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Lenk et al.

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[54] **WINDING DEVICE FOR SYNTHETIC THREADS**

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[52] **U.S. Cl.** ..... **242/18 DD,** 242/18 A, 242/46.4

[51] **Int. Cl.** **B65h 54/20,** B65h 54/44

[58] **Field of Search** ..... 242/18 A, 18 DD, 46.4

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[57] **ABSTRACT**

A winding head for the winding freshly spun and/or stretched synthetic threads running continuously at a high speed onto a bobbin securely held by means of a chuck which bobbin and its winding are driven by a drive roller in steady rotation, and a fluid operated system for operating the chuck, for moving and pressing of the drive roller against the bobbin, and for the braking of the chuck shaft.

14 Claims, 9 Drawing Figures

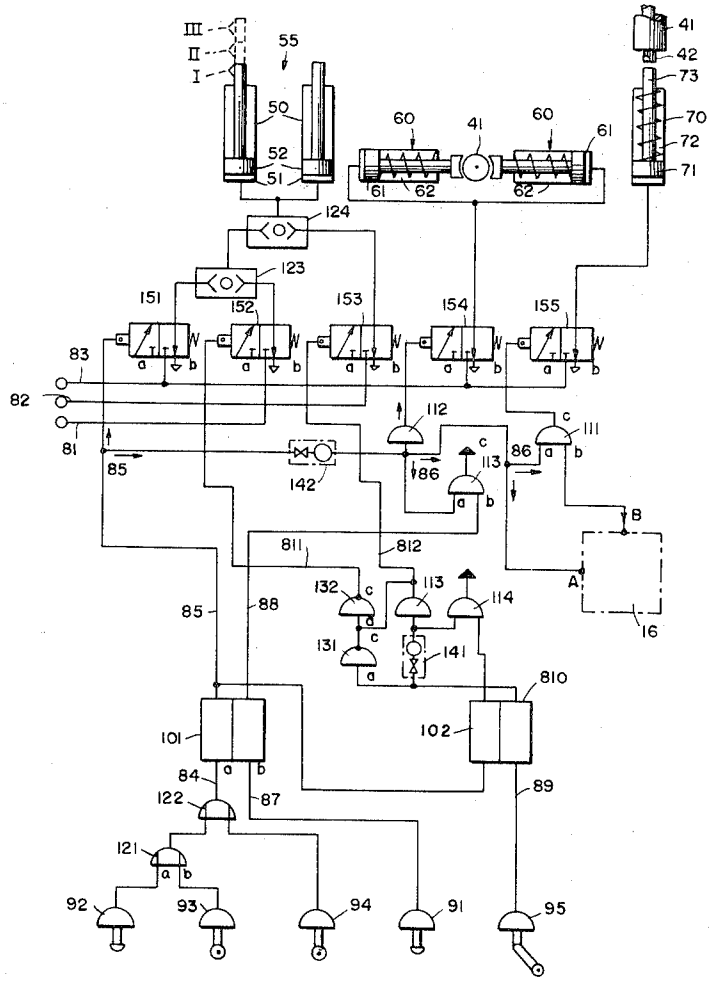

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FIG. 6

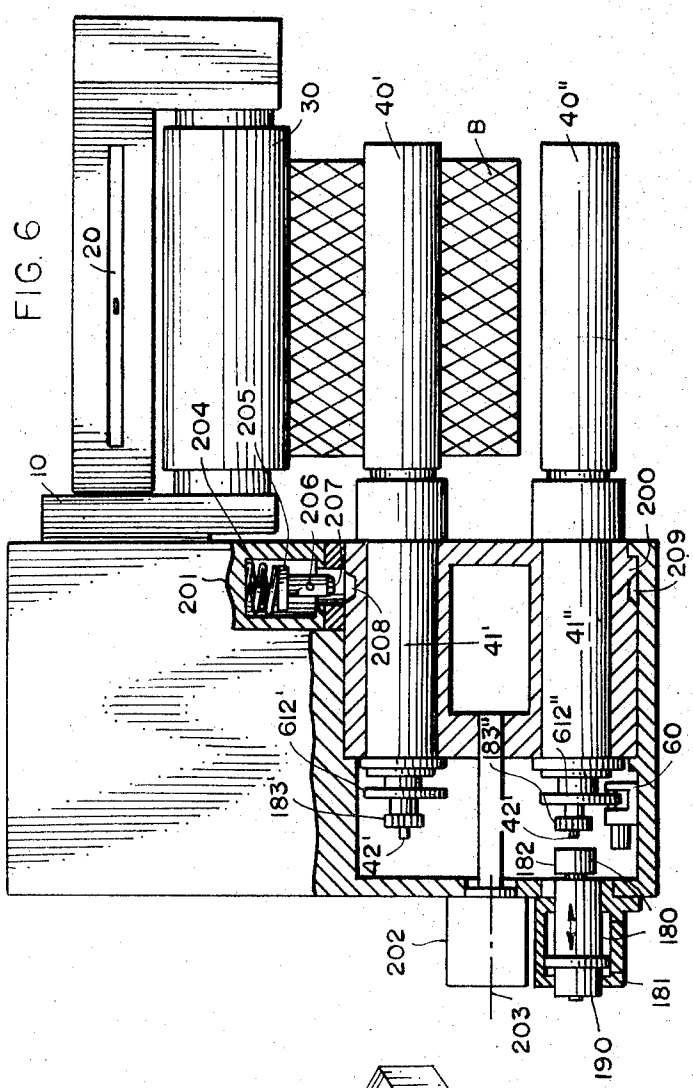

FIG. 6A

