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RAYON SPINNING BUCKET

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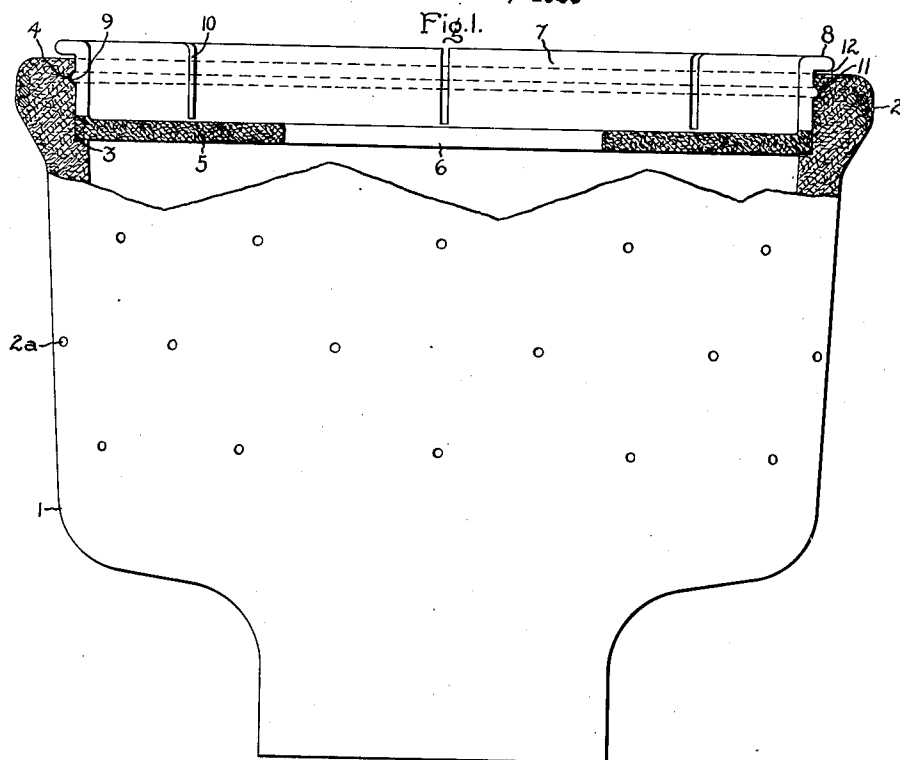
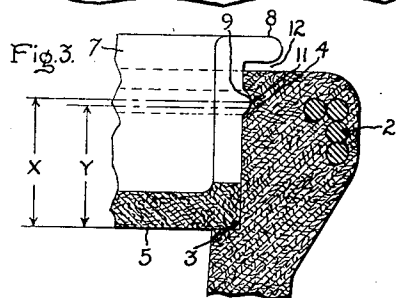
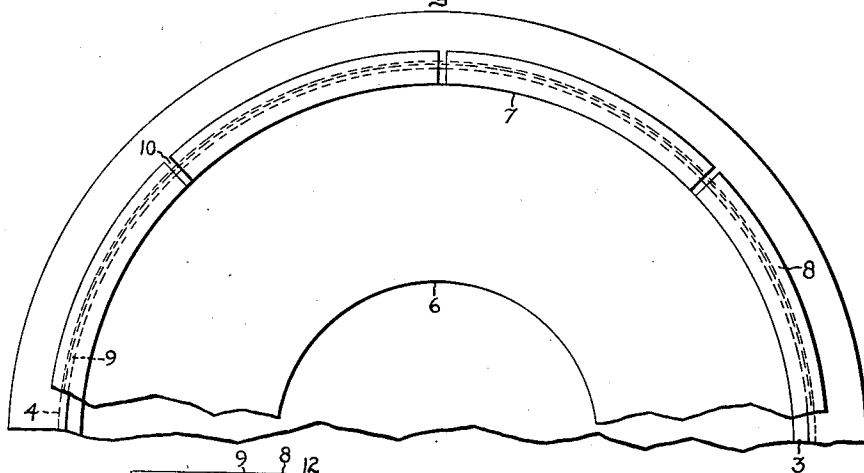


Fig. 2.



