Jan. 2, 1923. 1,441,110

L. A. O'LENA.

METHOD AND APPARATUS FOR PRODUCING KNITTED FABRIC.

FILED OCT. 20, 1922. 2 SHEETS-SHEET 1

Fig. 1.

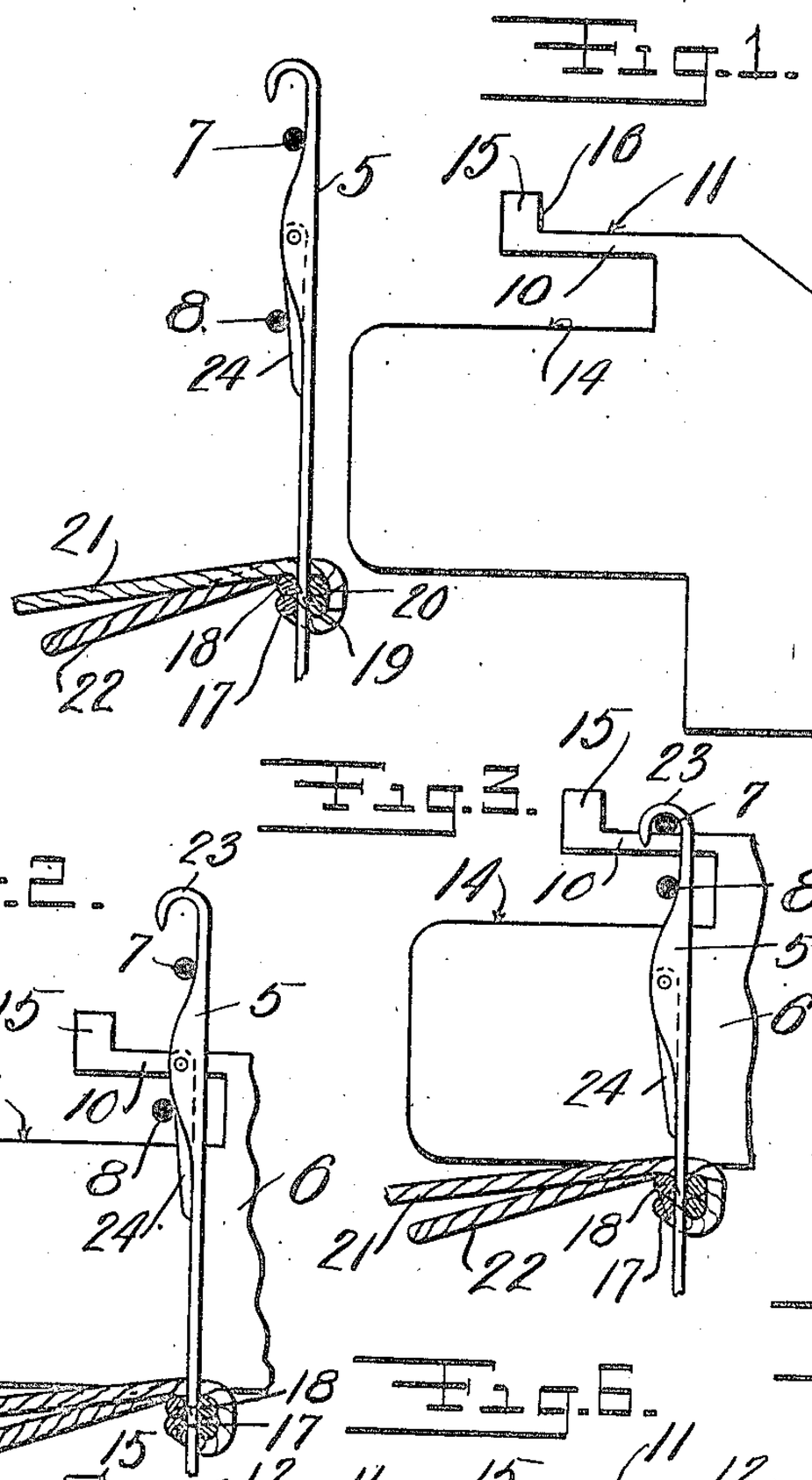


Fig. 2.

