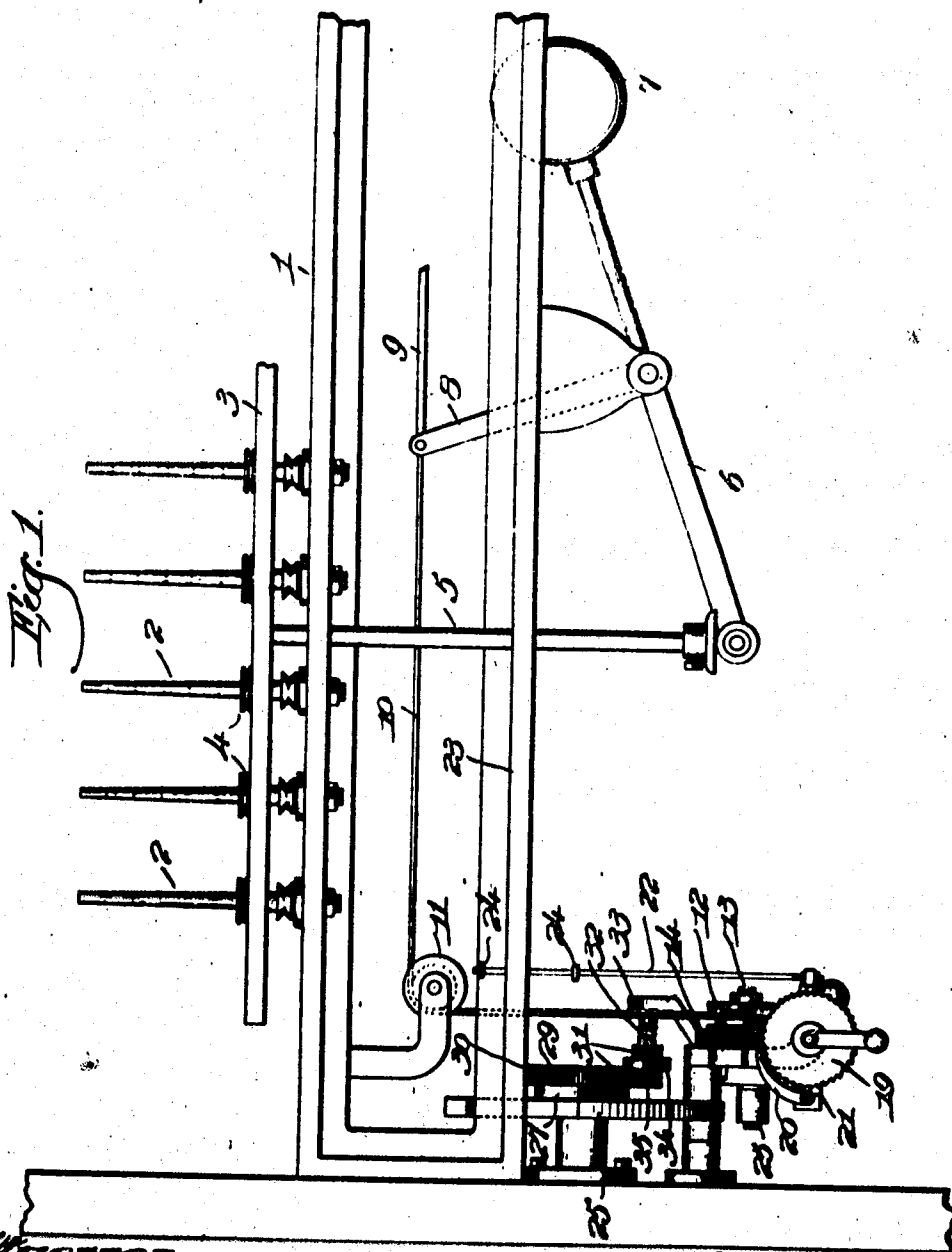


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TRAVERSE MOTION FOR YARN SPINNING APPARATUS.
APPLICATION FILED JULY 27, 1910.

974,614.

Patented Nov. 1, 1910.

2 SHEETS—SHEET 1.



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Fig. 2.

