

No. 875,770.

PATENTED JAN. 7, 1908.

B. BORZYKOWSKI.
PATTERN PAPER LINEN.
APPLICATION FILED MAR. 19, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

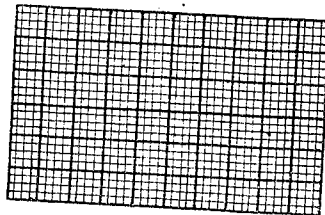


Fig. 2.

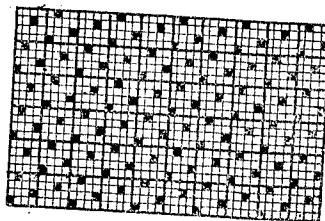
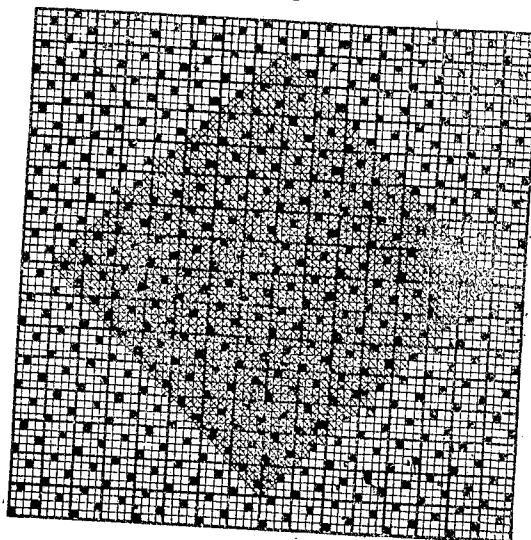


Fig. 3.



WITNESSES.

W. H. Derrigan
F. H. Logan

INVENTOR,
BENNO BORZYKOWSKI,
BY *H. W. Derrigan*
Attorney.

No. 875,770.

PATENTED JAN. 7, 1908.

B. BORZYKOWSKI.
PATTERN PAPER LINEN.
APPLICATION FILED MAR. 19, 1907.

2 SHEETS—SHEET 2.

Fig. 4.

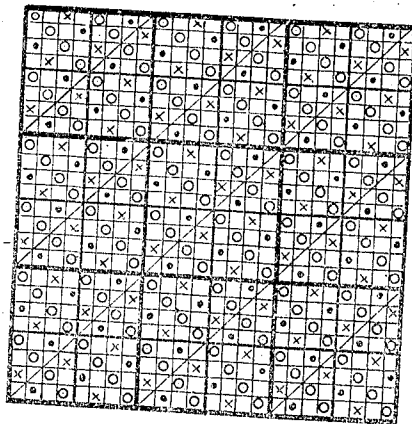
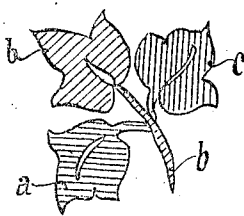


Fig. 5.



WITNESSES:

W. H. Pennington
F. H. Logan

INVENTOR,
BENNO BORZYKOWSKI,
By *Frank Olden*
Attorney.

UNITED STATES PATENT OFFICE.

BENNO BORZYKOWSKI, OF BERLIN, GERMANY.

PATTERN-PAPER LINEN.

No. 875,770.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed March 19, 1907. Serial No. 363,290.

To all whom it may concern:

Be it known that I, BENNO BORZYKOWSKI, a subject of the Emperor of Russia, and resident of Berlin, Germany, have invented a certain new and useful Improvement in Pattern-Paper Linen, of which the following is a specification.

For the production of figures in woven fabrics, knitted goods and the like it is first necessary to draw those figures on so-called pattern paper or design paper in order to be able to cut the jacquard cards according to this drawing.

Since the intervals between the crossing lines of the pattern paper which represent the warp and weft threads are relatively broad, the figure to be woven must be drawn on the pattern paper to considerably enlarged scale. Now the enlarged transfer of simple easy figures on to the pattern paper takes up a great deal of time and can only be carried out by practical and skilled designers. But with intricate artistic drawings in which all the details are to be inserted, or in case, for example, a portrait is to be reproduced, experienced artists and a great amount of time are necessary and even then it is almost impossible to obtain an exact likeness of the portrait on the pattern paper with the great enlargement.

The subject matter of the present invention is a new pattern paper, linen etc. by the use of which the production of patterns is substantially simplified.

The pattern paper, linen etc. of the present invention is printed with a net work of lines and so sensitized that after developing the photographic picture the ruling of the paper remains visible. On this pattern paper provided with the known line system the various shots or bindings necessary for producing the fabric can be indicated by different signs, numerals, letters or by differently colored dots etc. in such manner that suitable bindings provided for on the paper can be used as desired alone or in combination. In particular for the purpose of producing multi-colored patterns the paper is covered with a coating sensitive to light of which the color depends on the length of exposure, as for example silver chlorid or silver bromochlorid emulsions.

For producing a pattern by means of the new pattern paper the process is as follows. From the picture to be woven there is produced, in the first place, a photographic negative which can be suitably relined. This negative is then so focused by means of a camera on to the pattern paper to be exposed that it appears enlarged to the desired size. For simplifying the focusing the apparatus can first be adjusted on a sheet of ordinary pattern paper the ruling of which corresponds to the sensitized coating of the pattern paper. - After focusing this sheet is then replaced by a new sensitized sheet.