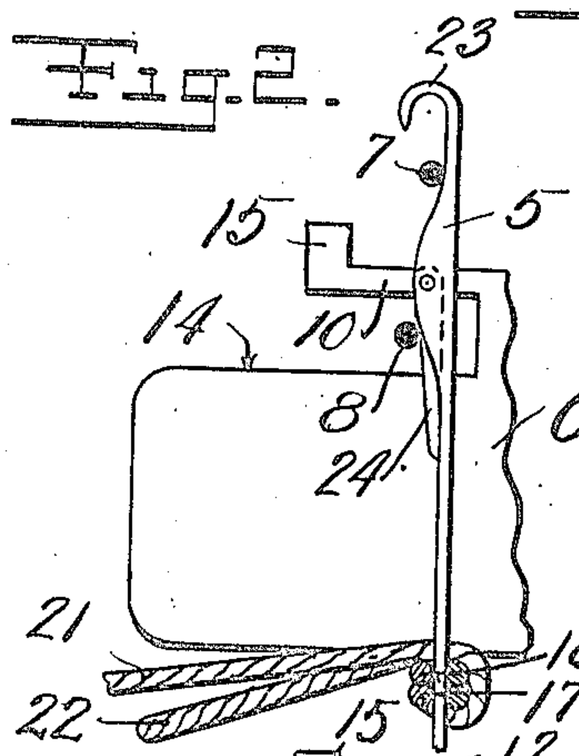


Fig. 3.

Fig. 4.

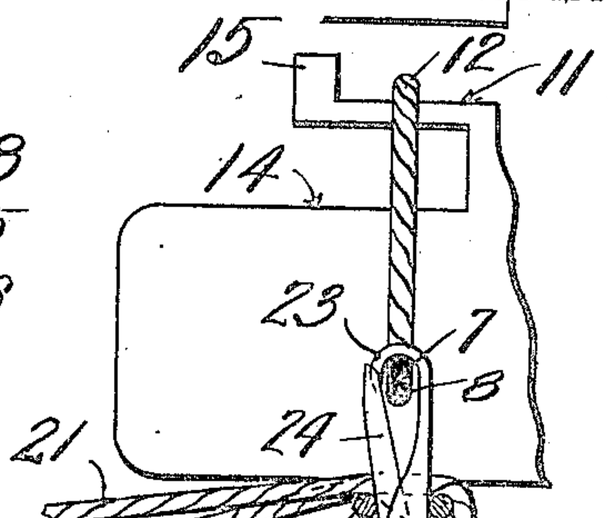


Fig. 5.

