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AUTOMATIC CHARGING DEVICE FOR PIRN CHANGING APPARATUS

Filed Aug. 13, 1958

4 Sheets-Sheet 1

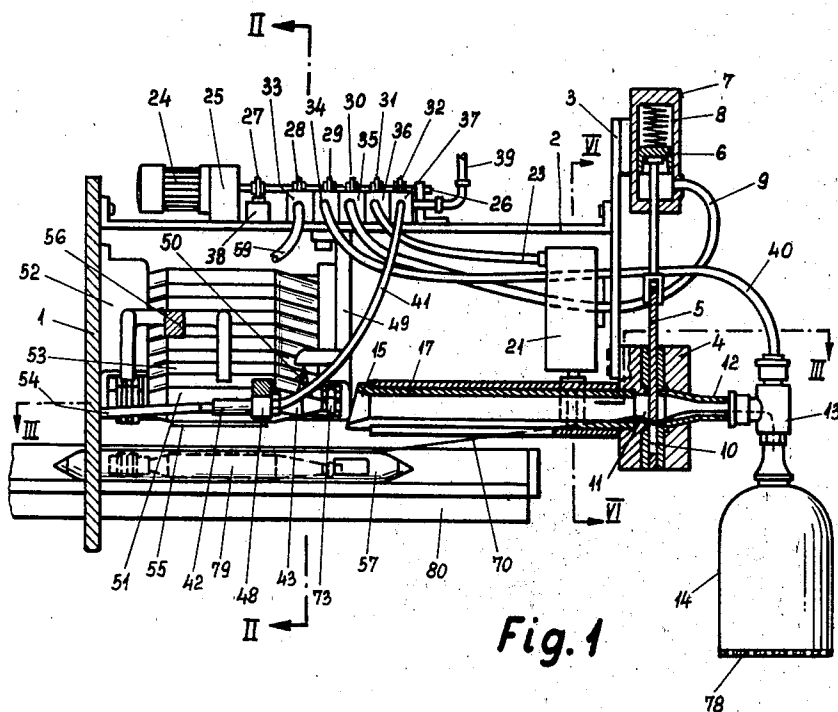
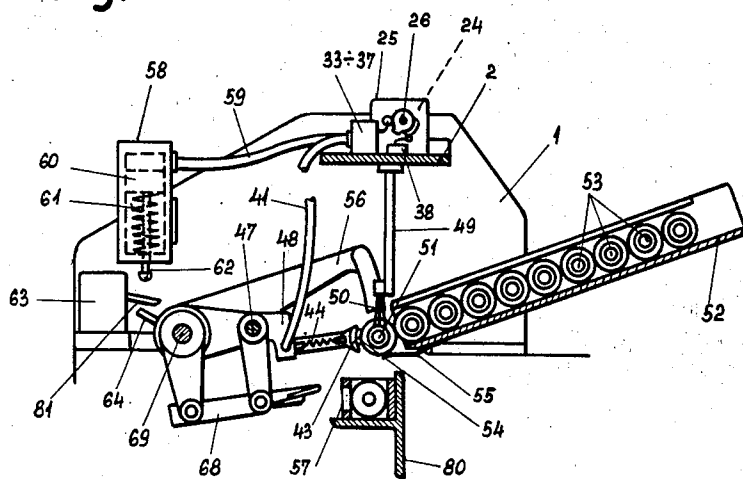


Fig. 1

Fig. 2



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Fig. 4

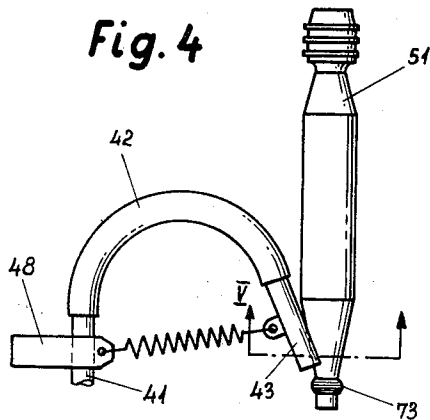


Fig. 5

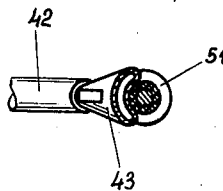
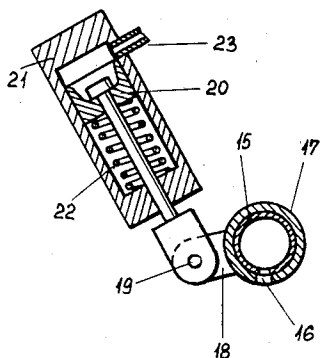


