Jan. 11, 1966 D. RYAN 3,228,621

WINDING APPARATUS

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FIG. 2

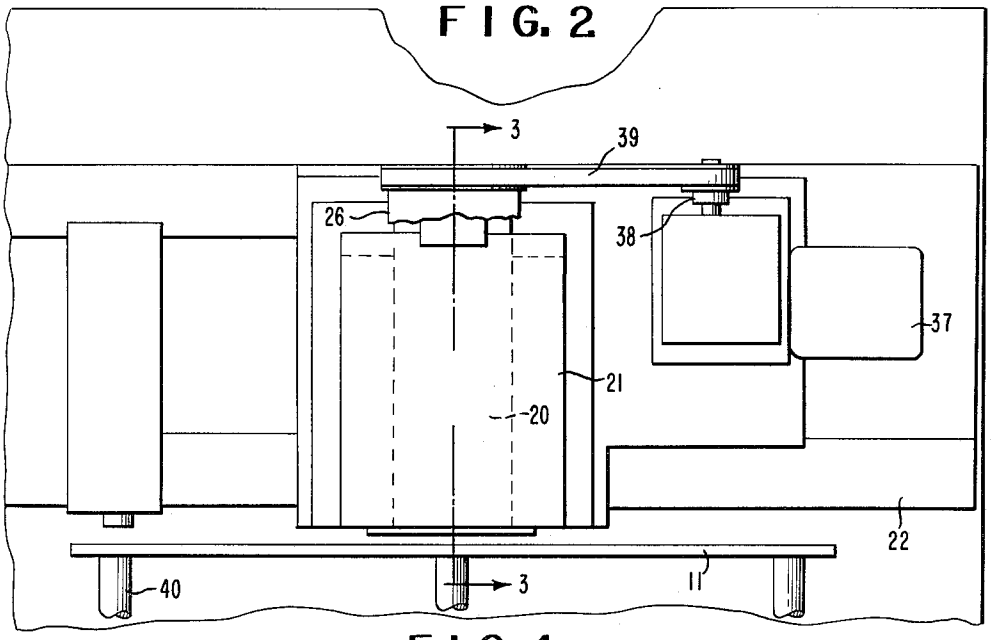
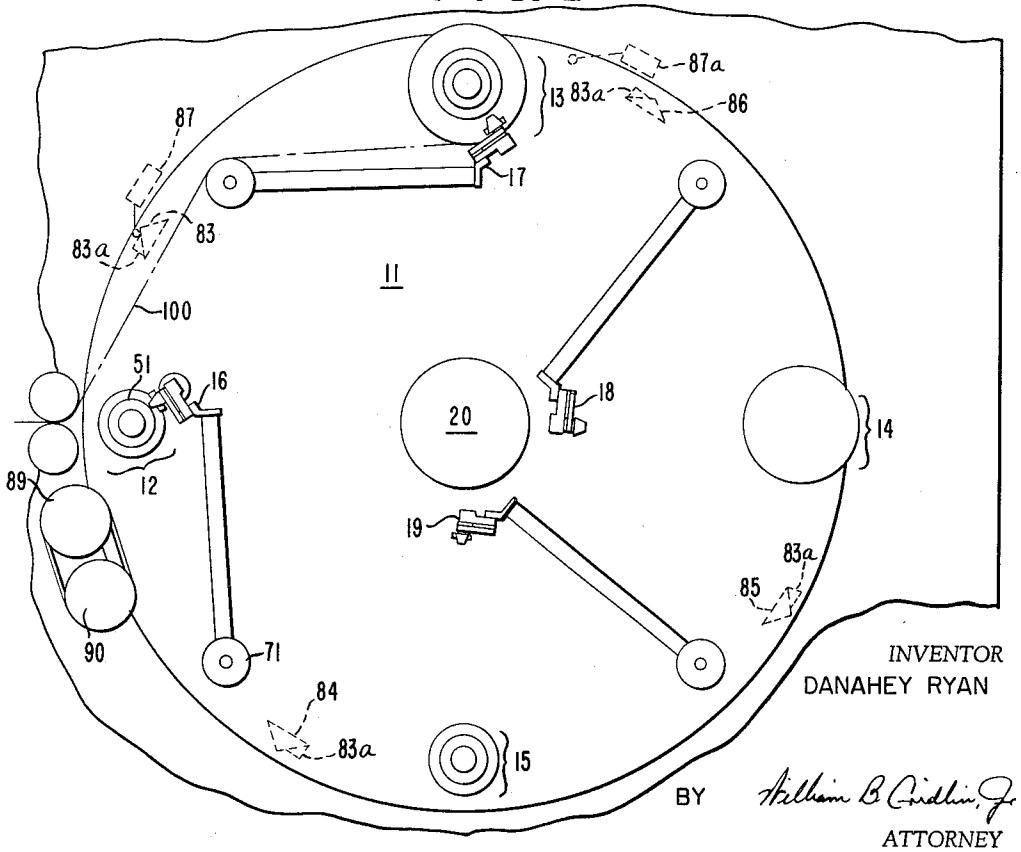


