This invention relates to apparatus for automatically cleaning or removing the residue of yarn left on a bobbin after discharge from an automatic weft-replenishing bobbin-changing loom and concerns an improvement in or modification of the apparatus for this purpose described in the specification of our prior U. S. patent specification No. 2,294,300.

The apparatus according to the said prior specification comprises stop means for temporarily arresting the discharged bobbin in its passage through the cleaner, mechanically driven rollers for entraining the yarn from the bobbin while the latter is thus temporarily arrested so as to unwind the yarn from the bobbin, means to ensure presentation of the bobbin base foremost and means for temporarily gripping or holding the loose or trailing end of the residue of weft yarn. The means for temporarily gripping or holding the loose end of the residue of weft yarn comprises a moving gripping surface, in the form of a carded endless belt conveyor or apron on to which the yarn end is pressed by a yielding yarn holder. This carded endless apron conveyor has the upper run of the belt on a level with the tops of the peripheries of a pair of nipping rollers by means of which the yarn end is entrained and drawn off the belt.

In the modified apparatus provided according to the present invention the endless apron conveyor is replaced by a fixed inclined guideway for gravitation of the bobbin received from the loom, a rough facing to the said guideway being adapted to frictionally engage the trailing yarn and partially unwind same from the gravitating bobbin; the apparatus also comprises a pair of constantly-rotating nip rollers one of which is positioned with its periphery close to the lower end of the guideway, a movable stop device positioned adjacent to one of the nip rollers and urged to an operative position thereby to allow the bobbin to fall from the apparatus, said displacing means being arranged to permit return of the stop device to operative position directly when the bobbin has passed said stop device, the said stop device being thus returned being arranged to engage the trailing yarn with one of the nip rollers thereby to cause said rollers to entwine the yarn through the nip.

An apparatus of preferred form in accordance with the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a sectional side elevation of the apparatus.

FIGURE 2 is a front elevation of the apparatus, and

FIGURES 3 and 4 are fragmentary side elevations looking from the left-hand and right-hand sides respectively of FIGURE 2.

Referring to the drawings, the apparatus comprises a main frame constituted by a pair of side plates 5, 6 which are connected together in spaced relation by bolts 7. Between said side plates there is fixed a guide block 3 which may be made of wood or any convenient material. Said guide block is formed with an inclined channelled wall 8, the channel having an arcuate shape in section; the channel base is indicated by the said reference 9, and the walls at the sides of the channel are indicated by reference 10. The channel base 9 is faced with card clothing 11 or with other material having a rough surface.

Between the side plates 5 and 6 there are rotatably mounted a pair of horizontal nip rollers 12, 13 which are geared together by pinions 14, the shaft 15 of roller 13 being extended and being formed to have a pin-and-slot connection with a shaft which is power driven from the loom. The said shaft extension 16 has secured thereon a pinion 17 which meshes with a gearwheel 18 freely rotating about a stub shaft 19 fixed on the outer face of the adjacent side plate 5 of the machine, said gearwheel 17 being provided with an eccentrically mounted roller 19 constituting a crank. The said crank roller is adapted to engage an arm 20 bent laterally from a pivot rod 21 on which is fixed a frame 22 mounted between the side plates, the arm 20 being adapted to be displaced by contact with the crank roller 19 to impart lifting movement intermittently to said frame 22. The said movable frame 22 carries a rotatable secondary roller 23 forming the movable stop device and normally maintained in contact with the lowermost nip roller 13 positioned remote from the guideway channel 8, the frame being urged to this position by gravity and/or by means of a tension spring.

As shown in Figure 1, the block 8 is recessed to partly accommodate the roller 12, the periphery of said roller 12 being close to the lower end of the channel guideway 8. The nip rollers 12, 13 have their peripheries in mutual contact and they are so arranged that the plane containing their two axes is parallel with the plane of the base of said channel guideway 8, said rollers projecting somewhat above the plane of the base of said channel guideway. Bearing blocks 24 for the shafts of said rollers 12,
13 are arranged to pass down inclined slots 25 formed in the side plates 5 and 6 to extend downwardly from corresponding upper corners thereof. Compression springs 28 are fitted in said slots, each of which bears at its respective ends upon the upper bearing block 24 and upon a back plate 27 fitted in a transverse slot 29 and having upturned ends. Said springs 28 serve to maintain contact pressure between the rollers 12 and 13. This arrangement allows the rollers to be readily removed by passing their bearing blocks 24 up the slots 25 after removing the springs 26.

