May 15, 1951 T. H. JOHNSON ET AL 2,552,680

METHOD AND APPARATUS FOR PRODUCING TWISTED YARN-LIKE STRUCTURES

Filed Nov. 30, 1948

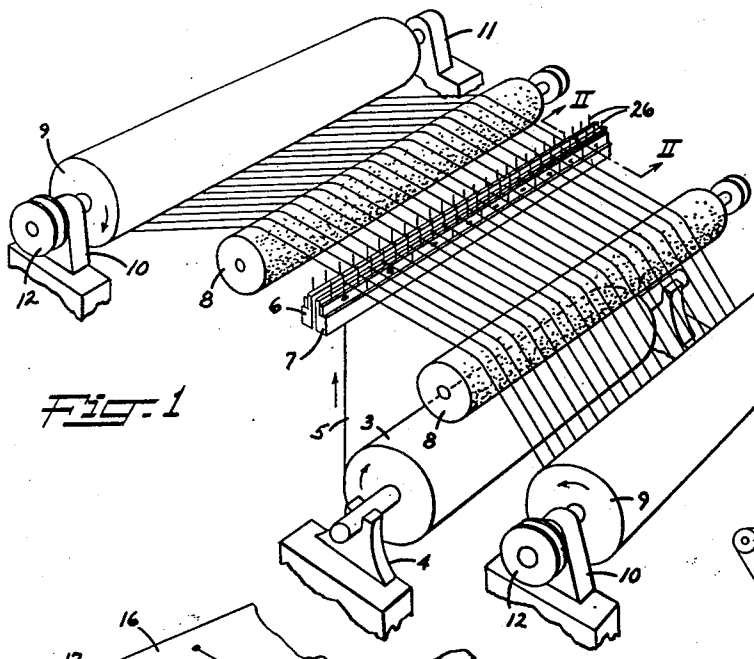



Fig. 1

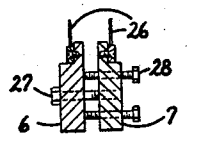



Fig. 2

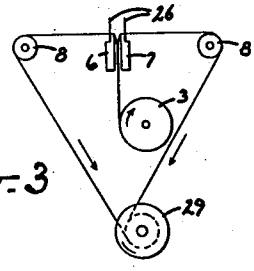



Fig. 3

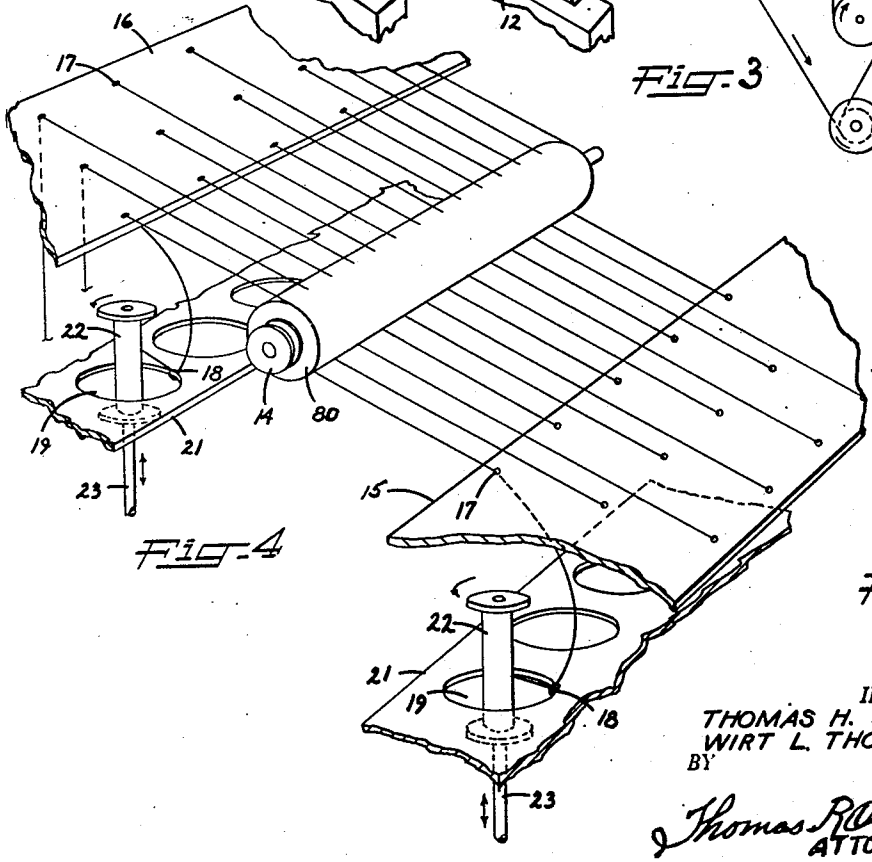



Fig. 4




Fig. 5

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2,552,680

## METHOD AND APPARATUS FOR PRODUCING TWISTED YARN-LIKE STRUCTURES

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Application November 30, 1948, Serial No. 62,606

14 Claims. (Cl. 28—1)

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United States Patent 2,433,279, of Thomas H. Johnson discloses the warpknitting of a splittable fabric for the purpose of producing in a single knitting operation on one machine an integral fabric which can then be subjected to any processing or converting treatment, such as bleaching, dyeing, sizing and the like, and, after the completion of such treatments, splitting the fabric into its units.

The present invention is concerned with an improved method and apparatus for splitting such a fabric into its unitary components.

It is an object of the present invention to provide a method whereby a plurality of the unitary fabrics are simultaneously pulled in one direction while a plurality of intervening units are simultaneously pulled in another direction, so as to separate the integral machine-width fabric into the ultimate components desired. A further object of the invention is to provide a machine adapted to execute the method in an automatic fashion. Other objects and advantages of the invention will be apparent from the drawing and the description thereof hereinafter.

In the drawing, which is illustrative of the invention,

Figure 1 is a perspective view of an apparatus adapted to carry out the splitting operation,

Figure 2 is a section on line II—II of Figure 1,

Figure 3 is a side elevation of a modification,

Figure 4 is a perspective view showing an apparatus adapted to twist the individual units separately, and

Figure 5 is a view showing a twisted yarn obtained in accordance with the invention.

In the earlier patent referred to, there are disclosed numerous warp-knitted fabrics having splittable wales at spaced intervals across the width of the fabrics. The unitary fabric components may comprise any number of wales between the splittable wales. The number of central wales between adjacent splittable wales may vary from one to 100 or more, depending upon the width of the narrow unit desired. In accordance with an application of Wirt L. Thompson, Jr., Serial No. 62,605, filed November 30, 1948, now Patent No. 2,535,376, the components may have from one to four central wales and be twisted to produce a novelty or specialty yarn-like structure. For other purposes such as for the making of labels to be sewn or otherwise fastened in garments, a greater number of central wales are generally desired.