FIG. 1



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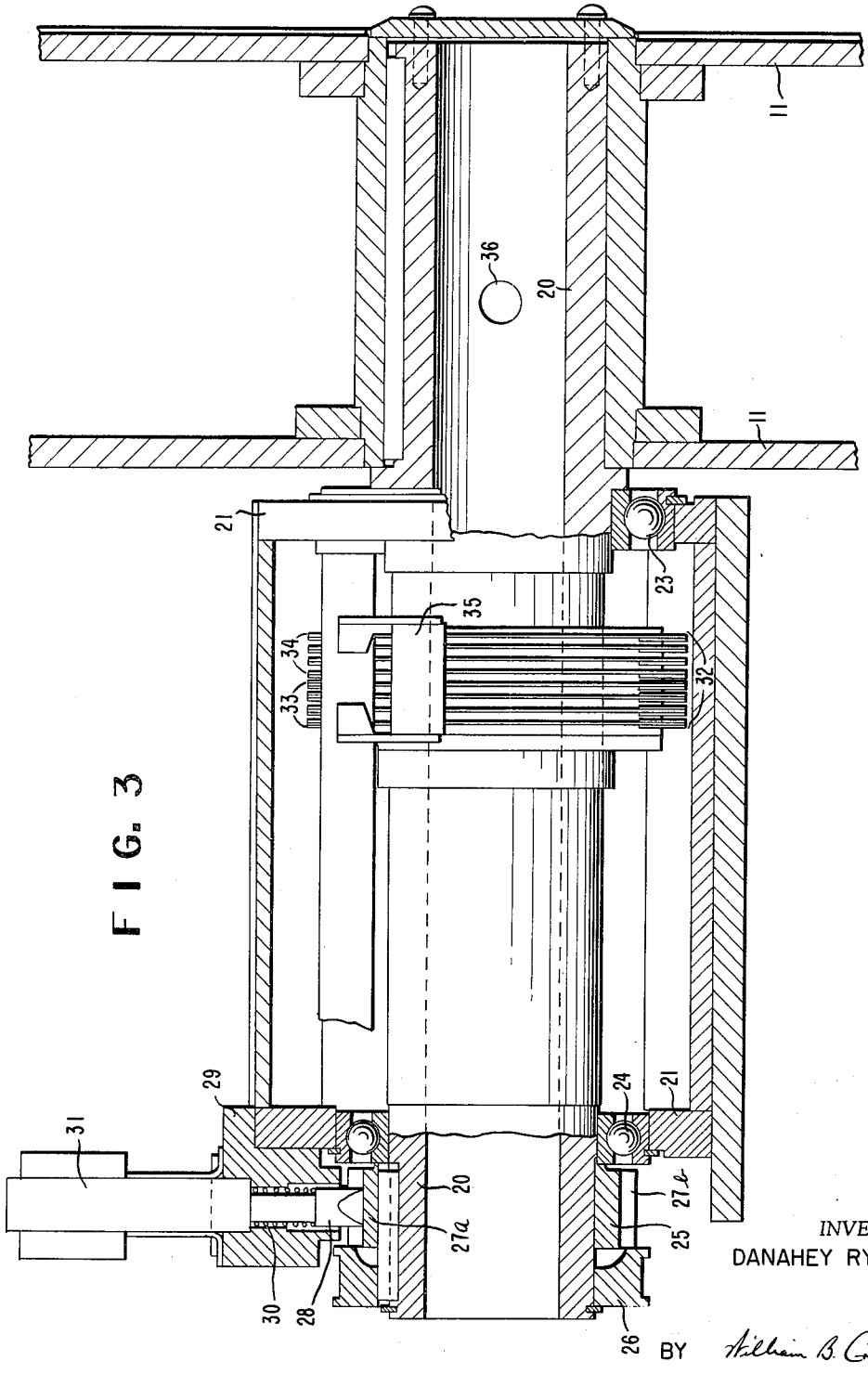


FIG. 3

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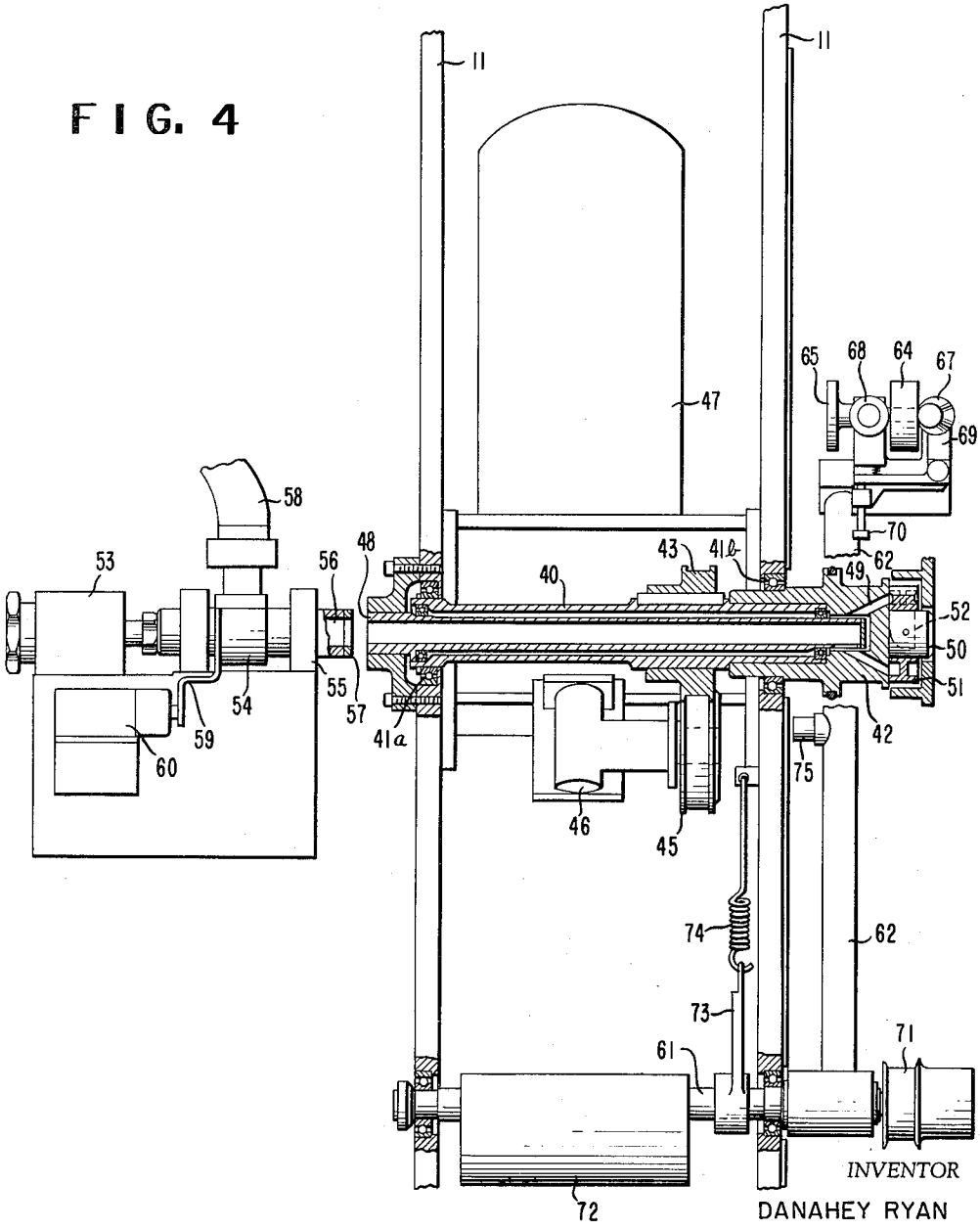
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FIG. 4



