Improvements in lace fabric

Patent Number: GB836318
Publication date: 1960-06-01
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Requested Patent: GB836318
Application Number: GB19580015992 19580519
Priority Number(s): GB19580015992 19580519
IPC Classification:
EC Classification: D04C1/00
Equivalents:

Abstract

Description

PATENT SPECIFICATION

DRAWINGS ATTACHED 8 I e___ Date of Application and filing Complete Specification: May 19, 1958.

No 15992/58.

Complete Specification Published: June 1, 1960.

Index at acceptance:-Class 74 (1), Dl(A 1: Bl: B 6), H(2: 3).

International Classificatlon:-D 04 c.

COMPLETE SPECIFICATION

Improvements in Lace Fabric I, CHARLES GOODLEY, a citizen of the United States of America, of Park Avenue R.D 16, Middletown Heights, Media, Pennsylvania, United States of America, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement: This invention relates to lace fabric as produced on a lace machine of the type known in the trade as a Nottingham curtain machine.

Lace fabric, i e a web of ornamental or decorative and mainly openwork fabric, is produced on a curtain machine by appropriate movements and intertwisting of distinct sets of threads, viz vertical threads and, bobbin threads Of vertical threads there are spool threads, warp threads and beam or "bottom board" threads, the latter customarily being used for strengthening purposes.

In a curtain machine, as well known to those acquainted with the art concerned, the bobbins, placed in carriages, swing like pendulums through the vertical threads, always in the same arcuate paths by virtue of being guided between blades of fixed, combs, and the vertical threads are threaded through holes or guides in steel bars which are actuated and moved various predetermined distances either to the right or to the left, according to the pattern by a cam mechanism located at one end of the machine The longitudinal shogging of the steel bars accordingly deflects the vertical threads laterally and causes the latter to become twisted around and to connect the bobbin threads, the said bars being moved any desired number of "gaits", a gait being, as well known, the distance between two adjoining carriages The forward and backward swinging movements of the bobbin carriages are conventionally referred to as "motions', and the carriages swing from the front to the back of the machine, and vice versa A curtain machine, moreover, is furnished with jacquard controlled jacks (sometimes known as "interceptors") for determining the manner in which lPrice 3 s 6 d l spool threads, are incorporated into the lace fabric For instance, the formation of ordinary clothing is effected by holding the jacks out of action on both motions of the bobbin carriages.

The object of the present invention is to provide an improved lace fabric as produced on a Nottingham curtain machine.

The improved lace fabric of this invention comprises warp threads constituting a series of pillars, double spool threads, bobbin tie threads and a strengthening background net of beam or bottom board threads, the fabric incorporating dropped ties of the double spool threads which are floated in either direction between two pillars, the said spool threads being pillared in pairs or four together, at desired, locations of the fabric.

The expression "dropped ties" means that the double spool threads are floated from their last point of tie to a pillar to a predetermined point of tie on an adjacent pillar.

Dropped ties of the double spool threads floated and pillared as mentioned above may, for instance, form long or short crosses, diamonds, hexagons or a net incorporating four spool thread pillar effects.

It is well known in the art to employ single spool threads for clothing effects by moving spool threads from one pillar to the left and back again to the right one or more gaits, and also to manipulate the single spool threads to produce openwork effects by pillaring the said spool threads at desired points The present invention is differentiated by the important fact that in the improved lace fabric double spool threads or pairs of double spool threads pillar on the same warp thread, such double spool threads each being floated in either direction between two pillars (warp threads) on

each of which they pillar together and being tied in to form a fancy ground with a strengthening net of beam or bottom board threads.

