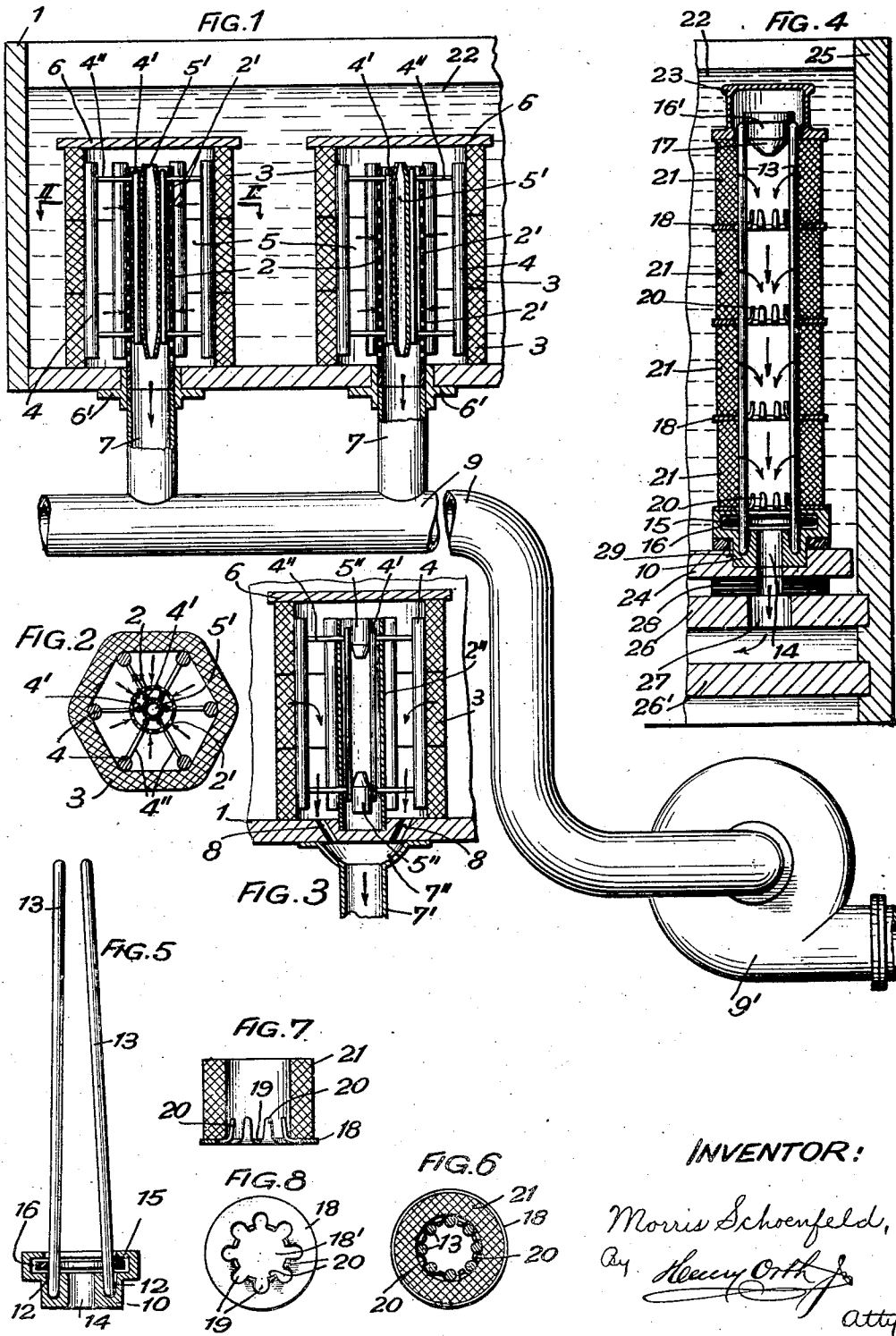


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 DEVICE FOR TREATING COILS OR SIMILAR ANNULAR MASSES
 OF SPUN FILAMENTS OF ARTIFICIAL SILK
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DEVICE FOR TREATING COILS OR SIMILAR ANNULAR MASSES OF SPUN FILAMENTS OF ARTIFICIAL SILK

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This invention relates to methods of and devices for treating thread coils or similar annular masses of spun filaments of artificial silk.

