Aug. 19, 1958 C. KRONSBEIN 2,848,146

TREATING HOSIERY MADE OF SYNTHETIC FIBERS

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Fig. 1

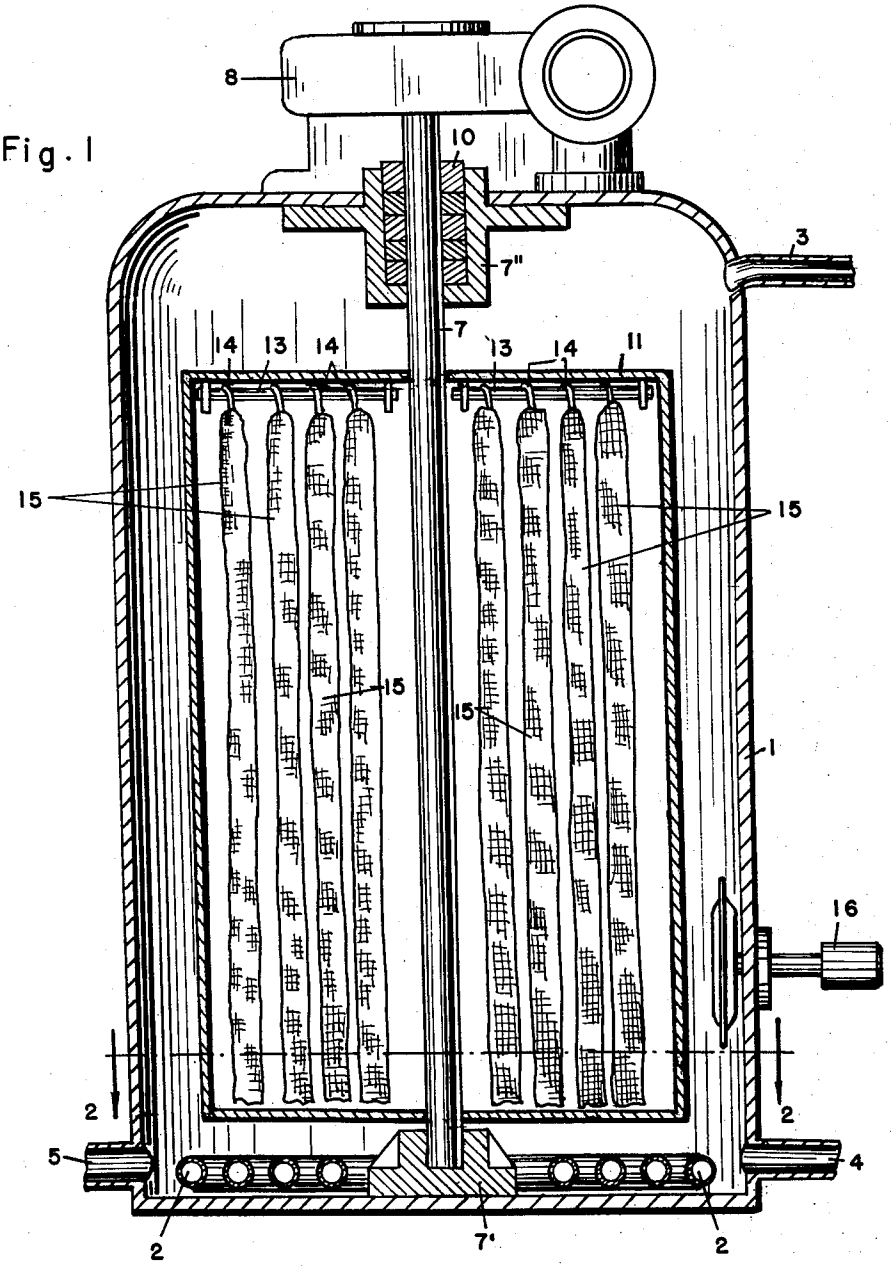

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Fig. 2

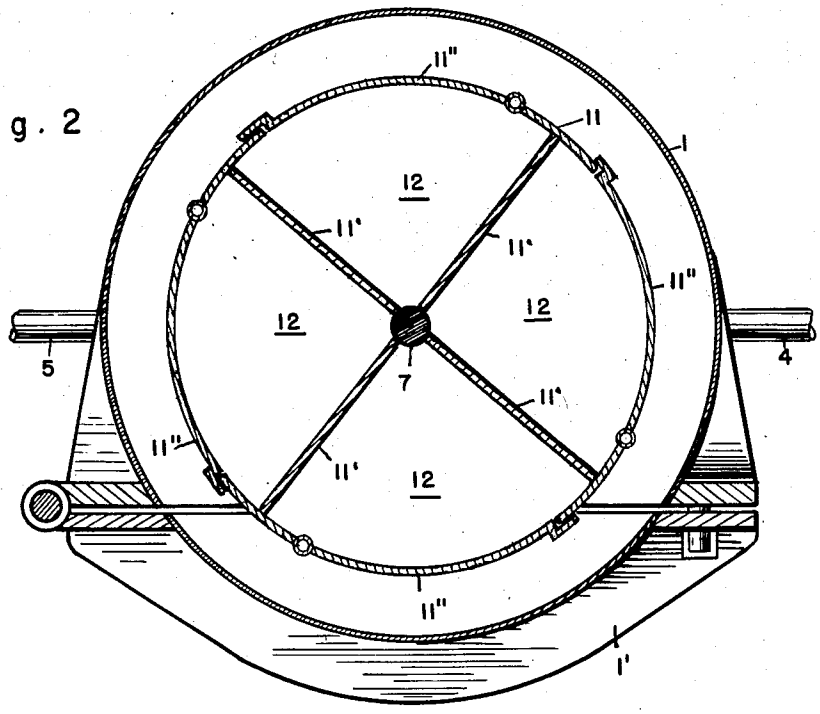
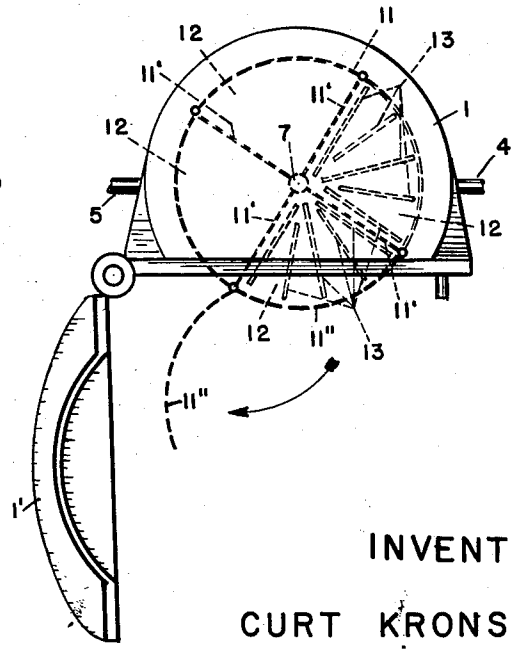


Fig. 3



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United States Patent Office 2,848,146
Patented Aug. 19, 1958

2,848,146

TREATING HOSIERY MADE OF SYNTHETIC FIBERS

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Application May 21, 1956, Serial No. 586,200

Claims priority, application Germany June 25, 1955

2 Claims. (Cl. 223—51)

This invention relates to treating hosiery made of synthetic fibers, and more particularly to an apparatus for performing a specific treatment of hosiery which may be referred to as pre-fixation or presetting.

The term pro-fixation or pre-setting is intended to cover a process preceding washing, dyeing and sewing of the hose. The purpose of this process is to impart a certain degree of dimensional stability to the hose to enable subsequent washing, dyeing, etc. without permanent shrinkage or impairment of the mesh structure.

As a general rule, pre-fixation or pre-setting, washing or scouring and drying of hosiery are effected in batches. The batch process requires relatively much floor space, and relatively complex equipment, and involves the danger of damage to the hosiery while in transit, in a relatively fragile state, from one treatment zone to another treatment zone.

It is, therefore, one object of this invention to provide an improved apparatus for pre-setting, washing or scouring and drying of hosiery requiring relatively little floor space, which apparatus is simple, and does away with the inherent danger of damage to fragile hosiery while in transit between treatment zones.

