

DESIGNING AND FABRIC STRUCTURE.

NOVELTIES IN WORSTED TROUSERING.

(Finished Width 56")

Fig. 1: Reproduction of fabric, actual size.

Fig. 2: Weave, Repeat 33 warp-threads and 4 picks.

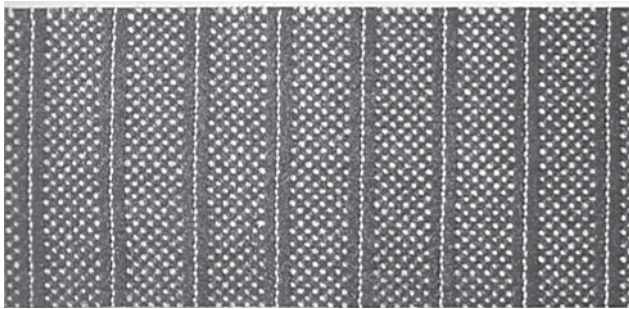


Fig. 1

Dress: 2 ends 120/2 spun silk, white
 4 ends 2/36's worsted, black
 2 ends 2-fold 2/56's worsted, white
 1 end 2/36's worsted, dk. gray
 3 ends 2/36's worsted, dk. gray } times 8

33 ends in repeat of pattern.

In place of using 2-fold 2/56's worsted white, you may try and substitute one end of 2/28's worsted.

Fig. 3: Color Scheme, *i. e.*, plan showing arrangement of placing warp with reference to weave, *viz.*:

Empty squares: silk
 Full squares: black worsted
 Cross squares: white worsted
 Dot squares: dk. gray worsted.

Ends in Warp: Seven (7) repeats of pattern in sample Fig. 1 measures 3 inches, hence:

$33 \times 7 \div 3 = 77$ ends to one inch in fabric.
 Width of fabric finished: 56 inches, consequently $(56 \times 77 = 4312)$
 4312 ends in warp.

REED CALCULATIONS:

$4312 \div 33$ (ends in pattern) equals
 130 $\frac{2}{3}$ patterns in warp.

Threading of Reed: 1 dent with 5 ends, 7 dents each 4 ends, or 33 ends (one repeat of pattern) for every 8 dents in reed to be used.

$130\frac{2}{3} \times 8 = 1045\frac{1}{3}$ dents needed in reed to use up the 4312 ends in the warp.

Width in Reed: 64 $\frac{1}{2}$ inches, exclusive selvage.

Number of Reed: $1045.33 \div 64.5 = 16.2 +$
 Reed 16 $\frac{1}{4}$ is wanted.

Reed 16 $\frac{1}{2}$ will make warp 63 $\frac{1}{2}$ inches wide, requiring a proportional adding of warp-threads to those used in sample.

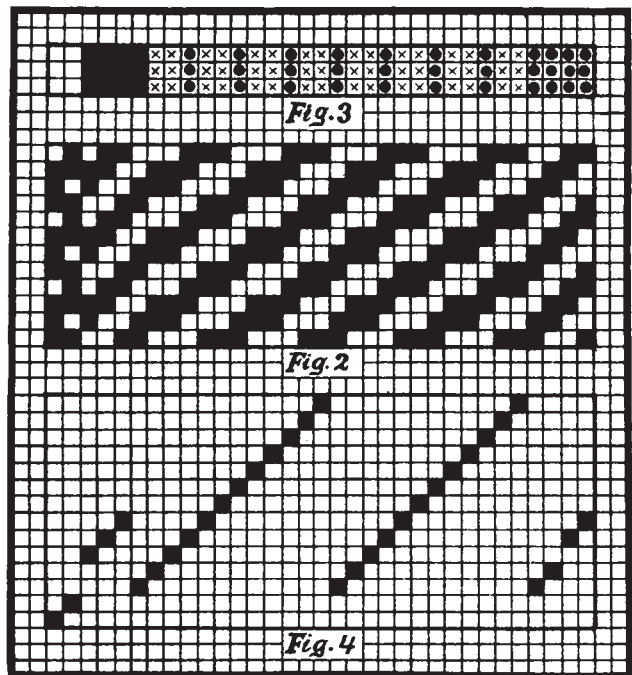
Reed 16 will make warp 65 $\frac{1}{2}$ inches wide, requiring a proportional taking away of warp-threads compared to those used in sample.