In substitution of the aforesaid wooden or like guide block 8, equivalent guideway components may be formed or otherwise provided on the inner faces of the side plates 5 and 6.

A tapered hopper 20 which admits the bobbin to the guideway channel 9, is detachably mounted on a bracket 30 attachable to the loom frame. The wall 31 of said hopper is in line with the base of the guideway channel 9 and is faced with rough-surfaced material 32. Said hopper wall 31 constitutes an extension of the guideway provided by the channel 9.

In the operation of the device a bobbin 33 discharged base foremost from the loom falls into the hopper 20 and gravitates therein to the guideway channel 9 and thence over the top of the uppermost nip roller 12 as far as the secondary roller 23, the latter serving as an arresting stop. The trailing thread 34, being in contact with the rough lining 32 and 11 of the hopper and channel, is, by the passage of the bobbin down the hopper and channel, unwound to some extent, leaving said thread 34 with a long trailing end. The secondary roller 23 after having thus temporarily arrested the bobbin, is raised (see dotted lines Figure 1) due to the crank roller 19 lifting the inner frame 22, and the bobbin is thereby released and falls at such a position that the trailing thread 34 keeps more or less in contact with the nip rollers 12, 13. The crank roller 19 releases the frame 22 at or about the moment that the bobbin has cleared the lowermost nip roller 13 and said frame immediately drops by its weight to a position in which the roller 23 grips the trailing thread 34 between itself and the roller 13. The thread is thus held firmly and becomes unwound from the bobbin 33 as same falls from the machine. By rotation of the rollers 12 and 13, the thread, which is gripped between the roller 13 and the secondary roller 23, is drawn into and through the nip, and is discharged down a chute 35. Guard strips 36 made of rough material and which contact with the roller peripheries or terminate close thereto, prevent the detached thread portions from becoming wound on to the rollers 12 and 13.

If desired, one of the nip rollers may be provided with end flanges 37 to prevent the thread from passing down behind the ends of the rollers.

We claim:

1. Apparatus for removing residue yarn from a bobbin discharged from an automatic weft-replenishing bobbin-changing loom, comprising a pair of plates connected together in spaced relation to form a frame, a guide block fixed between said plates and having an inclined channel faced with rough-surfaced material and constituting a guideway for gravitation of a bobbin received from the loom, said rough-surfaced guideway being adapted to frictionally engage the trailing yarn and partially unwind same from the gravitating bobbin, a pair of constantly-rotating nip rollers mounted between the side plates and geared together and arranged so that the plane containing their two axes is substantially parallel to the guideway, one of said rollers being positioned with its periphery close to the lower end of the guideway and so that a bobbin gravitating down said guideway will pass on to the top of said roller, a secondary roller mounted in a movable frame positioned between the said plates, means urging said frame to a position in which the said secondary roller contacts with the nip roller positioned remote from the guideway and constitutes a stop device adapted to arrest a bobbin passing down the guideway, and means for momentarily displacing said frame and consequently raising the secondary roller to allow the bobbin to fall from the apparatus, the secondary roller being adapted on its return to operative position to engage the trailing yarn with the nip roller with which said secondary roller contacts, thereby to entrain the yarn through the nip.

2. Apparatus for removing residue yarn from a bobbin discharged from an automatic weft-replenishing bobbin-changing loom, comprising, a frame, a guide block fixed in the frame and having an inclined channel faced with rough-surfaced material and constituting a guideway for gravitation of a bobbin received from the loom, said rough-surfaced guideway being adapted to frictionally engage the trailing yarn and partially unwind same from the gravitating bobbin, a pair of constantly-rotating nip rollers mounted between the side plates and geared together and arranged so that the plane containing their two axes is substantially parallel to the guideway, one of said rollers being positioned with its periphery close to the lower end of the guideway and so that a bobbin roller 13 shall pass on to the top of said roller, a secondary roller mounted in a movable frame positioned between the said plates, means urging said frame to a position in which the said secondary roller contacts with the nip roller positioned remote from the guideway and constitutes a stop device adapted to arrest a bobbin passing down the guideway, means for momentarily displacing said frame and consequently raising the secondary roller to allow the bobbin to fall from the apparatus, the secondary roller being adapted on its return to operative position to engage the trailing yarn with the nip roller with which said secondary roller contacts, thereby to entrain the yarn through the nip, a hopper adapted to receive a bobbin on its discharge from the loom, and a wall to said hopper disposed in line with and constituting an extension of the guideway channel of the block, said hopper wall being faced with rough-surfaced material.

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