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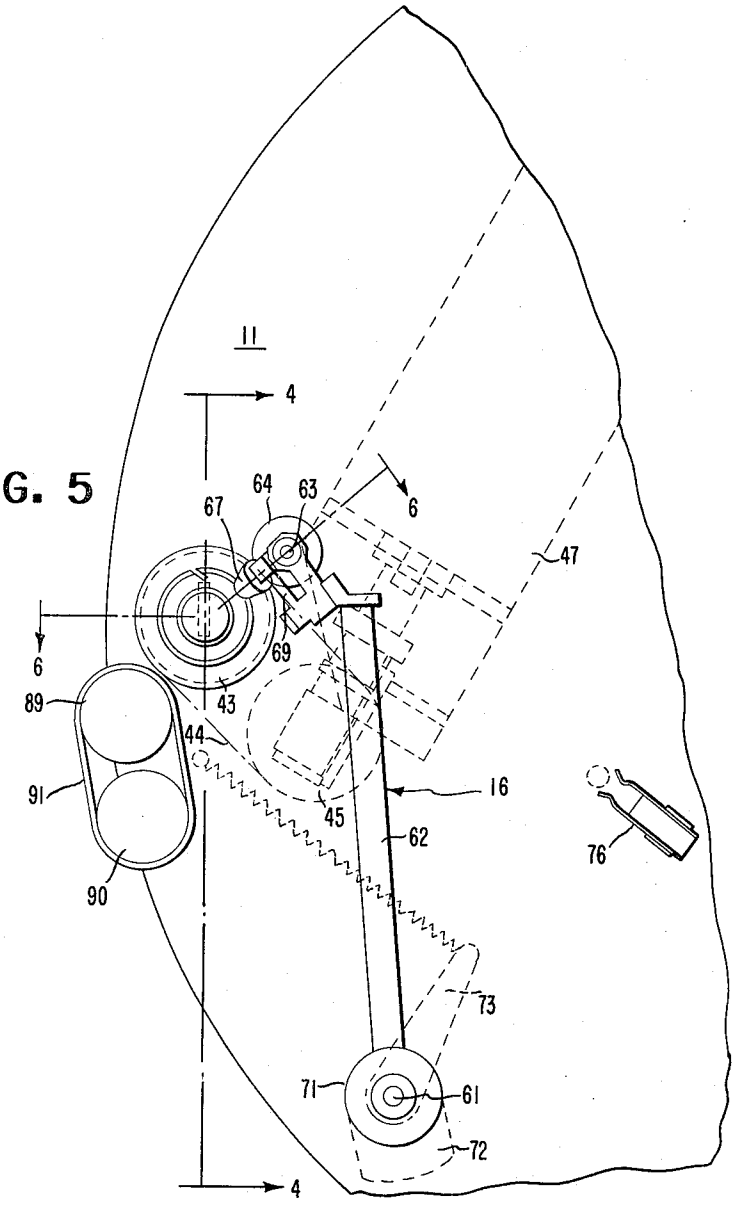
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WINDING APPARATUS

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FIG. 5



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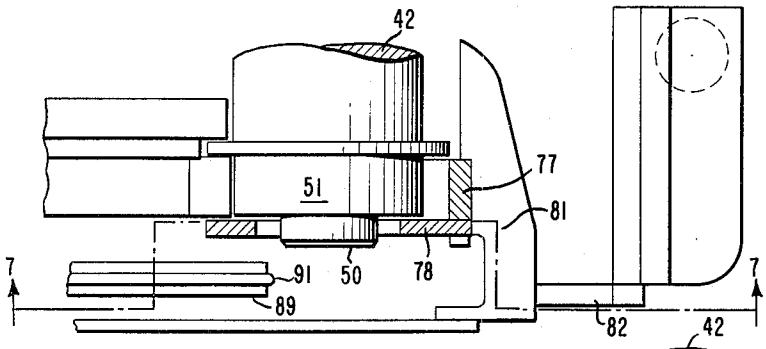


