May 9, 1933. W. I. TAYLOR 1,907,898

MANUFACTURE OF TEXTILE MATERIALS

Filed May 6, 1930

FIG_1_

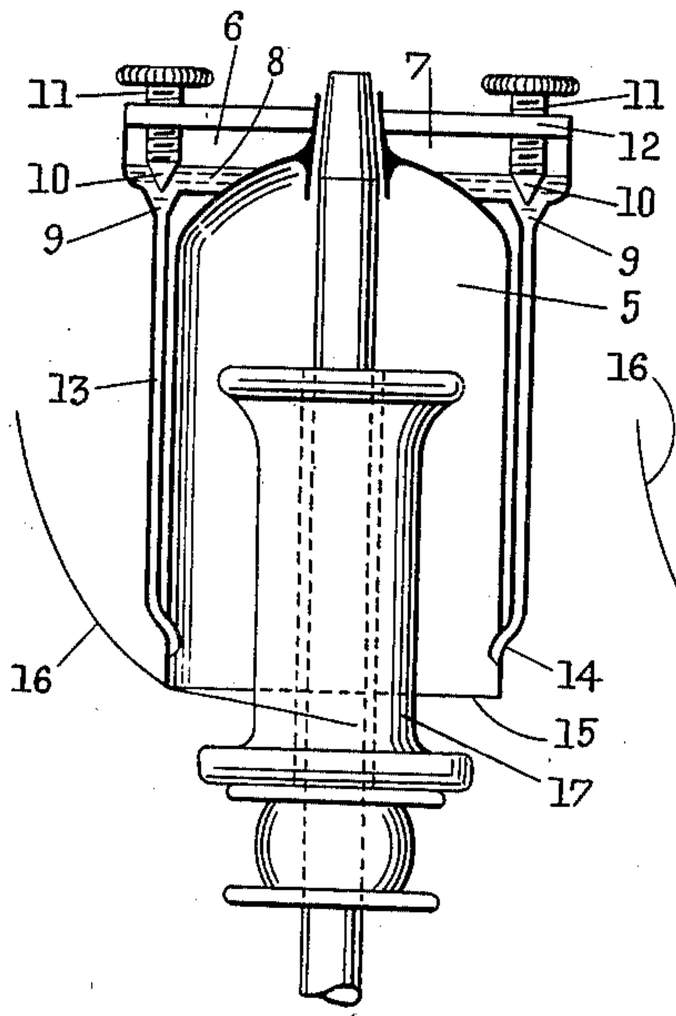


FIG_2_

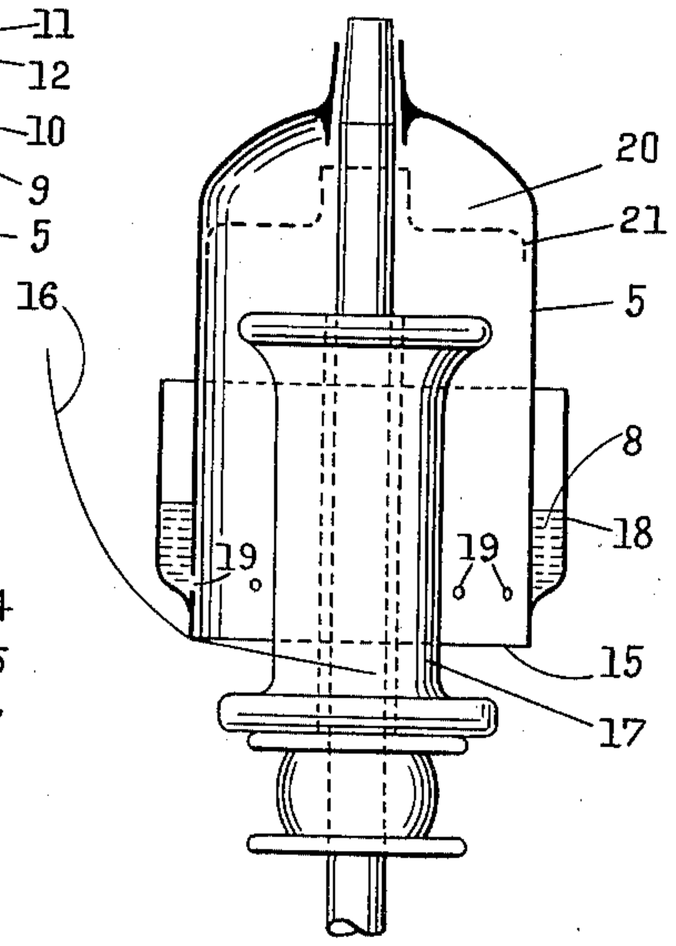


FIG_3_

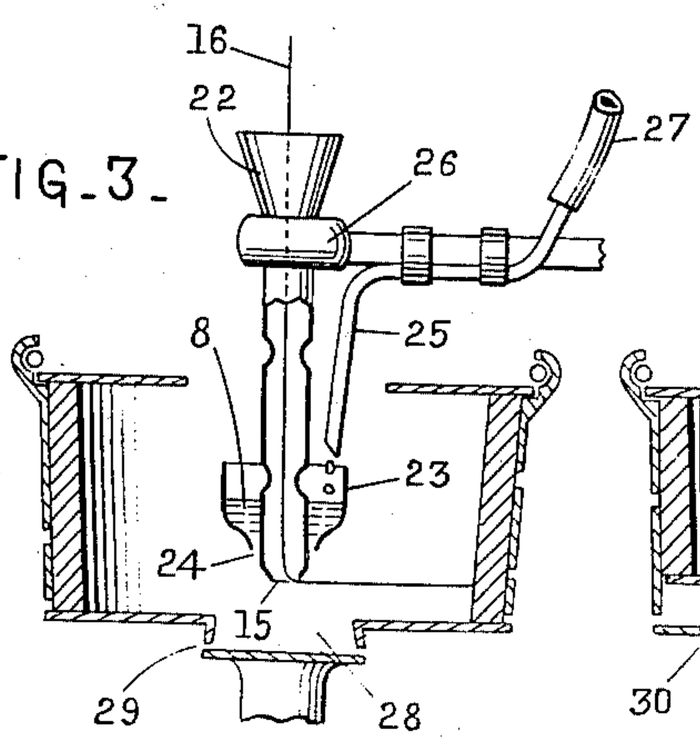
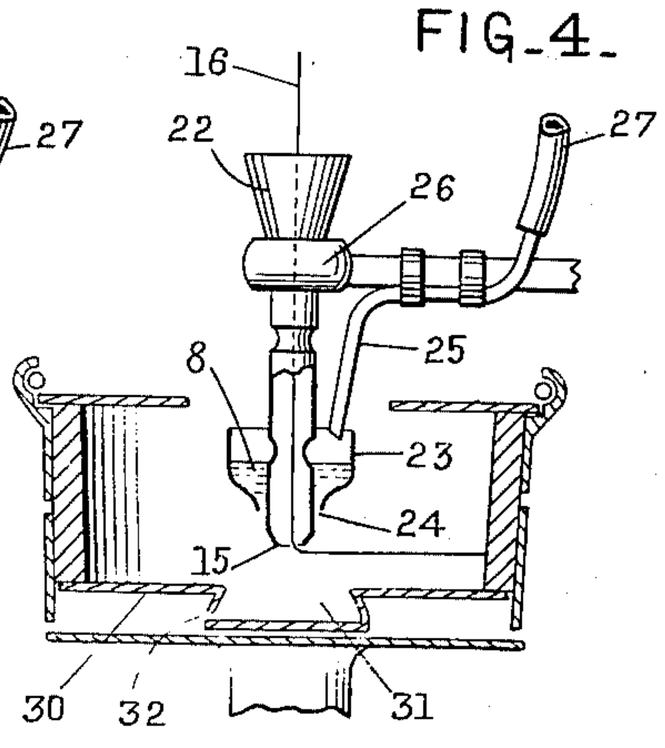


FIG_4_



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Patented May 9, 1933 1,907,898

UNITED STATES PATENT OFFICE

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MANUFACTURE OF TEXTILE MATERIALS

Application filed May 6, 1930, Serial No. 450,186, and in Great Britain May 30, 1929.

