

Oct. 18, 1949.

P. ALEXANDER ET AL

2,485,230

TREATMENT OF NYLON AND OTHER YARNS

Filed Aug. 20, 1946

3 Sheets-Sheet 1

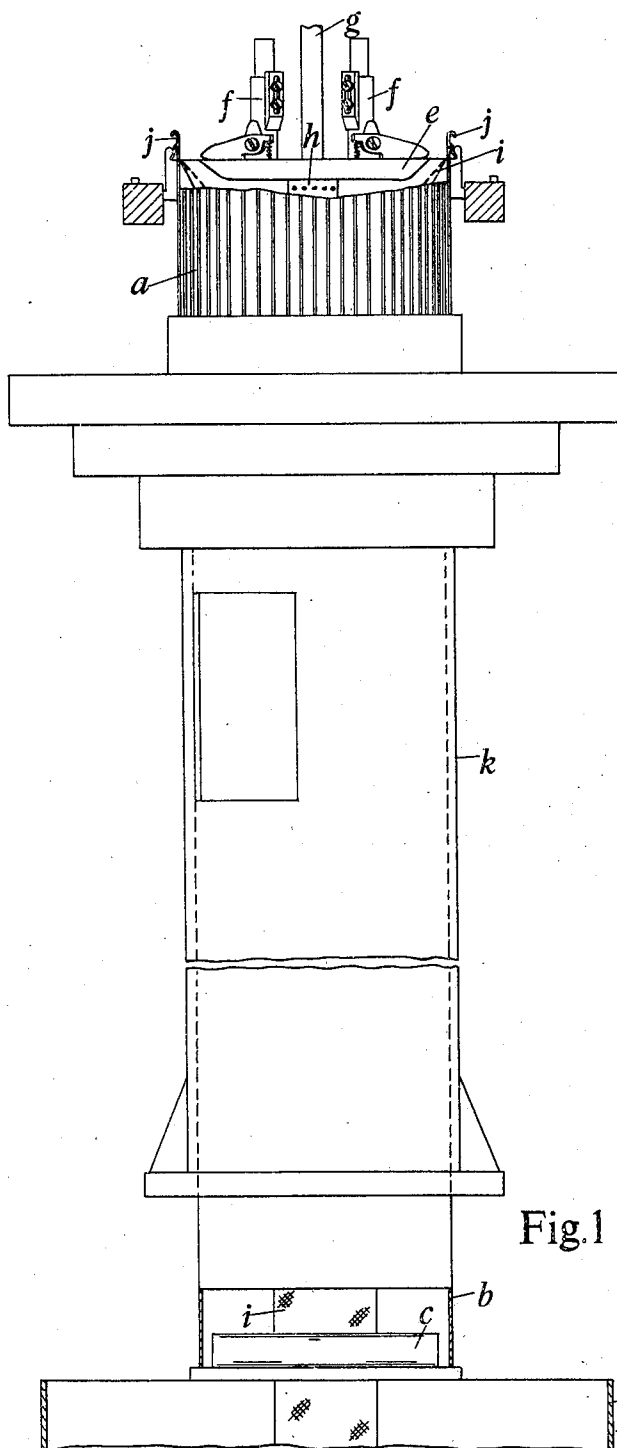


Fig. 1

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3 Sheets-Sheet 2

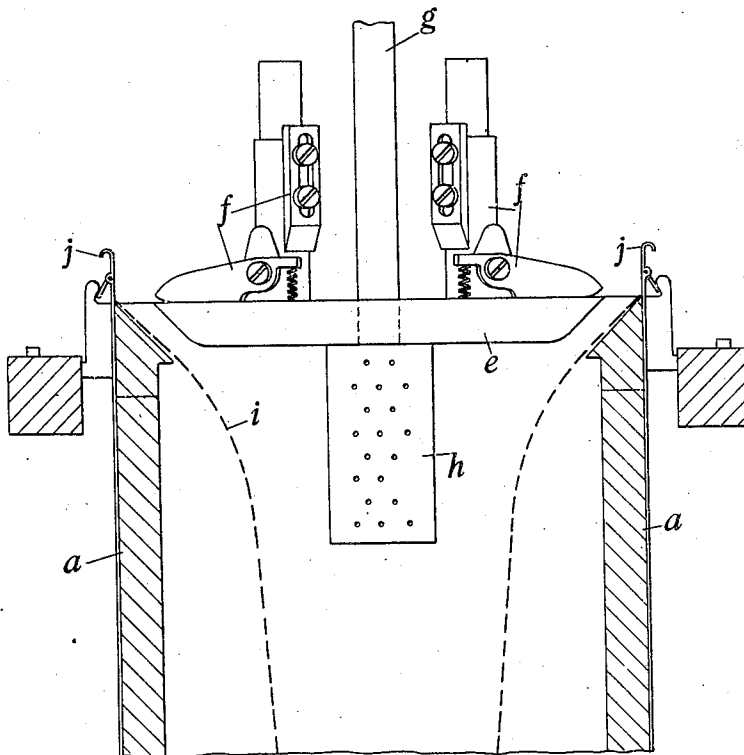


Fig 2

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3 Sheets-Sheet 3

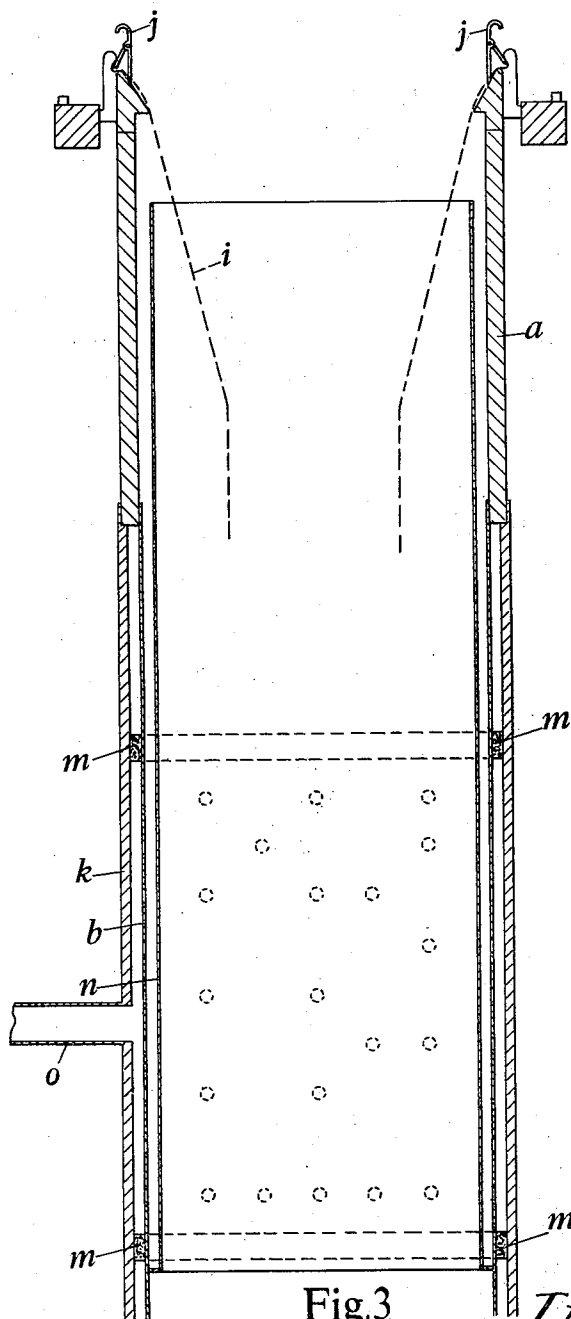


Fig.3

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UNITED STATES PATENT OFFICE

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TREATMENT OF NYLON AND OTHER YARNS

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1 Claim. (Cl. 66—147)

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At the present time it is customary to subject knitted fabrics made from nylon or other thermoplastic yarns, to a process in which the fabric is stretched on a support, or form, and then subjected to the heating action of steam under pressure. In other cases the fabric is merely suspended in a chamber and exposed to steam at atmospheric pressure. The purpose of these treatments is to set, or impart permanence of form to, the loop formations or general shape of the fabric, the treatment being necessitated by the fact that otherwise deformation is liable to occur in subsequent dyeing, scouring or like operations to be performed on the fabrics.

