Oct. 1, 1946. H. J. McDERMOTT 2,408,670

SPINNING BUCKET ASSEMBLY

Filed June 7, 1944

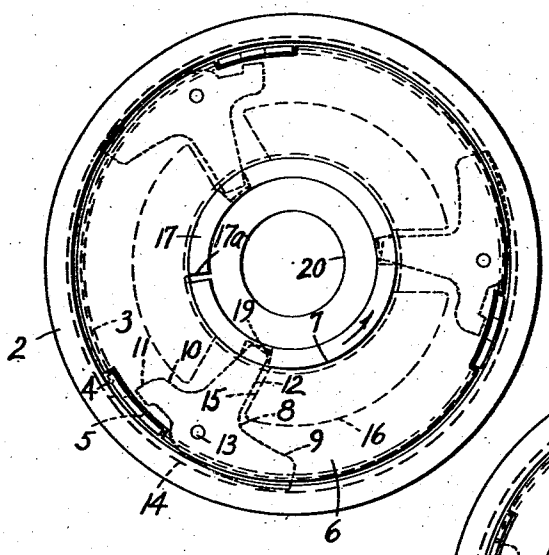
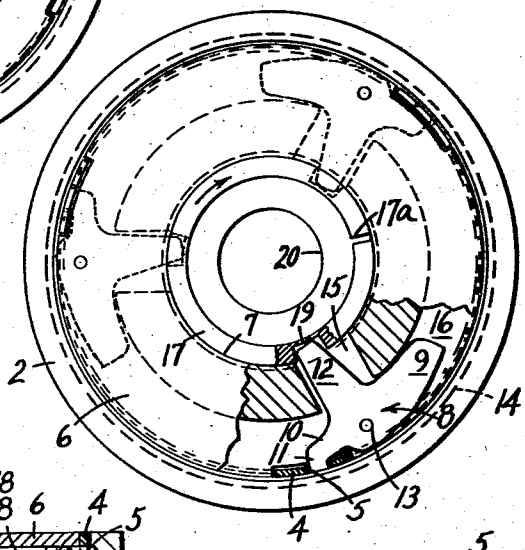


Fig. 1

Fig. 2



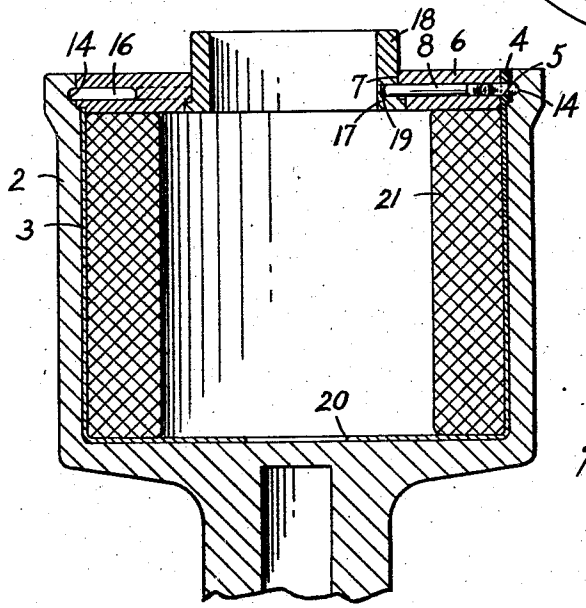


Fig. 3

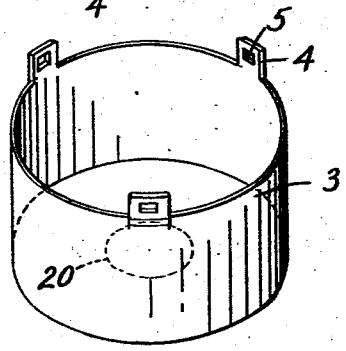


Fig. 4

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Patented Oct. 1, 1946 2,408,670

UNITED STATES PATENT OFFICE

2,408,670

SPINNING BUCKET ASSEMBLY

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Application June 7, 1944, Serial No. 539,216

16 Claims. (Cl. 57—76)

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This invention relates to an improved centrifugal bucket assembly such as may be used in the manufacture of artificial filamentary material according to the viscose process, for example.

