for serving strand material spirally to a core, a serving head, a capstan for drawing the served core through said serving head, means for applying a tension along its length during the serving of the strand material thereto, said means engaging the core at a point between the supply end of the core and the said serving head.

30. In a machine for serving tape spirally to a core, a serving head, a capstan for drawing the taped core through said serving head, and means for applying a tension to the core along its length during the serving of the tape thereto, said means comprising spring pressed rollers adapted to engage the core at a point between the supply end of the core and said serving head.

31. In a machine for serving tape spirally to a core, a serving head, a capstan for drawing the taped core through said serving head, and means for applying a tension to the core along its length during the serving of the tape thereto, said means comprising spring pressed frictionally retarded rotatable members adapted to engage the core at a point between the supply end of the core and said serving head.

32. In a machine for serving tape spirally to a core, a serving head, a capstan for drawing the taped core through said serving head, and means for applying a tension to the core along its length during the serving of the tape thereto, said means comprising spring-pressed grooved rollers adapted to engage opposite sides of the core at a point between the supply end of the core and said serving head.

33. In a mechanism for serving tape spirally to a core, a rotatable serving head, a tape supply holder carried by said head and rotatable therewith in such manner that the tape is wrapped on the core with a minimum amount of tension exerted on the tape, a serving device rotatable with said head, a plurality of rollers carried by said serving device for wrapping the tape around the core, said rollers being so located as to support the core and insure its traveling in a straight line at the point of application of the tape.

34. In a mechanism for serving tape spirally to a core, a rotatable serving head, a tape supply holder carried by said head and rotatable therewith in such manner that the tape is wrapped on the core with a minimum amount of tension exerted on the tape, a serving device rotatable with said head, a plurality of rollers carried by said serving device for wrapping the tape around the

core, said rollers being so located as to support the core and insure its traveling in a straight line at the point of application of the tape, and means associated with said serving device for moving said rollers in unison away from the core.

35. In a mechanism for serving tape spirally to a core, a rotatable serving head, a tape supply holder carried by said head and rotatable therewith in such manner that the tape is wrapped on the core with a minimum amount of tension exerted on the tape, a serving device rotatable with said head, a plurality of spring pressed rollers carried by said serving device for wrapping the tape onto the core, said rollers being so located as to support the core and insure its traveling in a straight line at the point of application of the tape.

36. In a serving mechanism, a serving head, a capstan spaced therefrom, and means positioned between the serving head and capstan for guiding the wrapped core in a straight line and to prevent vibration thereof between the head and capstan, said means engaging the periphery of the wrapped core at points spaced substantially 90°.

37. In a mechanism for serving tape spirally to a core, a core supply, a serving head, a capstan for drawing the wrapped core through said serving head, means positioned above the core supply for applying a substantially constant tension to the core along its length during the serving of tape thereto, said means comprising spring-pressed frictionally retarded rotatable members adapted to engage the core at a point between the core supply and said serving head, and a guide lever associated with said rotatable members over which the core passes from the core supply, said rotatable members adapted to be actuated by said lever when an undue tension is exerted upon the core between the core supply and the rotatable members to release the pressure of the spring pressed rotatable members upon the core.

38. In a serving mechanism, a rotatable serving head, a serving material supply holder attachable to said head, means for securing said holder from moving off the head, said means comprising a plurality of radially disposed spring-pressed latches carried upon the head and engaging said holder, and a ring rotatably mounted upon the head provided with a plurality of cam surfaces adapted upon rotation to operate in unison said spring-pressed latches.

39. In a mechanism for serving strand material spirally to a core, a rotatable serving head, a strand supply holder carried by said head, a plurality of guiding elements adapted to guide said strand material around the core, resilient means for pressing said guiding elements toward the core, said resilient means so arranged as to reduce the action of centrifugal force tending to move said elements away from the core.

40. In a mechanism for serving strand material spirally to a core, a rotatable serving head, a strand supply holder carried by said head, a plurality of rollers adapted to guide said strand material around the core, resilient means for pressing said rollers toward the core, said resilient means so arranged as to reduce the action of centrifugal force tending to move said rollers away from the core.

41. In a mechanism for serving tape spirally to a core, a rotatable serving head, a tape supply holder carried by said head, a serving device rotatable with said head, said serving device comprising a support, a plurality of radially disposed levers pivotally mounted thereon intermediate their ends, a plurality of rollers carried upon the inside ends thereof for guiding the tape on to the core, a plurality of circularly arranged springs engaging said radially disposed levers, said springs functioning to reduce the action of centrifugal force tending to move said rollers away from the core.

42. In a mechanism for serving tape spirally to a core, a rotatable serving head, a tape supply holder carried by said head, a serving device rotatable with said head, said serving device comprising a support, a plurality of radially disposed levers pivotally mounted thereon intermediate their ends, a plurality of rollers carried upon the inside ends thereof for guiding the tape on to the core, a member rotatable upon said support and operatively connected to the outside ends of said levers, and a plurality of circularly arranged springs mounted between complementary depressions formed in said support and said rotatable member carried thereon, said springs functioning to reduce the action of centrifugal force tending to move said rollers away from the core.

In witness whereof, we hereunto subscribe our names this 26th day of August, A. D. 1922.

FREDERIC SHIELDS KOCHENDORFER.
MILTON EARL ROBINSON.