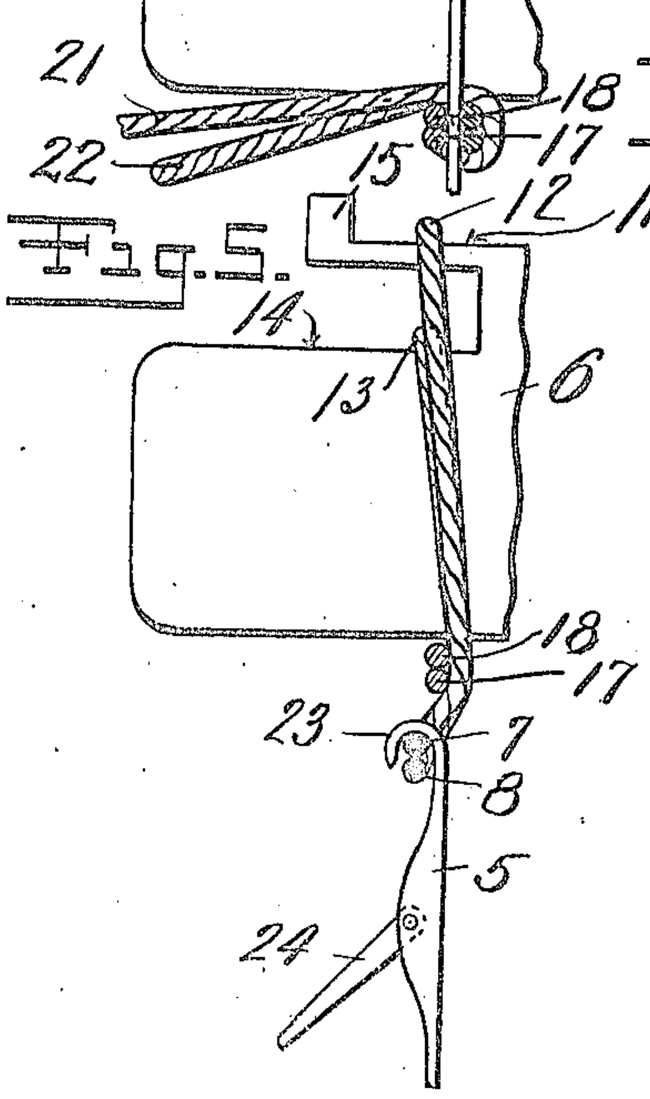


Fig. 6.

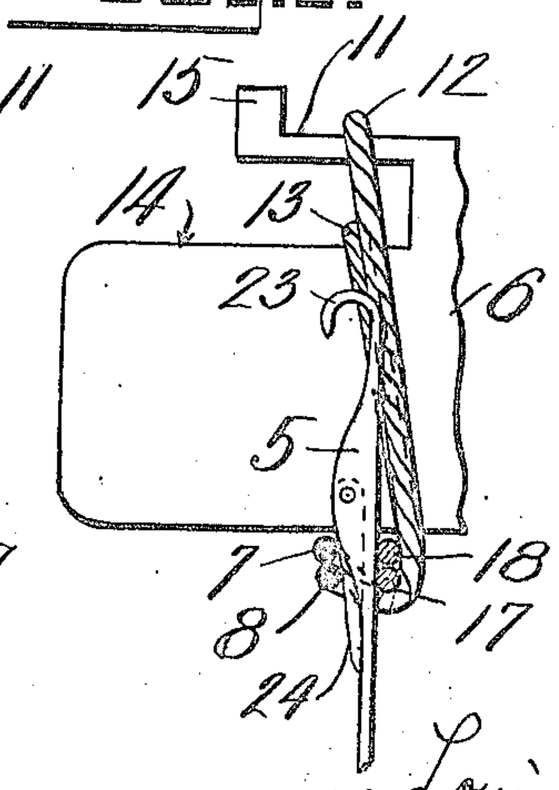
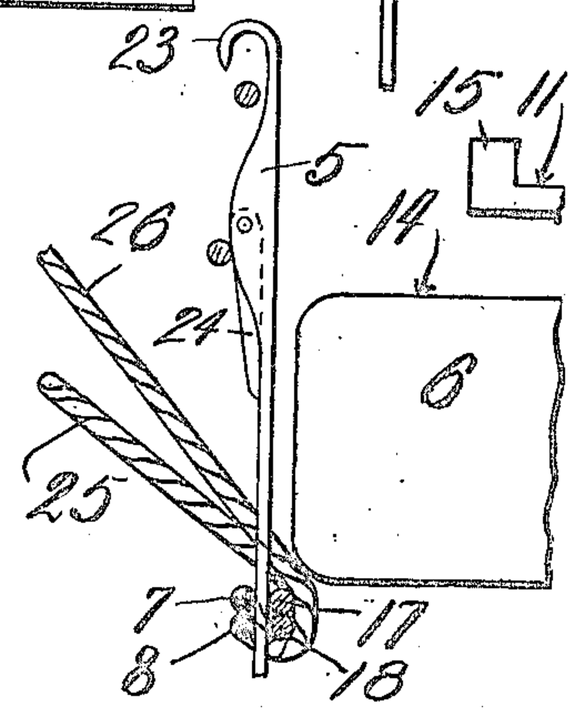


Fig. 7.



