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G. LIEBENDER

MANUFACTURE OF CHENILLE PRELIMINARY FABRICS

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Fig. 1

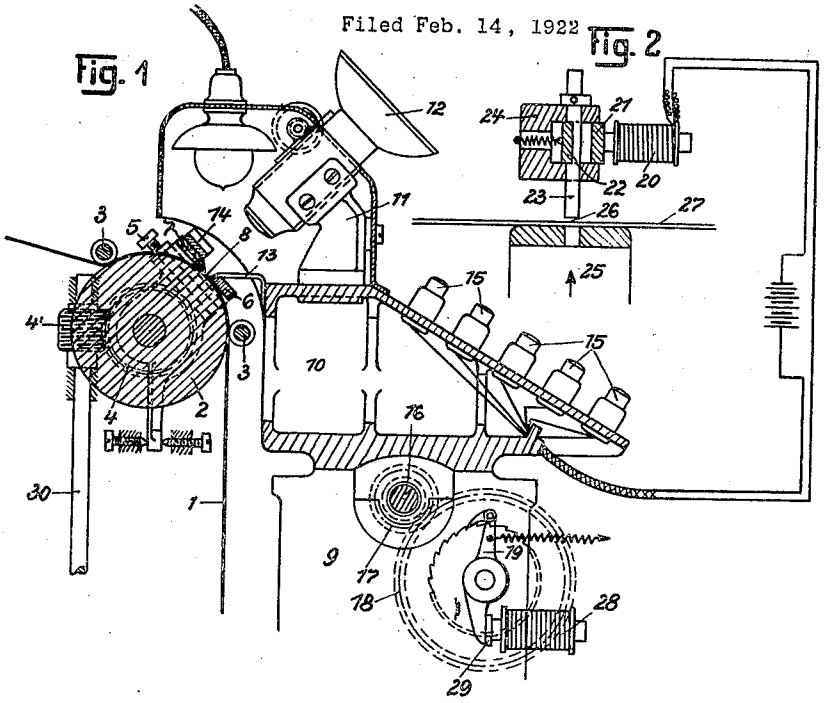
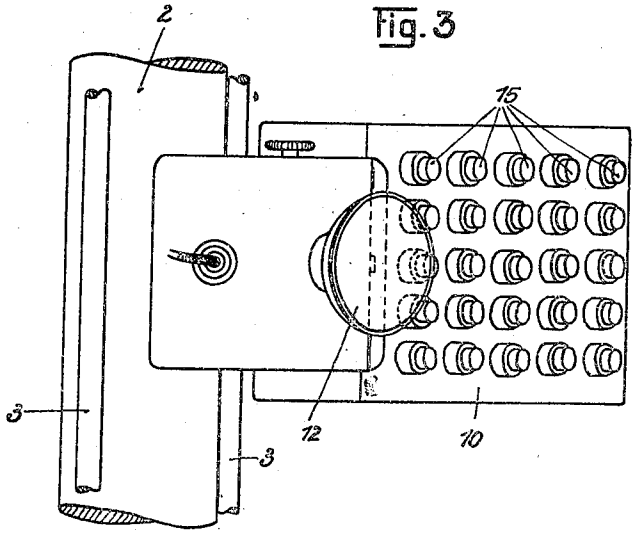


Fig. 2

Fig. 3



Inventor:
Gottlieb Liebender
by: Hubert J. R.
Attorney

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GOTTLIEB LIEBENDER, OF OELSNITZ, GERMANY.

MANUFACTURE OF CHENILLE PRELIMINARY FABRICS.

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To all whom it may concern:

Be it known that I, GOTTLIEB LIEBENDER, a citizen of the German Republic, and resident of Oelsnitz, Germany, have invented certain new and useful Improvements in the Manufacture of Chenille Preliminary Fabrics, of which the following is a specification.

This invention relates to a method of manufacturing the chenille preliminary fabric as required for the production of Axminster-carpets.

The chenille warp thread which is differently dyed or colored along its length according to the pattern to be produced has up to now been manufactured in a circumstantial manner upon a hand weaving loom. That method consists in introducing by hand, with aid of a prepared templet, colored weft threads into a plurality of sets of ordinary warp threads arranged side by side, whereby a fabric with colored transverse stripes, a so-called preliminary or ante-carpet is produced in which afterwards the various sets or groups of warp threads are separated from each other in their longitudinal direction by a suitable cutting means. There were obtained in this way, according to the breadth of the preliminary or ante-carpet, a larger or smaller number of transversely striped bands having colored thread ends projecting beyond the band breadth. These colored bands would then be folded up to V-shape and the folded up bands were subjected to the action of steam in such a manner that all burls or nops remained standing upright.

The thus prepared chenille thread was then placed in a shuttle and further worked upon in the carpet loom.

