

Feb. 16, 1932.

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1,845,010

DYEING MECHANISM

Filed April 3, 1931

3 Sheets-Sheet 1

Fig. 1

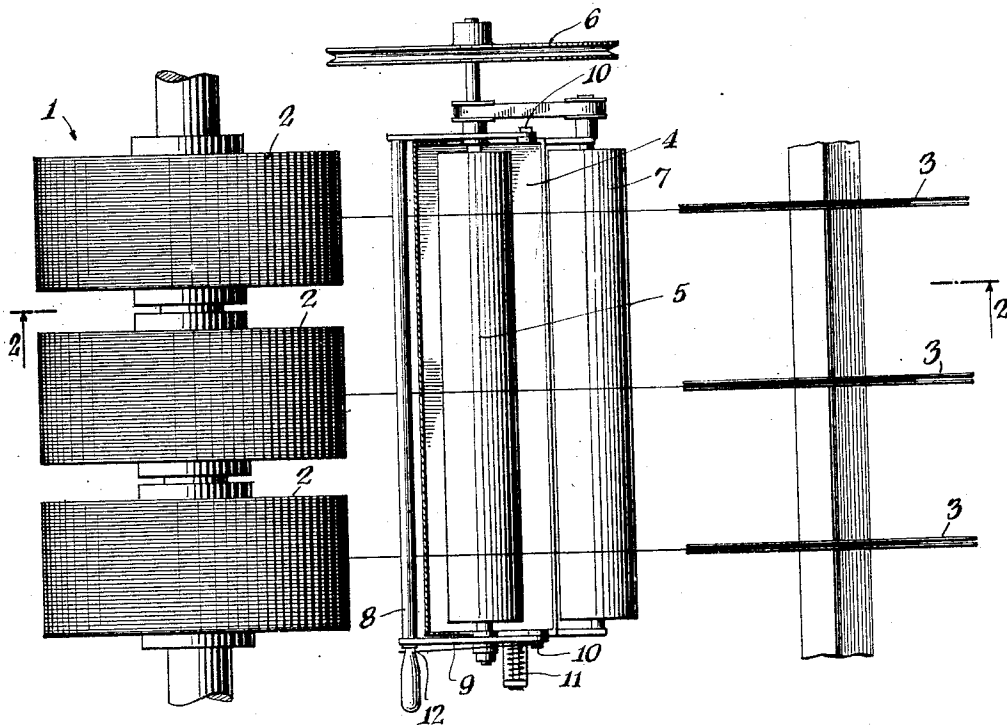
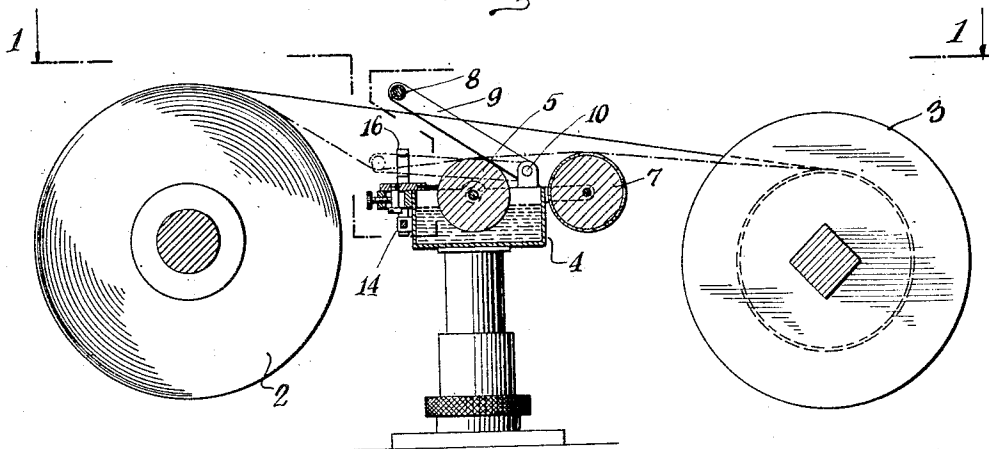


