Oct. 31, 1933. W. SCHIEBER ET AL 1,932,913

APPARATUS FOR TREATING CAKES OF ARTIFICIAL SILK WITH LIQUIDS

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Fig 1.

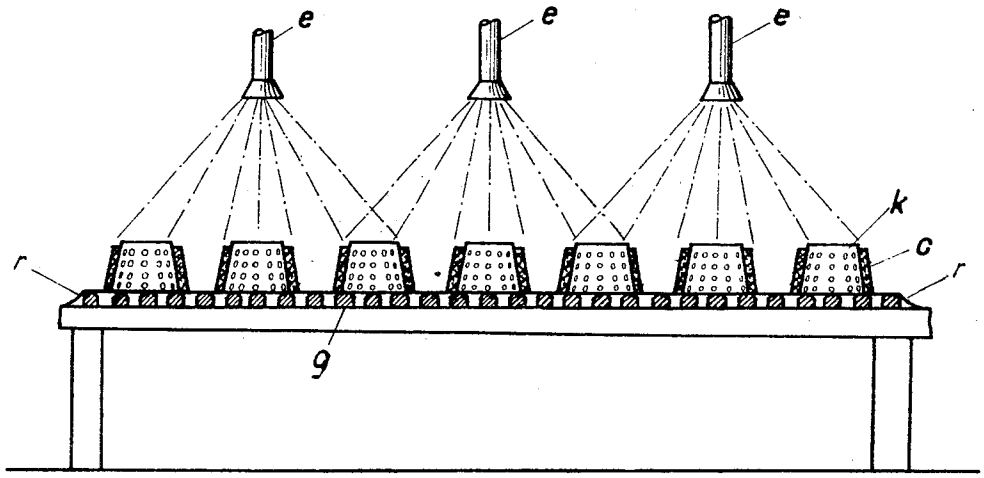

Fig 2.

