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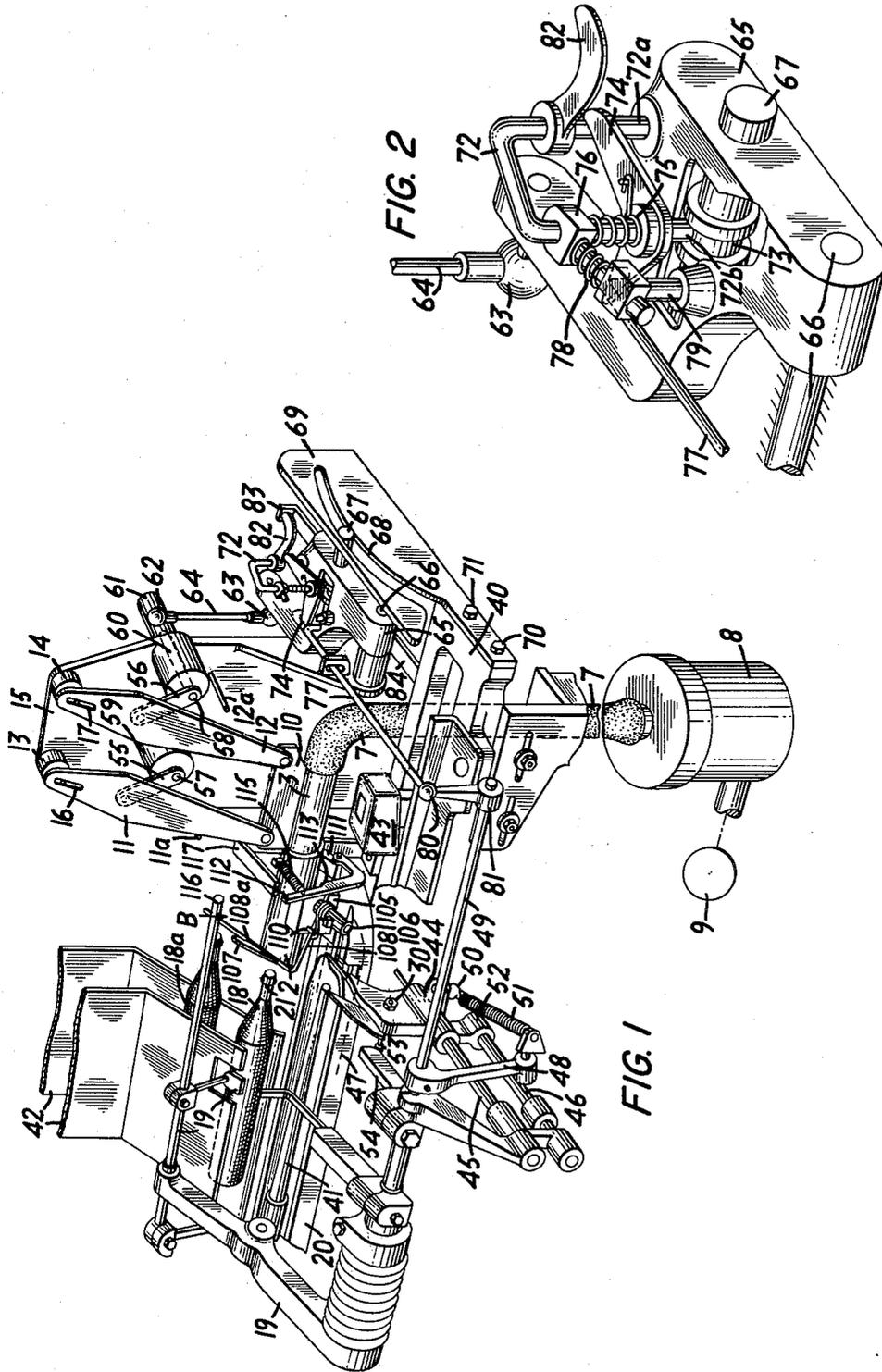
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PIRN BUNCH REMOVING AND HOLDING MEANS

