April 1, 1930. R. JONGEDYK 1,752,489

WRAPPING APPARATUS

Filed Oct. 11, 1927 2 Sheets-Sheet 1

Fig. 1.

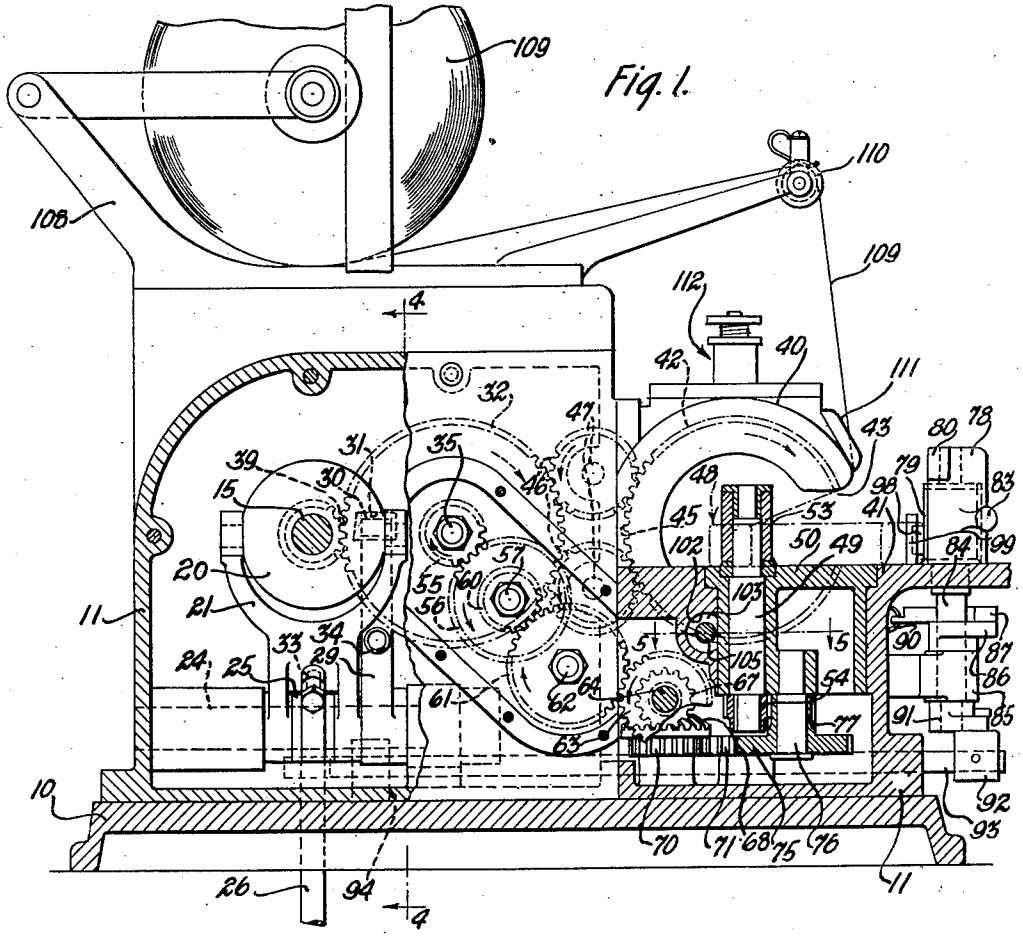
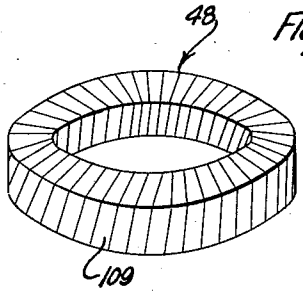


Fig. 6.



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Fig. 2.