Another object of this invention is to provide an improved apparatus for pre-setting, washing and drying of hosiery, which apparatus enables to achieve substantially all the advantages of a continuous flow process, and whose operation does not involve any movement of the hosiery under treatment from one treating zone to another.

A further object of this invention is to provide a compact apparatus adapted to perform pre-setting, washing and drying of hosiery therein.

Other objects and advantages of this invention will become apparent as this specification proceeds, and the features of novelty of this invention are being pointed out with particularity in the claims appended to, and forming part of, this specification.

The application of the apparatus according to this invention comprises a number of steps, namely that of mounting hosiery on individual supports, of accommodating said hosiery while on said supports in a tank, of subjecting said hosiery inside of said tank simultaneously to the action of moisture and heat above 100 deg. C., of admitting a washing or scouring medium into said tank and of producing a relative motion between said washing or scouring medium and said hosiery to wash said hosiery, of draining said washing or scouring medium from said tank, and of thereafter subjecting said hosiery while still on said supports inside of said tank to a sufficiently high angular velocity to dry said hosiery by centrifugal action. The aforementioned relative motion between the washing or scouring medium and the hosiery may be effected by moving the hosiery relative to the washing or scouring medium. As an alternative, the hosiery may fixedly be suspended in a tank receiving the washing or scouring medium, and the latter may be subjected to supersonic vibrations by means of a supersonic vibrator mounted inside of the tank and submersed in the washing or scouring medium.

In the accompanying drawing:

Fig. 1 shows, in part in side elevation, and in part in vertical section, an apparatus embodying the invention;

Fig. 2 is a section along 2—2 of Fig. 1; and

Fig. 3 is a top-plan view on a relatively smaller scale of the structure shown in Figs. 1 and 2.