Filed Oct. 3, 1961

3 Sheets-Sheet 1



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FIG. 3

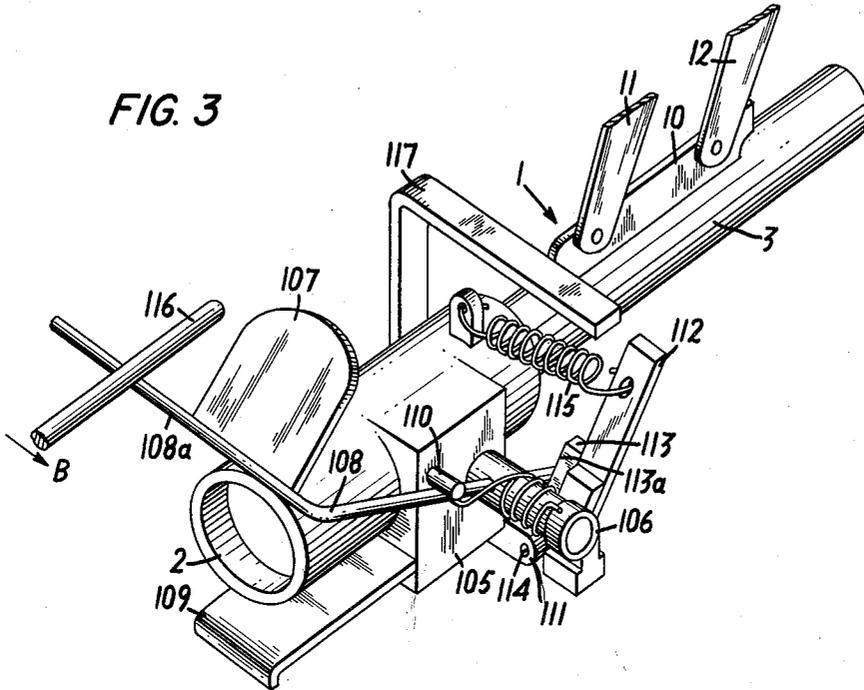
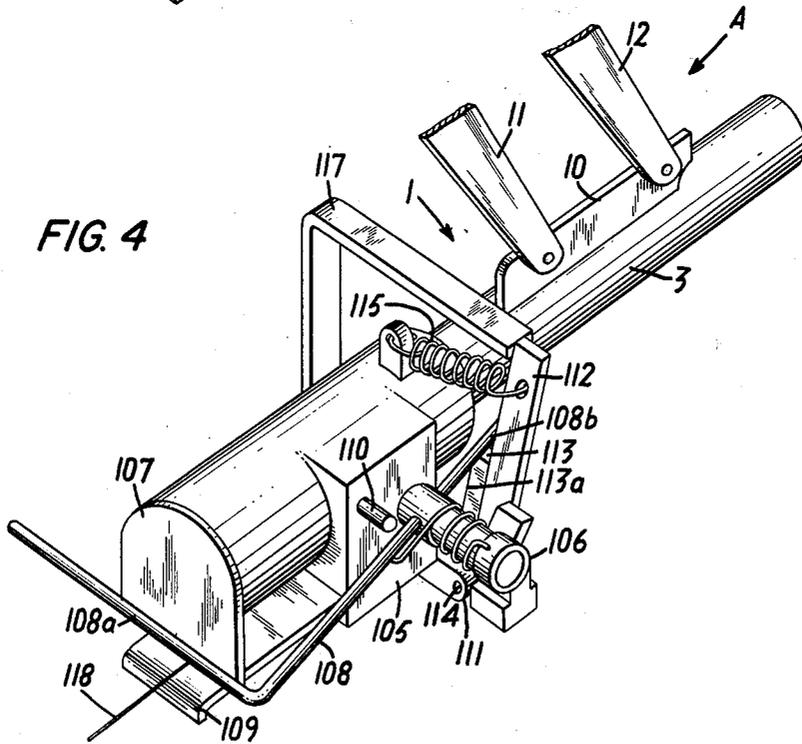


FIG. 4



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PIRN BUNCH REMOVING AND HOLDING MEANS
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2 Claims. (Cl. 139—257)

The present invention relates to an automatic pirn 10
 changer of a loom and more especially to a device for
 holding the outer thread end of a pirn to be transferred
 to the shuttle, on the tip of which pirn there is a separate
 end winding with the outer thread end.

