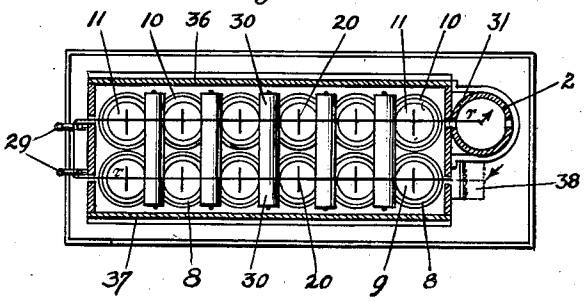
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APPARATUS FOR DYEING THREADS OR YARNS FOR TEXTILE MACHINES AND THE LIKE

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Fig 3.



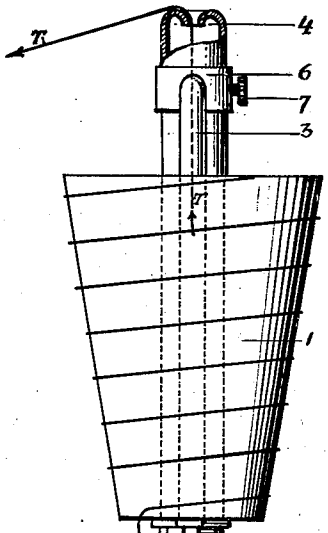


Fig. 2.

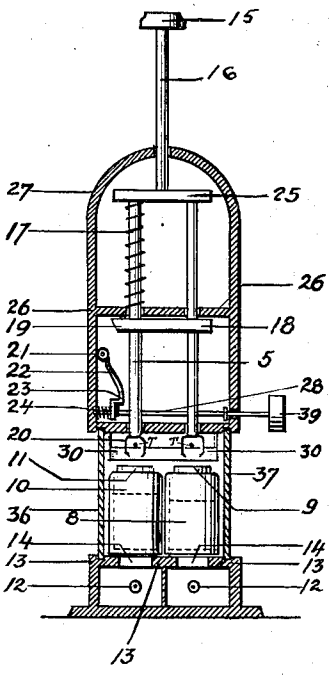
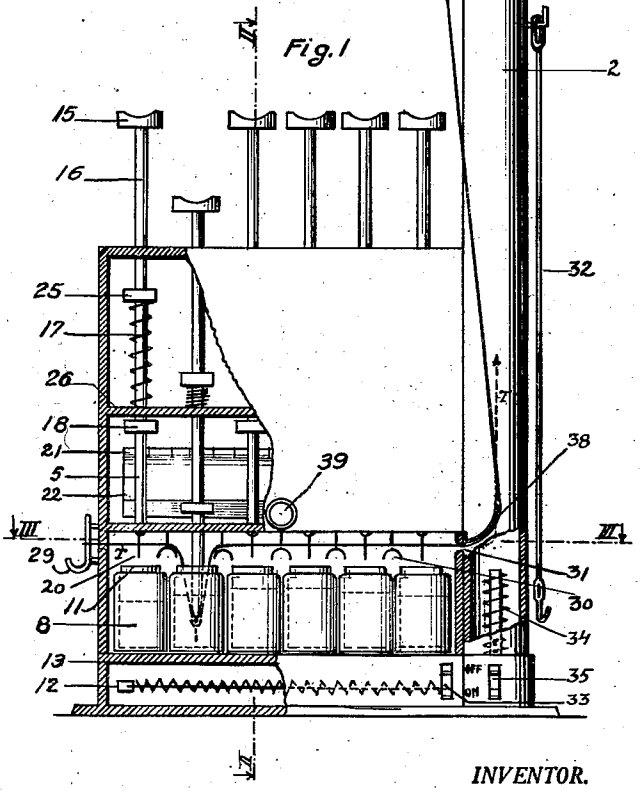


Fig. 1



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Fig. 4.