In order that the invention may be more clearly understood and readily carried into practical effect, specific examples of the fabric and the manner in which it is made will 36318 now be described with reference to the accompanying drawings, wherein, Figure 1 is a front elevation of so much of a Nottingham curtain machine as is necessary to depict structural elements employed in the manufacture of lace fabric, viz jacks, jack guides and bobbins with their carriages, Figure 2 is a part sectional side elevation of the elements shown in Figure 1, the bobbin carriage being in front motion and one of the jacks being shown withdrawn, Figure 3 illustrates in purely diagrammatic fashion the arrangement of the warp threads, double spool threads and beam or bottom board threads in a simple form of the improved lace fabric, Figure 4 is a composite view comprising clothing and adjoining portions of lace fabric incorporating patterns more complex than those shown in Figure 3, Figure 5 is a diagram illustrating typical motions of two spool threads (i e a double spool thread) to pillar them on warp threads, Figure 6 is a development of Figure 5 and shows the pillaring of two double spool threads ran three successive warp threads, and Figure 7 depicts a portion of a practical lace fabric constructed in accordance with this invention.

Referring to Figures 1 and 2 it will be seen that the Nottingham curtain machine employed in the manufacture of the improved lace embodies a spool bar 1, a warp bar 2 and a beam bar 3 A pair of simultaneously operable jacquard controlled jacks (or interceptors) such as 4 is provided for each pair of spool threads At 5 is shown one of the bobbins in its carriage 6, and it is important to note that every other bobbin and carriage is removed from the machine That is to say, alternate bobbins and carriages are left in the machine whilst the intervening ones are removed The front and back fixed comb bars, for the support and guidance of the bobbin carriages 6 during their motions, are indicated at 7 and 8 respectively In Figure 2, a spool thread is indicated at a, a warp thread at b, a bobbin thread at c and a beam or bottom board thread (for strengthening purposes) at d.

In the operation of the machine to produce 50 the improved lace fabric, the warp bar 2 through which the warp threads b are threaded moves one gait to the left on the first or back motion of the bobbin carriages and one gait to the right on the second or front motion 55 On the other hand, the spool bar 1 through which are threaded the spool threads a executes the following movement: -on the back motion it moves two full gaits to the left, pauses while the pairs of simultaneously oper 60 able jacks 4 make their selection, and then moves two further gaits to the left On the front motion, the said spool bar 1 moves two gaits to the right, pauses for selection by the said pairs of jacks, and then moves two addi 65 tional gaits to the right The selection by the jacks in action each motion, is effected by either two jacquards or one jacquard operation at double speed.

In order to produce the improved lace fab 70 ric embodying any of the illustrated nets and many others not shown, in a clean, free flowing manner a special system of drafting employing four colours is adopted The use of this system of drafting, wherein each colour 75 signifies a different way of punching the pattern jacquard cards, constitutes an important aspect of the method of producing the improved fabric.

As a preliminary to explaining this system, 80 reference will first be made to Figure 2, in which a bobbin carriage 6 is shown in the comb bar 7 at the front of the machine, and the jack 4 (one of a simultaneously operable pair) is in the withdrawn position Thus, to 85 be at the back of the machine, the carriage 6 must be swung pendulum-wise into the comb bar 8 and, when released, the pair of jacks 4 will engage spool threads a Employing white, reds green and yellow as the four 90 colours concerned in the system of drafting, then, when read and appropriately translated to a punched card pack, the colours would determine operation of a simultaneously operable pair of the jacks 4 in the following 95 manner: 836,318 836,318 Colour Used Action of pair of jacks When carriages When carriages are at back are at front Red Withdrawn Withdrawn Green Withdrawn Released Yellow Released Released White Released Withdrawn Whites keep the spool threads pillaring on their original warp.

Greens move the spool threads to the adjacent left hand warp and continuation of greens keep the said spool threads pillaring on that warp.

Yellows float the spool threads until a white or a green carries them to the right or left respectively.

Reds move the spools threads to and fro to form clothing.

The formation of ordinary clothing is effected by employing the jacks 4 in a known and conventional manner, i e by holding the jacks out of action on both motions As will be appreciated this is indicated by the colour red on the draft

In the formation of openwork, the pillaring of spool threads a is effected by holding the pairs of jacks 4 withdrawn when the carriages 6 are at the front, i e in the comb bar 7, and releasing them when the carriages are at the back, i e in the comb bar 8 This is indicated by white on the draft.