There has already been proposed a mechanical brake 15
 device for holding the outer thread end. It is further-
 more known to strip off the end winding of pirn to be
 transferred and to hold it pneumatically. A disadvan-
 tage in this case is that the effect of the air current is gen-
 erally insufficient for holding the thread end reliably, 20
 so that during the first pick of the weft, it may be pulled
 out off the pneumatic suction device, due to the tension
 of the weft thread that occurs in pirn changing and dur-
 ing the first pick.

The present invention is now based on the problem of 25
 obviating the aforesaid disadvantage in a reliable manner.

Accordingly, the device of this invention is substantial-
 ly characterised in that it comprises a brake, an operating
 member for closing the brake, said operating member be-
 ing arranged on the pirn transferer of the loom, 30
 a stripping device for drawing-off the outer thread end from
 the pirn, said stripping device being provided with a lock-
 ing device for holding the brake closed, and a pusher
 arranged on the sley of the loom, for releasing the lock-
 ing device and opening the brake.

The brake may advantageously comprise two brake 35
 parts, one of which consists of a leaf spring secured on
 the stripping device, and the second of a movable brake
 member pivotally mounted on the stripping device, be-
 tween which parts the outer thread end of the pirn to be
 transferred can be clamped. 40

Further features of the invention will follow from the
 claims, the description and the drawings which represent
 purely as an example one embodiment of the invention.
 In these drawings:

FIG. 1 shows in perspective the part of an automatic
 loom with the device for drawing off and holding or
 braking the outer thread end of the pirn to be transferred
 to the shuttle;

FIG. 2 shows a part of the device according to FIG. 50
 1 on a larger scale;

FIGS. 2a and 2b are detailed perspectives of parts of
 the device shown in FIG. 1;

FIG. 3 shows in perspective the stripping and braking
 device in the most forward position with brake open; 55

FIG. 4 shows the device according to FIG. 3 in the
 rearward, i.e. starting, position with brake closed.

According to the embodiment shown in FIGS. 1, 3 and
 4, the stripping and suction clamping device 1 has a
 sleeve-like mouthpiece 2, detachably connected to a tu-
 bular carrier 3, for example by means of a bayonet joint. 60

Connected to the end of the carrier tube is a flexible
 tube 7 leading to a thread container 8, which in its turn
 is connected to a vacuum pump 9 (FIG. 1).

The tube 3 is mounted on a carrier piece 10, pivotally 65
 engaged by two control arms 11 and 12, and indicated
 with reference to the stripping and clamping device in
 FIGS. 3 and 4 and with reference to parts of the loom
 in FIG. 1. The arms 11 and 12 are pivoted on pivots 13
 and 14, mounted in a plate 15, fixed to the loom in a man-
 ner not shown. The swinging of the arms 11 and 12,
 which will be explained more fully below, produces a 70

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forward and backward movement of the stripping device
 1. By means of slots 16 and 17 in the arms 11 and
 12 at the bearings 13 and 14, a purely axial forward and
 backward movement of the stripping device is obtained
 despite the swinging movement of the arms 11 and 12,
 because the bearings 13 and 14 rise and fall in the slots
 16 and 17. The movement of the stripping device is limited
 in both directions by stops 11a, 12a. The pirn 18 which
 is to be transferred to the shuttle 20 by the transferer 19
 (FIG. 1) of the pirn changer on the next pirn change is
 positioned as shown in FIG. 1. The pirn 18 carries on its
 conical shaped end the end winding 21 which is intended to
 be stripped off by the stripping device unwound and drawn
 by the suction device 7 and 9 into the thread container after
 the end thread has been severed from the weft thread.

