(No Model.) 2 Sheets—Sheet 1.

A. BOLLENTIN.

TUFTED FABRIC.

No. 423,659. Patented Mar. 18, 1890.

Fig. 2.

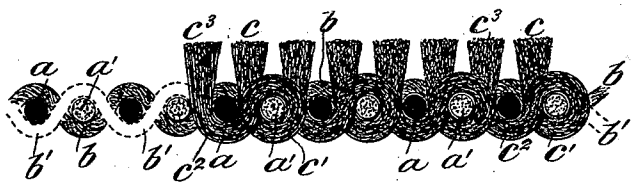


Fig. 3.

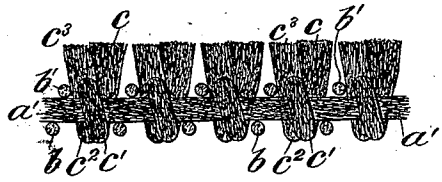
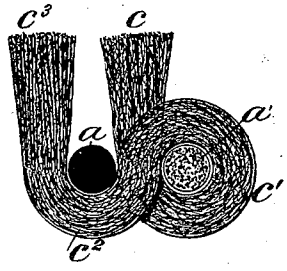


Fig. 1.



Witnesses:
C. L. Sundgren
D. H. Haywood

Inventor:
Adam Bollentin
by attorneys
Brown & Griswold

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

A. BOLLENTIN.

TUFTED FABRIC.

No. 423,659. Patented Mar. 18, 1890.

Fig. 4.

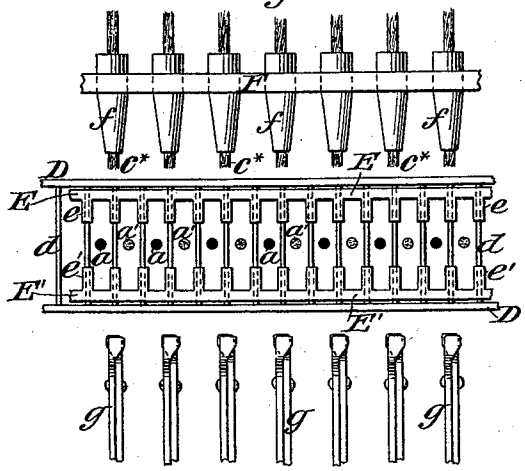


Fig. 5.

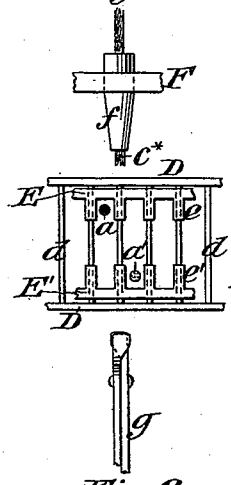


Fig. 6.

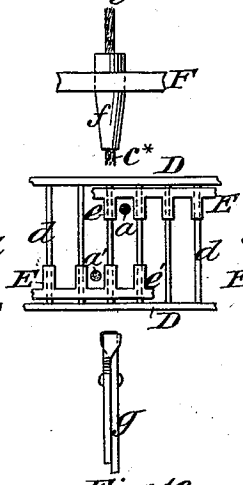


Fig. 7.

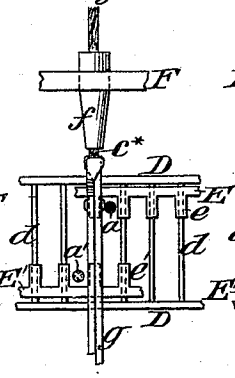


Fig. 8.

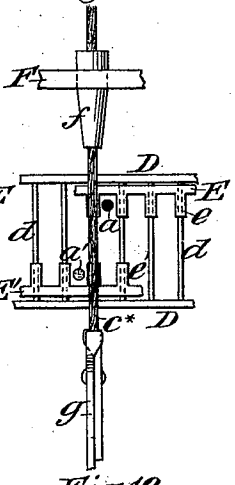


Fig. 9.

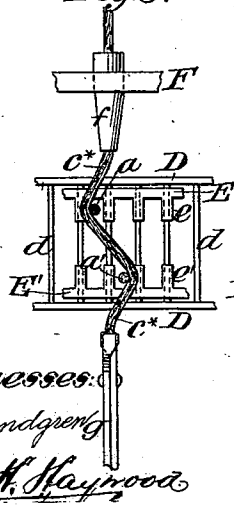


Fig. 10.

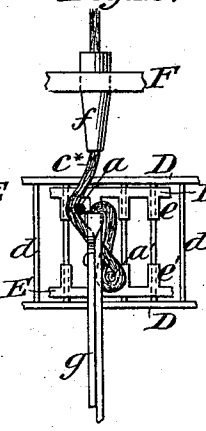


Fig. 11.

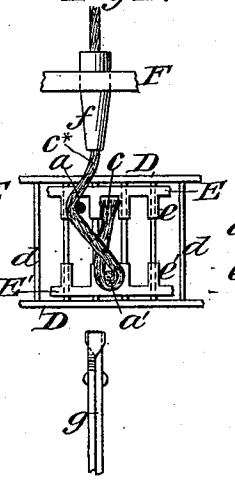
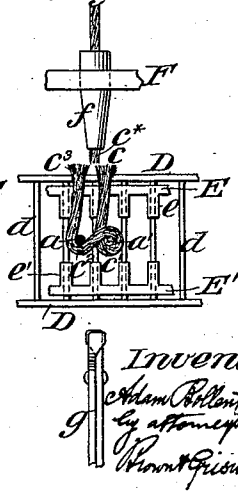


Fig. 12.



Witnesses:
C. L. Sundgren
D. H. Haynes

Inventor:
Adam Bollentin
by attorneys
Brown & Griswold

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ADAM BOLLENTIN, OF NEW YORK, N. Y.