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RAYON SPINNING BUCKET

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8 Claims. (Cl. 118—49)

The present invention relates to spinning buckets such as are used in the manufacture of rayon.

Spinning buckets of this type are required to revolve at high speeds, for example, speeds of the order of 10,000 R. P. M. This means that the buckets are subjected to centrifugal stresses of a high order and to withstand such stresses must be of uniform construction in order to give the greatest strength for a given weight and thickness of material. During the spinning operation, the bucket is closed with a cover. It is required that while running, the cover be held firmly in place in a manner such that the axial pressure from the rayon cake being wound up inside the bucket will not raise the cover. However, when the bucket is stopped, it is desirable that the cover be capable of being removed readily.

The object of my invention is to provide an improved spinning bucket and cover therefor wherein the cover may be easily inserted and removed when the bucket is not running and is locked firmly in place when the bucket is running; and wherein at the same time, the locking means for the cover does not require the provision of a relatively deep groove at the rim of the bucket for the reception of a locking ring.

For a consideration of what I believe to be novel and my invention, attention is directed to the following description and claims appended thereto.

In the drawing, Fig. 1 is a side elevation, partly in section, of a bucket and cover embodying my invention; Fig. 2 is a plan view of a portion of the cover and bucket, and Fig. 3 is an enlarged view showing the locking means for the cover.

Referring to the drawing, 1 indicates a rayon spinning bucket of any suitable type. In the present instance, I have indicated the bucket as being of the molded type. It may be formed of textile fibres united by an artificial resin, such as phenolic condensation product, and reinforced by a winding of wire as indicated at 2. For example, it may be a bucket such as that disclosed in the application of Bergman, Serial No. 622,272, filed July 13, 1932. The usual drain holes for the bucket are indicated at 2a.

The upper edge of the bucket is provided with a ledge 3 spaced from the top surface of the bucket and forming a seat for a cover. To provide seat 3, the upper portion of the bucket is offset outwardly somewhat but the wall of the bucket is maintained at substantially the same thickness. Above seat 3, adjacent the plane of the top of the bucket is a shallow annular groove 4. By this arrangement, the rim of the bucket is not weak-

ened by a relatively deep groove for a cover locking arrangement as is the usual practice.

The cover comprises a bottom wall 5 having a central opening 6, a side wall 7, and a flange 8. Side wall 7 fits loosely within the upper end of bucket 1, the bottom of the cover resting on seat 3. Side wall 7 is provided with a bead 9 which fits snugly into groove 4. Flange 8 and side wall 7 are provided with a plurality of slots 10 which extend down substantially to bottom wall 5. The slots serve to give a certain amount of flexibility to the flange and side wall.

Referring particularly to Fig. 3, groove 4 is provided with an angular sloping upper surface or wall 11 with which the upper surface of bead 9 engages. Surface 11 may have, for example, a slope of the order of 60° with respect to the horizontal. Also, the arrangement is such that the distance X from the bottom surface of the cover to the center line of bead 9 is greater than the distance Y from the surface of seat 3 to the lower edge of surface 11. With this arrangement, when the cover is in place and the bucket is rotating, centrifugal force, which tends to expand side wall 7, causes bead 9 to press against surface 11, thus forcing the cover downward on its seat. As a result, centrifugal force causes the bucket cover to be firmly pressed against seat 3 and to be firmly locked in position by bead 9.

When the cover is in position, flange 8 is spaced slightly from the top surface of the side wall of the bucket as is indicated at 12 in Fig. 3. This enables a suitable tool to be inserted under the flange to assist in lifting the cover from the bucket.

With the above described arrangement, the cover can be inserted readily into the bucket, the side wall 7 yielding sufficiently to permit bead 9 to engage surface 11 of groove 4. In the practical use of the arrangement, it is desirable that the bucket may be lifted from the spindle by the machine operator grasping the cover at the opening 6. Flexure of the cover caused by a direct upward lifting force at the rim of opening 6 causes the bead 9 to engage more firmly in groove 4, thus causing the cover rim to hold against the bucket with a force sufficient to enable the bucket to be lifted from the spindle by means of the cover. It is also desirable that the cover be easily removable from the bucket. This is accomplished by the operator exerting downward pressure at the rim of opening 6, together with a turning movement about an axis in the plane of the cover, which combination of forces tends to disengage the bead 9 from the groove 4 and lift

the cover at one side, allowing it to be easily removed. Or, if found more convenient, the operator may run a small piece of suitable material around under flange 8, prying the cover upward and thus lifting bead 9 out of groove 4.

