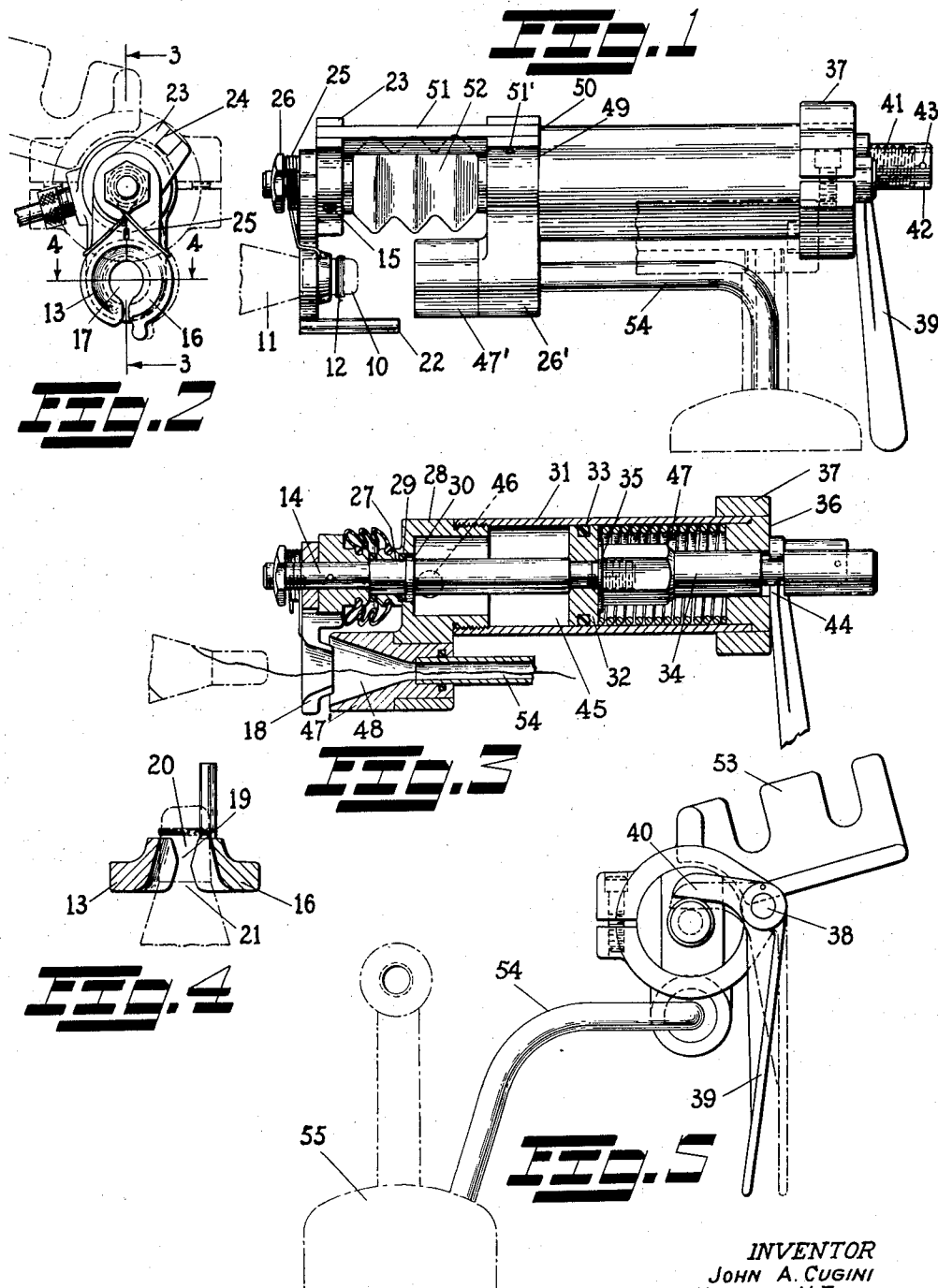


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FILLING BUNCH EXTRACTOR

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FILLING BUNCH EXTRACTOR

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This invention relates to looms for weaving and, in particular, to improvements in filling bunch control means for use with automatic batteries for looms wherein a supply of bobbins or filling packages is automatically controlled incidental to transfer to a shuttle.

