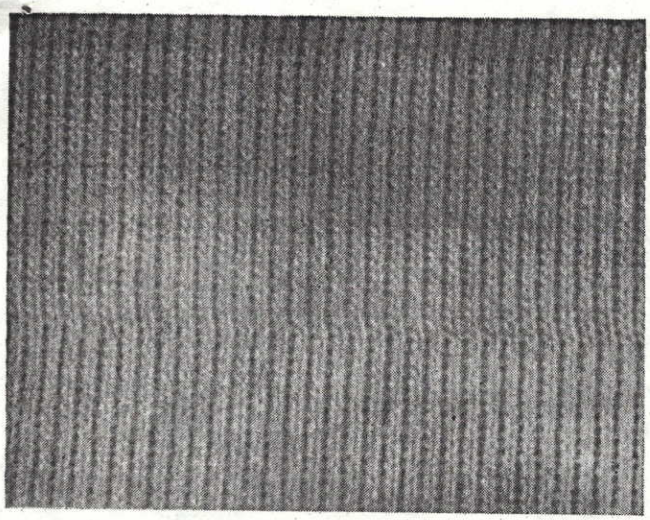
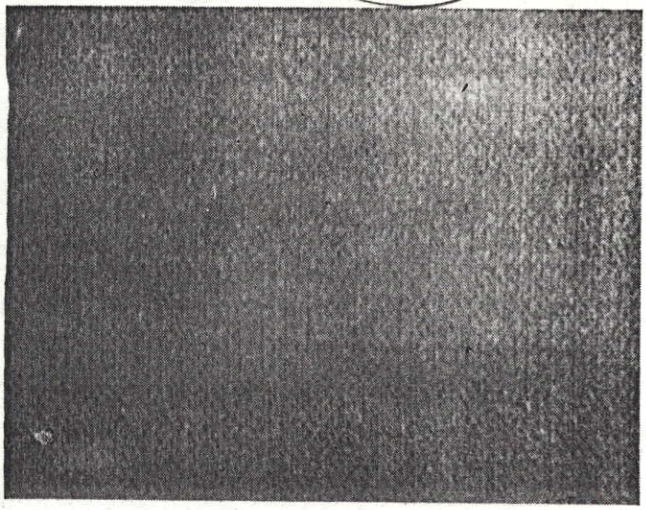


SIMPLEX 48-STEP ATLAS FABRIC made from 100s cotton yarn has two return courses.



SAME FABRIC finished with a 22% caustic-soda solution has closed-up stitches.

How Simplex GLOVE FABRICS Are Made

▶ The two-needle-bar tricot machine produces good fabrics for gloves. Here are the knitting and finishing details for several fabrics.

By **FREDERICK SCHMIDT,** Regent Knitting Mills Ltd.

GLOVE FABRICS with a suede finish were originally made from cotton yarns on tricot machines. These fabrics were not tight enough to provide a suitable hand; so two layers of tricot fabric were glued back to back. From this development, double-faced tricot or Simplex fabrics were produced.

When properly produced and finished, the fabric looks like a leather product. Simplex fabric is, however, cheaper than the leather product; it is easily washable; and it gives a better fit because of its elasticity.

The Simplex machine uses spring needles. The needles are set back to back and inclined to each other at an angle of 40 to 45°. Each needle bar has its own cams, presser bar, and sinker bar. The two guide bars supply yarn to both sets of needles.

Use 60s to 110s Cotton Yarn

Cotton yarn used on 28- and 32-gauge machines ranges from 60s to 110s. The best results are obtained from combed yarn, usually of Egyptian cotton. The yarn should be waxed or sized with a softener to increase the yarn's smoothness, strength, and flexibility.

Cotton fabrics generally have two-guide-bar atlas structures. These structures produce even, clean, and regular fabrics because the threads traverse sideways; irregularities in the yarn are further evened out because the second guide bar travels in the opposite direction. The most-common atlas is a repeat over 48 steps, although 36- or 24-step atlas fabrics are made.

