

Sept. 17, 1968

T. P. JOHNSON

3,402,076

GARMENT DE-LINTING METHOD

Filed Sept. 18, 1964

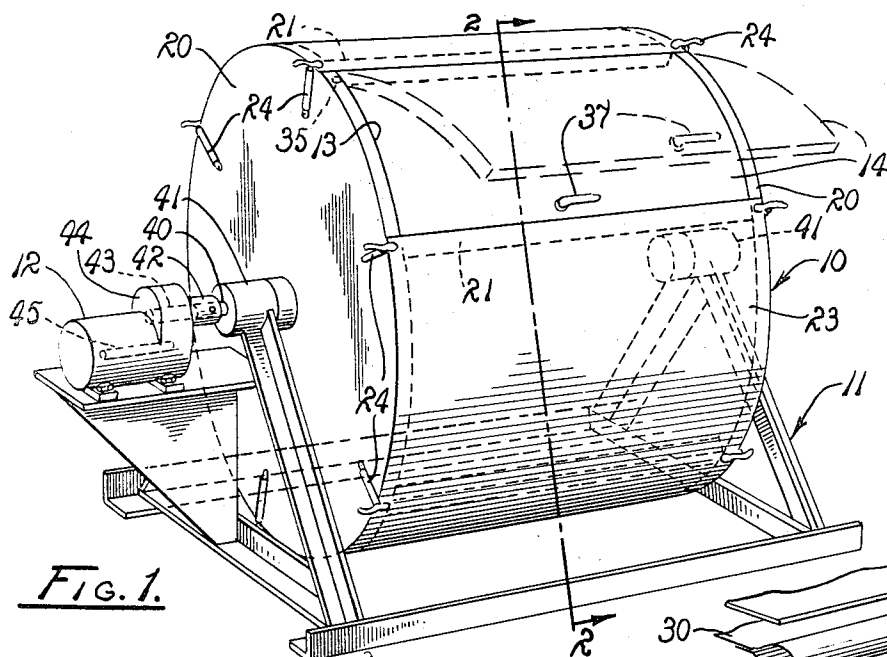


FIG. 1.