Inventor
Louis A. O'Lena
By his Attorney
Frank S. Kent

Jan. 2, 1923. 1,441,110

L. A. O'LENA.

METHOD AND APPARATUS FOR PRODUCING KNITTED FABRIC.

FILED OCT. 20, 1922. 2 SHEETS-SHEET 2

Fig. 8.

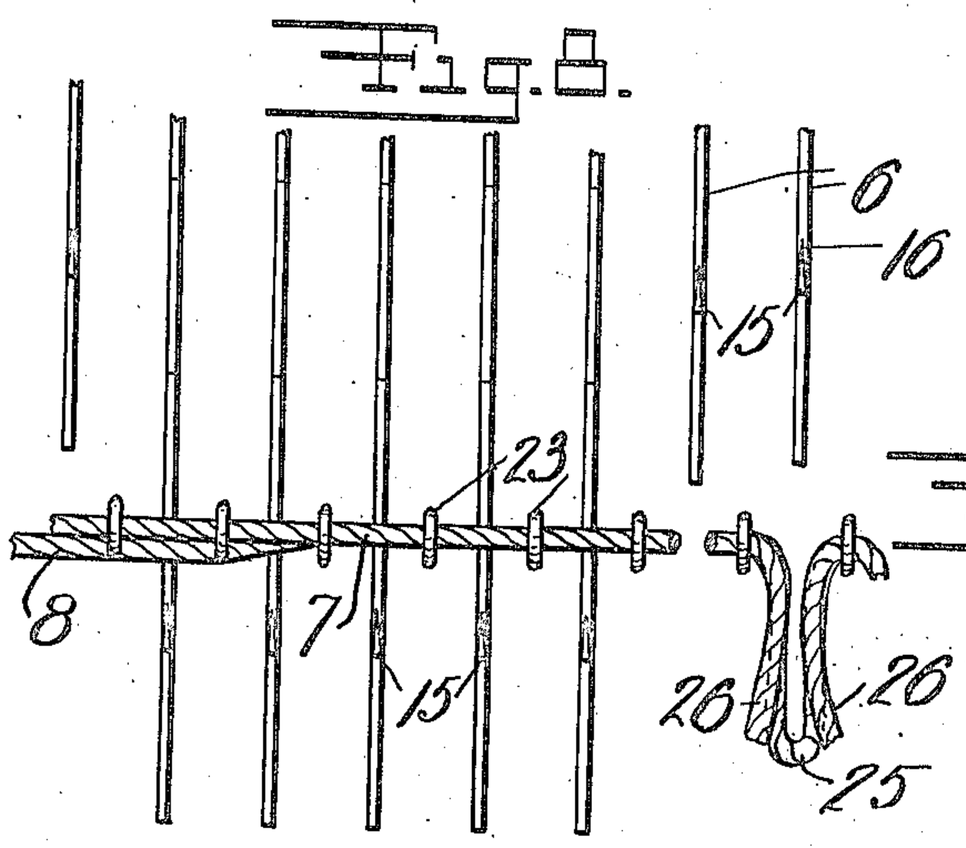


Fig. 11.

Fig. 10.

