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BOBBIN REMOVING DEVICE

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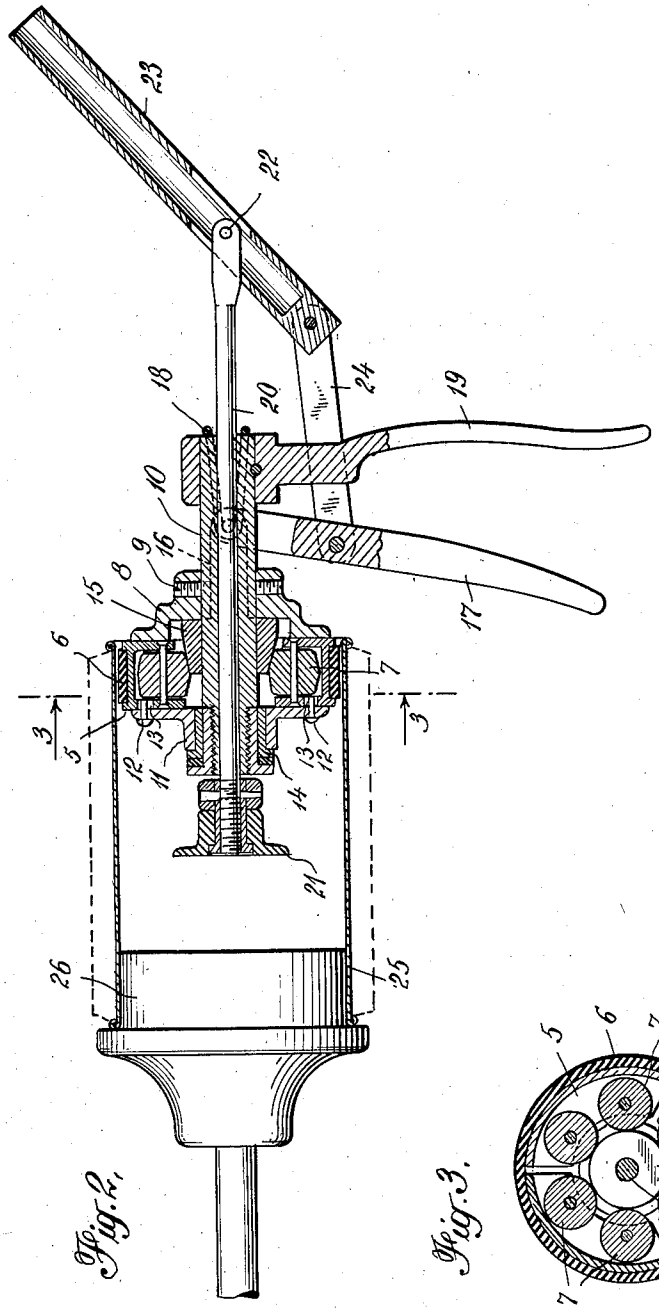


Fig. 2.

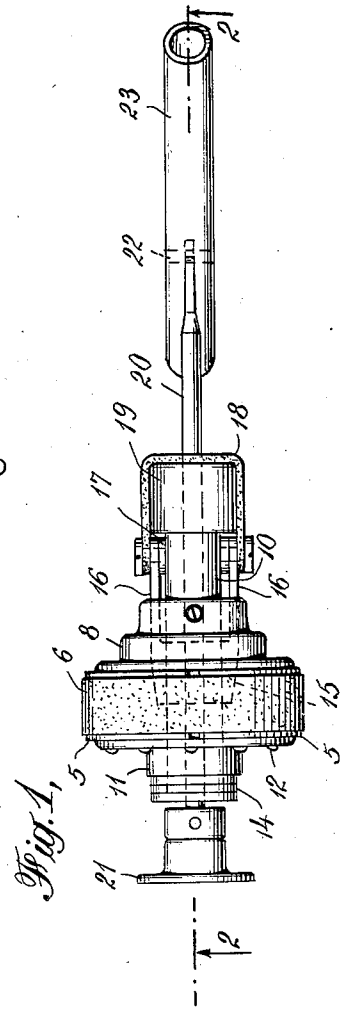


Fig. 1.

Fig. 3.

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BOBBIN REMOVING DEVICE

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6 Claims. (Cl. 254—131)

This invention relates to bobbin removing devices, and particularly to devices for removing rotating bobbins from their holders or carriers, and has for its object the provision of an improved device of this character. The invention is specially applicable to devices for removing or "pulling" bobbins from artificial silk spinning machines and similar apparatus while the bobbins are rotating.

The bobbin removing device of the invention comprises an expansible bobbin gripping element adapted to be inserted into the hollow interior of a rotating bobbin. The gripping element is rotatably mounted on a suitable spindle or shaft, and is laterally movable with respect to a relatively fixed part of the device, such as a stop member abutting against the bobbin holder. When contracted, the gripping element (inserted within the bobbin) does not engage the bobbin, but when expanded the element engages and rotates with the bobbin. Lateral movement of the element, when expanded and engaging the bobbin, serves to remove the bobbin from its rotating holder.

The invention will be better understood from the following description taken in conjunction with the accompanying drawing, in which

Fig. 1 is a plan of a device embodying the invention;

Fig. 2 is a sectional elevation of the device taken substantially along the line 2—2 of Fig. 1; and

Fig. 3 is a sectional elevation of the device taken on the line 3—3 of Fig. 2.

The device illustrated in the drawing comprises a gripping element including segments 5 which, when assembled, form an annular unit having a grooved cylindrical periphery into which is tightly fitted a band of elastic rubber 6. Two annularly spaced rollers 7 are axially mounted in each segment. One side of the assembly of segments abuts against the face of a bearing flange 8 secured by setscrews 9 to a tubular spindle or shaft 10. The other side of the assembly of segments abuts against the face of a bearing flange 11, operatively connected to the segments by pins 12 projecting into radial slots 13 in the sides of the segments. The cylindrical bearing portion of the flange 11 surrounds a flanged bearing bushing 14 threaded on one end of the spindle 10.