FIG. 9

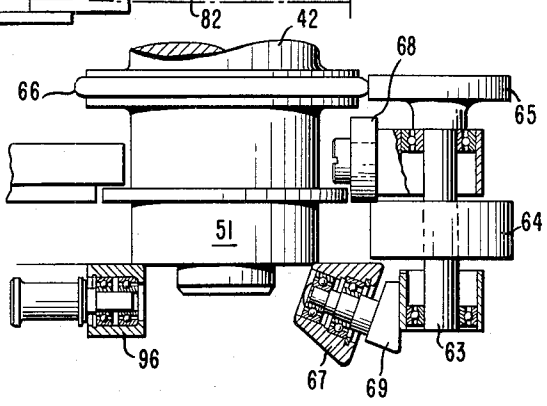


FIG. 6

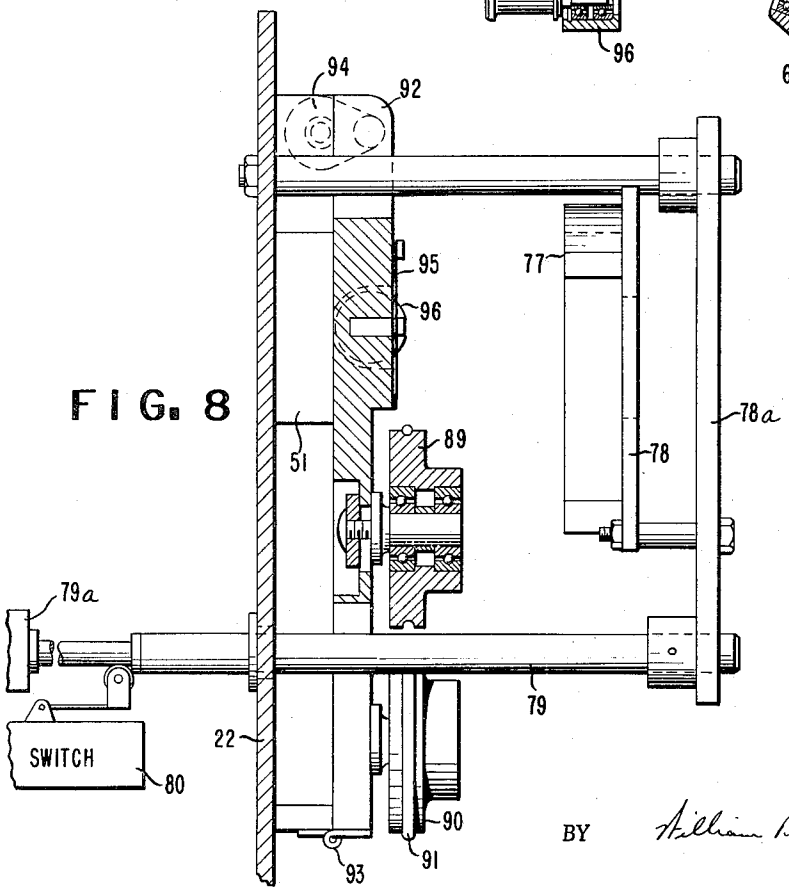


FIG. 8

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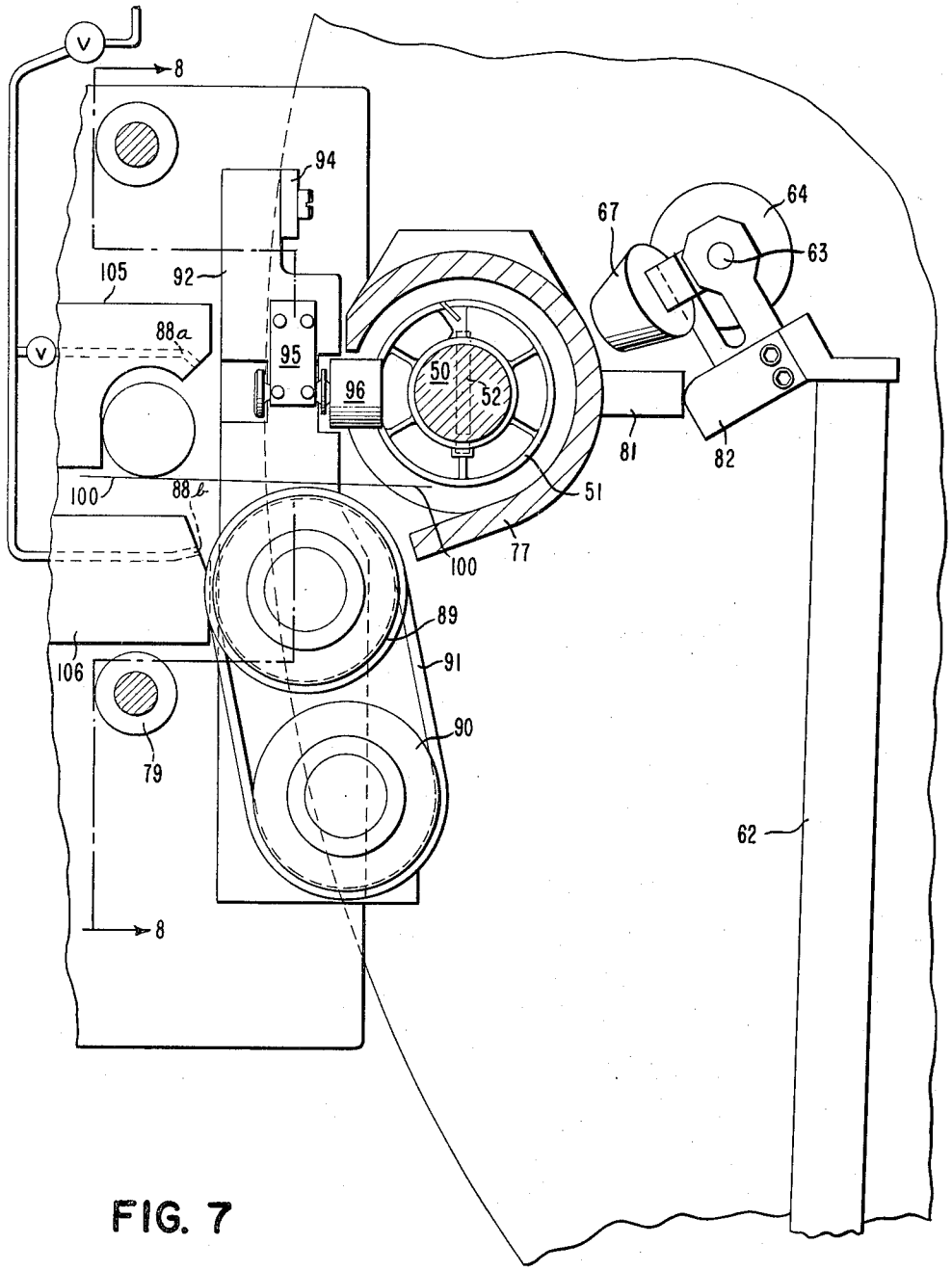


FIG. 7

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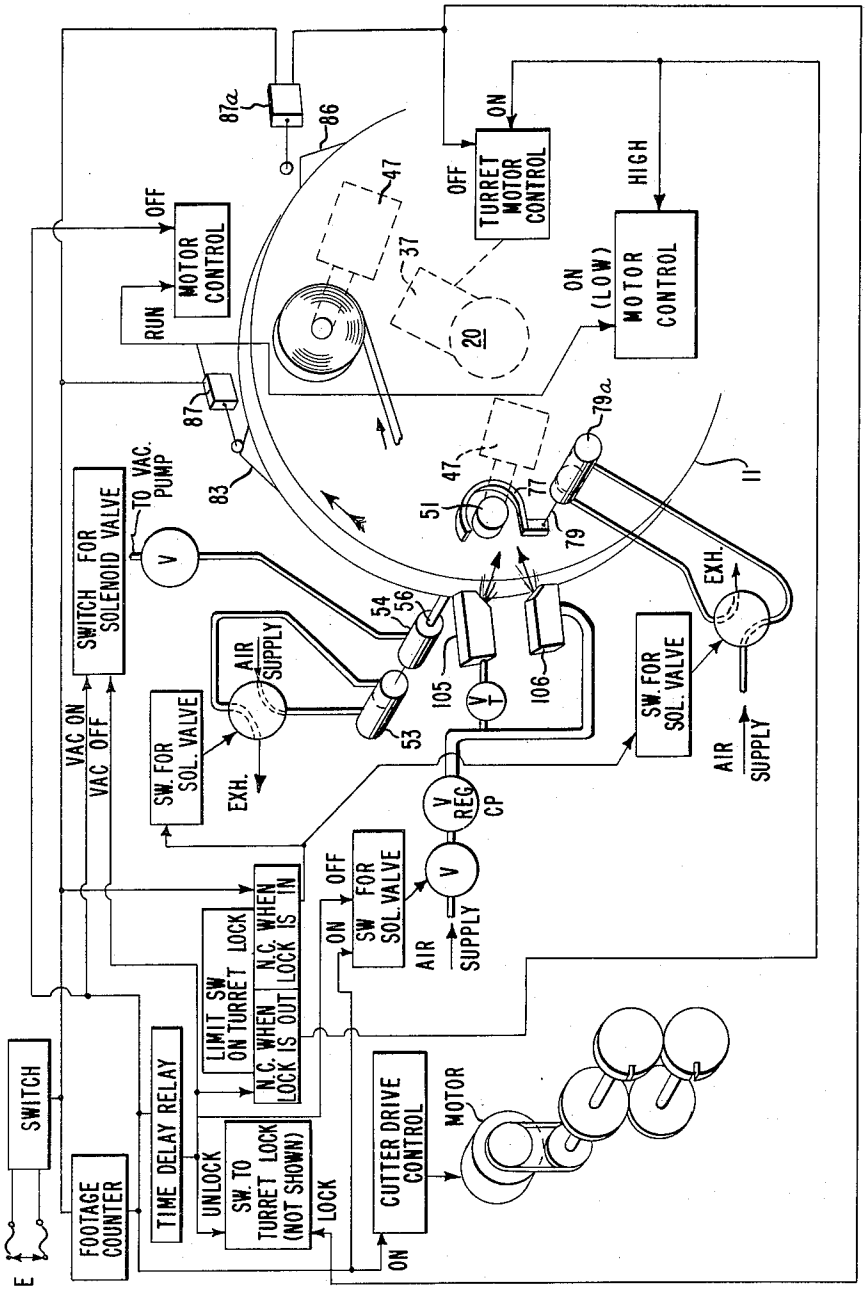
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WINDING APPARATUS

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FIG. 10



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United States Patent Office 3,228,621
Patented Jan. 11, 1966

3,228,621

WINDING APPARATUS

Danahey Ryan, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware

Filed Feb. 5, 1964, Ser. No. 342,661
7 Claims. (Cl. 242—64)

This invention relates to a continuous rewind device for web material and more particularly to a continuous rewind device for the preparation of rolls of cine film.