The previous methods of splitting such fabrics have been tedious and time-consuming and hence

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the splitting has been an expensive operation. However, in accordance with the present invention alternate components of the machine-width fabric are seized together as by hand or by any clamp adapted to be held in the hand, and the intervening components are seized with the other hand or by a similar clamp. Then the two groups are pulled apart in opposite directions, whereby all of the units or components to be made by the single fabric are separated simultaneously in a continuous operation. During this continuous operation, the machine-width fabric may be withdrawn from a wide roll thereof and the individual components may be wound on individual packages or upon a common core or beam.

In Figure 1, a mechanical system for accomplishing the separation is shown comprising the fabric supply roll 3, rotatably mounted in suitable brackets 4. The full-width fabric 5 proceeds between spaced rods or bars 6 and 7 respectively. The corners of these rods against which the fabric may rub are preferably square but smooth to prevent abrasive action thereon. If desired, they may be rounded.

The component fabrics proceed under tension over two driven rolls 8 having a rough surface or covering such as emery cloth to beams 9 mounted in suitable brackets 10 and 11 and adapted to be driven such as by pulleys 12 to take up the component fabrics proceeding over the bars 6 and 7. It will be observed that the beams 9 are disposed on opposite sides of the pair of bars 6 and 7 so that the individual component fabrics proceeding to one of the beams 9 must be separated from the intervening component fabrics proceeding to the other beam. This separation occurs somewhere in the space between the bars 6 and 7 and the drawing action on the rolls 8 serves to supply the drawing force necessary to split the component fabrics from the machine-width fabric and also to withdraw the latter from the supply roll 3. In place of a common core on the take-ups 9, individual take-up cores or bobbins may be provided for winding the split fabrics directly after splitting, one bobbin for each split fabric unit or for any group of two or more of the split fabrics. The split fabrics can be wound on the take-ups or wound and twisted thereon as in Figure 4.

