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P. E. HARRISON

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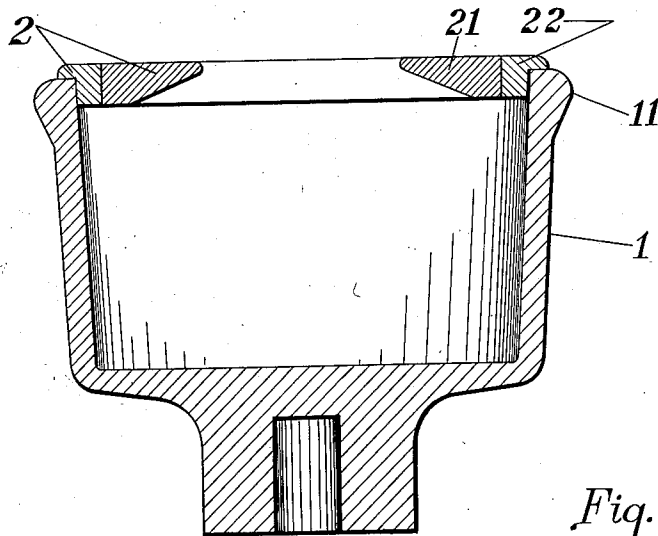


Fig. 1

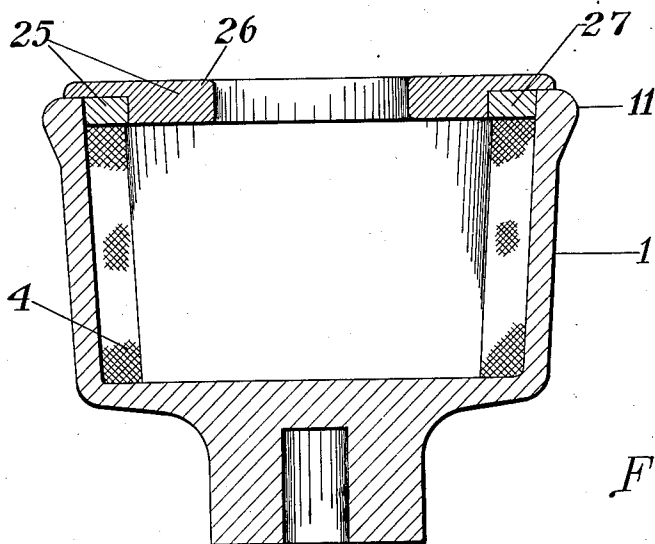


Fig. 2

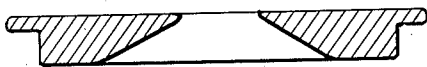


Fig. 3.

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6 Claims. (Cl. 118—49)

This invention relates to the manufacture of thread. More particularly the invention relates to the production of thread by a bucket process. Still more particularly the invention relates to a spinning bucket and to a cover for a spinning bucket.

In a method of manufacturing rayon by the viscose process wet, regenerated thread is drawn into a swiftly revolving bucket and is laid by centrifugal force and a traversing mechanism against the walls of the bucket in superimposed helices which form a cake. The bucket is substantially circular, has a closed bottom, an open top, and a slight flare from the bottom to the top. The flare of the bucket and whirling air currents tend to throw some of the threads up toward the rim of the bucket, which is, consequently, usually provided with a cover to prevent the thread from being thrown out at the top. However, the cover and the bucket have heretofore not fitted precisely and the thread has been damaged by being forced into small cracks and crevices between them.

Many attempts have been made to overcome this difficulty, all of them, so far as I know, involving the formation or cutting of various types of grooves in the bucket and/or in the bucket cover designed to make the cover fit precisely in its place under the pressure of a spring clip or of a tongue and groove arrangement. In one such device the bucket cover rests on a shoulder formed in, or cut out of, the top of the bucket, an annular groove is formed in the edge of the bucket cover, an aligned groove of similar size is sunk into the bucket wall above the shoulder, and a rubber ring is mounted in the cover groove to be expanded by the rotational force of the bucket into locking engagement with the corresponding groove in the bucket wall.

This device and all similar devices with which I am acquainted have the disadvantage that the upper portion of the bucket is weakened and must be strengthened by increasing its thickness, by an encircling metal band, or by other similar methods, all of which tend to increase the power load, and have the additional disadvantage that the covers still do not fit accurately and permit the thread to be damaged by creeping in between the cover and the shoulder.