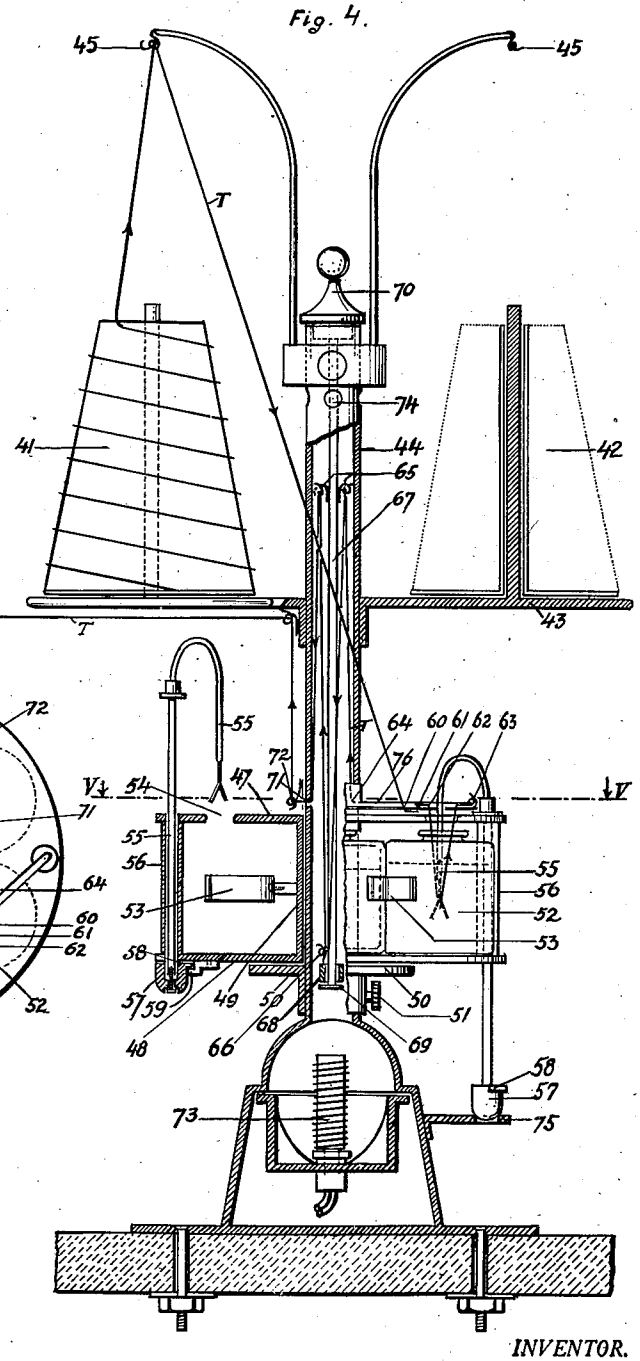
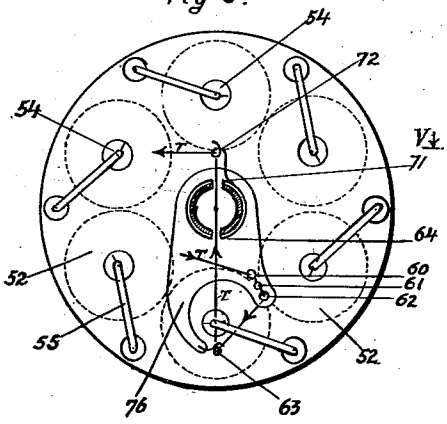


Fig 5.



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UNITED STATES PATENT OFFICE

2,310,764

APPARATUS FOR DYEING THREADS OR YARNS FOR TEXTILE MACHINES AND THE LIKE

Harold H. Denhof, New York, N. Y.

Application October 7, 1939, Serial No. 298,346

6 Claims. (Cl. 68—9)

This invention relates to an apparatus for supplying threads, or yarns of any material and of various colors to textile machines such as e. g. sewing machines, weaving machines, knitting machines and the like.

According to my invention white threads i. e. undyed threads which may be bleached or unbleached and which are supplied from a reel or the like are dyed and dried before the same are supplied to the textile machine. The threads, yarns or the like may be dyed in any desired color or the threads may, if desired, be used without dyeing.

In the manufacture of garments such as men's, ladies' and children's wear and underwear, shirts, shorts and the like as well as in the manufacture of shoes, textile fabrics, hosiery fabrics which are made by weaving and knitting threads, including silk threads, yarns, and the like must be used which have a different color. If e. g. colored shirts are sewn the sewing must be interrupted several times in order to thread another thread of a different color. This operation consumes time and a certain care must be exercised which is detrimental to mass production.

In accordance with my invention the thread, yarn or the like is dyed on the textile machine. If a thread of another color is required, instead of threading another colored thread, by the simple operation of a knob or the like the thread may be dyed in the desired color and may be dried before the same is fed into the textile machine. This operation consumes only a few seconds and requires no skill.

