Dec. 10, 1935. J. W. H. CONGDON 2,023,914

AUTOMATIC BUNCH BUILDER

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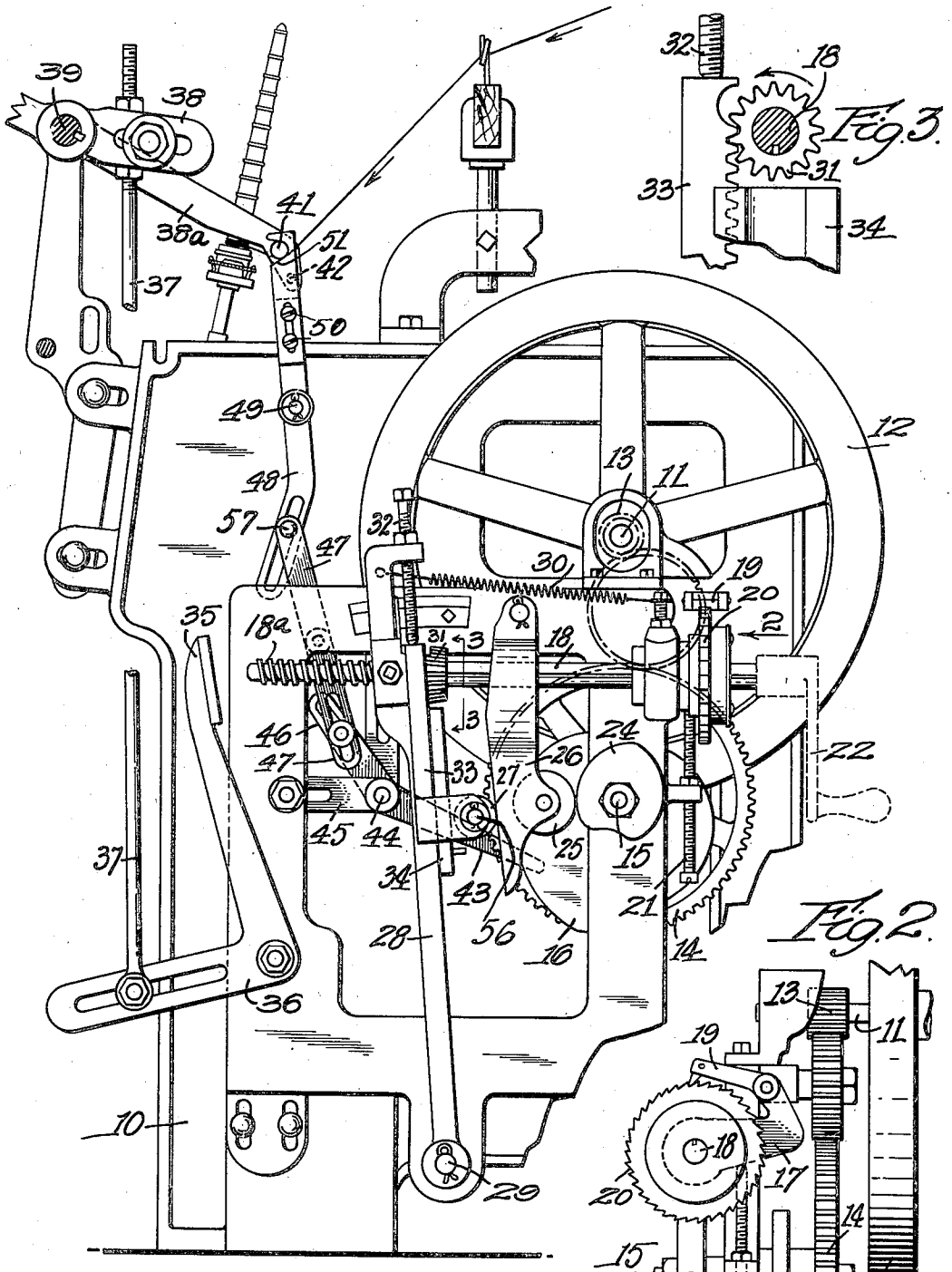


Fig. 1.

