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MIXED FABRIC

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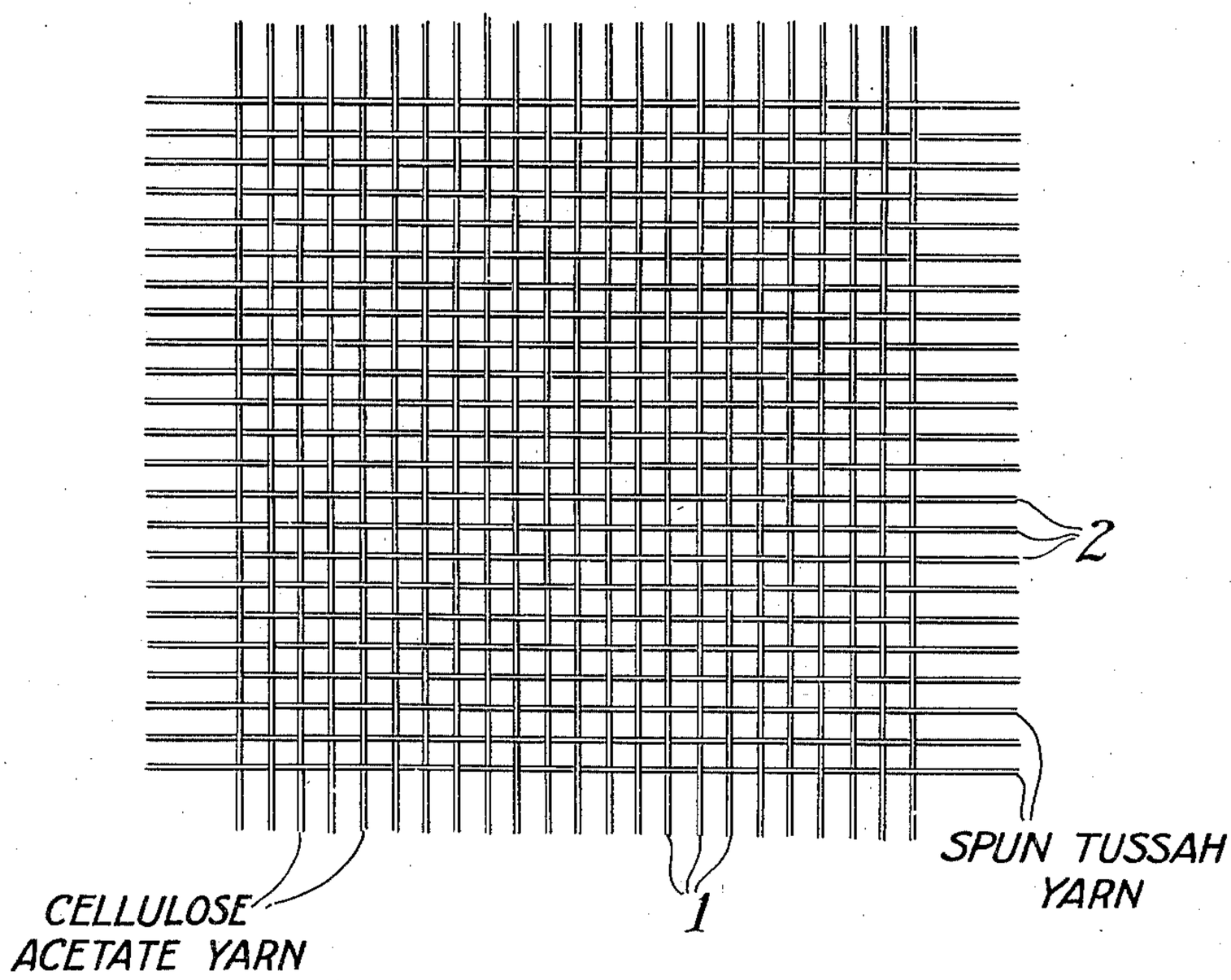

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MIXED FABRIC

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6 Claims. (Cl. 139—426)

This invention relates to a novel fabric comprising a new combination of yarns, which fabric has certain properties that are particularly desirable for summer or tropical suitings, dresses and other purposes.

This application is in part a continuation of my copending application Serial No. 82,937, filed June 1, 1936.

Cloth made from Tussah silk has been produced for years and while tough and long wearing, its shrinkage properties and coarse nature prevent it from being used to any appreciable extent for garments whereas cultivated silk is, of course, used extensively.

Tussah silk, as is well known, is a wild silk grown in China and Manchuria which silk has irregularities in diameter at irregular intervals so that when the filaments are spun into yarn and the yarn woven into cloth, the cloth has a somewhat rough texture. It has considerable natural resiliency and toughness and does not retain wrinkles and because of its coarse character (compared to other natural silks) it has great springiness and resistance to abrasion.