In the artificial silk industry it is known, for the purpose of further treating the spun filaments coiled to annular masses in the spinning can to remove the said filaments from the can, to press them flat and to subsequently pack them into trays or similar containers with perforated walls before exposing them to the action of a liquid. Thereby the employment of special supporting sleeves or the like for the coils is rendered superfluous, but the latter when treated in this manner before being reeled require to be individually opened up again by the aid of special widening means, so as to re-assume their original annular shape.

According to the invention the method of treating the annular masses of spun filaments or similar coils of artificial silk is distinguished by the annular masses of artificial silk threads after their removal from their supports being arranged in rows around a tensioning appliance having radially movable tensioning members, with the latter in retracted position, under avoidance of any contacting with the said members, and thereupon being commonly expanded by the same members from inside to outside in the radial direction and consequently brought to bear thereon, whereafter, with the tensioning appliance accommodated in upright position inside of a container, the annular masses of artificial silk stacked on the said appliance are subjected to a liquid treatment in a manner known per se.

Thus the thread coil is adapted to be subjected in a manner to a liquid treatment which renders the treatment simple and thoroughly performable in a short time, whereby the annular shape of the thread coil is maintained thus permitting the thread to be reeled after the wet treatment without any further provisions.

In the accompanying drawing several constructional forms of a device for carrying the method into effect are illustrated by way of example only, wherein

Fig. 1 shows a section of a first constructional form of the device with thread coils stacked to form a column;

Fig. 2 is a section on the line II—II of Fig. 1;

Fig. 3 shows a modified part of Fig. 1;

Fig. 4 shows a further modification of the device;

Fig. 5 is a vertical section of the skeleton core of Fig. 4;

Fig. 6 is a cross-section of a thread coil, as slid on the skeleton core before the wet treatment;

Fig. 7 is a vertical section of the thread coil of Fig. 6 placed on a separating member;

Fig. 8 is a top plan view of the separating member.

The present method enables the annular mass of spun filaments obtained in the spinning can as well as the coils produced on the spinning spool in the parallel spinning process to be further treated in the same manner. The annular mass obtained in the spinning can is readily removable from the can and the coil produced on the spool is easily slid off the latter when the spool is constructed for changing its diameter.

Then the coil 3 for the further treatment, such as washing, de-sulphurizing, bleaching, drying or eventually dyeing and the like respectively is slid on a hollow core or a standard 2 placed in a container 1 (Fig. 1) which for certain purposes is closed. The standard 2 is provided with outwardly movable parts each consisting of a pair of parallel exterior and interior longitudinal bars 4 and 4' interconnected by two transverse bars 4'' so as to provide a complete frame. In Fig. 2 these frames are shown six in number which by the bars 4'' being slidably arranged in the mantle of the standard 2 are simultaneously moved radially outwardly with the bars 4 extending parallel to the axis of the standard when the plug 5' is inserted between the bars 4'. After the coil 3 is mounted to the standard 2 or preferably a plurality of coils in superposed position, so as to form a column, the outwardly movable parts are expanded, thus securing the coils 3 thereon. This may be accomplished before the standard is in-

serted in the container 1 with its lower end fitting in a socket 6' in the bottom of the latter. The coils 3 bearing tightly on each other, without leaving any interstices between them or between the lowest coil and the bottom of the container, provide a sealed vessel with the said bottom when they are covered at the top by a cover 6 associated with each standard 2. The lower end of the standard 2 joins with a conduit 7 ending in the socket 6', all of the conduits 7 being connected at their other end with a suction or pressure main 9, connected to a suction or pressure pump 9' respectively, depending on the direction in which the liquids 22 and gases required for the further treatment of the silk are to be passed through the coils 3. For this purpose the standard 2 is apertured such as at 2' to allow the treatment medium to pass from the interior of the container 1 through the windings of the coils 3 into the hollow space 5 between the coils and the standard 2 and from there through the apertures 2' into the pump 9' via the conduits 7 and 9 in the direction of the arrows in Fig. 1 or vice versa.

