April 5, 1949. G. BLOCH 2,465,996

YARN AND FABRIC

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Fig. 1.

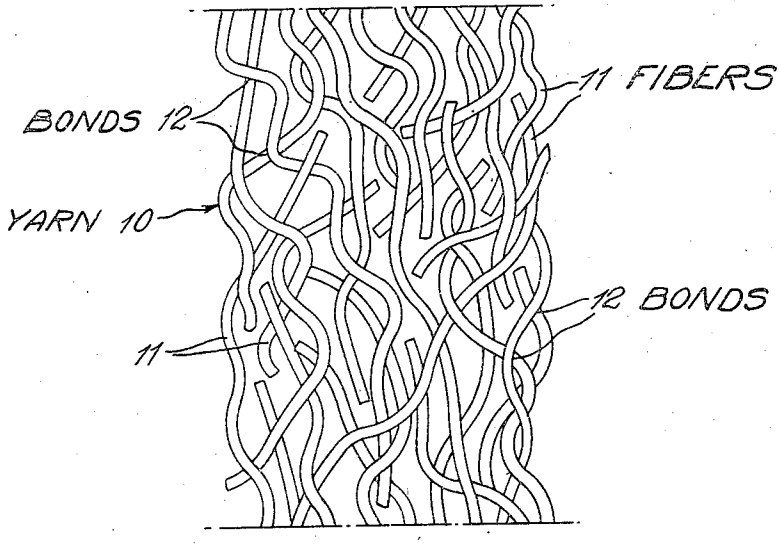
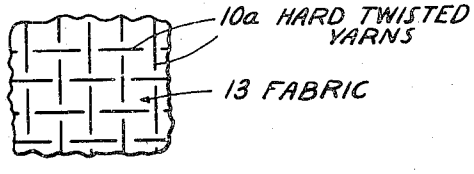


Fig. 2.



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YARN AND FABRIC

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5 Claims. (Cl. 57—140)

1

This invention relates to yarn and fabric and fabric-making materials and more especially to materials composed of synthetic textile fibers, such as fibers composed of cellulose acetate, saran (vinylidene chloride), vinyon, nylon, etc.

Fabrics produced from yarns composed of synthetic fibers have heretofore been subject to the objectionable feature that after washing they have lost a good deal of such warmth as they have. Initially some fabrics have had considerable dead air space which has been responsible for the warmth characteristic of the goods. The air space has resulted from the position of the fibers in spun yarn accentuated by the crimp of the artificial fibers sometimes heightened by special crimping processes during manufacture of the fibers. However, upon washing, the fibers slip relative to each other despite their crimp and move into closer relation to each other, thereby reducing or largely eliminating the dead air space with consequent loss of warmth by the fabric. Loftiness of feel and resilience may also be lost thereby.

An object of this invention is to prevent the slippage of artificial fibers relative to each other in a fabric made up of yarns composed of such filaments whereby the fabric will retain its warmth characteristic.

Acording to this invention, artificial fibers, preferably crimped and of resilient structure, are spun into yarns in the normal manner, and insofar as the spinning operation lessens the crimp, the crimp is somewhat restored by wetting (as in subsequent finishing operations) as is now known, or according to the chemistry may be restored by extreme changes in temperature. Subsequently, the yarn is treated for the purpose of plasticizing the filaments sufficiently that they will become interjoined at their interstices and remain interjoined after treatment. Preferably, the treatment of the fibers may be effected by radiant heat, such as short wave length heat or by what is sometimes colloquially called "electronic annealing," which will heat the interior of the yarns and fibers as well as the intersections thereof and surface heat is dissipated by air if desired. Such heating may be of the type described in the trade as "induction" heating, or "dielectric" heating, but it is here meant to include all forms of devices or methods which transfer energy in sufficient quantity to elevate the temperature to accomplish the purpose. Other treatments for effecting bonding of the fibers at intersections thereof may be made use of. In this way, slippage of the fibers relative

2

to each other is effectively prevented and the dead air spaces formed in the yarn by reason of the crimps in the fibers are retained in the yarn after washing. Consequently, fabrics made from yarn produced in accordance with the invention retain their warmth after washing. Reliance may sometimes be placed on the manner of spinning in whole or in part rather than on crimp in fibers. For instance, fibers spun on the wool system will by that fact alone be so placed as to enclose large air content. Even in cotton spinning, variations in procedure may enhance air content.