It is an object of this invention to provide a device for the continuous rewinding of a web. Another object is to provide means for automatically cinching a web on a core to facilitate rewinding the web. A further object is to provide a device which will index itself to rewind a new roll of web upon completing the formation of a roll of the web material of the desired length. Other objects will appear hereinafter.

These and other objects are accomplished by a device for rewinding a web which comprises a support; a turret rotatably mounted on said support with means for automatically rotating said turret; wind-up chuck means located on said turret for receiving and winding said web and follower-arm means located on said turret for guiding the web onto said chuck while said web is being wound.

The device shown in these preferred embodiments is described in the following discussion and attached drawings. However, the device as described is not limited to the specified embodiments of the following discussion.

In the drawings:

FIGURE 1 is a front elevational view of the turret with chuck assemblies and follower arms.

FIGURE 2 is a plan view of FIGURE 1 minus the front turret face.

FIGURE 3 is a cross-section elevation view of the turret shaft.

FIGURE 4 is a cross-section elevation view of the wind-up assembly and chuck assembly.

FIGURE 5 is a partial front elevational view of the turret showing a follower arm assembly.

FIGURE 6 is a plan view of a chuck assembly with guide rolls.

FIGURE 7 is a partial elevational view of a chuck assembly, follower arm assembly and guide chute in receiving position.

FIGURE 8 is an end view of the guide chute assembly when extended away from the chuck assembly.

FIGURE 9 is a plan view of an empty core surrounded by the guide chute.

FIGURE 10 is a schematic view showing a standard manner for initiating the rewind device.

As shown in FIGURE 1, the indexing windup unit essentially comprises a circular rotatable turret **11** with four, driven, identical windup chucks **12** (at the start position) **13** (at the winding position) **14** (at the doff position) and **15** (at the standby position) each spaced equidisant from one another and four follower arm assemblies **16, 17, 18, 19** mounted at 90° intervals on the turret between the windup chucks so as to provide a follower arm for each chuck.

As shown in FIGURE 2, the above mentioned assemblage is attached to one end of a rotatable turret shaft **20** journaled in a shaft housing **21** which, in turn, is rigidly mounted on the main machine frame **22**. All of these are described in more detail below.

Referring to FIGURE 3, the turret shaft **20** is shown as a generally hollow tube journaled in a pair of antifriction bearings **23** and **24** which are retained in the housing **21**. The shaft extends beyond the housing **21** at either

end; at one end it is attached to the turret plate **11** and associated members (described later) and at the other end to a locking collar **25** and a drive pulley **26**. Both are fixedly held to the shaft **20** for rotation therewith by a standard square-shaped key. The circumferential face of the locking collar **25** is interrupted at 90° intervals by four open slots **27***a* and **27***b* (only two shown) which are grooved in collar **25** and engage a dog **28** sequentially as the turret plate **11** is indexed. The dog **28** is slidably held in a bracket **29** which is attached to the housing **21** above the collar **25**. A compression spring **30** urges the dog **28** into engagement with any of the slots in the collar **25** thereby locking the turret plate **11**. The other end of the dog **28** is coupled to the plunger of a power solenoid **31** also attached to the bracket **29**. The solenoid is energized only when the turret plate is to be indexed 90°; whereupon it functions to override the compression spring, forcibly disengage the dog from the collar and unlock the turret plate.

Still referring to FIGURE 3, shown inside the housing **21** and firmly attached to the shaft **20** is a commercial slip ring assembly **32** which comprises eight spaced annular discs four of which, **33**, have a conductive ring on both of their sides, the conductive rings extend 360° and are insulated from each other and from the shaft. In addition, there are four rings that are split into 180° arc lengths and one of these is located on each disc of the remaining four discs **34**. These rings provide a convenient means for supplying electrical power to windup chuck motors mounted on the rotating turret plate **11** and provide a part of the switching means for starting and stopping the motors during various operations. These motors are described in detail later. Electrical power is transmitted to each slip ring by a set of spaced brushes which are retained in a pair of stationary brush holders **35** which are fastened to the housing **21**. The various electical devices, described below, which are mounted on the turret plate **11** derive power by way of the slip ring assembly **32**. Each is connected thereto by insulated electrical conductors which in turn, are attached directly to the rings. The conductors are combined into a cable (not shown) inside the shaft **20** and emerge through a pair of openings **36** in the shaft **20**.

In FIGURE 2, a commercial type speed reduction motor **37** fastened to the main machine frame **22** supplies the rotating motion to the turret plate **11**. Torque is transmitted from the motor **37** to the turret by means of a pulley **38** on the output shaft and a belt **39** that engages the drive pulley **26** of the turret shaft.

As previously mentioned, four windup chuck assemblies are mounted on the turret plate. All are structurally and functionally identical; hence to simplify the description, only windup chuck assembly **12** is discussed in detail.

Referring now to FIGURE 4, the windup chuck assembly **12** comprises a hollow spindle **40** which is rotatably journaled in an antifriction bearing **41***a* in the back face of the turret **11**. The other end is pinned to an extension **42** which, in turn, is journaled in an antifriction bearing **41***b* in the front face of the turret **11**. Inside the turret, i.e., in the space between the front and back faces, the spindle **40** is keyed to a pulley **43** which is operatively connected to a belt **44** (shown in FIGURE 5) and by that to a pulley **45** which is attached to the output shaft of a commercial angle gear unit **46**. The input shaft of the gear unit is connected by a conventional coupling to the shaft of an electric motor **47** which is thus enabled to rotate the spindle **40** in a counter clockwise direction when viewed from the front or operator's side, e.g., as shown in FIGURE 5 or 7. The motor **47** and the angle gear unit **46** are rigidly fastened to the turret **11**.

Telescoped inside the spindle **40** is non-rotating vacuum

tube 48 which is attached at one end, by means of a flange, to the backface of the turret 11 and is rigidly supported within the spindle 40 on a pair of antifriction bearings that merely serve as rotary spacers. The end of the tube 48 inside the extension 42 is apertured and communicates with a series of radially inclined passages 49 that terminate on the radial end face of the extension 42. A core shaft 50 protruding from the end face, in line with the axial center of the spindle 40, supports a core 51 on which the processed web product is wound. The core 51 is manually mounted on the shaft 50 flush against the end face of extension 42 and is locked for rotation with the spindle 40 by means of a locking key 52 which is pivotably attached to the core shaft 50 and engages a matching slot in the core 51. The core 51 has a slot in its circumferential face which communicates with the passages 49 and the vacuum tube 48 when mounted as shown.