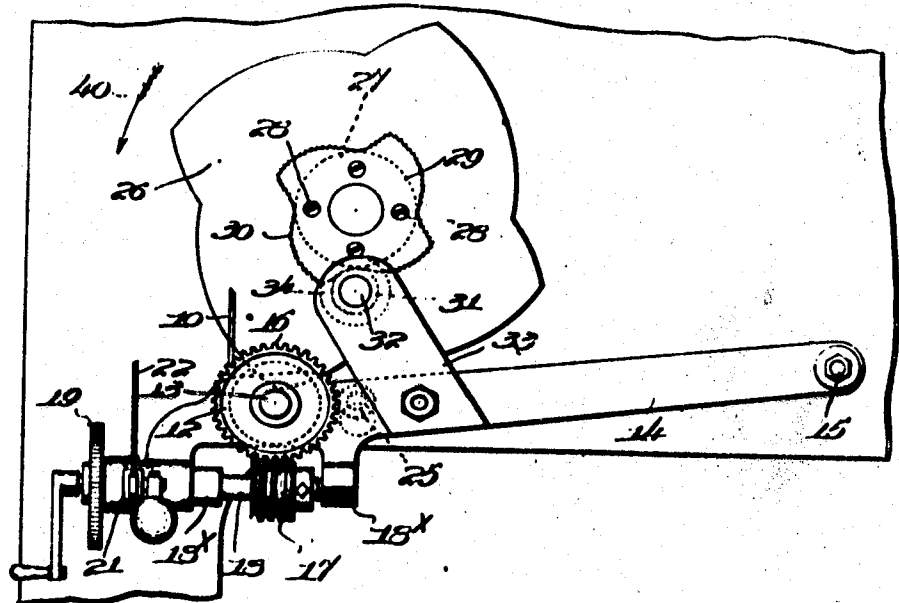
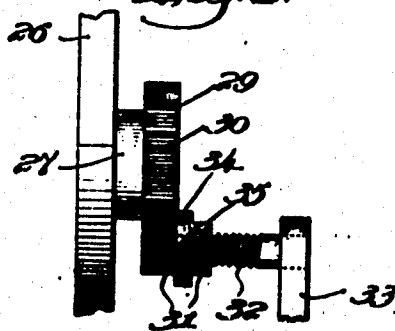
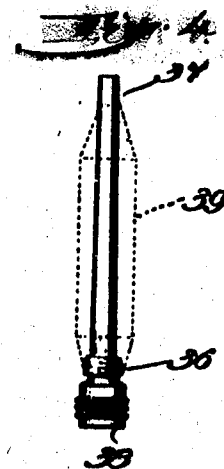


Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL R. TRUESDALE, OF LONSDALE, RHODE ISLAND, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

TRAVERSE-MOTION FOR YARN-SPINNING APPARATUS.

974,014.

Specification of Letters Patent.

Patented Nov. 1, 1910.

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To all whom it may concern:

Be it known that I, SAMUEL R. TRUESDALE, a citizen of the United States, and resident of Lonsdale, Cumberland township, county of Providence, State of Rhode Island, have invented an Improvement in Traverse-Motions for Yarn-Spinning Apparatus, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to a traverse motion for yarn spinning apparatus of the type wherein the yarn is first wound upon the bobbin to form a primary winding or "bunch," and thereafter a secondary or main winding of the yarn is laid upon the bobbin to complete the building of the yarn-mass thereon.

Bobbins so wound are designed for use in automatic filling-replenishing looms wherein the change of filling is effected through the instrumentality of a feeler when the yarn has been woven off to a predetermined extent, the primary winding or bunch then containing a sufficient length of the yarn to preserve continuity of filling when filling replenishment is effected.

Looms of this type are well known in the art and require no further description herein.

My present invention has for its general object the production of a traverse motion of the character above specified, and has for its more particular object the simplification and improvement in various features of construction of the traverse motion forming the subject-matter of United States Patent No. 949,399, granted February 15, 1910 to J. F. Mulheim. In said patent the bunch is formed by or through the coöperation of a bunch-building cam with a cam-roll or follower carried by the builder-arm, to give the desired short traverse to the ring-rail, and by means of transmitting connections between the cam-shaft and a threaded hub, coöperating with the shaft on which the follower is mounted, such hub is revolved to move the follower laterally out of engagement with the bunch-building cam when the bunch is completed. Thereupon the heretofore inoperative main building cam is brought into coöperation with its own follower, carried by the builder-arm, and the main or service winding of yarn is laid

on the bobbin to complete the yarn-mass. In my present invention I also employ a bunch-building cam and a main building cam, each having its own follower, carried by the builder-arm, but I so construct the bunch-building cam and its follower that the rotative movement of the cam is transmitted directly to the follower, the rotation of the follower effecting also a lateral movement thereof to disengage it from its cam when the bunch winding is completed.

