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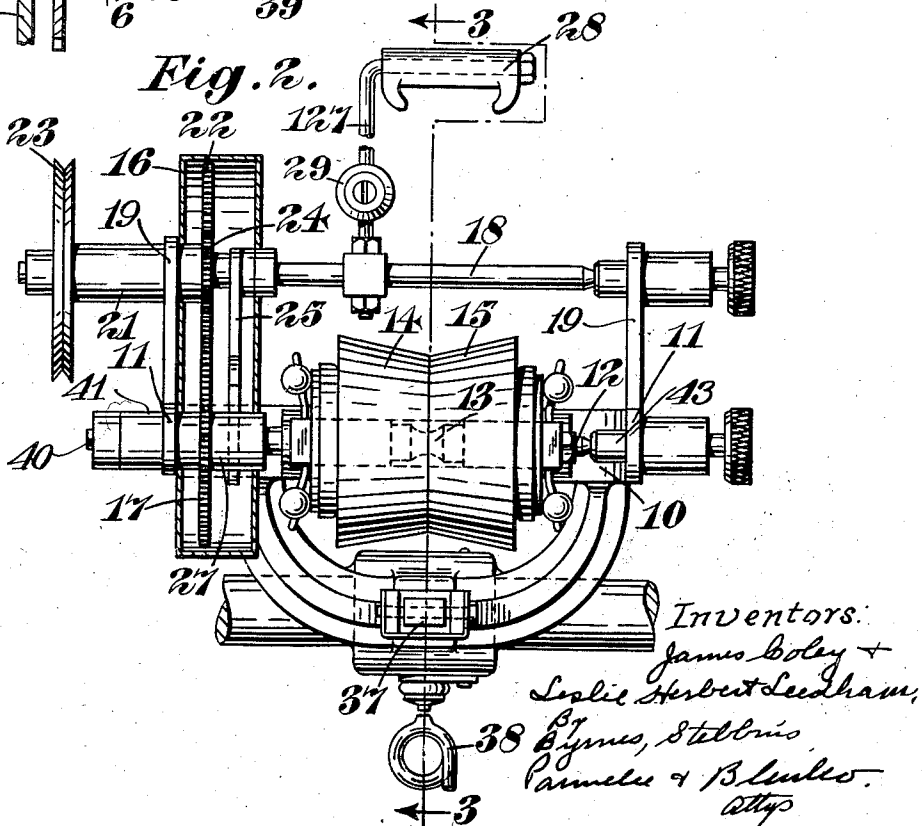
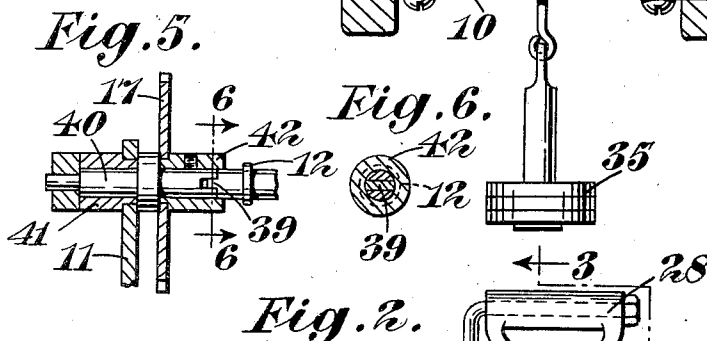
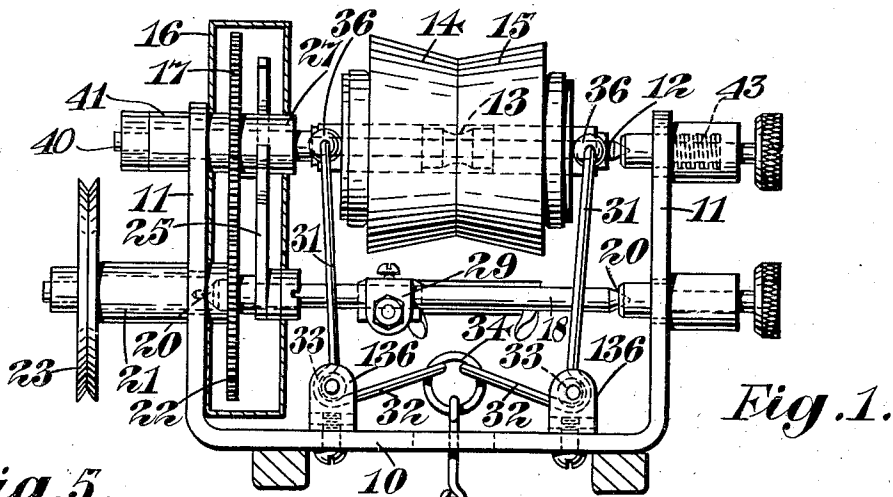
J. COLEY ET AL