The mechanical brake device according to the inven-
 tion is built on to the stripping device 1. Fixed to the
 stripping device 1 (see FIGS. 1, 3 and 4) is a carrier
 105 on which is mounted the brake comprising a rod 108,
 108a, 108b and a leaf spring 109. On the cross-piece
 108a of the rod is a flap 107, the purpose of which is to
 close the mouthpiece 2 of the stripping device 1.

The rod 108, which is pivoted on a pivot 106 of the
 carrier 105, is urged by a torsion spring 111 against a
 pin 110 (FIG. 3) which is fast in the carrier 105. The
 leaf spring 109 is mounted on the carrier 105 and forms
 part of the brake, the other part of which is the cross-
 piece 108a of the rod 108. Pivoted to the carrier 105
 on a pin 114 mounted thereon is furthermore a lever
 112, on which is fast a locking nose or shoulder 113 co-
 operating with the end 108 (see FIG. 4) of the rod 108.
 A tension spring 115, engaging by its respective ends the
 stripping device 1 and the lever 112, biases the lever 112
 35 to engage the edge 113a of its locking nose 113 against
 the end 108b of the rod 108. An arm 116 (FIG. 1),
 fixed to the movable transferer 19 of the automatic pirn
 changer, can be brought into and out of engagement
 with the cross piece 108a of the rod 108. A striker arm
 117, fixed to the movable sley 40, can be brought into
 and out of engagement with the lever 112.

The device described operates as follows:

On pirn changing, the stripping device 1 is moved
 from the starting position according to FIGS. 1 and 4 in
 the direction of the arrow A forwardly into the position
 according to FIG. 3, the brake comprising cross piece
 108a and leaf spring 109 being opened. As soon as the
 end winding 21 has been seized by the stripping de-
 vice 1, the stripping device returns to its starting position
 according to FIG. 4 in a direction opposite the arrow A.
 The end winding 21 is thereby stripped off the pirn 18
 and is drawn into the tube 3 by the suction. During the
 backward movement of the stripping device 1, the new
 pirn 18 is transferred to the shuttle 20. By this transfer
 movement of the transferer 19, the arm 116 (FIG. 1)
 55 fixed to the latter is moved downwardly in the direction
 of the arrow B. On this downward movement of the
 arm 116, the latter strikes against the cross piece 108a
 of rod 108, in opposition to the force of the torsion spring
 111, and presses the cross piece against the leaf spring
 109. The thread 118, drawn into the stripping device 1,
 is thereby clamped between the rod part 108a and the
 leaf spring 109. The purpose of the flap 107, which
 closes the mouthpiece 2 in this position of the part, is
 to prevent the part of the thread 118, which is still situ-
 ated outside the suction tube 3 (in FIG. 4, on the left
 of the clamping place) from also being drawn into the
 suction tube and possibly wrapping itself round the brake
 rod 108a. In this movement of the rod 108 cross piece
 108a, the end 108b slides on the edge 113a of the lock-
 ing nose 113 to above this nose, so that the spring 115
 can pull the lever 112 toward the stripping device 1. 60

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In this pivoting movement of the lever 112, the nose 113 comes below the end 108b of the rod 108 (FIG. 1), and thereby prevents the braking member 108a from being able to move upward again under the action of the torsion spring 111 when the rod 108a moves out of contact with the arm 116 due to the backward movement of the stripping device 1. In the starting position of the stripping device 1 (FIG. 4), the lever 112 is in the path of movement of the striker arm 117 fixed to the sley 40. In the beating-up movement of the sley following the pirn change, the striker arm 117 strikes against the lever 112; the nose 113 thereby disengages from the cross piece 108b of the rod 108, so that the brake can open under the action of the torsion spring 111, and hence the thread 118 is released again. The end of the thread 118, as soon as it has been severed by the temple cutter, can now be drawn completely into the suction tubes 3, 7 by the suction air.