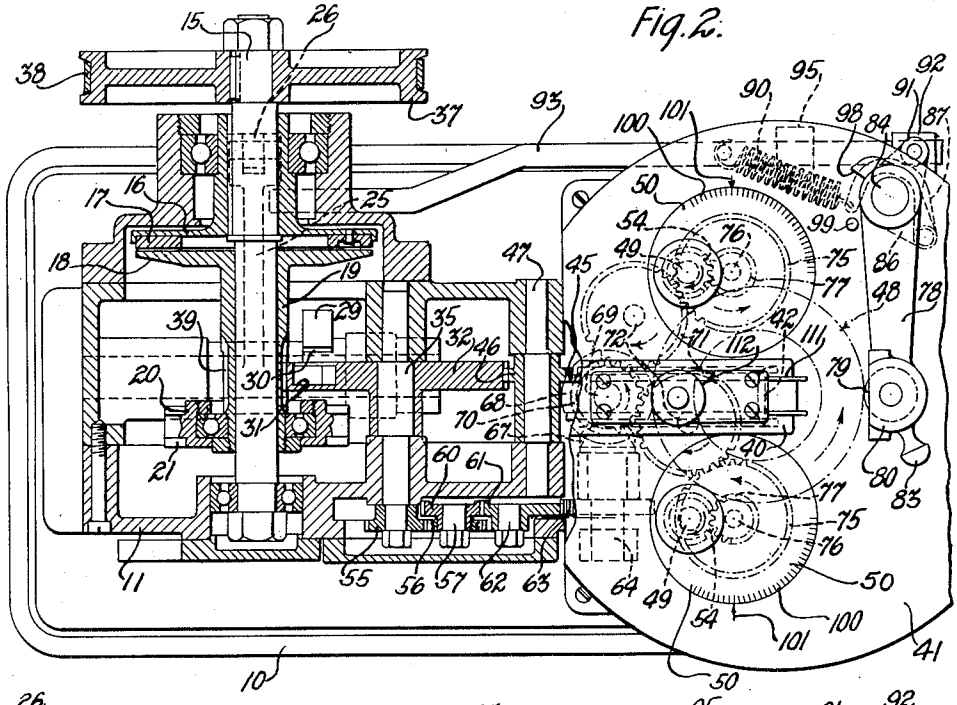


Fig. 3.

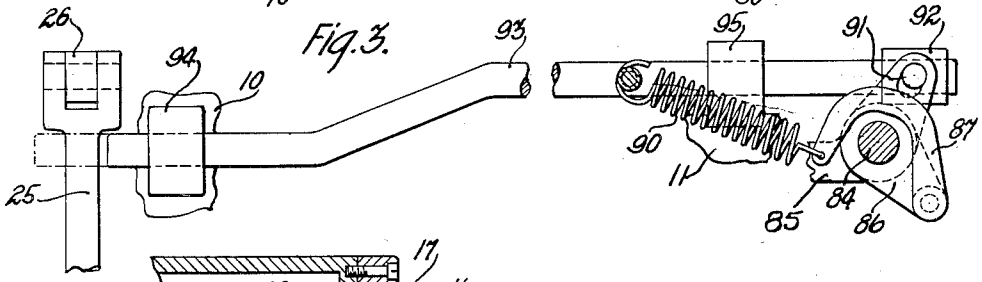


Fig. 4.

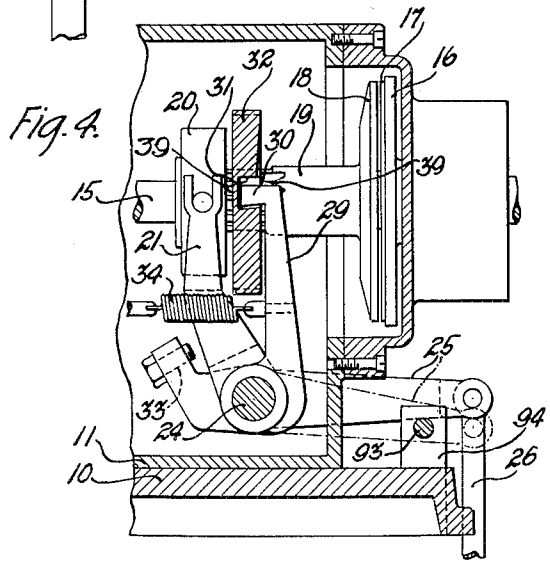
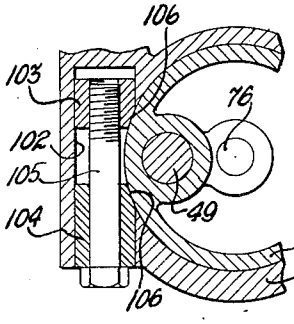


Fig. 5.