Fig. 3.

Fig. 2.

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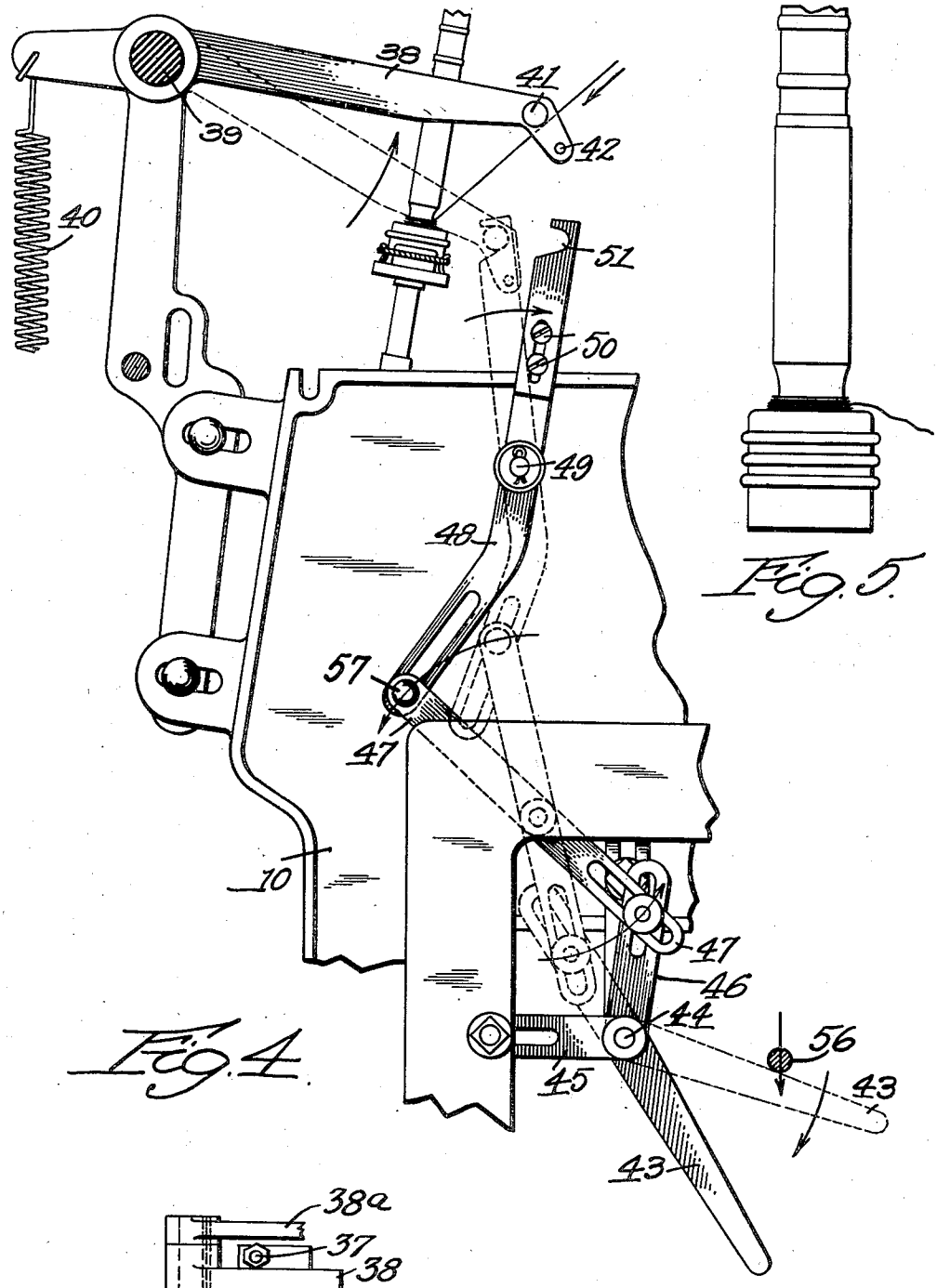


Fig. 4.