Fig. 6

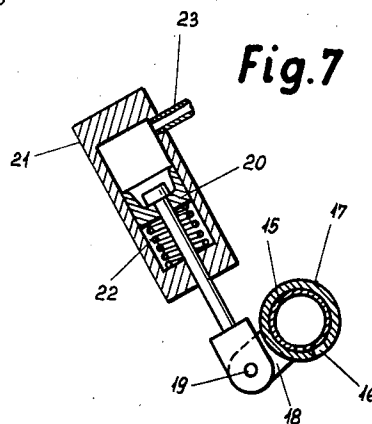


Fig. 7

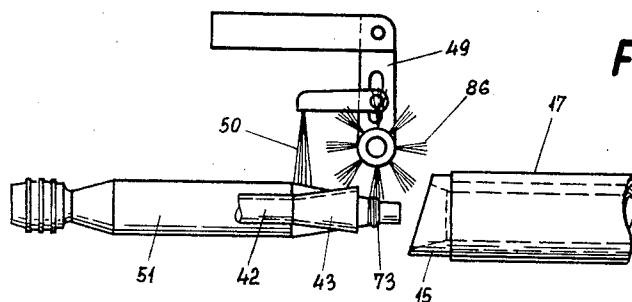


Fig. 8

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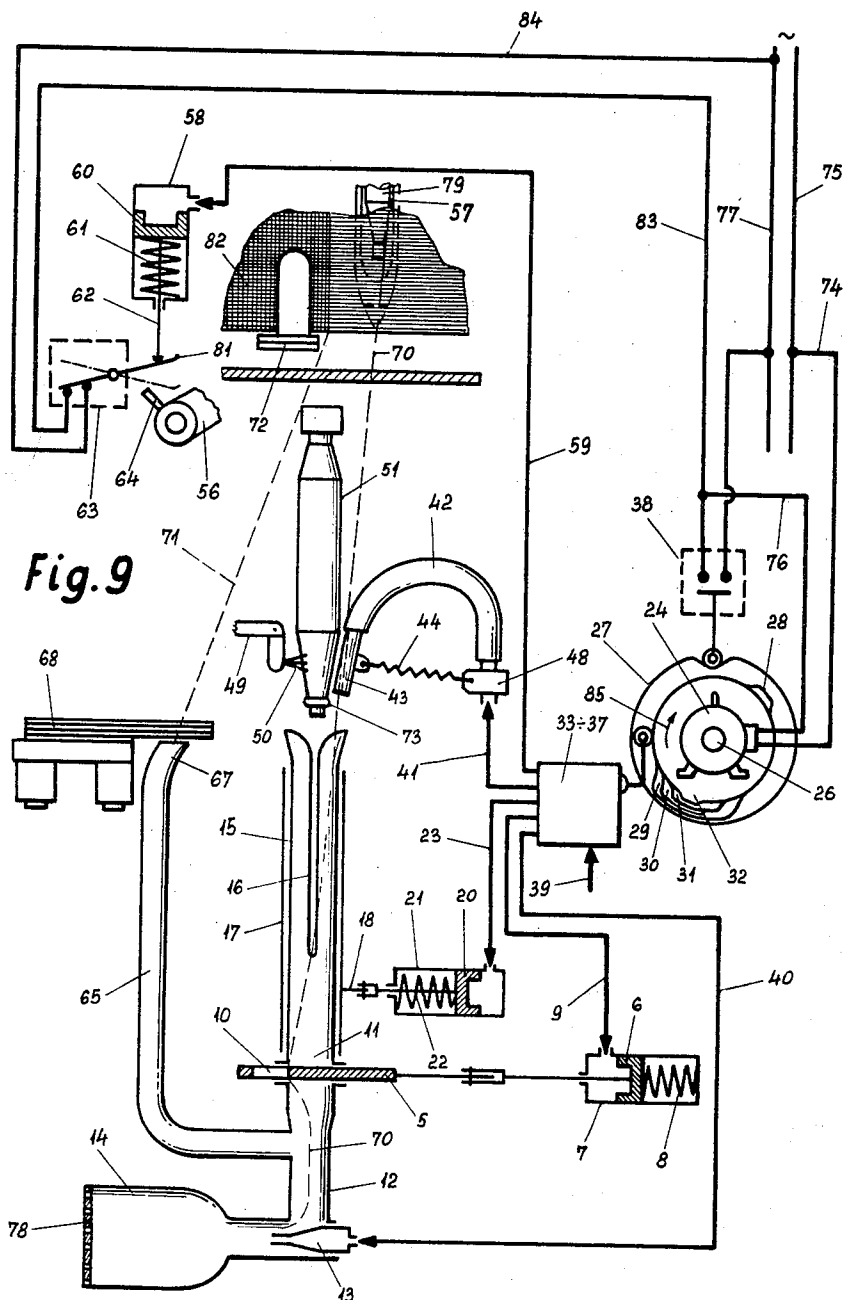