Selvage: 32 ends 2/24's worsted, white, for each side; 4 ends per dent.

Filling: 58 picks per inch in finished sample, use 56 picks per inch in loom. 2/32's worsted, all black.

Finish: Worsted Finish, scour well, shrinkage in length 3%, clear face, to show pattern distinct; 56 inches wide.

Drawing-in Draft: The same is given in diagram **Fig. 4** below the weave, calling for 14-harness fancy draw. Harnesses 1 and 2 carry the silk threads.



Calculations as to Amount of Material.
for 1 yard and 1000 yards.

Warp: 2 ends 120/2 silk
 4 ends 2/36's worsted, black
 16 ends 2-fold 2/56's worsted, white
 11 ends 2/36's worsted, dk. gray
 —
 33 ends, repeat of pattern; 130 $\frac{2}{3}$ patterns in warp.

$$\begin{aligned}
 130 \times 2 + 2 &= 262 \text{ ends silk} \\
 130 \times 4 + 4 &= 524 \text{ ends worsted,} \\
 &\quad \text{black} \\
 130 \times 16 + 11 &= 2091 \text{ ends worsted,} \\
 &\quad \text{white} \\
 130 \times 11 + 5 &= 1435 \text{ ends worsted,} \\
 &\quad \text{dk. gray} \\
 \hline
 &4312 \text{ ends in repeat} \\
 &\quad \text{of pattern.}
 \end{aligned}$$

Allowing 5 per cent for take-up at weaving, amount of warp yarn needed for producing one yard of cloth from loom calls for:

$$\begin{aligned}
 262 \div 95 &= 275.7 \text{ yards silk} \\
 524 \div 95 &= 551.5 \text{ yards worsted, black} \\
 2091 \div 95 &= 2201.0 \text{ yards worsted, white} \\
 1435 \div 95 &= 1510.6 \text{ yards worsted, dk.} \\
 &\quad \text{gray}
 \end{aligned}$$

$$\begin{aligned}
 \hline
 &4538.8 \text{ yards of warp re-} \\
 &\quad \text{quired for pro-} \\
 &\quad \text{ducing one yard of} \\
 &\quad \text{cloth on loom.}
 \end{aligned}$$

Proof: $4312 \div 95 = 4538.8$

Selvage: $64 \div 95 = 67.4$ yards of yarn required for one yard of cloth on loom.

SPUN SILK WARP.

$$\begin{aligned}
 120/2 &= 120 \times 840 = 100,800 \text{ yards per lb.} \\
 275.7 : x &:: 100,800 : 16 \\
 0.044 \text{ oz.,} &\text{ amount required for one yard.}
 \end{aligned}$$

BLACK WORSTED WARP.

$$\begin{aligned}
 2/36 &= 18 \times 560 = 10,080 \text{ yards per lb.} \\
 551.5 : x &:: 10,080 : 16 \\
 0.815 \text{ oz.,} &\text{ amount required for one yard.}
 \end{aligned}$$

WHITE WORSTED WARP.

$$\begin{aligned}
 2\text{-fold } 56 &= 14 \times 560 = 7,840 \text{ yards per lb.} \\
 2201 : x &:: 7,840 : 16 \\
 4.491 \text{ oz.,} &\text{ amount required for one yard.}
 \end{aligned}$$

DK. GRAY WORSTED WARP.

$$\begin{aligned}
 2/36 &= 18 \times 560 = 10,080 \text{ yards per lb.} \\
 1510.6 : x &:: 10,080 : 16 \\
 1.993 \text{ oz.,} &\text{ amount required for one yard.}
 \end{aligned}$$

SELVAGE.

