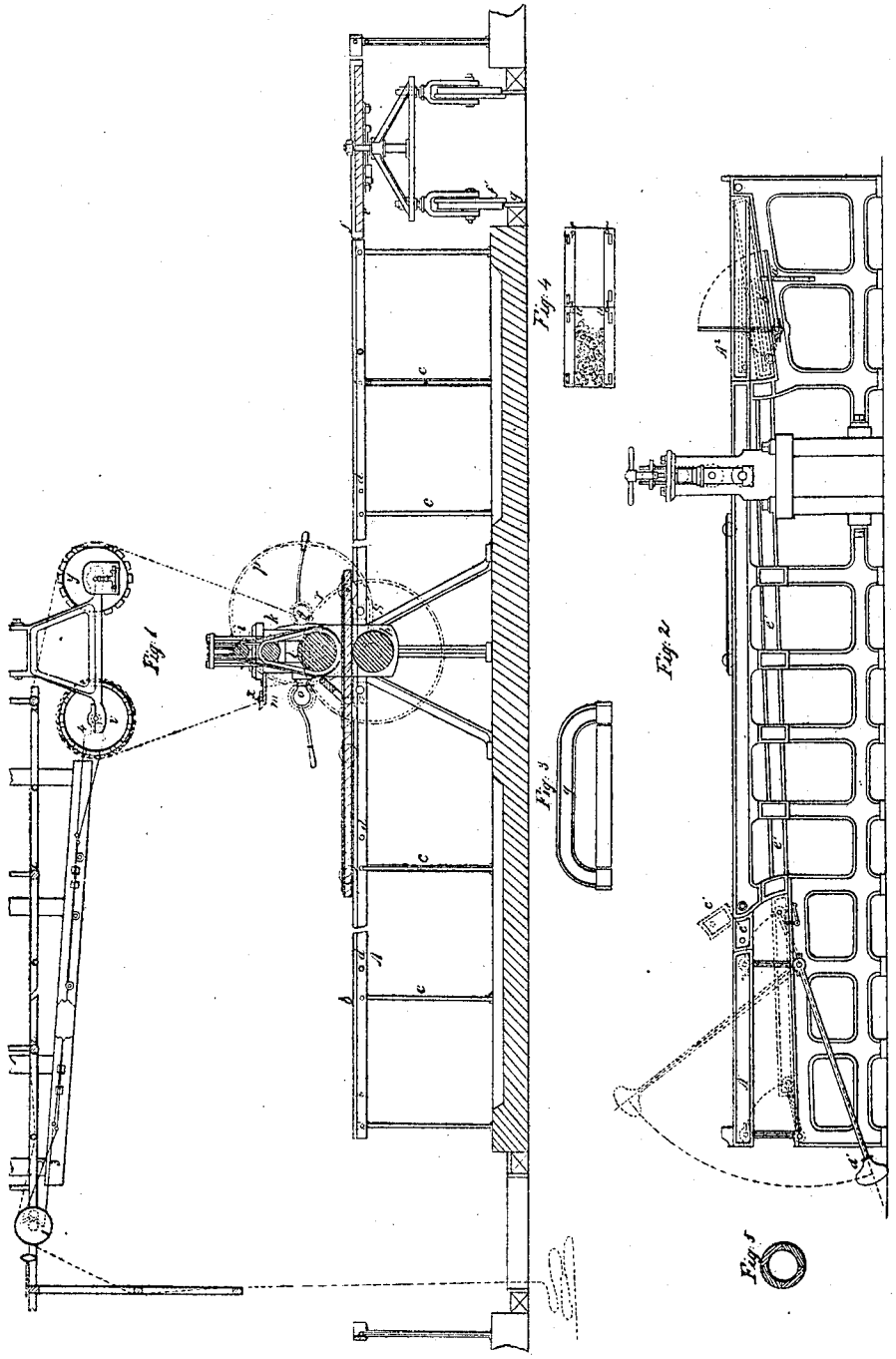
A. A. DESPREAUX.

PRINTING AND ORNAMENTING TEXTILE FABRICS.

No. 42,713. Patented May 10, 1864.



Witnesses

Inventor

UNITED STATES PATENT OFFICE.

ALEXANDRE ADRIEN DESPRÉAUX, OF PARIS, FRANCE.

PRINTING AND ORNAMENTING TEXTILE FABRICS.

Specification forming part of Letters Patent No. 42,713, dated May 10, 1864.

To all whom it may concern:

Be it known that I, ALEXANDRE ADRIEN DESPRÉAUX, of Paris, in the Empire of France, have invented certain new and useful improvements in printing and ornamenting textile fabrics, paper-hangings, and other materials, and in surfaces and apparatus for such purposes; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, to be hereinafter referred to.