TUFTED FABRIC.

SPECIFICATION forming part of Letters Patent No. 423,659, dated March 18, 1890.

Application filed August 21, 1889. Serial No. 321,517. (No specimens.)

To all whom it may concern:

Be it known that I, ADAM BOLLENTIN, of the city of New York, county of New York, and State of New York, have invented a new and useful Improvement in Tufted Woven Fabrics, of which the following is a specification, reference being had to the accompanying drawings.

This improvement relates especially to tufted woven fabrics—such as are now made by hand for rugs; but the tufted fabric which constitutes my invention may be of various materials and weights to adapt it to various other uses. This fabric is composed of a warp and a weft and a series of tufts, each of which tufts completely encircles one warp-thread and has one portion thereof looped around the back of an adjacent warp-thread on one side of that which it encircles, the tufts thus being so knotted to the warp as to be firmly secured in the fabric.

My improvement is illustrated in the accompanying drawings.

Figure 1 represents a transverse section of two warp-threads and a tuft inclosing one of them and looped around the back of another one, illustrating the way in which the tufts are knotted in my fabric. Fig. 2 represents a section of a piece of my fabric, taken parallel with the weft. Fig. 3 represents a section of the same parallel with the warp. Figs. 4 to 12, inclusive, represent portions of a loom which may be employed for the manufacture of my fabric, showing the parts which encircle and knot the tuft into the fabric in different positions.

Similar letters of reference designate corresponding parts in all the figures.

a a' are the warp-threads; b b', the weft.

The letters c c' c^2 c^3 designate the tufts, these four letters being employed to indicate the different parts of a tuft.

In Fig. 1 the portion c' of the tuft is shown as completely encircling the warp a', the portion c^2 as looped around the back of the warp a, and the two ends c c^3 as projecting above the warp. Each tuft thus encircles one warp-thread and is looped around the back of the next one on one side of it between the successive shots of wefts, as shown in Figs. 2 and 3.

This fabric may be produced in various ways and may be woven in a loom of any suitable kind. I do not confine myself to the use of any particular method or any particular kind of loom or mechanism for the purpose. I will, however, describe with reference to Figs. 4 to 12, inclusive, certain parts of a loom and their operation by which the fabric may be produced.

D d designate an ordinary loom-reed. E e and E' e' designate two toothed racks arranged in front of said reed, the upper rack having its teeth e presented downward and the lower one having its teeth e' presented upward. These racks are intended to have imparted to them at proper intervals, as will be presently explained, a longitudinal movement across the reed, the movements of the two being simultaneous, but always in opposite directions. Above the reed and at a suitable distance in front of it is a horizontal bar F, which carries a number of trumpet-like tubes f, equal to half the number of warp-threads in the fabric, minus the selvage-threads. The yarn from which the tufts are made is supplied through these tubes from a series of beams or rollers, said rollers or beams and tubes and their appurtenances resembling, substantially, those employed in known looms for weaving tufted fabrics. Under the said bar F and tubes f are arranged a series of nippers g—one for each tube.

To explain the method of inserting and knotting the tuft by the means herein represented, I will first suppose the parts to be in the position indicated in Fig. 4, the rack-bars E E' having their teeth opposite the dents of the reeds and the nippers being depressed below the reeds.

For the purpose of better illustrating the operation I have represented the warp-threads as shaded alternately light and dark, the dark threads being designated by a and the alternating light ones by a'.

The necessary movements of the parts take place in the following order:

First. The shed is opened, as illustrated in Fig. 5, wherein the warp a is shown raised and the warp a' depressed.

Second. The movements of the racks take place, the upper one E moving to the right and the lower one E' moving to the left, as shown in Fig. 6.

Third. The nippers *g* rise between the threads *a a'* and seize the end of the tuft-yarn *c**, which protrudes through the bottom of a tube *f*.

Fourth. The nippers *g* descend a distance equal to the length of yarn required to make a complete tuft and knot—such as is shown in Figs. 1 and 2—and carry the tuft-yarn from the tube *f* down between the warp-threads to a proper distance below the open shed, as shown in Fig. 8.

Fifth. The rack-bars E E' are moved back to the position first mentioned corresponding with Fig. 5, thus causing the tuft-yarn *c** between the tube *f* and the nippers *g* to take a zigzag form, as shown in Fig. 9.

Sixth. The nippers rise again, as shown in Fig. 6, and carry up with them between the two threads *a a'* a sufficient length of tuft to produce one of the tuft ends, as shown in Fig. 10. The yarn is now looped around the lower thread *a'* of the shed and is crossed above the said thread.

Seventh. The nippers open and liberate the end of the yarn and descend to their first-described position, as shown in Fig. 11.

Eighth. The shed is closed and the yarn is then cut off near the bottom of the tube *f*. The closing of the shed causes the warp-threads *a* to carry down the yarn over the thread *a'*, so that the latter is completely encircled by the yarn, and at the same time the yarn is left looped under the thread *a*. The knot is thus completed. One or two shots of filling are now put in, as in ordinary plain weaving. The manufacture of the fabric is a repetition of the above-described operations.

The fabric thus produced not only possesses the advantage of having the tufts knotted into it in a very secure manner, but also has the further advantage that the tufts appear closer together in the pile because their ends are evenly distributed.

What I claim as my invention, and desire to secure by Letters Patent, is—

The tufted fabric herein described, consisting of warps and wefts and a series of tufts, each of which completely encircles one warp-thread and has one portion thereof looped around the back of the next warp-thread at one side of that which it encircles, substantially as herein described.

ADAM BOLLENTIN.

Witnesses:
FREDK. HAYNES,
GEO. BARRY.