Still referring to FIGURE 4, each spindle, i.e., 40 and corresponding spindles for each chuck, can be connected, in turn to a source of vacuum by means of a retractable vacuum connector, described below, as the turret 11 is indexed into a web starting position which position is adjacent to a film feeding station (not shown). The rod end of a commercial short stroke cylinder 53 is threadedly coupled to the retractable vacuum connector 54, which is slidably journaled in a bracket 55. The cylinder and the bracket are attached to the main machine frame by conventional fasteners. The connector has an axial passage 56 which is a through going passage and, in effect, is a continuation of the vacuum tube 48. The passage 56 opening adjacent to the tube 48 is provided with a resilient gasket 57 which forms an air tight seal when the connector 54 is actuated forward against the machined end face of the tube 48. The rear opening of the passage 56 is threadedly coupled to a commercial flexible hose 58 that connects into a remotely located vacuum source and valve (not shown). Bracket 59 affixed to the slidable connector 54 is operatively connected to switch 60. The switch functions as an interlock in the electrical circuitry controlling the turret drive motor 37 such that when the vacuum connector 54 is extended against the vacuum tube 48, switch 60 is opened and the electrical circuit is interrupted making the turret motor 37 inoperative.

As shown in the FIGURES 5 and 6 the follower arm assembly 16 comprises a rotatable shaft 61 journaled in the turret 11. A pivotable arm 62 is fixedly attached to one end of shaft 61. The extremity of the arm 62 terminates as a forked yoke for supporting a pair of antifriction bearings which, in turn, rotatably support a shaft 63. Pinned to the shaft 63 between the bearings is an elastomer-covered follower wheel 64 which, during windup, frictionally contacts the surface of a product being rolled around core 51. A driver roll 65 is fixedly attached to an extension of the shaft 63 in such a position as to be situated opposite an elastomer-covered rim 66 of the extension 42. The roller 65 frictionally engages the rim 66 of the rotating extension 42 at the start of windup and brings the wheel 64 up to speed so that the web that is to be wound on the core is not damaged upon contact. Rotatably mounted on each fork of the yoke on the arm 62 at right angles to the axis of shaft 63 are guide rolls 67 and 68 which contact the edges of the product being rolled and urge it to build a package roll with accurately convoluted layers. It can be seen that the guide roll 67 is generally conical in shape, providing for nearly constant surface velocity at any point along the line of contact between the roll 67 and the end face of the product roll. The guide roll 67 is mounted on a spring-loaded, pivoted bracket 69 which is connected to one side of the yoke on the arm 62. A spring urges the bracket in a counter clockwise direction thus urging the conical roll 67 against the end of the product roll as it is being wound; the pivoted bracket 69 is stopped by an adjustable screw 70 which is threadedly engaged in the yoke and serves to establish the distance between guide roll 68 and conical guide roll 67 which is usually set to some preselected minimum distance (e.g., the minimum width of the web being processed). Since the pivoted bracket 69 is spring-loaded (spring not shown) against the adjusting screw, the conical roll 67 may move outward to accommodate webs of greater width than the minimum. Since the position of guide roll 68 is fixed, one edge of the web will always occupy the same position (or plane) regardless of variations in the width of the web. It may also be seen in FIGURE 6 that the guide roll 68 engages part of the end face of the follower wheel 64 and will be accelerated when it is accelerated; conical guide roll 67 is accelerated by contact with the edge of the core 51 or the outer edge of the web wound thereon.

Referring back to FIGURE 4, journaled on the shaft 61 outboard of the arm 62 is a web guide roll 71 which serves to support the web during windup. A counterweight 72 and a lever 73 are attached to the opposite end of the shaft 61. The extremity of the lever 73 is connected to one end of an extension spring 74 which is anchored at the other end to the turret 11. The counterweight 72 tends to balance the follower arm assembly during turret indexing while the lever 73 and spring 74 provide a predetermined force for the wheel 64 to apply against the product roll. Pin 75 attached to the arm 62 and a clip 76 fastened to the turret 11 operatively engage each other and provide a convenient means for latching the follow arm assembly away from the completely wound product roll at doff.

Referring now to FIGURE 7 and FIGURE 8, the leading end 100′ of web being introduced to a core 51, is guided into a cinching engagement about the rotating core by a retractable chute unit 77 which comprises a generally U shaped guide which is joined on its outwardly facing edge to a flange 78 (shown in FIGURE 8); the flange 78 is attached, by means of bolts and spacer sleeves, to a plate 78*a* which is secured to the end of the rod 79 of air cylinder 79*a*, as further described below. The flange 78 has a small central hole which fits over a core shaft 50 or projecting end on the extension 42 of spindle 40. When the chute 77 is in operative position, shown in FIGURE 7 and 9, it may be seen that the rear edge of the U shaped guide is in close proximity to the end face of extension 42; similarly, the inner face of the flange 78 is spaced from the outer end of the core 51. The inner wall of the curved portion of the U shape of guide 77 is spaced away from the outside surface of the core 51 by about ¼″ thus forming an annulus of about 180° extent around the core. Except for the open ends of the U shaped guide, the guide forms a substantially airtight seal around the core so that the air has only one path to follow (i.e., around the core).

The leading end 100′ of web 100 can be fed to core 51 in a manner to be described. The rewind device of this invention will usually be located immediately following another web processing device such as a web cutter. The preferred method of feeding the web to the core is by utilizing air streams from air jets 88*a* and 88*b* (FIGURE 7) which are drilled into upper block 105 and lower block 106, respectively, and communicate with suitable drilled passages in the blocks. The jets 88*a* and 88*b* are located such that the issuing air streams are generally tangential to the lower part of the core 51 so that they move in a generally counterclockwise direction about the core when viewed from the front. The lower jet has a diameter about twice the size of the upper diameter, e.g., (3/64″ to 1/32″ respectively). The passages leading up to the air jets (blowers) in upper and lower blocks 105 and 106 are connected to a constant pressure outlet valve which, in turn, is connected to a source of air (not shown) under pressure; downstream of that valve in the branch passage leading to the upper jet 88*a* is a manual throttling valve.