My invention relates to the production of figures, devices, or designs upon textile fabrics having metallic threads interwoven, by printing or applying pressure—that is to say, by the use of printing, figuring, or pattern surfaces bearing the required device or design, which they transmit to the fabric or material to be printed or ornamented by means of pressure—imitating the embossed or raised effects obtained by Jacquard machinery, and by tapestry or needle-work.

The printing, figuring, ornamenting, or pattern surfaces used in my invention are thus produced: The intended design or device is first traced on a plate or slab, and is then cut out therein—that is to say, parts are cut away from the plate or slab, the cutting following the lines of the tracing, and thus producing the device or design as a sort of open-work, but portions of the plate or slab must be left where required to serve as connections for keeping the parts of the device together. The edges of the lines of the device or work thus cut out are sharp, instead of having seams or inequalities, as in cast patterns. The device, cut out as described, is then riveted or fastened down to a plate, which serves as a back or mount, and the connecting-strips which had been left between the device lines, but which are no longer required, can now be removed. To save time the plate from which the device is to be cut may be divided into portions, on which different workmen can work at the same time, so as to produce different parts or repetitions of the device simultaneously, the portions being afterward duly put together on the back or mount, to which they are fastened. The back or mount plate, with the device thereon, is fastened down to a block, slab, or foundation of marble or other like hard material. A device may be produced in like manner on cylinders or rollers by dividing a cylinder into sections, on which the device is traced and cut out, as described, and which are afterward fixed over a cylinder, so as to surround it. The cylinder is mounted on an axis, as is usual with printing-rollers; or the printing or ornamenting surfaces may be obtained by reproducing a pattern or device by electrotype or by molded and cast plates, the various copies so produced being duly fitted and united together by fixing them on a plate or block. The materials used for the printing or ornamenting surfaces may be metal, indurated wood, and caoutchouc and other substances, according to the fabric to be printed or ornamented; but when carrying out the mode first hereinbefore described thin copper plates with hammer-hardened and smooth surfaces are in most cases recommended as a fit material on which to trace the device, and in which to cut it out, as before described. By the means first described printing, figuring, or pattern blocks, plates, cylinders, or surfaces are obtained in which the device or outlines are formed with sharp edges and are cut of sufficient depth to be very durable. The colors are applied by rollers or otherwise upon the raised parts or reliefs of the printing or figuring surfaces, so that those parts imprint the colors, while the hollow serve as the blanks or spaces. The quantity and density of the colors should be regulated according to the nature and thickness of the materials. The colors employed are prepared without using acid mordants, and they consist of metallic oxides, or of lacs crushed or reduced to a fine powder with fatty or unctuous oils, or with fatty varnishes, but without acid mordants. In the printing machinery employed it is preferred to adopt arrangements in which the printing, figuring, or pattern blocks, plates, or surfaces, instead of being fixtures to the table or frame-work on which the printing is performed, are free to travel on and off it, and in which arrangements, also, the said blocks or surfaces, after they have applied the device on the material to be printed or figured, are brought back again to start afresh and repeat their work. The best mode of doing this is by traveling tables, which bring back the block on the same horizontal plane, or instead of traveling tables inclined surfaces may be used. In one

arrangement two rails are supported on a frame-work, at one end of which is a carriage supporting a table on which are a pair of rails, which, when the table is shifted, accordingly form a continuation of those on the frame-work. The table is capable of turning round to the required extent preferably on a gudgeon working in a socket. The carriage travels along a railway from one end of the machine frame-work to the other. Three rollers are supported in the frame-work, round the second and third of which is an endless band of sufficient breadth to extend from end to end thereof, and the third and topmost are also connected by a similar but thinner band, which comes in contact with the material while the latter is being printed, and thus affords an elastic pressure thereon. Below the lowest of these three rollers is a fourth roller at a distance corresponding to the depth of the block. These rollers can be adjusted as to their respective distances by screws or otherwise. The fourth roller is worked by a crank-handle, or by a crank-shaft and pinion and train of wheels. The blocks may be connected two or more together, and are run on the rails of the frame-work and passed between the two lowest rollers; and when one block has passed it is detached from the next behind it and moved onto the turn-table on the carriage, which is the unfastened from that end of the frame-work and run round to the other end, the table being turned sufficiently to bring the front end of the block forward, ready for being again passed between the rollers, between which the second one may be passed meanwhile. The material to be printed or figured is delivered from off a beam or roller and brought under the third roller, where it is printed by the block, and is thence carried over guide-rollers to a frame, which is so caused to move by cranks and rods worked by the delivery-roller as to cause the material to fall in regular folds. Instead of the traveling table the machine may be furnished with an inclined plane or inclined rails, and also with rising and falling tables, slabs, or frames at each end of the frame-work, which works thus: When the block has passed between the rollers, and is to be returned to the other end of the machine, it is run onto the table at the farther end of the machine, which table is kept horizontal by a lever taking into a catch. A piece of the frame-work at the other end is next pulled up, and the table at that end is depressed by raising a lever or otherwise, whereby the rails thereon are brought into a line with the inclined rails, so that on lifting the lever of the first-named table the block will slide down the inclined rails onto the second-named table, which is then raised, and the portion of the frame-work is shut again so as to form a level surface, on which the block is again run between the rollers. A crane may be also used for returning the blocks. The pattern-surfaces may receive their colors, among other modes, by pressure upon traveling plates or tables brought back after doing their work to commence it afresh. A device may be printed in different colors by using printing-surfaces with different colors, and by having a number of plates or surfaces on which different colors are applied, and which are duly arranged or brought into proper register. The device can be printed on the material in various colors. The colors will be fixed on the material by drying it by hot air without either steaming or washing in a running stream for fixing them.