Cloth made from cellulose organic derivative yarn has much greater moisture resistance than Tussah silk cloth and also upon being subjected to heat (considerably above body temperature) and pressure, takes a press or crease easily because of its thermoplastic character yet holds that press or crease at ordinary atmospheric temperatures.

I have found that a fabric made from the proper combination or mixture of these two types of yarn constitutes a new creation having properties which cannot possibly be had in a cloth composed of either yarn alone; this new fabric both tends to retain its shape or press and at the same time to be relatively free from mussing or accidental wrinkling. The cloth, on account of the springy, irregular nature of the Tussah silk and particularly the springy, fluffy nature of the spun Tussah yarn, appears to be heavier and more substantial than it actually is and, thus, has a substantial appearance but at the same time a very light actual weight suitable for summer and tropical use. The cellulose organic derivative yarn has low shrinkage characteristics (a thing which cannot be said of other synthetic yarns or natural fibres) and this, therefore, adds unusual stability to the cloth.

It is, therefore, among the objects of my invention to provide a fabric consisting essentially of a mixture of cellulose organic derivative yarn and Tussah yarn and more preferably a fabric of cellulose organic derivative yarn warp and spun Tussah silk yarn filling.

It is a further object to provide a cloth having thermoplastic characteristics and low shrinkage as well as substantial appearance and light weight. Other objects will appear hereinafter.

In its broader aspects my new fabric comprises a properly balanced mixture or combination of warp yarn consisting of or predominating in cellulose organic derivative yarn (the remainder being Tussah and/or other material) and the filling yarn consisting of or predominating in Tussah yarn (the remainder being cellulose organic derivative yarn and/or other material). In its preferred embodiment the fabric consists of cellulose organic derivative yarn warp and spun Tussah silk yarn filling.

The cellulose organic derivative yarn which I employ in my new fabric may consist of cellulose acetate, cellulose propionate, cellulose acetate propionate, cellulose acetate butyrate and similar cellulose organic esters as well as cellulose ethers, such as ethyl and benzyl cellulose, the yarn normally having a few turns per inch. The warp of my new fabric preferably consists of continuous filaments of one of these forms of cellulose organic derivatives, such as cellulose acetate, cellulose acetate propionate or cellulose acetate butyrate although a minor proportion of Tussah may be doubled with the cellulose organic derivative. The filling of my new fabric preferably consists of spun Tussah silk yarn although a minor proportion of cellulose organic derivative yarn may be doubled therewith if desired. In the case of both the warp and filling a small proportion of regenerated cellulose yarn may be added or substituted if desired although such addition or substitution in most cases contributes no particular advantage to the finished fabric except for making possible additional cross-dye effects.

It is well to point out that the Tussah yarn of commerce called Tussah silk is a continuous filament yarn of low twist. While I may employ this type of yarn I much prefer to employ a yarn which is composed of short filaments of Tussah, such as filaments three to six inches in length which short filaments are spun into a thread in much the same manner as wool or worsted is spun into a yarn, except that it is produced on a spun silk system. In this specification, therefore, in referring to Tussah silk the continuous filament silk is indicated whereas when referring to spun Tussah a yarn composed of short filaments is indicated. I employ the term Tussah yarn as generic to both.

The Tussah yarn may be doubled with the cellulose organic derivative yarn in such proportions as hereinafter indicated or in producing the spun Tussah yarn other filaments in minor proportions may be blended into the same thread.

My new fabric may be produced upon the usual

type of loom, either the plain, dobby, or jacquard type. The fabric, as is well known in textile constructions, may be produced in an endless number of weave patterns. As will be noted from the examples set forth hereinafter the cloth may be produced in a wide range of weights and effects by varying the number of ends in the warp and picks in the filling as well as by varying the proportion of Tussah yarn to cellulose organic derivative yarn in the fabric or by varying the diameter of the yarn in the warp and filling. Also, in view of the irregularity existing in the diameter of the Tussah filaments, I prefer to have the cloth woven on a two or more box loom in order to provide a more uniform distribution of the irregularities in the cloth.

I prefer to employ a dull lustre type of cellulose organic derivative yarn. This, taken with the dull effect produced by employing a spun Tussah yarn, gives a fabric which has a beautiful, soft, matte finish not obtainable with cellulose organic derivative yarn alone or with Tussah silk yarn alone and which beautiful, matte finish continues to exist in the cloth even after the cloth has been worn for long periods. In addition, beautiful tone effects as well as designs may be obtained by virtue of the natural brown color of the Tussah in conjunction with the white character of the delustered cellulose organic derivative yarn. This is much desired, particularly in suitings, where the wearer does not want the conspicuousness of the pure white. Thus I obtain beautiful tones and designs without the necessity and added cost of dyeing, a thing which is a common necessity in other suitings. In addition I may obtain very beautiful patterns by doubling colored cellulose organic derivative yarn with the white delustered yarn or with the Tussah yarn. Of course, I may dye my new fabric to any desired color or combination of colors.