The yarn thus produced has many of the desirable characterictics of wool yarn and in many respects is an equivalent of or a substitute for wool yarn. As such, it may be used in place of wool yarn for weaving or knitting with excellent results. Like wool yarn, the yarn of this invention may constitute a fibrous air trap in which purposely distorted artificial fibers enclose within the yarn relatively large bodies of air. The fibers are fastened to each other at least at some of their points of contact whereby their arrangement is maintained irrespective of cleaning and flexing of wear so that the air content will be maintained in the yarn.

The drawing in Fig. 1 illustrates on a greatly enlarged scale and somewhat schematically a section of yarn embodying the invention. Fig. 2 is a plan view on an enlarged scale and diagrammatically of fabric embodying yarn of this invention. In Fig. 1, the yarn as a whole is designated by the reference character 10 and is composed of crimped fibers 11 interjoined at at least some of their points of contact. Bonds between contacting fibers are indicated by the reference character 12. By reason of the interconnection of the fibers slippage thereof relative to each other is effectively prevented and the advantages above pointed out result.

The invention is not limited to the use of thermoplastic fibers as other fibers may be used providing they are effectively bonded together. The action of bonding the fibers to each other may be applied to a woven (or conceivably knitted) fabric as well as to yarns. In that case, the binding of the crossings of one yarn over another will cause a loss of flexibility. Toward restoring some lost flexibility, the fabrics (as well as certain yarns) may be subjected to mechanical flexing which will restore flexibility by breaking some adhesions and loosening others. A machine like a button machine may be used.

This invention may be made use of in blends

with fibers other than synthetic fibers. For example, natural wool might be used in part for its own qualities and viscose rayon or cotton might be admixed because of the fact that they have moisture absorption.

The yarn above described may be advantageously used in the production of wrinkle-resistant fabric suitable for summer wear, similar to the so-called "tropical worsteds." For this purpose, yarns 10a (Fig. 2) having bonded artificial fibers are hard twisted in the known manner and then a fabric 13 is woven therefrom in the usual manner. Such fabric has all the advantages of a tropical worsted with respect to wrinkle resistance and constitutes a very satisfactory summer wear material.

This application is a continuation-in-part of applicant's co-pending application, Serial No. 530,938, filed April 13, 1944, now abandoned.

In the claims "crimped" is meant to include any deviation in fibers from a straight line, however brought about, sufficient to accomplish the purposes of this invention.

I claim:

1. As a substitute for wool, a product composed of purposely distorted artificial filamentary fibers spun into yarn form and having multiple points of contact, the distortion of the fibers forming myriad air pockets, said fibers being fixed together at points of intersection to maintain the fibers in their original positions and prevent relative movement thereof thereby retaining said air pockets in the yarn.

2. As a substitute for wool, a product comprising crimped artificial staple fibers in yarn form and having multiple points of contact and the crimp forming myriad air pockets, said fibers being integrally interjoined at points of intersection to maintain their fibers in relative position and prevent movement therefrom, thereby retaining said air pockets in the yarn.

3. A product composed of crimped and resilient artificial filaments in yarn form, the filaments having multiple points of contact and the crimp forming myriad air pockets comparable to those contained in wool yarn, said filaments being fixed together at points of intersection to maintain the fibers in their position and prevent relative movement thereof, thereby retaining said air pockets in the yarn.

4. Fabric made from yarn according to claim 2.

5. Fabric made from yarns according to claim 2 from which some of the air content has been eliminated by hard twisting of the yarns whereby to produce a resilient fabric.

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The following references are of record in the file of this patent:

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