It is a general object of this invention to provide a mechanism for automatically removing the tip or filling bunch from a bobbin just prior to transfer of said bobbin to a shuttle, holding said filling bunch for a period of time, and then removing said bunch and depositing it in a waste receptacle.

It is a further object of this invention to provide an extractor which is operated by air under pressure and which will accomplish this removal of the filling bunch very rapidly in timed sequence with other parts of the loom.

It is a further object to provide an extractor having a novel extractor head which operates to effect a positive physical removal of the tip bunch and to bring said bunch to the mouth of a fixed suction device which holds the loosened thread for a period of time until this portion of the filling is cut by the temple thread cutter at which time the suction device causes a positive removal of this thread away from the transfer area.

Other objects will become apparent from the following more detailed disclosure.

It has been recently suggested to improve the manner of removal of the tip bunch from bobbins during transfer thereof into a shuttle by utilizing a suction thread disposal means concentrically contained within a part of a tip bunch remover and connected to an air system at the loom and controlled by an air operated timer means acting to valve air to the system upon the initial movement of the members of the bobbin transfer system. Such a device is disclosed in United States Patent No. 2,845,957. The timer disclosed therein operates to actuate an air controlled extractor head which operates to remove the tip bunch from its bobbin and simultaneously provides a suction means for removal of this bunch as well as the filling end of the exhausted, outgoing supply from the selvage to a #25 Draper cutter mechanism at the proper time. Such an extractor operates extremely well and assures removal of the tip bunch from the bobbin and eliminates the hazard of loose thread ends being carried back into the shed and causing imperfections in the fabric.

According to the instant invention, the above advantages are incorporated in a modification of an extractor assembly. A novel extractor has been devised which is air operated by means of a timer which may be similar to that disclosed in the above-cited patent and which comprises an air operated gripping means effective to cause physical removal of the tip bunch from its bobbin directly to a fixed suction means. A novel extractor head allows transfer of a bobbin in the event of a failure in the air supply or in the event that the bobbin is transferred at a time when the extractor head is not completely removed from the end of the bobbin.

The invention will be described in greater detail by

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reference to the accompanying figures of drawing, in which:

Fig. 1 is a general view of the extractor assembly with the extractor head fully expanded in position over the next bobbin to be transferred.

Fig. 2 is an end view as seen from the left side of Fig. 1 with certain parts removed therefrom.

Fig. 3 is a section taken on line 3—3 of Fig. 2, showing the extractor head in retracted position and with bobbin in position for transfer.

Fig. 4 is a section taken on line 4—4 of Fig. 2 and with bobbin in position for transfer.

Fig. 5 is an end view as seen from the right side of Fig. 1.

Now referring to the figures, 10 denotes one end of a bobbin having a filling 11 wound thereupon and a tip bunch 12 adjacent the end received in the extractor. The bobbin is tapered so that its diameter is slightly smaller at the end shown than at its opposite end for reasons to be explained later. A first extractor head 13 is fixedly mounted to a piston rod 14 by means of a pin 15 extending through the rod and the rim portion of said extractor head surrounding the rod. A second extractor head 16 is pivotally mounted on said rod adjacent said first head. The two heads form an adjustable opening 17 at their lower end as seen in Fig. 2 for receiving the end 10 of the bobbin. The opening is tapered as shown at 18 so that its smaller diameter is at that end of the opening which last receives the bobbin. As shown at 19 in Fig. 4 the opening is never completely enclosed and the cross section of the heads at their lowermost portion forming the opening is such that it forms outwardly directed tapered paths 20 and 21. This insures ready removal of the bobbin from the extractor heads in the event that a transfer should take place at a time when the extractor heads are not completely removed from the end 10 of the bobbin. Thus, if a transfer should take place with the extractor assembly in the position shown in Fig. 1 (which would happen, for example, in the event of a failure of air pressure to the assembly as will be apparent from the description of the apparatus to follow) no matter if the end 10 of the bobbin were flexed upwardly or downwardly by the transfer mechanism, the tapers 20 and 21 permit ready release of the bobbin.

