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IMITATION LINEN FABRIC

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This invention relates to an imitation linen thread and an imitation linen fabric made therefrom. More particularly, the invention relates to a haphazardly irregular thread made from spun rayon or cotton or both, and which, when woven in the usual manner, produces a fabric having irregularities similar to those characteristic of natural linen fabrics.

A haphazardly irregular thread made from spun rayon or cotton or both and having the irregularities characteristic of natural linen thread, is, so far as I am aware, a new article of manufacture, and so also is an imitation linen fabric made therefrom. While my new thread and fabric may be made wholly of spun rayon or wholly of cotton, or of a mixture of both in any desired proportion, I prefer to employ rayon and cotton mixtures containing not less than 30 per cent. nor more than 90 per cent. of rayon. By so doing, the natural lustre of the rayon imparts to the thread and fabric a sheen closely approximating that of linen.

Many attempts have been made in the art to produce irregular cotton threads for the purpose of making various novelty fabrics, or fabrics such as imitation pongees. Such methods are of course equally applicable to the production of spun rayon threads. In all of the irregular spun rayon or cotton threads heretofore produced, however, the irregularity has been introduced by continuously varying the motion of some part of the carding, roving, spinning and/or twisting machinery. The irregularities have therefore always been definite and fixed and repeat themselves at regular intervals. Efforts have been made, such as are described in the Wood Patent No. 982,830, dated July 20, 1909, to provide a long series of differing irregularities, so as to lessen the effect of the repeat, but the repeat was still present.

In contradistinction to the definite and repeated irregularities of prior spun rayon or cotton threads, the thread of my invention is entirely haphazardly irregular, and the irregularities are of such nature that they closely resemble those characteristic of natural linen thread.

In order to inform those skilled in the art how to make my new thread, I shall describe two methods that I prefer to employ for this purpose. These methods may be used either separately or in conjunction with one another as desired, and the resulting imitation linen thread may be woven in any usual or desired manner to make an imitation linen fabric.

One of these methods is to make exaggerated

maladjustments of a standard revolving flat top carding machine, the maladjustments being so chosen that the card clothing is filled with fibers as full as possible. As a result of this condition, the slivers formed are exceedingly irregular, and these irregularities follow no pattern, but are entirely haphazard. The irregular slivers so made are then formed into rovings, yarns and thread, in the customary manner, but the irregularities in the slivers cause irregularities in the subsequent drafting so that these irregularities are reflected in the finished thread.

The slivers made in this manner are preferably made either wholly of rayon fibers or wholly of cotton fibers, although mixed fibers could be introduced into the carding machine if desired. In order to make a mixed rayon and cotton thread by this method, however, it is preferable to use some rayon slivers and some cotton slivers during the subsequent drafting and spinning operations. It is not necessary that all of the slivers used in the manufacture of a single thread be irregularly formed as described. Where a thread is made from six slivers, for example, it will be sufficient if only, say, four of these slivers are of this irregular character.

As a specific example of the carrying out of this method, which example is given solely by way of illustration and not of limitation, a standard carding machine, Whitin revolving flat top card, may be adjusted as shown in the following table, the first column giving the standard or ordinary adjustment for producing uniform slivers, and the second column giving the adjustments for producing an irregular sliver as above described:

	Normal adjustment	Irregular adjustment
Flats.....	.007 inch	.053 inch.
Doffer.....	do	.012 inch.
Doffer speed.....	4 R. P. M.	15 R. P. M.
Feed plate.....	.007 inch	.015 inch.
Mote knives.....	Up	Down.
Draft gear speed.....	Normal	Plus 25%.
Barrow gears speed.....	do	Plus 50%.
Production pulley speed.....	do	Plus 150%.
Calender rolls speed.....	do	Plus 200%.
Total production.....	do	Do.

In the foregoing table, the speeds of the various parts in the normal operation are indicated as those normally employed, and in the irregular operation are given as percentage increases over the normal speed; that is to say, an increase of 200 per cent. in the speed of the calender rolls as shown in the irregular column means that they

will be rotating three times as fast as ordinarily.

