Jan. 14, 1941. L. BRANDT 2,228,944

FABRIC AND STITCH

Filed July 12, 1939 2 Sheets-Sheet 1

Fig. 1.

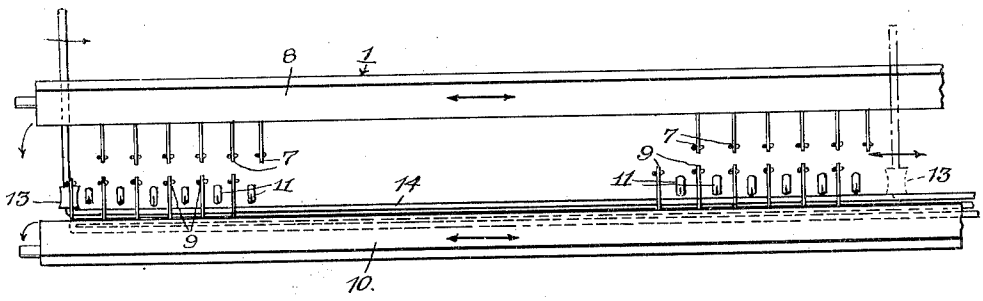


Fig. 2.

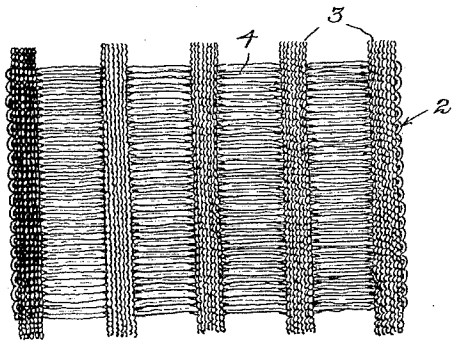


Fig. 4.

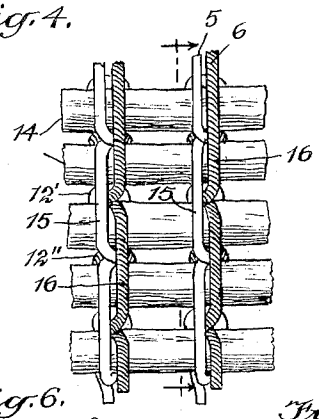


Fig. 5.

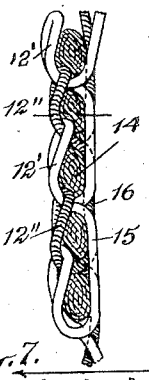


Fig. 3.

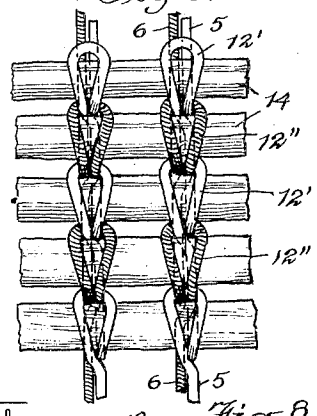


Fig. 6.

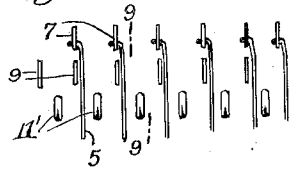


Fig. 7.

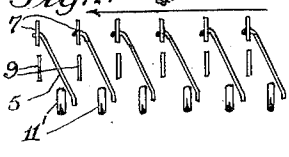
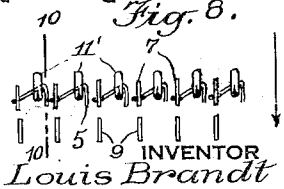


Fig. 8.



WITNESSES

Geo. W. Naylor

A. L. Ritchie

INVENTOR

Louis Brandt

BY

Munn, Anderson & Liddy

ATTORNEYS

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FABRIC AND STITCH

Filed July 12, 1939 2 Sheets-Sheet 2

Fig. 9.