In that process, the freshly formed filamentary material obtained by extruding a suitable spinning solution into a setting medium, is collected in a centrifugal bucket mounted for rotation on a shaft or spindle. The present day practice is to guide the thread directly into the bucket itself, which means that when the cake is wound therein and ready for doffing, the bucket must be removed from the spindle. This necessity for removing the bucket from the spindle each time a cake is ready for doffing therefrom has become increasingly burdensome and objectionable with the marked tendency in the industry to use larger-sized buckets, since the moisture-laden filamentary material greatly increases the weight of the bucket and renders it difficult for the operators to handle without dropping which, of course, must be avoided especially when, as is usual nowadays, the bucket is constructed of a frangible material such as Bakelite, or the like. Also, in doffing, the rim of the bucket is often chipped or nicked which makes it liable to cracking while in use and renders it less resistant to the excessive centrifugal forces to which it is subjected when the bucket is rotated at high speeds.

It is an object of this invention to provide a light-weight shell or liner for the bucket, which conforms to the shape thereof, and into which the filamentary material may be guided and collected in package form, and which may be readily removed from the bucket, upon cessation of rotation thereof and after a cake of thread has been collected. It is also an object of the invention to facilitate the doffing of a thread cake collected in a centrifugal spinning bucket. A further object is to provide a cover for the bucket having a special locking means adapted for alternate engagement with the bucket and shell, and cooperable with the shell to facilitate removal thereof from the bucket.

In the drawing illustrative of a preferred embodiment of the invention,

Figure 1 is a plan view of a spinning bucket assembly according to the invention showing the cover locking means in engagement with the bucket;

Figure 2 is a plan view, partly in section of a spinning bucket assembly showing the cover locking means in engagement with the shell;

Figure 3 is a cross-sectional elevation of the bucket assembly, and

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Figure 4 is a perspective view of the bucket liner.

Referring more particularly to the drawing, there is shown a spinning bucket 2 having a removable shell or liner 3 positioned therein and provided with a plurality of lock-engaging means which in the embodiment shown take the form of a plurality of lugs 4 each having a slot 5 therein and spaced about the rim of the liner. A cover 6 having a central aperture 7 is shown in place on the bucket and, in accordance with the invention is provided with a plurality of spaced locking means 8 each of which is adapted for alternate locking engagement with either the bucket or the shell, as desired. As shown, the locking means constitutes essentially a bell crank arrangement having a lever arm 9 normally extending along the inside of the outer periphery of the cover in one direction, a lever arm 10 provided with an earlike projection 11 and normally extending along the inside of the outer periphery of the cover in a direction opposite to arm 9, and an inwardly extending lever arm 12, the locking means being supported on the cover and adapted for swinging motion in one direction about their respective pivots 13, to throw the lever arm 9, hereby designated as the bucket engaging member, outwardly into locking engagement with a groove 14 in the inner periphery of the upper rim of bucket 2, and swingable in a reverse direction to disengage the bucket and bucket engaging member and to simultaneously throw the lever arm 10 which is hereby designated as the shell engaging member outwardly so that ear 11 extends into slot 5 in lug 4, in locking engagement with the liner 3. Means are provided for imparting pivotal motion to the locking means and for limiting the extent of such pivotal motion. In the embodiment shown, the cover is provided with a plurality of recesses 15 into which the inwardly projecting arm 12 of the locking means extends, and with a groove 16 which extends annularly in the cover, and in which the bucket engaging member 9 and the shell engaging member 10 are normally retained. A sleeve 17 is positioned in central aperture 7 in cover 6, for rotary movement therein, and so that it partially protrudes above the cover to provide a grasping means 18 (Figure 3), the inner end thereof being provided with a plurality of spaced notches 19 which cooperate with recesses 15 to receive arms 12 of the locking means. Sleeve 17 is preferably split radially at 17a and is of such size that it tends to spring outwardly to grip the inner periphery of the cover 6 with just sufficient force