This invention relates to the treatment of artificial yarns or threads and has particular reference to the application of liquids, such as for example, sizes or dyes to the yarns or threads.

The principal object of the invention is to enable such liquid application to be effectively carried out during twisting and winding of artificial threads, whether continuously with their production or subsequently thereto.

According to the invention a liquid is applied to a yarn or thread (hereinafter referred to as a "thread") while the thread is passing over the edge of a substantially annular or cylindrical member which serves to guide the yarn to a package during the twisting and winding operation.

The invention is particularly applicable to the treatment of a thread during twisting and winding operations performed by cap-spinning devices or centrifugal boxes, in which case the application of the liquid to the thread takes place as the thread is leaving the edge of the cap or the edge of the funnel guide by which the thread is led into the centrifugal box. The liquid is supplied in any suitable manner to the edge of the guide member and is swept on to the thread by the passage of the thread over the edge. Preferably the liquid is applied to the side of the edge from which the thread leaves the guide member, e. g. to the outside of the thread guides of centrifugal boxes, or to the inside of the caps so that after receiving the liquid the thread makes contact with no part of the apparatus until it is wound on to the yarn package. After receiving the liquid the thread passes evenly and smoothly over the edge of the guide member, and is laid under uniform tension on the package.

The liquid may be fed in such a manner, or in such quantity to the edge of the guide that the thread receives a substantially uniform application of the liquid over the whole of its length, such uniform application being particularly suited to the sizing of the threads. It is possible, however, to apply the liquid at intervals to the thread which is passing over the edge of the guide by applying the liquid non-uniformly to the guide edge. Thus, size may be applied intermittently to the thread, but this particular feature of the invention is especially useful for the production of intermittent coloured effects on the thread, as will be more fully explained hereafter.

Conveniently the liquid is supplied to the guide edge from a reservoir or conduit associated with or carried by the guide member, means being provided if desired for adjusting or varying the flow of the liquid to the edge. For the purpose of applying different kinds of liquids, e. g. two or more different dyes to the threads, several conduits may be provided or the reservoir may be divided into compartments, from each of which the liquid is led, preferably in controlled amount to the guide edge.

While the invention is applicable to the sizing, dyeing or dressing during twisting and winding of all kinds of artificial yarns or threads, it is particularly suitable for the sizing, dyeing or dressing of yarns or threads of cellulose acetate or other organic derivatives of cellulose. The invention may be applied to the sizing, dyeing or dressing of yarns during twisting and winding operations performed continuously with the production of the yarns or threads by the dry or evaporating method, or by the wet or coagulation method, as well as during twisting or winding operations carried out at any subsequent stage of the manufacture of the yarns or threads.

The invention will now be described in greater detail, with reference to the accompanying drawing, but it is to be understood that the following description is given by way of example only and is in no way limitative.

Fig. 1 is a part section of a cap-spinning device fitted with one form of reservoir;

Fig. 2 is a part section of a cap-spinning device showing alternative forms of reservoir which my be used;

Fig. 3 is a section of a centrifugal box and one form of guide according to the invention; and

Fig. 4 is a view similar to Fig. 3 showing

a modified construction of the centrifugal box.