But still more circumstantial than the weaving of the chenille carpet itself, is the preparation of the templet requisite for weaving the preliminary or ante-carpet. Hitherto the templet has been made in such a way that a carpet design drawn on a smaller scale was transferred or enlarged respectively, into natural size and was stencilled in this size, that is to say, it was subdivided into small colored individual fields, preferably of rectangular shape. These colored rectangles were then jointed in that succession which was necessary for introducing the colored warp threads.

The preliminary or ante-carpet from which the chenille thread was produced in the above-described manner was to be manufactured by a greater or lesser number of hand-loom weavers, partly from certain reasons of expediency or opportuneness, partly in dependency on the final size of the carpet to be made.

It is but natural that the working of a templet and the production of a preliminary or ante-carpet, if several persons are occupied with the same task, does not warrant a uniform working-through. One weaver, for instance, strikes the inserted warp more or less than another one, in consequence of which the one carries more or less warp threads than the other into a rectangle of the pattern templet. This becomes perceptible only in the finished carpet in which then the pattern or design is distorted and the velour-like surface is of non-uniform condition.

The object of the present invention is to greatly simplify the manufacture of the preliminary or ante-carpet and thus, the production of the chenille thread, first of all by obviating the necessity of manufacturing a templet of the original size of the Axminster-carpet to be made, that is to say, a templet after the pattern which, as is known, is always made on a smaller scale. The decomposition of the pattern is now effected, according to this invention, in a purely mechanical way, without the least destruction of the pattern itself. The colors present upon the pattern are subdivided, as with the stencilling, in smaller or greater rectangles and each of these latter, according to its value as established by its color, is transferred upon a jacquard-card by means of a mechanical perforating or punching device. The thus formed jacquard-card is then introduced into an automatically operating device by which the colored warp threads are automatically introduced in their proper succession during the weaving of the preliminary or ante-carpet.

In order to make my invention more clear, I refer to the accompanying drawing, which shows, by way of example, one form of construction of an apparatus by which my improved method may be carried into effect. Figure 1 is a vertical transverse section through a device by which the pattern is mechanically subdivided into small rectangles and is read off in this subdivided state. Figure 2 is a vertical transverse section through a jacquard-card perforating

or punching device which is actuated as the pattern is read off. Figure 3 is a plan of the upper part of Figure 1.

The carpet pattern 1 is laid around a cylinder 2 and pressed so firmly against it by rollers 3 that it is moved by, and together with, the cylinder 2 which is rotated by a worm-wheel 4 and a worm 4'. Above the pattern 1, or above the cylinder 2 respectively and parallel to its axis, are two rulers 6 and 7 which may be adjusted relatively to one another by an adjusting screw 5. The rulers when properly adjusted form between them a slot 8, the width of which corresponds about to the thickness of a colored chenille thread.

In front of the cylinder 2 is a slide 10 supported upon a base 9. The slide 10 carries an observation magnifying glass 12 which is directed exactly upon the slot 8, and is, furthermore, provided with a pointer 13, the end of which lies just in the line of vision of the magnifying glass 12.

The pattern strip visible through the slot 8 is illuminated by a lamp by which the color graduation is illuminated uniformly and independent of the day-light. In order to prevent confounding of fine shades of color where such exist, the ruler 7 is provided with a slide 14 which also bears the colors present upon the pattern and is provided with certain appropriate marks or signs for the various colors.

The slide 10 carries contacts 15, of which there is one for each color of the pattern.

The slide is driven by a threaded spindle 16 having at one end a cog-wheel 17 which meshes with a cog-wheel 18 that is intermittently rotated in certain intervals by means of an intermediate member 19.

The contacts 15 serve for closing circuits and thus for exciting the magnets 20 (Fig. 2) of a card punching device. When any one of these circuits is closed by the respective contact, the armature 21 of the thus excited magnet is attracted and at the same time coupled with a bolt 23 having a recess 22 for the reception of the armature. This coupling entails another coupling, viz, between the bolt 23 and the punch head 24, and if then the punching table 25 is raised, as indicated by the arrow in Fig. 2, a hole is punched at 26 into the jacquard-card.

The contacts 15 show colors and signs or designations corresponding to those of the slide 14, and that contact is depressed which corresponds to the color just visible through the slot 8. There is then punched at least one hole, may be a plurality of holes, into the jacquard-card 27 in the manner just described. This having been performed, the circuit of the magnet 28 is closed, the armature 29 is attracted and the pawl-lever 19 actuated whereby the cog-wheels 17 and 18 and the spindle 16 are moved so much or so little that the slide 10 is displaced for the thickness of a warp thread.

This step-wise displacement of the slide with the parts it carries is continued until the edge of the pattern is reached. Then the spindle 30 of the worm 4' is rotated in such a measure that the cylinder 2 is turned for the thickness of a warp thread, after which the procedure is repeated and so on, until the whole of the colored pattern conducted over the cylinder 2 has, in the manner described, been mechanically decomposed into individual color squares and for each of these latter a hole, or a plurality of holes, has been punched into the card 27.