By the construction referred to I attain the desired results by very simple and direct-acting mechanism, as will be made apparent hereinafter. I have also provided simple means for regulating the amount of yarn to be laid in the bunch winding.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

In the present embodiment of my invention the construction is such that the ring-rail rises and falls with the ascent and descent, respectively, of the oscillating arm of the builder-motion.

Figure 1 is a front elevation of a portion of a spinning-frame with my present invention applied thereto; Fig. 2 is an enlarged side elevation of the traverse-motion embodying my present invention, looking toward the left-hand end of the apparatus illustrated in Fig. 1; Fig. 3 is an enlarged detail in front elevation of the bunch-building cam, its follower, and a portion of the main building cam; Fig. 4 is a view of the bobbin with the bunch winding thereon, the completed yarn-mass being indicated by dotted lines.

The spindle-rail 1, Fig. 1, provided with usual rotatable spindles for the bobbins 2, the vertically reciprocating ring-rail 3 provided with rings 4, the lifter-rods, as 5, rocker 6 having the weight 7, rocker-arm 8, and link 9, and the flexible connection or chain 10 passing from said rocker-arm over the guide-sheave 11 to the winding drum of the builder-motion, are and may be all of well known construction and operate in usual manner; the rocker 6 and rocker-arm 8 being fixedly connected to rock in unison as the ring-rail rises and falls.

The builder-motion is of usual construction in general, and comprises the winding drum 12, rotatably mounted on a stud 13

extended laterally from the oscillating builder-arm 14, fulcrumed on the main frame at 15, Fig. 2; the worm-gear 16 secured to or forming a part of the drum 12 and driven by a worm 17, Fig. 2, on a shaft 18 rotatable in bearings 18' on the builder-arm, and the ratchet or pick-wheel 19 fast on the front end of the shaft 18 is rotated step by step by the pawl 20. Said pawl is mounted on the rocking pawl-carrier 21 and the latter is actuated by the rod 22 extended upward therefrom through a part 23 of the main frame and provided with nuts 24 above and below said part 23, all in usual manner, the oscillation of the builder-arm acting through the rod 22, pawl-carrier, pawl 20 and pick-wheel 19 to rotate the winding drum 12 intermittently and thereby gradually let off the flexible connector 10 to provide for the gain of the traverse as the winding proceeds.

The builder-arm 14 is provided with a roller or other stud 25, Figs. 1 and 2, serving as a follower for the main building or traverse-cam 26 when brought into engagement therewith after the completion of the bunch, said cam being shown in Fig. 2 as a four-point traverse-cam of familiar form, mounted on the left hand of the frame and rotated by suitable mechanism, not shown. When said cam is operative to actuate the builder-motion the follower 25 is held in engagement therewith by the weight 7, as will be understood.

Upon the inner side of the cam is formed a thick boss or hub 27, to the end of which is fixedly secured, as by screw-bolts 28, Fig. 2, a bunch-building cam 29 concentric with cam 26, and herein shown as a four-point cam very similar in shape to the main building-cam, but whereas the cam face of the latter is smooth the face of the cam 29 is provided with transverse teeth 30. The contour of this cam is shaped to give a gradual but short rise to the ring-rail and a quick descent, whereby the winding of the bunch is effected in a manner similar to that of the main or service winding, but with a relatively short traverse, as will be apparent from Fig. 2. This bunch-building cam co-operates, during the formation of the bunch, with a follower formed as an elongated toothed roll 31 having an integral spiral groove to co-operate with a spirally threaded stud 32 extended horizontally from an up-turned arm 33 rigidly mounted on the builder-arm 14.

A stop-collar 34 is adjustably held on the follower 31 by a set-screw 35, Fig. 3, said collar being set up adjacent the inner side of the cam 29 when bunch-building is to begin.

Supposing that the parts are in the position shown in the drawing, in readiness to begin bunch winding, the weight 7 holding

the toothed follower 31 in engagement with the toothed face 30 of the cam 29. At this time the high points of the cam 26 will clear the follower 25 as the cam revolves, so that the builder-motion is controlled wholly by the smaller cam 29. The rotation of this cam will then act through the follower 31 to cause the builder-arm 14, and with it the ring-rail 3, to rise and fall with the short traverse, to thereby form the primary or bunch-winding 36, Fig. 4, on the bobbin 37 adjacent its head or butt 38. By reason, however, of the co-operating toothed surfaces of the cam 29 and its follower 31 the latter will be revolved on its supporting stud 32, and as it revolves the spiral thread on such stud will cause said follower to move longitudinally on the stud to the right, Fig. 3, across the face of the cam, and finally to leave it altogether. While this gradual lateral shift of the follower with relation to the cam is taking place the bunch 36 is being wound, and immediately the follower and cam are disengaged, the builder-arm 14 is lifted more or less to bring the follower 25 into engagement with the main building-cam 27, and thereupon the main or service winding 39, indicated by dotted lines Fig. 4, will be laid to complete the yarn-mass.