A pin 22 is welded or otherwise fastened to the lower edge of the movable extractor head and prevents outward ballooning of the filling as it is removed from the bobbin. The fixedly mounted extractor head has an extension 23 at its opposite end with a slot 24 therein. A coil spring 25 bears against the outer edges of the two extractor heads so that it tends to maintain the opening defined thereby at a minimum size. A nut 26 is threaded on the end of the rod 14 to lock the spring and extractor heads in position.

The piston rod 14 extends through an opening 27 in a cylinder head 28. A rubber ring 29 forms an air seal between the rod and said opening and is locked in place by means of a seal retainer 30. A cylinder 31 is threadably engaged to the cylinder head 28. At its other end the piston rod has a reduced portion over which the piston 32 having a rubber sealing ring 33 in a circumferential groove therein is slidably engaged. An extractor latch rod 34 is threadably engaged with the piston end of the rod and bears against lock washer 35 to maintain the piston in position. A cap 36 is inserted into the end of the cylinder opposite the cylinder head and has a central opening therein for receiving the latch rod 34 which protrudes therethrough. A latch clamp 37 is fastened around the capped end of the cylinder and has protruding therefrom a pin 38 over which is pivotally mounted the latch 39 having an end 40 which is biased in the direction of the rod 34 by means of a coil spring

41 held in place by a spring case 42 and cotter pin 43. The rod 34 has a circumferential groove 44 therein for receiving the end 40 of the latch when air is introduced into the chamber 45 through the opening 46 to move the piston 32 to the right side of the extractor assembly as shown in Fig. 2, thus simultaneously moving the extractor head in the same direction to effect a physical removal of the tip bunch from the extractor. A spring 47 returns the piston and its attached parts back into position for the extractor heads to slip over the next bobbins to fall into position. This happens when the air supply to the chamber 45 is turned off by a timer assembly (not shown) which may be identical to that shown in Patent No. 2,845,957, while at the same time the latch 39 is released by a trip means (not shown) attached to the lay of the loom.

At its lower end of the cylinder head has an extension 26' having an opening in line with the opening 17 defined by the extractor heads. A nozzle 47' having a tapered inlet 48 is press fitted or otherwise immovably fixed in said cylinder head opening. At a second point the cylinder head has another extension 49 having a slot 50 in line with the slot 24 in the extractor head 13. A guide rod 51 is fixed in the extension 49 by means of a pin 51' and the extension 23 of the extractor head is slidable thereover. The guide rod thus acts to maintain the openings 17 and 48 aligned at all times. A rubber boot 52 protects the exposed portion of the piston rod from becoming coated with lint which may effect the operation of the assembly. A cylinder bracket 53 is attached externally of the cylinder and is adapted to be fastened to a stationary part of the loom. A suction tube 54 leads from the opening 48 to a suction device 55 which is also timed in its operation by the air controlled timing means.

The extractor heads, piston rod, cylinder head and nozzle are preferably constructed of a non-rusting metal such as brass or aluminum, while the latch, latch clamp and cylinder bracket are preferably, although not necessarily of cast iron. The guide rod and latch rod may be of steel.

The operation of the extractor assembly is as follows:

Before a call for transfer is made by the usual feeler mechanism of the loom, the extractor will be in the position shown in Fig. 1 with the extractor heads over the end of the bobbin as shown and the tip bunch still in place. As the call for transfer is made, the timer means permits entry of air to the chamber 45 as well as to the suction means 55. The piston 32 is caused to be moved to the right moving the extractor heads with it which cause a physical removal of the tip bunch from the end of the bobbin. The end 40 of the latch falls into the groove in the latch rod thus holding the assembly in the position shown in Fig. 3. Since the suction device 55 is now in operation, the tip bunch will be sucked through the tube 54 and held therein.

The usual bobbin transfer mechanism then causes the bobbin 10 to be transferred into the shuttle. The timer permits air to be supplied to the cylindrical chamber for a period of time sufficient to permit another bobbin to fall into place and become aligned with the opening of the extractor heads. This period of time is about two picks of the shuttle and thus since the air pressure is on during this time, the trip means on the lay does not release the latch upon its first impact therewith, but rather upon the second impact.

