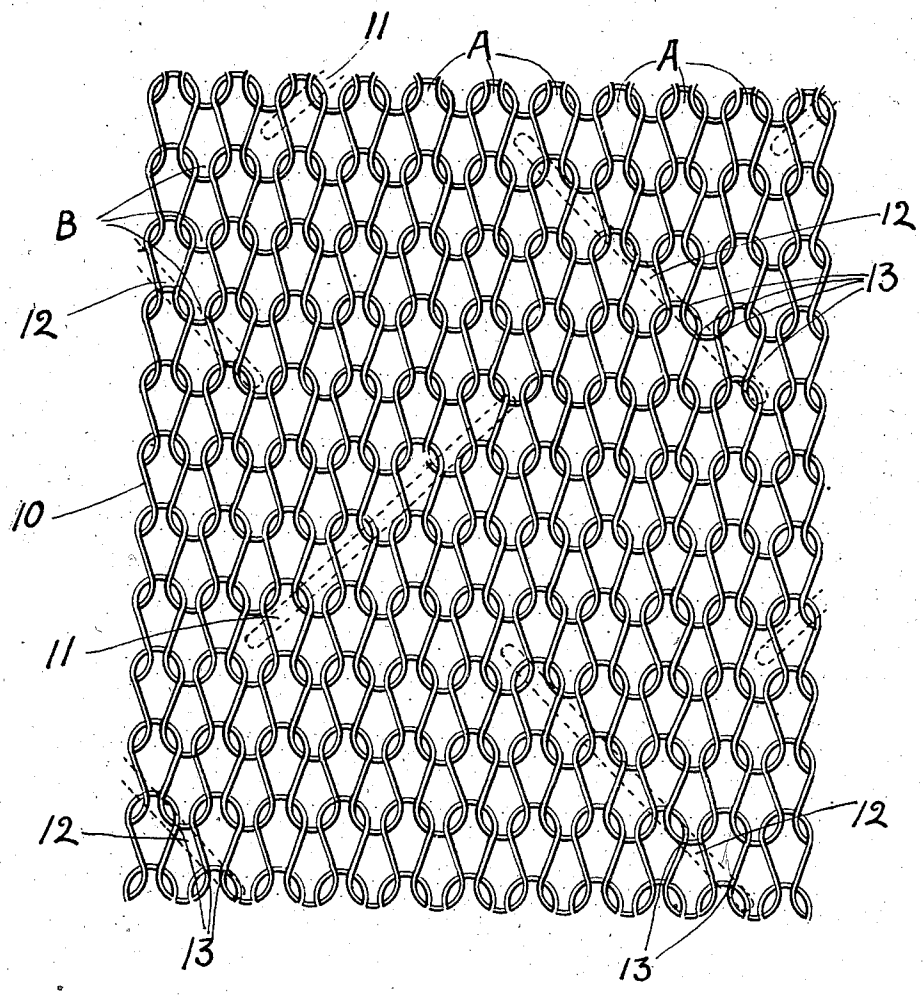
Oct. 30, 1945. F. HEADON 2,388,144

KNITTED GOODS

Filed Sept. 13, 1943



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Patented Oct. 30, 1945

2,388,144

UNITED STATES PATENT OFFICE

2,388,144

KNITTED GOODS

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Application September 13, 1943, Serial No. 502,083

3 Claims. (Cl. 28—78)

This invention relates to improved non-run knitted goods including fabrics and articles made from yarns of organic derivatives of cellulose and more particularly to cellulose acetate yarn or yarn of material possessing some of the same general characteristics such as the quality of being thermo-plastic, and methods of treating knitted fabrics and articles made from such yarn, whereby the tendency to develop such faults as runs or laddering may be greatly reduced.

An object of the invention is to provide novel and advantageous knitted fabrics and articles which are strongly resistant to runs or laddering.

Another object is to provide a novel and advantageous method for carrying out the invention.

A further object is to provide knitted goods of yarn such as cellulose acetate in which runs or laddering are held within predetermined limits without substantial loss of elasticity or flexibility.

In carrying out the invention in a preferred manner, knitted fabric of cellulose acetate which is thermo-plastic, is treated by means including a heated die, roll or other suitable device to heat and to some extent soften or melt the material of the yarn so as to secure together at their crossings yarn of adjacent loops, the points of attachment being so arranged as to avoid any substantial impairment of the elasticity of the fabric while adapted to prevent run of any substantial length, or splits of any substantial size. The points of connection may be so arranged that in one longitudinal area or major zone containing a plurality of wales the joining points will be in spaced lines or minor zones extending in inclined direction from one edge of the area or major zone to the other; and in the areas or major zones at opposite sides of the first major zone the lines or minor zones are inclined in the opposite direction with their ends substantially between the ends of the lines of the central strip. Due to this arrangement the stresses are well distributed in the different courses and wales of the fabric.