The spiral thread of stud 32 is so formed as to move the follower 31 to the right, Fig. 3, when said follower is revolved opposite to the arrow 40, Fig. 2, which indicates the direction of rotation of the cams.

Manifestly the longer the follower 31 is in engagement with its cam 29 the greater will be the quantity of yarn laid in the bunch 36, and conversely, the sooner said cam and follower are disengaged the less will be the yarn laid in the bunch. Hence by adjusting the stop collar 34 to the right or the left, Fig. 4, the more or less yarn will be laid in the bunch, the operator by means of the collar effecting reverse rotation of the follower 31, until the said collar comes against the inner side of the cam when setting the apparatus to begin the winding of a set of bobbins. At such time the builder-arm can be depressed by the foot to enable the follower 31 to be positioned properly with relation to its cam.

Inasmuch as the builder-arm is depressed when the high parts or points of cam 29 engage the follower 31 the follower 25 can be so located on the builder-arm as to just clear the points of the cam 26 at such times, and consequently if the follower 31 is disengaged from its cam at the instant the follower 25 is opposite a high part or point of the cam 26 there will be practically no appreciable jump of the builder-arm as it passes from the control of one to the control of the other cam. This enables me to curtail the lower end of the main winding 39 substantially down to the base of the bunch

winding 26, as shown, and a very symmetrical form is given to the completed yarn-mass, and the yarn will weave off better, while more yarn can be laid than if the main winding started at the top of the bunch, as in the Muheim structure before referred to. In other words the lowest position of the builder-arm as it oscillates during bunch-winding is substantially the same as during the main winding.

Should the bunch-winding follower leave its cam when at one of its low points, as for instance when the parts are in the position shown in Fig. 2, there will be a slight sudden uplift or jump of the builder-arm as the follower 25 rises the short distance necessary to engage its cam 26 at one of its low points, but such jump is not objectionable, and as the cam 26 rotates the yarn will be carried down to substantially the bottom of the bunch by the descent of the ring-rail. Thus by employing similarly shaped and symmetrically located cams for effecting the bunch and main windings I am enabled to make the lower ends of the bunch and main windings at substantially the same height on the bobbin.

By effecting the disengagement of the bunch-building cam and its follower through the direct coöperation of one with the other I secure a very simple and efficient construction and an absolutely direct action, eliminating a train of actuating mechanism between the cam and follower to effect the movement of the latter across the face of its cam.

As the bunch-winding progresses there will be some gain of the traverse, due to the pick-wheel and pawl, but it will be exceedingly slight as the stroke of the builder-arm during such winding is very short, but when the longer stroke during main winding is imparted by the cam 26 the regular gain will be effected as the connection 10 is gradually let off by the winding drum.

The boss or hub 27 is made thick enough to admit of adjustment of the follower 31 for a bunch of maximum capacity without interference with the cam 26, as will be apparent from an inspection of Fig. 8.

Various changes or modifications in details of construction and arrangement may be made by those skilled in the art without departing from the spirit and scope of my invention as set forth in the claims annexed hereto.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. In apparatus of the class described provided with a builder-motion including a builder-arm, a cam to control the movement thereof during the building of the main winding of yarn on the bobbin, and a connected bunch-building cam having a

toothed face, in combination, a toothed follower to coöperate with and be rotated by said bunch-building cam, and movable with the builder-arm, and also laterally relatively thereto, means rendered operative by such rotation of the follower to move it gradually across the face and out of engagement with its cam when the bunch is completed, and a second follower carried by the builder-arm, to coöperate with the first-named cam when the bunch-building cam and its follower are disengaged.

2. In apparatus of the class described, a builder-motion including a builder-arm, different actuating cams therefor, to effect respectively the winding of a bunch, and a main winding of yarn on the bobbin, a follower for each cam, carried by the builder-arm, means to rotate the follower of the bunch-building cam by direct engagement with such cam, and means rendered operative by rotation of said follower to move it axially of the coöperating cam and out of engagement therewith to terminate the winding of the bunch.