Fig. 2



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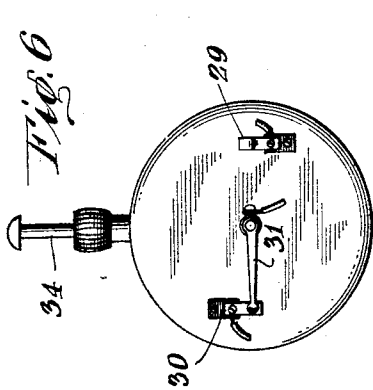
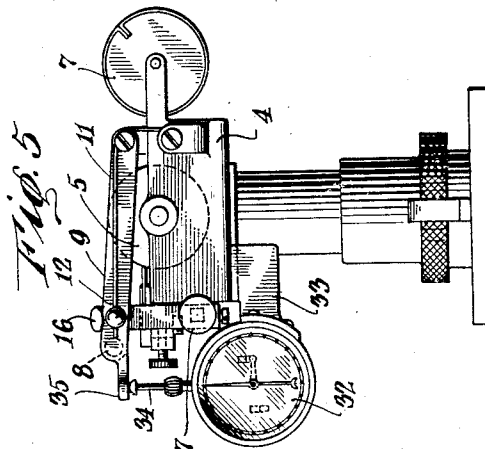
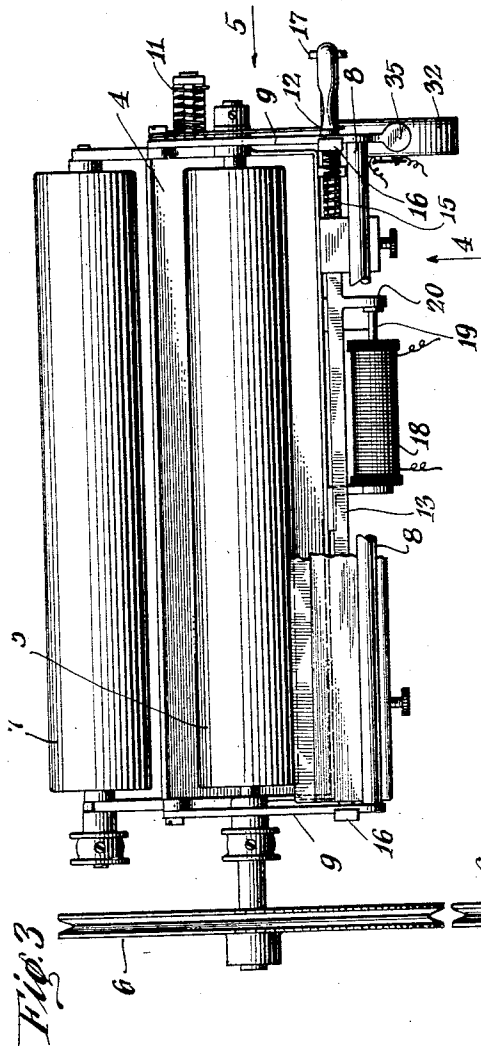
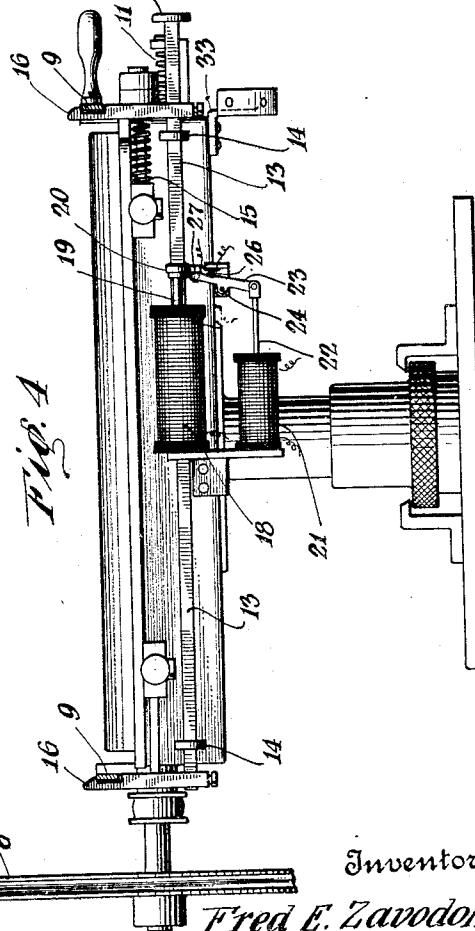
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3 Sheets-Sheet 2