$$\begin{aligned}
 2/24 &= 12 \times 560 = 6,720 \text{ yards per lb.} \\
 67.4 : x &:: 6,720 : 16 \\
 0.165 \text{ oz.,} &\text{ amount required for one yard.}
 \end{aligned}$$

TOTAL WARP YARN.

$$\begin{aligned}
 0.044 \text{ oz. } &120/2 \text{ spun silk.} \\
 0.815 \text{ oz. } &2/36\text{'s worsted, black.} \\
 4.491 \text{ oz. } &2\text{-fold } 2/56\text{'s worsted, white.} \\
 1.993 \text{ oz. } &2/36\text{'s worsted, dk. gray.} \\
 0.165 \text{ oz. } &2/24\text{'s worsted, white selvage.} \\
 \hline
 &7.508 \text{ oz., amount of warp yarn required to pro-} \\
 &\quad \text{duce one yard of cloth on loom.}
 \end{aligned}$$

FILLING.

$$\begin{aligned}
 \text{Width of fabric in reed: } &64\frac{1}{2} \text{ inches.} \\
 \text{Selvage 8 dents, each side: } &1 \text{ inch.} \\
 \hline
 \text{Total width of structure: } &65\frac{1}{2} \text{ inches.}
 \end{aligned}$$

$$\begin{aligned}
 56 \text{ picks per inch, } &65\frac{1}{2} \text{ " wide, equals} \\
 3668 \text{ yards of filling} &\text{ required.}
 \end{aligned}$$

2/32's worsted, 8960 yards per lb.

$$3668 : x :: 8960 : 16$$

6.55 oz. amount of filling required to weave one yard of cloth.

TOTAL MATERIAL.

$$\begin{aligned}
 7.508 \text{ oz. } &\text{warp and selvage} \\
 6.55 \text{ oz. } &\text{Filling} \\
 \hline
 &14.058 \text{ oz. total amount of material required to} \\
 &\quad \text{produce one yard of cloth from loom.}
 \end{aligned}$$

TO CALCULATE WEIGHT EXPRESSED IN POUNDS REQUIRED FOR PRODUCING TEN, HUNDRED OR THOUSAND YARDS.

In any of the examples or answers quoted, expressed in ounces (oz.) for one yard,

for 10 yards remove decimal one point to the left
for 100 yards remove decimal two points to the left

for 1000 yards remove decimal three points to the left (or omit).

Divide the result in either case by 16 (ounces in 1 lb.) and answer is expressed in pounds.

Example: Quote pounds of 2 36's black warp required for producing 1000 yards of cloth.

0.815 oz. for one yard.

$$815 \div 16 = 50\frac{1}{4}, \text{ or practically considered, 51 lbs. of yarn required.}$$

Example: Quote total amount of material required for producing 1000 yards of cloth.

14.058 oz. for one yard.

$$14,058 \div 16 = 878\frac{3}{4}, \text{ or practically considered, 1000 yards of the goods (from loom) will weigh about 880 lbs.}$$

TO ASCERTAIN LENGTH FOR A WARP WHEN TWO OR MORE DIFFERENT COUNTS OF YARN ARE CALLED FOR; number of ends, counts and weight of yarn being given.

Combine one repeat, or the average of one repeat of the pattern in a compound thread; multiply the standard of this compound thread by the weight; divide quotient by the number of compound threads in width.

Example:— Find length of warp required, 4,800 threads in width of cloth.

Dressed: 2 ends face 5-run woolen yarn
1 end back 2½-run woolen yarn

3 ends in repeat.

Weight of complete warp 40 lbs.

$$5 \div 5 = 1$$

$$5 \div 5 = 1$$

$$5 \div 2\frac{1}{2} = 2$$

4

$$5 \div 4 = 1\frac{1}{4} \text{ compound size.}$$

$$1\frac{1}{4}\text{-run} = 2,000 \text{ yards per lb.}$$

2,000 × 40 = 80,000 yards of the compound thread in the amount of weight required.

80,000 ÷ 1,600 (Number of compound threads in width.) = 50.

Answer:— 50 yards, length of warp required in given example. From "Textile Calculations" by E. A. Posselt.