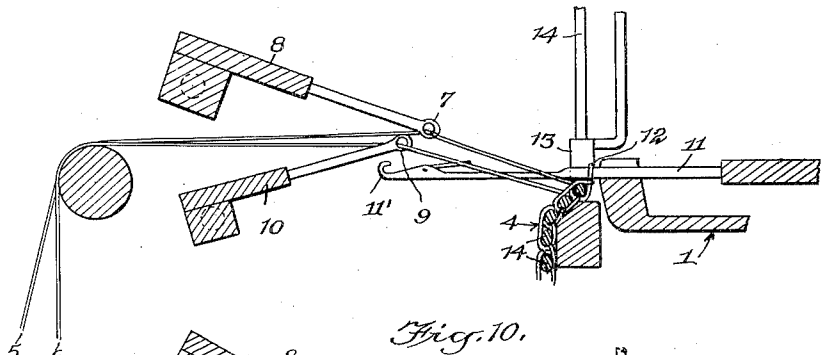


Fig. 10.

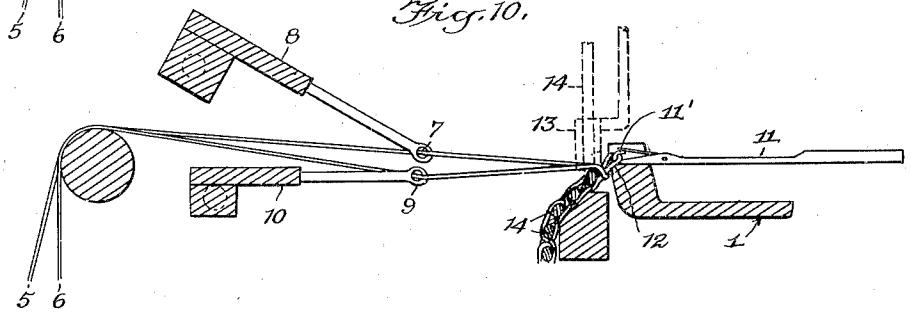


Fig. 11.

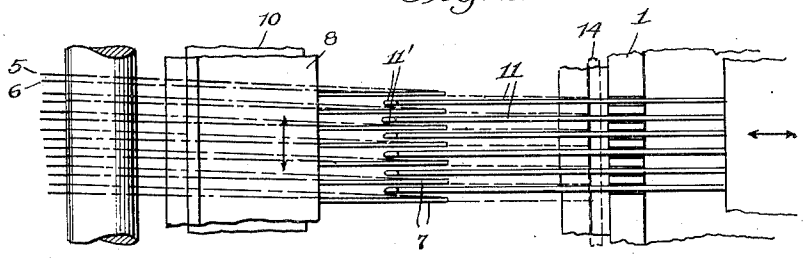


Fig. 12.

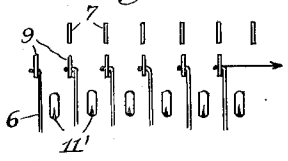


Fig. 13.

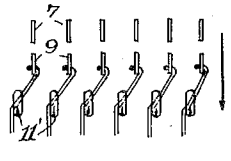


Fig. 14.

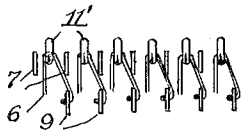
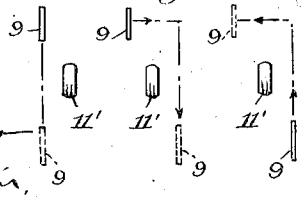


Fig. 15. Fig. 16. Fig. 17.



WITNESSES

George Taylor

A. L. Ritchie

INVENTOR

Louis Brandt

BY

Munn, Anderson & Liddy

ATTORNEYS

Patented Jan. 14, 1941 2,228,944

UNITED STATES PATENT OFFICE

2,228,944

FABRIC AND STITCH

Louis Brandt, New York, N. Y.

Application July 12, 1939, Serial No. 284,027

1 Claim. (Cl. 66—193)

This invention relates to an improved fabric and stitch forming the fabric, an object being to provide a construction wherein the warp yarn of the fabric is positively tied in place.

Another object of the invention is to provide a fabric which may be very ornamental and in which pairs of warp yarns are used in connection with a filling yarn for holding the filling yarn in place and preventing any raveling of the fabric.

An additional object is to provide a fabric wherein spaced rows of warp yarn may be used together with a filling that extends through the rows of warp yarn and across the space between the warp yarn to present an ornamental appearance.

A further object is to provide a fabric wherein pairs of warp yarns may be used in connection with filling yarn so that the filling yarn will be completely covered except at the ends or wherein only longitudinal zones will be covered.