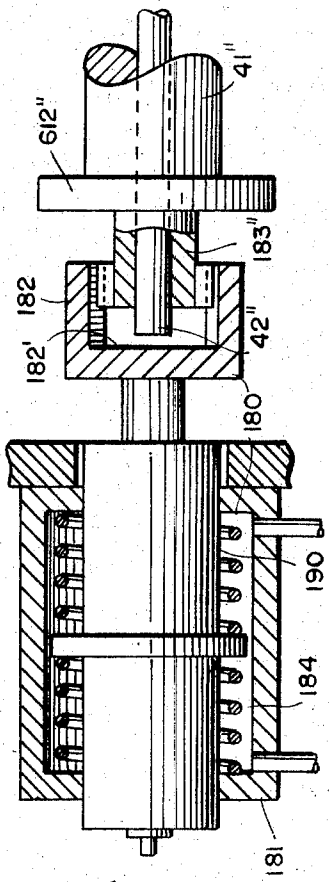

FIG. 1

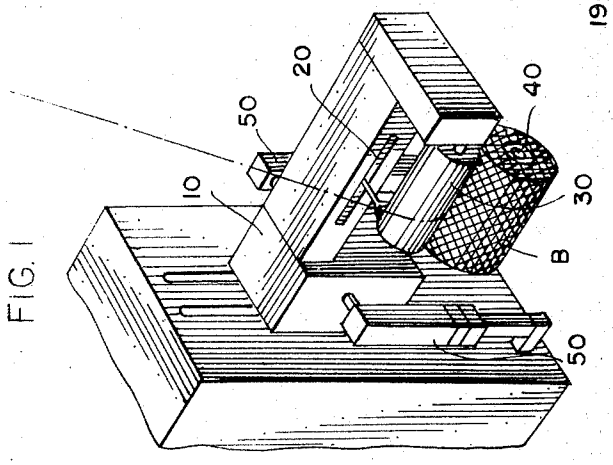

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FIG. 2

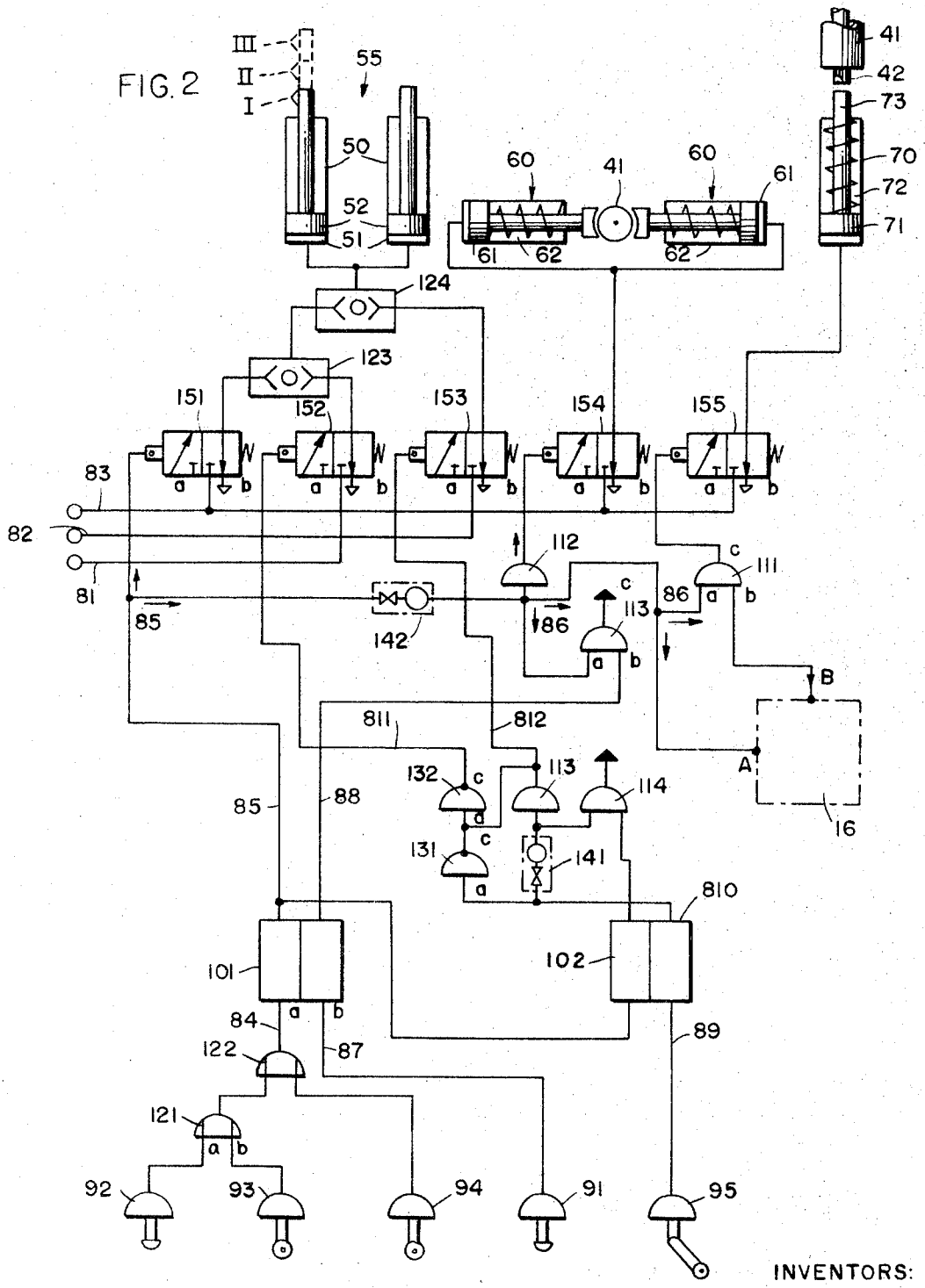

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FIG. 3

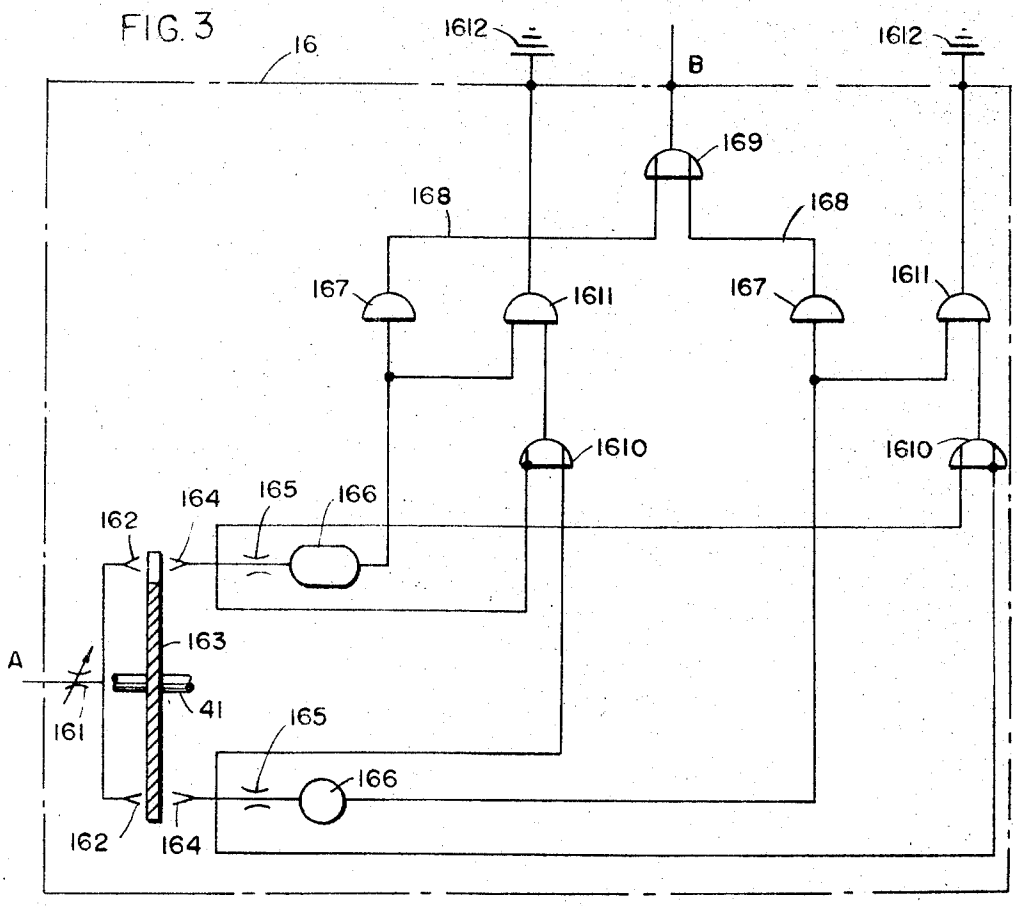

FIG. 4A

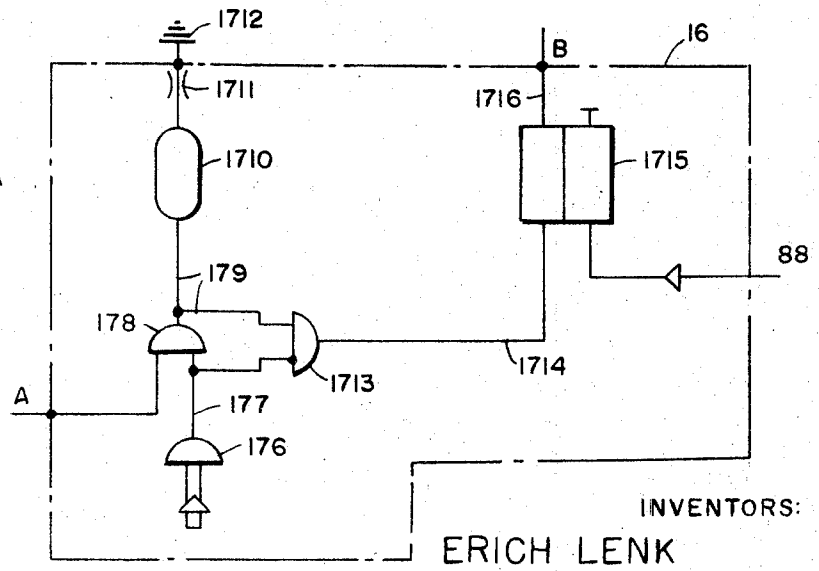

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FIG. 4

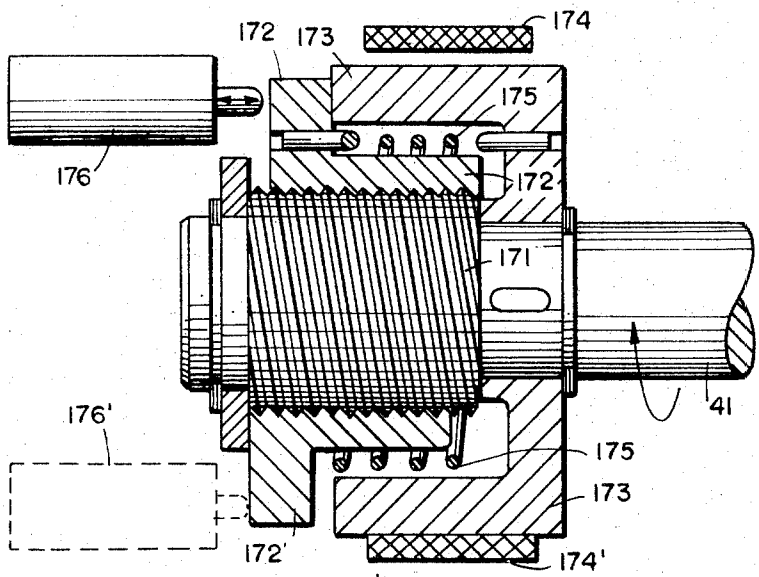


FIG. 5

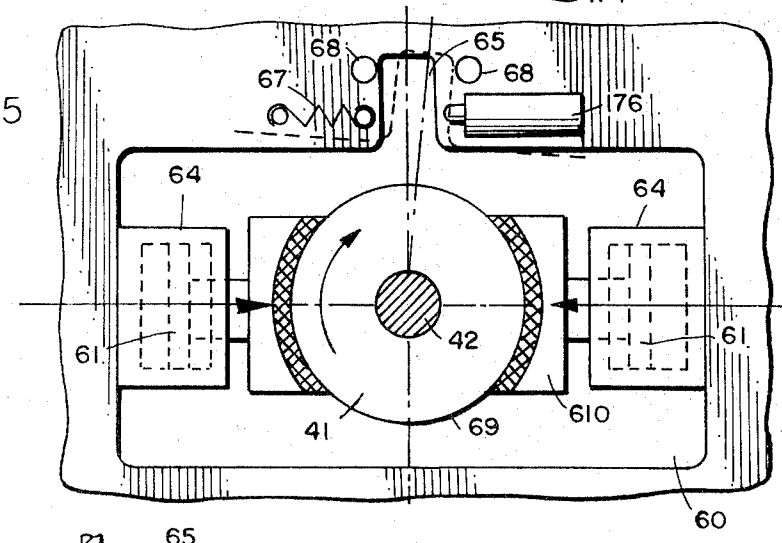
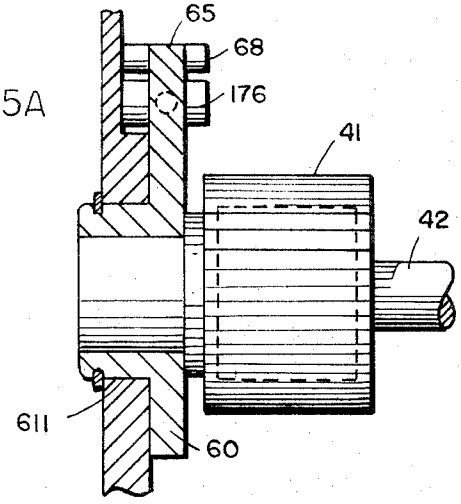