The notation for a 48-step atlas is 1-0,2-3/4-5,6-7/ and so on for the front bar, while the back guide bar is 96-97, 95-94/93-92,91-90/ and so on. The first pair of numbers of each bar in the notation works with the front needle bar, and the second pair of numbers works with the back needle bar.

Open stitches are produced except at the two turning courses where the traverse changes. Since the underlaps are under one needle, the 48-step atlas traverses across 96 needles and makes 48 stitches. There are 24 stitches on each side of the two needle bars. Only every fourth fabric loop is made by the same thread on the same needle bar.

The 36-step atlas traverses over 72 needles, and the 24-step atlas traverses over 48 needles. In all cases, both front-bar beam and back-bar beam have equal runner lengths.

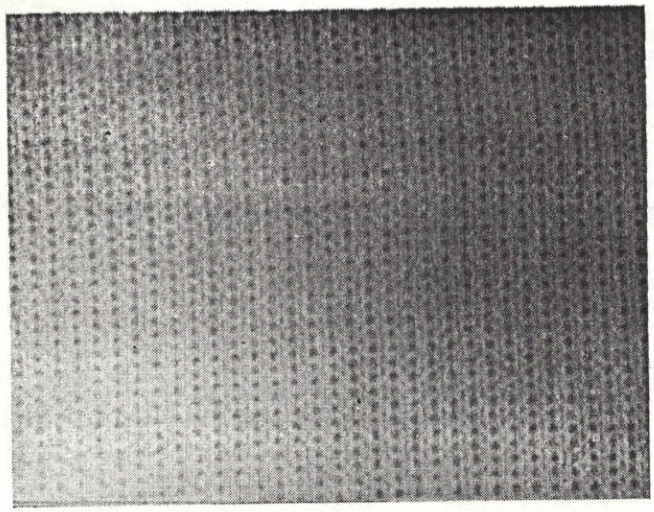
Control Quality With Stripes

The two return courses at the beginning and the center of the repeat are closed loops, and these loops are tighter than the open loops. These courses produce a faint line across the fabric. The distance between these courses changes with the fabric quality. The tighter the stitches are, the smaller is the distance between the stripes.

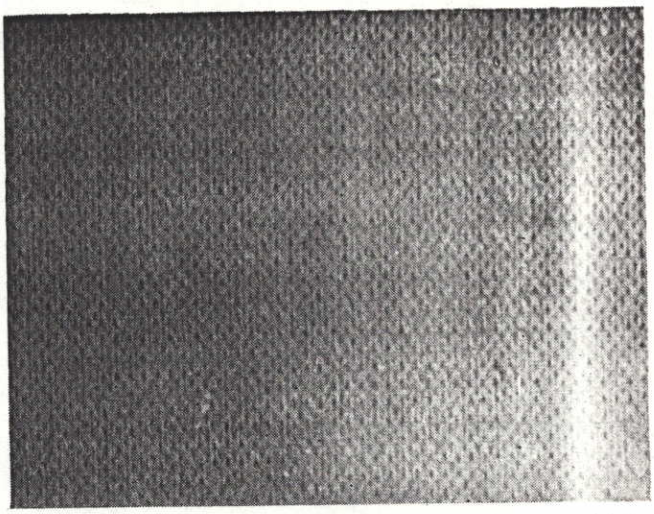
The standard quality measurement can be based on this distance. The number of lines in a certain length unit indicates the fabric quality. The standard will vary with the yarn number, the length of repeat, and the machine gauge.

For instance, a 48-step atlas fabric knitted with 80s cotton on a 30-gauge machine may have 14 horizontal stripes in 10 ins. of fabric. A decrease in the number of lines indicates a bigger stitch and a lighter material.

This system is better than the conventional tricot system of checking quality. The machine does not have



SILK ATLAS FABRIC made from 60-den. acetate yarn has no return courses.



TWO-STEP ATLAS ACETATE FABRIC is treated like cotton fabrics except for brushing.

to be stopped, and stop marks are eliminated during checking.