The advantages of the device described consist substantially in the fact that the thread end can still be seized by the brake during the transfer movement and held by the brake until the first pick has been beaten up by the sley. By the use of the resilient leaf spring as one of the brake parts, the thread is clamped resiliently, but in the event of excessive tension can be withdrawn from the brake, so that thread breakage is avoided.

With regard now to the operation of the lever arms 11, 12, to which the stripping device 1 is pivoted, as well as the associated functions of the pirn change and outer cutter, the construction of the mechanism concerned and its mode of operation will now be explained with reference to FIG. 1.

In this figure, the sley 40 of a loom is approximately in its forward dead centre position, and the shuttle 20 is on the side of the automatic pirn changer. The pirn 41 in the shuttle 20 has only a small quantity of yarn, so that a pirn change has to take place. A pirn feeler, not shown in FIG. 1, of known construction, projects through a lateral opening of the shuttle 20 and makes contact with the pirn 41 for determining its filling or the point of time of the pirn change and then to initiate the changing operation. The spare pirns 18 and 18a are situated in a feed channel 42, in which they slide downwardly under the effect of gravity. The bottom pirn 18, on signal is to be transferred to the shuttle 20 by means of the transferer 19, with ejection of the almost empty pirn 41, is prevented from prematurely falling down by means known per se. The picker for driving the shuttles 20 is denoted by 43.

FIG. 1 illustrates the position of the parts at the moment immediately before the transfer of the pirn 18 to the shuttle 20. The usual outer cutter 30 of the loom, which is slidably mounted by means of a slide 44 on two fixed guide bars 45 and 46 for movement from the front to the back of the loom, is in an advanced position in which the cutter 30 is open near the shuttle 20. The weft thread 47 last picked in the fabric, and indicated by a chain line in FIG. 1, passes through the open outer cutter 30. This shifting of the outer cutter is done by means of shaft 49. On shaft 49 is mounted a lever 48 which, by means of a rod 50, moves the slide 44, on which the outer cutter 30 is mounted, forwards and backwards. The rod 50 is slidably guided at the lower end of lever 48; the transmission of the movement of the lever 48 to the slide 44 is done through a pressure spring 51. The helical pressure spring 51, surrounding the link 50 enables the slide 44 with the outer cutter 30 in FIG. 1 to be shifted somewhat to the left downward, without the lever being correspondingly turned. The slide 44 is provided with an adjustable stop 52, against which the sley 40 can strike, and which is adjusted so that contacting of the cutter 30 against the wall of the shuttle 20 is prevented. The outer cutter is closed by a spring (not shown). For opening the outer cutter 30 there is provided on its movable part a roller 53, which works together with a

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stationary stop 54. When the outer cutter 30 is withdrawn, this roller 53 pushes against the stationary stop 54 upon which the outer cutter opens. The pirn 18, that is in readiness for transfer to the shuttle 20, is provided with an end winding 21 which is seized by the stripping device. The construction of the stripping device has already been described.

Referring to FIG. 1, the sley 40 of an automatic loom is approximately in its forward dead center and the shuttle 20 is on the side of the automatic bobbin-changer. The weft-bobbin 41 in the shuttle 20 is substantially exhausted so that a bobbin change has to take place. A bobbin-feeler (not shown in FIG. 1) of a conventional type moves through a lateral opening in the shuttle 20 and feels the weft-bobbin 41 in order to determine its filling and the moment of bobbin change, and to initiate the change. The spare bobbins 18, 18a are in a feed channel 42, in which they descend by gravity. The lowermost bobbin 18 which at bobbin-change is knocked into the shuttle 20 by means of the hammer 19, the nearly empty bobbin 41 being just previously ejected from the shuttle. The picker for driving the shuttle 20 is designated 43.