Accordingly, it is an object of the invention to provide an apparatus by means of which one or more threads supplied to a textile machine such as a weaving machines, knitting machines, sewing machines or the like may be dyed together in any desired color and dried thereafter before the same are supplied to the machine.

It is another object of the invention to provide an attachment for textile machines, and the like which allows to save considerable time while sewing or knitting articles comprising threads or yarns of different colors.

It is a further object of the invention to provide an attachment for textile machines and the like which allows to increase the output of the individual machine.

It is still an object of the invention to provide an attachment for textile machines and the like which allows to save thread or yarn. In sewing machines and the like used heretofore the thread had always to be threaded again if a thread of a different color had to be used. This operation is not only time consuming but causes a wastage of thread.

It is still a further object of the invention to provide an attachment for textile machines and the like which allows to select the correct color for the thread without fail and which thus increases the safety of operation of the sewing machine.

It is still another object of the invention to provide an attachment for textile machines and the like which obviates the necessity to keep a large number of reels containing threads of various colors in stock. By the use of my improved attachment for textile machines and the like the manufacturer needs only keep white thread of standard quality in stock. This has the further advantage that the quality of the thread of any color will always be the same while it may be sometimes difficult to procure the same quality of thread in all necessary and desired colors. Also, if only a small quantity of thread of a certain color is required it is not necessary to buy reels of thread having the desired color which may usually be obtained in large quantities only.

With my improved attachment for textile machines it is possible to weave a small lot of fabrics such as handkerchiefs showing a new design in a new color and to weave other fabrics in a different color if desired.

Heretofore the entire warp of the loom had to be dyed before use while with my new apparatus it is possible to dye the warp on the loom and thus to obtain different shades on the same warp. In accordance with my invention it is possible to dye the thread, yarn or the like on the knitting machine and thus to avoid the necessity to tie the threads together. Heretofore, it has not been possible to knit hosiery such as stockings or socks having different colors without tying the individual threads of different colors. Also, in colored socks as made up to now long threads may be observed in the colored socks where the threads have been tied together.

Accordingly, it is still an object of the invention to provide an attachment for knitting machines and the like which allows to produce a better and cheaper product.

With these and other objects in view, the invention comprises the specifically described and illustrated embodiments shown in the accompanying drawings, in which,

Fig. 1 is a front elevation with parts broken

away of my improved thread-dyeing and drying device,

Fig. 2 a section on line II—II of Fig. 1.

Fig. 3 a section on line III—III of Fig. 1,

Fig. 4 a front elevation with parts broken away of a modification of my improved thread-dyeing and drying device, and

Fig. 5 a section on line V—V of Fig. 4.

Though the embodiments of my invention shown in the drawings are designed for the use of a sewing machine it will be understood by the man skilled in the art that my new attachment may also be applied to other types of textile machines such as knitting machines or weaving machines.

Referring more particularly to the drawings, in which similar parts are designated by the same reference characters, 1 designates a reel of thread or yarn T. Reel 1 is rotatably arranged on a thread carrier 3 having a customary construction. As shown in Fig. 1 an adjusting ring 6 provided with a set screw 7 is arranged on cylinder 2. Ring 6 may be moved up and down on cylinder 2 and the same may be turned so that reel 1 may be adjusted and fixed in any desired position. On ring 6 one or more thread reel carriers 3 are arranged which support reel 1. Uusually one or two reels will be sufficient because for customary sewing machines not more than two threads will have to be dyed simultaneously. However, e. g. for special sewing machines such as chain stitch machines, buttonhole machines, overlock and underlock machines using several sewing needles four or more thread reel carriers will be required. It will be appreciated by the man skilled in the art that my improved device may easily be adapted for a plurality of thread reel carriers.

In order to dye the thread or yarn a plurality of bottles are provided each containing a dye having a suitable color. In the embodiments shown in the drawings six dye bottles 8 are provided. The dye bottles are preferably made of a heat resisting material and the same are provided with an opening 9 which is sufficiently large to introduce a fork which is adapted to dip the thread into the bottle. A number of bottles 10 equal to the number of bottles 8 is provided for an after treatment of the thread if this should be necessary for the type of dyestuff used. Bottles 10 are similar to bottles 8 in construction and shape and the same are provided with an opening 11. A heating means 12 is provided which preferably consists of an electric heating element in order to heat the dye bottles 8 and 10 if this should be necessary. It will be understood that, if required, only bottles 8 may be heated or that bottles 8 and bottles 10 may be heated in such a manner that each has a different temperature. Between walls 13 which support bottles 8 and 10 a space 14 is provided which allows the air heated by heating means 12 to heat the bottles 8 and 10.