Runner lengths per rack must be constantly checked to maintain equal runners from both warps.

Apply Low Tension on Take-Up

To prevent load-ups during knocking over, the fabric take-up should be adjusted to give as little tension as possible. The weight of the fabric is usually sufficient to pull it down, and the fabric can be released if a load-up occurs.

Filament yarns do not require a long atlas to obtain an even cloth; so a silk atlas lap that traverses two steps only is used. The usual notation for a silk lap is:

Front guide bar 2-3,4-5/3-2,1-0/
Back guide bar 3-2,1-0,/1-2,3-4/

The ratio of the runners is nine for the back bar and ten for the front bar.

Since no long traverses are made, there are no horizontal stripes. The quality is measured by the number of stitches per inch or the inches of fabric per rack of 480 stitches.

One popular Simplex fabric with the silk atlas construction uses 40-den. nylon in one bar and 70-den. nylon in the other bar.

Net Fabrics Made With Empty Guides

Net fabrics can be made on Simplex machines by using long atlas laps for cotton yarns and short repeats for filament yarns. Here is the setout for a rayon or nylon net:

Front guide bar—7-8,7-6/7-8,7-6/7-8,7-6/5-4,3-2/1-0,1-2/1-0,1-2/1-0,1-2/3-4,5-6/

Back guide bar—1-0,1-2/1-0,1-2/1-0,1-2/3-4,5-6/7-8,7-6/7-8,7-6/7-8,7-6/5-4,3-2/

The threading is 11 in and 1 out on both guide bars.

Pigskin imitations are made with cotton yarn. An interrupted atlas lap with a partially threaded set-out in one guide bar only is used. A different yarn number in each guide bar may be used.

Quality Depends on Finishing

The quality of Simplex glove fabrics depends largely on the finishing processes. Here is a recommended procedure for cotton fabrics:

1. Wet out
2. Boil off or kier-boil for 6 hrs. Use 6% soda ash, 6% soap, 6% turkey red oil, 6% caustic soda (30%), and 1½% waterglass
3. Neutralize
4. Hydro-extract, but do not dry
5. Mill with 15% caustic-soda solution for preshrunk fabrics and with 30% caustic soda for fully shrunk fabrics
6. Rest for 2 to 6 hrs.
7. Neutralize
8. Bleach
9. Soap bath with 8% P. G. soap and 3% soda ash
10. Hydro-extract
11. Dry
12. Make the first brush, twice on each side, with emery-covered rolls. This brushing should be strong.
13. Dye
14. Hydro-extract
15. Dry
16. Make the second brush lightly, once on each side, with emery-covered rolls
17. Shear
18. Press
19. Steam and roll

Control Fabric Shrinkage

Fully shrunk fabrics and preshrunk fabrics carry an indication of the fabric quality and the amount of shrinkage in the fabric. A fully shrunk cloth is fuller in hand and heavier than a preshrunk one. The fabric shrinkage is controlled by the caustic-soda-solution strength during milling.

A fabric knitted from 100s cotton on a 30-gauge machine and treated with 30% caustic soda solution will shrink from the gray width of about 84 ins. to 36 ins. The fabric area shrinks about 35% and is fully shrunk. The same material subject to a 15% caustic-soda-solution treatment results in a fabric about 43 ins. wide. This is a preshrunk fabric, and the area shrinkage is about 28%.

As in mercerizing, the cotton fibers swell. As the fabric is not under tension during the treatment, no luster is obtained. The swelling gives a tight, compact fabric.

The 50 to 60% shrinkage in width is not entirely achieved in milling but only after the final tenter-frame drying. The fabric is stretched in drying to gain about 35% length. The fabric should be kept under tension in width during stretching to obtain a sideways elasticity of about 70%.

During the 2- to 6-hr. rest period, the fabric should be kept free from draft or conditions that may partially dry the exposed places. Dry spots result in uneven dyeing, and they can be prevented by covering the fabric with a damp cloth.