

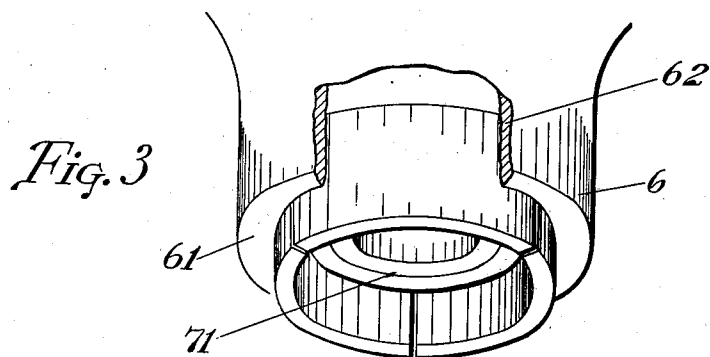
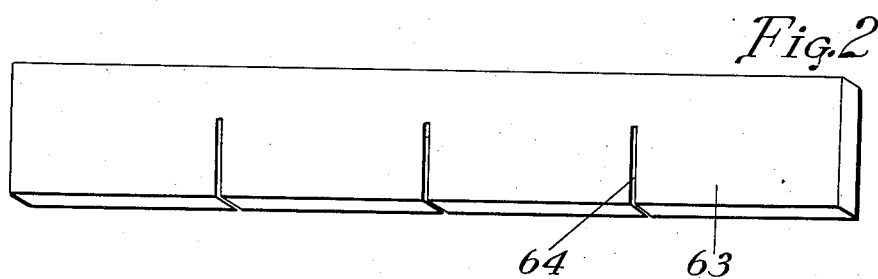
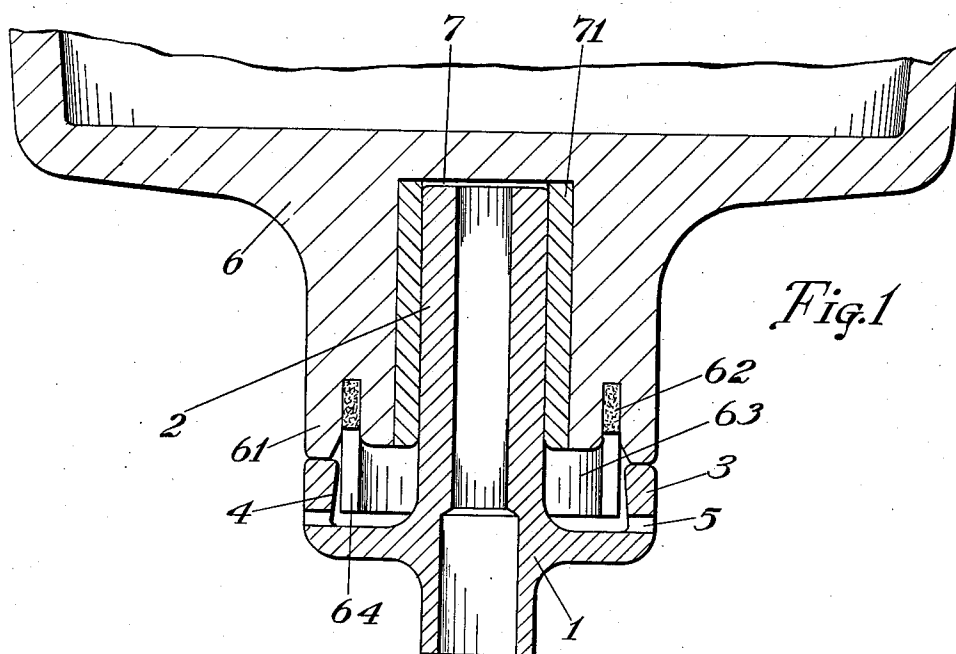
Aug. 27, 1935.