When the bucket is running, centrifugal force causes the bead 9 of side wall 7 to engage tightly with the groove 4 in the wall of the bucket whereby the cover is locked firmly in position and as already explained, the pressure of bead 9 against surface 11 serves to force the cover inward against seat 3. As a result, the cover is firmly seated and locked in position whereby the possibility of any strands of yarn working their way under the edge of the cover is prevented. At the same time, any excess acid which may gather between the top bucket drain holes and the cover may find its way around the edge of the cover and leak out through the slots 10. Thus the slots serve not only to lend flexibility to the side walls 7 of the cover but may serve also for the escape of acid.

In some instances, I have found the flange 8 to be sufficiently flexible without the provision of slots 10 and, since the cover is forced tightly against seat 3, there can be but little, if any, escape of acid past the cover. I may, therefore, if found desirable, omit the slots 10 and make the wall 7 a continuous wall.

Since there are no projections on the cover, the windage losses are reduced to a minimum. Also, the cover has the advantage that the centrifugal load transmitted by it to the rim of the bucket is a minimum, and since the rim of the bucket is of substantially uniform thickness and without a deep groove such as found in the conventional type of rayon spinning bucket, there is provided a construction wherein the rim of the bucket is capable of withstanding high centrifugal stresses. This means, in substance, that by the use of my improved cover, I am enabled to so construct a bucket that it is capable of operating at a speed higher than would be the case otherwise.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. The combination with a rayon spinning bucket having a seat spaced from its upper end, and means which provides an inwardly sloping surface above the seat, of a cover having a bottom wall which engages the seat and a wall which engages said sloping surface to force the cover toward the said seat under the action of centrifugal force.

2. The combination with a rayon spinning bucket having a seat spaced from its upper end, and means which provides a sloping surface above the seat, of a cover having a bottom wall which engages the seat and a wall which engages said sloping surface to force the cover toward said seat under the action of centrifugal force, and

a flange surrounding the bucket cover which is spaced from the top surface of the bucket side wall when the cover is in place.

3. The combination with a rayon spinning bucket having a side wall which presents a seat and means providing an inwardly sloping surface spaced from the seat, of a cover having a surface which engages said seat and a side wall adapted to expand radially under the action of centrifugal force having a complementary sloping surface which engages said first named sloping surface to force the said cover surface toward said seat under the action of centrifugal force.

4. The combination with a rayon bucket having a side wall which presents a seat and a groove spaced from the seat, of a cover having a surface which engages said seat and a bead which engages said groove, the distance from said cover surface to the center of said bead being greater than the distance from said seat to the center of said groove.

5. The combination with a rayon spinning bucket having a side wall which presents a seat, of a cover having a surface which engages said seat and a side wall adapted to expand radially under the action of centrifugal force, and means providing engaging angular surfaces on said side walls which under the action of centrifugal force tend to force the cover surface against said seat.

6. A bucket cover for a rayon spinning bucket having a bucket cover seat and a groove spaced from the seat, comprising a bottom wall, a side wall and a flange, the side wall being provided with a bead the center of which is spaced from the lower surface of the bottom wall a distance greater than the distance between the seat and the center of the groove of the bucket with which the cover is to be used.

7. A bucket cover for a rayon spinning bucket having a bucket cover seat and a groove spaced from the seat, comprising a bottom wall, a side wall and a flange, the side wall being provided with a bead the center of which is spaced from the lower surface of the bottom wall a distance greater than the distance between the seat and the center of the groove of the bucket with which the cover is to be used, and with spaced slots to lend flexibility thereto.

8. The combination with a rayon bucket having a side wall which presents a seat, of a cover having a surface which engages said seat and a side wall provided with spaced slots, said side walls being provided with engaging sloping surfaces spaced from said seat and said cover surface respectively distances such that said sloping surfaces tend to force the cover toward said seat under the action of centrifugal force.

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