to prevent the sleeve from sliding within the cover because of vibration when the bucket is coming to a stop. The locking means, by virtue of the engagement of inwardly extending arms 12 with the notches 19 in sleeve 17 swing about their respective pivots 13 in response to rotary movement of sleeve 17. In the embodiments specifically illustrated, when sleeve 17 is turned in a counterclockwise direction (Figure 1) each locking means 8 is swung about its pivot 13 so that the bucket engaging member is thrown outwardly into locking engagement with groove 14 in the rim of bucket 2, and maintained in that position under the influence of centrifugal force during collection of the filamentary material which is guided into shell 3 by the customary reciprocating funnel, and wound therein due to the rotation of the bucket on its spindle. When the sleeve 17 is turned in a clockwise direction (Figure 2), the locking means swings about their respective pivots 13 in the same direction, and bucket engaging member 9 is disengaged from the bucket and each shell engaging member 10 is simultaneously thrown outwardly into locking engagement with the slot 5 of the lug 4 on shell 3.

As shown in Figures 1 and 2, the locking means is so constructed that the bucket-engaging member 9 which lies on one side of pivot 13 is heavier than the shell engaging member 10, as a result of which the bucket engaging member may be engaged with the groove 14 in bucket 2 without manual manipulation of sleeve 17, being thrown outwardly into engagement with the groove as the result of centrifugal force created by rotation of the bucket and shell on the spindle. When the bucket engaging member is thus thrown outwardly into locking engagement with groove 14, arm 12, positioned in notch 19 of sleeve 17 pivots therein and drags sleeve 17 into bucket-locking position automatically.

As shown more clearly in Figure 3, the sleeve 17 positioned in the aperture in cover 6 protrudes above the cover and constitutes a grasping means 18 for manual manipulation of the locking means. Shell 3 in which a cake of rayon 21 is collected may be provided with a central aperture 20 in its bottom wall so that there is less tendency for the lever to adhere to the bucket wall by a suction effect, thus facilitating removal of the shell. The shell is preferably constructed of a tough light weight acid-resistant plastic material such as polyvinyl chloride, polyvinylidene chloride or the like, and is sufficiently rigid to support a thread cake while being at the same time sufficiently flexible to be thrown against the inner bucket wall and gripped thereby as the result of centrifugal force, during rotation of the bucket, and thus is prevented from wobbling or vibrating while the bucket assembly is in use. If desired, holes may be provided in the wall of the shell for permitting the escape of liquid. Such holes may be in approximate registry with those in the bucket, suitable indicia being provided, in such event, on the bucket and/or cover to guide the operator in placing the shell into the bucket.

Any number of cover-locking means and elements cooperating therewith may be provided When the locking means is constructed as specifically illustrated herein, it is necessary to position the shell in the bucket with its lugs adjacent the groove in the inner periphery of the upper rim of the bucket, so that the locking means may be alternately thrown into locking engagement with either the bucket rim or the shell lugs, and it is preferred for that reason that the groove 14 extend annularly about the rim. However, the groove may be of shorter length, if desired, in which case, however, in order to facilitate accurate register of the shell lugs therewith, and of the locking means with both the grooves and shell lugs, suitable indicia may be placed about the outside of the bucket rim, and on the cover, to guide the operator in assembling the device in operating condition.

While preferred embodiments of the invention have been disclosed, the description is intended to be illustrative only, and it is to be understood that changes and variations may be made therein without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In combination, a removable shell adapted to be positioned in a spinning bucket and conforming to the shape thereof, a cover for the bucket, means for interlocking the cover and the bucket, and means for interlocking the cover and the shell.

2. In combination, a removable shell adapted to be positioned in a spinning bucket and conforming to the shape thereof, a cover for the bucket, and locking means on the cover adapted for selective interlocking engagement with the bucket and shell.

3. In combination, a spinning bucket adapted to receive a cover, a removable shell in the bucket provided with a plurality of spaced lock-engaging means, and a cover for the bucket having supported thereon a plurality of spaced locking means each comprising a bucket engaging member and a shell engaging member and adapted to be moved into selective locking engagement with the bucket and one of the lock-engaging means on the shell.

4. In combination, a spinning bucket adapted to receive a cover, a removable shell in the bucket provided with a plurality of spaced lock-engaging means, and a cover for the bucket having pivoted thereon a plurality of spaced locking means each comprising a bucket engaging member and a shell engaging member, and adapted to be swung into selective locking engagement with the bucket and one of the lock-engaging means on the shell.