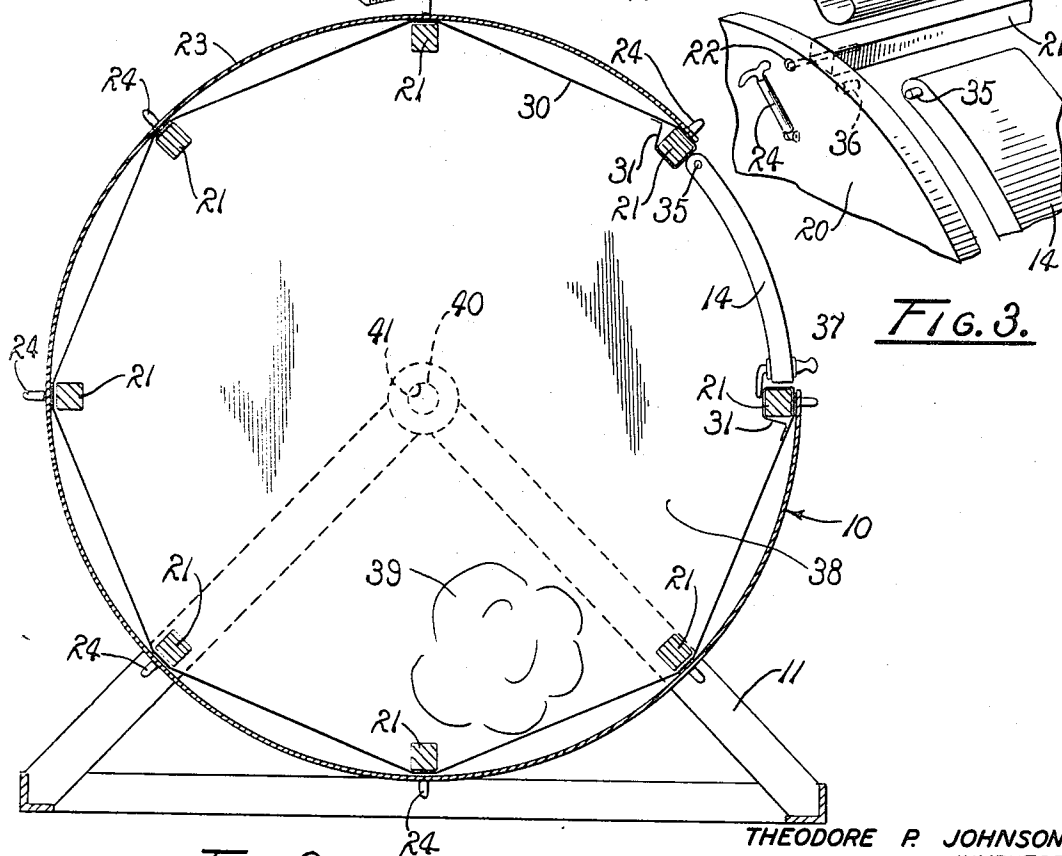


FIG. 2.

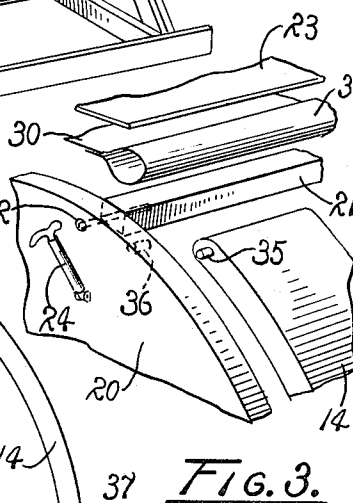


FIG. 3.

THEODORE P. JOHNSON
INVENTOR

Huelmer & Huelmer
ATTORNEYS

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3,402,076

GARMENT DE-LINTING METHOD

Theodore P. Johnson, Visalia, Calif., assignor of
fifty percent to E. C. Presthus, Tulare, Calif.
Filed Sept. 18, 1964, Ser. No. 397,557
3 Claims. (Cl. 134-25)

The present invention relates to a garment de-linting method and more particularly to a method for bringing cloth garments into repeated contact with an adherent surface to raise the nap of the garments and to remove lint and other foreign objects therefrom.

In the cleaning and finishing of cloth garments, the removal of lint and/or other extraneous matter, such as threads and the like represents a major portion of the direct labor costs. Prior to this invention, there has been no dependable mechanical method of accomplishing such removal from garments in bulk lots. The conventional method has been to resort to tedious brushing, by hand, of the individual articles. Hand-operated devices have been found to be satisfactory to a degree for an individual wearer of clothes. However, such devices are inefficient from the viewpoint of direct labor costs, and hence not practical for commercial use.

Concomitant with the problem of lint removal is that of napping the garment fabric. Any device which can simultaneously accomplish both objects will obviously afford further time savings. Prior to this invention, there has been no such dual-purpose machine.

Therefore, it is an object of the present invention to provide a garment de-linting method which can effectively de-lint the cloth fabric of a quantity of cloth garments.

Another object is to provide such a method which simultaneously raises the nap of the cloth fabric, while removing lint and the like therefrom.

Another object is to provide such a method which can accommodate a quantity of cloth garments in bulk.

Another object is to provide such a method which can accomplish such lint removal and nap finishing expeditiously with a minimum of manual manipulation.

Another object is to provide such a method employing an apparatus containing a minimum number of working parts and requiring only simplified and economical maintenance procedures.

These, together with other objects, will become more fully apparent upon reference to the following description and accompanying drawings.

In the drawings:

FIG. 1 is a perspective view of the garment finishing apparatus employed in the method of the present invention.

FIG. 2 is a view in vertical, transverse section of the apparatus employed in the method of the present invention taken in a plane represented by line 2-2 of FIG. 1.

FIG. 3 is a fragmentary perspective view of a door hinge of the apparatus and structural details permitting replacement of the adherent liner employed therein for removal of lint and finishing of the nap of garments.