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UNITED STATES PATENT OFFICE

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WRAPPING APPARATUS

Application filed October 11, 1927. Serial No. 225,441.

This invention relates to wrapping apparatus, and more particularly to apparatus for wrapping annular objects with a spirally applied wrapping.

A wrapping apparatus embodying the features of this invention has been found articularly useful in wrapping a tape spirally upon closed annular cores, such as are used in loading coils of telephone circuits. Such an apparatus consists in one embodiment thereof of a rotary open gap winding ring or shuttle which passes through the center of the core while the same is rotated, the tape being drawn from a stationary supply and wound upon the shuttle and then applied to the core in a well known manner.

The primary object of this invention is to provide an improved apparatus for wrapping annular objects, such as loading coil cores, with a spirally applied tape in a uniform, expeditious and practical manner which provides the highest degree of safety for the operator.

In accordance with one embodiment of this invention as applied to a loading coil taping apparatus the closed annular core during the taping thereof is driven frictionally by power driven friction rolls engaging the periphery thereof, the core being predeterminately positioned in operative relation with the rolls by an oppositely disposed spring actuated idler roll carried upon a lever which is interlocked with a clutch controlling or operating lever to prevent the starting of the apparatus before the core positioning lever is in its operative position or the actuation of the latter to its inoperative position until the clutch lever is returned to its inoperative position. The driving rolls may also be readily adjusted to accommodate cores of different diameter.

Other objects and advantages of this invention will more clearly appear from the following detailed description taken in connection with the accompanying drawings, in which—

Fig. 1 is a fragmentary side view, partly in section, of a loading coil core taping apparatus embodying the features of this invention;

Fig. 2 is a fragmentary plan view thereof, partly in section;

Fig. 3 is an enlarged fragmentary detail view of an interlock mechanism between the core positioning idler roll lever and the clutch operating lever;

Fig. 4 is a vertical section on the line 4—4 of Fig. 1 looking in the direction of the arrows;

Fig. 5 is an enlarged horizontal detail section on the line 5—5 of Fig. 1 looking in the direction of the arrows, and

Fig. 6 is a perspective view of taped loading coil core.

Referring now to the drawings in detail in which like reference numerals designate similar parts throughout the several views, a base 10 supports a framework or housing 11 composed of several members and which has been partially removed in several views to more clearly illustrate the shuttle and core driving mechanism. Horizontally journaled in the housing 11 is a main driving shaft 15 having fixed thereto for rotary movement a driving member 16 of a friction clutch, the friction driving surface thereof comprising a ring 17 of a suitable friction material. Rotatably and reciprocally journaled upon the shaft 15 is a driven clutch member 18 provided with a hub portion 19 upon which is rotatably journaled a shifting collar 20. The collar 20 is provided with a pair of diametrically opposed lugs which are operatively engaged by the furcations at the upper end of a pivotal bifurcated clutch shifting lever 21 in a well known manner (Fig. 1). The lever 21 is also bifurcated at its lower pivotal portion, the furcations thereof being freely pivoted upon a rocker shaft 24 journaled in the housing 11. Fixed to the shaft 24 between the lower furcations of the lever 21 is a horizontally extending clutch controlling lever 25, which at its outer end, as viewed in Fig. 4, is pivoted to the upper end of a depending rod 26, the lower end of which is connected to a foot treadle (not shown) of a well known type. Fixed upon the shaft 24 to the right of the lever 21 (Fig. 1) is a vertically extending trip lever 29 provided at its upper end with a tooth formation 30,

which in the operation of the apparatus cooperates with a depression 31 provided in a gear 32 to cause a stoppage of the driving mechanism at a predetermined point each time the friction clutch previously described is disengaged, the tooth dropping into the depression, the purpose of which will be clearly apparent as this description progresses.