5. In combination, a spinning bucket adapted to receive a cover and having a groove in the inner periphery of the upper rim thereof, a removable shell positioned in the bucket provided with a plurality of spaced lock-engaging means, and a cover for the bucket having a plurality of spaced locking means pivoted thereon, each comprising a bucket engaging member and a lock engaging member and adapted to be swung into selective locking engagement with the groove in the bucket rim and with one of the lock-engaging means on the shell.

6. In combination, a spinning bucket adapted to receive a cover and having a groove in the inner periphery of the upper rim thereof, a removable shell in the bucket provided with a plurality of spaced lock-engaging means, and a cover for the bucket having a plurality of spaced locking means pivoted thereon, each locking means comprising a bucket engaging member and a shell engaging member and adapted to be swung in one direction to move the bucket engaging member into locking engagement with the bucket and to be swung in a reverse direction to disengage the bucket engaging member and to move the shell engaging member into locking engagement with one of the lock-engaging means on the shell.

7. In combination, a spinning bucket adapted

to receive a cover and having a groove in the inner periphery of the upper rim thereof, a removable shell positioned in the bucket provided with a plurality of spaced lock-engaging members, and a cover for the bucket carrying a plurality of spaced locking means each comprising a bucket engaging member and a shell engaging member, said locking means being pivoted on the cover and adapted to be swung in one direction to move the bucket engaging member into locking engagement with the groove in the bucket rim, and adapted to be swung in a reverse direction to disengage the bucket and bucket engaging member and simultaneously move the shell engaging member into locking engagement with one of the lock-engaging members on the shell.

8. In combination, a spinning bucket adapted to receive a cover and having a groove on the inner periphery of the upper rim thereof, a removable shell positioned in the bucket and conforming to the shape thereof, a plurality of spaced lugs on the shell each having a slot therein, a cover for the bucket, a plurality of spaced locking means pivoted on the cover, each locking means comprising a bucket engaging member, a shell-engaging member, and a member extending inwardly therefrom, and being adapted to be swung on its pivot in one direction to throw the bucket engaging member outwardly into engagement with the bucket, and adapted to be swung in an opposite direction to disengage the bucket and bucket engaging member and throw the shell engaging member into the slot in one of the lugs on the shell, and means for limiting the pivotal motion of the locking means.

9. In combination, a spinning bucket adapted to receive a cover and having a groove in the inner periphery of the upper rim thereof, a removable shell positioned in the bucket and provided with a plurality of spaced lock-engaging members, and a cover for the bucket carrying a plurality of spaced locking means each comprising a bucket engaging member formed integrally with a shell engaging member, said locking means being pivoted on the cover and adapted to be swung in one direction to throw the bucket engaging member into locking engagement with the bucket, and adapted to be swung in a reverse direction to disengage the bucket and bucket engaging member and throw the shell engaging member into locking engagement with one of the lock-engaging members on the shell.

10. In combination, a spinning bucket adapted to receive a cover and having a groove on the inner periphery of the upper rim thereof, a removable shell in the bucket and conforming to the shape thereof, a plurality of spaced lock-engaging means on the shell, a cover for the bucket, a plurality of spaced locking means pivoted on the cover each comprising a bucket engaging member normally extending along the inside of the outer periphery of the cover, a shell engaging member normally extending along the inside of the outer periphery of the cover in a direction opposite to the bucket engaging member, and a member extending inwardly from the bucket and shell engaging members, and means for pivoting the locking means in one direction to throw the bucket engaging member outwardly into locking engagement with the bucket and for pivoting the locking means in a reverse direction to disengage the bucket and bucket engaging member and throw the shell engaging member into locking engagement with one of the lock-engaging members on the shell.

11. In combination, a spinning bucket adapted to receive a cover and having a groove on the inner periphery of the upper rim thereof, a removable shell in the bucket and conforming to the shape thereof, a plurality of spaced lock-engaging means on the shell, a cover for the bucket, a plurality of spaced locking means pivoted on the cover each comprising a bucket engaging member normally extending along the inside of the outer periphery of the cover, a shell engaging member normally extending along the inside of the outer periphery of the cover in a direction opposite to the bucket engaging member, and a member extending inwardly from the bucket and shell engaging members, and means for pivoting the locking means in one direction to throw the bucket engaging member outwardly into locking engagement with the bucket and for pivoting the locking means in a reverse direction to disengage the bucket and bucket engaging member and simultaneously throw the shell engaging member into locking engagement with one of the lock-engaging members on the shell.