A cone 15 is slidably mounted on the spindle 10, concentrically within the bobbin gripping element. The cone has two diametrically positioned arms 16 (secured thereto or integral therewith) extending from its larger end through recesses or apertures in the head of the flange 8. The arms 16 are pivotally connected at their outer ends to the bifurcated ends of a lever 17. An elastic rubber band 18 passes around the bifurcated ends of the lever 17 and the end of the spindle 10 and holds the cone 15 in its normal inoperative position with its large end abutting against the inner face of the flange 8.

A handle 19 for holding the device is secured to one end of the spindle 10, adjacent the lever 17. A rod 20 is slidably mounted within the tubular spindle 10, and carries at one end (adjacent the bushing 14) a rotatably mounted stop member 21. The other end of the rod 20 is pivoted at 22 to an operating lever 23. A link 24 pivotally connects one end of the lever 23 to the lever 17.

In operating the device to remove a rotating bobbin 25 from its rotating holder or carrier 26, the gripping element is inserted within the hollow interior of the bobbin. With one hand the operator grasps the handle 19 and lever 17, pulling the lever towards the handle (against the tension of the rubber band 18). The cone 15 is thereby slid along the spindle 10 (towards the left in the drawing) and moves the rollers 7 outwardly until the resulting expansion of the rubber band 6 brings it into operative contact with the inside of the bobbin. The gripping element then rotates as a whole with the bobbin. With his other hand, the operator now pushes inwardly (towards the left in the drawing) on the lever 23, thereby moving the rod 20 through the tubular spindle 10 until the rotatably mounted stop member 21 engages the head or end of the bobbin holder 26. In this position the stop member 21 rotates freely with the holder. Further pressure on the lever 13 in the same direction then pulls the bobbin from its holder. The bobbin is then readily removed from the gripping element by release of the lever 17.

The expansible gripping element, while relatively fixed to the tubular spindle, is freely rotatable about the spindle, thus permitting rotation of the element when gripping the rotating bobbin while the spindle is held relatively stationary. The rollers 7 further permit free rotation of the gripping element when the cone 15 by its wedging action forces the rollers and associated segments outwardly into their expanded positions. When the wedging action of the cone 15 is withdrawn (by the tension of the rubber band 18 when the lever 17 is released), the peripheral rubber band 6 promptly contacts the gripping element. The rubber band 6 also provides a suitable friction contact between the gripping element and the inside of the bobbin. The stop member 21 rotates freely on the rod 20 when in engagement

with the rotating bobbin holder **26**. When thus engaged with the holder **26**, further lateral movement of the rod **20** is arrested, and the gripping element and engaged bobbin can then be pulled laterally along the rod by the lever **23** and associated link mechanism. The radially directed slots **13** of the segments **5** permit outward and inward movement of the segments (in expanding and contracting the bobbin gripping element) while maintaining through the cooperating pins **12** the necessary operative connection between the segments and the bearing flange **11**.

I claim:

1. A device for removing a bobbin from a rotating holder comprising an expansible bobbin gripping element rotatably mounted on a spindle, said element including a plurality of annularly assembled segments peripherally surrounded by an elastic member and circumferentially spaced rollers axially mounted in the segments, means for moving said rollers and associated segments outwardly to expand the gripping element, and means for moving the gripping element longitudinally with respect to a relatively fixed part of the device.

2. A device for removing a bobbin from a rotating holder comprising an expansible bobbin gripping element rotatably mounted on a tubular spindle, said element including a plurality of annularly assembled segments peripherally surrounded by an elastic member and circumferentially spaced rollers axially mounted in the segments, means for expanding said element by moving said rollers outwardly, a rod slidably mounted in said tubular spindle, a stop member carried by said rod, and means for moving said gripping element away from said stop member when lateral movement of the stop member is arrested.

3. A device for removing a bobbin from a rotating holder comprising an expansible bobbin gripping element rotatably mounted on a tubular spindle, means for expanding said element so that it will engage the inside of a bobbin, a rod slidably mounted in said tubular spindle, a stop member carried by said rod, and means for moving said gripping element away from said stop member when lateral movement of the stop member is arrested.

4. A device for removing a bobbin from a rotating holder comprising a tubular spindle, an expansible bobbin gripping element mounted on said spindle, means for expanding said element so that it will engage the inside of a bobbin, a rod carried within said spindle, a rotatable stop member at one end of said rod, and means associated with the other end of said rod for moving said gripping element laterally along the rod when lateral movement of the stop member is arrested.

5. A device for removing a bobbin from a rotating holder comprising an expansible bobbin gripping element rotatably mounted on a spindle, said element including a plurality of annularly assembled segments peripherally surrounded by an elastic member and circumferentially spaced rollers axially mounted in the segments, a cone slidably mounted on said spindle, means for sliding said cone into wedging engagement with said rollers to move the rollers and associated segments outwardly, and means for moving the gripping element longitudinally with respect to a relatively fixed part of the device.

6. A device for removing a bobbin from a rotating holder comprising an expansible gripping element rotatably carried by a tubular spindle said element including a plurality of annularly assembled segments peripherally surrounded by an elastic member and circumferentially spaced rollers axially mounted in the segments, a cone slidably mounted on said spindle, means for sliding said cone into wedging engagement with said rollers to move the rollers and associated segments outwardly, a rod carried within said spindle, a rotatable stop member at one end of said rod, and means associated with the other end of said rod for moving said gripping element laterally along the rod when lateral movement of the stop member is arrested.

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