The single figure of the drawing illustrates, in conventional manner, the construction of the fabric of this invention. In the drawing, the warp threads **1** are designated as cellulose acetate yarn and the weft or filling threads **2** are designated as spun Tussah yarn. While a plain weave is shown in this drawing, it will be understood that any of the known types of weaves may be employed in this invention.

The following are a number of examples of cloth constructions in accordance with my invention in which it will be noted is employed a cellulose acetate yarn warp with a spun Tussah yarn filling. These examples are, of course, intended only to be illustrative of the manner in which my new fabric may be constructed and it will be obvious that any other cellulose organic derivative yarn may be similarly employed in the warp or that any of the various mixtures of blends above referred to may be similarly employed in either the warp or the filling.

Fabric #1

Width—43'' in the reed to finish 39''/40''.
Construction—96 ends x 40 picks.
Warp—120 denier 40 filament bright cellulose acetate yarn 4 turns.
Filling—9/2 ply spun Tussah ungassed.

Warp lbs. required	12.00	Per 100 yds. woven
Filling lbs. required	23.21	incl. waste.
Total lbs.	35.21	

Unit weight of fabric—3.38 sq. yds. per lb.

Fabric #2

Width—43'' in the reed to finish 39''/40''.
Construction—96 ends x 32 picks.
Warp—120 denier 40 filament bright cellulose acetate yarn 4 turns.
Filling—6/1 single spun Tussah ungassed.

Warp lbs. required	12.00	Per 100 yds. woven
Filling lbs. required	27.84	incl. waste.
Total lbs.	39.84	

Unit weight of fabric—2.99 sq. yds. per lb.

Fabric #3

Width—43'' in the reed to finish 39''/40''.
Construction—96 ends x 64 picks.
Warp—120 denier 40 filament bright cellulose acetate yarn 4 turns.
Filling—22/2 ply spun Tussah ungassed.

Warp lbs. required	12.32	Per 100 yds. woven
Filling lbs. required	15.19	incl. waste.
Total lbs.	27.51	

Unit weight of fabric—4.33 sq. yds. per lb.

Fabric #4

Width—43'' in the reed to finish 39''/40''.
Construction—135 ends x 64 picks.
Warp—100 denier 34 filament dull cellulose acetate yarn 4 turns.
Filling—22/2 ply spun Tussah ungassed.

Warp lbs. required	14.46	Per 100 yds. woven
Filling lbs. required	15.19	incl. waste.
Total lbs.	29.65	

Unit weight of fabric—4.02 sq. yds. per lb.

Fabric #5

Width—48'' in the reed to finish 44''/45''.
Construction—135 ends x 60 picks.
Warp—100 denier 34 filament dull cellulose acetate yarn 4 turns.
Filling—22/2 ply spun Tussah ungassed.

Warp lbs. required	16.14	Per 100 yds. woven
Filling lbs. required	15.89	incl. waste.
Total lbs.	32.03	

Unit weight of fabric—4.16 sq. yds. per lb.

Fabric #6

Width—43'' in the reed to finish 39''/40''.
Construction—135 ends x 60 picks.
Warp—100 denier 34 filament dull cellulose acetate yarn 4 turns.
Filling—22/2 ply spun Tussah ungassed.

Warp lbs. required	14.46	Per 100 yds. woven
Filling lbs. required	14.24	incl. waste.
Total lbs.	28.70	

Unit weight of fabric—4.16 sq. yds. per lb.

Fabric #7

Width—42'' in the reed to finish 39''/40''.
Construction—96 ends x 44 picks.
Warp—200 denier 68 filament dull cellulose acetate yarn 4 turns.
Filling—12/2 ply spun Tussah ungassed.

Warp lbs. required	20.17	Per 100 yds. woven
Filling lbs. required	18.87	incl. waste.
Total lbs.	39.04	

Unit weight of fabric—2.99 sq. yds. per lb.

Fabric #8

Width—43'' in the reed to finish 39''/40''.
Construction—110 ends x 68 picks.
Warp—75 denier 26 filament dull cellulose acetate warn 4 turns.
Filling—24/1 single spun Tussah ungassed.

Warp lbs. required	8.82	Per 100 yds. woven
Filling lbs. required	14.94	incl. waste.
Total lbs.	23.76	

Unit weight of fabric—5.01 sq. yds. per. lb.