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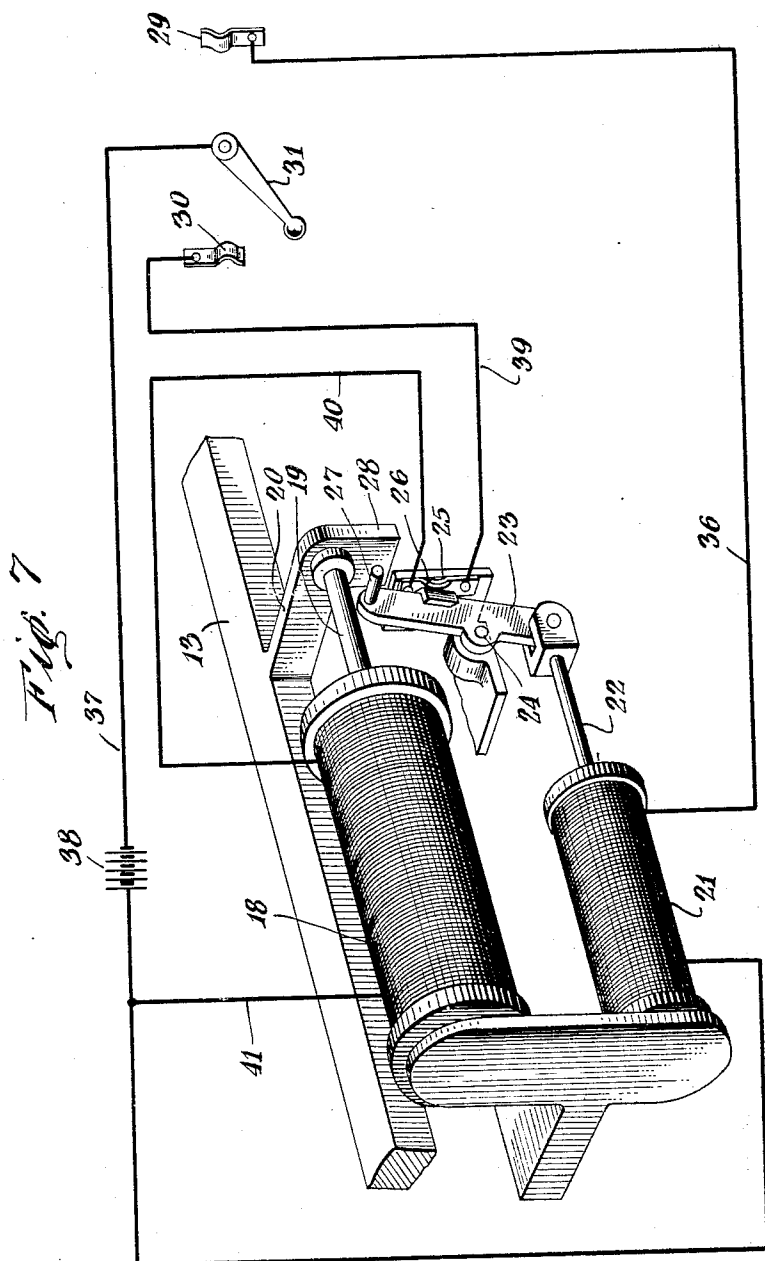
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DYEING MECHANISM

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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DYEING MECHANISM

Application filed April 3, 1931. Serial No. 527,432.

This invention relates to devices that apply a coloring agent to a length of thread, and has for its main feature and object means whereby the device will cease to be operative a predetermined time after it has been set in operation.

