Jan. 1, 1935. P. E. HARRISON ET AL 1,986,434

WRINGING MACHINE

Filed Oct. 1, 1932 3 Sheets-Sheet 1

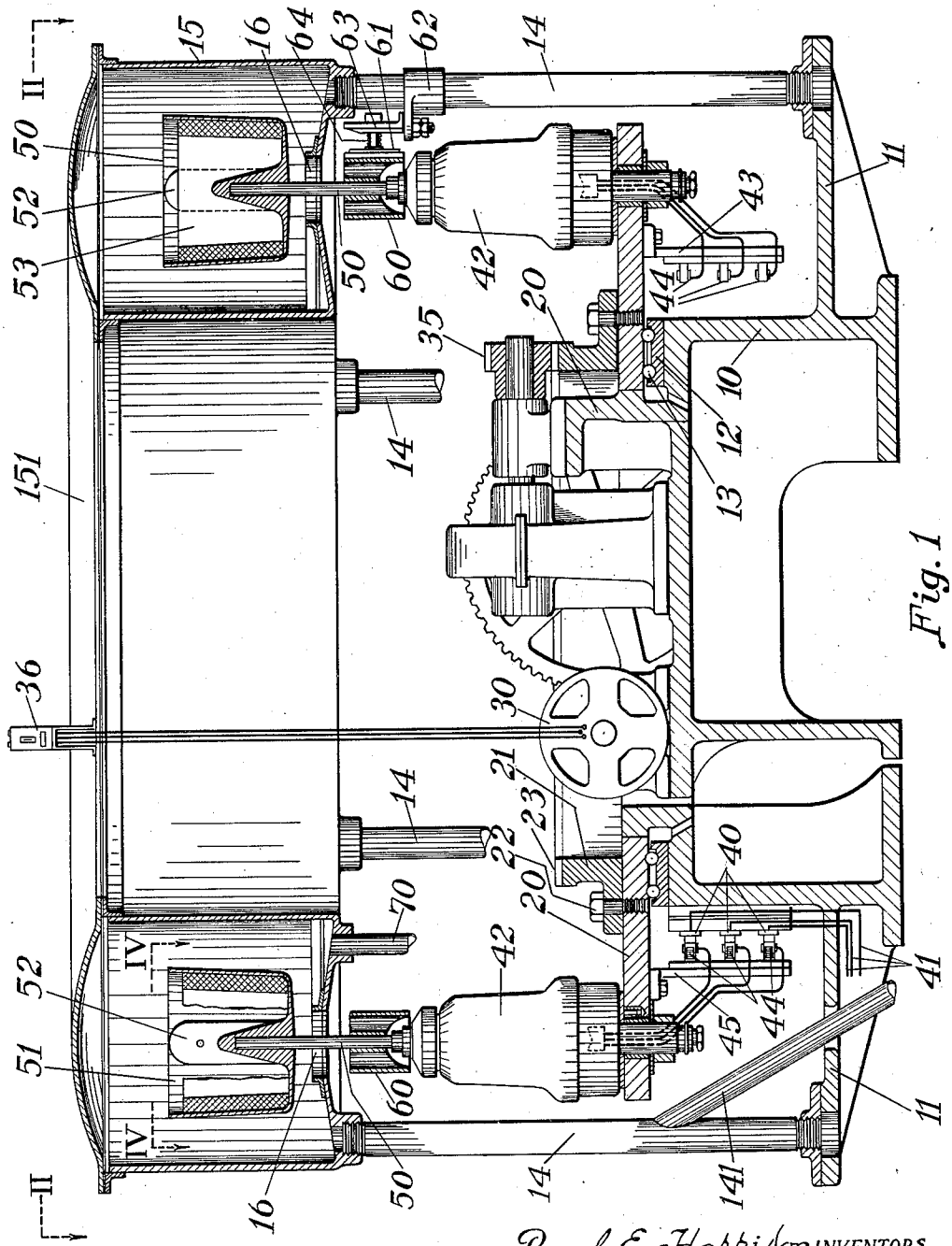


Fig. 1

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WRINGING MACHINE

Filed Oct. 1, 1932 3 Sheets-Sheet 2

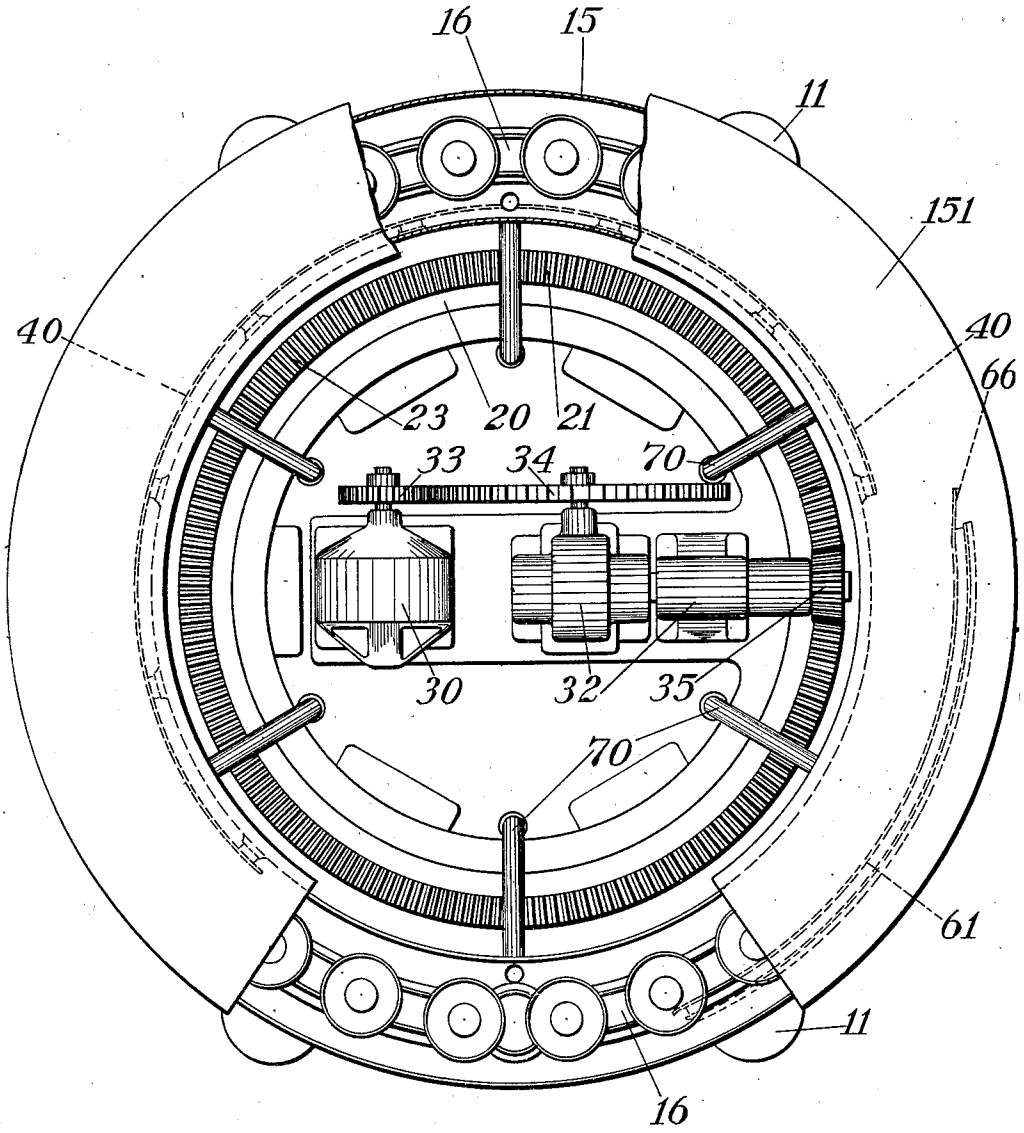


Fig. 2

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WRINGING MACHINE

Filed Oct. 1, 1932 3 Sheets-Sheet 3

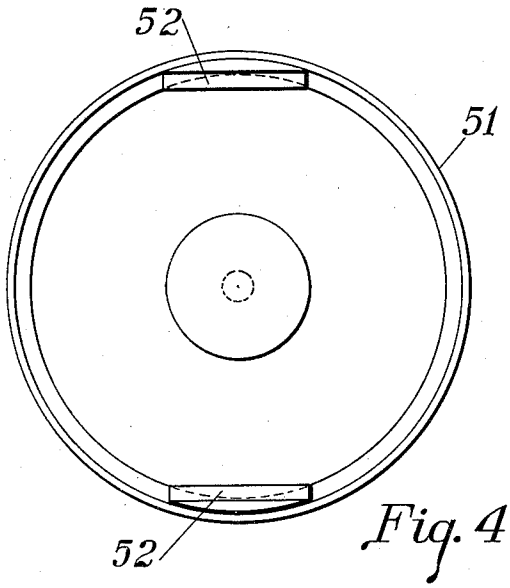


Fig. 4

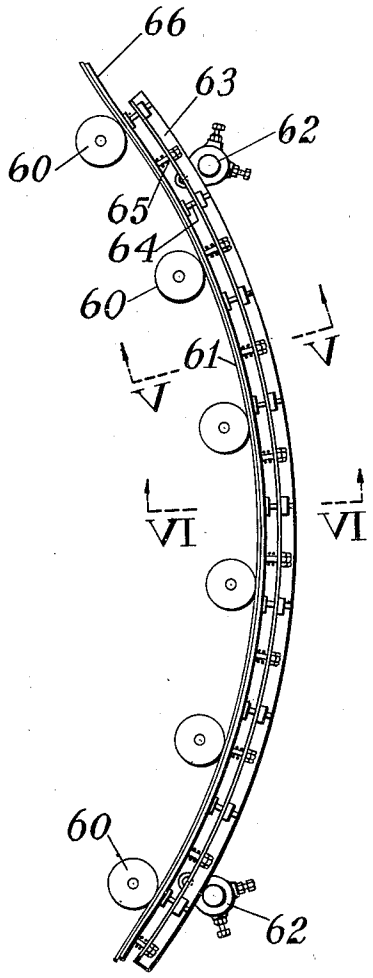


Fig. 3

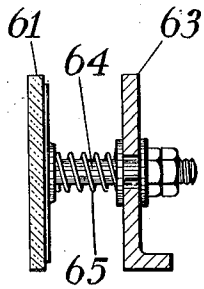


Fig. 5

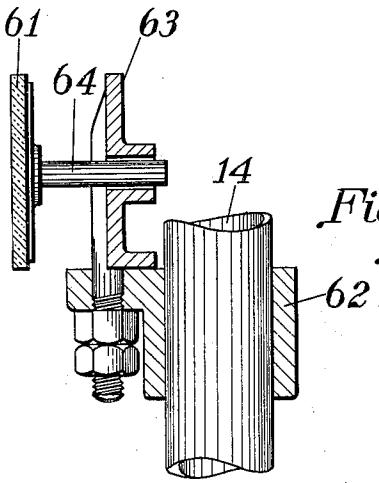


Fig. 6

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Patented Jan. 1, 1935 1,986,434

UNITED STATES PATENT OFFICE

1,986,434

WRINGING MACHINE

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Application October 1, 1932, Serial No. 635,744

7 Claims. (Cl. 210—71)

This invention relates to a means and method for the centrifuging of objects and especially of annular objects, such as cakes of yarn, filaments, cord, ribbon, or the like. The invention will be described in its application to centrifugal wringing of wet cakes of regenerated cellulose thread, but this description is adopted for purposes of facility only and is not a limitation of the invention.

In the manufacture of artificial threads by the viscose process wherein the freshly formed threads are collected in centrifugal thread holders, one type of which is called buckets, revolving at high speed, a cake containing several thousand yards of yarn is formed. These cakes, after the usual desulfuring and purification, contain relatively large volumes of liquid which must be removed. It is economically expedient to remove as much of the liquid as possible from the cake by mechanical means before completing the drying by the action of hot gases.