To carry my invention into effect I use as a material to be printed upon a fabric having metallic threads interwoven. When printed in the manner herein set forth, the edge of the pattern will indent into the fabric, and the indentations so made will be more permanent than if the fabric were composed of vegetable or animal fibrous substances alone. The effect intended—*i. e.*, imitating the embossed or raised effects obtained by Jacquard machinery and by tapestry or needle work—will thus be produced.

The accompanying drawings represent printing or ornamenting apparatus constructed according to my invention.

Figure 1 is a sectional elevation of a machine in which each block, after having been used for one impression, is brought back in the same horizontal plane to the place whence it started to perform a fresh impression. A is the general frame-work, on which are secured a pair of rails, *b b*, extending from one end thereof, and supported on frame-bars *c d*. At one end of the frame-work A is placed a carriage or traveling frame, E, on which is mounted a table or plate, *e*, on which are fixed a pair of rails, *f f*, corresponding in gage and level with the rails *b b*, so that when the table is turned around so as to bring the rails *f* in a line with the rails *b* the former form a continuation of the latter. The table-top *e* is free to turn in its frame, being fixed on a central pivot or socket turning in an annular groove in the center of the carriage E; but it is prevented from performing more than a single revolution in either direction at a time by stops or catches. The carriage E is held to the frame-work A, when required, by a hook or fastening, which may easily be undone. The carriage E is set on wheels *f' f'*, which run on curved rails *g*, (shown on a smaller scale in the plan, Fig. 3,) leading from one end of the machine frame-work A to the other end thereof. *h h* are a pair of standards fixed to the frame-work A near the middle, one at each side. In these standards are supported three rollers, *i k l*. Round the rollers *k* and *l* is a blanket or endless woolen band, *m*, of sufficient breadth to extend from end to end of each roller, espectively. *m'* is another blanket or endless woolen band, thinner than *m*, and passing round the rollers *l* and *i*. *s* is a fourth roller secured to the frame-work A below the roller *l*. The space between the rollers *s* and *l* is equal to the depth of the printing-block. The roller

s is driven by a train of wheels, *o p q r*, actuated by a handle or by a crank-shaft carrying a fly-wheel. R is the fabric to be printed, which is delivered continuously off a beam, *v*, and guided by a guide-piece, *x*, to the rollers. It passes under the blanket *m'*, which comes in contact with it while it is being printed, by which means a suitable degree of elastic pressure is obtained on the fabric. After the fabric is printed, it passes over a guide-wheel, *y*, and guide *z*, hereinafter referred to. The four rollers *i*, *k*, *l*, and *s* may be brought nearer to or farther from each other as required by screws, with which their bearings are fitted. Q Q' are the printing-blocks, which are mounted on small wheels or friction-rollers, so that they may run freely on the rails.