As previously mentioned, it is the floating of the double spool threads a in either direction between two warp threads as a preliminary to tying them to selected warp threads b, and the double or quadruple pillaring of the spool threads on the warp threads which characterizes the improved lace fabric, and this floating is accomplished by releasing the pairs of jacks 4 on both back and front motions of the curtain machine This is indicated by yellow on the draft It will be readily understood by those versed in the art that normally spool threads a automatically return to their original pillars during the cycle of operation of the spool cam but, by virtue of the design of the said cam, the motions previously described and the withdrawal of jacks on the back motion and release of jacks on the front motion, the pillaring of a double spool thread can be transferred to the warp thread on the immediate left and continue to be pillared there at will This is indicated by the colour green on the draft.

To illustrate the motion of two spool threads (i.e a double spool thread), reference is now made to Figure 5 wherein are depicted two vertical warp threads b' and b P, two spool threads a" and a', and a front view of the tips of two jacks 4 c and 4 d From A to B, the jacks are withdrawn from the spool threads a', a' on both back and front motions of the machine to produce clothing This is indicated by the colour red on the draft From B to C the jacks 4 c and 4 d are released on the back motion and withdrawn on the front motion, thereby pillaring the spool threads on their original warp thread b'-this being indicated by white on the draft From C to D the said jacks are released on both front and' back motions to enable the pair of spool threads aand ad to float across from the warp thread b' to the warp thread b P This is indicated by yellow on the draft From D to E the jacks 4 c and 4 d are withdrawn on the back motion and released on the front motion, pillaring the spool threads a' and a' on the adjacent left hand warp thread b P This is indicated by green From E to F the said jacks are released on both motions, again indicated by yellow on the draft, to float the spool threads a and a' back again to the right from the warp thread b' to the warp thread b', and from F downwards the whites are once again employed to indicate pillaring of the said spool threads on warp thread 1 ".

In Figure 6 wale W is a duplication of the wale shown in Figure 5, and at WI is indicated the wale on the immediate left Referring to wale WI, the colour employed on the draft to determine the operation of the pair of jacks 4 a and 4 b to produce clothing of the spool threads at and a 2 from A to B would, of course, be red The colour used similarly to determine the operation of the same jacks from B to C would be green The colour from D to E would be white and from E to F yellow From F downwards, greens are employed to pillar the spool threads a' and a 2 on warp thread b Y Moreover, between D and E in Figure 6 the two double spool threads are pillared doubly, that is to say all four threads a, a 2, a' and a' are pillared together on the same warp thread b 2 The spaced vertical warp threads are the pillars.

It will accordingly be appreciated from Figures 5 and 6 and the description thereof that by various indications of pattern by the use of four colours a variety of fancy nets can be produced These fancy nets will be designed for combination with a predetermined strengthening beam or bottom board net actuated by a suitable cam to throw beam or bottom board threads according to conventional practice Two different forms of strengthening nets are shown, by way of Carriages at Back Wale i Released Wale ii Withdrawn Released Withdrawn Released Withdrawn In Figure 4 the square background strengthening net is produced by incoroporation into the lace fabric structure of double beam or bottom board threads d' In this case, moreover, floats or dropped ties of the double spool threads a are thrown both to the left and to the right in various ways to produce hexagons at G, diamonds at H which are of only half the depth of the diamonds shown in Figure 3, and large diamonds at J four times the size of the diamonds in Figure 3.

At K the double spool threads a are formed, into clothing by withdrawal of jacks on both motions of the machine, At each of the locations such as those indicated at L four spool threads are pillared together upon one of the warp threads b In forming the large diamonds at J, double spool threads a are floated in one direction and tied to two adjacent warps before being floated and similarly tied twice in the opposite direction.

With regard to the portion of practical lace example, in Figures 3 and 4.

