

Aug. 19, 1941.

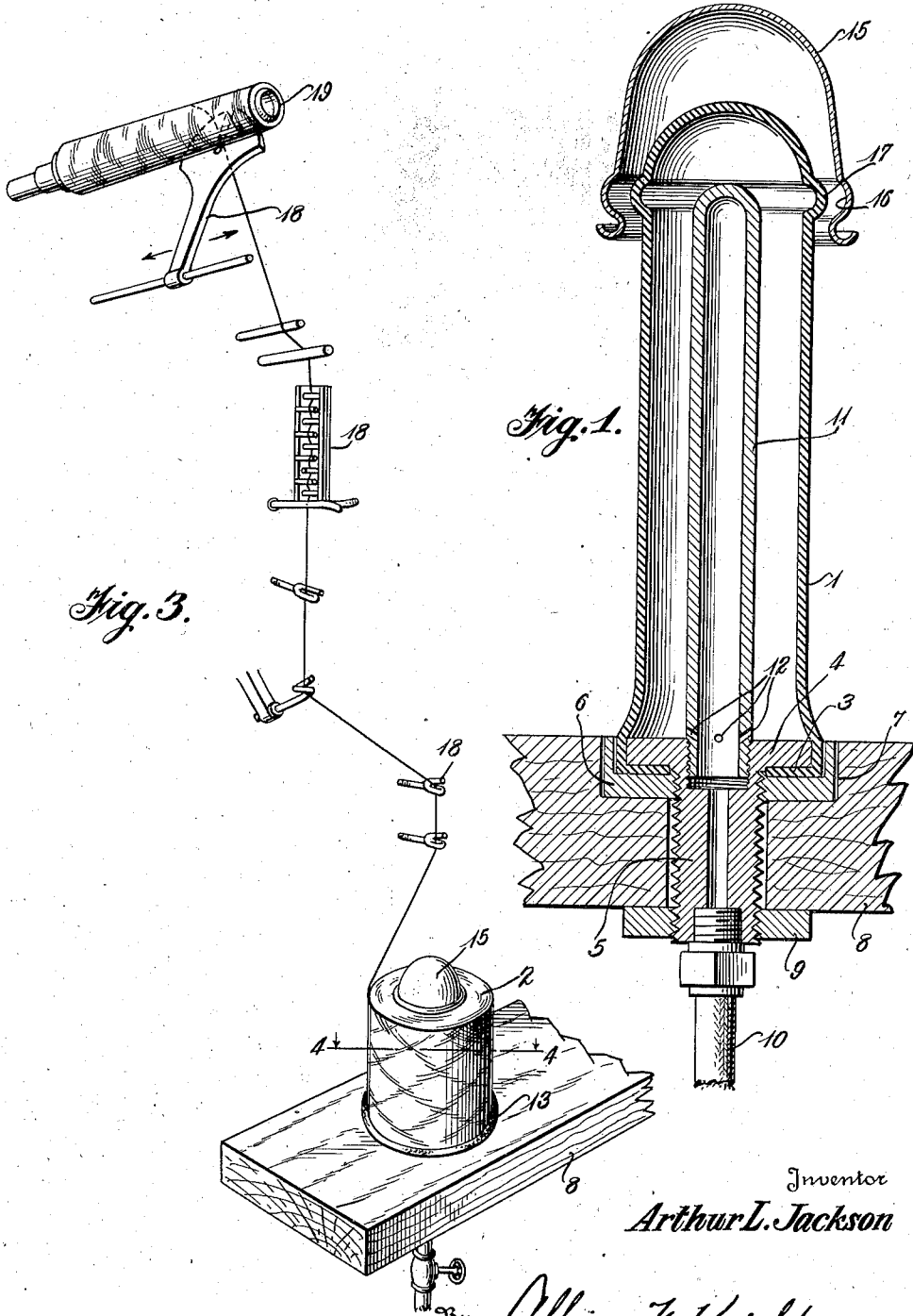
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2,253,238