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BUCKET

Filed Aug. 17, 1933

2,012,851



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2,012,851

BUCKET

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Application August 17, 1933, Serial No. 685,514

7 Claims. (Cl. 118—40)

This invention relates to the driving of spinning buckets, such as are used in the manufacture of rayon, and the like. The invention will be described in its application to the art of driving a centrifugal bucket of the type used in the manufacture of rayon and in the after-treatment of rayon cakes, but it is to be understood that this particular description does not serve to limit the claims beyond the terms found therein.

In one form of centrifugal spinning machine a bucket detachable from a driving spindle is used. In order to avoid excessive strain on the driving motor, or other driving mechanism, the bucket should be able to slip on the spindle during acceleration, but after the bucket has attained its operating speed it should revolve at substantially constant speed. In a common form of prior art driving connection a bucket having a hub with an internal taper is mounted on a spindle having a taper and size equal to the taper and size of the hub seat. In the hub is a bushing having an internal diameter just enough larger than the outer diameter of the spindle seat to permit the bucket to be slipped on and off the spindle without much effort; the bucket hub bushing rests on the top of the spindle, the bucket being driven, during acceleration, by their frictional contact. If this driving connection were alone used during spinning, the bucket would be given an uneven pace which would deleteriously affect the quality of the thread. In order to overcome this disadvantage an auxiliary driving connection is provided which comes into operation after the bucket has picked up speed.

It is an object of this invention to provide a driving means capable of slipping while the driving member picks up speed and of furnishing a practically positive drive throughout the period in which it is desirable that the bucket revolve at constant speed.

The objects of the invention are accomplished by a multiple drive, a portion of which permits slippage and is always in action to drive the driven member from the driving member, and a portion of which, furnishing a substantially positive drive, is brought into action by centrifugal force at high speeds of rotation. The objects of the invention are accomplished in some measure, furthermore, by the details of construction set forth hereinafter.

In the accompanying drawing Figure 1 is a vertical section through a driving connection made in accordance with my invention. Figure 2 is a perspective view of the driving washer or strip.

Figure 3 is a perspective view, partly broken away, of the bottom of a spinning bucket with the driving washer in place.

In the drawing 1 is a driven spindle, for instance a spindle which projects upwardly from an electric bucket motor, which may be integral with or separable from the motor armature or driving means; 2 is a stud-like portion of the spindle which serves to aline the bucket and the spindle and which may or may not be tapered; 3 is a cup-like member having an upstanding annulus; 4 is a somewhat undercut inner face on the annulus; 5 are holes for draining the cup-like member 3 of any fluid which may collect therein; 6 is the hub of a centrifugal bucket such as is used in the manufacture of artificial thread by the so-called bucket process; 7 is a socket in the hub of the bucket; 71 is a bushing, preferably of bronze but which may be of any other suitable material, which should preferably be not too tight a fit with the spindle stud 2; 61 is an annulus on the bucket hub which serves to support the bucket and to furnish a driving connection between the spindle and the bucket; 62 is an annular recess in the lower face of the bucket hub; 63 is a flexible washer firmly mounted in the annular seat 62; 64 are incisions in the flexible driving member 63.

My driving connection functions as follows: When the spindle is started, particularly if it is driven by an electric motor, it picks up quickly to maximum speed. During the early portion of the acceleration and the late stages of retardation the driving washer 64 is out of contact with the spindle and takes no part in the driving of the bucket, the driving of the bucket being done substantially entirely by contact of the annulus 3 with the annulus 61, which permits slippage between the bucket and the spindle and prevents overloading the motor. As the speed of the bucket picks up, however, centrifugal force tends to throw the flexible driving member 63 into contact with the inner face of the annulus 3. That face is slightly undercut, as shown in the drawing, so that in its centrifugally deflected position the sides of the driving member will make firm and flat contact with the wall of the annulus. The incisions 64 in the driving member permit it to be deflected readily into driving position by centrifugal force. At the high speeds of rotation normally used in the manufacture of, for instance, artificial thread, the drive of the bucket from the spindle is made practically positive by my invention.

The driving washer may be made annular or

it may be made flat as shown in Figure 2. Many flexible materials are suitable for its manufacture: as instances rubber, leather, and woven fibrous materials may be mentioned. It need not be slotted when the resilience of the material is itself sufficient to permit expansion by centrifugal force into operative position.