The lace fabric depicted in Figure 3 comprises a simple diamond net produced by the regular floating of pairs of the spool threads a Each such double spool thread is floated alternately to the left and to the right between two adjacent warp threads b and is tied by bobbin threads to the said warp threads at equally spaced points therealong The fabric is strengthened by a square background net of beam or bottom board threads d incorporated as shown.

The action of the pairs of jacquard controlled jacks (interceptors) operating between adjacent vertical warp threads and forming an equal sided diamond of double spool threads (like the diamonds shown in Figure 3) is as follows: Carriages at Front Wale i Withdrawn Wale ii Released Released Withdrawn Released Withdrawn fabric illustrated in Figure 7, all that requires to be pointed out is that much of the pattern is produced by clothing formed with double spool threads within the squares of a background strengthening net, and that at M and N are shown portions of diamond net wherein the diamonds are of respectively different depths.

Claims

WHAT I CLAIM IS:-

1 A lace fabric produced on a curtain machine and comprising warp threads constituting a series of pillars, double spool threads, bobbin tie threads and a strengthening background net of beam or bottom board threads, the said fabric incorporating dropped ties of the double spool threads which are floated in either direction between two pillars, the said spool threads being pillared in pairs or four together at desired locations of the fabric.

2 A lace fabric made upon a curtain lace machine equipped with double jacquards or a single double acting jacquard, a spool bar, 836,318 , predetermined locations on the other of said two warp threads.

4 A lace fabric according to Claim 3, wherein each desired pair of spool threads where it is pillared together with another such pair of spool threads is tied to the relevant warp thread by a bobbin thread and is floated from this tie to a lower point on an adjacent warp thread.

A lace fabric according to any of the preceding claims which is made on a curtain lace machine using jacquard pattern cards punched in accordance with colours on fourcolour drafts laid out and adapted to be used substantially as herein described with reference to the accompanying drawings.

E N LEWIS & TAYLOR, Chartered Patent Agents, Berridge Street Chambers, Leicester, Agents for the Applicant.

a warp bar and a beam strengthening net bar, the fabric comprising a series of pillars each constituted by a warp thread, pairs of spool threads employed as a filling, bobbin threads and beam or bottom board (strengthening net) threads, the spool threads, in addition to being traversed together in pairs and tied by bobbin threads both to the warp threads and to the beam or bottom board threads, also being pillared on the warp threads, in pairs or double pairs, at desired locations of the fabric and floated in pairs to form dropped ties at predetermined points.

3 A lace fabric according to Claim 2, wherein desired pairs of spool threads are traversed to form clothing at predetermined areas of the fabric, each such pair in addition being not only pillared at desired locations on one of two appropriate warp threads but also being pillared together with another pair of spool threads (four spool threads together) at Leamington Spa: Printed for Her Majesty’s Stationery Office, by the Courier Press -1960.

Published by The Patent Office, 25, Southampton Buildings, London, W C 2, from which copies may be obtained.

836,318

Fig. 1.

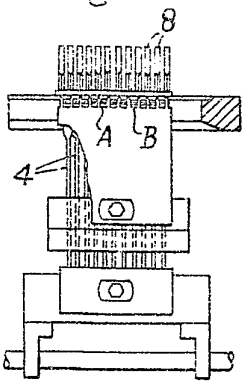


Fig. 2.

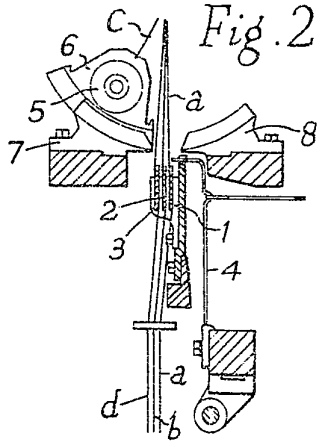


Fig. 3.