Fig. 9

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AUTOMATIC CHARGING DEVICE FOR PIRN CHANGING APPARATUS

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12 Claims. (Cl. 139—257)

The present invention relates to a weft pirn changer for weaving looms and more particularly to an automatically operating charging device for such weft pirn changers.

Prior to the changing of a weft pirn in the shuttle of a weaving loom the thread or yarn of the new pirn must be secured outside of the fabric for the weaving of the first weft. This operation will be referred to hereinafter as charging of the pirn changer.

In actual practice the charging operation is presently being carried out at least to a certain extent manually and while suggestions have been made to make manual steps unnecessary these suggestions have not led to practical results, either due to the fact that the apparatus involved is complicated and therefore unreliable or else because the pirns could not be charged continuously.

It is therefore an important object of the present invention to provide for the facilitated charging of weft pirns in weft pirn apparatus while avoiding the disadvantages of charging devices heretofore known.

It is a further object of the present invention to provide for a simple yet reliable charging of weft pirns for the changing operation in the weaving process without requiring manual handling of the pirns.

A further object of the present invention is the provision of means permitting the charging of pirns for the changing thereof in the shuttle of a weaving loom to be effected in an efficient manner and without requiring the presence of an operator.

Another object of the present invention is the provision of means redounding to the fully automatic charging of weft pirns in weaving looms with a resultant saving in labour and production costs.

Still another object of the present invention is to provide for means in a charging device for the changing apparatus of a weaving loom effecting the drawing-off of a yarn end from a pirn to be changed into a shuttle of the loom, and the mechanical retention of this yarn end while the pirn is changed and the shuttle is passed into the shed for the first weft.

A further object of the present invention is the provision of means permitting the drawing-off of a yarn end from a pirn to be changed into the shuttle of a weaving loom and the transport of this yarn end to a mechanically and automatically operated holding means to be effected pneumatically.

Another object of the present invention is the provision of blast nozzle means and of suction nozzle means for drawing-off and catching a yarn end, respectively, from a weft pirn to be changed to the shuttle of a weaving loom and transporting said yarn end to holding means pneumatically.

Still another object of the present invention is to provide for means in a charging device enabling the changing of a pirn from charging location to a shuttle with an end of the yarn being held stationary without risk of damage to or breaking of the yarn.

It is a further object of the present invention to provide

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for control means in a charging device for a weft pirn apparatus which will effect the charging operations, to be carried out automatically and in a predetermined sequence, the operating sequence being initiated by the changing of a pirn already charged to a shuttle.

These and other objects of the present invention will become better apparent from the following description when taken in connection with the accompanying drawing, in which:

Fig. 1 is a sectional view of the charging device in accordance with the invention shortly after a pirn has been changed, the section being taken along line I—I in Fig. 3;

Fig. 2 is a vertical sectional view of the device, a section being taken along line II—II in Fig. 1;

Fig. 3 is a horizontal sectional view of the charging device taken along line III—III in Fig. 1;

Fig. 4 is a detail view of the blowing device in operative position;

Fig. 5 is a sectional view of blast nozzle and pirn taken along line V—V in Fig. 4;

Fig. 6 is a sectional view of the shuttle means and the actuating means thereof taken along line VI—VI in Fig. 1 in inoperative position;

Fig. 7 is a sectional view of the means of Fig. 6 taken along line VI—VI in Fig. 1 in operative position;

Fig. 8 is a side view of a rotary brush, and

Fig. 9 is a diagrammatic view of the charging device of Fig. 1.