In the accompanying drawings the invention is disclosed in a concrete and preferred form in which:

Fig. 1 is a plan view, with parts omitted, of an arrangement of elements embodying the invention, said view being partly in section substantially on the plane of irregular line 1—1 of Fig. 2;

Fig. 2 is a vertical sectional view substantially on the plane of line 2—2 of Fig. 1;

Fig. 3 is a top plan view of the coloring device shown in Fig. 1, but shown more in detail and with parts broken away and omitted;

Fig. 4 is a view in front elevation, with parts omitted and in section, looking substantially in the direction of arrow 4 of Fig. 3;

Fig. 5 is a view in side elevation looking substantially in the direction of arrow 5 of Fig. 3;

Fig. 6 is a view of the reverse side of the timing means shown in Fig. 5;

Fig. 7 is a more or less diagrammatic view of the circuit arrangements employed to control the device; and

Fig. 8 is a diagrammatic view showing a wound thread having its inner convolutions impermanently colored or bleached.

1 indicates a support for a source of supply of thread, here shown as spools 2, from which spools the thread is drawn and wound on bobbins 3. When bobbins 3 have been supplied with sufficient thread from the spools, said bobbins become in turn a source of supply for a lace-making or other machine. To notify the operator of the lace-making machine when the supply of thread on bobbins 3 is about to become exhausted it is desired to impermanently color the innermost convolutions of the thread wound on the bobbins, and such impermanent coloring may of course be produced by means of a washable dye or by bleaching. In order to color the innermost convolutions of the thread of

bobbins 3 (see Fig. 8), a device is interposed between the spools and the bobbins located out of the path (indicated in full lines in Fig. 2) which the thread normally takes in passing from one to the other, and means are provided to deflect the thread (indicated in dotted lines in Fig. 2) into engagement with the device.

In the form of the invention here disclosed, 4 indicates a fountain and 5 is a fountain roll rotatably mounted in the fountain and actuated by any suitable means such as pulley 6. 7 is a drying roll mounted outside of the fountain and in such position that the thread after engaging the fountain roll will engage the drying roll before it passes to the bobbin. The drying roll may have a surface of absorbent material such as blotting paper, if desired. 8 is a guide in the form of a rod carried by arms 9 pivoted at 10. A spring 11 anchored on the frame at 12 normally urges the guide into its upper or inactive position. 13 indicates a latch taking the form of a bar slidably mounted in brackets 14 and normally moved into latching position (to the right in Fig. 4) by means of a spring 15. Said latch carries two upright latching members 16 to engage arms 9, and it will be understood that when the operator desires to render the device operative to color the thread, he simply depresses guide 8, thereby bringing the thread into engagement with the rolls, and as said guide descends, the arms thereof engage the upright latching members and force the latching bar to the left in Fig. 4 against the tension of spring 15, after which said latching bar clicks back and retains guide 8 in its operative position against the tension of spring 11. When it is desired to release the guide, the operator will press button 17 on the end of the latching bar, thereby moving the latter to the left in Fig. 4 thus permitting spring 11 to move the guide into its upper or inactive position.

The foregoing constitutes a complete, operative device, but if desired this device may be rendered semi-automatic in action, for example by the following means. 18 indicates an electro-magnetic device, here a solenoid, mounted on the framework, the core 19 of

which solenoid is connected by means of arm 20 to latching bar 13, the parts being so arranged that, when the solenoid is energized, the latching bar will be moved to the left in Figs. 3 and 4 against the tension of spring 15. 21 indicates an auxiliary solenoid also mounted on the framework, the core 22 of which auxiliary solenoid is connected to switch arm 23 pivoted at 24 and adapted, when 21 is energized, to move contact spring 25 against contact spring 26. Arm 23 also carries a projection 27 to be engaged by member 28 of arm 20 to separate springs 25 and 26 by turning 23 on its pivot when solenoid 18 is energized and latch bar 13 is moved to the left (Fig. 7). 29 and 30 indicate two contact springs placed in the path of revoluble contact member 31, here shown as being operated by a timing device or stop clock 32. This stop clock (32) is so mounted on the framework (in bracket 33) that its stem 34 is beneath a projection 35 of guide 8. It will now be understood that when the operator depresses guide 8 to bring the thread against the rolls, he likewise depresses stem 34 and starts the timing element. If springs 25 and 26 are in contact, the movement of the latching bar (13) to the left (caused by the downward movement of guide 8) will separate the springs. Contact member 31 now starts rotation and eventually encounters contact 29, thereby closing a circuit through solenoid 21 over wires 36, 37 and battery 38 to member 31. This energizes 21 and closes contacts 25—26. Member 31 continues its rotation and eventually reaches contact 30, thereby closing a circuit through solenoid 18 over wire 39, contacts 25 and 26, wire 40, solenoid 18, wire 41, battery 38 to member 31. This energizes solenoid 18 and moves latching bar 13 to the left (Fig. 7) thereby releasing guide 8 (the latter moving upward under the compulsion of spring 11). The effect of this is to stop timing element 31 (stem 34 being permitted to rise), to break the circuit at 25—26 by the left-hand releasing movement of latching bar 13, and to permit the thread to resume its normal path out of contact with the rolls. It will be evident therefore that, after a predetermined period or after a given length of thread has been colored, the device is automatically released.