In order to dip the thread T unwound from reel 1 into bottles 8 and 10 the device described hereinafter may be used. Push button 15 actuates rod 16 which in turn is connected to a transverse rod 25 fastened to bifurcated rod 5. Between wall 26 of the housing and the rod 25 spring 17 is arranged. Underneath wall 26 transverse rod 18 connects bifurcated rod 5. Rod 18 is provided with a sharp nose 19. At the lower end of bifurcated rod 5 forks 20 are arranged which, when button 15 is pushed down, are adapted to dip the thread into one of each of the bottles 8 and 10. Rear wall 27 is provided with a hinge 21 which is connected with a curved rod 22 having a shoulder 23. Spring 24 is interposed between wall 27 and rod 22. Against the action of spring 24 shoulder 23 can be pressed by means of button 39 having a rod 28. It will now be evident that if it is desired to dip the thread into one of the bottles 8 and 10 it is only necessary to press the button 15 of the desired dye bottle. Nose 19 of the pressed button 15 while moving down presses curved rod 22 against wall 27 and thus releases nose 19 of the button 15 previously depressed. Nose 19 will now engage with shoulder 23 and forks 20 will dip the thread into the desired dye bottle. If release button 39 is pressed shoulder 23 disengages rod 18 and the spring 17 pulls fork 20 out of the bottles again. It will be understood that button 39 is only actuated if it is desired to release all forks 20. 29 and 38 are guiding members which guide the thread from the reel 1 through the dyeing device.

Cylinder 2 is provided with an opening 31 through which the thread T is threaded and thread T leaves the cylinder through opening 4. Threading needle 32 is provided to thread the thread T through the dyeing device. Switch 33 opens and closes the electric current for heating element 12.

Cylinder 2 is arranged as a drying device for the thread. For this purpose a heating element 34 having a switch 35 may be provided at the bottom of cylinder 2.

Walls 36 and 37 are preferably made of glass which makes it possible to inspect the bottles 8 and 10 without removing the same. Furthermore, it can be observed when a bottle is empty and the same may be refilled.

Figs. 4 and 5 show a modification of my invention. In this modification two thread reels 41 and 42 are provided arranged on disk 43 which in turn is fixed on cylinder 44. A drum consisting of cylinder 49 spacing disks 47 and 48 is rotatably supported on cylinder 44 by adjusting ring 50 which is provided with set screw 51. Six bottles 52 are arranged on disk 48 and the same are fixed by means of spring 53. Openings 54 are provided in disk 47 above each of the bottles 52. Dipping forks 55 are adapted to move through opening 54. Forks 55 are guided through tubes 56 and the same are adapted to move through openings in upper disk 47 and lower disk 48. At the lower end of each fork 55 a handle 57 is rotatably arranged and provided with nose 58. Nose 58 engages with flange 59. In order to prevent a rotary movement of forks 55 the same are provided with a guiding recess which cooperates with a nose which may e. g. be arranged in disk 47. Thus forks 55 will always have the correct position in regard to opening 54. If handle 57 is turned nose 58 disengages flange 59 and handle 57 moves downwardly until the same rests upon plate 75. At the same time the selected fork 55 moves through opening 54 and dips into its appertaining bottle 52. It will be noted that each bottle containing a distinct color is provided with its own dipping fork 55 in order to prevent that the dyestuff remaining on the dipping fork contaminates the dyestuff contained in another bottle. By turning drum 47, 48, 49 any desired bottle 52 may be brought under the thread T.

Adjacent and above disk 47 a fork-shaped sheet member 76 is immovably arranged on cylinder 44. Member 76 is provided with three openings 60, 61 and 62 and with ear 63. Member 76 serves the purpose to guide thread T through open-

ings 60, 61, 62 and through ear 63 and opening 64 in order to provide the necessary tension of the thread. It is essential that member 76 with its ear 63 is arranged below the upper position of forks 55 because otherwise the thread T on member 76 will be gripped by the forks 55.