Generally it will be seen that the present invention provides for an automatic charging device including a blow-off or blast device and a mechanical holding device for the prepared thread end, the blow-off device comprising a blow nozzle shaped to correspond to the weft pirn and movable towards the surface of the weft pirn, which is arranged on an elastic hose and removes from the pirn the thread end consisting of a few coils of thread additionally wound on the pirn end and blows it into a suction tube, which is under a partial vacuum and provided with a closable slot, and that a housing is provided at the end of the suction tube to mechanically hold the blown-off thread end, a clamping member provided with an opening and slidably displaceable transversely with respect to the axis of the suction tube in said housing and holding the thread end blown through said opening between the said clamping member and the wall of the suction tube in a position of rest thereof. More specifically numeral 1 in Fig. 1 indicates the frame of a loom. A bracket 2 of which the outer end holds a supporting plate, is secured with its inner end to frame 1. Attached to the bracket 2 is a control device, including an electric motor 24 driving a control shaft 26 via a reduction gear 25. Arranged on the control shaft 26 are six disc shaped cam members numbered 27 through 32 for rotation with said shaft. The cam members 28 through 32 cooperate each with one of the valves 33 through 37, respectively, which are combined into a valve block and mounted on bracket 2. A pressure medium, preferably compressed air, is supplied to the valve block, i.e. to each valve 33 through 37, by a source (not shown) via a pressure supply line 39. The cam members 28 to 32 actuate, i.e. open and close said valves when rotated by shaft 26.

The cam member 27 actuates an electric interrupter 38 arranged therebelow on bracket 2. Screwed to the lower end of the plate 3 is a housing 4 in which a clamping member 5, in the form of a slide, is movably guided. The clamping member 5 is provided with a transverse opening 10 of which the diameter corresponds to the bore 11 in housing 4. Connected to the clamping member 5 is a piston 6, slidably arranged in a cylinder 7 attached to the plate 3. A pressure spring 8 arranged

in cylinder 7 holds the piston in its lower position which corresponds to the position of rest of this piston. A pressure line 9 interconnects cylinder 7 with the valve 35 and supplies compressed air from the latter into the cylinder 7 when the cam 30 actuates said valve.

The bore 11 of the housing 4 is connected with an injector 13 via a tube 12. The injector may be supplied with compressed air via a pressure line 40 over the valve 34 controlled by cam 28, the air flowing through the said injector 13 and into a container 14. The latter is provided with a bottom 78 designed as a filter which retains the waste threads referred to below while allowing the compressed air to pass to atmosphere. In the manner known, the passage of the compressed air through the injector 13 produces a partial vacuum in the space above the injector nozzle, which is connected with the tube 12, so that the low pressure is obtained also in the latter and in a suction tube 65 (Fig. 3) connected therewith.

Rigidly connected to the housing 4 (Figs. 1 and 3) is a tubular suction member 15 provided with a slot 16 extending in longitudinal direction thereof. A slotted shutter tube 17 is coaxially arranged with and rotatably seated on the suction tube 15. In inoperative position, the slots of tubes 15 and 17 are in register (Fig. 6). Pivoted to an arm 18 rigidly connected with shutter tube 17 by means of a pin 19 is a piston rod with a piston 20 which is slidably guided in a cylinder 21 attached to the plate 3. A pressure spring 22 acts against the piston 20 so as to hold the shutter tube 17 in inoperative position while displacement of piston 20 against this spring will effect movement of shutter tube 17 into operative position in which slot of tubular member will be closed and the latter will act as a suction nozzle. A line 23 connects the cylinder 21 with the valve 36 to permit displacement of piston 20 by a pressure medium.

As will be seen from Fig. 3, a sleeve 45 rigidly attached to the loom frame 1. A bracket 46 is secured to the sleeve 45 and carries a shaft 47. A connecting member 48 is attached to the shaft 47 and designed to connect, on the one hand, a pressure line 41 leading to the valve 37 and, on the other hand, an elastic hose or flexible member 42. Inserted in the free end of the hose member 42 is a blow or blast nozzle 43 which is pulled towards the connected member 48 by means of a tension spring 44. The shape of the blowing nozzle 43 is adapted to the diameter of the full weft pirn 51 (Fig. 5) to be changed.

Rotatably arranged on the sleeve 45 is a pirn hammer 56 which is capable of performing a pirn change by means of known devices (not shown). A weft pirn change is triggered by a pirn feeler or sensing means (not shown) and transmitted to the changing device, which is not shown in detail, by a releasing shaft 69 rotatably held in the sleeve 45.

The suction tube 65 is attached to and held by the shaft 47 by means of a clip 66. The front end of the suction tube 65 is arranged adjacent to an exterior cutter 68 of conventional design and operation of the loom, which is supported by the shaft 47 on the one hand, and the releasing shaft 69 on the other.

