

C. W. BIRKIN & E. SANDS.
LACE.

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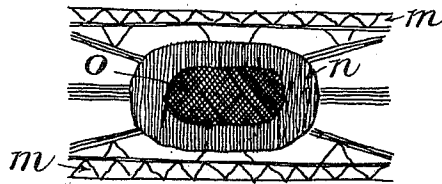


Fig 1



Fig 2

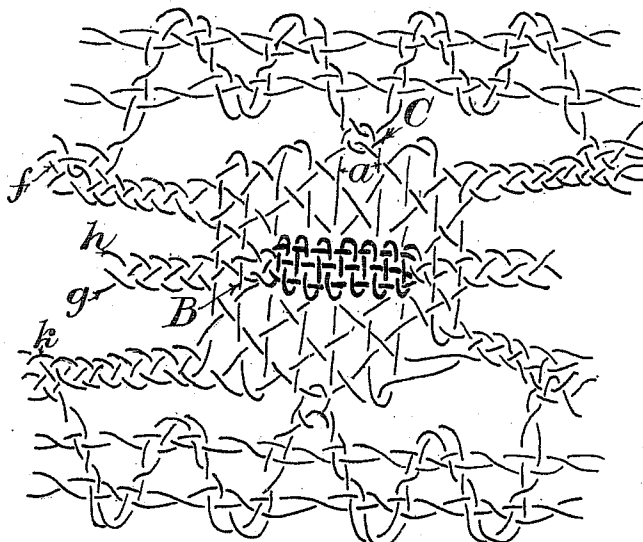


Fig 3

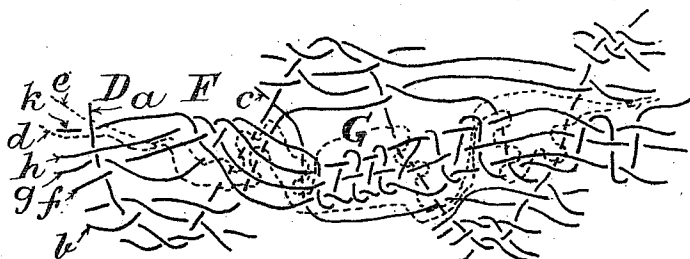


Fig 4

Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES WILFRED BIRKIN AND EDWIN SANDS, OF NOTTINGHAM, ENGLAND.

LACE.

994,634.

Specification of Letters Patent.

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Application filed September 8, 1910. Serial No. 581,048.

To all whom it may concern:

Be it known that we, CHARLES WILFRED BIRKIN and EDWIN SANDS, subjects of the King of Great Britain, and residents of the city of Nottingham, in the county of the said city, England, have invented new and useful Improvements in Lace, of which the following is a specification.

This invention relates to improvements in braided lace made upon machines in which it is possible to twist any thread in the machine with any other thread, and which have a single spindle race and are substantially of the type described in specification of British Patent No. 11411 of 1894, in which machine there are a number of spindles which are thrown into and out of action in pairs, and in which it is possible to twist braid, or plait any thread in the machine with any other thread; the object of the present invention being the production of a lace of the kind made upon such a machine having a loose or floating spot, or other object, over a groundwork or net, and in which the threads used for making the spots or other objects are incorporated in the lace between the making of the spots or other objects.

In the accompanying drawings:—Figure 1 is a diagram of a lace insertion illustrating this invention. Fig. 2 is an edge view of the same. Fig. 3 is a diagram of a piece of lace made according to this invention showing the interlacings of the various threads and, Fig. 4 is an enlarged diagram of part of the piece of lace shown in Fig. 3.

The lace shown in Figs. 1 and 2 illustrates the object of this invention and is a drawing of a lace "insertion" which has parallel edges *m* with figures *n* at intervals, and according to this invention there is in the center of each figure a floating spot *o* which is connected to the figure at both ends as shown in Fig. 2. The invention may however be used in connection with any of the kinds of lace usually made on machines of the type herein referred to and in all cases the floating spot or other object is formed over a figure or groundwork and the threads used for making the spot or other object are incorporated into the lace before and after the making of the spot or other object.

As is well known by those skilled in the art of producing lace by machinery, a braided lace of the type to which this invention is applied is made upon a machine

in which are employed a number of spindles that are worked together in pairs, that is to say, two spindles are thrown into or out of work at the same time. In such a machine it is possible by proper selections of the spindles which are caused to operate together, to twist or braid together any two selected threads, the lace so made, in this respect, differing from that of the kind which is made upon Lever's and go-through machines where are employed warp threads and bobbin threads and where it is impossible to twist together two warp threads or two bobbin threads. In order to produce the floating spots over a groundwork in machine-made braided lace, it has been found necessary to have certain of the spindles which are caused to work together empty or without a bobbin and thread, else the spots will be tied into the groundwork, and these empty spindles are termed dummies, and the operation of such dummies is indicated in Fig. 4.

In Fig. 3 the floating spot is shown in thicker lines as made from four threads *f*, *g*, *h* and *k*, and Fig. 4 illustrates the motion of the bobbins for the passing of the thread *a* under the floating spot between the points B and C, Fig. 3, and also the paths of the dummies or empty bobbins *d* and *e*, which paths are indicated by dotted lines. At the point D Fig. 4 the thread *a* is shown interweaving with the spot threads *f*, *g*, *h*, *k*, for the last time before the making of the spot, after which the spot threads weave with each other as shown as F and G, but whenever the thread *a* has to pass a spot thread, it and the spot thread are so worked in conjunction with a dummy, that if the dummy carried a thread such thread would always pass under the thread *a* and over the spot threads and fasten the thread *a* to the spot, but since there is no thread to the dummy the thread *a* passes under the spot threads without interweaving with such threads. The drawing Fig. 4 illustrates also the working of the ground threads *b* and *c*, and these and all other ground threads are worked in the same manner as herein described with reference to the ground thread *a*.

The drawing Fig. 4 shows a spot made from four threads and with two dummies, but the number of threads and dummies used may be varied, provided that in all cases the dummy, if it had a thread, would always

- work such thread under or over the spot threads and over or under the ground threads, also any threads in the machine used for making the groundwork at one part of the fabric may be selected and worked as spot forming threads in another part of the fabric, and different threads may be used for forming the spot in different parts of the same fabric.
- 10 We claim:—
1. A machine-made, braided lace fabric in which at some parts all the threads are braided with each other and at other parts some of the threads are braided with each other to form the groundwork and the other threads are interwoven with each other to form a floating spot or other object over the groundwork substantially as herein set forth.
- 20 2. A machine-made, braided lace fabric having floating spots or other objects over the groundwork of the lace and connected to such groundwork at their ends only by the threads used for making such floating spots or other objects substantially as herein set forth.
3. A machine-made, braided lace fabric having floating spots or other objects over a groundwork of the lace and connected thereto by the threads used for making such floating spots or other objects which threads are incorporated in the lace when not used for making floating spots or other objects substantially as herein set forth.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
