

UNITED STATES PATENT OFFICE.

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BALLING-MACHINE.

No. 815,378.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALONZO E. RHOADES, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Balling-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like

parts. In chain-warping a balling-machine is used, the warp-threads being taken from spools in the usual creel through the regular warper to the front comb, where the leasing motion is generally applied, and after passing therethrough the warp ends are brought together in a trumpet and carried in chain form over and around a pulley, and thence backward to a traverse-guide, which winds the chain into a ball. The warper is provided with a measuring-roll which drives a clock mechanism—as, for instance, such as is shown in United States Patent No. 766,383, granted to me on the 2d day of August, 1904—to measure the yarn and effect automatically the stoppage of the apparatus when a predetermined length of warp has passed the measuring-roll, so that a thread lease may be taken in the chain. The measuring-roll subjects the yarn to considerable strain, which is objectionable, and in my present invention I have dispensed entirely with the roll, and thereby overcome the objectionable strain referred to. Inasmuch as the yarn must be measured, I have herein provided means for driving a clock mechanism by or through the pulley of the balling-machine, which subjects the yarn to no additional or undue strain.

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

Figure 1 is a side elevation of a sufficient portion of a balling-machine to be understood, showing one embodiment of my present invention. Fig. 2 is an inner end or rear view of the main portion of the apparatus illustrated in Fig. 1 viewed from the left. Fig. 3 is a side elevation of the scroll and its attached worm-gear illustrated in Fig. 1. Fig. 4 is a perspective view, on a smaller scale, of the machine, omitting the lower part of its

supporting-column to show the relative position of the various operating parts.

The upright standard or column 1, having an open head 2, provided with bearings 3 for the shaft 4 of the pulley 5, and the adjustably-mounted trumpet 6, which collects the warp ends into a chain as they pass from the warper, may be and are all of usual construction, the chain 7 passing around the pulley and being led rearwardly to the roll 8, on which the ball is wound, (see Fig. 1,) the ball being driven as wound on the roller by two cylinders or drums 9.

In accordance with my present invention the pulley-shaft 4 is extended at one side beyond the head 2 (see Fig. 2) and has fixedly mounted thereon a gear 10 and a worm 11, the gear meshing with a pinion 12 on a shaft 13, rotatably mounted in a sleeve-bearing 14, (see dotted lines, Fig. 1,) and said shaft has secured to its outer end a worm 15. The shaft is eccentric to the longitudinal axis of the bearing 14, the latter being rotatably mounted in a tubular support 16, fixedly secured to the head 2, all substantially as in my Patent No. 766,383, hereinbefore referred to.

The warper-clock C, having a setting-wheel c^x and a transmitting-gear c , adapted to mesh with the worm 15, is of usual construction, the clock measuring the length of the chain which passes over the pulley 5, the gearing 10, 12, 15, and c , Fig. 2, constituting actuating means for the clock. By means of a handle 17, pivotally connected with an arm 18, rigidly secured to the bearing 14, the latter can be manually turned to withdraw the worm 15 from engagement with the transmitting-gear c , so that the clock can be reset or otherwise manipulated, all as in my patent referred to.

I will now describe the scroll and cooperating finger for controlling a stopping instrumentality and the means for operating the scroll.

A bracket 19, secured to the head 2, has bearings 20, Fig. 1, for a horizontal shaft 21, provided at its rear end with a pinion 22 and at its opposite front end with a worm-gear 23 in mesh with the worm 11 on the pulley-shaft 4.

A horizontal arm 24, bolted to the end of the bracket 19, has adjustably secured to it a

bearing 25, Figs. 1 and 2, for the short shaft of a gear 26, meshing with the pinion 22, the gear also meshing with and driving a gear 27, having its shaft supported in a bearing 28 (see Fig. 1) on the bracket 19. The shaft of the gear 27 has upon it a worm 29, which meshes with and drives a worm-gear 30, having connected with it or forming a part thereof a scroll 31, (shown separately in Fig. 3,) a deep slot 32, Fig. 1, being provided at the end of the scroll-groove. A finger 33, slidably mounted on a rod 34, parallel to the axis of rotation of the scroll, travels in the scroll-groove and is held therein by the elongated head 35^x (see Fig. 4) of a weighted arm 35, the scroll and finger, worm-gear 30, and worm 29 forming a stopping-clock substantially such as shown in United States Patent No. 624,541, granted to me May 9, 1899, and operating as therein set forth. The finger 33 drops into the slot 32 when it reaches the end of the scroll-groove, and thereby lowers an arm 36, fixedly connected with the finger. This arm is connected in usual manner with the stopping instrumentality of the warper, only the upper end of a link 37 being herein shown as a part of said connection, as it and the stopping instrumentality are well known and not of my invention. As is well known to those familiar with such apparatus, the coöperation of the finger 33 and the scroll gradually causes the finger to slide along the rod 34 until the outer end of the scroll is reached, the head 35^x of the weighted arm 35 being shaped to present a longitudinal up-turned lip or ridge 50, which can be best seen in Fig. 4, the finger sliding along the top of such rib. When it is desired to permit withdrawal of the finger from the scroll, the arm 35 is swung upward to the right, Figs. 1 and 4, and thereby the turning of the head 35^x moves the rib 50 away from beneath the finger, freeing the same.

The pinion 22, gears 26 27, and worm 29, with worm 11 and worm-gear 23, constitute a speed-reducing and driving connection between the pulley 5 and the stop-motion-controlling clock, the latter operating through the movement of the finger 33 when the pul-

ley 5 has made a predetermined number of revolutions corresponding to a definite length of chain 7 passed thereover.

The clock C, hereinbefore referred to, serves merely to indicate on the dial thereof the number of yards of chain which has passed around the pulley 5. Inasmuch as the diameter of the latter is relatively large and the warps are in chain form where passing around it, there is no objectionable strain put upon the warps and the clock mechanism is accurately and easily operated.

By making the bearing 25 adjustable the gear 26 and pinion 22 can be removed and a gear and pinion of different diameters substituted as a change-gear device.

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

1. In a balling-machine, a rotatable pulley around which the yarn-chain passes, and mechanism operatively connected with and driven by the pulley, said mechanism including a scroll and a coöperating finger, and a speed-reducing connection including a change-gear and pinion between the pulley and the scroll.

2. In a balling-machine, a driven roll, a rotatable pulley around which the yarn-chain passes to the roll to be wound thereupon, a pulley-shaft, a gear and a worm fast on said shaft and rotatable with the pulley, a measuring-clock having a pinion in mesh with and continuously driven by said gear, a separate scroll and coöperating finger, adapted to cause the stoppage of the roll independently of said clock, and speed-reducing transmitting-gearing intermediate the scroll and said worm and actuated thereby, said scroll and clock being continuously and separately driven by the rotation of the pulley.

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

ALONZO E. RHOADES.

Witnesses:

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