In this manner a quick and thorough treatment of the coils is ensured the treatment medium finding no other way in or out of the tightly sealed column provided by the coils than through the individual windings of the latter in uniform distribution. Upon choice the treatment medium may be caused to circulate through the described path repeatedly when the other end of the pump 9' is connected with the container 1 by a return conduit.

Alternatively, as shown in Fig. 3, the wall of the standard 2'' may not be apertured and the socket in the bottom of the container 1 omitted. Instead the standard 2'' ends below in a recess in the said bottom and communication between the hollow space 5 and the pipe 7' is provided by passages 8 formed in the bottom of the container 1 to connect the space 5 with an enlarged mouth piece 7'' on the pipe 7', and to permit the treatment medium to circulate (see the arrows in Fig. 3).

The described method has the advantage that for the further treatment of the goods any spools or the like as supports for the coils 3 can be dispensed with, whereby great economies are obtained. Furthermore, the advantage arises that the new method is equally applicable to coils obtained in the spinning can or on spools with the parallel spinning method.

The device shown in Fig. 4 is based on the same principle as that illustrated in Fig. 1 the difference between the two devices residing in their construction. Instead of a standard a skeleton core is provided.

The base 10 of the skeleton core is formed with recesses 12 arranged in a regular octagon around the central bore 14 of the base, for the lower ends of the bar-shaped longi-

tudinal members 13 to enter so as to be loosely accommodated therein. It is obvious that instead of an octagon any other regular polygon, for instance, a hexagon may be used. 15 designates an elastic connecting member, for example, a rubber ring which is inserted in an annular groove 16 of the base 10 so as to surround the longitudinal bars 13 with the tendency to urge them inwardly to bear with their inner sides on the inner portion of the wall of the respective recess and to hold them together in this fashion and at the same time to secure them against dropping out of the base, thus forming a self-contained unit together with the latter (Fig. 5). A head piece 16' is provided with a conical portion 17 for entering between the longitudinal bars 13 of the skeleton core and to press them apart when the head piece is placed on top of the core.

Fig. 8 shows a flat separating member 18 having a central opening 18' which follows the contour of the longitudinal bars when assembled in the base 10. The free ends of the thus formed ears 20 between the notches 19 for the longitudinal bars 13 are bent up for axially centering the thread coil or annular mass of spun filaments 21 respectively which they support (Fig. 7). The separating members 18 suitably consist of a material which is indifferent to the liquid 22 to be used for the further treatment of the thread coils. A hollow cover or cap 23 serves for covering the top-most thread coil 21 (Fig. 4) of a plurality of coils piled up around the skeleton core to form a column after the head piece 16 has been inserted between the longitudinal bars 13 of the skeleton core, thus bringing the bars to bear from inside on the windings of the thread coils. The described device is used for carrying out the method according to the invention as follows:

A plurality of columns assembled of thread coils 21 in the above-described manner are mounted on a base plate 24 which is insertable in a container or tub 25 (Fig. 4). In the double bottom 26 of the tub openings 27 with superposed sealing members 28 are arranged. In the inserted position of the base plate 24 in the tub the openings 27 register with the bores 29 in the base plate, so as to enable the liquid 22 to flow off from the tub 25 between the double bottom 26, 26' of the latter in the direction of the arrows.

For this purpose, as described in connection with the previous constructional forms of the device an under-pressure is caused between the double bottom of the tub, or when the latter is closed on top, pressure may be applied to the interior of the tub, whereafter the treatment liquid 22 is forced through the windings of the various thread coils to perform the wet treatment.

In course of this treatment the thread coils ordinarily shrink, thus causing the height of the column to decrease. The cover 23 is so shaped, as to take care of this shrinkage and to permit the coils to always bear tightly on each other, thus leaving no other exit for the liquid than through the windings of the coils.