FIG. 5A



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WINDING DEVICE FOR SYNTHETIC THREADS

INTRODUCTION

The invention aims, in view of rising salaries and ever scarcer personnel, to reduce the number of working hours to accomplish windings of synthetic polymer threads or yarns. Simultaneously damage to the machine or individual parts of the machine caused by faulty manual operations are avoided.

The technical problem underlying the invention consists in designing a winding head of the type mentioned at relatively low cost, at least to such an extent for an automatic operation wherein operating errors with harmful effects upon the winding head or the sensitive synthetic yarn winding are avoided.

In turning away from the measures hitherto used in the winding of freshly spun synthetic threads it is proposed according to the invention that the system allocated to the winding head for the execution of the individual working steps required in the bobbin change be driven pneumatically and that the winding head — according to one first embodiment by means of only one pneumatic switching-on impulse — is automatically set into operation and by means of only one pneumatic switch-off pulse operation is automatically stopped. According to another embodiment, the system is equipped additionally with a carrying device having two chucks which are alternately in operation and with an auxiliary drive for the mounting of an empty bobbin. It is operable for the purpose of the bobbin change by means of only one pneumatic switching pulse. By means of logically linked pneumatic control elements operated by switching pulses or a switching pulse, the systems perform the individual working steps required in the bobbin change in a technologically expedient sequence.

Through use of the winding head according to the invention, manual operation is restricted at least to the extent that only the removal of the finished winding and the sliding on of a new empty tube or bobbin need be performed. For the initiation of operation and for the setting out of operation of the winding head, only the corresponding controls have to be triggered. The controls cover precisely the range or zone of the winding head operation, to which a considerable portion of the manual operation hitherto was used, and in which the danger of harmful straining of the machine or of individual parts, of a time loss or of damage to the delicate winding through faulty hand operation is especially great.

The pneumatic operation of the winding head and the pneumatic control for the starting and for the switching off of the winding head assure that the individual operations proceed free of harmful strains and harmful inertia forces for the sensitive winding and the machine.

THE INVENTION

In developments of the invention, the switch-on pneumatic pulse can be triggered at will by hand, by a bobbin changing arrangement or by a stop operated in the slipping of the bobbin onto the chuck. The pneumatic switch-off pulse is triggered by hand, by a thread detector, a winding detector or a device directly or indirectly detecting the thickness of the winding, in particular an end switch or a time switching mechanism.

Further, the invention makes possible in an advantageous manner a gentle movement of the drive roller onto the bobbin, as well as the influencing of the contact pressure force between bobbin and drive roller in the course of the winding process. These characteristics avoid deformations of the winding and excessively high pressure on the inner layers of the winding. This takes place, on the one hand, through the fact that, to the arrangement for the traveling and pressing-on of the drive roller against the bobbin, there are provided path-dependent and/or time-dependent control elements. They, in the operation of the traveling and pressing-on movement against the bobbin, bring about a stepwise or continuous reduction of the feed movement velocity, and also through the fact that in the system for the traveling and pressing-on of the drive roller against the bobbin there are time-dependent and/or path-dependent control elements which bring about in the course of the bobbin travel a stepwise or continuous change, preferably in reduction of the contact pressure force.

Expediently the control for the setting out of operation of the full bobbin has a device for the standstill monitoring of the chuck shaft over which the system for the relaxing of the chuck can be switched on only after standstill of the chuck shaft has occurred. The standstill monitoring, as stated in the following description, can take place pneumatically or through devices responding to the braking retardation.

The supplying of the winding head with compressed air of different pressures for the control and the drive can take place through known arrangements such as chokes or pressure regulators which are connected to a compressed air line and are connected to each individual winding head. There is, however, the further problem of regulating or controlling from a central point the course of individual process or movements, such as, for example, the velocity, acceleration with retardation of the starting movement of the drive roller onto the bobbin or the level of the contact pressure force. For this reason, the compressed air supply takes place through several compressed air mains with differing pressures adjustable in common for several winding heads. This saves the expenditure of time and personnel required for individual settings.

For a winding head equipped for the additional acceleration of the bobbin change with an additional drive of the chuck shaft for the mounting of the empty bobbin, this drive, too, is pneumatic and is switchable on through the switch-on pulse and switchable off via a time relay. Because of the short switch-on duration and the low switch-on frequency this drive can be relatively small and, in the process, highly loaded.

Further, in a winding head with an additional drive for the chuck shaft, for the avoidance of slippage and an excessively high contact pressure force between pneumatic drive roller and bobbin, the drive can be switchable on or switchable off over a device directly or indirectly detecting the torque.

The advantages of the invention consist in a rapid operation of the winding head, gentle on the product and the machine, largely free of operational errors, with smooth, shockfree and jerk-free running of the movements and processes, with shortest control paths and approximately inertia-free switchings and controls. The winding head according to the invention is distinguished, further, by a space-saving construction with a

simple, sturdy casing not weakened by bearings and openings. Its control operates largely free of wear. The parts subject to wear are commercially available. Through the simplified operation and the automatic control, personnel is saved, and the time needed for a bobbin change or for the remedying of thread breakage or false winding is shortened. Tending of the winding head by operators during the winding process, for example, for the modification of the control pressure force between drive roller and bobbin, is eliminated.

The use of logically linked pneumatic control elements makes it possible to provide only a few operating elements and to arrange these on the head side of the winding head. It is feasible to arrange the individual winding heads parallel to their longitudinal axis close together and to lay out the machines on which the winding heads are used with corresponding space-saving effect.