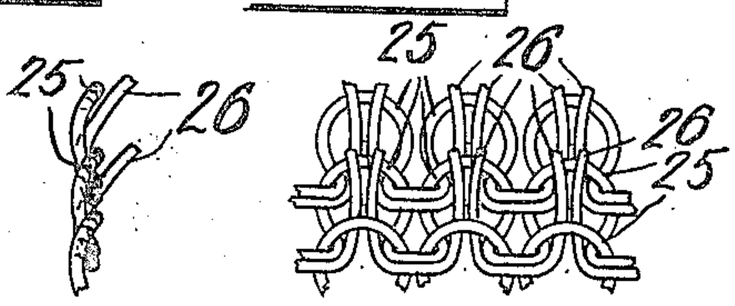


Fig. 9.

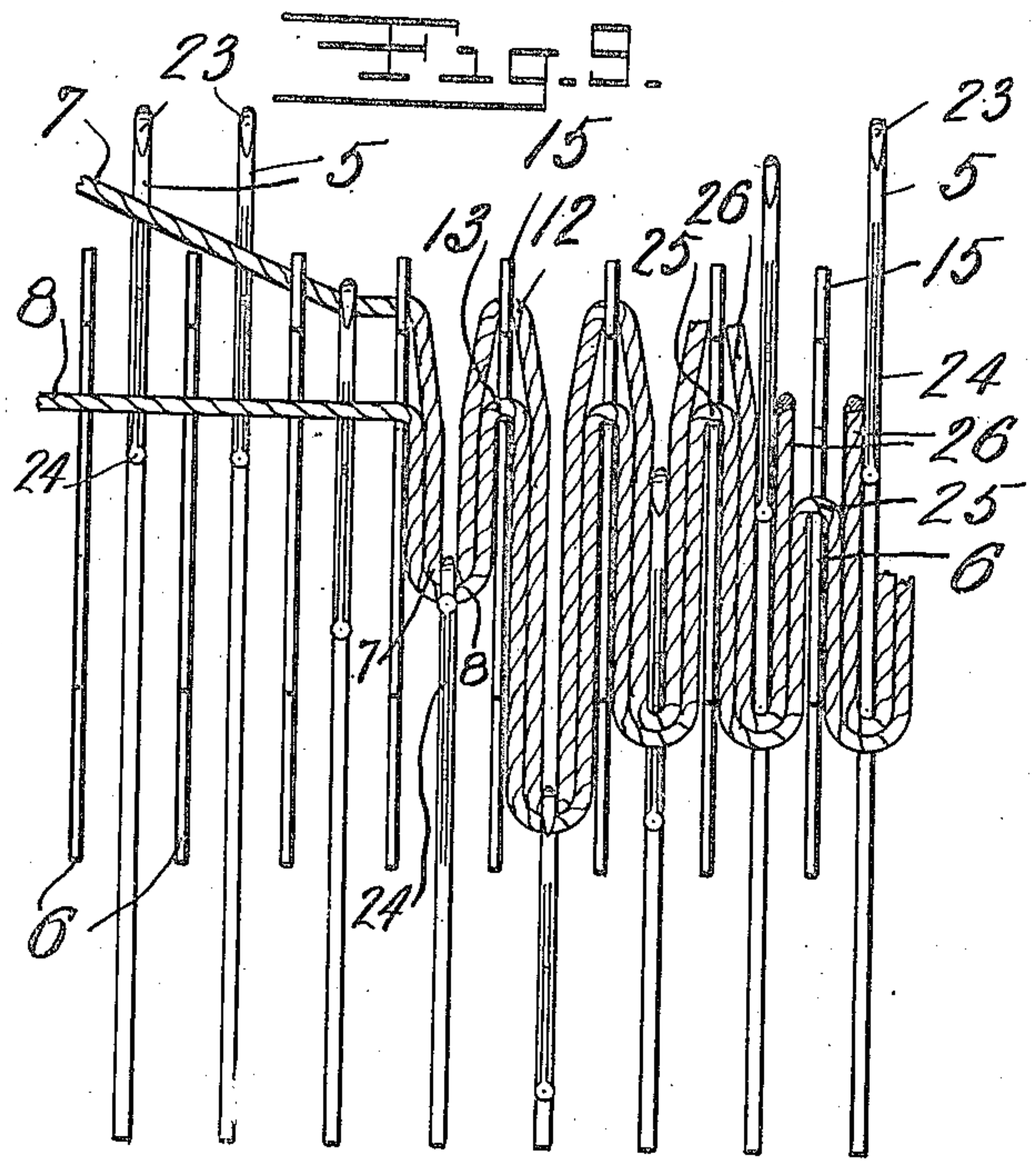


Fig. 12.

