June 21, 1949. A. E. COLLIDGE ET AL 2,474,093

METHOD OF PLASTICIZING KNITTED GOODS MADE FROM THERMOPLASTIC YARN

Filed July 31, 1944 2 Sheets-Sheet 1

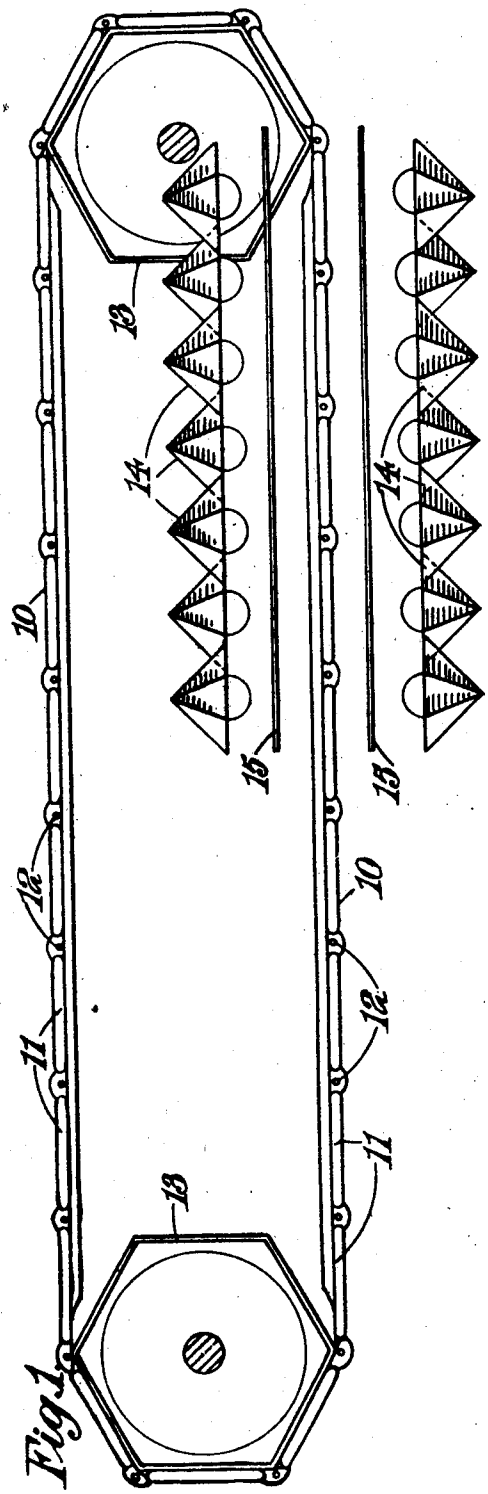


Fig. 1.

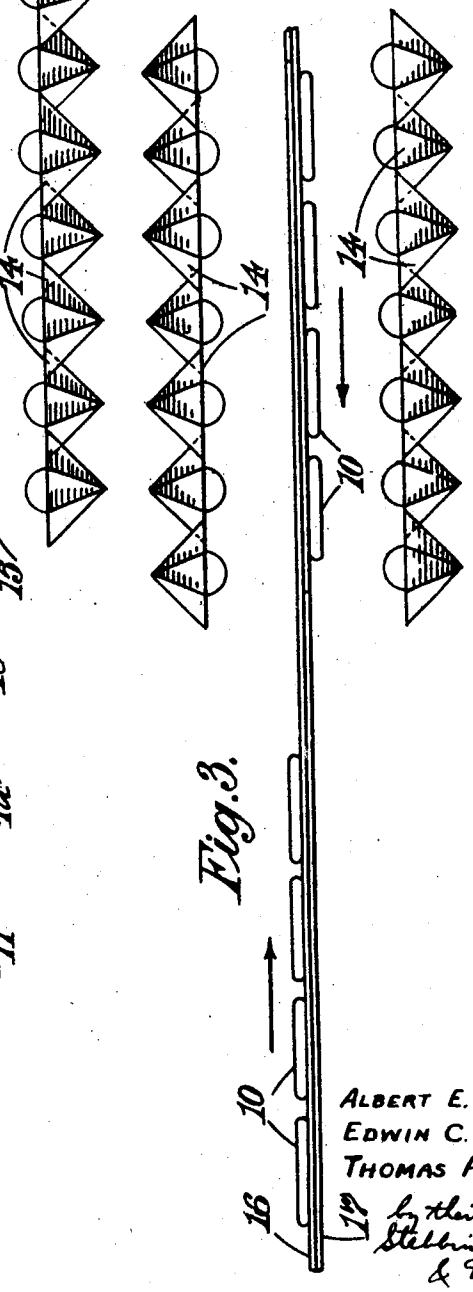


Fig. 3.