The selected dye bottle 52 as well as its opening 54 must be brought into such a position that opening 54 is bisected by the thread between ear 63 and opening 64. This position is assured when handle 57 meshes with an opening provided in plate 75.

Thread T is threaded and guided as follows. The same unwinds from reel 41 and moves through ear 45, through openings 60, 61 and 62 and through ear 63. Now the thread is seized by fork 55 and dipped into bottle 52 wherefrom the same moves through opening 64 into cylinder 44. In cylinder 44 the thread moves once or several times through ears 65 provided at the upper part of rod 67 and through ear 66. Rod 67 having a knob 70 is provided in cylinder 44 and the lower end of rod 67 is provided with disk 69 and weight 68 having an ear 66. In order to thread thread T the same is threaded through ear 45, through openings 60, 61 and 62 and through ear 63, opening 64 and 71 and through ear 72. Openings 64 and 71 are provided on cylinder 44. Now, rod 67 is lifted by means of knob 70 and disk 69 seizes thread T extending between openings 64 and 71 whereby thread T is pulled out of cylinder 44. Now, while rod 67 is outside of cylinder 44 the thread is wound one or several times over ears 65 and 66. Weight 68 is adapted to move up and down on rod 67.

If e. g. a white thread is desired the fork 55 will be in its upper position and the thread T will, accordingly, be longer. If one of the forks 55 is in its lower position as shown in Fig. 4 weight 68 will be in a higher position.

Cylinder 44 serves the purpose to dry the dyed thread and for this purpose, a heating element 73 is provided which heats the interior of cylinder 44 and a suitable number of openings 74 are provided to facilitate the circulation of the hot air.

I claim:

1. An apparatus for the uninterrupted dyeing of threads or yarns comprising a source of supply for the threads, a plurality of vats each containing a dyestuff of a different color, a plurality of containers each containing a liquid adapted for a furher treatment of a dyed thread, means for selectively guiding the thread from said source of supply and dipping it first through one of said vats and thereafter through one of said containers, and means for drying the thus dyed and treated thread.

2. An apparatus for continuously dyeing threads or yarns comprising at least one reel adapted to supply thread, a hollow body, a plurality of vats each containing a dyestuff of a different color, a plurality of containers arranged adjacent to said dyestuff vats, each of said containers containing a liquid adapted for a further treatment of a dyed thread, the number of said after treatment containers being equal to the number of said dyestuff vats, means for moving the thread supplied by said reel first over each and all of said vats and thereafter over each and all of said containers, means for moving the thread through a predetermined vat and through a predetermined container, means for heating said dyestuff vats, further means for heating said after treatment containers, still further means for heating said hollow cylinder, and means for moving the thus dyed and treated thread through said heated cylinder whereby the thread is dried.

3. An apparatus for continuously dyeing threads or yarns comprising at least one reel adapted to supply thread, a hollow cylinder, a plurality of vats each containing a different dyestuff, a support rotatably arranged on said cylinder, said vats being supported by said support, means for rotating said support to bring a selected dyestuff vat into a predetermined position, means for moving the thread from said reel through the selected vat, means for heating said cylinder, and means for moving the thread through said cylinder whereby the dyed thread is dried.

4. An apparatus for continuously dyeing threads or yarns comprising a source of supply for the threads, a plurality of vats each containing a different dyestuff, and a plurality of means, each being associated with one of said vats, for selectively guiding the thread from said source of supply through any one of said dyestuff vats.

5. An apparatus for continuously dyeing threads or yarns comprising at least one reel for supplying thread, a plurality of vats each containing a dyestuff of a different color, a plurality of containers arranged adjacent said dyestuff vats, each of said containers containing a liquid adapted for a further treatment of a thread, means for moving the thread supplied by said reel first over each and all of said vats and thereafter over each and all of said containers, a plurality of means, each being associated with one of said vats and with one of said containers, for moving the thread through a predetermined vat and through a predetermined container, and means for drying the dyed thread.

6. An apparatus for continuously dyeing threads or yarns comprising at least one reel for supplying thread, a rotatable support, a plurality of vats each containing a different dyestuff and arranged on said support, means for rotating said support to bring a selected dyestuff vat into a predetermined position, and a plurality of means, each being associated with one of said vats, for moving the thread from said reel through the selected vat.

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