It is an object of this invention to construct a spinning bucket and cover in which the bucket will have a substantially smooth inner wall, in which the bucket cover will be in one piece, in which the bucket cover will form an absolutely tight seal with the bucket, and in which the

bucket cover will be invariably dynamically balanced.

The objects of the invention are accomplished, generally speaking, by the use of a bucket having a substantially smooth inner wall, and by the use of a bucket cover which is expandable by centrifugal force into sealing contact with the bucket walls.

In the drawing, Figure 1 is a vertical section through a spinning bucket showing bucket and cover constructed according to one form of my invention; Figure 2 is a similar view showing another form of the invention, and Fig. 3 is a similar view showing another modification of the invention.

Referring to the numerals of the drawing: 1 is a spinning bucket; 11 is an enlargement or reinforcement at the upper edge of the bucket designed to resist the great bursting tendency which exists at high speeds of rotation at this part in the bucket; 2 indicates generally a bucket cover; 21 is a core in the bucket cover of hard rubber, molded material, synthetic resin, incorrodible metal, or other substantially non-expandable material; 22 is an annulus of soft rubber or other material which is capable of expanding under the influence of centrifugal force. The annulus 22 is integral with, or is integrated to, the core 21 by means well known to those skilled in the art of manufacturing rubber products.

In Figure 2, 1 indicates a bucket similar to that which has just been described; 25 indicates generally a bucket cover; 26 indicates a substantially non-expandable core; 27 indicates an annulus expandable by centrifugal force integrated to the core 26; 4 indicates a rayon cake in the bucket. In this form of the invention the annulus 27 is preferably integrated to the core 26 only at the vertical line of contact between them and not at the horizontal line of contact because the bonding of the annulus along the horizontal line of contact would tend to prevent its expansion into contact with the wall of the bucket.

In normal practice the annulus 22 or 27 will be of a size that can be removed or applied without effort when the bucket is in a position of rest, and which will be expanded as the bucket begins to rotate into contact with the walls of the bucket. The higher the speeds of rotation the more firmly are the bucket walls gripped and the more tightly is the joint between cover and bucket sealed by the annulus, which automatically centers the cover and prevents it from causing vibration by rotation off center.

The bucket cover can be made of a single piece

of semi-hard rubber, that is, of rubber which is just elastic enough to expand into contact with the bucket, but which is not sufficiently elastic to materially increase the bursting stress on the bucket rim.

An advantage of my invention is in the production of a one-piece, self-attaching bucket cover. Another advantage of the invention is in the production of a bucket cover which automatically seals the joint between bucket cover and bucket. Another advantage of the invention is in the production of yarn free from portions mangled between bucket cover and bucket. Another advantage of the invention is in the use of a bucket cover which is automatically centered during rotation and which, consequently, does not cause vibration. Another advantage of the invention is in increased speed of operation resulting from the instant removability and applicability of the bucket cover when the bucket is at rest. Another advantage is in the bucket having smooth and unweakened walls. Another advantage is in the combination of bucket and bucket cover. Other advantages will be apparent.

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 centrifugal thread collector having a smooth inner wall, and a cover therefor having a substantially non-expansible core and having within the collector opening integral means somewhat smaller than the said opening, said means

forming the outer, lower edge of the cover and being expansible by centrifugal force into sealing contact with the collector wall.

2. In a centrifugal thread collector, a centrifugal bucket and a cover therefor having integral means within the bucket opening, said means forming the outer, lower edge of the bucket cover and being expansible by centrifugal force into sealing contact with the bucket wall.

3. In a centrifugal thread collector, a bucket, and a cover therefor having integrated annular means somewhat smaller than, and within, the bucket opening, said means forming the outer, lower edge of the bucket cover and being expansible by centrifugal force into sealing contact with the bucket wall.

4. In a centrifugal thread collector, a centrifugal bucket, and a cover therefor having a substantially non-expansible core and having integral means within the bucket opening, said means forming the outer, lower edge of the bucket cover and being expansible by centrifugal force to prevent the entry of thread between bucket and cover.

5. In a centrifugal thread collector, a centrifugal bucket, and a cover therefor having integral circular means, forming the outer, lower edge of the bucket cover, expansible by centrifugal force to prevent the entry of thread between bucket and cover.

6. In a centrifugal thread collector, a centrifugal bucket, and a cover therefor having integral means, forming the outer, lower edge of the bucket cover, expansible by centrifugal force to prevent the entry of thread between bucket and cover.

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