APPARATUS FOR WINDING STRANDULAR MATERIAL

Filed Jan. 19, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

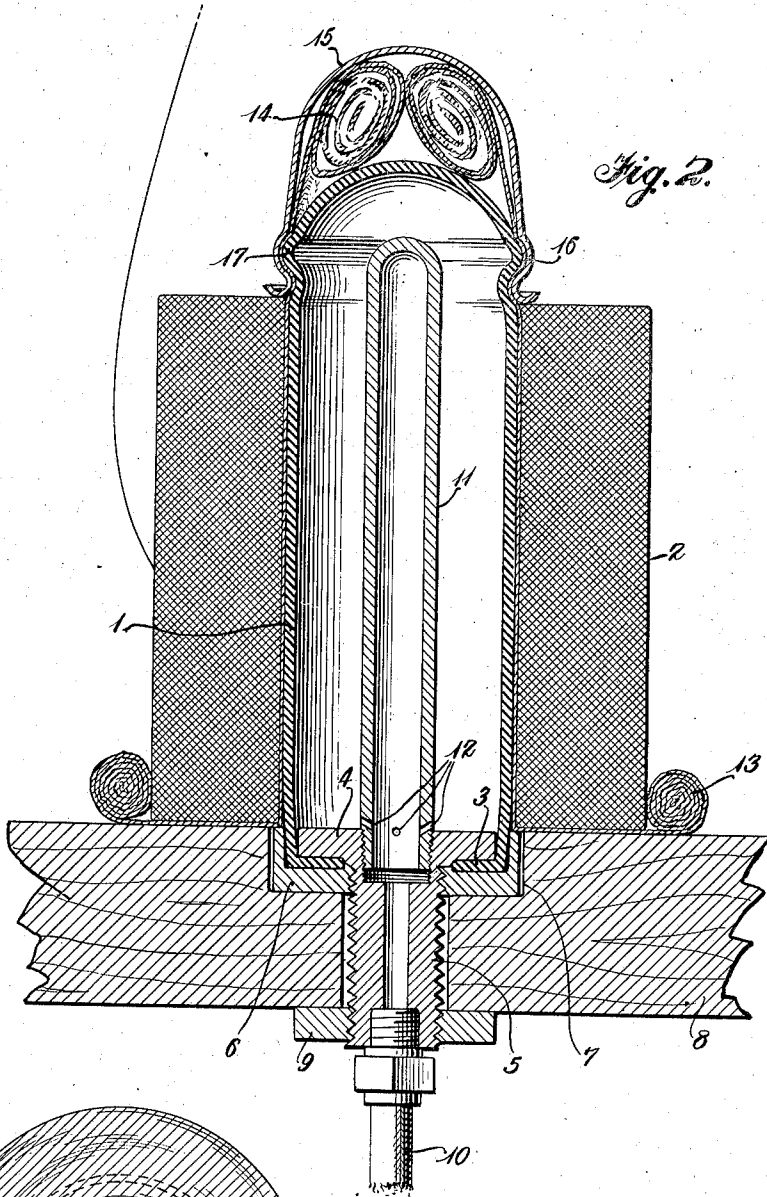


Fig. 2.

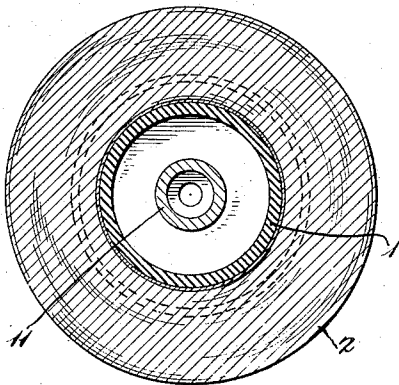


Fig. 4.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR WINDING STRANDULAR MATERIAL

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3 Claims. (Cl. 242-130)

The present invention relates to an improved method of rewinding packages of strandular textile materials into convenient forms, and more particularly to a novel type supporting device for use in bobbin or pot spun packages of rayon that have been suitably processed and preferably dried.