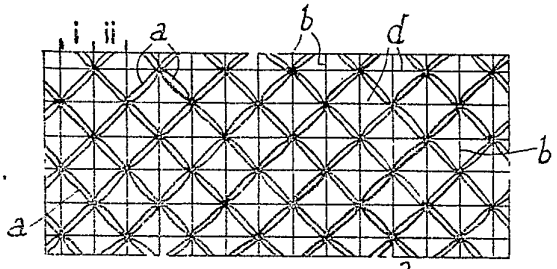
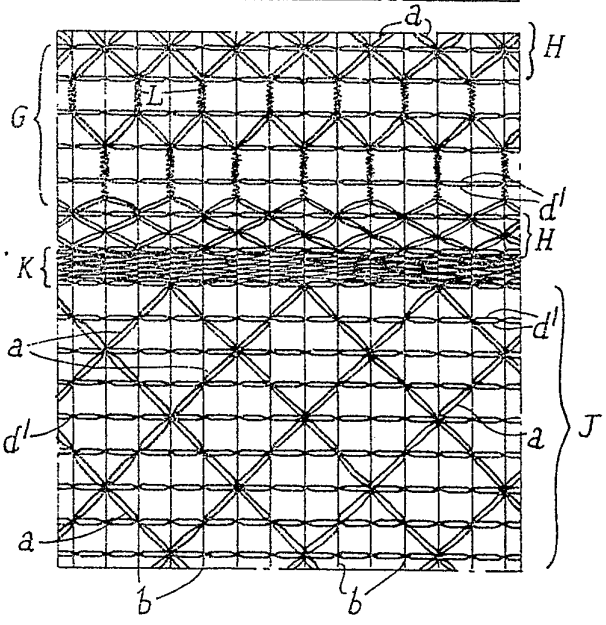


Fig. 4.



836,318 COMPLETE SPECIFICATION
2 SHEETS This drawing is a reproduction of the Original on a reduced scale.
SHEETS 1 & 2

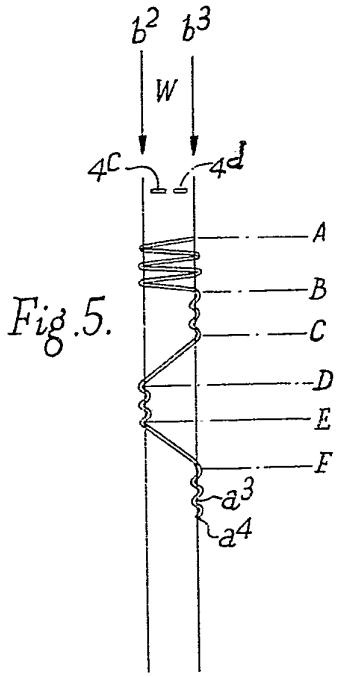


Fig. 5.