The thus prepared jacquard-card is then placed into an automatic apparatus similar to those already known and used in the art of weaving.

The advantages which the improved method offers are of various kind. It is no more necessary to manufacture after the pattern a special templet corresponding in size to the natural size of the carpet to be made. The pattern may be repeated at any time in any size; only a special jacquard-card is necessary for each size. If working according the novel method, cutting the difficulty produced templet into single transverse stripes may be obviated, as may also the gluing together of these stripes to form an endless band with transverse stripes. Manufacturing the chenille upon the hand loom which is a very expensive procedure may be dispensed with. Owing to the carrying in of single weft threads between the warp, the rim ledge otherwise arising is obviated; the whole breadth of the fabric may be turned into chenille. It is also no more necessary to produce that very great number of colored bobbins of small diameter as required for hand weaving on account of the bobbin shuttles. According to the novel method, the bobbins may have any desired diameter because no bobbin shuttles are made use of, and the bobbins are supported in a special framing outside the loom. Furthermore, the chenille-thread may be manufactured by one weaver upon one loom, and the disadvantages entailed by having the chenille thread produced by a plurality of weavers, or a comparatively large number of them respectively, are, thus, completely done away with.

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

1. A device for use in the manufacture of chenille preliminary fabric with chenille weft threads dyed in conformity with the pattern for the weaving of Axminster carpets, comprising, in combination, a horizontal roller, a carpet-pattern conducted over the upper part thereof, and means for rotating said roller intermittently as much

as corresponds to about the thickness of a chenille-thread; a slide arranged in front of the roller and being adapted to be shifted laterally in steps corresponding to the distribution of the colors on the carpet-pattern, parallelly to the said roller; a pattern reading device arranged on said slide, opposite the roller; a jacquard-card punching device; means provided on the said slide in front of the said reading device and adapted to act on the various punches of said punching device; and means adapted to transmit power from said means on the said slide to said punches.

2. A device for use in the manufacture of chenille preliminary fabric with chenille weft threads dyed in conformity with the pattern for the weaving of Axminster carpets, comprising, in combination, a horizontal roller, a carpet-pattern conducted over the upper part thereof, and means for rotating said roller intermittently as much as corresponds to about the thickness of a chenille-thread; a slide arranged in front of the roller and being adapted to be shifted laterally in steps corresponding to the distribution of the colors on the carpet-pattern, parallelly to the said roller; a pattern reading device arranged on said slide, opposite the roller; electric contacts also provided on the slide in front of said reading device; a jacquard-card punching device; longitudinally movable punches forming parts thereof; electromagnetically operated means for rendering stationary selected punches, and conductive connections between these means and said contacts, substantially as set forth.

3. A device for use in the manufacture of chenille preliminary fabric with chenille weft threads dyed in conformity with the pattern for the weaving of Axminster carpets, comprising, in combination, a horizontal roller, a carpet-pattern conducted over the upper part thereof, and means for rotating said roller intermittently as much as corresponds to about the thickness of a chenille-thread; a slide arranged in front of the roller and being adapted to be shifted laterally in steps corresponding to the distribution of the colors on the carpet-pattern, parallelly to the said roller; a magnifying lens arranged on said slide, radially with respect to the roller; a casing covering said magnifying lens, except the objective thereof, and being arranged on the top of the said slide, opposite the upper front part of the roller, and being open opposite this part, illuminating means in said casing, a jacquard-card punching device; means provided on the said slide in front of the said reading device and adapted to act on the various punches of said punching device; and means adapted to transmit power from said means on the said slide to said punches.

4. A device for use in the manufacture of chenille preliminary fabric with chenille weft threads dyed in conformity with the pattern for the weaving of Axminster carpets, comprising, in combination, a horizontal roller, a carpet-pattern conducted over the upper part thereof, and means for rotating said roller intermittently as much as corresponds to about thickness of a chenille-thread; a slide arranged in front of the roller and being adapted to be shifted laterally in steps corresponding to the distribution of the colors on the carpet-pattern, parallelly to the said roller; a magnifying lens arranged on said slide, radially with respect to the roller; a casing covering said magnifying lens, except the objective thereof, and being arranged on the top of the said slide, opposite the upper front part of the roller, and open opposite this part; electric illuminating means provided within said casing over the open bottom-side thereof; electric contacts also provided on the slide in front of said reading device; a jacquard-card punching device; longitudinally movable punches forming parts thereof; electromagnetically operated means for rendering stationary selected punches, and conductive connections between these means and said contacts, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GOTTLIEB LIEBENDER.

Witnesses:

CHARLES L. TURRILL,

ARTHUR SCHROEDER.