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SPINNING BUCKET ASSEMBLY

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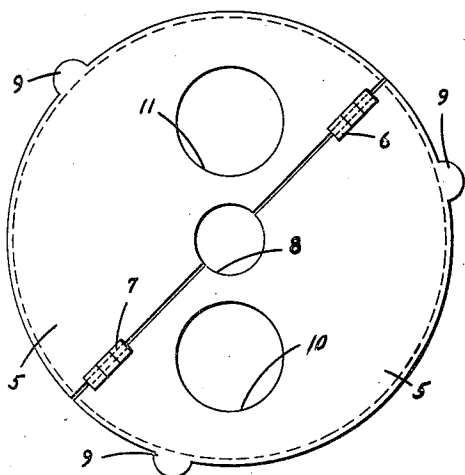


FIG. 1

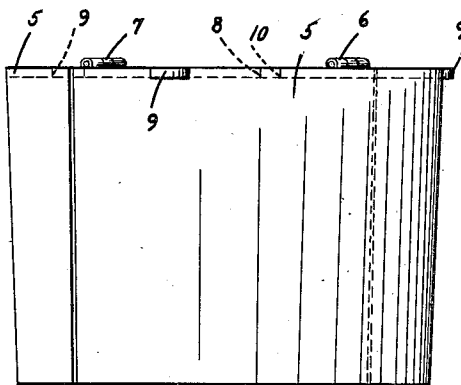


FIG. 2

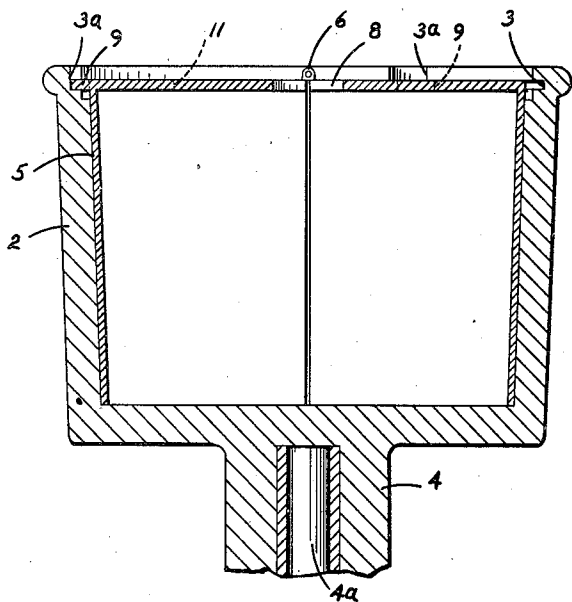


FIG. 3

FIG. 4

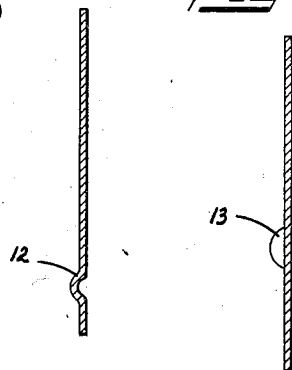


FIG. 4

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SPINNING BUCKET ASSEMBLY

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12 Claims. (Cl. 57—76)

This invention relates to apparatus for use in the manufacture of artificial filamentary material.

Conventional apparatus for collecting filamentary material in the form of a cake comprises a bucket molded from a frangible resinous material such as Bakelite, provided with an annular groove about its inner upper rim for the reception of a molded cover which is secured in place by means of a rubber ring, the filamentary material being guided into the bucket by a vertically reciprocating guide and collected directly therein. After the cake has been wound and is ready for doffing, it is necessary to remove the bucket from the spindle on which it is rotatably supported. The necessity for removing the bucket from the spindle at each doffing has become increasingly burdensome and objectionable with the marked tendency in the industry to use larger sized buckets because the filamentary material, especially in the case of moisture-laden freshly spun material coming directly from a spinning bath, appreciably increases the weight of the bucket so that it is difficult for the operator to handle without dropping. Also, in doffing, the rim of the bucket is often chipped or nicked thereby being rendered less resistant to the excessive centrifugal forces to which it is subjected when the bucket is rotated at high speeds. Such buckets have other disadvantages, as well. For instance, it is sometimes necessary for the operator to insert his hands into the center of the cake to assist doffing, which may damage the inner windings of the cake. Further, the outer windings of the cake are subject to abrasion due to rubbing thereof against the interior wall of the bucket during removal therefrom. Often it is necessary to strip the inner and/or outer windings of the cake in order to remove soiled or damaged material. It sometimes happens, also, that during collection of the cake directly in the spinning bucket, the partially formed cake rides up vertically in the bucket and material being fed into the bucket tends to be lapped under the cake at the bottom of the box resulting in a poorly built thread package which does not unwind smoothly in subsequent operations, frequently becoming entangled or snarled. Usually the cakes are removed from the spinning bucket in the vicinity of the spinning machine and transported to another point for wrapping in protective covers prior to being washed or otherwise after-processed, and during such transportation the thread is also liable to damage.