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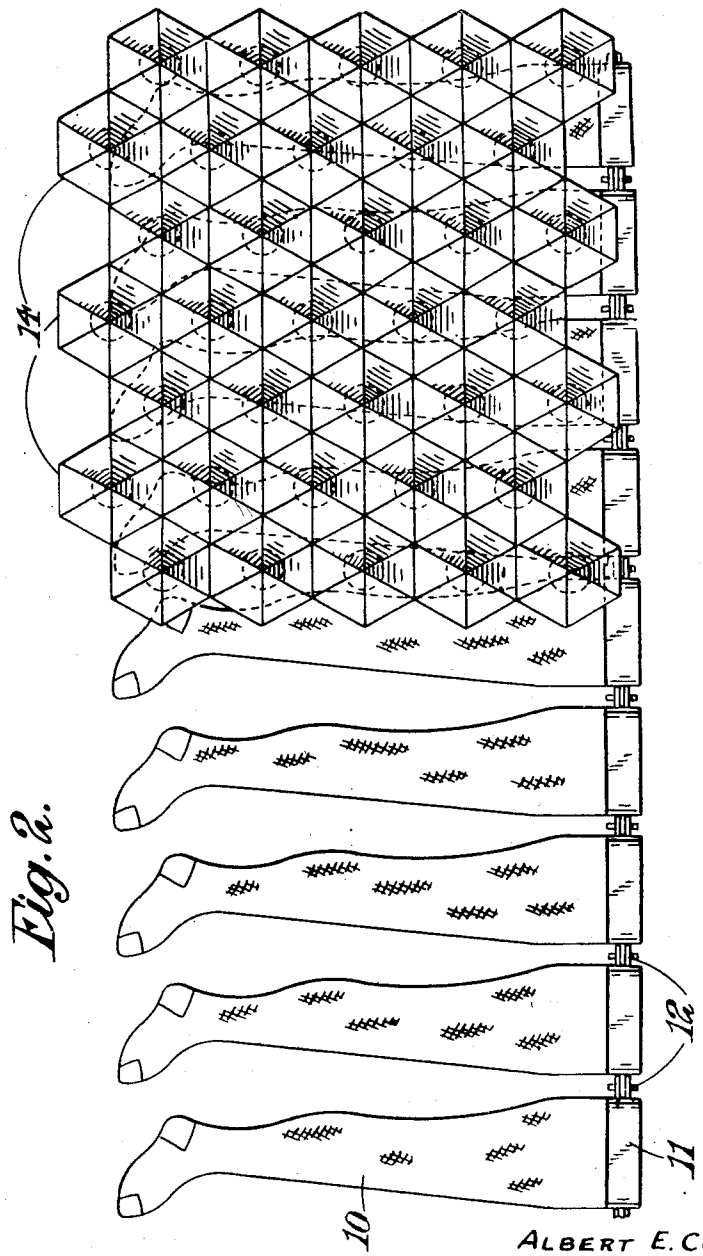


Fig. 2.

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2,474,093

METHOD OF PLASTICIZING KNITTED GOODS MADE FROM THERMOPLASTIC YARN

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4 Claims. (Cl. 223—60)

1

This invention consists in improvements in or relating to the manufacture of knitted goods and provides a new process for the treatment of such goods made from plasticizable materials.

Hitherto, superheated and/or pressure steam has been employed for the step of plasticizing, and the step of finishing or shaping the goods has been carried out in a separate operation.

By means of the present invention the plasticizing of the knitted goods is improved and the cost of such treatment reduced, and furthermore, if desired, shaping, finishing and plasticizing can be carried out in the same operation, and plasticizing by this invention can be carried out either prior to or after the goods have been dyed.

Finishing or shaping involves the employment of formers by which the goods are shaped under a heat treatment and during which any creases or wrinkles in the goods are removed. This step is necessary in the finishing of all knitted goods but in the case of articles knitted from filaments of plasticizable material, such as filaments of cellulose acetate composition or of vinyl cellulose composition, including filaments of material known as "nylon," the step of plasticizing is also required in order that the shape and appearance of the articles will not be impaired when subsequently, under conditions of ordinary use they are subjected to heat, as for instance, when they are washed. Owing to the thermoplastic nature of such materials after they are shaped and plasticized at a certain temperature they will not alter their shape and appearance when subsequently treated at a temperature somewhat less than that at which they are plasticized, and the plasticizing temperature therefore involves a temperature above boiling point of water.

According to the present invention a method of plasticizing knitted articles of this character consists in passing the articles over and on to formers each of which provides a continuous surface possessing black-body characteristics to underlie the article to be shaped, and subjecting the goods on their black-body formers to externally applied radiant heat.

