NOVELTY IN WORSTED TROUSERING.

Fig. 1: Reproduction of fabric, actual size.

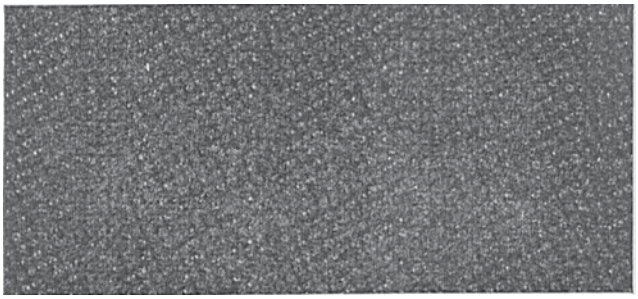
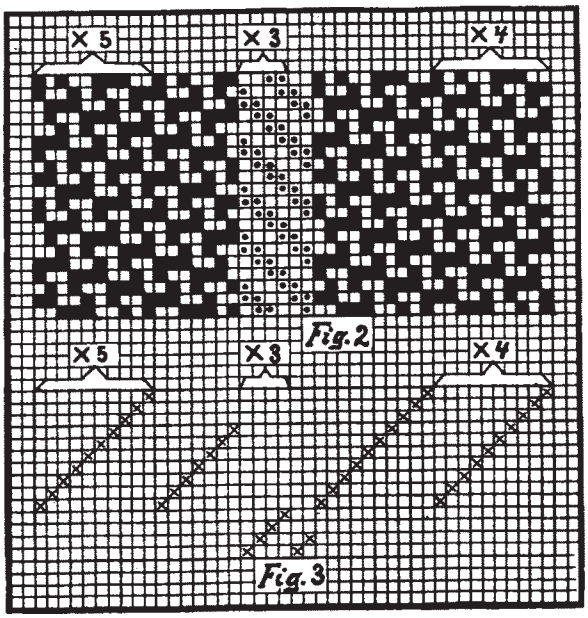


Fig. 1

Fig. 2: Weave; Repeat 121 warp-threads and 20 picks.

Fig. 3: Drawing-in Draft; 14-harness, fancy draw.



Warp: 3993 ends.

Dress: 11 sections, each to contain 3 patterns @ 121 ends, or 363 ends in section, arranged thus:

2 ends 2/40's worsted, black
1 end 2/45's worsted, med. & dk. gray
1 " 2/40's worsted, dark brown
2 ends 2/40's worsted, black
2 " 2/45's worsted, med. & dk. gray
2 " 2/40's worsted, black
1 end 2/45's worsted, med. & dk. gray
1 " 2/40's worsted, black
1 " 2/45's worsted, med. & dk. gray } × 23
1 end 2/40's worsted, green
1 " 2/40's worsted, black
2 ends 2/45's worsted, med. & dk. gray
2 " 2/40's worsted, black } × 2
2 ends 2/45's worsted, med. & dk. gray
1 end 2/40's worsted, black
1 " 2/40's worsted, green
1 " 2/45's worsted, med. & dk. gray
1 " 2/40's worsted, black } × 24
2 ends 2/45's worsted, med. & dk. gray

121 ends in repeat of pattern.

Reed: 15 with 4 ends per dent, or 60 ends per inch; 66½ inches wide in reed, exclusive of selvage.

Filling: 58 picks per inch, arranged thus:
1 pick 2/45's worsted, med. & dk. gray
1 " 2/40's worsted, black

2 picks in repeat of pattern.

Finish: Worsted finish, clear face to show pattern distinct; 56 inches wide.

The Production of Permanently Fireproof Cotton Goods.

W. H. Perkin.

The prevention of fire is one of the oldest and most difficult of the questions with which the world has concerned itself. Even the old Romans tried to fireproof wood by immersion in a bath prepared from vinegar and powdered clay, the process only finding limited application, owing to the cost of vinegar. In a paper published in 1683, *Nicholes Sabattini* recommended the mixing of clay and gypsum with the colors employed for painting theatres. Later, in 1735, *Wild* proposed the use of a mixture of alum, borax, and sulphuric acid, and in 1740, before the Stockholm Academy of Sciences, *Fagot* recommended a mixture of alum and green vitriol, while the *Dictionnaire, de l'Industrie* of 1786 mentions a mixture of alum, green vitriol, and salt. The numerous researches which were made after the burning of the Court and National Theatre in Munich, resulted in the wood used for the building of the new theatre receiving several coatings of sodium silicate and chalk, giving a very durable coating which made the material difficult to inflame. At a later date it was discovered that fireproof material is also obtained by soaking wood in other salts, *i. e.*, copper sulphate, ammonium phosphate, or zinc chloride; the latter appears to be the most active in this respect, as it has a great affinity for wood fibre. As zinc chloride also possesses strong antiseptic properties, it is particularly suited for the wood used in building hospitals.

Turning to the particular subject of which the paper treats, the author's idea of a permanently fireproofed wearing apparel is such protection as is not removed by the usual domestic washing. The defect of the agents suggested at an early date, such as alum solution, and particularly ammonium salts and sodium tungstate, is that their effectiveness gradually diminishes on washing, and the treatment has to be continually repeated. The researches included 10,000 special inflammability tests. Experiments with many tungstates yielded no satisfactory results, but showed that the tin and zinc tungstates possessed the greatest fastness to washing with soap and water.

After extending the work, it was proved that certain soluble salts, such as aluminates, antimoniates, zincates, and plumbates, in which the metallic oxide acts as an acid, yielded precipitates. These precipitates were even more resistant to washing than the more common insoluble salts, such as barium sulphate and magnesium carbonate, particularly those from zinc and tin salts. Careful examination of the tin salts, which readily dissolve, as oxide, in alkalis, soon showed that these salts actually combine more intimately with the cotton fibre than any of the other salts tested.

In a subsequent series of experiments, the piece