As will be further seen from Figs. 1 and 2 a support 49 screwed to the bracket 2. The lower end of support 49 carries small brush 50 adjustably mounted in a manner not shown which lightly engages the full weft pirn 51 to be inserted. In order to facilitate the removal of the thread end 73, an additional brush wheel 86 (Fig. 8) may be provided which is rotated by the current of air emitted from the blow nozzle 43 whereby the thread end 73 is drawn-off from the pirn. The brush wheel 86 may be replaced by any other suitable detaching means.

Full deft pirns 53 are placed in an inclined feed chute 52 (Fig. 2) and slide, under their own weight, towards the pirn charging location after a prepared, i.e. charged pirn 51 has been changed. A stop 54 mounted on loom frame 1 and a spring 55 connected to the lower end of

chute 52 cooperate with each other to prevent the pirn 51, from falling freely from the chute 52, i.e. the charging location thereof. The pirn hammer 56 changes when actuated the weft pirn 51 from the charging location into a shuttle 57 resting on the slay 80 against the action of spring 55. The weft pirns 53 are provided with a prepared thread end 73, i.e. with a number of additional coils at the end of the pirn which are produced by the winder at the end of the winding process.

Supported by the loom frame 1 is a cylinder 58 (Fig. 2). A pressure line 59 connects the cylinder 58 with the valve 33. A piston 60 slidably arranged in cylinder 58 is held in inoperative or raised position in the latter by means of a pressure spring 61. Displacement of piston 60 against the action of spring 61 under the influence of pressure medium admitted by valve 33 over line 59 serves to actuate an electric interrupter 63 by means of a piston rod 62 connected to piston 60. Interrupter 63 is mounted on the loom frame 1 and includes a switch 81 of an electrical circuit described below. In inoperative position the switch 81 of the interrupter 63 is in the lowered position shown in Fig. 2 so that the switch is open. Provided on the pirn hammer 56 is a cam 64 cooperating with the switch 81 to actuate, i.e. close the latter when the pirn hammer is operated to change a pirn.

The operation of the charging device according to this invention is shown diagrammatically in Fig. 9 and described below.

For the purpose of describing the operation in connection with Fig. 9 it is assumed that a pirn 79 has been changed immediately prior and that the first weft of this full pirn has been picked in the shed. The unwound thread end 70 of the pirn 79 located in the shuttle 57 is retained by the thread clamping member 5 in the suction tube 15. The thread end 71 from the emptied pirn just exchanged, which is not shown in Fig. 9, has been severed by the exterior cutter 68 in the shuttle and held in the thread holder of the exterior cutter 68. Fig. 9 shows this condition.

A temple cutter 72 operated by means not shown will now cut both threads, i.e. the end 70 and the end 71, respectively, adjacent the fabric.

Resting in the inclined chute 52 (not shown in Fig. 9) are reserve pirns 53 with the prepared additionally wound thread end 73. A pirn 51 is a pirn supplied by chute 52 to the charging location, to be prepared for changing by the pirn hammer.

During the insertion and ejection movement of the pirn hammer 56 in the above-mentioned changing operation, the cam 64 swivels the switch 81 of the interrupter 63 from the inoperative or open position shown in dot-dash lines into the closed position shown in full lines. The interrupter thereby closed the electric circuit which will now be described in greater detail.

The electric motor 24 is connected to a source of electrical current indicated by the mains 75 and 77 by means of conductors 74 and 76, the latter being connected to mains 77 via a connector 83, the interrupter 63 and a further connection 84. When the interrupter 63 is closed, the electric motor will be started so as to rotate the control shaft 26, via the reduction gear 25, in the direction of the arrow 85. This rotation of the control shaft 26 initiates the sequence of the charging operations by timing of the individual units of the charging device, i.e. the automatic charging proper begins.

An electrical interrupter 38 connected in parallel with the interrupter 63 is first closed by the cam 27 when shaft 26 starts rotating. The cam 29 then opens the valve 34 to the pressure line 40 leading to the injector 13, thereby admitting compressed air to the latter. A vacuum is built up in the tube 12, which is extended to the suction tube 65. The thread end 71 severed by the temple cutter 72 and held by the thread holder of the exterior cutter 68 is sucked into the suction tube 65. At the next pirn

change, i.e. when the thread end of the pirn 79 now located in the shuttle 57 is cut by the exterior cutter 68, the thread end 71 is released by the thread holder of the exterior cutter 68 and sucked into the container 14.