Heretofore, in the one or more rewinding steps involved in rayon twisting, coning or the like operations, metallic and wooden inserts have been employed in the interiors of the packages to be unwound. Such inserts are substantially rigid so that during the initial rewinding stage the layers throughout the packages of rayon are maintained in situ. As the rewinding progresses, however, the rigidity of the inner layers is decreased and the layers tend to separate and fall apart. This is due to the absence of the support previously furnished by the outer layers and to the fact that the packages have been dried without internal supports, thereby resulting in a substantial amount of suppleness and crinkle within the inner layers. Now, when the inflexible support is inserted into each package, the inner layers are urged outwardly to increase the degree of crinkle or waviness and, therefore, a loose residual inner portion of the package occurs. The latter part of the rewinding operation has accordingly been impractical and subject to numerous objections, because the loose inner layers tended to become entangled or even fall apart thereby incurring substantial breakage and improper winding.

In an effort to overcome these difficulties it has been attempted to drive wedge-shaped inserts or separable inserts having wedges therebetween into the interiors of the packages, but this procedure only accentuated the poor results. It was determined that as greater pressure was imposed on the said interiors prior to unwinding, the crinkle on the inner layers was increased. The only outward pressure exerted by these inserts was that imparted by the wedging action per se and after the unwinding was allowed to continue for a time, the resistance of the residual layers became less than the force derived from the wedging action. For this reason, during the latter part of the rewinding period the same aforementioned problems were involved even when wedge-shaped inserts were used.

It is, therefore, the object of the present invention to apply a continuous outward pressure, automatically, to the interiors of packages of strandular materials throughout a complete winding off operation.

It is further contemplated to provide an improved method of rewinding packages of strandular materials wherein all portions thereof are maintained taut and in position during rewinding to facilitate a continuous operation.

Another object of the invention is the provision of novel type internal supports to be inserted into bobbin or pot spun packages of rayon, which inserts increase in size in direct proportion to the decrease of the resistance of the inner layers as the unwinding of the outer layers progresses.

Other objects and advantages of my invention will be apparent from the following detailed description when considered in connection with the accompanying drawings, wherein:

Figure 1 is a cross-sectional view of a pneumatic type of support formed in accordance with the present invention;

Figure 2 exemplifies a cross-section of the structure illustrated in Figure 1, after inflation of the same with a package thereon in readiness to be unwound;

Figure 3 is a diagrammatic perspective view illustrating a rewinding operation conducted in accordance with this invention; and

Figure 4 is a cross-sectional view taken on line 4-4 of Figure 3.

Referring to the drawings, the numeral 1 indicates an expandible rubber member for internally supporting a rayon package 2. This rubber member is in the shape of an elongated tube and when deflated, is of smaller diameter than the thread-free interior of the said package. The lower open end of the tubular member is formed with an inwardly extending flange 3 and is thereby mounted on a metallic base 4. This base, preferably constructed of brass, is provided with a screw-threaded lower portion 5 adapted to receive thereon a cup-shaped washer 6 for maintaining an air-tight juncture and for holding the rubber member rigidly in place against the flange 3.

The base and washer fit into a cut out portion 7 formed in the platform 8 which is conveniently positioned for supporting a number of similar package retaining members or supports. The screw-threaded lower portion of the base extends through the platform and a steel nut 9 is screwed thereon so as to hold the assembled elements in a fixed, stationary position. The portion 5 of the base is hollow and internally threaded adjacent its lower end for the purpose of receiving an air hose 10 suitably connected to an air supply (not shown) to provide

sufficient pressure to maintain the rubber member inflated and in expanded engagement with the rayon package during the winding off period (see Figure 2). The upper portion of the base is similarly internally threaded to receive a tube 11 which is closed at its upper end and extends up through a portion of the interior of the rubber member. Closed tube 11 is provided with air outlet jets 12, preferably located at points about the periphery thereof adjacent the upper face of the base. Such location permits the exhaustion of any moisture introduced into the inflation zone. The primary function of the tube is to prevent injury to the rubber supporting member when positioning a rayon package thereon. In some cases when the rubber member is sufficiently stiff, this pipe may be entirely eliminated.

If, during the processing of the rayon packages, it becomes necessary to protect the same with a permeable covering such as a cotton sock, then appropriate means are employed to prevent the covering from interfering with the unwinding operations. In Figure 2 the lower half 13 of a cotton sock is shown rolled down to the bottom of the package and resting on the platform 8. The upper half 14 of the cotton sock is shown as having been folded into a compact position at the top of the rubber member and retained by means of a brass cap 15 having a circular channel 16 fitting over a ridge 17 formed in the upper part of the rubber member 1. The ridge and channel form a tight joint when the rubber member is properly inflated.