As this happens the extractor heads are caused to slide over the end of the new bobbin due to the pressure exerted by the spring 47 upon the piston and the extractor assembly is in position for the next transfer. A slight tapering of the bobbin in the same direction as the direction of taper of the opening defined by the extractor heads permits the latter to slide over the tip bunch without displacing it while also being able to apply sufficient pressure by the heads upon the bobbin to insure removal of

the tip bunch upon retraction of the heads. For the latter reason the opening defined by the extractor heads should be slightly smaller than the diameter of the bobbin at that point at which the tip bunch is normally wound.

The timer permits air to be introduced to the suction device 55 for a time sufficient to permit the usual salvage cutter to cut the end of the thread of the bobbin which has just been transferred into the shuttle. As the thread is cut, the suction device causes it to be withdrawn through the tube 54 and to be deposited in a waste receptacle.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

We claim:

1. In a loom for weaving having a bobbin feeding means for retaining and presenting for transfer to a loom shuttle a supply of bobbins having filling wound thereon an end of which is wound in the form of a tip bunch adjacent the bobbin end, transfer means for moving the leading one of said supply of bobbins into the shuttle upon call for replenishment, a combined means for removing the bunch from bobbin ends and for disposing of it and retaining the filling end while the shuttle is picked the improvement which comprises a pair of extractor members defining an opening therebetween, one of said members being pivotally mounted to vary the size of said opening, fixed suction means and air pressure responsive means for moving said extractor members to a position adjacent said suction means.

2. In a loom for weaving having a bobbin feeding means for retaining and presenting for transfer to a loom shuttle a supply of bobbins having filling wound thereon an end of which is wound in the form of a tip bunch adjacent the bobbin end, transfer means for moving the leading one of said supply of bobbins into the shuttle upon call for replenishment, a combined means for removing the bunch from bobbin ends and for disposing of it and retaining the filling end while the shuttle is picked the improvement which comprises a pair of extractor members defining an opening therebetween, one of said members being pivotally mounted to vary the size of said opening, fixed suction means and an air controlled piston for moving said extractor members to a position adjacent said suction means.

3. In a loom for weaving having a bobbin feeding means for retaining and presenting for transfer to a loom shuttle a supply of bobbins having filling wound thereon an end of which is wound in the form of a tip bunch adjacent the bobbin end, transfer means for moving the leading one of said supply of bobbins into the shuttle upon call for replenishment, a combined means for removing the bunch from bobbin ends and for disposing of it and retaining the filling end while the shuttle is picked the improvement which comprises a cylinder and piston out of alignment with that bobbin which is next to be transferred, gripping means operatively connected to said piston and movable therewith to a position to engage said bunch and remove it from its bobbin, means to admit air under pressure to force said piston in one direction and resilient means to move said piston in the opposite direction, and a suction means fixedly mounted on an axis parallel to that of said cylinder for receiving said bunch directly from said gripping means.

4. The combination of claim 3 wherein said gripping means comprises an extractor head fixed to one end of a piston rod inserted into said piston at its other end and a second extractor head movable on said rod defining an adjustable opening in line with said suction means.

5. The combination of claim 4 and including means

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for maintaining said fixed extractor head aligned with said suction means.

6. The combination of claim 4 including means to retain said gripping means and piston in said one direction for a period of time.

7. The combination of claim 6 wherein said retaining means comprises a spring biased latch element adapted to be received in and released from a circumferential groove in a latch rod co-axially fixed to said other end of the piston rod.

8. The combination of claim 6 wherein said retaining means comprises a spring biased latch rod.

9. For a loom employing bobbins having filling wound thereon an end of which is wound in the form of a tip finder bunch adjacent the bobbin end, an extractor head for stripping said bunch from a bobbin to be transferred which comprises a first bracket fixedly mounted at one end upon an axis and a second bracket loosely mounted at one end upon said axis and spring biased toward said first bracket, said brackets at their other end jointly forming an adjustable opening adapted to receive said finder bunch.

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10. The extractor head of claim 9 wherein said opening is tapered toward one end thereof.

11. For a loom employing bobbins having filling wound thereon an end of which is wound in the form of a tip finder bunch adjacent the bobbin end, an extractor head for stripping said bunch from a bobbin to be transferred which comprises two brackets mounted at one end thereof upon a common axis and movable with respect to each other such that they form an opening of variable size at their other end, said brackets being spring biased toward each other to maintain the opening at a minimum.

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