THE DRAWINGS

Embodiments of the invention and its manner of operation are described in detail with the aid of the drawings, wherein:

FIG. 1 is a perspective view of the winding head;

FIG. 2 is a schematic view of a system of the pneumatic control, switching and drive elements used with a winding head according to FIG. 1;

FIGS. 3 and 4A are schematic views of pneumatic controls used for monitoring the system at standstill;

FIGS. 4, 5 and 5A are section views showing details of the braking unit and standstill monitoring devices of the winding head;

FIG. 6 is a front elevation of a winding head and auxiliary components; and

FIG. 6A is a detail view in cross-section of the coupling used in FIG. 6.

THE ILLUSTRATED EMBODIMENTS

The winding head of FIG. 1 consists of a vertically movable carriage **10**, which carries the traverse device **20** as well as the steadily driven drive roller **30** and of a stationary, rotatably borne chuck **40** for the reception and mounting of the bobbin B and its winding.

The drive roller **30** can be moved against the bobbin by lowering of the carriage **10** and is pressed thereagainst under the weight of the carriage. The carriage **10** is securely connected with a pneumatic cylinder piston system **50**. The force exerted in the case of pressure action on the cylinder **51** (FIG. **2**) by the piston **52** counteracts the carriage weight.

The chuck shaft **41** is braked by a pneumatic brake system **60**. The brake is applied by pressure acting on the piston **61** (FIG. **2**) and released on pressure relaxation by the springs **62** (FIG. **2**).

The chuck **40** is released by loading of a pressure rod **42** aligned with its axis and on relief of the pressure rod is tensioned under the force of a spring (not represented). The pressure force for the force-loading of the pressure rod is exerted by compressed air charging of the device **70**. The rod **73** of the piston **71** of the device **70** moves away from the pressure rod **42** on pressure relief under the force of the spring **72**.

For supplying the compressed air there are provided three compressed air line systems **81, 82, 83** with different pressures of, for example, **2, 3, 6** atmospheres gauge pressure. The sources for the air of these pressures is provided centrally for several winding stations.

The schematic representation of the illustrated embodiment is made by means of circuit or switching symbols whose actual form in apparatus technology can be various and can take place through elements with mechanically moved parts (for example, piston valves) or by elements without mechanically moved parts (for example, pneumatic flow control elements).

For initiating the operation or stopping of the bobbin, there is in each case a pneumatic pressure pulse **84** or **87** to the pneumatic storage member **101**. Thereby there is triggered the corresponding movement of the carriage **10**, the adjustment of the contact pressure force between drive roller and bobbin, the tensioning or releasing of the brake **60** as well as of the chuck **40**.

The construction of the embodiment in detail is given from the following description of its manner of functioning:

For the triggering of the pneumatic pressure pulse **84** for the stopping of the bobbin there serve the pneumatic switches **92, 93, 94**, which are actuated by hand (switch **92**) or by a thread or winding monitor (switch **93**) or, when the bobbin is filled, by the carriage **10** (**94**) switch. The pulse released by the switches **92** to **94** is passed to pneumatic control elements **121** and **122**, which in each case show an output signal if only one of the input signals *a* or *b* is present, as pneumatic pulse **84** to the pneumatic storage element **101**. The storage element **101** converts this time pressure pulse **84** into a time-independent pneumatic pressure signal **85**. This pressure signal **85** has the following effect:

a. The carriage with the drive roller moves off the bobbin into its end position III, namely, by the fact that the piston **52** of the cylinder piston system **50**, through displacement of the pneumatic amplifier setting member **151** in position *a*, is acted upon from the air line system **83** with a pressure of, for example, **6** atmospheres gauge pressure.

b. The brakes **60** are applied by the fact that the pistons **61**, through shifting of the pneumatic amplifier setting member **154** in position *a*, are acted upon from the air line system **83** with a pressure of, for example, **6** atmospheres excess pressure. For this the pressure signal **85** is conducted over the pneumatic delayaction member **142**. Its pneumatic choke and pneumatic storer are adjusted or pre-set in such a way that the pneumatic output signal **86** brings about the shifting of the pneumatic setting member **154** and causes the compressed air acting on the piston **61** with time lag of sufficient duration to assure that the bobbin and drive roller are no longer in contact.

c. The device **70** for the relaxing of the chuck **40** by means of the pressure rod **42** (FIG. **2**) is set in operation after standstill of the chuck and the bobbin thereon by shifting of the pneumatic amplifier setting member **155** in position a. Pressure action on the piston **71** is applied from the air line system **83** with a pressure of, for example, **6** atmospheres gauge pressure, via the pneumatic standstill monitoring unit **16**, when the standstill monitoring unit is activated by the pneumatic pressure signal **86**. The manner of functioning and switching of the standstill monitoring **16** is described further below.

For the releasing of the pneumatic pressure pulse **88** for the setting in operation of the empty bobbin, the

pneumatic switching element **91** is operated. The pneumatic time pressure pulse **87** is converted in the pneumatic storage member **101** into a pneumatic time-independent pressure signal **88.** The signal **88** is given to the input *b* of a pneumatic control element **113** which frees an exhaust outlet c when the input signals *a* and *b* are present. Since the control element **113** is acted upon with the pressure signal **86** in its input *a*, activation of its input *b* with the pneumatic pressure signal **87** leads to the exhaust action and to the breakdown of the pressure signal **86** to give the following effects:

a. The bobbin is clamped in on the chuck and

b. The brake is released under the force of the springs **62,** since the pneumatic output signals of the pneumatic control elements **111** and **112,** which only occur when the provided inputs have a signal, likewise drop off with decline of the pressure signal **86,** whereby the pneumatic setting members **155** and **154** are shifted under the force of a restoring spring into air exhaust position *b.*

c. The carriage **10** descends under its weight, since the air in cylinder piston system **50** is being exhausted by the shifting, delayed in the pneumatic choke of the pneumatic delay member **142,** of the pneumatic setting member **151.** Through the delayed shifting the bobbin is prevented from being set in revolution by the drive roller before the brake is released and the bobbin clamped in place.