2,014,127

DEVICE FOR WAXING YARNS

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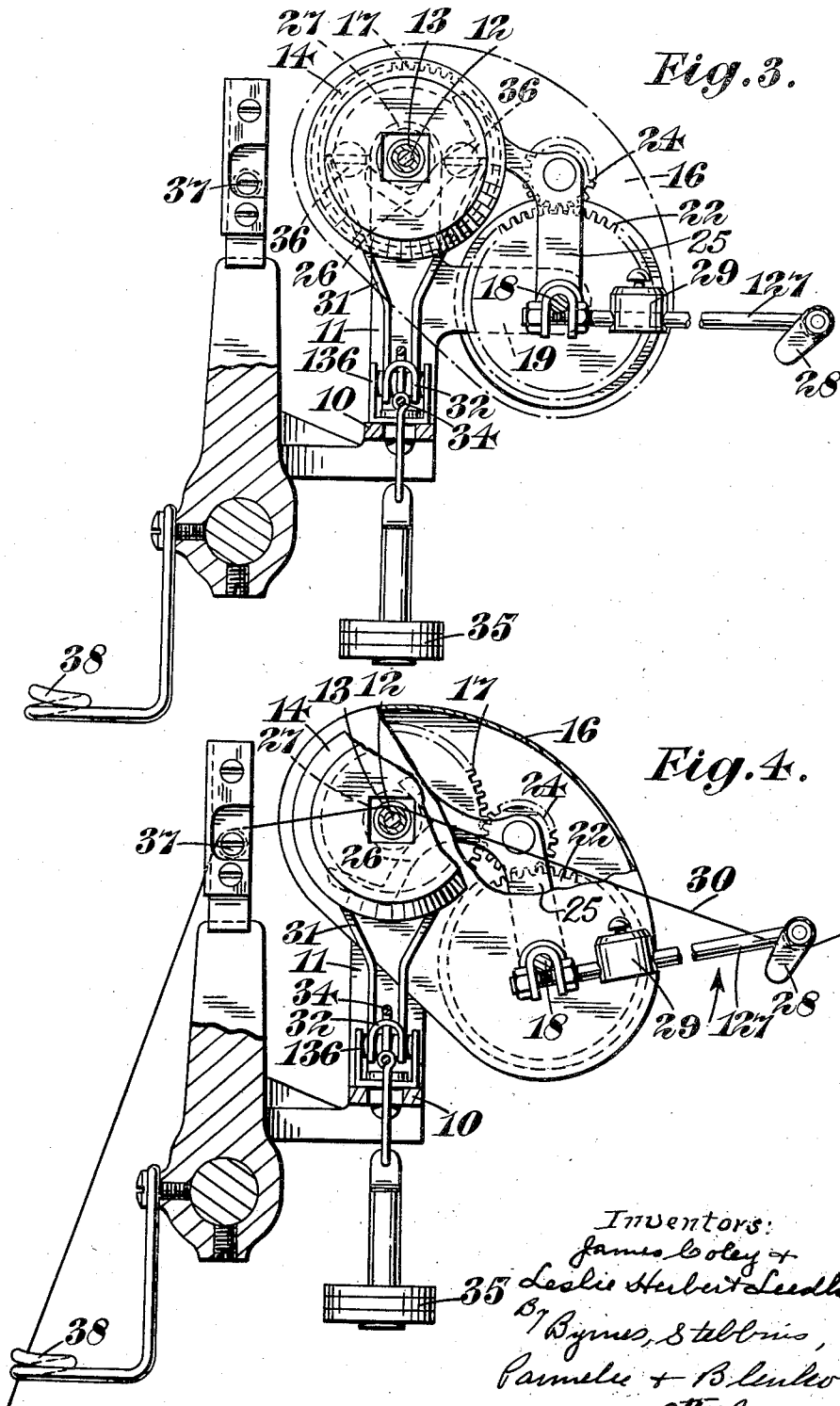
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UNITED STATES PATENT OFFICE