Other objects, features and advantages will appear upon consideration of the following detailed description and of the drawing in which the figure is an enlarged face view of a piece of knitted fabric according to the present invention, showing the lines along which the points of connection are arranged.

The type of the fabric shown in the drawing consists of a single ply having needle loops A and sinker loops B formed from a yarn 10 of cellulose acetate. If any loop or stitch is broken in any manner, it releases a loop in the next course and this action may continue indefinitely along a wale until the end thereof is reached. Frequently the run extends only a short distance at first, but if the fabric be not repaired immediately, it will only be a matter of time before the run has extended to the full limit of the goods. Obviously where the loops in one wale are released they will straighten out and allow the adjoining wales to separate thus giving the laddering effect.

According to the present invention runs and laddering effects may be prevented by connecting the cellulose acetate yarn at certain crossings 13 of the loops as by heating the yarn at such points so as to partially melt the same and render it sticky while at the same time exerting enough pressure to cause a kind of welding or coalescing at the crossings. Upon cooling, the yarn at the crossings will be securely held together and a run cannot pass that point.

As indicated in the drawing, heat and pressure may be applied along the parallel dotted-line areas or minor zones 11 extending in an inclined direction across a major zone at the upright central part of the figure and dotted-line areas or minor zones 12 extending across side areas or major zones at a reverse inclination, the ends of one set of minor zones coming midway between the ends of an adjacent set. The yarn loops are then secured together at the crossings 13 within the dotted line areas or minor zones on the drawing. It should be understood that the fabric before the heat treatment starts, should be stretched to a proper extent before the application of the heated member or members, so as to separate the crossings and determine to a certain extent at what points the crossings are to be joined.

One way of fusing or welding the loops together is by running the fabric between a heated roller having the pattern raised thereon to heat the fabric along the dotted line areas shown on the drawing, and a supporting roller which may be heated if found desirable.

The fabric is shown on an enlarged scale but in the actual fabric, the joining positions along a wale should not ordinarily be farther apart than a predetermined distance such as one-quarter or one-half of one inch.

A finished fabric such as shown in the drawing could be used satisfactorily in stockings in that the fabric, although substantially proof against runs, may readily be stretched in any direction. Such elasticity is necessary in a stocking particularly at the ankle where the stocking must be stretched considerably in passing it over the foot in putting on or taking off the stocking. When

the fabric is stretched laterally, the lines of points of attachment will be turned more nearly to transverse directions with reference to the wales and when stretched longitudinally these lines will be turned more nearly to longitudinal directions. Of course such lines of points of attachment may be somewhat distorted in this stretching but the fabric will tend to return to normal condition when the tension is relieved.

It should be understood that the pattern may be varied but should extend over all parts to be treated, and that there should not be a gap of more than one-quarter or one-half of an inch between joinings on any wale of the fabric.

Up to this point the description has been directed to treatment of a fabric in flat form. However, the treatment of the invention may also be applied to articles such as stockings but for this purpose it may be necessary to place the stockings or other objects on suitable forms which may be heated.

It should be understood that various changes may be made and that certain features may be used without others, without departing from the true scope and spirit of the invention.

Having thus described my invention, I claim:

1. A non-run knitted textile fabric comprising wales and courses of interconnected loops of a thermoplastic yarn, said fabric having the yarn united with itself at certain points of crossing of certain adjacent loops, said points being arranged in parallel diagonal lines each intersecting a plurality of wales and courses in the same walewise zone, and in an adjacent walewise zone having loops similarly united at certain of their points of crossing but on diagonal lines at an angle to those of the first-named zone, each of said last-named lines terminating at the junction of said zones midway between the ends of a pair of said first-named lines, whereby runs are arrested in all of the wales while the fabric retains its elasticity in the areas between successive parallel lines.

2. A non-run knitted textile fabric comprising wales and courses of interconnected loops of a termoplastic yarn, said fabric having the yarn united with itself at certain points of crossing of certain adjacent loops, said points being arranged in parallel diagonal lines each intersecting a plurality of wales and courses in a group of wales, and in an adjacent group of wales having loops similarly united at certain of their points of crossing but on diagonal lines at an angle to those of the first-named group of wales, said lines terminating at the junction of said groups of wales but the ends of lines in one group of wales terminating at points remote from the ends of the lines in the other group of wales, whereby runs are arrested in all of the wales while the fabric retains its elasticity in the areas between successive parallel lines.

3. A non-run knitted textile fabric comprising wales and courses of interconnected loops of a yarn including thermoplastic material, said fabric having the yarn united with itself at certain points of crossing of certain adjacent loops, said points being arranged in parallel diagonal lines each intersecting a plurality of wales and courses in a group of wales, and in an adjacent group of wales having loops similarly united at certain of their points of crossing but on diagonal lines at an angle to those of the first-named group of wales, said lines terminating at the junction of said groups of wales but the ends of lines in one group of wales terminating at points remote from the ends of the lines in the other group of wales, whereby runs are arrested in all of the wales while the fabric retains its elasticity in the areas between successive parallel lines.

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