As soon as the carriage has moved out of position III into position II it operates the pneumatic switch **95,** which leads to a stepwise switching over of the air pressure in the cylinder chambers **51** to give a gentle setting of the drive roller on the bobbin and with a predetermined time lag to the reduction of the contact pressure force between drive roller and bobbin. For this the pneumatic pulse **89** emanating from the switch **95** is converted in the pneumatic storage element **102** into a time-independent pneumatic pressure signal **810.** This pressure signal **810** through the pneumatic control elements **131** and **132,** which in each case give a pneumatic signal at c only if no pneumatic input signal a is present, is converted into the pneumatic pressure signal **811** and is used for the shifting of the pneumatic amplifier setting member **152.** Through this shifting the cylinder piston system **50** is switched over to an air pressure of, for example, 2 atmospheres gauge pressure and thereby the carriage movement is braked. In the second place, the signal **810** is converted over the pneumatic delay member **141** and the pneumatic control element **113** into the pneumatic signal **812.** The pneumatic delay member **141** is adjusted in such a way that the signal **812** occurs only when the bobbin has reached the peripheral velocity of the drive roller. With the pressure signal **812,** the pneumatic amplifier setting member **153** is shifted, so that the cylinder piston system **50** is acted upon from the air line system **82** with superatmospheric pressure of, for example, 3 atmospheres gauge pressure, and the drive force between bobbin and drive roller is correspondingly reduced. Simultaneously, the pressure signal **812** is given to the input of the pneumatic control element **132,** whose pneumatic output signal **811** thereby drops off and makes possible the restoring of the pneumatic setting member **152** under spring force.

The pneumatic monitoring unit **16** according to FIG. **3** consists of a slit diaphragm **163,** which turns with the chuck shaft **41.** On the one side of the slit diaphragm there is a pair of nozzles **162,** each connected and supplied via the compressed air input A (FIG. **2**) and the adjustable pneumatic choke **161** by the air pressure signal **86** (FIG. **2**). On the other side of the slit diaphragm **163** there is opposite each of the nozzles **162** a pickup nozzle **164** in series circuit with of an optional pneumatic amplifier (not represented), a pneumatic choke or throttle **165,** a pneumatic storer **166,** a pneumatic control element **167** and a pneumatic control element **169.** The pneumatic output B of the standstill monitoring unit (FIG. **2**) is acted upon by air pressure when one of the air pressure signals **168** is present. The slit diaphragm **163** is constructed in such a way, and the nozzles **162** are staggered relative to one another in such a way, that in any arbitrary position of the slit diaphragm **163,** the jet of one nozzle **162** can pass through the slit diaphragm. The chokes **165,** the storers **166,** the control elements **167** as well, possibly, as the amplifiers, are laid out in such a way that a control pressure signal **168** for the acting upon of pneumatic control element **169** is triggered only if the slit diaphragm is approximately at rest. On arrival of the pneumatic start signal, which has as a consequence the dropping out of the air pressure signal **86** and the exhaust or relief of the pneumatic input A (FIG. **2**), the pneumatic storers **166** are immediately coupled with the pneumatic elements **1610, 1611** and the pneumatic outputs **1612.** The pneumatic signals **168** and the pneumatic output signal B decline, and the bobbin is clamped on the chuck.

It is also possible in this standstill monitoring to construct the slit diaphragm as well as the after-engaged nozzles, chokes, storers and other pneumatic control elements in such a way that an air pressure build-up takes place only during the rotation of the slit diaphragm, and to use this pressure for the shifting of the pneumatic switching element **176** (FIG. **4A**). The pneumatic switching circuit according to FIG. **4A** is still to be described.

For the generation of the control pneumatic pressure signal in the output B of the standstill monitoring unit (FIG. **2**) with the slit diaphragm at a standstill, there can also be utilized the phenomenon that the time-back pressure bounce effect of the slit diaphragm and thereby also the mean pressure in front of the nozzles **162** or of a corresponding nozzle is greater at standstill of the diaphragm than in rotation. If the slit diaphragm is to operate according to this principle, the pick-up nozzles **164** become unnecessary.

In the arrangement represented in FIG. **4** for the standstill monitoring, a rotary ring **172** held by a spring **175** rotates with the screw-threaded end **171** of the chuck shaft **41.** The upper part of FIG. **4** shows the standstill monitoring with brake drum **173** and brake jaws **174** disengaged. The lower part of FIG. **4** shows the standstill monitoring with brake jaw **174'** engaged. In braking the rotary ring **172** executes relative to the chuck shaft **41** a rotary movement and thereby on the screw threaded end **171** an axial movement. Thereby the pneumatic switching element **176** (FIG. **4, 4A**) is shifted. In this position, via the input A of the pneumatic monitoring unit (FIG. **4a**) the pneumatic storer **1710** is charged via pneumatic control element **178.** After termination of the braking process the rotary ring **172** moves back into its starting position. The switching element **176** returns automatically into its starting posi-

tion, the pneumatic storer **1710** discharges via the pneumatic choke **1711** and the pneumatic output **1712** and in so doing, simultaneously gives a pneumatic shifting pulse **179** to the pneumatic control element **1713** which thereupon responds with the pneumatic pulse **1714** only if the pneumatic switching pulse **177** is not present. The pulse **1714** is then converted in the pneumatic storer **1715** into the time-independent air pressure signal **1716,** which via output B (FIG. **2**) leads to the shifting of the pneumatic amplifier setting member **155** in the direction of relaxation of the chuck. On initiation of the pneumatic start signal **88** (FIG. **2**) the storer element **1715** (FIG. **4A**) is blocked.

In the standstill monitoring according to FIGS. **5** and **5a**, the entire chuck braking arrangement **60** (FIGS. **1** and **2**) with brake jaws **610,** pistons **61,** and cylinders **64** with the pivot pin **65** is rotatably borne in the bearing **611** coaxially with the chuck shaft **41.** The turning rotation path is limited by the pivot pin **65** and the fixed pins **68.** The braking device is held in its starting position by the tension spring **67.** On engagement of the brakes, the braking device is deflected to the right. Thereby pivot pin **65** operates the pneumatic switching element **176** and after conclusion of the braking operation releases it again. Switching element **176** is switched for the operation of the cylinder unit **70,** in one manner represented in FIGS. **2** and **4A.**

FIG. **6** shows the section through an alternate form of winding head. As in the embodiment of FIGS. **1** and **2,** a carriage **10** carries the traverse device **20** and the steadily driven drive roller **30.** The carriage is movable in vertical direction. The drive roller **30** can be applied, through lowering of the carriage **10,** onto a bobbin located in working position on the chuck **40'**. The carriage — as shown in FIGS. **1** and **2** — is moved by means of a pneumatic cylinder piston system **50** which can be motivated with compressed air counter to the weight of the carriage. In deviation from the embodiment of FIG. **1** and FIG. **2,** two chucks **40'** and **40''** are rotatably borne with their chuck shafts **41'** and **41''** in a rotatable carrying device **200.**