Optionally sley-points 26 may be provided along the upper surface of the bars 6 and 7 to guide the individual fabrics as they leave the bars. The spacing between bars 6 and 7 may be adjusted by means of the cap screws 27 and the set screws 28 (see Figure 2).

Figure 3 shows diagrammatically an arrangement for winding both sets of component fabrics side by side on a common beam 29.

When the component fabrics are collected on a common roll or beam as shown in Figures 1 to 3, and when the components have one or more central wales and are intended to be twisted to form yarn-like structures of bouclé character, the arrangement of Figure 4 may be employed for twisting the structures in accordance with which either of the take-up beams 9 or 29 formed in Figs. 1 and 3 is positioned at 30 and is rotated by a pulley 14 and the unwinding narrow-width fabrics pass to eye-plates 15 and 16 on opposite sides of the roll. Alternate fabrics proceed to the plate 15 and the intervening fabrics proceed to the plate 16. The narrow fabrics pass through the guide-eyes 17 in the eye-plates, through the travelers 18 carried by the rings 19 in the ring rails 20 and 21 respectively. Thus, the narrow fabrics are twisted as they are wound upon bobbins 22 rotatably driven on vertically reciprocating spindles 23. Any form of twister may be used, such as a cap twister, a flyer twister, or centrifugal pot.

In Figure 5, the yarn-like structure shown is illustrative of the twisted material that can be obtained from the operation carried on in the machine of Figure 4. This structure comprises a central core 24 which is made up of one to four central wales and the outwardly projecting loops 25 which extend from the edges of the central wale but because of the twist in the structure project radially outwardly at all angles to the core. The product is a yarn-like structure having a bouclé appearance.

It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as described in the appended claims.

We claim:

1. A method of producing a yarn-like structure comprising simultaneously pulling alternate component fabrics of an integral machine-width knitted fabric splittable along spaced wales thereof in one direction as a group, and simultaneously pulling intervening components in another direction as a separate group.

2. The method of claim 1 comprising the step of collecting the components by winding thereof.

3. A method in accordance with claim 2 in which the components pulled in one direction are collected on a take-up core and those pulled in the other direction are collected on a take-up core.

4. A method in accordance with claim 2 in which all of the components are wound on a common take-up core.

5. A method in accordance with claim 1 in which each group of components passes over a smooth surface extending transversely of such group immediately after their separation from the other group.



6. A method according to claim 5 comprising the subsequent step of collecting each group on a separate take-up common to the group.

7. Apparatus comprising means for supporting a wound fabric package for unwinding, a pair of spaced rods, take-up means and guide means disposed on opposite sides of said supply means for directing yarns from the rods to the take-up means.

8. Apparatus in accordance with claim 7 in which the take-up means is a beam to which the yarns proceed from both guide means.

9. Apparatus in accordance with claim 8 in which the beam is approximately in vertical alignment with the supporting means.

10. Apparatus comprising means for supporting a wound fabric package for unwinding, a pair of spaced rods, take-up means disposed to one side of said supply means and adapted to wind a material passing thereto, and a second take-up means disposed to the other side of the supply means and adapted to wind material passing thereto from the supply means.

11. Apparatus in accordance with claim 10 in which the spaced rods intermediate the take-up means extend parallel to the axes thereof.

12. Apparatus in accordance with claim 11 in which the rods are also parallel to the axis of the supply means.

13. Apparatus in accordance with claim 12 in which the adjacent surfaces of the rods about which the fabrics may rub are smooth and rounded.

14. Apparatus comprising means for supporting a wound fabric package for unwinding, a pair of spaced rods, take-up means disposed to one side of said supply means and adapted to wind a material passing thereto, a second take-up means disposed to the other side of the supply means and adapted to wind material passing thereto from the supply means, and a drawing roll between each take-up and the nearest of the pair of rods.

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