Upon further rotation of shaft 26 the valve 35 is opened by the cam 30, to admit compressed air to conduct 9 so that the piston 6 raises the clamping member 5 against the action of spring 8. The passage from the tube 12 over the bore 11 and into the suction tube 15 is opened by the opening 10. The thread end 70 so far held by the clamping member 5 is consequently sucked through the tube 12 and passed into the container 14.

Subsequently the valve 36 is opened by cam 31 and compressed air admitted to the line 23. The piston 20 will therefore be actuated by this compressed air to rotate the shutter tube 17 so that the slot 16 will be closed (Fig. 7).

Due to further continued rotation of shaft 26 the cam 32 will open the valve 37 connected with the line 41. The compressed air flowing into the elastic hose 42 will tend to stretch the latter against the action of spring 44. This will cause the blow nozzle 43 to move into operative position to lightly engage the weft pirn 51 (Figs. 4 and 5). The air flow or jet emitted by nozzle 43 passes along the surface of the pirn towards the thread end 73 prepared on the said pirn. Thereby this end is removed, i.e. drawn-off, and blown into the suction tube 15, which is located concentrically in front of the pirn 51 situated in the charging location. The blowing pressure of the nozzle 43 and the suction of the injector 13 cause the thread end 73 to unwind until the thread is retained by the holding brush 50.

It is obvious that the slot 16 must be closed if the thread end 73 is to be blown and sucked into the suction tube 15 properly.

The above movements complete the removal of the thread end 73 from the pirn 51.

The next control step is the closing of the valve 37 by the cam 32 caused by further rotation of shaft 26, whereby the line 41 is then relieved from pressure and the blow nozzle 43 will be lifted off the pirn 51 into inoperative position by means of the tension spring 44. Fouling of the pirn 51 during the changing process is prevented by this retraction of the blow nozzle 43.

When the control shaft 26 continues its rotary motion, the cam 30 will close the valve 35 and the piston 6 will be displaced under the action of the pressure spring 8. The opening 10 of the clamping member 5 will consequently be moved out of its concentric relation with bore 11. The blown-off thread end 70 has previously been carried along the wall of the suction tube 15, bore 11 and tube 12, through the opening 10 and this yarn end will now be engaged when the member 5 reaches its clamping position.

Subsequently the cam 31 closes the valve 36 to the line 23 and the piston 20 being relieved of air pressure therefrom is returned to inoperative position by pressure spring 22 so that the shutter tube 17 pivoted by the piston 20 is rotated into its position of rest (Fig. 6) and opens the slot 16. When the pirn 51 is changed, the clamped thread end 70 is thereby permitted to move downwards from the suction tube 15 through the slot 16, and obstruction or breaking of the thread end during the threading into the shuttle is prevented. It will be realized that if no slot were present in tube 15 it would be difficult to rigidly retain the drawn-off thread without undue stress being imposed on the thread during changing due to the fact that the pirn is moved out of its concentric relation with respect to tube 15 to the shuttle during this operation.

The valve 34 is closed by means of the cam 29 and the injector becomes inoperative.

The electric motor 24 further rotates the control shaft 26 and the cam 28 will open the valve 33. Due to the consequent admission of compressed air the piston 60 is

moved downwardly. The rod 62 thereby actuates the electrical interrupter 63 and its switch 81 will be opened. The electric circuit to the electric motor 24 will remain closed via the electrical interrupter 38, so that the shaft 26 will continue to rotate until the cam 27 releases the contact in the interrupter 38 so as to open the latter. The control shaft 26 has thereby been returned to its initial position and the entire device and control or timing unit is ready for a further preparing process and charging of a weft pirn respectively.

The compressed air employed for moving the pistons may be replaced by other pressure media, e.g. water or oil. The entire unit could also be controlled electromagnetically.

The present invention achieves a substantial advance in the automatization of looms. The setting on pirn drums or the time required for filling drop magazines with the subsequent removal of the thread ends by hand can thereby be reduced. It is possible to arrange, above the chute according to the present invention, a container holding 100 or more pirns from which the latter are supplied to the chute. Only little manual labour is required to apply such a container. Further work, as the locating and tying of thread ends, is performed by the automatic charging device according to this invention.

The fact that the two threads, i.e. the end of the old pirn and the beginning of the new pirn, are removed by suction eliminates the greatly feared weft shots.