The constant pressure outlet valve is preset for a delivery pressure of about 10 to 18 p.s.i. gauge, preferably at about 12 to 15 p.s.i. gauge, while the manual throttling valve is set so that the delivery pressure issuing from the upper orifice is about one-half that of the lower jet. This pressure ratio of about 0.5 to 1.0 (or 1:2) upper-to-lower jet is preferred. In adjusting the jets, initially, the upper jet must at least have an air flow such that the oncoming end of web is not permitted to curl upward in such a way that it will avoid entering the chute **77** (because of any natural tendency to curl that way or because of the influence of the lower jet); the upper jet **88***a*, then must have an air flow such that the oncoming end of the web will just barely pass under the lower edge of the core **51**. On the other hand, the lower jet **88***b* must at least have an air flow such that the end of web will not fall below the chute **77** and, in addition, must have a sufficient air flow that the stream will enter the annular space in the chute and persist circumferentially of the annulus in such a way that the lower web face is carried around the interior curving face of the chute (i.e., the web is floated or levitated) which causes the web to curl in a counter clockwise direction as it is simultaneous urged generally radially inward in respect to the core **51** to the state where the vacuum in drawing air through the slot in the core **51** will eventually cause the web to lie against the core **51**. When the leading end of the web has encircled the core by about 270°, the leading end may, because of its resistance to bending, tend to run vertically downward (i.e., more-or-less perpendicular to the horizontal portion of web then passing under the core); this leading end must be directed into the nip between the horizontal web and the core in order for proper cinching to occur, therefore, the upper air jet **88***a* must be forcible enough to urge or start the leading end of web in that direction. From the foregoing it will be seen that a balance must be achieved between the air flow for the upper and lower jets. The air can be supplied by any suitable means and can be controlled by switches to automatically operate at desired intervals when guide chute **77** is surrounding core **51**.

The flange **78** and the plate **78***a* are attached rigidly to the end of the movable rod **79** of the pneumatic cylinder **79***a* which later serves as the means for moving the flange (and associated members) into or out of operative engagement with the core **51**. The cylinder is fastened to the supporting frame of the rewind mechanism. Microswitch **80**, also fastened to the supporting frame is operatively engaged by a part of rod **79**. Since the flange **78** completely encircles the core shaft **50** during cinching and the U shaped guide of the chute unit **77** partially encircles the core **51**, the turret **11** cannot be indexed until these parts are moved out of engagement with the core shaft and the core. The switch **80** therefore serves as another interlock in the electric circuit that controls the turret drive motor **37**.

Referring to FIGURE 9, a wedge or cam **81** is rigidly mounted on the flange **78** to the right of the U shaped guide unit **77** and is thus adapted to move in and out with the chute unit. The tapered surface of the cam engages a lobe **82** which is secured to each follower arm **62** near its outer end. The cam functions to move the following arm assembly aside when chute unit **77** moves into operative engagement with empty core **51**. Similarly, when the chute unit is moved out, the cam withdraws, permitting the follower arm assembly to move toward the core, as this occurs, the periphery of the drive roll **65** (see FIGURE 6) moves into contact with the rim **66** located on extension **42**, being accelerated thereby.

Referring to FIGURE 1, four lobe cams **83**, **84**, **85** and **86** (shown schematically) are mounted near the periphery of the turret **11** on its back face. The cams are spaced 90° from each other and are displaced clockwise 30° from the horizontal and vertical centerline respectively of the turret **11**. The cams operatively engage a pair of microswitches **87** all of which are stationary and are mounted to the main machine frame. Cams **83** and **85** are identical and actuate one of the pairs of microswitches; cams **84** and **86** are also identical and operatively engage the other microswitch. The switches are part of the circuitry which controls the switching of electrical power from one core windup motor, **47**, to another as the turret **11** indexes. Attached side by side to each of the cams **83**, **84**, **85** and **86** are identical plate cams **83***a* each of which engages switch **87***a* successively. Near the completion of a 90° index of the turret **11**, actuation of the switch **87***a* by the identical plate cams causes the solenoid **31** and the turret motor **37** to be deenergized, thus allowing the turret **11** to come to a stop and the dog **28** (see FIGURE 3) is urged into engagement with one of the four slots in the collar **25** thereby locking the turret plate against rotation. When the turret **11** rotates, it is necessary to remove dog **28** from the slot in collar **25**. Associated with the dog **28** is a limit switch (not shown) which has a dual function shown generally in FIG. 10. When the dog **28** is removed from the slot, a portion of the limit switch is closed thereby allowing the turret motor **37** to be energized and also increasing the speed of the chuck motor **47** to high speed. At the same time a second portion of the limit switch is opened. This is the part of the limit switch that energizes the solenoids for actuating cylinders **53** and **79***a*. The solenoids that actuate these cylinders are spring-loaded to be closed unless actuated by the limit switch. Thus, one part of the limit switch operates while the turret rotates and the other part operates to force the chute **77** and vacuum tube **54** into position when the turret is locked.

Referring to FIGURES 7 and 8, a pair of idler rolls **89** and **90**, encircled by a belt **91**, are mounted on antifriction bearings which are supported on stationary shafts which project horizontally from a support plate **92**. The plate is held at its lower end by a hinge **93** which is secured to the main machine frame **22**; at its upper end the plate is secured by a pivoted latch **94**. The upper idler roll **89** is situated so that the belt **91** can contact a roll from any type of machine (not shown) which is used to feed the web to the rewind device. If desired, roll **89** can be operated by a separate drive motor (not shown) which will turn the roll at the same speed at which the web is fed to the rewind device. Referring particularly to FIGURE 1, it may be seen that in the course of indexing the turret **11**, the periphery of the guide roll **71** will make contact with the outer surface of the portion of the belt **91** which extends between the two idler rolls; thus, the guide roll **71** is accelerated, in the course of a turret index cycle, just before the roll **71** makes contact with the moving web **100**.

Also mounted on the support plate **92** is a cantilevered spring **95** which holds an idler roller **96** the axis of which is horizontal but at right angles to the axis of the core **51**. The outboard end of the idler roller **96** rests against the end face of the core, being driven thereby. The idler roller functions to guide the web, as it is first taken-up on the core, into precisely aligned layers (this function is later taken over by the conical guide roll **67** and the guide roll **68** both of which are on follower arm **62** and are temporarily out of service, when the guide chute **77** surrounds the core). When the turret **11** is indexed, the newly-formed product roll passes out of engagement with the idler roller **96**.

At the start of operations, the machine and the web are disposed as follows:

As seen in FIGURE 1, a web **100** is being wound to the product roll on chuck assembly **13** at the "top" position on the turret **11**. An empty core **51** has been mounted on the shaft of chuck assembly **12**, having been placed there manually. The turret and the chuck assembly had been indexed into position to receive the leading edge of the film; in the course of going through the index cycle, the cam **83** had engaged switch **87** thereby energizing the core

assembly motor **47** to chuck assembly **12** and bringing the empty core **51** on chuck assembly up to "initial" speed. Motor **47** is a torque motor and would rotate too fast at its no load running speed with an empty core to allow for the web to properly cinch the core.

The vacuum connector **54** is in the extended position against the tube **48** connecting a slot on core **51** to a source of vacuum; however, the vacuum has not yet started. The pneumatic cylinder that provides the movement for chute unit **77** has pulled the unit into operative engagement with the rotating empty core **51**; in moving inwardly, the cam **81** on the chute unit has pushed the follower arm aside and out of operative engagement with rim **66** on shaft extension.