3. In apparatus of the class described, a builder-motion including a builder-arm, different actuating cams therefor, to effect respectively the winding of a bunch, and a main winding of yarn on the bobbin, a follower for each cam, carried by the builder-arm, means to rotate the follower of the bunch-building cam by direct engagement with such cam, and means rendered operative by rotation of said follower to move it axially of the coöperating cam and out of engagement therewith to terminate the winding of the bunch, combined with adjustable means to determine the extent of axial movement of said rotated follower to thereby regulate the volume of the bunch.

4. In apparatus of the class described, a builder-motion including a builder-arm, different actuating cams therefor, to effect respectively the winding of a bunch, and a main winding of yarn on the bobbin, a follower for each cam, carried by the builder-arm, means to rotate the follower of the bunch-building cam by direct engagement with such cam, and means rendered operative by rotation of said follower to move it axially of the coöperating cam and out of engagement therewith to terminate the winding of the bunch, combined with a stop collar longitudinally adjustable on said rotatable follower, to determine the axial position of the latter with respect to its actuating cam when starting the bunch winding, and means to retain said collar in adjusted position.

5. In apparatus of the class described, a builder-motion including a builder-arm, two co-axial and similar actuating cams therefor but of different throw, to effect the winding upon the bobbin of a bunch with a short

traverse, and a main winding with a long traverse, respectively, a follower for each cam, carried by the builder-arm, one of said followers being toothed externally and spirally grooved internally, a threaded stud on which said follower is moved longitudinally when it is rotated, and teeth on the bunch-winding cam to engage and rotate the toothed follower, rotation of the latter causing movement thereof across the face of its cam and final disengagement therefrom to terminate the bunch winding.

6. In apparatus of the class described, a builder-motion including a builder-arm, different actuating cams therefor, to effect respectively the winding of a bunch, and a main winding of yarn on the bobbin, said cams being similar in shape, co-axial, and symmetrically mounted with respect to each other but of different throw, to effect a short traverse and a long traverse, respectively, a follower for each cam, carried by the builder-arm, means to rotate the follower of the bunch-building cam by direct engagement with such cam, and means rendered operative by rotation of said follower to move it axially of the cooperating cam and out of engagement therewith to terminate the winding of the bunch.

7. In apparatus of the class described provided with a builder-motion including a builder-arm, a cam to control the movement thereof during the building of the main winding of yarn on the bobbin, and a connected bunch-building cam having a toothed face, in combination, an elongated, toothed follower to cooperate with and be rotated positively by the bunch-building cam, a laterally extended, spirally threaded stud extended from the builder-arm and on which said follower is rotatable, and movable longitudinally by engagement with the thread, whereby during bunch winding the follower is moved across the face of its cam and disengaged therefrom to complete such winding, and a second follower carried by the builder-arm and adapted to cooperate with the first-named cam when the winding of the bunch is completed.

8. In apparatus of the class described, provided with a builder-motion including a builder-arm, a small, bunch-building cam and a larger main building-cam to which it is fixedly connected, to wind a bunch and

a main winding, respectively, of yarn on a bobbin, the bunch-building cam having a toothed face, a toothed follower to cooperate with and be rotated by said bunch-building cam, a stud laterally extended from the builder-arm and spirally threaded to engage internally the follower and effect movement thereof across the face of its cam as the latter rotates the follower, cooperation of the latter and its cam oscillating the builder-arm to build the bunch with a short traverse, and a second follower carried by the builder-arm and maintained out of engagement with the main building-cam during bunch building, disengagement of the bunch-building cam and its follower due to longitudinal movement of the latter terminating bunch winding and permitting the main building-cam to cooperate with its follower and oscillate the builder-arm with a longer traverse to complete the winding of the yarn-mass on the bobbin.

9. In apparatus of the class described, a builder-motion including a builder-arm, different actuating cams therefor, to effect respectively the winding of a bunch, and a main winding of yarn on the bobbin, a follower for each cam, carried by the builder-arm, means to rotate the follower of the bunch-building cam by direct engagement with such cam, and means rendered operative by rotation of said follower to move it axially of the cooperating cam and out of engagement therewith to terminate the winding of the bunch, said cams being similar in contour and symmetrically positioned with relation to the high and low points thereof, the follower of the bunch-building cam being located above the other follower on the builder-arm at such a distance therefrom that the main winding cam will clear its follower during bunch-winding, the builder-arm being moved to substantially the same position by the high points of each cam to thereby position the lower end of the main winding on the bobbin adjacent the bottom of the bunch-winding.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL R. TRUESDALE.

Witnesses:

THOMAS A. PINOREE,
FRANK ALLEN.