Upon a short arm of the lever 25 at its left end (Fig. 4) is an adjustable screw 33 arranged to engage the shifting lever 21 after being rocked a predetermined distance when the clutch controlling lever 25 is rocked clockwise by a depression of the rod 26 by means of the foot treadle. A tension spring 34 having opposite ends thereof connected to the housing 11 and the lever 29 serves to maintain the tooth 30 of the lever in the depression 31 of the gear 32 when the clutch is disengaged and also the lever 25 in its normal position, since the levers 29 and 25 rock together with the shaft 24. The shaft 15 receives rotary motion from a pulley 37 which is connected to a suitable source of power (not shown) by a belt 38. In the drawings the friction clutch is shown in a disengaged condition, the screw 33 being spaced from the lever 21 and the tooth 30 within the depression 31. From the description heretofore given it will be apparent that upon a downward movement of the rod 26 the levers 25 and 29 will be rocked clockwise, as viewed in Fig. 4, the tooth 30 immediately leaving the depression 31. By the time the tooth 30 is clear of the depression 31 the screw 33 engages the shifting lever 21, which is then rocked a very short distance, and by means of the collar 20 the driven clutch member 18 is frictionally engaged with the continuously rotating driving clutch member 16. Formed upon the peripheral surface of the hub portion 19 of the driven clutch member 18 intermediate its ends is a pinion 39 which meshes with the gear 32, the gear 32 being fixed to a shaft 35 journaled in the housing 11.

Rotatably mounted in a housing 40 which is secured to the main housing 11 and extending upward from a table portion 41 thereof is a winding ring or shuttle 42. The housing 40 and the shuttle are both provided with openings or gaps 43 through which the cores are placed in position upon the table 41 and removed when the taping thereof is completed, the gaps 43 being in registry during the positioning and removing of the cores, due to the tooth 30 of the lever 29 moving into the depression 31 of the gear 32 as hereinbefore described. The shuttle 42 in cross-section is channel-shaped, as shown in dotted outline in Fig. 2, the peripheral edge at one side thereof having gear teeth 45 formed thereon which mesh with a pair of driving pinions 46. The pinions 46 are carried upon a pair of stud shafts 47 fixed to the housing 11 and receive motion from the gear 32 with which they mesh. The axes of the gear 32 and shuttle 42 are arranged in the same horizontal plane, the pinions 46 being disposed equi-distant therefrom. The purpose of driving the shuttle 42 with two pinions 46, it will be apparent, is due to the gap 43 formed therein, the arrangement being such that one or the other of the pinions will be in driving engagement with the shuttle at all times. The shuttle 42 has not been disclosed and described in detail since it forms no part of the present invention and is believed not necessary to a complete understanding of this invention.

For the purpose of rotating a core 48, shown in dotted outline in Figs. 1 and 2, through the eye of the shuttle 42 and for centering and positioning the core therewith during the application of the tape thereto by the shuttle, the following mechanism is provided.

Extending upwardly from the table 41 and equally spaced from either side of the shuttle 42 are a pair of shouldered roller shafts 49 which are eccentrically journaled in shouldered bushings 50 in turn rotatably adjustable in the table portion 41 of the housing 11. Keyed to the upper ends of each of the shafts 49 above the table 41 is a raw hide collar 53 providing a roller driving peripheral friction surface to the shaft with which the core 48 is engaged in the operation of the apparatus. The upper surface of each of the bushings 50 is positioned flush with the surface of the table 41, the bushing being shouldered and resting upon a complementary shoulder formed in the table 41, as clearly shown in Fig. 2. Fixed to the lower end of each of the shafts 49 is a gear 54, the gears receiving motion from the gear 32 by the following gear train. Referring to Figs. 1 and 2 the shaft 35 to which the gear 32 is fixed has secured at its forward end (Fig. 2) a pinion 55 which meshes with a gear 56 freely rotatable upon a stud shaft 57. Secured to the gear 56 for rotation therewith is a gear 60 which meshes with a gear 61 freely rotatable upon a stud shaft 62, the gear 61 meshing with a gear 63 fixed to one end of a rotatable shaft 64 journaled in the base 10. To the opposite end of the shaft 64 is secured a bevel pinion 67 which meshes with a bevel gear 68 freely rotatable upon a vertical stud shaft 69. Upon the underside of the bevel gear 68 is secured a gear 70 which is in mesh with a pair of gears 71 freely rotatable upon vertical stud shafts 72. Each of the gears 71 mesh with a gear 75 freely rotatable upon a stud shaft 76 fixed axially to each of the bushings 50. A hub portion of each of the gears 75 has formed thereon a pinion 77 which meshes with the adjacent gear 54 fixed to the lower end of its shaft 49. It is to be understood that the several stud shafts 57, 62, 69 and 72 are suitably fixed in the housing 11. From