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE

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AUTOMATIC BUNCH BUILDER

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Application January 21, 1935, Serial No. 2,619

4 Claims. (Cl. 242—43.7)

This invention relates to an automatic bunch builder constituting a part of a yarn winding machine.

The principal objects of the invention are to provide simple and effective means for winding a definite amount of yarn in the bunch at the butt of the bobbin to avoid waste, and to provide automatic control therefor.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a side view of a bobbin winding machine showing a preferred embodiment of the bunch builder which is the subject of this invention;

Fig. 2 is an end view, looking in the direction of the arrow 2 in Fig. 1;

Fig. 3 is an enlarged sectional view on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged side view of the means for releasing the bunch building mechanism so as to provide for the regular winding of the bobbin, showing two positions in full and dotted lines;

Fig. 5 is a full size view of a bobbin with the bunch wound thereon, and

Fig. 6 is a plan at the left of Fig. 1.

In the winding of yarn automatically on a bobbin, in such a manner that the bobbin will function properly in an automatic loom, a so-called "bunch" is formed at the butt end of the bobbin. This bunch or knob of yarn constitutes the reserve amount of yarn on the bobbin which is required after the feeler in the loom shuttle functions. It provides the necessary reserve of three picks, usually, so that the bobbin may make one complete cycle on this yarn before being thrown out of the magazine in the head of the loom. To avoid excessive waste it is essential that an allowance be made for three picks and no more. The present bunch builder, operating under automatic control, provides for winding this definite amount of yarn and thus prevents waste. Without automatic control the operator would have no positive method of preventing excessive waste.

The present invention relates only to the automatic control of the bunch builder. The invention is shown as applied to a bobbin winding machine, mostly constructed according to well known principles.

The machine frame 10 supports the main shaft 11 which is provided with a fly wheel 12 fixed thereon. On the shaft 11 is a pinion 13 which, through a gear, drives a gear 14 on a shaft 15, which carries a heart shaped cam 16. This cam, as it rotates, oscillates an arm 17 pivoted freely on a shaft 18 which really constitutes a part of the builder screw 18a. The arm 17 carries a pawl 19 which operates a ratchet wheel 20 which is splined to the builder screw. Consequently, every time the cam engages the arm 17 it advances the ratchet wheel. A screw 21 is provided as a stop screw for the arm 17. If the screw is adjusted downwardly the throw of the pawl will be increased, obviously. This gives an intermittent rotation to the builder. This builder screw is provided with a detachable handle 22 by which it can be turned for adjustment before the machine starts to operate.

On the shaft 15 is another heart shaped cam 24, which operates a roll 25 on a depending arm 26 and in turn moves a roll 27 which is carried on a bracket on a rack 33. This rack is slidably mounted on a frame 28 pivoted on a stud 29 and is moved to the left by the operation of the cam 24 and held against the arm 26 by a spring 30. This frame is provided with the rack 33 on the back side engaging a pinion 31 slidably splined to the builder screw shank 18. The frame 28 extends above this builder screw and is provided with a bracket at the top carrying an adjusting limit screw 32 for engaging the rack 33 slidably mounted on the frame 28. The end of the shaft 18 is in the form of a screw which is the usual builder screw. The rack 33 slides against a way 34 on the frame 28. The rack 33 is capable of a motion along the frame 28 that is adjusted by the use of the screw 32.

In the usual way the builder screw reciprocates, and at one extreme, engages the end of a toe 35 on a lever 36 which is adjustably connected to a rod 37 also adjustably connected with an arm 38 on a shaft 39. On the shaft 39 is another arm 38a. A spring 40 normally tends to hold the parts normally in the position shown in Fig. 4 and also the toe 35 against the end of the builder screw at all times when the builder screw is far enough to the left so that it will follow it as it moves to the right, but not all the way because the motion of the toe 35 to the right is limited by the rod 37. When the parts are free this builder screw and guide studs 41 and 42 on the lever arm 38a will guide the yarn to move throughout the length of the bobbin and lay the yarn on the bobbin in the regular way but the toe 35 is held beyond the end of the builder screw except just at the end of its stroke by the rod 37.