With the machine in the above-described state, the web **100** continues to run while being wound on the product roll on chuck assembly **13** at the "top" position on the turret **11**. At this juncture a signal from an outside source such as a footage counter (see FIGURE 10) signals the completion of the product roll on the assembly at the "top" position whereupon several things occur substantially simultaneously as follows: compressed air is emitted from air jets **88***a* and **88***b*; the vacuum commences through tube **48** connected to the core; the motor for the chuck assembly in the top position is cut off and a time delay relay is energized.

The winding device of this invention is usually found following a cutter device such as that described in the assignee's copending patent application to Ryan entitled "Apparatus," Serial No. 320,419, filed October 31, 1963. The footage counter mentioned above would signal for the film to be cut as well as signalling the rewind device.

When the cutter severs the web, the trailing end is pulled up to the completed product roll while the leading end is propelled toward the empty core **51** of assembly **12**; as the leading end approaches the empty core, it enters the annulus between the "U" shaped guide of chute **77** and the core where the web is struck on both its top and bottom surfaces by the columns of air from jets **88***a* and **88***b*, respectively. As previously described, parts of the chute unit **77** fit tightly around corresponding parts of the core shaft and the core, thus the two columns of air swirl counter clockwise around the annulus having the momentary effect of cushioning the web against contact with either the core or the "U" shaped guide. As the leading end of the web proceeds around the core and the "U" shaped guide, however, the cushioning effect of the air columns diminishes and the web end then falls into contact with the core where it remains, being held by atmospheric pressure aided by the vacuum exerted through slots in the core. The core is rotating, and the leading end of the web is then carried around the core thus causing the web to be cinched or wrapped upon itself.

When the time delay relay emits its signal, the following events occur: The motor **47** is switched from "initial" speed condition to "running" condition; the air supply to the jets **88***a* and **88***b* is shut off; the solenoid controlling the vacuum is de-energized thus cutting the vacuum off; a solenoid allows pressurized air to be admitted to (a) the head end of the cylinder controlling rod **79** thus forcing chute **77** away from the core and (b) to cylinder **53** to release the vacuum tube from the hollow spindle **40**; and power is supplied to the turret motor **37** and solenoid **31** causing the turret to index 90°.

During the period of turret rotation or indexing the newly started product roll is moved out of contact with the stationary idler roller **96**; however, the web edge guiding function is taken over by the roll **68** and the conical roll **67** on the follower arm. Also during indexing, the guide roll **71** makes grazing contact with the running belt **91** and is accelerated before it makes contact with the underside of the running web; the guide roll **71** then reaches an approximate 10 o'clock position, where it guides the web ahead of the point where the latter is being taken up on the core which has just reached the top position on the turret.

As the turret nears the end of its 90° index, one of the identical plate cams **83***a* located by the side of each cam **83**, **84**, **85** and **86**, engages the limit switch **87***a* whereupon the turret motor **37** is de-energized and the turret stops; the solenoid **31** is also de-energized, permitting the dog **28** to enter one of the slots thus locking the turret against rotation. When the turret is locked, the guide chute **77** and vacuum connector **54** are restored to operative engagement respectively with the core **51** and **48**. At the end of the index the product roll which had just been completed and which was formerly at the top position is now located at the 3 o'clock or doffing position on the turret where it may be removed by the operator. At this stage the operator may push the follower arm aside manually, engaging the pin **75** in the clip **76** thus holding the arm aside. After this roll has been doffed, an empty core is placed on the shaft **50** and the follower arm is released from the clip; this places the turret in a state of readiness for its eventual winding procedure.

The advantages of the apparatus of this invention are evident when it is considered that sensitive web materials such as photographic film are automatically rewound with ease. These materials must be rewound in total darkness and this novel apparatus allows minimum operator assistance while achieving a rapid rewind rate. Also the film is cinched and wound with a minimum of scuffing and scratching which is associated with many of the available rewind devices.

What is claimed is:

1. A web rewind apparatus having a web receiving position and a web rewind position, said apparatus comprising

(A) a turret;

(B) a turret motor for indexing said turret;

(C) hollow rewind chucks with web receiving cores located on said turret, each chuck having independent drive means and one of said chucks and cores being in web receiving position while another chuck and core is in the rewind position;

(D) follow arm means attached to said turret in conjunction with each of said cores for shaping the roll of said web being wound on said core;

(E) detachable vacuum means which connects to said hollow chuck in the receiving position;

(F) removable guide means for surrounding said chuck and core located in the receiving position to guide said web to cinch upon said core; and

(G) air blower means immediately preceding said guide to provide an air cushion for said web to enter said guide.

2. An apparatus as defined in claim **1** having control means for selectively actuating (1) said vacuum means, (2) said guide means, (3) said turret motor, (4) said chuck drive means, and (5) said blower means.

3. An apparatus as defined in claim **1** where said guide is a chute having one opening in its circumference, the remainder of said chute fitting substantially air-tight around said chuck and core.

4. An apparatus as defined in claim **1** where said blower means is represented by an upper and lower air jet to give a ratio of air flow of about 1:2 respectively, said jets being situated on both sides of said web and directed toward the web in the direction of said guide.

5. An automatic web cinching device for grasping a web material around a core comprising

(A) a support;

(B) a hollow chuck with a web core, said chuck being rotatably attached to said support;

(C) drive means for rotating said chuck and core;

(D) vacuum means connected to said chuck and core for providing suction through said core;

(E) movable guide means for surrounding said core

to provide a path for the leading edge of said web to follow around said core;

(F) air blower means connected to said support immediately preceding said guide and located on both sides of the travel path of the web to provide an air cushion for said web to enter said guide; and

(G) control means for selectively actuating (1) said drive means, (2) said vacuum means, (3) said guide means and (4) said blower.

6. A device as defined in claim 5 where said blower means comprises an air jet above said web and an air jet below said web the air flow of both jets impinging upon said web at an angle toward said guide.

7. A web rewind apparatus having a receiving position to accept the oncoming web, said apparatus comprising

(A) a turret;

(B) a turret motor for indexing said turret;

(C) hollow chucks with web receiving cores located on said turret, each chuck having an independent drive motor;

(D) follow arm means attached to said turret in conjunction with each of said cores for shaping the roll of said web being wound on said core;

(E) detachable vacuum means which connects to said hollow chuck in the receiving position;

(F) removable U shaped guide means for surrounding said chuck and core located in the web receiving position to guide said web to cinch upon said core;

(G) air jets, immediately preceding said guide, on both sides of said web to give an air flow ratio of the upper to lower jet of about 1:2 with the air flow impinging upon said web at an angle directed toward said guide; and

(H) control means for selectively actuating (1) said vacuum means, (2) said guide means, (3) said turret motor, (4) said chuck motors and (5) said air jets.

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