the foregoing description of the drive to the shuttle 42 and the roller shafts 49 it will follow that upon causing an engagement of the clutch members 16 and 18 rotary motion will be simultaneously transmitted to the shuttle and the roller shafts, the arrangement being such that the shuttle and roller shafts will be rotated in a clockwise direction, as viewed in Figs. 1 and 2, respectively, at predetermined speeds, the core 48 being rotated in a counter-clockwise direction when held in peripheral engagement with the raw hide collars 53 of the roller shafts by a mechanism which will now be described.

Pivotally mounted upon the table 41 at the upper right hand corner (Fig. 2) is a spring actuated core positioning lever 78 pivotally carrying at its free end an idler roll 79 composed preferably of a fibre composition. The roll 79 is disposed intermediate the roller shafts 49 and arranged to engage the periphery of the core 48 upon the opposite side of the axis thereof at which the roller shafts engage therewith. The free end of the lever 78 is provided with a pocket or housing portion 80 within which the idler roll 79, with the exception of a small peripheral portion, is carried, which housing serves as a guard for the protection of the operator, who in the operation of the taping apparatus, to be described hereinafter, swings the lever upon its pivot to and from the core 48 by means of a finger knob 83. Referring particularly to Figs. 1 and 3 the lever 78 is pinned to the upper end of a shaft 84 rotatable in an aperture provided in the table 41 and a bearing 85 secured to the housing 11 at a point below the table, the lower surface of the lever at its pivotal point bearing upon the upper surface of the table and thereby vertically supporting the shaft. Pinned to the shaft 84 between the bearing 85 and the lower surface of the table 41 is a lever 86 to the free end of which is pivoted one end of a U-shaped lever 87 which loops around the shaft 84. To the free end of the lever 87 is attached one end of a tension spring 90, the opposite end of the spring being fixed to a pin depending from the lower surface of the table 41. At the lower end of the shaft 84 is pinned a lever 91 which is pivotally connected at its free end by means of an elongated slot formed therein and a pin secured to a block 92 in turn fixed to a lock or stop bar 93, the latter being reciprocally slidable in bearings 94 and 95 secured to the base 10 and housing 11, respectively. As shown in dotted outline in Figs. 1 and 3 and in full lines in Fig. 4, the left end of the bar 93 is arranged to be projected under and close to the under surface of the horizontally extending lever 25. In the drawings a core 48 is shown in dotted outline on the table 41 ready to be taped, the core poistioning lever 78 has been rocked clockwise about its pivot to engage the idler roller 79 carried thereby with the core, the tension of the spring 90 operatively connected thereto maintaining it in this latter position and thus the core against the roller shafts 49. With this position of the lock bar 93 it will be apparent that an operator may operate the foot treadle (not shown) to cause a downward movement of the rod 26, as clearly shown in Figs. 3 and 4, the clutch controlling lever 25 attached thereto being rocked downwardly about its pivotal axis, since the bar 93 does not act as a stop and thus as hereinbefore described the clutch will be engaged. In its lowered position, as shown in dotted lines Fig. 4, the lever 25 lies in the path of the bar 93 so that the lever 78 cannot be returned to its inoperative position until the clutch is disengaged. Upon the operator releasing the foot treadle upon completion of the taping operation the spring 34, as hereinbefore described, serves to return the clutch controlling lever 25 to its normal position, whereupon the lever 78 is rocked counterclockwise by the operator, which movement by means of the lever 91 interconnecting the shaft 84 and the block 92 fixed to the bar 93 causes the left end of the latter to be projected under the lever 25 as shown in dotted outline in Fig. 3. In this latter position of the bar 93 it will be apparent that the clutch cannot be engaged without first moving the core positioning lever 78 into its normal position, as shown in Figs. 1 and 2, thus insuring that the core 48 to be taped will be correctly positioned against the roller shafts 49 at the moment of engaging the clutch and without any danger of the operator's hand being in the path of a power driven part, particularly the shuttle 42 as it moves through the gap 43 of the housing 40. A lug 98 formed upon the lever 78 and engaging a pin 99 fixed to the upper surface of the table 41 acts as a stop for the lever while in its normal position as just described. The purpose of the lever 87 is to cause the spring 90 to exert a pull upon the lever 78 in either of its manually actuated positions as will be readily understood.