Referring particularly to Fig. 1, a spinning cap 5 is provided at its upper end with a reservoir 6 adapted to contain sufficient size, dye, or other liquid 8 to treat one or more bobbins. The reservoir 6 may be divided into two or more compartments one such compartment being indicated at 7. The liquid 8 passes from the reservoir 6 through one or more outlets 9, the flow through which is controlled by a needle valve 10 having a screwed spindle 11 passing through a bridge piece 12. The liquid 8 passing the valve 10 is led by a tube 13 down the wall of the cap, passing to the inside of the cap at a point 14 near to the cap edge 15 and forms a film which is swept off the edge 15 by the passage of the thread 16 to the bobbin 17 where it is wound. It will be seen that the liquid 8 is applied to the thread 16 while it is travelling in the direction of its length, at the point where it intersects the closed figure in space 15 formed by the cap edge. The thread 16 is caused always to intersect the Figure 15 as it passes across it, and to intersect it at a point which rotates round, and therefore traces the said figure.

When a uniform or substantially uniform application of the liquid is required, as is usual in sizing, a comparatively large number of tubes 13 is employed and the flow of the liquid is adjusted so that a continuous film is formed round the edge of the cap, the liquid thus being supplied to the whole length of the thread.

By restricting the flow of the liquid from the several tubes 13 to the edge 15, or more especially by reducing the number of points 14 from which the liquid flows to the edge 15, a non-uniform film or a series of independent globules of the liquid may be formed on the edge of the cap, thus effecting an irregular or intermittent application of the liquid. Size may be applied intermittently in this manner to secure the filaments of the thread together at intervals. If a dye is applied in a similar manner, shaded or intermittent colour effects are produced. By using a reservoir 6 whose compartments contain different coloured dyes, intermittent multi-colour effects can be produced in which the colours are either spaced apart along the thread, or abut on each other, or even shade one into the other. The lengths of the coloured portions may be adjusted by regulating the flow of the dye through the valves 10.

Referring now to Fig. 2, the reservoir is formed as an annular vessel 18 on the outside of the cap 5, a number of holes 19 at the base of the reservoir leading liquid from the vessel through the cap wall to the inner face of the cap 5 near to its lower edge 15 from which it is wiped off by the thread 16. The reservoir 20 may be arranged, as shown in dotted lines inside the body of the cap 5 above the highest point reached by the bobbin 17 in its traverse, orifices 21 being provided at the base of the reservoir 20 to lead the liquid to the wall of the cap 5. The liquid passing through these orifices 21 runs or trickles down the wall of the cap to the lower edge 15 as previously described.

The application of the invention to the twisting and winding of artificial threads by the centrifugal box method is illustrated in Fig. 3. The thread 16 coming from the godet or feed roller (not shown) passes through a funnel guide 22, from the lower edge 15 of which it passes to the thread package on the internal periphery of the box. A small reservoir or conduit 23 is mounted on the funnel guide 22 a short distance from the edge 15 of the guide, the liquid to be applied passing through small orifices 24 to the outer wall of the guide and running to its lower edge, from which it is wiped off by the thread 16 passing to the yarn package. The reservoir may be supplied continuously by means of a feed tube 25 fitted or secured to the funnel bracket 26, and connected to a flexible supply pipe 27 which allows the whole guide assembly to be temporarily displaced when it is required to remove the centrifugal box. The base of the box is recessed at 28 so that any surplus material falling from the edge of the funnel 22 drops into the recess, and passes from the box through holes 29 under the action of centrifugal force.

In Fig. 4 a false bottom 30 is provided with a recess 31 serving the same purpose as the recess 28 shown in Fig. 3. In this case surplus liquid falling into the recess 31 escapes through holes 32 in the recess and in the base of the box.

What I claim and desire to secure by Letters Patent is:—

1. Method of applying liquids to travelling threads, comprising supplying liquid to the circular edge of a guide member round and in contact with which edge the thread is revolving so that the liquid is swept from the edge by the passage of the thread along and across said edge, said thread coming into contact with the liquid on the guide member only at the edge thereof.

2. Method of applying liquids to threads comprising applying the liquid to the yarn or thread as a substantially uniform coating while the thread is passing over the edge of a substantially annular member which is supplied with the liquid and which serves to guide the thread on to a package during a twisting and winding operation, said thread coming into contact with the liquid on the guide member only at the edge thereof.