12. In combination, a spinning bucket adapted to receive a cover and having a groove on the inner periphery of the upper rim thereof, a removable shell in the bucket and conforming to the shape thereof, a plurality of spaced lock-engaging means on the shell, a cover for the bucket, a plurality of spaced locking means pivoted on the cover each comprising a bucket engaging member normally extending along the inside of the outer periphery of the cover, a shell engaging member normally extending along the inside of the outer periphery of the cover in a direction opposite to the bucket engaging member, and a member extending inwardly from the bucket and shell engaging member, and means for pivoting the locking means in one direction to throw the bucket engaging member outwardly into locking engagement with the bucket and for pivoting the locking means in a reverse direction to disengage the bucket and bucket engaging member and throw the shell engaging member into locking engagement with one of the lock-engaging members on the shell, and means for limiting the extent of pivotal motion of the locking means.

13. In combination, a spinning bucket adapted to receive a cover and having a groove on the inner periphery of the upper rim thereof, a removable shell in the bucket and conforming to the shape thereof, a plurality of spaced lock-engaging members on the shell, a cover for the bucket, a plurality of spaced locking means pivoted on the cover each constituting substantially a bell crank arrangement having a lever arm comprising a bucket engaging member normally extending along the outer periphery of the cover and within the limits defined thereby, a lever arm comprising a shell engaging member normally extending along the outer periphery of the cover and within the limits defined thereby and in a direction opposite to the bucket engaging member, and a lever arm extending inwardly, means for pivoting the locking means in one direction to throw the bucket engaging member outwardly into locking engagement with the bucket and for pivoting the locking means in a reverse direction to disengage the bucket and bucket engaging member and throw the shell engaging member outwardly into locking engagement with one of the lock-engaging members on the shell.

14. In combination, a spinning bucket adapted to receive a cover and having a groove on the inner periphery of the upper rim thereof, a removable shell in the bucket and conforming to the shape thereof, a plurality of spaced lock-engaging members on the shell, a cover for the bucket, a plurality of spaced locking means pivoted on the cover each constituting substantially a bell crank arrangement having a lever arm comprising a bucket engaging member normally extending along the outer periphery of the cover and within the limits defined thereby, a lever arm comprising a shell engaging member normally extending along the outer periphery of the cover and within the limits defined thereby and in a direction opposite to the bucket engaging member, and a lever arm extending inwardly, means for pivoting the locking means in one direction to throw the bucket engaging member outwardly into locking engagement with the bucket and for pivoting the locking means in a reverse direction to disengage the bucket and bucket engaging member and simultaneously throw the shell engaging member outwardly into locking engagement with one of the lock-engaging members on the shell.

15. In combination, a spinning bucket adapted to receive a cover and having a groove on the inner periphery of the upper rim thereof, a plurality of spaced lock-engaging members on the shell, a cover for the bucket, a plurality of spaced

locking means pivoted on the cover each constituting substantially a bell crank arrangement having a lever arm comprising a bucket engaging member normally extending along the outer periphery of the cover and within the limits defined thereby, a lever arm comprising a shell engaging member normally extending along the outer periphery of the cover and within the limits defined thereby and in a direction opposite to the bucket engaging member, and a lever arm extending inwardly, means for pivoting the locking means in one direction to throw the bucket engaging member outwardly into locking engagement with the bucket and for pivoting the locking means in a reverse direction to disengage the bucket and bucket engaging member and throw the shell engaging member outwardly into locking engagement with one of the lock-engaging members on the shell and means for limiting the extent of pivotal motion of the locking means.

16. In combination, a shell adapted to be positioned in a spinning bucket and readily removed from the bucket, said shell conforming to the shape of the inner wall of the bucket and having a cylindrical peripheral wall and an annular bottom wall for supporting a rayon cake, a cover, and means for interlocking the cover and the shell to permit withdrawal of the shell in association with the cover.

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