As hereinbefore described the bushings 50 having the roller shafts 49 eccentrically carried thereby are adjustable in the table 41. Since the drive to the shafts 49 is through the pinions 77 coaxial with the bushings 50 which mesh with the gears 54 fixed to the lower end of the shafts, the latter may be revolved about the bushing axes to accommodate cores 48 of varying diameter. In the present embodiment of this invention the bushings are each individually adjustable and to facilitate the adjustment of each roller shaft a uniform amount, the upper peripheral edge of each of the bushings which lie flush with the top of the table 41, is marked with a series of graduations 100 extending therearound for substantially 112°, a stationary index mark 101 being formed in the table surface for cooperating with each series of graduations. It

will be apparent, referring to Fig. 2, that upon rotating the upper and lower bushings 50 counter-clockwise and clockwise, respectively, an equal amount, the axial opening of a smaller diameter core 48 upon being positioned against the roller shafts 49 will be correctly centered for the passage of the shuttle 42 therethrough and vice versa. After adjusting the bushings 50 they are secured against rotation in the housing 11 by individual clamping devices comprising the following: Referring particularly to Figs. 1 and 5 the housing 11 upon opposite sides and adjacent each of the bushings 50 is provided with a horizontal aperture 102 which at one side is interconnected with the vertical aperture provided for the bushing. Inserted in the aperture 102 at either side of the axis of the bushing 50 is a clamp nut 103 and a clamp collar 104. Passing loosely through the collar 104 is a headed screw 105, the inner end thereof being threaded into the nut 103 and its head arranged to rest against the outer end surface of the collar. The nut 103 and the collar 104 are provided with arcuate surfaces 106 corresponding to the radius of the bushing 50, which are arranged to engage the peripheral surface thereof. It will be apparent that upon turning the screw 105 in one direction, the collar 104 and the nut 103 will be drawn toward each other, the arcuate surfaces thereof being clamped against the peripheral surface of the bushing and thereby maintaining it in its adjusted position.

Supported upon the housing 11 is a bracket 108 carrying a roll of tape 109, the free outer end thereof being first guided over a roller 110 supported upon the housing 11 and thence by a stationary channeled guide member 111 into the shuttle 42, the guide member being fixed to the shuttle housing 40. A tension device 112 associated with the shuttle 42 serves in the operation of the apparatus to provide a uniform tension on the tape during its application to the core 48. The details of the device 112 as well as that of the shuttle 42, as hereinbefore mentioned, it is believed are not necessary to a complete understanding of this invention.

In the operation of the taping apparatus as hereinbefore described and upon uniformly adjusting the bushing 50, which carry the roller shafts 49, to correspond with the diameter of the core to be taped as described hereinbefore, the core 48 is positioned on the table 41 in peripheral engagement with the driving collars 53 of the roller shafts 49. It is to be understood that at this time the core positioning lever 78 is in its inoperative position (not shown), in which position the left end of the bar 93, as shown in dotted outline (Fig. 3), acts as a lock or stop to prevent a premature actuation of the clutch controlling lever 25 by a downward movement of the foot treadle rod 26. The tape 109 is then drawn over the roller 110 and guide 111 and secured to that portion of the core which is within the center of the shuttle 42, as shown in Fig. 1, and thereafter the spring pressed lever 78 carrying the idler roll 79 is rocked clockwise into the position shown in the drawings with the roll pressing against the core, thus the latter is pressed into frictional driving engagement with the collars 53 of the shafts 49. This latter movement of the lever 78 as hereinbefore described withdraws the left end of the bar 93 from under the clutch controlling lever 25, whereupon the operator may actuate the lever in the manner hereinbefore described to engage the friction clutch members 16 and 18 which simultaneously sets in motion the shuttle 42 and the roller shafts 49 through the gear train previously described. The rotation of the core 48 through the eye of the rotating shuttle 42 results in a uniform spiral wrapping of the tape 109 upon the core in the manner shown in Fig. 6. The operator during the taping of the core judges the length of tape necessary to complete the taping thereof and then severs the tape 109 just below the roller 110 and upon all of the tape being unwound from the shuttle and onto the core releases the foot treadle, whereupon the clutch members 16 and 18 are disengaged. The lever 78 may then be manually rocked to its inoperative position which projects the bar 93 under the clutch controlling lever 25 to prevent premature engagement of the clutch before the next core 48 to be wrapped is correctly positioned on the table 41. It will be readily apparent that the lever 78 cannot be moved to its inoperative position until the clutch is disengaged, the clutch controlling lever 25 at this time being in the path of the bar 93.