The carrying device **200** is swingable about the axle **203** by means of the pneumatic swinging drive **202** in each case through 180° continuously or also in alternating direction and controlled by means of the releasable lock control device **201.** This consists of an air cylinder with piston **205,** rod **206** and spring **204.** The chuck **40'** with the tube or bobbin situated on it is in the engagement range of the drive roller **30** and thereby in working position. The other chuck **40''** is in rest or bobbin change position. It is situated with its brake disk **612''** in the engagement range of a braking device **60** and with its coupling half **183''** in the engagement range of the coupling half **182** of the drive **190.** The brake disks **612** and the coupling halves **183', 183''** are arranged in like manner at the end of each of the two chuck shafts **41'** and **41''**. Likewise in each of the chucks or chuck shafts there is a pressure rod **42', 42''**. By pressing in this pressure rod the chuck is relaxed. On pressure relief of the pressure rod the chuck is tensioned under the force of a spring (not represented).

The drive **190** is a motor briefly highly overloadable, which is operated above its nominal load. The motor casing is constructed as a piston and conducted in axial direction of the motor in the fluid cylinder **181.** The motor shaft is securely joined with the coupling half **182.** The coupling half **182** is cup-shaped and has on its inner circumference teeth or ribs. The coupling half **183', 183''** is a shaft with a wheel correspondingly constructed with teeth or ribs. As long as the cylinder **181** is not acted upon by pressure, the two coupling halves **182** and **183', 183''** in consequence of the force of the spring **184,** are in engagement with one another. By pressure action on the left pressure chamber of the cylinder **181** (FIG. **6A**), the coupling half **182** is pressed with its face side **182** against the pressure rod **42'** or **42''**. This leads to relaxation of the chuck **40''** which is in rest position. Through compressed air action on the right-hand pressure chamber (FIG. **6A**) the coupling halves **182** and **183', 183''** are uncoupled.

For the execution of the bobbin change a tube is slipped onto the chuck **40''** which is in rest position and thereupon by triggering of a switching pulse by hand the following working cycle occurs:

The cylinder **181** and thereby the pressure rod **42''** is relieved from pressure, so that the chuck **40''**, on which the empty tube is seated, is tensioned under the force of a spring (not represented) to clamp against the winding tube or spool (not shown). The coupling halves **182** and **183''**, however, remain coupled. The brake **60** is released. Now the chuck **40''** is set in motion by means of the auxiliary motor **190** and, namely, in such a way that the peripheral velocity of the empty bobbin approximates the peripheral velocity of the drive roller and of the thread velocity. This acceleration requires a certain amount of time. After or shortly before the expiration of this time the carriage **10** with the drive roller **30** in high-speed rotation travels into its uppermost position. The releasable lock device **201** for the carrying device **200** is released by fluid pressure action on the piston **205** against the force of the spring **204** to retract the tip **207** of rod **206** from the tip's recess seat **208** in the periphery of the carrying device **200** and the auxiliary drive **190** is decoupled by corresponding fluid pressure action on the cylinder **181** from the chuck **40''** set in rotation. Now the carrying device **200** is swung by the pneumatic swinging drive **202** through 180° and thereupon stopped upon pressure relief of the device **201** by means of movement by spring **204** of bolt **206** downwardly so that its tip seats in recess seat **209.** Now the carriage **10** travels, first rapidly and then, shortly before contact with the bobbin, slowly into driving engagement with the empty bobbin on the chuck **40''**, which is in rotation and through contact by the drive roller, is brought to the peripheral velocity of the drive roller or thread velocity.

Through the swinging of the carrying device through 180° and its stopping in this position, the chuck **40'** with the full bobbin has moved to rest position. Simultaneously the brake disk **612'** of the chuck **40'** has been brought into the range of action of the brake **60.** The full bobbin, therefore, can be braked. The rotation of the chuck is sensed over one of the already described pneumatic standstill monitoring systems. After standstill of the chuck the casing of the auxiliary drive **190** is driven forward in axial direction by fluid pressure relief of the cylinder **181** under the force of the spring **184,** the coupling halves **182** and **183'** are coupled and by pressure action on the left-hand pressure chamber of the cylinder **181** (FIG. **6A**) the face side **182'** of the coupling half **182** is pressed against the pressure rod **42',** whereby the chuck is relaxed. Now the full bobbin can be drawn off, a new bobbin tube slipped on, and a

new bobbin change can be carried out at the appropriate time.

An example of a chuck or mandrel used in winding devices with releasable bobbin-gripping members operated by a rod like rod **42** or **42''** is disclosed and illustrated in Elka U.S. Pat. No. 2,345,246. Conrad U.S. Pat. No. 3,355,116 describes a pneumatic mechanism for raising and lowering the drive roller.

It is thought that the invention and its numerous attendant advantages will be fully understood from the foregoing description, and it is obvious that numerous changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, the forms herein disclosed being preferred embodiments for the purpose of illustrating the invention.

The invention is claimed as follows:

1. A winding head for the continuous winding at high velocity of freshly spun or stretched, synthetic polymer filaments onto a bobbin, which comprises rotatable chuck means having bobbin-gripping means for releasably gripping a bobbin, a drive roller for rotatably driving said bobbin and the winding thereon, bobbin drive-actuating means for bringing said drive roller and said bobbin into driving contact, releasable braking means for braking said chuck means, respective pneumatic means for operating each of the aforementioned means, and pneumatic control means having pneumatically-operated members which are (A) activated by a single pneumatic starting pulse generated by said pneumatic control means to (a) operate the pneumatic means of said bobbin-gripping means to grip a bobbin, (b) operate the pneumatic means for said bobbin drive-actuating means, and (c) operate the pneumatic means for the braking means to release said braking means and (B) activated by a single pneumatic stopping pulse generated by said pneumatic control means to (a') operate the pneumatic means for the braking means to apply the braking means, and (b') after the bobbin comes to a standstill, operate the pneumatic means for the gripping means to release said bobbin-gripping means.