The second method of producing my irregular imitation linen thread depends upon the employment of fibers of differing staple lengths. For example, in a thread made from six slivers, one sliver may be a uniform sliver made from cotton fiber of short staple, that is, one inch to one and one-sixteenth inches in length, and the remaining five slivers may be of rayon staple fiber of one and one-half inches in length, each of these slivers being likewise uniform. Haphazard irregularities are then produced in the thread made from these uniform slivers during the drafting operations, as will now be described.

It is customary in the manufacture of spun rayon or cotton thread to pass the slivers successively through various machines well known in the art, such as a slubber, a first intermediate or first fly frame, a second intermediate or second fly frame, and thence to a spinning frame. The slubber converts the slivers into rovings, which are drawn and twisted in the fly frames, and made into yarn or thread in the spinning frame. On each of these machines, including the spinning frame, a drafting operation similar in principle is performed. Each operation of drafting is carried out by two or more, usually three, pairs of rolls through which the fibers to be drafted pass successively. The second pair of rolls is driven at a greater speed than the first pair, and so on through the series. The pairs of rolls are gauged at a distance apart slightly greater than the length of the fibers being drafted, the difference being usually about one-sixteenth inch. Inasmuch as the distance between the rolls is greater than the length of the individual fibers, and the second pair of rolls is turning at a greater speed than the first pair, it will be evident that the fibers gripped by the second pair of rolls will be pulled out from the length of the material between the two pairs of rolls, thus diminishing the diameter of the roving or yarn. In the ordinary operation the fibers are of substantially uniform staple length and the distance between the rolls is only slightly greater than that length, and hence there is little tendency for the fibers being pulled by the second pair of rolls to drag with them any uncontrolled fibers.

In making my haphazardly irregular thread, I depart from the usual practice by using fibers of two differing staple lengths, and adjusting the gauge between the pairs of rolls to be considerably greater than the longer of these staple lengths. In this manner, I produce a condition in which it is easier for the fibers under the control of the faster turning rolls to drag with them a considerable number of uncontrolled fibers, thereby making the diameter of the roving or yarn uneven. I find it sufficient to change the gauge of the rolls only on each of the two fly frames usually em-

ployed and also on the spinning frame, the drafting rolls on the slubber being adjusted in the conventional manner. When using ordinary fly and spinning frames having three pairs of rolls to the set, I prefer to gauge the rolls in the customary manner for the longer staple of the two, and then to remove the top middle roll of each set. This makes the distance between the first and the last pair of rolls more than twice the length of the longest fibers in the mass, and eliminates the grip upon the fibers usually exerted by the middle rolls. The drafting then becomes haphazardly irregular, the long staple fibers being plucked by the last pair of rolls and carrying with them varying quantities of the short staple fibers, thus making an uneven yarn.

This method is particularly suitable for use in making threads of a mixture of a rayon and cotton, since these fibers are readily obtainable in differing staple lengths. It would, of course, be possible to obtain the same result with long and short staple cotton fibers, which are also obtainable in the market, or with long and short staple rayon fibers, which, however, are not as readily available.

Although this second method has been described above in connection with the use of uniform slivers, it will be apparent that it could equally well be practiced in connection with the use of irregular slivers made by the first method described.

It will be apparent to those skilled in the art that many changes or modifications might be made without departing from the spirit of my invention, and I desire to be limited, therefore, only by the prior art and the scope of the appended claims.

I claim:

1. An imitation linen fabric woven from a thread made from spun rayon and cotton fibers and having haphazard irregularities similar to those characteristic of natural linen thread.
2. A woven imitation linen fabric made from and having staple rayon and cotton fibers throughout and comprising a thread having haphazard irregularities so that the irregularities in the fabric are placed haphazardly and are similar to those characteristic of natural linen.
3. An imitation linen fabric woven from a thread comprising at least one sliver of cotton fibres and at least one sliver of rayon fibres and having haphazard irregularities similar to those of natural linen thread.
4. An imitation linen fabric woven from a thread made from spun rayon and cotton fibres of differing staple lengths and having haphazard irregularities similar to those characteristic of natural linen thread.

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