Referring more particularly to the drawings, the garment de-linting apparatus employed in the method of the present invention is shown generally in FIG. 1 and provides a cylindrical drum 10 mounted for rotation on a supporting frame 11. An electric motor 12 is mounted on the frame for imparting rotational movement to the drum at a predetermined speed of rotation. A garment access, or door, opening 13 is provided for the drum, as well as a hinged door 14 mounted for pivotal movement between open and closed positions.

The drum 10 is formed by two circular end walls 20 rigidly interconnected and held in parallel relation by a series of elongated parallel rib members 21. The opposite

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ends of the rib members are rigidly secured at their respective opposite ends to one of the end walls by any suitable means, such as welding, indicated at 22. A flexible retaining side wall 23 encloses the rib members, to form a fractionally cylindrical enclosure, which defines the access opening 13, in conjunction with the end walls 20. The side wall 23 is removably secured to the end walls by a series of suitable quick-disconnect fasteners, as, for instance, the spring-biased latches 24. Each of these latches is pivotally mounted on the end walls by a respective pin 25 to permit ready assembly and disassembly of the side wall relative to the end walls.

The interior surface of the side wall 23 is covered with a removable adherent member, such as the membrane 30. It has been found practical to employ a continuous sheet of material, having only one side adherent, for the membrane 30. Material such as commercially available adhesive cloth tape, masking tape, or tacky cellophane tape has been found to be satisfactory. Other suitable materials should occur to those skilled in the art.

One end of the membrane 30 is anchored to a rib member 21 adjacent to one end of the access opening 13 and extended about the periphery of the drum to the rib member adjacent to the other end of the opening 13, circumferentially spaced from the first. In this manner a readily replaceable tacky, adherent inner surface is provided for the drum in the nature of a removable shell, and thereby permits periodic renewal of such adherent surface.

Depending upon the speed of rotation of the drum 10 and the exterior surface of the garments placed within the drum, the adherent inner surface of the membrane 30 is normally sufficient to promote a tumbling of the garments within the drum, thereby to provide access by the adherent surface to substantially all of the area of the exterior surface of the garments. Accordingly, lint will be removed from the garments and the nap of the garments exterior surface raised, which is desirable from an aesthetic point of view. To insure such tumbling of the garments during drum rotation, the rib members 21 are of a predetermined radial dimension, which thereby provides a plurality of circumferentially spaced vanes available to contact the garments during drum rotation. Consequently, the rib members, as such vanes, enhance the tumbling action of the adherent surface of the membrane 30.

The door 14 is pivotally mounted between the end walls 20 by means of dowel hinges 35 received in suitable pilot holes 36 provided in each of the end walls. The latch 37 is secured to the door and includes an operating handle adapted to facilitate movement of the door between a closed position, shown in FIG. 2, and an open position, shown in dashed lines in FIG. 1. With the door in the closed position, the drum provides an internal chamber 38 adapted to receive a quantity of garments, one of which is shown at 39.

The drum 10 is mounted on the frame 11 for rotation about a substantially horizontal axis to insure appropriate tumbling of the garments disposed within the internal chamber 38. Stated differently, the drum movement agitates the garment within the chamber to effect a contacting of substantially all of the exterior surface of the garment 39 with the adherent inner surface of the membrane 30 lining the drum.

For rotation about a substantially horizontal axis, the drum is supported on aligned oppositely axially extended shafts 40 projecting outwardly from respective end walls 20 and journaled within a respective one of a pair of bearings 41 carried by the frame. For powered rotation of the drum and consequent agitation of the garments, one of the shafts 40 is extended beyond its bearing and provided with a positive drive coupling member 42. The coupling

member 42 is driven by a suitable output shaft 43 rotatably mounted in a speed reduction gear housing 44 and driven by a shaft 45 of the motor 12. A conventional power source and control switch, not shown, is provided for selective operation of the motor 12 and consequent rotation of the drum 20.