I claim:

1. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of means, located out of the normal path of the thread from the source to the bobbin, to apply a coloring agent to the thread, a guide, normally urged out of active position, to deflect the thread out of its normal path into a path where it receives the coloring agent as it passes from the source to the bobbin, latching means to retain the guide in its active position, and means to release the latching means.

2. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of means, located out of the normal path of the thread from the source to the bobbin, to apply a coloring agent to the thread, a guide, normally urged out of active position, to deflect the thread out of its normal path into a path where it receives the coloring agent as it passes from the source to the bobbin, latching means to retain the guide in its active position, and means to automatically release the latch a predetermined period after it has been moved into position to retain the guide in its active position.

3. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of means, located out of the normal path of the thread from the source to the bobbin, to apply a coloring agent to the thread, a guide, normally urged out of active position, to deflect the thread out of its normal path into a path where it receives the coloring agent as it passes from the source to the bobbin, latching means to retain the guide in its active position, and means to automatically release the latch after a predetermined length of the thread has been colored.

4. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of a device, normally inactive, which when rendered active applies a coloring agent to the thread as it passes from the source of supply to the bobbin, latching means to retain the device in its active position, electro-magnetic means which when energized releases the latching means and renders the device inactive, and means to automatically close a circuit through said electromagnetic means a predetermined period after the device has been rendered active.

5. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of a device, normally inactive, which when rendered active applies a coloring agent to the thread as it passes from the source of supply to the bobbin, latching means to retain the device in its active position, electro-magnetic means which when energized releases the latching means and renders the device inactive, and means to automatically close a circuit through said electro-magnetic means after a predetermined length of thread has been colored.

6. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of means, located out of the normal path of the thread from the source to the bobbin, to apply a coloring agent to the thread, a guide, normally urged out of active position, to deflect the thread out of its normal path into a path where it re-

ceives the coloring agent as it passes from the source to the bobbin, latching means to retain the guide in its active position, electro-magnetic means which when energized releases the latch, and means to close a circuit through said electro-magnetic means.

7. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of a device, normally inactive, which when rendered active applies a coloring agent to the thread as it passes from the source of supply to the bobbin, a timing element, means to render the device active and to place it under the control of the timing element, and means controlled by the timing element to render the device inactive.

8. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of a device, normally inactive, of means, located out of the normal path of the thread from the source to the bobbin, to apply a coloring agent to the thread, a guide, normally urged out of active position, to deflect the thread out of its normal path into a path where it receives the coloring agent as it passes from the source to the bobbin, a timing element rendered active by the guide when the latter causes the thread to be deflected, latching means to retain the guide in its active position, and means controlled by the timing element to release the latching means.

9. The combination with a support for a source of supply of thread and a bobbin on which the thread is wound, of a device, normally inactive, of means, located out of the normal path of the thread from the source to the bobbin, to apply a coloring agent to the thread, a guide, normally urged out of active position, to deflect the thread out of its normal path into a path where it receives the coloring agent as it passes from the source to the bobbin, a timing element rendered active by the guide when the latter causes the thread to be deflected, latching means to retain the guide in its active position, electro-magnetic means which when energized releases the latching means, and means controlled by the timing element to close a circuit through the electro-magnetic means.

Signed at New York city, in the county of New York, and State of New York, this 13th day of February, 1931.

FRED E. ZAVODOFF.