It is an object of this invention to provide a

light weight shell for a spinning bucket, in which shell the filamentary material is collected, and which is readily removable from the bucket. Another object is to eliminate the necessity for removing the bucket from its spindle in order to doff a cake of filamentary material. Another object is to facilitate doffing of a cake of filamentary material without subjecting the cake to handling or abrasion. A further object is to provide a shell which is permanently covered, thus eliminating the necessity for a cover for the bucket proper.

The objects of this invention are accomplished by providing a shell comprising a split side wall having its inner surface tapering inwardly from top to bottom and only one end wall adjacent the larger inner periphery of the side wall, the shell being comprised of a plurality of segments swingably mounted on axes lying approximately in the plane of the end wall.

In the drawing illustrative of the invention, Figure 1 is a plan view of a shell in accordance with the invention;

Figure 2 is a side view of the shell of Figure 1;

Figure 3 is a side view, in cross-section of a modification of the shell shown in Figures 1 and 2;

Figure 4 is a side view, in cross-section, of another modification of the shell of Figures 1 and 2, and

Figure 5 is a cross-sectional elevation of a bucket and shell assembly.

Referring more particularly to the drawing, there is shown a spinning bucket 2 having an annular groove 3 extending about its upper inner rim and having a plurality of notches 3a spaced thereabout. The bucket is provided with a hub 4 adapted to fit on the spindle 4a of a motor in the usual manner. A removable shell constructed in accordance with the invention is positioned in the bucket. As shown more particularly in Figures 1 and 2, the shell comprises a plurality (two being shown) of segmental elements 5 which together form a generally cylindrical split wall against the internal surface of which the filamentary material is thrown, and a top surface constituting a permanent cover for the shell. The segments are swingably mounted in the plane of the top surface, hinges 6 and 7 being provided on the cover, at the line of juncture of the assembled segments, for that purpose. The portions of the segments which together form the split wall of the shell are tapered inwardly from top to bottom for holding the filamentary material collected in the shell stationary therein. It

will be seen that each segment 5 constitutes a portion (as shown a half) of a body which is generally cylindrical but which tapers inwardly from top to bottom and which is closed at the top and open at the bottom. The cover or top surface is provided with a central aperture 8 for permitting entry of the usual reciprocating feeding funnel into the shell. The shell is provided with projections or ears 9 adapted to be slipped through notches 3a on the bucket. When the shell is turned, ears 9 are positioned in groove 3 of the bucket so that the shell and bucket are secured together. Finger grips, such as holes 10 and 11 provided on the cover, facilitate removal of the shell from the bucket and also afford a ready means of transporting the shell and cake of filamentary material wound therein after the shell has been lifted from the bucket. It is unnecessary to remove the bucket from its spindle when a cake of filamentary material has been collected and is ready to be doffed. In operation, the filamentary material is led into the covered shell comprising the plurality of segments 5, and, due to the taper provided in the portions of the segments forming the split wall of the shell, the filamentary material does not tend to move relatively of the shell during collection but is laid evenly along the wall thereof, resulting in a well-built package which unwinds smoothly in subsequent operations. As shown in Figures 3 and 4, the inner surface of each of the segments making up the wall of the shell may be provided with an annular ridge 12 (Figure 3) or a spiral ridge 13 (Figure 4) for assisting in retaining the cake in position in the shell but the provision of such ridges is optional, since due to the tapered wall of the shell, the filamentary material is held firmly in place and ridges or other similar expedients are not required. After a cake has been wound in the shell, the operator may insert his fingers into grips 10 and 11, manipulate the shell to disengage projections 9 from groove 3 and remove the shell and cake from the bucket as a unit. To remove the cake from the shell, the operator simply swings the segments comprising the shell apart, and removes the cake. If desired, a protective paper or other wrapping may be placed over the cake after the segments have been swung apart without the operator having to touch the cake itself with his hands.

Since the cake is not doffed by pulling it from the shell with the hands, or by up-ending the shell and permitting the cake to fall out there is no opportunity for the operator to damage the inner windings of the cake or for the outer windings to rub against the wall of the liner, thus becoming abraded, and the cake may be collected and prepared for the usual after-treatments without damage of any kind.

The shell comprising a split side wall having its inner surface tapering inwardly from top to bottom and only one end wall adjacent the larger inner periphery of the side wall may be comprised of any number of segments 5 which may be swingably mounted on axes lying approximately in the plane of the end wall in any appropriate manner. If desired, holes may be provided in the wall of the shell for permitting the egress of liquid therefrom. Such holes may be in approximate registry with corresponding holes in the bucket, and in such event, suitable indicia may be placed on the bucket and/or shell to guide the operator in properly positioning the segments in the bucket.