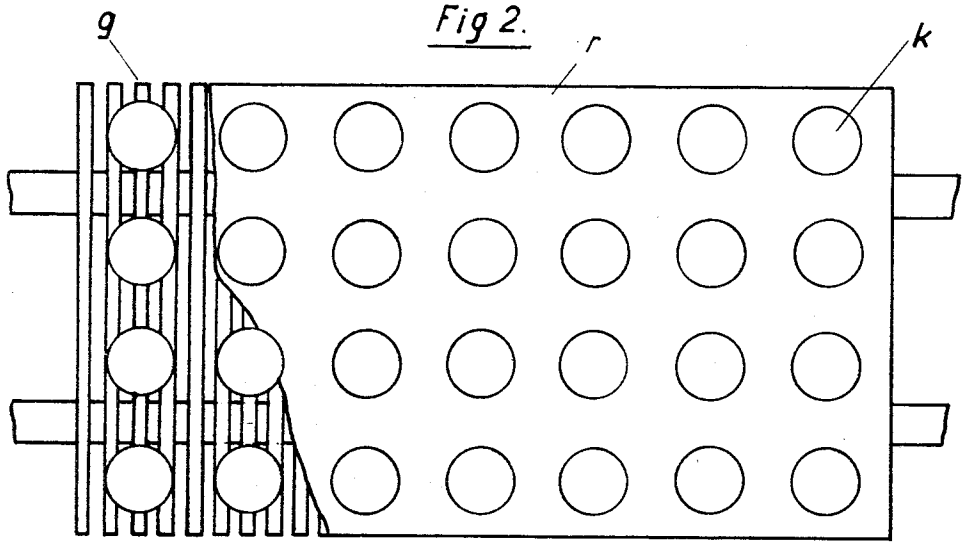

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Fig 3

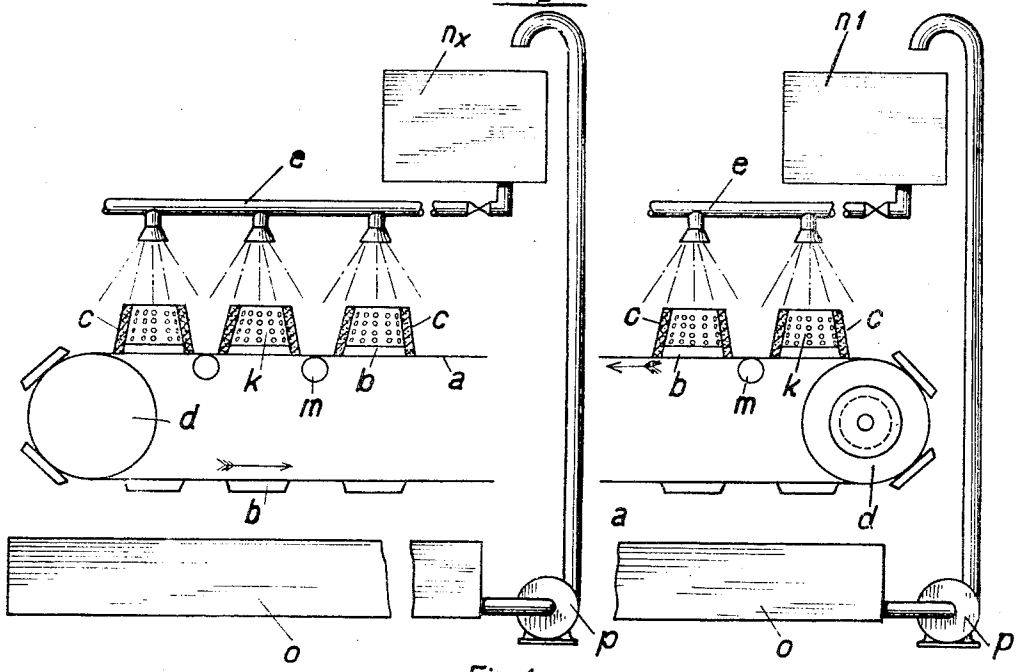
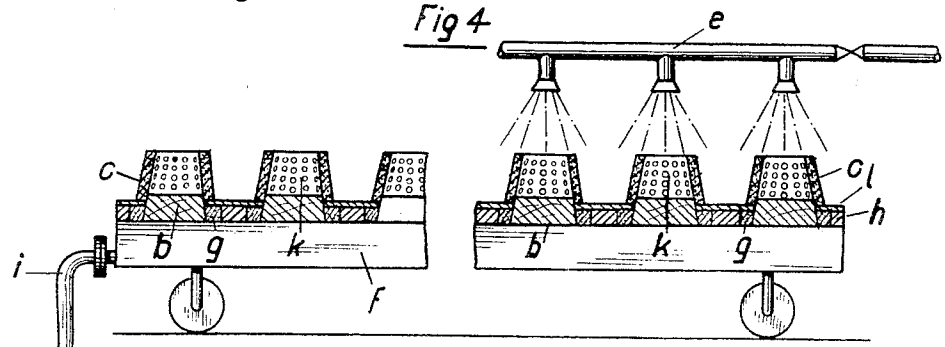


Fig 4



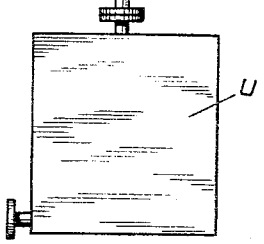


Fig 6.

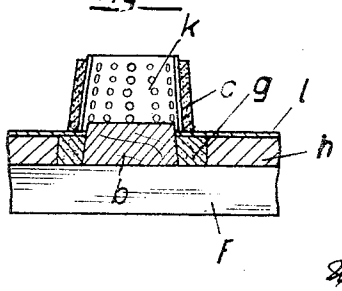
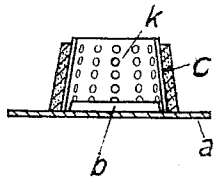


Fig 5.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR TREATING CAKES OF ARTIFICIAL SILK WITH LIQUIDS

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3 Claims. (Cl. 18—8)

Our present invention relates to a new process of washing and after-treating cakes consisting of artificial threads and to a device suitable to carry out our process.

We have found that the annular cakes of artificial threads formed in the spinning pot of a centrifugal spinning machine after removal from the pot by inverting it and after applying an insert into the interior of the cake in order to maintain its shape, may be immediately subjected to a washing process or after-treatment by an irrigating or a spraying operation with the requisite liquid agent. As an insert we prefer to use an elastic flap or collar of the same size and form as the interior opening of the cake. It may consist of celluloid, rubber or of another acid-proof, preferably non-metallic material and may be provided with perforations. The spun cakes of threads originally of a nearly cylindrical form in the spinning pot, after having been withdrawn from the centrifugal box and after introduction of the insert assume a slightly conical form and are placed with their smaller opening upwards on a suitable permeable support. When spraying or irrigating water by means of showering nozzles or slotted nozzles upon the freshly spun fiber cakes arranged in this manner, the rate of removal of the adhering acid is considerably increased especially when using warm or even hot water. Thus, the washing out process may be finished in the course of 1 to 2 hours without damage to the individual fibers and derangement of the fibers in the cake.

In the same manner, the after-treatment of the artificial threads as, for instance, desulfurizing, bleaching and soaping may be performed by a corresponding irrigating or spraying operation. It is unnecessary in our process to provide clips or protective coverings to hold the cakes together or to press the cakes into a flat form, or to hang them upon rotating rods. Those and similar means would render the process more difficult and inconvenient.

In order to perform our process, the fiber cakes provided with an insert of the kind mentioned above, are placed, for instance, on a lattice work covered with cloth allowing the washing or treating liquid to run off freely. Or they are arranged on suitable vehicles which travel to the different showers of the requisite liquid agent. Finally, the cakes may be carried through the irrigating zones of the individual liquids by means of a conveyer band. In order to avoid stagnation of the treating liquids on the base of the cakes, a permeable support may be used through which the liquids are removed by suction.