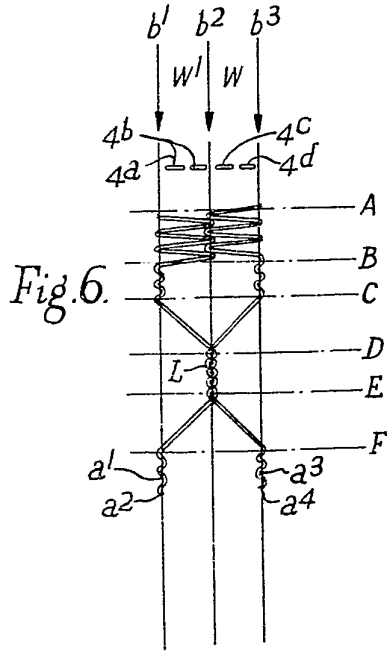
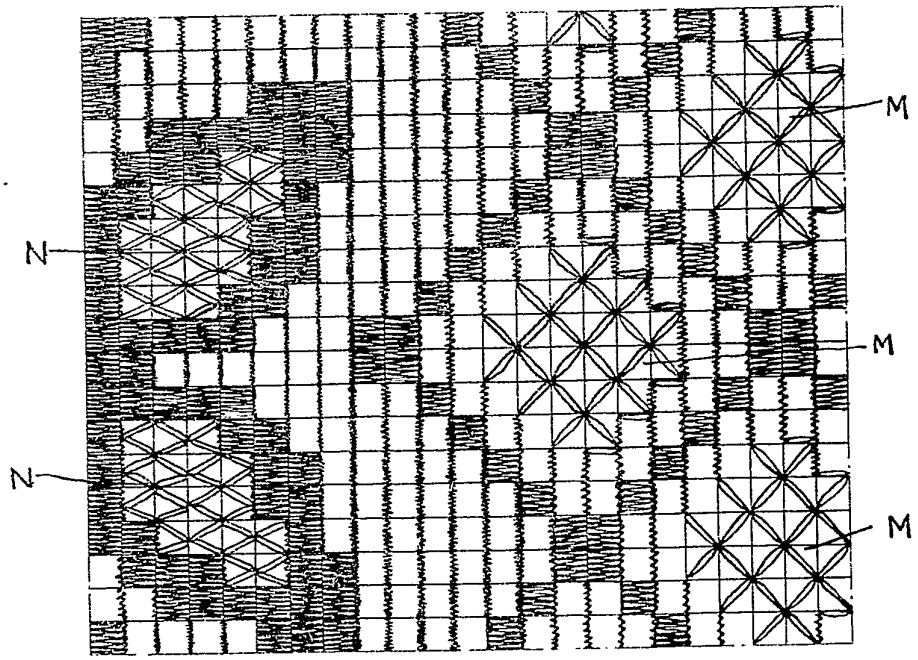


Fig. 6.

Fig. 7.



836,318 COMPLETE SPECIFICATION
2 SHEETS

Fig. 1.

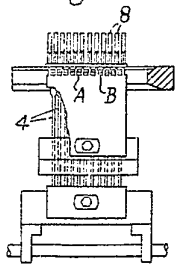


Fig. 2.

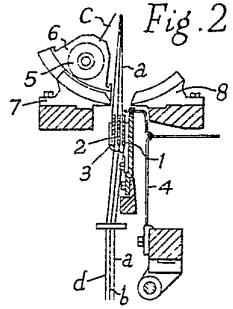


Fig. 3.

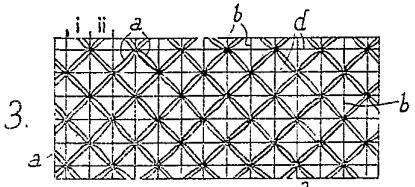


Fig. 4.

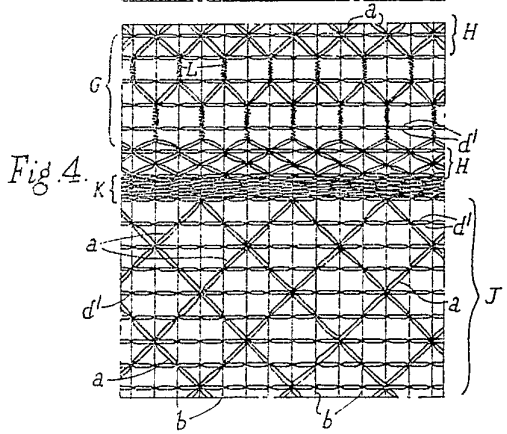


Fig. 5.

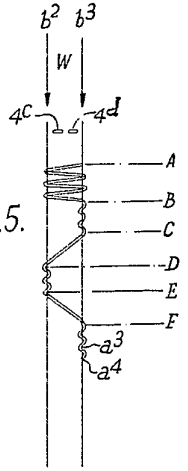


Fig. 6.

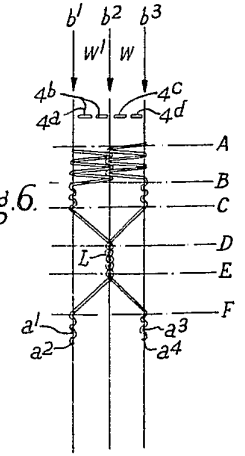


Fig. 7.