I claim:

1. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable parts adapted to engage the annular mass of filaments interiorly in the axial direction of the mass, supporting means for said movable parts adapted to be mounted on the bottom of said container at the bored portion thereof, to provide a stable column together with the filaments, means for expanding said movable parts radially in engagement with said filaments, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through said filaments and the bored portion of said container.

2. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable parts adapted to engage the annular mass of filaments interiorly in the axial direction of the mass, supporting means for said movable parts adapted to be mounted on the bottom of said container at the bored portion thereof, to provide a stable column together with the filaments, means for expanding said movable parts radially in parallel relationship in engagement with said filaments, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through said filaments and the bored portion of said container.

3. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable parts adapted to engage the annular mass of filaments interiorly in the axial direction thereof, radial guide means connected to said movable parts, a hollow standard adapted to be mounted on the bottom of said container at the bored portion thereof, to provide a stable column together with the filaments and for guiding said radial guide means in circumferentially distributed relationship of said movable parts to its mantle, a plug insertable between said radial

guide means, for expanding said movable parts radially in engagement with said filaments and securing said parts in their expanded position on said standard, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through said filaments and the bored portion of said container.

4. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable parts adapted to engage the annular mass of filaments interiorly in the axial direction thereof, radial guide means connected to said movable parts, a hollow standard comprising an apertured mantle and adapted to be mounted on the bottom of said container at the bored portion thereof to provide a stable column together with the filaments, and for guiding said guide means in circumferentially distributed relationship of said movable parts to said apertured mantle, a plug insertable between said radial guide means for expanding said movable parts radially in engagement with said filaments and securing said parts in their expanded position on said standard, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment liquid through said filaments, said apertured mantle and the bored portion of said container.

5. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable rod-shaped parts adapted to engage the annular mass of filaments interiorly in the axial direction thereof, two transverse bars on each of said rod-shaped parts, a hollow standard adapted to be mounted on the bottom of said container at the bored portion thereof to provide a stable column together with the filaments and for guiding said transverse bars in circumferentially distributed relationship of said rod-shaped parts to its mantle in guide bores of the latter, a connecting bar for the free ends of said transverse bars of each movable part, a through plug axially insertable between said connecting bars for expanding said movable parts radially in engagement with said filaments and securing said parts in their expanded position on said hollow standard, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through said filaments

and the bored portion of said container.

6. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable rod-shaped parts adapted to engage the annular mass of filaments interiorly in the axial direction thereof, two transverse bars on each of said rod-shaped parts, a hollow standard adapted to be mounted on the bottom of said container at the bored portion thereof to provide a stable column together with the filaments and for guiding said transverse bars in circumferentially distributed relationship of said rod-shaped parts to its mantle in guide bores of the latter, a connecting bar for the free ends of said transverse bars of each movable part, terminal plug portions axially insertable between said connecting bars for expanding said movable parts radially in engagement with said filaments and securing said parts in their expanded position on said hollow standard, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through said filaments and the bored portion of said container.

7. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable rod-shaped parts adapted to engage the annular mass of filaments interiorly in the axial direction thereof, two transverse bars on each of said rod-shaped parts, a hollow standard comprising an apertured mantle and adapted to be mounted on the bottom of said container at the bored portion thereof to provide a stable column together with the filaments and for guiding said transverse bars in circumferentially distributed relationship of said rod-shaped parts to said apertured mantle in guide bores of the latter, a connecting bar for the free ends of said transverse bars of each movable part, a through plug axially insertable between said connecting bars for expanding said movable parts radially in engagement with said filament and securing said parts in their expanded position on said hollow standard, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment liquid through said filaments, said apertured mantle and the bored portion of said container.

8. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for

the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable rod-shaped parts adapted to engage the annular mass of filaments interiorly in the axial direction thereof, two transverse bars on each of said rod-shaped parts, a hollow standard comprising an apertured mantle and adapted to be mounted on the bottom of said container at the bored portion thereof to provide a stable column together with the filaments and for guiding said transverse bars in circumferentially distributed relationship of said rod-shaped parts to said apertured mantle in guide bores of the latter, a connecting bar for the free ends of said transverse bars of each movable part, terminal plug portions axially insertable between said connecting bars for expanding said movable parts radially in engagement with said filaments and securing said parts in their expanded position on said hollow standard, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment liquid through said filaments, said apertured mantle, and the bored portion of said container.

9. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one recessed portion in the bottom of said container, a plurality of movable parts adapted to engage the annular mass of filaments interiorly in the axial direction of the mass, radial guide means connected to said movable parts, a hollow standard adapted to be inserted in said recessed portion of the bottom of said container to provide a stable column together with the filaments and for guiding said radial guide means in circumferentially equally distributed relationship of said movable parts to its mantle, conducting means for the treatment medium provided in the bottom of said container exteriorly of said standard between the latter and the filaments, a plug insertable between the said radial guide means for expanding said movable parts radially in engagement with said filaments and securing said parts in their expanded position on said standard, a top closure for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through the filaments and said conducting means for the treatment medium provided in the bottom of said container.

10. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable parts adapted to en-

gage a plurality of annular coils of spun filaments interiorly in the axial direction of the mass, a supporting base for said movable parts adapted to be mounted on the bottom of said container at the bored portion thereof and receiving the lower ends of said parts in recesses to be swingable in said recesses in the radial direction, an annular groove formed in said base above said recesses, an elastic connecting member held in said groove against axial displacement and surrounding said movable parts for urging them inwardly, a plug axially insertable between said movable parts for expanding said parts radially and to lock said parts with said filaments to provide a stable column with the filaments, a cap disc for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through the filaments and the bored portion of the container.

11. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable parts adapted to engage a plurality of annular coils of spun filaments interiorly in the axial direction of the mass, a supporting base for said movable parts adapted to be mounted on the bottom of said container at the bored portion thereof and receiving the lower ends of said parts in recesses distributed about the axis of said base to be swingable in said recesses in the radial direction, an annular groove formed in said base above said recesses, an elastic connecting member held in said groove against axial displacement and surrounding said movable parts for urging them inwardly, a plug axially insertable between said movable parts for expanding said parts radially and to lock said parts with said filaments to provide a stable column together with the filaments, a separating member between each two coils, a cap disc for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through the filaments and the bored portion of the container.

12. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable parts adapted to engage a plurality of annular coils of spun filaments interiorly in the axial direction of the mass, a supporting base for said movable parts adapted to be mounted on the bottom of said container at the bored portion thereof and receiving the lower ends of said parts in recesses distributed about the axis of said base to be

swingable in said recesses in the radial direction, an annular groove formed in said base above said recesses, an elastic connecting member held in said groove against axial displacement and surrounding said movable parts for urging them inwardly, a plug axially insertable between said movable parts for expanding said parts radially and to lock said parts with said filaments to provide a stable column with the filaments, a separating member between each two coils, a notch for each movable part in said separating member, bent up ears between the said notches for centering the coil supported thereby, a cap disc for the annular mass of filaments freely carried by said mass for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through the filaments and the bored portion of the container.

13. In a device for treating thread coils or similar annular masses of spun filaments of artificial silk, in combination, a container for the treatment liquid, at least one bored portion in the bottom of said container, a plurality of movable parts adapted to engage a plurality of annular coils of spun filaments interiorly in the axial direction of the mass, a supporting base for said movable parts adapted to be mounted on the bottom of said container at the bored portion thereof and receiving the lower ends of said parts in recesses distributed about the axis of said base to be swingable in said recesses in the radial direction, an annular groove formed in said base above said recesses, an elastic connecting member held in said groove against axial displacement and surrounding said movable parts for urging them inwardly, a plug axially insertable between said movable parts for expanding said parts radially and to lock said parts with said filaments to provide a stable column with the filaments, a cap disc for the annular mass of filaments freely carried by said mass and surrounding the inserted plug with sufficient top clearance to allow relative displacement between the cap and the plug for automatically compensating the axial shrinkage of the mass, and means for passing the treatment medium through the filaments and the bored portion of the container.

In testimony whereof I have signed my name to this specification.

MORRIS SCHOENFELD.

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