The fiber cakes after washing with water or after other treatment with liquids in the manner described, may be reeled into skeins either in the wet state or preferably after drying them. In order to dry the cakes, we prefer to place them together with the insert for a short time on a centrifugal machine to remove the bulk of the water; then they are passed into an oven where they are steamed, if necessary, and finally, dried. Rewinding of the finished threads from the cakes occurs without difficulties. Still carried by the inserts, the dried yarn can be reeled much more rapidly than is possible when it is wet or damp or when the cakes have lost their original form as a result of being repeatedly handled and transferred from one machine to another.

If exactly uniformly spun fiber cakes are treated, the use of the inserts mentioned above may be dispensed with in the washing process and in the after-treatment. In this case, the inserts are only necessary when rewinding the yarns.

In the accompanying drawings devices are illustrated suitable to perform our process, the same reference characters being used throughout the different figures to indicate the same parts.

Fig. 1 is a front view partly in cross section of the device, and

Fig. 2 a plan view, the fiber cakes being indicated by circles, the shower devices being omitted.

Fig. 3 shows parts of a device in which the fiber cakes are carried by means of a conveyer band in the irrigating zones of different liquids,

Fig. 4 shows a similar device in which the cakes are placed on a vehicle,

Figs. 5 and 6 show in detail the arrangement of the fiber cake in the devices shown in Figs. 3 and 4, respectively.

Referring to Fig. 1 e represents a shower device irrigating the fiber cakes c mounted on an elastic conical carrier k and resting on a permeable cloth r which covers a lattice work q.

In Fig. 3 a device is shown in which the fiber cakes c mounted on carriers k are slowly moved under the irrigating device e. The cakes with their inserts are placed on conical plate-like projections b to prevent the elastic insert from collapsing (see Fig. 5). These projections, preferably of wood, are mounted on a conveyer band a moving slowly in the direction indicated by an arrow. The conveyer band a is driven by drums d and supported by rods m. The container n_1

may be filled, for instance, with hot water while the receptacle n_x contains a solution of soap. Between the showers from containers n_1 and n_x the cakes have to pass a number of other showers, for instance, for desulfurizing and bleaching, but substantially constructed in the same manner, so that the treatment of the cakes is finished by its passage through the series of showers. The treating liquids are recovered in the receptacles o from which they return to the containers n_1—n_x by means of the pump p.

Fig. 4 shows another embodiment of a device suitable for our new process in which the cakes are placed on vehicles. The cakes c provided with the inserts k are arranged in the same manner as seen in Fig. 3, on plate-like projections b. Around these projections, permeable filter plates g are mounted through which the irrigating liquid is removed by suction; f is a hollow bottom of the vehicle connected by the tube i with the container u which may be evacuated.

Fig. 5 represents a single fiber cake and the manner in which it is mounted on the conveyer band seen in Fig. 3. c is the fiber cake, k the elastic insert provided with holes, a the conveyer band and b the plate-like projection.

Fig. 6 shows details of the device illustrated in Fig. 4. c is the fiber cake, b the plate-like projection, k the insert, g a permeable annular filter plate, h an impermeable layer of material, l a thin cover of felt and f the hollow bottom.

Our process may be carried out according to the following example:—

The annular cake of artificial threads formed in the spinning pot of a centrifugal spinning machine is withdrawn from the centrifugal box and put on an elastic collar of celluloid provided with holes. The cake thus stiffened is introduced into an aqueous spraying bath or shower bath. Thus, a fiber cake comprising a yarn of 36 individual threads and having a total liter of 180, the cake having a thickness of about 1.5 cm., is freed from acid after 60 to 90 minutes when using water of a temperature of 30 to 60° C. In an analogous manner its after-treatment is completed by irrigating it with a desulfurizing, a bleaching and a soaping liquid. The finished thread is dried in an oven at a temperature of about 50 to 60° C. and then reeled into skeins without difficulties with a speed of 500 meters per minute.

What we claim is:—

1. A device for washing and after-treating artificial threads in form of fiber cakes, comprising a horizontal support of permeable material, on the said support plate-like projections adapted to securely engage the larger openings of the fiber cakes, a plurality of spraying nozzles and means to carry the fiber cakes through the irrigating zones of the individual spraying nozzles.

2. In a machine for washing and after-treating artificial threads in form of a fiber cake, a horizontal support, on said support plate-like projections, a permeable annular filter plate surrounding said plate-like projections, a cover of felt on said support, said support being arranged on a hollow bottom and connected therewith a collecting vessel which may be evacuated.

3. In a machine for washing and after-treating artificial threads in form of fiber cakes a horizontal grate-like support comprising parallel rods, on said support a permeable cloth, said fiber cakes being mounted on an elastic, conical carrier and distributed on said permeable cloth, and means for irrigating said fiber cakes.

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