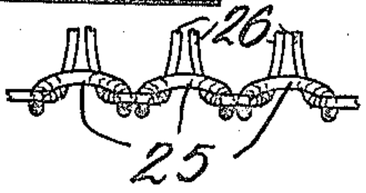


Fig. 13.

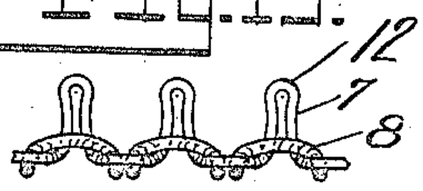
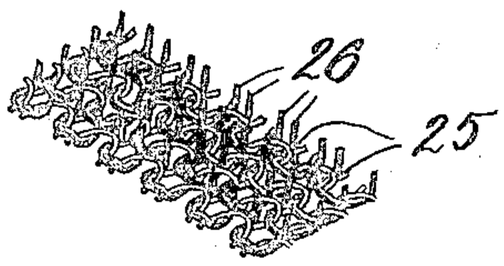


Fig. 14.



Inventor
Louis A. O'Lena

By his Attorney
Frank A. Hunt

Patented Jan. 2, 1923. 1,441,110

UNITED STATES PATENT OFFICE.

LOUIS A. O'LENA, OF BROOKLYN, NEW YORK, ASSIGNOR TO NATHAN HALPERIN, OF BROOKLYN, NEW YORK.

METHOD AND APPARATUS FOR PRODUCING KNITTED FABRIC.

Application filed October 20, 1922. Serial No. 595,710.

To all whom it may concern:

Be it known that I, LOUIS ALBERT O'LENA, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Methods and Apparatus for Producing Knitted Fabric, of which the following is a specification.

This invention relates generally to means and a method for producing by knitting machine operations an improved fabric having a pile or nap.

Napped fabrics have been heretofore produced by knitting as distinguished from weaving operations but the machines used in producing such goods have been unduly complicated by the provision of an extra row or set of needles. It is an object of the present invention to produce napped or looped fabrics on a knitting machine provided with merely the usual single row of needles.

The invention includes the use of specially formed sinker members having two thread engaging surfaces so related to each other that when the double thread is caught and drawn into engagement with the interposed sinkers by the downward movement of the flanking needles, one of the threads is formed into an extended loop formation with relation to the other thread. The sinker member may also be provided with a thread cutting member which operates to sever the extended loop, when the sinker member is withdrawn at the conclusion of the interlooping or enchaining operation performed by the needle, to provide a pile in the finished fabric having severed and open rather than looped ends.

In the drawings, in which a preferred embodiment of the invention has been selected for illustration,

Figures 1 to 7 inclusive are views on an enlarged scale of the principal operating parts of a knitting machine embodying the invention and showing the cooperative steps between the sinkers and the needles in making up a cycle of operation.

Figure 8 is a plan view showing a series of steps of operation corresponding to those shown in Figures 1 to 7.

Figure 9 is a diagrammatic illustrating the several steps shown in Figure 8.

Figure 10 is a view on an enlarged scale in plan of a portion of a piece of fabric produced in the operations illustrated in Figures 1 to 7.

Figure 11 is a side view of the article shown in Figure 10.

Figure 12 is a view in section of a modified form of fabric produced in the machine.

Figure 13 is a sectional view of still another form of fabric.

Figure 14 is a view in perspective of the type of fabric illustrated in Figure 12.