2,014,127

DEVICE FOR WAXING YARNS

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This invention consists in improvements in or relating to a device for waxing yarns as they pass from the hank, cop or other form of supply in which they are purchased to a winding spool in a winding machine.

The invention is applied to a known type of waxer in which two wax blocks are mounted on a spindle to rotate therewith and pressure levers acting on the end faces of the blocks press them together to a degree that is regulated by a weight or a spring or like means acting on the pressure levers. The yarn is led between the wax blocks and the latter are rotated by passing the running yarn over a pulley, the spindle of which is itself geared to the spindle which supports the wax blocks. Thus, it is the action of the running yarn which serves to rotate the wax blocks. The angular velocity of the latter is such as to give a differential speed between the moving surfaces of the blocks and the yarn. Generally, the direction of rotation of the blocks will be opposite to that of the passage of the yarn between them as regards the surfaces of the blocks with which the yarn is in contact.

According to the present invention, in a waxer of this type the wax blocks are positively driven by means other than the passage of the yarn in contact with a driving element. For example, a lay spindle in each of the waxers may be power-driven and mechanically coupled with a spindle that carries the wax blocks.

In a modification of the invention a coupling element for the two spindles is movable into and out from coupling relationship and a carrier for the coupling element comprises a yarn-guide which, while it is engaged by the running yarn, will hold the coupling element in its coupling relationship but will allow it to move therefrom immediately the yarn breaks.

Preferably, the coupling element comprises a gear wheel mounted in a swinging bracket whereby it is rotatable bodily about the axis of one gear member secured to one of the spindles so as to be always maintained in mesh therewith, and the yarn-guide extends from the bracket. In such a construction the lay spindle and the waxer spindle will be gear-connected by two gear elements having a movable coupling gear member between them.

In a previously known waxer of the type set forth at the commencement of this specification, end pressure was applied to the wax blocks by means of pivoted bell-cranks formed from specially shaped strip metal. They were arranged so that corresponding vertical arms engage at

their outer ends directly or indirectly with the wax blocks, whereas the other corresponding arms cross one another. A weight was suspended by a loop passing from the crossing point of the arms.

In a further modification of the invention these levers are now replaced by similar levers each formed from a single length of wire doubled back on itself and coiled at the angle to afford a pivot bearing. Preferably, the arms which correspond to the crossing arms of the earlier construction now terminate short of one another and are interconnected by a link from which a weight is suspended which tends to turn the arms about their pivots so as to press the wax blocks together. Consequently, the suspension weight applies pressure equally to both arms. In the old construction where the weight suspension was looped over the two arms at their crossing point, the weight was sometimes found to act on one arm only, so that the effect of the weight was to cant both arms to one side, thereby shifting the positions of the wax blocks relatively to the running yarn. By the present construction, however, this drawback is avoided.

In order that the invention may be more fully understood a preferred example will now be described with the aid of the accompanying drawings, in which—

Figure 1 is a view of a waxer according to the present invention seen in elevation.