The operation of the described embodiment of the subject invention is believed to be readily apparent and is briefly summarized at this point. The drum 10 is constructed of a size to accommodate the desired quantity of garments to be finished in a single batch. Commercial dry cleaning operations have indicated that an eight pound load of clothes is a practical batch load. Accordingly, it has been found to be quite effective to employ a drum having an axial length of eighteen inches and a diameter of two feet. A drum construction according to these dimensions effectively accommodates a six to eight pound load of cloth garments, depending upon the type of garment and their respective bulk.

Following cleaning of the garments by any suitable method, the garments 39 are deposited within the chamber 38 through the access opening 13 by appropriate movement of the door 14 to an open position. Subsequently, the door is closed and the control switch of the motor 12 moved to an operating position to effect rotation of the drum 10 and agitation of the clothes therein.

In the form of the invention illustrated, rotation of the drum 10 about its substantially horizontal axis causes a tumbling of the garments within the chamber 38 due to the interaction of the adherent surface of the membrane 30 and the rib members 21 acting as agitation vanes. Consequently, substantially all of the exterior surface of the garments 39 is exposed to the adherent surface of the membrane 30 during drum rotation.

This rotation is continued until lint and other extraneous matter is removed from the exterior surface of the garments and the nap has been finished to a desired degree. The duration of the operation cycle will vary according to the quantity of garments and the type of material, however, it has been found that a normal operating cycle extends from approximately three minutes to approximately ten minutes. The motor is then de-energized and the garments removed through the access opening 13 by appropriate movement of the door 14.

After prolonged use by successive batches of garments, the adherent surface of the membrane 30 becomes saturated with lint and other extraneous matter removed from the garments and approaches a point of inefficient operation. At this time, the adherent surface of the drum 10 must be renewed so that the apparatus can resume effective lint removal and garment finishing.

To achieve this surface renewal, the flexible side wall 23 is first disassembled from the drum by appropriate unlatching of the spring latches 24. Access to the membrane 30 is thereby permitted so that the opposite ends of the membrane are removed from the rib members 21 adjacent to the access opening 13. A replacement membrane 30 is then anchored to one of such rib members and drawn circumferentially about the drum in engagement with the rib members circumferentially spaced thereabout and anchored to those rib members on opposite sides of the access opening 13. The side wall 23 is then reassembled to the drum to provide a flexible, side wall of sufficient

strength to insure reliable confinement of the garments 39 within the chamber 38. Consequently, the adherent inner surface of the drum 10 provided by the membrane 30 is easily and expeditiously renewed by reason of the flexibility of the side wall 23 and the quick-disconnect design afforded by the latches 24.

Accordingly, the present invention provides a garment finishing apparatus and method for effectively removing lint and other extraneous matter from bulk quantities of cloth garments, and concurrently raises the nap in a garment finishing operation. The apparatus insures effective exposure of substantially all of the exterior surface of each garment to the lint removing surface of the drum during operation thereof, and does not require the attendance of a monitoring workman. In addition, the efficiency of the apparatus is easily maintained at an optimum level by reason of the speedy removal of the adherent lint removing and garment finishing surface provided internally of the drum. In view of its simplicity of design, the invention provides a highly reliable and economical apparatus, previously unavailable in the cleaning and garment finishing industry.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred method and embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent methods and apparatus.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of de-linting a cloth garment having an exterior surface comprising the steps of providing a container affording an internal chamber and a tacky adherent inner surface, placing a garment within said chamber, and tumbling said garment to effect contacting of substantially all of the exterior surface thereof with said adherent inner surface of said container.

2. The method of de-linting a cloth garment having an exterior surface comprising the steps of providing a container affording an internal chamber and a tacky adherent inner surface, placing a garment within said chamber, and rotating the container about a substantially horizontal axis to effect tumbling of the garment and contact with said adherent inner surface.

3. The method of claim 2 which includes periodically renewing said adherent inner surface.

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MORRIS O. WOLK, *Primary Examiner*.

J. T. ZATARGA, *Assistant Examiner*.