Referring to the drawings for a more detailed description of the invention, in Figure 1 is shown a needle 5 of the ordinary hook and latch type such as is commonly used on standard forms of knitting machines, and a sinker member 6 arranged to mechanically cooperate with the needle 5 in the operation of the machine. In operation the needle 5 is reciprocated vertically to draw the threads 7 and 8 downward through a loop formed in the thread in the last previous operation. The sinker 6 is laterally moved in synchronism with the movement of the needle 5 in the usual manner into and out of position between adjacent needles to hold the yarn or thread in the position and arrangement best adapted for the effective operation of the needles.

The sinker member 6 differs from the ordinary sinker in the provision of an extension or arm 10 on its upper margin which presents a secondary edge 11 for engaging the thread 7 and causing it to take an extended loop formation 12 relative to the position of the corresponding portion 13 of the thread 8 engaged by the upper edge 14 of the sinker member 6 proper.

In order to sever the extended loops 12 and thereby produce a pile formation in the finished fabric having severed instead of looped ends, the extension member 10 on the sinker is provided with a cutting member 15 having a cutting edge 16 that upon withdrawal of the sinker to the right, as illustrated, will engage and sever the loop 12 supported by the extension 10. The upper edge 11 of the extension may also be formed to itself cut the engaged thread during the

latéral withdrawal of the sinker member, and the cutting function thus obtained may be utilized in conjunction with or independently of the cutting action of the cutting member 15.

In order to describe the successive operative steps comprising in a complete cycle of operations, reference is made to Figures 1 to 7 inclusive of the drawings.

In Figure 1 the needle 5 is shown in its elevated position and the sinker member 6 is shown in its retracted position to the right. The two threads represented at 7 and 8 are led into the machine from separate spools and are held pressed by suitable guide members against the left-hand edge of the needle 5. At 17 and 18 are shown loops formed by the last previous cycle of operation in which are enchained the loops 19 and 20 of the second previous set of operations. At 21 and 22 are extensions of the loops 17 and 18, the extension 22 being wholly absorbed in the body of the work and the ends 21 remaining in extended position beyond the work to form a pile in subsequent operations.

In Figure 2 the sinker member 6 has been advanced to the left to its operative position in which the lower thread 8 passes into the space between the lower edge of the extension 10 and the upper edge 14 of the sinker member 6 while the upper thread 7 engages the needle 5 beneath the terminal hook portion 23 thereof. Meanwhile the lower edge of the sinker member rests on the loops previously formed in the thread and holds the loops depressed during the succeeding enchaining operation.

In Figure 3 of the drawing the needle 5 has begun its descent and the hook member 23 has engaged the upper thread 7 and brought it into engagement with the upper edge of the sinker extension 10.

In Figure 4 of the drawing the descent of the needle has continued and the thread 8 has also been engaged by the hook 23 and drawn downwardly across the edge 14 of the sinker. Meanwhile the latch 24 has engaged the loop 18, the engagement causing the latch to swing to its raised position in guarding relation to the end of the hook 23 to facilitate the downward movement of the hook with its contained threads through the loops 17 and 18.

In Figure 5 of the drawings the descent of the needle has been completed and the threads 7 and 8 have been drawn through the loops 17 and 18. Meanwhile the previously formed loops 19 and 20 have been withdrawn and form their part of the completed fabric.

In Figure 6 the return and upward movement of the needle has begun and the portions of the threads 7 and 8 which were engaged by the hook 23 in the descent of the needle are now engaged by the lower edge of the sinker 6 and remain in that position to form the new loops through which the new thread sections are drawn in the next cycle of operation.