Referring now to the drawing, numeral 1 has been applied to indicate a tank substantially in the shape of an oblong cylinder arranged vertically with the longitudinal axis thereof. Tank 1 is adapted to be heated in either of two ways, i. e. either by admitting steam to a system of steam pipes 2 arranged at the bottom of tank 1, or by admitting steam directly into the tank. Pipes 3, 4 and 5 may be used for admitting fluids to the tank, draining fluids from the tank and evacuating the tank. Rotatable shaft 7 is mounted inside of tank 1 along the longitudinal axis thereof. The lower end of shaft 7 is supported by a bearing 7' and the upper end thereof is supported by a bearing 7'' combined with a stuffing box the packing of which has been designated by reference numeral 10. Motor means including a variable speed drive 8 are supported by the top of tank 1 and adapted to drive shaft 7 at different speeds, of which one is relatively low and the other relatively high. Perforated drum 11 is arranged inside of tank 1 and supported by shaft 7 for joint rotation with shaft 7. Drum 11 comprises a plurality of perforated partitions 11' subdividing said drum into a plurality of treating chambers 12. Drum 11 further comprises a plurality of perforated cylinder-segment-shaped doors 11''. Each treating chamber 12 is provided with a separate door 11''. A plurality of arms or hanger rods 13 are arranged inside drum 11 adjacent to the ceiling thereof and supported by the ceiling. Arms or hanger rods 13 extend radially outwardly from shaft 7. A plurality of hosiery supports 14, each supporting pieces of hosiery 15, are suspended from each arm or hanger rod 13. Fig. 3 shows only the hanger rods 13 in two compartments of drum 11. Actually all compartments are provided with hanger rods 13. Tank 1 is provided with a large door 1' shown in the closed position in Fig. 2 and in the open position in Fig. 3. Opening of door 1' gives access to one of doors 11'' and compartments 12 become accessible one after another upon successive rotation of drum 11 about angles of 90 degrees and opening of the individual door 11'' of each compartment. Hence compartment or treating chambers 12 are being charged in sequence and are being discharged in sequence.

Reference numeral 16 has been applied to indicate a supersonic vibrator which may comprise a magnetostrictive core and an energizing winding for the core. Such vibrators are of conventional design and therefore do not need to be described in detail. Vibrator 16 may be used as an alternative means for causing relative motion between the liquid inside of tank 1 and the hosiery 15 suspended inside of drum 11. Provision of vibrator 16 enables to dispense with variable speed drive 8. A one speed drive taking its place is then used for drying the hosiery within drum 11, whereas relative movement between the hosiery 15 and the liquid around it is achieved by operation of vibrator 16 with drum 11 in fixed position.

The relatively fragile non-pre-set hosiery is mounted on individual shape-maintaining supports 14 which are accommodated in drum 11 and tank 1, respectively. Thereupon the hosiery is simultaneously subjected to the action of moisture and of heat above 100 deg. C. A washing medium is admitted into tank 1 and a relative motion between said medium and the hosiery is being produced. This relative motion may be effected either by rotation of drum 11 at a relative small speed or by energizing the

supersonic vibrator **16**. Either water, or water with a detergent added to it, may be used as washing or scouring medium. When washing is completed the washing medium is being drained off tank **1** and thereafter the hosiery **15**, while still on the individual shape-maintaining supports inside of tank **1** and drum **11**, is subjected to a sufficiently high angular velocity to dry the hosiery by centrifugal action.

It will be apparent from the foregoing that this process minimizes handling of the relatively fragile hosiery prior to pre-setting thereof and during pre-setting operations.

Having disclosed a preferred embodiment of this invention, it is desired that the same be not limited to the particular means disclosed. It will be obvious to any person skilled in the art that many modifications and changes may be made without departing from the broad scope and spirit of the invention. Therefore it is desired that the invention be interpreted as broadly as possible and that it be limited only as required by the prior state of the art.

It is claimed:

1. An apparatus for processing hosiery made of synthetic fibers comprising a tank substantially in the shape of an oblong cylinder arranged vertically with the longitudinal axis thereof and sufficient in length to permit suspension of hosiery therein in a stretched out condition, means for heating the inside of said tank, fluid admitting and fluid draining means on said tank, a rotatable shaft mounted inside of said tank arranged along said longitudinal axis thereof, motor means adapted to drive said shaft, a perforated drum arranged inside said tank supported by said shaft, a plurality of perforated partitions subdividing said drum into a plurality of treating chambers, a plurality of perforated cylinder-segment-shaped doors on said drum one for each of said plurality of treating chambers, a plurality of arms arranged inside said drum adjacent the ceiling thereof extending radially outwardly from said shaft, a plurality of hosiery supports suspended on each of said plurality of arms, and one single lateral door on said tank adapted to expose upon appropriate rotation of said drum each of said plurality of doors to give access to each of said plurality of treating chambers.

2. An apparatus as specified in claim 1 wherein said motor means is supported on the top of said tank and associated with a variable speed drive adapted to drive said shaft at different speeds.

References Cited in the file of this patent

UNITED STATES PATENTS

2,039,660	Reama	May 5, 1936
2,333,160	Dunn	Nov. 2, 1943
2,463,842	Woods	Mar. 8, 1949
2,468,550	Fruth	Apr. 26, 1949
2,641,120	Bailey	June 9, 1953

FOREIGN PATENTS

1,907,081	France	June 29, 1955