In the operation of my invention the deflated rubber member is mounted by screwing the washer 6 onto the base 4 prior to positioning it within the cut out portion 7 formed in the platform 8. The parts are then secured to the base and a rayon package is placed on the rubber member which is in turn connected to a suitable air supply by means of the air hose 10. The rubber member 1 is inflated and maintained at a constant air pressure of from five to ten pounds. This pressure inflates the tubular device and expands the same so as to rigidly hold the package in position. After arranging the cotton sock as previously described, the textile strand is threaded through a series of guides and tensioning devices 18 and on to a driven cone or core 19 upon which it is to be rewound. The rewinding operation is then initiated and proceeds in accordance with the showing of Figure 3. Normally, upon the withdrawal of the outer layers of thread, the loose, supple inner layers of thread would fall apart and become entangled. However, in a rewinding operation conducted in accordance with this invention, a constant pressure is maintained in the inflation zone of the rubber member during the winding off period and this increases the size of the rubber member due to the decrease of support and looseness of the residual inner layers. It is obvious that the unwinding can now be carried out uninterrupted because the residual inner layers are successively held taut and in position until the operation is completed.

In some cases a resilient spring member or circular spring inserts that will increase in size or expand transversely of the axis of the rayon package during the winding off process, may be substituted for the pneumatic rubber device and improved results realized.

It is to be understood that my invention is not

to be restricted to the specific aforescribed details, as various changes and modifications can be made without departing from the spirit and scope thereof. The invention is limited only to the extent recited in the appended claims.

What I claim is:

1. A holder for strandular textile material particularly adapted for holding normally unsupported thread packages provided with fabric coverings while winding off during their rewinding operation with the coverings folded back to expose the package exteriors comprising a tubular base inset in a recess in a platform and extending therethrough, an inflatable tubular member having its open end, secured to the upper portion of the base with an airtight connection, said tubular member having a rib adjacent its upper end, and a cap fitting over the end of said member provided with a recess for engaging the rib of the member and forming a compartment, said tubular member being constructed to freely receive thereover a thread package having a thread-free interior and to first engage the wall of the thread-free interior of the package upon being inflated and thereafter to support the inner convolutions of strands as the outer convolutions are wound off, the compartment formed by the cap providing a retainer for the upper folded portion of the fabric covering during the operation.

2. A holder for strandular textile material particularly adapted for holding normally unsupported thread packages provided with fabric coverings while winding off during their rewinding operation with the coverings folded back to expose the package exteriors comprising a tubular base inset in a recess in a platform and extending therethrough, an inflatable tubular member having its open end secured to the upper portion of the base with an airtight connection, a support positioned within said tubular member and having its end secured to the upper portion of the base, the said inflatable member having a rib adjacent its upper end, and a cap fitting over the end of said member provided with a recess for engaging the rib of the member and forming a compartment, said tubular member being constructed to freely receive thereover a thread package having a thread-free interior and to first engage the wall of the thread-free interior of the package upon being inflated and thereafter to support the inner convolutions of strands as the outer convolutions are wound off, the compartment formed by the cap providing a retainer for the upper folded portion of the fabric covering during the operation.

3. A holder for strandular textile material particularly adapted for holding normally unsupported thread packages provided with fabric coverings while winding off during their rewinding operation with the coverings folded back to expose the package exteriors comprising a tubular base inset in a recess in a platform and extending therethrough, an inflatable tubular member having its open end secured to the upper portion of a tubular base with an airtight connection, an air supply communicating with the interior of a tubular support through the medium of the opening in the base, said support being secured to the base and positioned within the inflatable tubular member, and being provided with ports adjacent its lower end through which inflation and deflation of the inflatable member is effected, the said inflatable tubular member having a rib adjacent its upper end, and

a cap fitting over the end of said member provided with a recess for engaging the rib of the member and forming a compartment, said tubular member being constructed to freely receive thereover a thread package having a thread-free interior and to first engage the wall of the thread-free interior of the package upon being inflated

and thereafter to support the inner convolutions of strands as the outer convolutions are wound off, the compartment formed by the cap providing a retainer for the upper folded portion of the fabric covering during the operation.

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