In the accompanying drawings—

Fig. 1 is a front view of part of a knitting machine which may be used for forming the fabric embodying the invention;

Fig. 2 shows a swatch of fabric embodying the invention;

Fig. 3 is an enlarged face view of a small portion of the fabric shown in Fig. 2;

Fig. 4 is a view similar to Fig. 3 but showing the opposite side of the fabric;

Fig. 5 is a sectional view through Fig. 4 approximately on the line 5—5;

Fig. 6 is a view in diagram illustrating how the needles and associated parts in Fig. 1 are located at the beginning of the weaving operation;

Fig. 7 is a view similar to Fig. 6 but showing the first movement of the knitting mechanism;

Fig. 8 is a view similar to Fig. 7 but showing the knitting mechanism moved to a third position in order to form the stitch and eventually the fabric;

Fig. 9 is a sectional view through Fig. 6 approximately on the line 9—9;

Fig. 10 is a sectional view through Fig. 8 approximately on the line 10—10, the same showing the needle in its retracted position;

Fig. 11 is a top plan view of the structure shown in Fig. 9;

Fig. 12 is a view similar to Fig. 6 but showing the parts associated with the second warp yarn;

Fig. 13 is a view similar to Fig. 14 but showing the parts of the mechanism advanced one step or movement toward forming the stitch;

Fig. 14 is a view similar to Fig. 13 but showing a further movement of the mechanism;

Fig. 15 is a diagram illustrating one yarn holder and one needle before the mechanism starts operating;

Fig. 16 shows the same structure as illustrated in Fig. 15 but indicates by arrows and dotted lines certain movements of the parts;

Fig. 17 is a view similar to Fig. 16 but showing the parts returning to their original position.

Referring to the accompanying drawings by numerals, 1 indicates broadly a well-known knitting machine which is adapted to produce the fabric shown in Figs. 2 and 3. It will be understood that the invention is not in the knitting machine and, consequently, this form of knitting machine or any other desired form of knitting machine may be used without departing from the spirit of the invention. It might even be possible to produce the knitting action by hand and if so the fabric would be the same, namely, as illustrated in Figs. 2 and 3 which present the invention. Fig. 2 shows a short section of the complete strip of fabric that has been produced. It will be understood that the fabric may be of any width within the limits of the knitting machine used and of any desired length.

In forming the fabric 2, the warp yarns 3 may be arranged in groups to produce horizontal strips or zones of warp yarn with the filling yarn covered. When the parts are formed in this way there will be zones 4 of filling yarn arranged between adjacent zones 3 of warp yarn. If desired, the zone 3 of warp yarn could extend entirely across the full width of the fabric so that there would be no exposed zones 4. Also the zones 3 could be one pair of warp yarns or any desired number. By reason of these facts a very ornamental appearance may be produced and numerous different designs woven with the same knitting mechanism.

As shown in Figs. 9 and 10, there are provided pairs of yarns 5 and 6 which form the construction illustrated especially in Fig. 3. These pairs of yarns may be spaced apart, as shown in Fig. 3, or arranged adjacent each other according to the design desired. The yarns 5 extend through the eye 7, which is connected to an actuating bar 8, and is adapted to swing the eye 7 upwardly and downwardly and at the desired time to move the same longitudinally, that is, transversely of the direction of the yarn 5. Yarn 6 extends through the eye 9 carried by an actuating bar 10, which functions in a similar manner to bar 8, namely, upwardly and downwardly, and also moves longi-

tudinally during the functioning of the mechanism. Also a suitable control may be used for actuating these bars, as, for instance, an ordinary pattern chain. It will be understood that the particular construction of the knitting machine and pattern chain, if used, forms no part of the present invention but these members are shown to illustrate how the stitch or knitting action is produced. Associated with each pair of yarns 5 and 6, is a needle 11 for alternately engaging the respective yarns for forming the respective loops 12, as shown in Figs. 9 and 10. It will be understood that there is one needle 11 for each pair of warp yarns 5 and 6, and if there are forty pairs of warp yarns there should be forty needles in use.