An object of this invention is to mechanically remove liquid from bucket cakes. Another object of this invention is a centrifugal wringing machine. Another object of the invention is to provide a continuous process for wringing liquid from cakes of yarn and to provide a machine which will centrifuge cakes more efficiently, more uniformly, and with less effort on the part of the operator.

The objects of our invention are accomplished, generally speaking, by revolving a number of centrifugal buckets about a common center, by rotating each bucket about its own axis during at least a portion of each revolution, and by, preferably, stopping each bucket during a portion of each revolution. The objects of the invention are also accomplished by the method which consists in arranging a number of individual buckets so as to be automatically moved past the operator and to be automatically started and stopped in a manner to facilitate the treatment and handling of the centrifuged object. The objects of the invention are also accomplished by the method and by the details of construction of the machine hereinafter described.

In the accompanying drawings Figure 1 is a vertical section through a machine embodying our invention; Figure 2 is a plan view, with a part broken away, of the same machine; Figure 3 is a detailed view of the brake; Figure 4 is a plan view of a bucket; Figures 5 and 6 are sections on the lines V—V, VI—VI, respectively of Figure 3.

Of the numerals on the drawings, 10 indicates an approximately circular frame of pedestal character; 11 are portions of the frame projecting outwardly from the pedestal; 12 is an annular bearing race mounted on the frame; 13 are bearings operating in the race; 14 are supports mounted in the frame portions 11; 15 is a ring-shaped housing carried by supports 14; 151 is a cover forming a removable part of housing 15; 16 is an annular opening extending completely around a base of the housing; 20 is a turntable mounted on bearings 13; 21 is an annular ring removably mounted as by bolts 22 on turntable 20; 23 are rack teeth on the ring 21; 30 is a motor, which may conveniently be of electric or other type, mounted on base 10; 32 is a speed-reduction gear; 33—34 are gears connecting the motor with the speed-reduction gear; 35 is a pinion driven by the motor through the speed-reduction gear enmesh with annular rack 23; 36 is a switch for starting or stopping the motor 30; 40 are bus bars mounted on the base of the machine; 41 are the power supply for the bus bars; 42 are motors mounted on the turntable; 43 are supports depending from the turntable below each motor; 44 are contacts mounted on supports 43 for contacting with the bus bars and supplying power to the motors 42; 50 are spindles projecting from the motors within the housing 15; 51 are buckets mounted, within housing 15, on spindles 50; 52 are inserts (which may or may not be removable) in the bucket walls for a purpose to be hereinafter described; 53 in Figure 1 is a cake of thread, such as regenerated cellulose thread, which has been produced by the bucket spinning process; 60 are brake drums mounted on each motor spindle; 61 is a brake for contact with the brake drum; 62 is a collar adjustably mounted on standard 14; 63 is a curved bar, L-shaped in cross section, removably mounted on collars 62; 64 are studs projecting from the brake 61 through the member 63; 65 are springs between brake 61 and member 63; 66 indicates the bending of the end of the brake to ensure smooth contact with brake drum.

Our invention functions as follows:

The switch 36 is thrown, starting the motor 30, which, through the reduction gear, drives pinion 35 which, meshing with rack 23, drives the turntable. Mounted on the turntable are a number of motors carrying buckets. These motors get their power by contact with bus bars which may be mounted on the frame. The bus bars do not completely encircle the frame but extend about a sufficient part of the periphery of the frame to ensure the proper wringing of the bucket cake. As the turntable slowly revolves, the buckets are driven at high speed so long as the contacts are

connected to the bus bars. As soon as the contacts have left the bus bars the brake drums 60 on the motor spindles come in contact with the brake 61, which is spring-pressed against them and stops them from rotating. A portion of the top 151 of housing 15 is cut away at a portion of the machine called the operator's position. Buckets coming into the operator's position will have been stopped by the brake and will not rotate until they have left the open section of the housing and the contacts 44 have connected them again with the bus bars.

The turntable is rotated at a speed which employs the entire time of the operator, for example, such that a bucket will pass the operator about every four seconds. As the buckets pass his position, the operator removes wrung cakes from the buckets and inserts wet cakes in their places.