FIG. 1 illustrates the position of the parts at the moment immediately prior to knocking the bobbin 18 into the shuttle 20. The usual outer scissors 30 of the loom, which by means of a slide 44 are displaceably carried on two stationary guide bars 45, 46 in the depth direction of the loom and in advanced position towards the shuttle 20 in which the scissors 30 are open. The weft 47, which is last inserted into the fabric and indicated in a chain-dotted line in FIG. 1, passes through the open outer scissors 30. Said displacement of the scissors 30 is brought about by a lever 48, a shaft 49 carrying the same and a link 50 articulated to lever 48 and slide 44 of the scissors 30. Shaft 49 is actuated in a known manner from the loom drive in known synchronization with a known type of bobbin feeder. A coiled compression spring 51 surrounding said link 50 permits of the slide 44 with the scissors 30 in FIG. 1 to be moved somewhat down to the left, without the lever 48 being oscillated accordingly. The slide 44 is provided with an adjustable stop 52 against which the sley 40 can strike and which is set so as to prevent the scissors 30 from contacting the wall of the shuttle 20. For closing the scissors 30, they are fitted with a roller 53 on which a stop 54 abuts which is associated with the hammer 19 and—with the downward movement of hammer 19—presses against the roller 53, thus causing the scissors 30 to close.

The tip bunch 21 of the bobbin 18 ready for being knocked into the shuttle, is engaged by the stripper 1, whose construction has already been described in detail hereinbefore.

The driving arms 11, 12 of the stripper 1 are pivotally connected to links 55, 56 which are fixed to the axles 57, 58 that are capable of rotating in bearings 59, 60 mounted on the plate 15. Only the lever 12 is driven, the lever 11 serving as a parallel guiding link of the stripper 1. The shaft 58 has fixed to its rear end a lever 61 which is associated with a bent lever 65 through two universal joints 62, 63 and a connecting rod 64. The lever 65 is rockable about a shaft 66 supported on plate 15. Axially and movably supported within lever 65 is a pin 67 which is engageable in an arcuate guide-cam 68 in a plate 69 fixed to the sley by screws 70, 71.

A fork 72 is pivotally supported by one of its ends 72a—in a portion of lever 65, while the fork's other free end 72b engages an annular groove 73 in the pin 67 (FIGS. 2, 2a and 2b). The leg 72b of the fork 72 has a two-armed lever 74 rockably secured thereon. A torsion spring, 75 which on the one hand is connected to the lever 74 and engages on the other hand a set-ring 76 of the fork leg 72b, tends to urge the lever 74 with its arm 74a towards the leg 72a of the fork 72. The end of the other arm 74b of lever 74 is engaged by a con-

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necting rod 77, the engaging end of which is shown in broken lines in FIG. 1. Said rod 77 can cause the fork 72 to swivel counterclockwise about its leg 72a. As the lever arm 74a abuts on leg 72a of the fork 72, and with rod 77 being drawn further, the fork leg 72b through the annular groove 73 pushes the pin 67 to the right and into engagement with the guide-cam 68 in plate 69.

A spring rocker ensures that the pin 67 is either displaced wholly to the right or wholly to the left and cannot remain in an intermediate position. For this there is provided a coiled compression spring 78 (FIGS. 2, 2a and 2b) which at one end is connected to the leg 72b of fork 72 and at the other to a bolt 79 firmly seated in lever 65. Through the fork leg 72b, the compression spring 78 tends to push the pin 67 to either its right or left position in the lever 65.

Through a universal joint 80 and a lever 81, the connecting rod 77 is associated with the shaft 49 to actuate the outer scissors 30. Consequently, incidental to the advance of the scissors 30 towards the shuttle 20, the pin 67 is moved into engagement with the guide-cam 68 in plate 69 through connecting rod 77, lever 74 and fork 72.

The fork leg 72a has mounted on it a lever 82 adapted to cooperate with the offset portion 83 of a rod 84 which in turn is fixed to the sley 40. As the sley 40 reaches its foremost position, the portion 83 of rod 84 comes against the lever 82 and causes the pin 67 through fork 72 again to move out of engagement with the guide-cam 68 in plate 69 in that the fork 72 swivels clockwise about its leg 72a, retracting with its leg 72b, through the groove 73, the pin 67 from the guide-cam 68.