When the device is functioning, the needle, for instance needle 11, interlocks with yarn 5 and pulls the same to form a loop 12 and then moves back to the position shown in Fig. 9 and interlocks with yarn 6 which is immediately pulled to form a second loop 12. It will be seen, therefore, that the respective yarns of each pair will be alternately formed into loops. Immediately after each loop has been formed the filler feed 13 will move across the respective needles, as shown in Fig. 1, so that the filling yarn 14 will be laid on top of the formed loop. As illustrated in Fig. 1, the filler feed 13 has just moved from the dotted position shown in Fig. 1 to the full-line position. As soon as the respective needles 11 function the filler feed will move back to the dotted position shown in Fig. 1 where it will remain stationary until the needles again function. A single strand of yarn is thus fed back and forth across the loom after each functioning of all the needles 11.

As shown in Figs. 6 to 8, inclusive, when the eye 7 is in its neutral or starting position the yarn 5 thereof will be at the right side of the needle 11'. The numeral 11' is used merely to identify a particular needle in describing the operation. When the parts are in the position shown in Fig. 6, the bar 8 is moved longitudinally and, consequently, the yarn 5 is moved to a diagonal position as shown in Fig. 7, and then downwardly as shown in Fig. 6, while the needle 11' remains stationary. As soon as this occurs, needle 11' will begin to function and move from the outer position shown in Fig. 9 to the inner position shown in Fig. 10. This is illustrated in diagram in Fig. 8 and will result in the needle interlocking with yarn 5 and forming a loop. As soon as the loop has been formed the needle returns to the position shown in Fig. 9 and the eye 7 returns to the position shown in Fig. 6, where it will remain stationary until bar 10 moves longitudinally and then swings downwardly so that the needle 11 may repeat the operation in respect to yarn 6. This is illustrated in Figs. 12 to 17 inclusive. As shown in these figures, the eye 9, for instance, holds the yarn 6 at the left of the needle 11'. The eye 9 moves to the right as shown in Fig. 13 and then downwardly as shown in Fig. 14, after which the needle is quickly moved to the position shown in Fig. 10 to produce a loop. This action is shown particularly in Figs. 15 to 17 in diagram.

Each time a row of loops is made the filling yarn feed 13 moves from one extreme position to the other, as illustrated in Fig. 1. The result will be the production of the fabric shown in Figs. 2 to 5, inclusive.

In the fabric shown ordinary textile yarn, cotton, silk, or other suitable material, is used for the respective pairs of warp yarns 5 and 6, while the filling yarn is shown as made of ribbons of Cellophane. When the loops are tightened around the filling yarn, they will crumple or coil somewhat, as illustrated in Fig. 5. It will be evident that other forms of filling yarn may be used and of other material without departing from the spirit of the invention.

As illustrated in Fig. 4, the respective yarns 5 and 6 are provided on the rear face with base sections or floats 15 and 16. On the front face there are provided interlocking loops 12' and 12''. From Fig. 5 it will be seen that the float 15 of yarn 5 extends through the loop 12'' of yarn 6 and the float 16 extends through the loop 12' of yarn 5. Float 15 and float 16 extend through alternate yarns 14, whereby the warp yarns not only hold or tie in the filling yarn but interlock with each other in such a way that the warp yarns will not ravel.

If desired, when the filling yarn has been exhausted, the machine could continue to function and the respective needles 11 and associated parts would function to form the various interlocking loops, as shown in Figs. 2 to 5 inclusive, whereby the pairs of warp yarns would form interlocked extensions projecting beyond the body of the fabric.

I claim:

A fabric comprising filling yarns extending the full width of the fabric and pairs of warp yarns for tying said filling yarns together, each pair of said warp yarns having base sections arranged parallel to each other and side by side, each of said base sections extending across two of said filling yarns, said base sections of one warp yarn of a given pair being staggered in respect to the base sections of the other warp yarn of said given pair so as to tie the filling yarns together, each base section at the space between each pair of filling yarns extending substantially at right angles to the length of the fabric from the reverse surface of the fabric to the obverse surface and on the observe surface merging into hook-shaped members, the loop of one hook-shaped member interlocking with the shank of the next adjacent hook-shaped member on the obverse surface of the fabric opposite the space between the filling yarns whereby the hook-shaped member of one warp yarn will extend across one filling yarn and the hook-shaped member of the next adjacent warp yarn will extend across the next filling yarn in longitudinal alignment with the first hook-shaped member and so on for the full length of the fabric.

LOUIS BRANDT.