The invention has been described in its application to a machine to be operated by one man. It is possible, however, to make the machine considerably larger and have a number of operators spaced equally about it, the entire wringing operation being performed between the positions of adjacent operators.

The buckets are provided with inserts 52 which are preferably flat and which act as wedges to slightly compress the cake and prevent it from turning in the bucket as the bucket accelerates and decelerates. The buckets may be drained in any convenient way, as by holes through the sides, and the housing is drained by pipes 70 and/or by standards 14 and tubes 141.

The bucket motors may be on the same circuit or may be on a different circuit than the motor which drives the turntable.

The brake may be adjusted to an increased or decreased pressure on the brake drums by adjusting the lock nuts on studs 64.

If desired, the interior of the housing may be heated, as by the introduction and withdrawal of hot, dry air, adding to the drying effect of the centrifugal wringing and completing, or not, in one action the entire drying of the thread.

It is preferred to wrap each cake with a cheesecloth or with some other open-mesh fabric such as is described in Patent 1,678,702 to E. K. Gladding before wringing, but this step may be omitted whenever such omission proves desirable.

By means of our invention it is possible to wring a cake more quickly, uniformly, and efficiently than has heretofore been possible. This represents a considerable saving in washing time and labor. The cakes are well wrung and are absolutely undamaged, and yield a valuable increase in the quality and quantity of usable yarn obtained from a given amount of raw, freshly spun yarn.

Another advantage of our invention is in the production of packages having small and uniform moisture content, which hold their shape well after leaving the drier and which unwind without substantial waste in subsequent textile operations. The cake, being firm, holds its shape and can be sent to a subsequent drying or treating operation without the use of an insert. This eliminates a step from the technical process and enables quicker and more uniform processing.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope, it is to be understood that we do not limit ourselves to the specific embodiments thereof except as defined in the appended claims.

We claim:

1. In a wringing machine a frame, a turntable mounted thereon, motors mounted peripherally of the turntable, centrifugal thread holder mounted on the motors, a housing carried by the frame and enclosing the centrifugal thread holder, bus bars carried by and partially encircling the frame, contacts on the turntable for connecting the motors with the bus bars, brake drums on the motor spindles, a brake mounted on the frame for resilient contact with the brake drum of each motor after the contact of the motor with the bus bars is broken.

2. In a wringing machine a turntable, motors mounted peripherally thereof, a centrifugal thread holder having drainage mounted on each motor, means for rotating the turntable, means for driving each centrifugal thread holder motor during a portion of each revolution of the turntable, a brake drum on each motor spindle, a brake mounted on the frame in a position to engage the brake drum of each motor after the driving of the motor has stopped and a drained housing enclosing the centrifugal thread holder while they are rotating.

3. In a wringing machine a turntable, centrifugal thread holder having drainage mounted thereon, means for rotating the turntable, means for driving each centrifugal thread holder during a portion of each revolution of the turntable, means for braking each centrifugal thread holder after the driving of the centrifugal thread holder has stopped, and a drained housing enclosing the centrifugal thread holder while they are rotating.

4. In a machine a centrifugal thread holder, means for revolving the centrifugal thread holder about a center outside itself, and means for rotating the centrifugal thread holder during a portion of each revolution and for stopping the centrifugal thread holder during a portion of each revolution.

5. In a centrifugal machine centrifugal thread holder supporting means, centrifugal thread holders mounted thereon, means for moving the supporting means in a closed path, means for rotating each thread holder at high speed during a portion of each circuit, and means for reducing the speed of each thread holder during a portion of each circuit to permit serving the thread holder.

6. In a wringing machine a frame, a turntable mounted thereon, motors mounted peripherally of the turntable, centrifugal thread holder mounted on the motors, a housing carried by the frame and enclosing the centrifugal thread holder, bus bars carried by and partially encircling the frame, contacts on the turntable for connecting the motors with the bus bars, and means for reducing the speed of the centrifugal thread holder while the centrifugal thread holder motor is unconnected to the bus bars.

7. A circular centrifugal thread holder having a flat portion in its thread contacting wall to prevent relative movement of holder contents and holder, the edges of the said portion being flush with the circular portion of the wall.

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