From the foregoing description it will be apparent that a wrapping apparatus has been provided wherein annular objects, such as loading cores, may be spirally wrapped in a safe, uniform, expeditious and practical manner.

Although the invention has been disclosed and described as applied to an apparatus for wrapping a particular object, it is clear that it may have a more general application and that modifications can be made without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In a wrapping apparatus, means arranged to be interlinked with an annular object for applying a wrapping thereto, means for supporting and advancing the object to cause the wrapping to be applied spirally thereto, manually controlled means for predeterminately positioning the object in operative relation with its advancing means, and a mechanism connected thereto for maintaining the same in either its operative or inoperative positions.

2. In a wrapping apparatus, means arranged to be interlinked with an annular object for applying a wrapping thereto, means for supporting and advancing the object to cause the wrapping to be applied spirally thereto, means for predeterminately positioning the object in operative relation with its advancing means, driving mechanism including a clutch for the wrapping applying and the object advancing means, clutch controlling means, and locking means connected to the object positioning means and movable into operative relation with the clutch controlling means to prevent the actuation thereof unless the object positioning means is in a predetermined position.

3. In a wrapping apparatus, means arranged to be interlinked with an annular object for applying a wrapping thereto, means for supporting and advancing the object to cause the wrapping to be applied spirally thereto, means for predeterminately positioning the object in operative relation with its advancing means, driving mechanism including a clutch for the wrapping applying and the object advancing means, clutch controlling means, and interlocking means connected to the object positioning means and movable into a plurality of operative positions relative to the clutch controlling means during actuation of the object positioning means for limiting the actuation of the clutch controlling means and the object positioning means to a predetermined sequence.

4. In a wrapping apparatus, means arranged to be interlinked with an annular object for applying a wrapping thereto, means for supporting and advancing the object to cause the wrapping to be applied spirally thereto, means for pedeterminately positioning the object in operative relation with its advancing means, driving mechanism including a clutch for the wrapping applying and the object advancing means, clutch controlling means, and interlocking means connected to the object positioning means and movable into and out of operative relation with the clutch controlling means upon movements of the object positioning means out of and into operative relation with the object, respectively, for limiting the actuation of the clutch controlling means and the object positioning means to a predetermined sequence.

5. In a wrapping apparatus, means arranged to be interlinked with an annular object for applying a wrapping thereto, friction driving rolls engaging the periphery of the object for rotating it and causing the wrapping to be applied spirally thereto, a spring pressed idler roll engageable with the periphery of the object for predeterminately positioning the object in operative relation with the driving rolls, driving mechanism including a clutch for the wrapping applying means and the object driving rolls, clutch controlling means, and means connected to the object positioning means and movable into locking engagement with the clutch controlling means upon withdrawal of the object positioning means from the object controlled by a movement of the idler roll into engagement with the object for permitting an actuation of the clutch controlling means.

6. In a wrapping apparatus, means arranged to be interlinked with an annular object for applying a wrapping thereto, friction driving rolls engaging the periphery of the object for rotating it and causing the wrapping to be applied spirally thereto, a pivotal spring actuated roller arm engaging the periphery of the object for predeterminately positioning the object in operative relation with the friction driving rolls, driving mechanism including a clutch for the wrapping applying means and the object rotating rolls, clutch controlling means, and an interlocking mechanism connected to the roller arm and movable into a plurality of operative positions relative to the clutch controlling means during actuations of the roller arm for causing the clutch controlling means and the roller arm each in one position to prevent the actuation of the other.

In witness whereof, I hereunto subscribe my name this 29th day of September, A. D. 1927.

RALPH JONGEDYK.