3. Method of applying liquids to threads comprising applying the liquid intermittently along the length of the thread while the

thread is passing over the edge of a substantially annular member which serves to guide the thread on to a package during a twisting and winding operation.

4. Method of applying a size to threads comprising applying the size to the thread while the thread is passing over the edge of a substantially annular member which is supplied with the size and which serves to guide the thread on to a package during a twisting and winding operation, said thread coming into contact with the size on the guide member only at the edge thereof.

5. Method of applying a size to threads comprising applying the size to the thread intermittently along its length while the thread is passing over the edge of a substantially annular member which serves to guide the thread on to a package during a twisting and winding operation.

6. Method of applying a dye to threads comprising applying the dye to the thread while the thread is passing over the edge of a substantially annular member which is supplied with the dye and which serves to guide the thread on to a package during a twisting and winding operation, said thread coming into contact with the dye on the guide member only at the edge thereof.

7. Method of applying a dye to threads comprising applying the dye to the thread intermittently along its length while the thread is passing over the edge of a substantially annular member which serves to guide the thread on to a package during a twisting and winding operation.

8. Method of dyeing threads comprising applying a plurality of dyes to the thread at intervals occurring intermittently along its length while the thread is passing over the edge of a substantially annular member which serves to guide the thread on to a package during a twisting and winding operation.

9. Method according to claim 8 comprising applying the dyes in such a manner that they overlap to produce shaded color effects.

10. Apparatus for applying liquids to travelling threads comprising an annular guide member round and in contact with which the thread revolves, and means for supplying liquid to the edge of the guide member so that the thread comes in contact with the liquid at said edge, and sweeps the liquid from the edge by the passage of the thread along and across said edge.

11. Apparatus for applying liquids to threads during a twisting and winding operation comprising a rotatable thread support, a substantially annular member whose edge is adapted to guide the thread on to the support during the winding operation, and means for supplying liquid to the edge of the guide member from the side of said edge towards which the thread is passing.

12. Apparatus for applying liquids to threads during a twisting and winding operation comprising a rotatable thread support, a substantially annular member whose edge is adapted to guide the thread on to the support during the winding operation, a reservoir associated with the guide member, and means for leading the liquid from the reservoir to the edge of the guide member from the side of said edge towards which the thread is passing.

13. Apparatus for applying liquids to threads during a twisting and winding operation comprising a rotatable thread support, a substantially annular member whose edge is adapted to guide the thread on to the support during the winding operation, means for supplying liquid to the edge of the guide member from the side of said edge towards which the thread is passing, and means for regulating the amount of liquid supplied to the edge of said guide member.

14. Apparatus for applying liquids to threads during a twisting and winding operation comprising a rotatable thread support, a substantially annular member whose edge is adapted to guide the thread on to the support during the winding operation, a plurality of reservoirs associated with the guide member, and means for leading the liquid from the reservoirs to the edge of the said guide member.

15. Apparatus for applying liquids to threads during a twisting and winding operation comprising a rotatable thread support, a substantially annular member whose edge is adapted to guide the thread on to the support during the winding operation, a plurality of reservoirs associated with the guide member, and means for regulating the from the reservoirs to the edge of the said guide member, means for leading the liquid amount of liquid supplied to the edge of the guide member.

In testimony whereof I have hereunto subscribed my name.

WILLIAM IVAN TAYLOR.

CERTIFICATE OF CORRECTION.

Patent No. 1,907,898. **May 9, 1933.**

WILLIAM IVAN TAYLOR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, lines 104 to 106, claim 15, strike out the words "and means for regulating the from the reservoirs to the edge of the said guide member, means for leading the liquid" and insert instead "means for leading the liquid from the reservoirs to the edge of the said guide member, and means for regulating the"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of June, A. D. 1933.

M. J. Moore.

(Seal)

Acting Commissioner of Patents.