The object of the present invention is to enable the setting of the yarn to be effected in a more convenient and satisfactory manner, and for this purpose the invention consists in wetting the yarn prior to the knitting operation, and subjecting the wetted yarn in the vicinity of the knitting needles to heat treatment by a stream of hot air so that the yarn is set in the form in which it is shaped on the needles.

In one manner of carrying the invention into effect, we employ a nozzle adapted to direct a stream of hot air on to the fabric which is on or suspended by the needles of the knitting machine, which may be of the flat or circular type, the fabric being held under tension by a draw-off mechanism. The nozzle is so designed as to concentrate the stream on the yarn and obviate as much as possible useless heating of other parts of the machine.

The yarn, immediately prior to knitting, is wetted with water, soap or detergent solution, or an oil in water emulsion, and a stream of hot air at a temperature of about 100–130° C. is directed on to the yarn at the knitting position. In this way a satisfactory set is imparted to the yarn in a very convenient manner.

A further advantage resulting from our invention is that an improved stitch formation is obtained, as the loops or stitches are set in the form in which they have been shaped on the needles, and risk of subsequent deformation is avoided.

The invention is applicable to the treatment of nylon yarns and also other thermoplastic yarns such as those made from vinyl chloride, cellulose acetate, or vinylidene chloride.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a known form of circular knitting machine. Figure 2 is a sectional elevation to a larger scale than Figure 1 showing the upper part of the machine and illustrating one mode of carrying the invention into effect.

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Figure 3 is sectional elevation also to a larger scale than Figure 1, showing another portion of the machine and an alternative mode of carrying out the invention.

Referring to Figures 1 and 2, the needle cylinder is represented by *a*. This is mounted at the upper end of the draw-off cylinder *b* which rotates with the cylinder *a* and has draw-off rollers *c* at its lower end. The drum into which the knitted article falls is represented by *d*. This drum rotates with the parts *a*, *b*. Above the needle cylinder *a* is supported a trapper plate *e*. The trapper and cutter mechanisms are represented by *f*, these parts serving to trap and cut loose ends of the yarn.

All the above mentioned parts are components of a known form of knitting machine. In one manner of effecting the invention in such a machine, we combine with the trapper plate *e* a pipe *g* which is preferably lagged with heat insulating material and serves to convey hot air from any convenient source. Beneath the trapper plate is mounted a perforated cylinder *h* which receives the hot air from the pipe *g* and discharges it laterally through its perforations on to the knitted garment or other article represented by the lines *i*.

The knitted article is drawn down the cylinder *b* from the needles *j* by the rollers *c* in the usual manner. The cylinder *b* is enclosed by the usual stationary cylinder *k*.

In the modified mode of carrying the invention into effect shown by Figure 3, we arrange felt or other packing rings *m* between the cylinders *b* and *k*, and the portion of the cylinder *b* between the packing rings is formed with perforations. Within the cylinder *b* is secured a liner *n* extending from the lower perforated part of the cylinder *b* to near the upper end of the needle cylinder *a*. A pipe *o* on the cylinder *k* serves to convey the hot air to the annular space between the parts *b*, *n*, and from the upper end of this space the hot air is discharged on to the knitted article *i*.

The invention is not, however, restricted to the examples above described, as the manner and means for carrying it into effect may be modified to suit different conditions. It may also be applied in essentially the same manner to knitting machines of the flat type.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

A process for setting or imparting permanence of form to loop formations or the general shape

of fabric knitted from thermoplastic yarn in a knitting machine, the process consisting in wetting the yarn prior to the knitting operation, and subjecting the wetted yarn in the vicinity of the knitting needles to heat treatment by a stream of hot air so that the yarn is set in the form in which it is shaped on the needles.

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