Figure 2 is a plan of the mechanism illustrated in Figure 1.

Figure 3 is a section on the line 3—3 of Figure 2 before the yarn is threaded up, and

Figure 4 is a view similar to Figure 3 showing the running yarn in action.

Figure 5 shows in section the interconnection between the spindle carrying the wax blocks and a stub axle connected to it, and

Figure 6 is a section on the line 6—6 of Figure 5.

Like reference numerals indicate like parts in the several figures of the drawings.

Referring to the drawings, it will be seen that a U-shaped metal bracket 10 supports between two upstanding arms 11 a spindle 12 on which the wax blocks are carried. This spindle preferably has two square-sectioned portions separated by a central grooved element 13 of porcelain or like anti-friction material against which the yarn can run as it passes between the two blocks 14 and 15.

In a gear case 16 near one side arm 11 is a gear wheel 17, carried on a stub axle 40, which

latter journals in a bushing 41 fixed in side arm 11. The gear 17 has a boss 42 attached firmly to it, and a set-screw secures axle 40 and gear wheel together. Axle 40 is slotted across, to form a means of engagement with tongue 39, and thus spindle 12 is positively driven with the gear wheel, while being capable of rapid disconnection therefrom. A spring plunger 43 applies a light end pressure to keep the parts engaged. By these means, the waxer may easily be dismounted. At a lower position a lay spindle 18 is carried in arms 19 extending outwardly from the arms 11 of the bracket 10. The two ends of the spindle have conical bearings at 20 (Figure 1) of which that shown on the right-hand side of Figure 1 is formed as a plunger and that on the left is located in the end of a spindle 21 which also carries a gear wheel 22 located within the gear box and driven by an external belt pulley 23. The belt pulley is driven from some part of the driving mechanism of the winding machine in which the waxer is mounted.

A jockey gear wheel 24 which constitutes a coupling element between the gear wheels 17 and 22 is carried in an arm 25 also contained within the gear box and having a cranked extended portion 26 to engage a bush 27 secured to the spindle 12 to serve as a limiting stop in the movement of the jockey gear wheel 24 into the decoupling position illustrated in Figure 3, as well as into the engaged position shown in Figure 4, thus avoiding jamming of the gears. The arm 25 is secured to the spindle 18 and outside the gear box another arm 127 is also secured to the same spindle and is furnished at its end with a porcelain yarn guide 28 and an adjustable weight 29.

The arms 25 and 27 may be secured to the spindle 18 in any preferred manner so as to rock with the spindle and it will be observed that the counterweight 29 tends when there is no yarn passing over the guide 28, to move the jockey gear wheel 24 into the decoupling position of Figure 3. When a running yarn 30, however, is in action it will pull on the yarn guide and turn the spindle 18 about its axis so as to bring the jockey gear wheel 24 into simultaneously geared relation with the gear wheels 17 and 22 and consequently rotation of pulley 23 will serve also to rotate spindle 12 and the wax blocks carried thereon.

Each of the counterbalanced pressure levers is constituted by a bell crank 31, 32 formed by twisting a length of wire so as to constitute a coil at 33 to serve as a pivot bearing. The lower arms 32 of each such bell crank terminate short of one another and are interconnected by a ring or link 34 and from this link there may be suspended weights 35 as requisite. The bell cranks are mounted in lugs 136 upstanding from the face of the bracket 10 and the upper arms 31 of the two levers press by means of freely mounted balls 36 against the outer end surfaces of the wax blocks 14 and 15.