In the accompanying drawings, Figure 1 shows the pattern paper, linen etc. on which the system of lines corresponding to the closeness of warps and wefts is printed. Fig. 2 shows the same paper with printed binding or shot points. Fig. 3 shows the paper with a photograph of a picture to be woven projected thereon. Fig. 4 shows by way of example a sensitized pattern paper, linen etc. with printed binding points, which are shown by different signs (dot, circle, cross, stroke), while Fig. 5 is intended to show a multi-colored figure to be reproduced.

The production of pattern paper, linen etc. according to the present invention is effected in the following manner. A paper or linen sheet or the like suitable for receiving a sensitive coating (most conveniently in rolls) is lined or squared by a ruling machine or in a suitable manner, the squares being arranged according to the closeness of warps and wefts. According to the relative closeness of the warps and wefts, the paper can also be lined otherwise for example 8:10 8:12 8:16. In the ruling suitable ground shots can be suitably printed. Hereupon first the paper so lined and dotted is sensitized in such a way that the lines and dots are not rendered invisible by the sensitized coating.

The sensitized coating is so chosen that according to the time of exposure different colors are obtainable and that the printed system of lines and shot points always remain visible. The printing of the network on the paper or the linen etc. can also be effected after coating the same with the sensitized coating if care be taken that the impression takes place in the absence of light.

If, for example, the photographic pattern paper for producing a single colored pattern for the figure to be woven is intended to be used, the negative of this figure will with the aid of a camera be thrown on the sensitized paper according to Fig. 3. In developing or in toning the picture, care is to be taken that the color of the picture is different from that of the lines and dots. In Fig. 3 this is pointed out by indicating the figure by crosses only, while the shot points fill the small rectangles.

For the multi-colored figures with multiple bindings the pattern paper, linen etc. can be used preferably in the form shown in Fig. 4 according to which, by copying different marks in the separate rectangles of the net work, eleven different bindings result so that, after projecting the figure as desired, the one binding can be used for the ground and another for the figure. It is evident that such a printed pattern paper, linen etc. for the production of hand-made patterns can be suitably used without being made sensitive to light by transferring the figure to be woven instead of as heretofore with opaque colors, with transparent colors which do not cover the printed binding points.

In Fig. 4 dots, circles, crosses and diagonal strokes stand for the different bindings. According as one or more of these signs is or are struck or left the following eleven bindings are obtained: (1) Dot, circle, cross struck gives taffeta or linen. (2) Circle struck gives four leaved weft twill. (3) Circle left all others struck gives four leaved warp twill. (4) Cross struck gives eight leaved weft satin. (5) Cross left all others struck gives eight warp satin. (6) Dashes struck gives eight leaved weft twill. (7) Dash left all others struck gives eight warp twill. (8) White left all others struck gives eight warp diagonal. (9) White struck gives eight leaved weft diagonal. (10) White, dot, dash, left all others struck gives eight weft crossing. (11) White, dot, dash struck gives eight warp crossing. If, for example, a pattern in twill (from right to left) in a ground of eight leaved satin is desired the cross is struck in the ground and the circle is struck in the figure.

It is evident that a multiple binding pattern paper, linen etc. can be produced where the binding ratios are not as in the drawing in eights or in eight rectangles but so that 10, 12, 16, 24, 32, 64, etc. ground bindings can be grouped according to the system described.

The signs or full binding points can be printed in different colors on the pattern paper, as will probably be mostly done in practice so that after transferring the figure, which in this case is preferably in a different color, the reading and cutting of the cards is simplified. Instead of the signs or dots, numerals

letters or the like can be used which also can be printed in several colors.

A list of the bindings on the pattern sheet can be provided on the edges or on the back of the sheet so that each weaver or card cutter can choose one or more bindings for the figure for the ground (specially in multi-warp or multi-weft fabrics) or one or more bindings for the figures.

If patterns for multi-colored figures as in Fig. 5 are intended to be produced photographically (in the figure the different colorings of different parts are shown by different shading) the process is carried out as follows. A photographic negative is produced from the copy and adjusted to the desired number of rectangles of the pattern paper whereupon the exposure of the pattern paper or the copying of the picture is effected. As soon as the normal time of exposure has passed the part *a* of the picture on the negative is covered either with color or with a mask or the like and the exposure of the paper only on the parts *b* and *c* of the figure continued. When a suitable time has elapsed the part *b* of the figure is also covered in the manner mentioned and further illuminated only by the part *c* of the negative. If it is assumed that each exposure takes a minute the part *b* of the figures is given two minutes and the part *c* is exposed three minutes.

As is known, papers which are coated with a suitable silver chlorid or silver chlorid bromid emulsion by different lengths of exposure or by different concentration of the developer toning bath or the like pictures in different tones from black-green to yellow result so that in developing the pattern the part *a* with the single (one minute) exposure will come out somewhat green, the part *b* with the double exposure brownish, and the part *c* with the treble exposure red or yellow.

Having described my invention what I claim and desire to secure by Letters Patent of the United States is:—

1. Pattern paper etc. for photographic patterns on which a copy of the picture is made in suitable tone, said paper being sensitized and mechanically printed with a network of lines the lines being distinguished from the copy of the picture.

2. Pattern paper for photographic patterns said paper mechanically printed with a network of lines adapted to be distinguished from the copy of the picture, the paper etc. being made sensitive to light in such wise that by different lengths of exposure and subsequent treatment in baths different colors from black to yellow or red result without the printed network of lines being covered after the copy is developed.

3. Pattern paper etc. for photographic patterns said paper sensitive to light and mechanically printed with a network of lines,

and with marks numbers, letters and the like
printed in the separate squares in one or more
colors so grouped that bindings provided on
the paper both for single colored (single warp
5 or single weft) fabrics and for multi-colored
(multi-warp and multi-weft) fabrics can be
used.

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

BENNO BORZYKOWSKI

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.