The action of the described mechanism is as follows:

When the aforementioned bobbin-feeler (not visible in FIG. 1) finds that a bobbin transfer has to take place, mechanically the changing operation will be initiated in exactly the same way as has hitherto been the case in automatic looms. It is understood that bobbin-change takes place whenever the shuttle 20 runs next into the end position according to FIG. 1.

Upon response of the bobbin-feeler, which makes an electric contact in known manner, the outer scissors 30 are brought into the advanced position shown in FIG. 1. Incidentally the connecting rod 77 is moved from the position (shown in broken lines in FIG. 1) on lever arm 74b (FIG. 2) into the position which corresponds to the end of the rod, indicated in solid lines. By this movement, the rod 77 causes the lever 74 to rock counterclockwise while the lever arm 74a causing with its end displacement of the pin 67 to the right and movement of the same into engagement with the guide-cam 68.

By the movement of the sley 40 having the plate 69 with guide-cam 68 fixed thereto, the pin 67 and hence the lever 65 will be raised at first. Incidentally the lever 65 pivots about the axle 66, the rod 64 being raised and the shaft 58 caused to rotate counterclockwise through lever 61. Thereby, through lever 56, the arms 11 and 12 articulated to the stripper 1, are pivoted clockwise about their axles 13, 14 on plate 15 so as to cause the stripper 1 with the mouthpiece 2 to move towards the bobbin 18, and the ring 4 (FIGS. 3-5) to sweep over the bunch 21 of the bobbin.

As soon as the pin 67 is again lowered by the guide-

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cam, there follows a counter-control of the members 65, 64, 61, 58, 56 and therewith of 11, 12 so that the stripper will be carried back (FIG. 4) from the forward position according to FIG. 3, removing thereby the bunch 21 from the bobbin 18. By said outward movement of the stripper, the flap 23 (FIGS. 1-5) comes out of the range of the control member 26 so that it closes the mouthpiece opening while clamping the thread end 21a (FIG. 4). As the stripper entirely reaches its outward position, the chain 27 strikes against the lever 29 on rod 77, thus causing the flap 23 to open partly and permit of the cut thread end 21a or loosened bunch 21 to be drawn into the container 8.

What I claim is:

1. An automatic pirn changer of a loom having a sley comprising transfer means for transferring a pirn from a magazine to a shuttle, said pirn being provided with a tip bunch, a stripping device drawing off the tip bunch from the pirn, said stripping device having a mouthpiece, a device for braking the tip bunch of the pirn to be transferred to the shuttle, comprising a brake, an operating member for closing the brake, said operating member being arranged on the pirn transfer means of the loom, a pusher for releasing the braking device, said stripping device being provided with a locking device for holding the brake closed, said pusher arranged on the sley of the loom for releasing the locking device and opening the brake, said brake comprising a leaf spring mounted fast on the stripping device and a movable brake member comprising a bent rod pivotally mounted on the stripping device and having a portion co-operating with said leaf spring to clamp the outer thread end of the pirn to be transferred and an end portion adapted to co-operate with the locking device which in turn co-operates with a part of the sley of the loom and a flap mounted on said rod for closing the mouthpiece of the stripping device in the closed position of the brake.

2. In an automatic pirn changer of a loom having means for transferring a pirn having a tip bunch from a magazine to a shuttle and a stripping device for drawing off the tip bunch from a pirn being transferred, said stripping device having a mouthpiece, a device for braking the tip bunch of the pirn to be transferred to the shuttle, said braking device comprising a leaf spring mounted fast on the stripping device and a movable member comprising a bent rod pivotally mounted on said stripping device and movable between a closed position and an open position, said rod having a portion co-operating with said leaf spring to clamp the outer thread end of the pirn when said rod is in closed position, means for biasing said rod toward open position, means for moving said rod from open to closed position and for releasably locking it in closed position and a flap mounted on said rod for closing the mouthpiece of the stripping device in the closed position of the brake.

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