Fabric #9

Width—42'' in the reed to finish 39''/40''.
Construction—86 ends x 40 picks.
Warp—300 denier 104 filaments dull cellulose acetate yarn 4 turns.
Filling—8/2 ply spun Tussah ungassed.

Warp lbs. required	26.43	Per 100 yds. woven
Filling lbs. required	25.75	incl. waste.
Total lbs.	52.18	

Unit weight of fabric—2.22 sq. yds. per lb.

I have found that a fabric having a unit weight of from about one and one-half to five square yards per pound is suitable for most purposes. For the majority of purposes one and one-half to four and one-half yards per pound is suitable. A desirable weight for men's suitings is aproximately one and one-half to three and one-half square yards per pound with aproximately three square yards per pound being preferred.

From the standpoint of construction I have found 86 ends of 300 denier to 96 ends of 200 denier cellulose organic derivative yarn desirable for the warp and 40 picks of 8s to 48 picks of 12s spun Tussah yarn for the filling to be desirable. The above described Fabric No. 7 is preferred.

From the standpoint of proportions of materials I have found that a fabric containing from about 35% to about 60% cellulose organic derivative yarn (such as cellulose acetate yarn) and the remainder Tussah yarn is desirable. From the above examples of fabrics it will be noted that the preferred fabric is one containing approximately squal parts of cellulose organic derivative yarn (such as cellulose acetate yarn) and Tussah yarn (preferably spun Tussah silk yarn).

The construction of the above fabrics is designated as having a certain width "set in the reed" which is the customary designation for such constructions. It will be noted however that the fabric comes off of the loom as greige goods with a narrower width than the setting in the reed. This narrowing naturally changes the count of the warp and filling slightly. It will also be noted that when the fabric is finished, such as bleaching, etc., the fabric is subject to further minor variations which causes additional further variation in the counts of the warp and filling in the finished fabric. The total variation from the reed width to the finished fabric may range from between three to eight percent. It will accordingly be understood that in this specification and in the claimsw here general reference is made to the number of ends in the warp and the number of picks in the filling that—depending upon whether one is dealing with the greige goods or the finished fabric—the count of the ends in the warp may vary from four to six ends above or below that designated and the count of picks in the filling may vary from four to eight picks above or below that designated without this being regarded as any substantial variation from the construction designated. As is customary in this art, ends and picks are counted per inch.

The fabric of my invention is defined in the appended claims as a "plain suiting" in contradistinction to a crepe fabric, pile fabric or the like. This is a matter of basic construction of the cloth, as illustrated by the foregoing examples, and is not to be confused with terminology used in connection with weave patterns which, as pointed out earlier in this specification, may be endless in number and produced upon the plain, dobby or jacquard type of loom.

Thus I have provided a new fabric of unusual construction, properties and appearance which is particularly suitable for men's and women's summer or tropical suitings, as well as for other purposes, which fabric has low shrinkage, can be pressed to a sharp crease under heat considerably in excess of body heat yet will not muss or wrinkle at ordinary atmospheric temperatures and in contact with the body. This fabric is also unusual in that it has light weight but at the same time has a substantial appearance which is desirable in suitings. Many other advantages will, of course, be obvious from the foregoing description and these advantages and many obvious variations falling within the scope of the appended claims of course is to be included therein.

What I claim as my invention and desire to be secured by Letters Patent of the United States is:

1. A plain suiting consisting of warp and filling threads, the warp being from 86 ends of 300 denier to 96 ends of 200 denier cellulose organic derivative yarn per inch and the filling being from 40 picks of 8s to 48 picks of 12s of spun Tussah yarn per inch.

2. A plain suiting consisting of warp and filling threads, the warp being approximately 96 ends of 200 denier cellulose organic derivative yarn per inch and the filling being aproximately 44 picks of 12s spun Tussah yarn per inch.

3. A plain suiting consisting of warp and filling threads, the warp being from 86 ends of 300 denier to 96 ends of 200 denier cellulose acetate yarn per inch and the filling being from 40 picks of 8s to 48 picks of 12s spun Tussah yarn per inch.

4. A plain suiting consisting of warp and filling threads, the warp being approximately 96 ends of 200 denier cellulose acetate yarn per inch and the filling being approximately 44 picks of 12s spun Tussah yarn per inch.

5. A plain suiting consisting of warp and filling threads, the warp being from about 86 ends of 300 denier to about 135 ends of 75 denier cellulose organic derivative yarn per inch, and the filling being from about 32 to about 68 picks of spun Tussah yarn per inch.

6. A plain suiting consisting of warp ar d filling threads, the threads being substantially of cellulose organic derivative and having from about 86 ends of 300 denier to about 135 ends of 75 denier yarn per inch, and the filling being substantially of spun Tussah and having from about 32 to about 68 picks of yarn per inch.

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