Various other changes and modifications may be made without departing from the spirit and scope of the present invention and it is intended that such obvious changes and modifications be embraced by the annexed claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. An automatic charging device for a weft pirn changer including operable pirn hammer means for changing a pirn, in a weaving loom; comprising feeding means for supplying a pirn to a charging location adjacent said pirn hammer means, retaining means cooperating with said feeding means for holding said pirn in said charging location, blower means including air supply means and blow nozzle means connected to said air supply means and movable between an operative position adjacent said charging location and an inoperative position removed therefrom, said blow nozzle means being directed when in said operative position towards an end of said pirn when in said charging location for directing a jet of air against said pirn end and liberating a yarn end therefrom, suction means including a suction nozzle directed towards said end of said pirn when in said charging location and substantially coaxial therewith, said suction nozzle being adapted to receive said jet of air and said yarn end liberated from said pirn end, tubular means connected to said suction nozzle to guide said yarn end downstream thereof, operable yarn end holding means downstream of said suction nozzle in said tubular means for retaining said liberated yarn end and operating means for said holding means, whereby upon changing of said pirn at said charging location by said pirn hammer means said yarn end may be held by said holding means.

2. In a weaving loom an automatic charging device for a weft pirn changer including operable pirn hammer means for changing a pirn; comprising feeding means for supplying a pirn to a charging location adjacent said pirn hammer means, retaining means cooperating with said feeding means for holding said pirn in said charging location, blower means including air supply means and blast nozzle means connected to said air supply means and movable between an operative position adjacent said charging location and an inoperative position removed therefrom, said blow nozzle means being directed when in said operative position towards an end of said pirn when in said charging location for directing a jet of air against said pirn end and liberating a yarn end therefrom; suction means including a suction nozzle directed to-

wards said end of said pirn when in said charging location and substantially coaxial therewith, said suction nozzle being adapted to receive said jet of air and said yarn end liberated from said pirn end, tubular means connected to said suction nozzle to guide said yarn end downstream thereof injection operated suction means connected to said tubular means for creating a suction flow therein, operable yarn end holding means downstream of said suction nozzle in said tubular means for retaining said liberated yarn end transported by said suction flow in said tubular means, operating means for said holding means, and respective control means for said air supply means and said operating means for actuating the latter automatically and in a predetermined sequence subsequently to said pirn being supplied to said charging location.

3. An automatic charging device for a weft pirn changer comprising a blow-off device for a thread end prepared on a weft pirn to be changed and including supply means for a pressure medium, an elastic hose connected therewith and a blow nozzle shaped to correspond to said weft pirn and movable towards the latter, said blow nozzle being attached to said elastic hose, suction means including a suction tube coaxially arranged with said pirn and having an upstream and a downstream end, a slot extending longitudinally of said suction tube and opening into the upstream end thereof, shutter means movable with respect to said tube to close said slot, said upstream end of said suction tube being adapted to catch said yarn end drawn-off from said pirn when said slot is closed, a housing connected to said downstream end of said suction tube, injection operated suction means in connection with said housing for creating a suction flow therethrough and through said suction tube, a clamping member arranged for sliding movement in said housing in a transverse direction with respect to said suction tube between an inoperative position and a clamping position, and operating means connected to said clamping member to move the latter into clamping position, whereby said thread end may be mechanically retained by said clamping member upon having reached said housing under the influence of said suction flow therethrough.

4. In a weaving loom including an oscillating slay moveable into a weft pirn changing position, a shuttle reciprocating on said slay and a weft pirn changing hammer cooperating with said shuttle when said slay is in said changing position, an automatic charging device for a weft pirn to be changed to said shuttle by said changing hammer comprising an inclined feed chute for supplying said pirn to a charging location situated above said slay when in said changing position and adjacent said changing hammer to permit the latter to engage said pirn upon changing thereof, resilient holding means for holding said pirn in said changing location during charging and permitting changing thereof by said changing hammer to said shuttle, a blow-off device for a thread end prepared on said weft pirn and including supply means for a pressure medium, an elastic hose connected therewith and a blow nozzle shaped to correspond to said weft pirn and movable towards the latter, said blow nozzle being attached to said elastic hose, suction means including a suction tube coaxially arranged with said pirn in said changing location and having an upstream and downstream end, a slot extending longitudinally of said suction tube and opening into the upstream end thereof, said slot being downwardly directed towards said slay when in said changing position, shutter means movable with respect to said tube to close and open said slot, actuating means for said shutter means to close and open said slot, said upstream end of said suction tube being adapted to catch said yarn end drawn-off from said pirn when said slot is closed, a housing connected to said downstream end of said suction tube, suction pump means in connection with said housing for creating a suction flow therethrough and through said suction tube, a clamping