An advantage of my invention is a driving connection for driving a member from a driven member in which the driven member is permitted to slip and accelerate gradually while the driving member accelerates swiftly, relieving the driving member of the great strains incidental to swift acceleration, but furnishing a practically positive drive at high speeds of rotation. Another advantage of the invention is that the bucket, or other driven member, is kept from shifting on the spindle and at all times is kept in balance by the pressure exerted against the spindle flange by the driving washer. Another advantage of the invention is in an inexpensive and readily replaceable driving connection. Other advantages of the invention will be apparent to persons skilled in the art.

A prior art structure used an expansible ring mounted in the bucket hub. This invention is an improvement over that structure because it is more easily flexed into operative position and because it does not require an accurate fit of the parts to become operative at reasonably low speeds. Another advantage over the said prior art structure is that the bucket can be taken off the spindle while the spindle is revolving. This is accomplished, as will be understood by persons skilled in the art, by the use of a bucket brake. This feature is most desirable because, even with motor driven spindles, five or six bucket positions are connected together to one switch and are switched on and off as a group. When a thread becomes broken in the middle of spinning and when for some other reason a particular bucket must be doffed and a new cake started, with my invention it is possible to remove a particular bucket without interfering with the operation of the other buckets on the same circuit.

Another advantage is that, after the motor has been turned off, the driving band acts as a brake to more quickly slow down the bucket.

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

I claim:

1. A driving connection for spinning buckets and the like comprising a driven spindle, a spinning bucket having a socket for receipt of the spindle, on the spindle an upstanding annulus, on the bucket an annulus for contact with the top of the spindle annulus, an annular recess in the bucket, and mounted in the recess to depend

within the spindle annulus a leather strip capable of centrifugal deflection into driving contact with the face of the spindle annulus.

2. A driving connection for spinning buckets and the like comprising a driven spindle, a spinning bucket having a socket for receipt of the spindle, on the spindle an annulus, on the bucket an annulus for contact with the spindle annulus, a recess in the bucket, and maintained in the recess a leather strip capable of centrifugal deflection into driving contact with the spindle annulus.

3. A driving connection for spinning buckets and the like comprising a driven spindle, a spinning bucket having a socket for receipt of the spindle, on the spindle an upstanding annulus, on the bucket an annulus for contact with the top of the spindle annulus, an annular recess in the bucket, and mounted in the recess to depend within the spindle annulus a rubber strip capable of centrifugal deflection into driving contact with the face of the spindle annulus.

4. A driving connection for spinning buckets and the like comprising a driven spindle, a spinning bucket having a socket for receipt of the spindle, on the spindle an annulus, on the bucket an annulus for contact with the spindle annulus, a recess in the bucket, and maintained in the recess a rubber strip capable of centrifugal deflection into driving contact with the spindle annulus.

5. A driving connection for spinning buckets and the like comprising a driven spindle, a spinning bucket having a socket for receipt of the spindle, an annulus on the spindle, means on the bucket to contact with the spindle annulus to steady the bucket, and a flexible, substantially circular skirt having incisions to permit it to be centrifugally deflected into driving contact with the spindle annulus attached to the bucket, the flexibility of the skirt and the relation of the said elements permitting relative motion of bucket and spindle at low speeds.

6. A driving connection for spinning buckets and the like comprising a rotatable spindle, a spinning bucket mounted thereon, a rigid, substantially circular member attached to and surrounding the spindle and, carried by the bucket, a substantially circular skirt having within the said rigid member a flexible portion capable of centrifugal deflection into driving contact therewith.

7. A driving connection for spinning buckets and the like comprising a rotatable spindle and a spinning bucket mounted thereon by a connection which permits relative motion at low speeds, a relatively rigid annulus on one of said members, a flexible skirt carried by the other of said members projecting within the said rigid annulus, the flexibility of said skirt permitting its deflection by centrifugal force into contact with the said rigid annulus.

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