2. A winding device as claimed in claim **1**, and said pneumatic control means having a plurality of alternate means for providing said single starting pulse including manually operated means and means automatically operated when an empty spool is exchanged on said chuck in place of a full spool, and a plurality of alternate means for providing said single stopping pulse including manually operated means and at least one of thread monitoring means, means monitoring the winding on the spool, and timer means.

3. A winding head as claimed in claim **1**, said bobbin drive-activating means embodying control means for moving said drive roller toward said bobbin at a decreasing velocity during travel of said drive roller to its position of driving contact with said bobbin.

4. A winding head as claimed in claim **1**, said control means including program control means operatively associated with the bobbin drive by said drive roller to reduce the pressing force therebetween in program responsive to the size of the winding.

5. A winding head as claimed in claim **1**, an additional drive means for the chuck means for starting rotation of the chuck and an empty bobbin thereon before contact of the bobbin and rotating drive roller, and pneumatic means for activating said additional drive means and operated by a manual switch.

6. A winding head as claimed in claim **1**, additional drive means for rotatably driving said chuck means and the chuck and bobbin thereon, and means responsive to the rotational moment of said chuck means for automatically switching said additional drive means on and off.

7. A winding head as claimed in claim **1**, an additional drive means for the chuck means for starting rotation of the chuck and an empty bobbin thereon before contact of the bobbin and rotating drive roller, and pneumatic means for activating said additional drive means and operated by a timer means.

8. A winding head for the continuous winding at high velocity of freshly spun or stretched, syntheric polymer filaments onto a bobbin, which comprises rotatable chuck means having bobbin-gripping means for releasably gripping a bobbin, a drive roller for rotatably driving said bobbin and the winding thereon, bobbin drive-actuating means for bringing said drive roller and said bobbin into driving contact, releasable braking means for braking said chuck means, respective pneumatic means for operating each of the aforementioned means, and pneumatic control means having pneumatically-operated members which are (A) activated by a single pneumatic starting pulse generated by said pneumatic control means to (a) operate the pneumatic means of said bobbin-gripping means to grip a bobbin, (b) operate the pneumatic means for said bobbin drive-actuating means, and (c) operate the pneumatic means for the braking means to release said braking means and (B) activated by a single pneumatic stopping pulse generated by said pneumatic control means to (a') operate the pneumatic means for the braking means to apply the braking means, and (b') after the bobbin comes to a standstill, operate the pneumatic means for the gripping means to release said bobbin-gripping means, said control means including sensing means for sensing the standstill state of said chuck and the bobbin thereon, and said bobbin gripping means being operatively associated with said sensing means to permit said bobbin-gripping means to release said bobbin only when said braking means brings said chuck means substantially to or actually at a standstill.

9. A winding head as claimed in claim **8**, said sensing means comprising a slotted diaphragm rotatable with the chuck, and air jet nozzle means directed toward said diaphragm to generate a signal by an air jet passing through said diaphragm to activate said chuck-operating means only when said diaphragm is substantially or actually at a standstill.

10. A winding head as claimed in claim **8**, said sensing means being a mechanical means responsive to braking deceleration of said chuck means and operatively associated with said bobbin-gripping means.

11. A winding head as claimed in claim **10**, said chuck means having a chuck shaft, said mechanical means comprising a member rotatably borne on the chuck shaft for relative rotation thereto, and spring means connecting said shaft and said member and urging said member against a stop surface rotatable with said chuck shaft to return said member to a position for activating said chuck-operating means as said braking means brings said chuck and the bobbin thereon substantially to a standstill.

12. A winding head as claimed in claim 10, said chuck means having a chuck shaft, said mechanical means comprising a member rotatably supported coaxially about said chuck shaft, and spring means yieldably restraining rotation of said member relative to said chuck shaft.

13. A winding head for the continuous winding at high velocity of freshly spun or stretched, synthetic polymer filaments onto a bobbin, which comprises pivotable chuck-supporting means bearing at least two chucks rotatably mounted thereon, said chucks being movable by said supporting means between a winding position and a bobbin-changing position, each chuck having bobbin-gripping means for releasably gripping a bobbin, a drive roller for rotatably driving the bobbin and the winding thereon which are in said winding position, bobbin drive-actuating means for bringing said drive roller and said bobbin into driving contact, releasable braking means for braking said chuck shaft, respective pneumatic means for operating each of the aforementioned means, and pneumatic control means having pneumatically-operated members which are (A) activated by a single pneumatic starting pulse to (a) operate the pneumatic means of said bobbin gripping means to grip a bobbin, (b) operate the pneumatic means for said bobbin drive-actuating means, and (c) operate the pneumatic means for the braking means to release said braking means for the bobbin the winding position, and (B) activated by a single pneumatic stopping pulse generated by said pneumatic control means to (a') operate the pneumatic means for the braking means to apply the braking means, and (b') after the bobbin comes to a standstill, operate the pneumatic means for the gripping means to release said bobbin-gripping means for the bobbin in the bobbin changing position.

14. A winding head for the continuous winding at high velocity of freshly spun or stretched, synthetic polymer filaments onto a bobbin, which comprises pivotable chuck-supporting means bearing at least two chucks rotatably mounted thereon, said chucks being movable by said supporting means between a winding position and a bobbin-changing position, each chuck having bobbin-gripping means for releasably gripping a bobbin, a drive roller for rotatably driving the bobbin and the winding thereon which are in said winding position, bobbin drive-actuating means for bringing said drive roller and said bobbin into driving contact, releasable braking means for braking said chuck shaft, respective pneumatic means for operating each of the aforementioned means, pneumatic control means having pneumatically-operated members which are (A) activated by a single pneumatic starting pulse to (a) operate the pneumatic means of said bobbin gripping means to grip a bobbin, (b) operate the pneumatic means for said bobbin drive-actuating means, and (c) operate the pneumatic means for the braking means to release said braking means for the bobbin the winding position, and (B) activated by a single pneumatic stopping pulse generated by said pneumatic control means to (a') operate the pneumatic means for the braking means to apply the braking means, and (b') after the bobbin comes to a standstill, operate the pneumatic means for the gripping means to release said bobbin-gripping means for the bobbin in the bobbin changing position, additional drive means for rotating the chuck bearing an empty bobbin placed thereon in the bobbin-changing position, and coupling means activating said additional drive means upon movement of said empty bobbin into said winding position from said bobbin-changing position.

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