member arranged for sliding movement in said housing in a transverse direction with respect to said suction tube between an inoperative position and a clamping position, operating means connected to said clamping member to move the latter into clamping position to thereby retain said thread end upon having reached said housing under the influence of said suction flow therethrough and complete charging of said pirn, and control means for said actuating means of said shutter means to effect opening of said slot subsequently to said thread end being retained by said clamping member and prior to the changing of said charged pirn, whereby when said charged pirn is changed by said changing hammer to said shuttle said thread end may extend downwardly through said open slot from said clamping position to thereby avoid damage and breaking of said thread.

5. An automatic charging device according to claim 4, said shutter means being formed by a tube rotatably and concentrically arranged with respect to said suction tube, said shutter tube including a slot adapted to register with said slot in said suction tube to open the latter.

6. An automatic charging device according to claim 4, said actuation means for said shutter means including a pneumatic piston and cylinder unit connected to said shutter means and supply means for compressed air to displace said piston in said cylinder.

7. An automatic charging device according to claim 6, said operating means for said clamping member including a further piston and cylinder unit connected to said supply means.

8. An automatic charging device according to claim 4, said suction means including an injection nozzle and a tubular casing which is connected with said housing by means of a tube.

9. An automatic charging device according to claim 4, wherein said blow nozzle is movable between an operative position adjacent said pirn and an inoperative position removed therefrom and wherein a tension spring is connected to said blow nozzle to normally retain the latter in inoperative position.

10. In a weft replenishing loom having an automatic charging device including means to hold a weft pirn in a position ready for charging, feed means for supplying weft pirns successively to said charging device, and means for actuating said charging device; the combination of thread end removing means cooperating with a weft pirn when in said charging position for liberating therefrom an end of thread wound thereon, tubular guide means substantially in alignment with said weft pirn in said charging position and having an open mouth portion at one end thereof directed toward and arranged adjacent said charging location for receiving said thread end liberated from said weft pirn, injection operated suction means connected to an end of said guide means opposite said mouth portion for creating a suction flow of air passing from said charging position into said mouth portion and through said guide means, and piston actuated clamping means in said guide means intermediate said mouth portion and said suction means, whereby upon operation of said removing means a thread end liberated from a weft pirn in said charging position will be transported through said mouth portion into guide means and along the latter past said clamping means whereupon the latter may be actuated to retain said thread end.

11. In a weft replenishing loom having an automatic charging device including means to hold a weft pirn in a position ready for charging, feed means for supplying weft pirns successively to said charging device, and means for actuating said charging device; the combination of thread end removing means cooperating with a weft pirn when in said charging position for liberating therefrom an end of thread wound thereon, tubular guide means substantially in alignment with said weft pirn in said charging position and having an open mouth portion at one end thereof directed toward and arranged adjacent

said charging location respectively for receiving said thread end liberated from said weft pirn, injection operated suction means connected to an end of said guide means opposite said mouth portion for creating a suction flow of air passing from said charging position into said mouth portion and through said guide means, piston actuated clamping means in said guide means intermediate said mouth portion and said suction means, a common source of compressed air for operating said removing means, said suction means and said clamping means and control means for actuating said removing means, said suction means and said clamping means in a predetermined sequence by compressed air from said source, whereby upon operation of said removing means a thread end liberated from a weft pirn in said charging position will be transported through said mouth portion into guide means and along the latter past said clamping means by said suction flow of air, whereupon the latter will be actuated to retain said thread end in said guide means.

12. The combination as claimed in claim 11, wherein said clamping means comprise a slide movable in a trans-

verse direction through said guide means between a clamping position and an inoperative position, said slide having an opening therethrough in alignment with said guide means when in said inoperative position and forming a passage for said thread end therethrough, said opening cooperating with said guide means when in said clamping position to positively engage and hold said thread end therebetween.

References Cited in the file of this patent

UNITED STATES PATENTS

971,541	Koechlin	Oct. 4, 1910
1,011,969	Koechlin	Dec. 19, 1911
1,058,977	Imbach	Apr. 15, 1913
1,060,831	Elmendorf et al.	May 6, 1913
2,318,743	Brown	May 11, 1943
2,354,624	Turner	July 25, 1944
2,845,957	Banks et al.	Aug. 5, 1958
2,872,948	Newbegin et al.	Feb. 10, 1959
2,892,470	Corneliusson et al.	June 30, 1959