C. RODER.

Improvement in Fabrics.

No. 131,906. Patented Oct. 1, 1872.

Fig. 1.

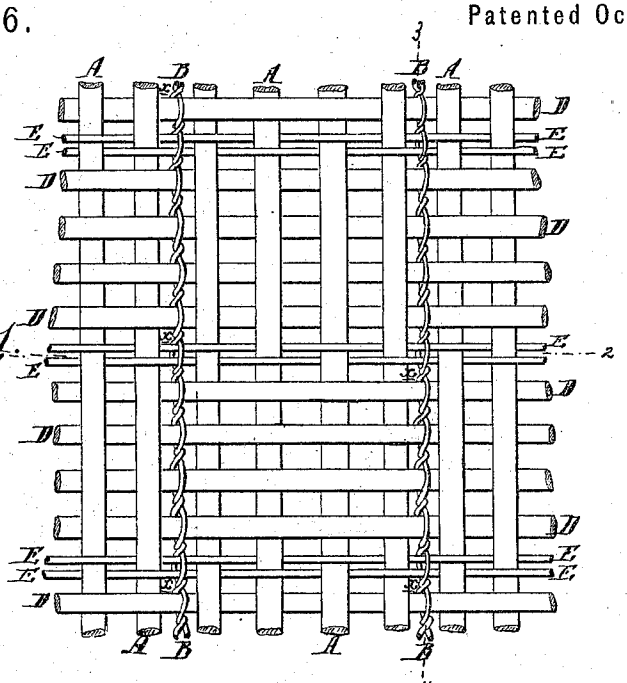


Fig. 2.

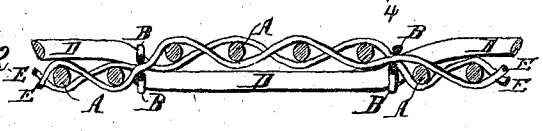


Fig. 3.

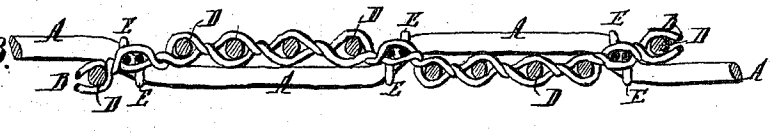
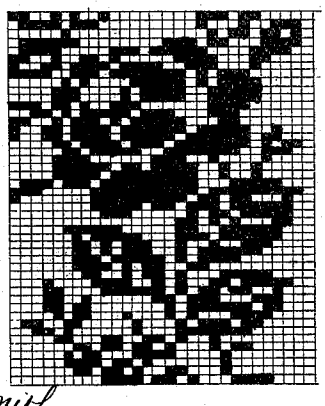


Fig. 4.



Witnesses

Harry Smith

Thomas McIlvain

Conrad Roder

by his Attys.

Howson and Son

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

# UNITED STATES PATENT OFFICE.

CONRAD RODER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO MARTIN LANDENBERGER, JR., OF SAME PLACE.

## IMPROVEMENT IN FABRICS.

Specification forming part of Letters Patent No. **131,906**, dated October 1, 1872.

*To all whom it may concern:*

Be it known that I, CONRAD RODER, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improved Woven Fabric, of which the following is a specification:

The object of my invention is a light open fabric, suitable for shawls, coverlets, &c., for summer use, the fabric being of full appearance, and, at the same time, so tightly bound together that, although the warp-threads are not beaten up, the fabric cannot be so readily disfigured by stretching as ordinary open fabrics. This result I attain by a peculiar combination of coarse warp and filling threads with fine binding-threads in both the warp and filling, as plainly shown in the enlarged view, Figure 1, where—

A represent the coarse or main warp-threads; B, the fine warp threads or binders; D, the coarse weft-threads; and E, the fine binding-wefts. The coarse warp and weft threads are, in the present instance, separated into sets of four threads each by the fine binding-threads of the warp and weft, the latter, owing to this division, being at equal distances apart, and having the effect, therefore, of separating the whole fabric into squares, as shown in Fig. 1. Each of these squares contains four coarse warp and four coarse weft threads, which are not interlocked, but merely cross each other, the whole of the coarse warps or of the weft being uppermost in any square, as desired. The coarse warp-threads A are bound at the opposite sides of each square by the two fine weft-threads E, each of which passes alternately over and under the warps, as shown in Fig. 1, and in the sectional view, Fig. 2; and the coarse weft-threads D are bound at the opposite sides of the squares by the fine warp-threads B. The latter are arranged in sets of two threads each, and are, in the operation of weaving, twisted around each other between each of the coarse wefts, as plainly shown in Figs. 1 and 3, which has the effect of securing each of the said coarse threads, and of thus retaining and preventing any displacement of the same over the warps in a fabric which is not closely beaten up. Both fine weft-threads E are also, at all four corners of each square, passed through a single loop, *x*, of the twisted warp-threads, the fine wefts being thus held so tightly that their disarrangement is impossible.

As the binding is effected entirely by the fine weft and warp threads, no interlocking of the coarse warp with the coarse weft threads is required, and either of the latter can, therefore, appear upon the face of the fabric to any extent required by the pattern without risk of producing a loose and imperfectly-bound fabric. (See diagram, Fig. 4.) The absence of all binding in the body of the squares also permits the tufting of the warp or weft threads which appear upon the surface, thus giving the fabric a full appearance.

I have instanced the formation of squares by grouping the coarse warps and wefts into sets of four threads each; but the groups may consist of any greater or less number of threads in the groups of warps than in the groups of wefts, or vice versa.

In weaving the fabric I have employed a loom in which two sets of heddles are combined with Jacquard apparatus. The coarse warps A are controlled alternately by one of the sets of heddles and the Jacquard, the heddles only acting during the throwing of the fine shots E E and remaining stationary during the formation of the squares, when each group of coarse warps is controlled by a single needle of the Jacquard. The remaining set of heddles, which control the fine-twisted warp B, are constantly operated, and are of a peculiar duplex construction, which will be fully described in a separate application for a patent. Their operation is such that as they rise and fall they cause one thread, B, to assume the position shown in the drawing.

I claim as my invention—

A fabric in which groups of coarse warp and weft threads A and D are combined with fine weft-threads E and with fine twisted warps B, substantially in the manner described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CONRAD RODER.

Witnesses:

CHARLES H. LANDENBERGER,
JOHN K. RUPERTUS,
LUKE V. SUTPHIN.