The segments comprising the split wall and

cover of the shell may be constructed of any suitable material, as for example, a metal such as stainless steel or the like. However, it is preferred to construct the several segmental elements of a tough, light-weight acid-resistant plastic material such as an artificial resinous material of the type of "Bakelite," or of a polyvinyl chloride, polyvinylidene chloride or the like. The segments are sufficiently rigid, and the wall portion thereof sufficiently tapered from top to bottom, that the filamentary material is firmly supported and securely held in place therein, and at the same time the wall of the shell is sufficiently flexible to permit the wall to be thrown against the inner surface of the bucket wall and gripped thereby when the bucket is rotated. Since the shell comprises a permanent top, a cover for the bucket itself or a rubber ring for holding the same in place is not required and, due to the taper provided in the wall of the shell, a bottom for the shell is not necessary, which makes for a bucket-shell assembly of comparatively light weight such as is desirable in order to permit high speeds of rotation during the spinning operation.

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 without departing from the spirit and scope of the invention as defined by the claims.

I claim:

1. A removable shell for a spinning bucket, said shell comprising a split side wall having its inner surface tapering inwardly from top to bottom and only one end wall adjacent the larger inner periphery of the side wall, said side wall comprising a plurality of segments swingably mounted on axes lying approximately in the plane of the end wall.

2. A removable shell for a spinning bucket, said shell comprising a split side wall having its inner surface tapering inwardly from top to bottom and only one end wall adjacent the larger periphery of the side wall, said side wall comprising two segments swingably mounted on axes lying approximately in the plane of the end wall.

3. A removable shell for a spinning bucket, said shell comprising split side and top walls, said walls comprising a plurality of segments swingably mounted in the plane of the top wall and each of which constitutes a portion of a body which is generally cylindrical but tapers inwardly from top to bottom, and which is closed at the top and open at the bottom.

4. A removable shell for a spinning bucket, said shell comprising split side and top walls, said walls comprising two segments swingably joined together in the plane of the top wall and each of which constitutes a half of a body which is generally cylindrical but tapers inwardly from top to bottom, and which is closed at the top and open at the bottom.

5. A removable shell for a spinning bucket, said shell comprising split side and end walls, said end wall constituting a permanent cover, and said side and end walls comprising a plurality of relatively swingable segments each of which constitutes a portion of a body which is generally cylindrical but tapers inwardly from top to bottom and which is closed at the top and open at the bottom, and means on the end wall for swingably mounting the segments.

6. A removable shell for a spinning bucket, said

shell comprising split side and end walls, said end wall constituting a permanent cover, and said side and end walls comprising two relatively swingable segments each of which constitutes a half of a body which is generally cylindrical but tapers inwardly from top to bottom, and which is closed at the top and open at the bottom, and means on the end wall for swingably mounting the segments.

7. In combination, a spinning bucket, a removable shell for the bucket comprising split side and top walls, said walls comprising a plurality of segments swingably mounted in the plane of the top wall and each of which constitutes a portion of a body which is generally cylindrical but tapers inwardly from top to bottom, and which is closed at the top and open at the bottom, and cooperating means on the bucket and on the shell for releasably securing the shell to the bucket.

8. In combination, a spinning bucket, a removable shell for the bucket comprising split side and top walls, said walls comprising two segments swingably mounted in the plane of the top wall and each of which constitutes a half of a body which is generally cylindrical but tapers inwardly from top to bottom and which is closed at the top and open at the bottom, and cooperating means on the bucket and on the shell for releasably securing the shell to the bucket.

9. In combination, a spinning bucket, a removable shell for the bucket comprising split side and top walls, said walls comprising a plurality of segments swingably mounted in the plane of the top wall and each of which constitutes a portion of a body which is generally cylindrical but tapers inwardly from top to bottom, and which is closed at the top and open at the bottom, cooperating means on the bucket and on the shell for releasably securing the shell to the bucket, and means for removing the shell from the bucket.

10. In combination, a spinning bucket, a removable shell for the bucket, comprising split side and top walls, said walls comprising two segments swingably mounted in the plane of the top wall and each of which constitutes a half of a body which is generally cylindrical but tapers inwardly from top to bottom and which is closed at the top and open at the bottom, cooperating means on the bucket and on the shell for releasably securing the shell to the bucket and means for removing the shell from the bucket.

11. In combination, a spinning bucket, a removable shell for the bucket comprising split side and top walls, said top wall constituting a permanent cover, said walls comprising a plurality of relatively swingable segments each of which constitutes a portion of a body which is generally cylindrical but tapers inwardly from top to bottom, and which is closed at the top and open at the bottom, means on the top wall for swingably joining the segments together cooperating means on the bucket and on the shell for releasably securing the shell to the bucket, and means on the shell for removing the shell from the bucket.

12. In combination, a spinning bucket, a removable shell for the bucket comprising split side and top walls, said top wall constituting a permanent cover, said walls comprising two relatively swingable segments each of which constitutes a half of a body which is generally cylindrical but which tapers inwardly from top to bottom and which is closed at the top and open at the bottom, means on the top wall for swingably mounting the segments, cooperating means on the bucket and on the shell for releasably securing the shell to the bucket, and means on the shell for removing the shell from the bucket.

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