Figure 7 shows the needle 5 nearing its uppermost limit of travel and the sinker 6 approaching its right-hand retracted position. The thread loop 25 is shown falling to the left to take a position corresponding to the loop 22 in Figure 1. The thread extensions 26 which formed the loop 12 in Figures 4, 5 and 6 were separated from each other by the engagement of the cutter member 15 with the loop 12 in the sinker retracting movement. It will be seen that the extended threads 26 project beyond the ends of the loops 25 by a distance equal to the distance separating the upper edge 14 of the sinker and the upper edge 11 of the sinker extension 10. This distance which can be determined in advance measures the depth of the pile provided by the extension ends 26 in the finished fabric.

It will be clear that the severing operation referred to may be omitted if desired as a result of which a napped fabric will be produced having extended loops similar to those in bath towel fabrics and as represented in Figure 13 of the drawing.

Portions of finished fabrics having severed ends forming the modified form of pile referred to are shown in Figures 10, 11, 12 and 14 of the drawings.

What I claim is:

1. In a knitting machine adapted to operate with a double thread, a sinker member having a thread engaging extension above and parallel to its upper thread engaging edge, said extension being adapted to enter between the two threads and hold the upper thread in an extended loop formation with relation to the lower thread during the operation of the needle, and means for severing the extended loop on the retraction of the sinker member, whereby the severed threads ends will project from the body of the goods following the knitting operation.

2. In a knitting machine, adapted to operate with a double thread, means for holding the threads in a spaced apart loop formation during the operation of the needle whereby one of the loops will project beyond the other, and means for severing the projecting loop on the withdrawal of the thread spacing means whereby the severed threads will project from the body of the goods following the knitting operation.

3. In a knitting machine adapted to operate with a double thread, a sinker member having a thread engaging extension above and parallel to its upper thread engaging edge, said extension being adapted to enter between the two threads and hold the upper thread in an extended loop forma-

tion with relation to the lower thread during the operation of the needle and a cutter carried by the sinker for severing the extended loop on the retraction of the sinker member, whereby the severed threads will project from the body of the goods following the knitting operation.

4. In a knitting machine adapted to operate with a double thread, a sinker member having a thread engaging extension above and parallel to its upper thread engaging edge, said extension being adapted to enter between the two threads and hold the upper thread in an extended loop formation with relation to the lower thread during the operation of the needle and a cutting blade projecting from the first mentioned sinker extension for severing the extended loop on the retraction of the sinker member whereby the severed threads will project from the body of the goods following the knitting operation.

5. In a knitting machine adapted to operate with a double thread, a sinker member having an extension for entering between the threads to hold the threads in a spaced apart loop formation during the operation of the needle, and means associated with the sinker for severing one of the loops on the withdrawal of the sinker, whereby the severed ends will project from the body of the goods following the knitting operation.

6. In a knitting machine adapted to operate with a double thread, a sinker member having a thread engaging extension spaced above its normal thread engaging upper edge, said extension being adapted to enter between the threads and to hold them in spaced apart loop formation during the operation of the needle, a cutter carried by the sinker and adapted to sever one of the loops on a withdrawal of the sinker, whereby the severed ends will project from the body of the goods following the knitting operation.

7. In a knitting machine adapted to operate with double threads for the formation of fabric having severed ends projecting from the body, means to support the threads in a separated loop formation, and a cutter rendered effective by the movement of said means.

8. The method of producing a knitted fabric which consists in supporting two threads in a separated looped formation and severing one of the loops on the withdrawal of the thread supports while producing the enchaining operation.

9. In a knitting machine adapted to operate with a double thread, a sinker having a body portion and a pair of relatively separated thread engaging surfaces for holding the threads in a spaced apart loop formation, one of said thread engaging surfaces having an extended cutting edge for severing said thread upon the retraction of the sinker.

10. In a knitting machine adapted to operate with a double thread for the formation of fabric having severed ends projecting from the body thereof, a sinker having a body portion and a pair of relatively separated thread engaging surfaces for holding the threads in a spaced apart loop formation, one of said thread engaging surfaces having an extended cutting edge.

In testimony whereof I affix my signature.

LOUIS ALBERT O'LENA.