Preferably the radiant heat is derived from a source producing infra-red rays.

The essential of the present invention is the employment of formers having black-body characteristics because by their use heat from the radiating source is first absorbed by them and is then given out to the article stretched over it so that the latter is heated mainly by heat travelling outwardly from the inner surface of the article. This effects a more efficient method of drying the

2

articles especially of drying them thoroughly during shaping, finishing or drying process carried out, if desired, simultaneously with plasticizing. As a result of the present invention the goods obtain an improved "bloom" and general appearance as compared with that of similar goods dried by known processes.

In order that the invention may be more clearly understood, preferred examples will now be described with the aid of the accompanying drawings, in which

Figure 1 is a plan view of apparatus embodying the features of the present invention;

Figure 2 is an elevation of the apparatus shown in Figure 1, and

Figure 3 is a modification of the apparatus intended for the processing of materials to be treated.

Like reference numerals indicate like parts in the several figures of the drawings.

Referring first of all to Figures 1 and 2, the knitted goods which are to be finished, and which are illustrated as hose, are trimmed and placed on formers as at 10. These formers each provide a continuous surface possessing black-body characteristics and shaped to correspond with and to underlie the entire inner surface of the goods to be treated and shaped. For example, the formers may be made of aluminium coloured black by anodizing or they may be of any other preferred material coloured in any known or preferred manner to afford the desired black body characteristics.

The articles on their formers are then placed on and carried by a travelling band composed of links 11 pivotally interconnected as at 12 each to an adjacent link so as to form an endless band. This band is carried over hexagonal or other preferred rollers 13 and one lap of the band travels between two banks 14 of infra-red lamps disposed on opposite sides of a portion of that lap of the band.

Instead of providing infra-red lamps on both sides of the band a bank of such lamps may be provided on one side and instead of the lamps only reflectors need be employed on the other side so that the illustration may be taken to indicate, on one side of the band, reflectors only without lamps.

Water and/or steam can be employed to increase the humidity and to add to the temperature of the articles being heated, the steam being released into the air surrounding the articles which need not necessarily be enclosed. The steam in such a case will be at atmospheric pres-

sure. Alternatively, shields 15 of suitable material may be arranged on each side of the articles to be treated, the material of the shields being such as to permit without hindrance passage of the requisite heat rays from the lamps and/or reflectors to the articles to be treated. These shields may be placed on both sides in the region of the banks of lamps and/or reflectors, so as to enclose a space in which humidity can be concentrated to the required degree.

The material used for the shields will be preferably, although not necessarily, a transparent plastic, and in order that the shape of knitted articles shall be retained permanently it is found desirable to raise the temperature to a degree somewhat above that to which the articles are ever likely to be subjected in use, as, for instance, during washing.

An alternative form of apparatus is illustrated in Figure 3 which again is a plan view. This apparatus comprises two reciprocating carriers 16 and 17 on which the articles 10, on formers or otherwise, are carried, the example illustrated being intended to represent hose carried on formers as illustrated in Figure 1. As before, banks of infra-red lamps 14 are provided on opposite sides of the reciprocating plates at one end, or these banks may be replaced by a single bank on one side and reflectors on the other and shields such as 15 may be employed if desired. Means, not shown, is provided for reciprocating the carriers 16 and 17 and the reciprocation will occur comparatively slowly so as to leave sufficient time for those articles lying within the zone of the source of heat to receive sufficient treatment. The articles on carrier 16 are shown in the loading and unloading position and it will be understood that after similar articles on carrier 17 have been sufficiently treated they will be removed to the loading and unloading position and carrier 16 will simultaneously be moved to convey its load into the zone of heat.

We claim:

1. A process for plasticizing knitted articles made from thermoplastic yarns which process consists in passing the articles over and on to formers each of which provides a continuous black body surface to underlie the article to be plasticized on the formers, and subjecting the articles on their black-body formers to externally applied radiant heat.

2. A process for plasticizing, and shaping and finishing knitted articles made from thermoplastic yarns, which process consists in passing the articles over and on to formers each of which provides a continuous black-body surface to underlie the entire portion of the article to be shaped, finished and plasticized on the formers, and subjecting the articles on their black-body formers to externally applied radiant heat.

3. A process for plasticizing knitted articles according to claim 1 in which radiant heat is applied simultaneously to the articles on their formers from both sides of the latter.

4. A process for plasticizing knitted articles made from thermoplastic yarns which consists in passing the articles over and onto formers, each of which provides a continuous black-body surface to underlie the articles to be plasticized on the formers, and subjecting the articles on their black-body formers to externally applied infra-red rays directed onto the formers whereby the latter absorb and re-radiate heat derived from the source of infra-red rays.

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