The machine is thus used: The carriage E is hooked to the frame-work A, its table *e* being turned so as to bring its rails *f* in a line with the rails *b*. Two or more blocks, Q Q', are hooked together, one behind the other, by hooks *u*, Fig. 4, and placed on the rails *b*, their printing surfaces being uppermost. The foremost block, Q, is pushed between the rollers *l* and *s*, the position of the fabric R which is to be printed by it having been first brought duly under the blanket *m'*. The device is thus impressed on the fabric, and rotary motion is communicated to the roller *s*, and the block is propelled between the rollers, and when it has cleared them it is unhooked from the block Q' next behind it, and brought on to the table *e* on the carriage E, which is unfastened from the frame-work A and run along the railway *g* to the other or back end of the frame-work, carrying the block Q with it, the table *e* being suitably turned on its axis to bring the proper end of the block foremost in the required position. While this is being done the second block, Q', is being propelled between the rollers and caused to print the fabric, and by the time it has passed through the rollers the first block is ready for being started afresh along the rails *b*, and the second block, Q', is run on to the rails *f* on the table *e*, which must be run back again to the front end of the frame-work A in time to receive the block, and is then rolled away with the block Q' upon it to the back end of the frame-work, and so on, thus with two blocks any length of material may be printed continuously. The fabric, after being printed, passes over the guide-rollers *y z z* to a vibrating-frame, which drops it in regular folds on the ground or into a receiver, the frame receiving a gentle motion from bell-cranks 1, actuated through rods 2 3 by other bell-cranks, 4, worked by the roller *v*.

Fig. 2 is a view of a modification, in which the printing-blocks, instead of traveling from end to end of the frame-work on the same level, are returned down inclined rails. Here the frame-work A has at one end a movable portion, A', and at the other end a movable portion, A^2, each such portion A' A^2 consisting of a rising and falling oblong frame or table. *e' e'* are inclined rails between the portions A and A^2. *c'* is another movable piece, forming part of the top of the frame work A, to which it is hinged, so as to open and close as required. *d'* is a weighted lever attached to the frame A'. The frames A' A^2 being first in a horizontal position, the printing-block is propelled from the end A' to and between the rollers, as before, and prints the fabric, and is then run onto the frame A^2, which is retained horizontal by a catch, *a'*, into which a lever, *b'*, takes. When the block is on A^2, the attendant raises the hinged piece *c'* into the position shown in blue lines, and so leaves room for the frame A' to work, and he raises the lever *d'*, and thereby depresses the frame A, bringing it into an inclined position, as shown in blue lines, so that the rails upon it come in a line with the inclined rails *e' e'*. When this has been done, the workman raises the lever *b'*, and thereby inclines the frame A^2, bringing it into the position shown in blue lines, in which position the rails which it carries come in a line with the rails *e' e'*, which thus lead direct from the rails on A' to those on A^2, and the block slides down the rails on A^2, along the rails *e' e'*, to the frame A'. Immediately on the blocks arriving fairly on that frame the workman depresses the end of the lever *d'*, so as again to raise the frame A' to a horizontal position, flush with the main portion of the top of the frame-work A, and shuts down the portion *c'*, and then pushes the block again between the rollers, as before, the frame A^2 being again raised flush with the rest of the top of the frame-work A to receive the block when propelled thereon. The block thus works continuously. The fabric is delivered to and from the printing-rollers in the same manner as shown in Fig. 1. The table E, Fig. 1, may be propelled by machinery or by hand. The blocks might also be moved from end to end of the frame-work by hand.

In producing the printing or figuring surfaces by cutting out the device, as before described, I may mention that the device (after being cut) is best attached to the mount by small rivets, the heads of which are afterward trimmed down, so as not to project above the surface. By producing a device in portions, and then fastening the portions together, very large artistic subjects may be reproduced. The surfaces of the blocks of marble to which the design is fastened should be made quite smooth or plane.

When the printing or figuring surfaces are produced by electrotyping or by casting, as before referred to, the edges should be made smooth or true by a lathe or planing-machine before fastening the portions of the device onto the mount.

In manufacturing printing or pattern rollers according to the mode described—that is to say, in producing patterns, devices, or designs thereon according to the cutting-out mode herein described—hollow or tubular cylinders (preferably of laminated copper) are

cut into four or six (or more or less) parts or sections along lines parallel to the axis, as shown in Fig. 5, and after the workman has produced the device on each such section by cutting away portions so as to form a sort of open-work, and proceeding in the manner before set forth the sections are riveted or otherwise secured on a copper or other roller, forming, as it were, a cylindrical core surrounded by the pattern-cylinder.

When rollers are used for applying the colors to the printing-surfaces, they may be worked by hand or by machinery.

In carrying into effect the mode of producing the colors before described, the oxides or lacs should be subjected to a protracted crushing to reduce them to the fine powder required.

Having now described the nature of my invention and in what manner the same may be performed, I declare that what I claim as a new article of manufacture, is—

Fabrics with metallic threads interwoven therein, printed or ornamented in the manner substantially as hereinbefore set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

DESPRÉAUX.

Witnesses:

PINSART,

GEO. HEMON.