For putting the bunch, consisting preferably of three picks of yarn, at the large end of the

bobbin it is possible to hold down the lever 38 in the position shown in Fig. 1 and prevent its motion back and forth while these three picks are wound on. For this purpose the stud 56 on which the roller 27 is mounted engages a lever 43 pivoted by a stud 44 mounted on adjustable brackets 45. The other arm 46 of this lever 43 is adjustably connected by a link 47 at 57 with a lever 48 pivoted on a stud 49. This lever has its opposite arm adjustable by bolts 50 and carries a notch 51 adapted to engage the guide pin 41 and hold the lever 38 down in the position shown in Fig. 1 to build the bunch.

The heart cam 16 functions to raise the lever 17, move the pawl and turn the shaft 18 intermittently. This shaft rotates in such a direction as to lower the rack 33 from the screw 32 by the action of the gear 31. When the required amount of yarn is wound on the bobbin, the stud 56 on which the roll 27 is mounted presses down on the lever arm 43 on account of the action of the rack in moving down. This operates the other arm 46 of this lever, link 47 and lever 48 to move the upper end of the latter backwardly into the position shown in full lines in Fig. 4. In fact, Fig. 4 shows in dotted lines the bunch building position of this set of levers and in full lines the released position. In the dotted line position the yarn has to be guided to the head of the bobbin and in the released position the yarn guiding pins 41 and 42 move back and forth in accordance with the ordinary operation of the bunch builder screw and under the control thereof. Therefore, it will be obvious that after the bunch is built the machine now functions to completely wind the full length of the bobbin.

This constitutes a simple device for holding the yarn temporarily to build the bunch and releasing it automatically after a definite amount of yarn has been wound so that the winding of the bobbin in the usual way may be continued. By this arrangement there is no danger of winding an excessive amount of yarn to provide the bunch and excessive waste, therefore, is prevented.

Having thus described my invention and the advantages thereof I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:—

1. In a bunch builder for a bobbin winding machine, the combination of a pivoted arm, a yarn guide on the arm, yielding means for swinging the arm in one direction, and means for controlling the moving of the arm in the opposite direction, with a lever having a notch engaging the guide for holding the guide in a position to guide the yarn to the butt end of the bobbin, and means for automatically moving the lever to release the guide, whereby the yielding means will operate it after a predetermined length of yarn has been wound.

2. In a bunch builder for a bobbin winding machine, the combination of a builder screw, means for rotating it intermittently, a lever for engaging the end of the screw, a movable arm carrying a yarn guide, means for connecting the lever with said arm, yielding means for moving the arm in one direction, means for holding the guide in stationary position, and means operated by the builder screw for disconnecting the last named means and leaving the guide free to be moved along the bobbin by the yielding means.

3. In a bunch builder for a bobbin winding machine, the combination of a builder screw, means for rotating it intermittently, a gear on the builder screw, a movable frame, a rack carried by said frame and meshing with the gear to be operated thereby, a stud carried by the rack, a lever in position to be operated by the stud when the rack moves to a predetermined point, a yarn guide, means for holding the guide stationary, and means operated by the lever for releasing the last named means.

4. In a bunch builder for a bobbin winding machine, the combination of a builder screw, means for rotating said screw intermittently, a gear on the builder screw, a frame pivoted to swing on an axis, a rack slidably carried by said frame and meshing with said gear, a stud carried by the rack, a lever in position to be moved by the stud when the rack is moved by the gear to a predetermined point, a link adjustably connected with the lever, a second lever adjustably connected with the link, said second lever having a notch, and a yarn guide in position to be engaged and held by said notch until the stud moves the first named lever and moves the notch away from the stud.

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