It will be understood that in operation the running yarn will be threaded as shown in Figure 4 from a hank or the like under the guide 28 then between the wax blocks 14 and 15 passing in so doing over the grooved guides 13, then over a guide roller 37, also preferably of porcelain, and finally through a twisted wire guide eye 38 to the winding spool. When the yarn is running unbroken the parts will be maintained in the position illustrated in Figure 4 and the gear wheels 17 and 22 will be interconnected

by the jockey gear wheel 24 so that the wax blocks are positively rotated preferably in a direction opposed to that in which the running yarn passes between them. The bell cranks 31, 32 apply end pressure to the wax blocks 14, 15 and the counterweight 35 is adjusted to apply the requisite pressure between the wax blocks. By suspending the counterweight in the manner described the tendency of previously constructed waxing devices for the wax blocks sometimes to be moved out of their correct centralized position is avoided and the blocks retain their alignment with the guides 28, 37 and 38 in a satisfactory manner. If for any reason the yarn 30 should break, the arm 127 will drop under the influence of the weight 29 and will rock the spindle 18 so as to swing the arm 26 into the position illustrated in Figure 3, thereby disconnecting the coupling between the gear wheels 15 and 22 and arresting rotation of the wax blocks 14 and 15.

If desired, the movement of the arm 127 consequent upon the breakage of the yarn 30 may be utilized to stop rotation of the winding spindle allocated to that particular yarn.

The arms 32 may be slidably coupled together in any other preferred manner and the weight so suspended that the pull thereof is equally distributed to both arms. For example, one arm may be hooked over the other to slide thereon and may be extended beyond the sliding interconnection to receive the weight at its extremity.

We claim:

1. A yarn waxer comprising in combination a waxing element, driving and driven members whereof the driven member is coupled to the waxing element, and a coupling gear element adjustable into and out from a position to transmit the drive from the driving to the driven member for the purpose respectively of starting and stopping rotation of the driven member.

2. A yarn waxer comprising in combination a waxing element, driving and driven members whereof the driven member carries the waxing element, and a coupling gear element adjustable into and out from a position to transmit the drive from the driving to the driven member, for the purpose respectively of starting and stopping rotation of the driven member.

3. A yarn waxer comprising in combination a waxing element, driving and driven members whereof the driven member is coupled to the waxing element, a coupling gear element adjustable into and out from a position to transmit the drive from the driving to the driven member, and a yarn-guide movable in company with the coupling gear element whereby the running yarn will hold the coupling gear element in its drive transmitting position.

4. A yarn waxer comprising in combination a waxing element, driving and driven members whereof the driven member is coupled to the waxing element, a coupling gear element adjustable into and out from a position to transmit the drive from the driving to the driven member, a yarn-guide movable in company with the coupling gear element, both said coupling gear element and yarn-guide being rotatable about the axis of one of the said members whereby the latter member and the coupling gear element are always maintained in driving relationship with one another.

5. A yarn waxer comprising in combination a waxing element, driving and driven gear members, a spindle carrying the driven gear member and also the waxing element, a coupling gear element adjustable into and out from a position to

transmit the drive from the driving to the driven gear member and a yarn-guide movable in company with the coupling gear element.

5 6. A yarn waxer comprising in combination a waxing element, driving and driven spindles whereof the driven spindle supports the waxing element, gear members carried by the driving and driven spindles, a coupling gear element, a bracket mounted to swing about the axis of one of the
10 spindles and supporting also the coupling gear element in driving relationship with the gear member on that spindle and a yarn-guide operatively connected with the bracket whereby a running yarn passing over the guide will move the coupling
15 gear element into engagement with the gear member of the companion spindle.

20 7. A yarn waxer comprising in combination a waxing element, driving and driven spindles whereof the driving spindle supports the waxing element, a bracket rotatable about the axis of the

driving spindle, a coupling gear element carried by said bracket in engagement always with the gear member on the driving spindle, a yarn-guide operatively connected with the bracket whereby a running yarn passing over the guide will move the bracket to engage the coupling gear element also with the gear member of the driven spindle, and means tending to bias the bracket against the pull of the running yarn, for the purpose described.

8. A yarn waxer comprising in combination two coaxially disposed rotatable wax blocks, driving and driven members whereof the driven member is coupled to the wax blocks, means to press the wax blocks towards one another, and a coupling gear element adjustable into and out from a position to transmit the drive from the driving to the driven member.

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