

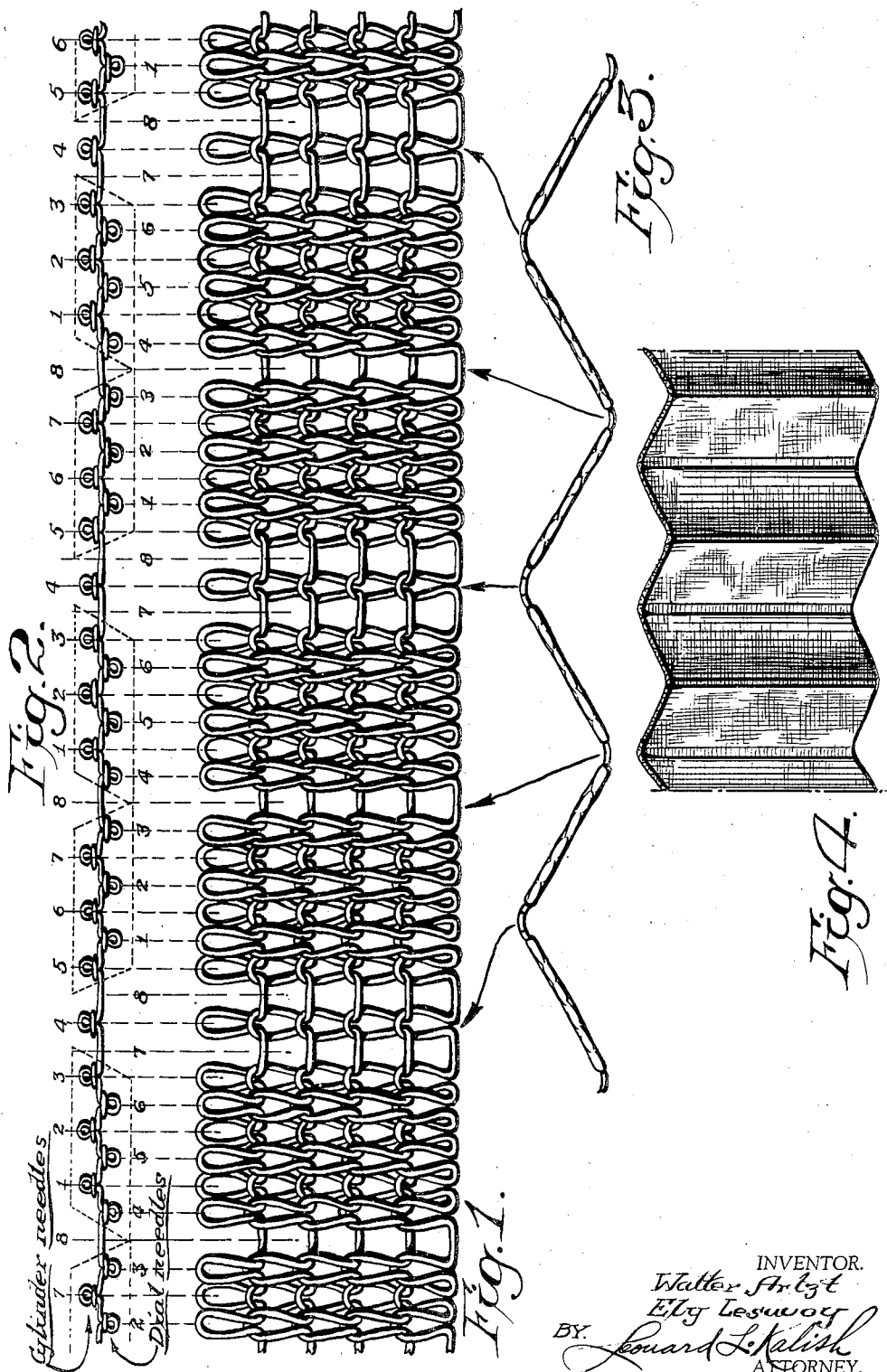
May 28, 1940.

W. ARTZT ET AL

2,201,980

PLAIT-KNITTED FABRIC

Filed March 25, 1939



INVENTOR.  
Walter Artzt  
Ely Lesuway  
BY Leonard L. Kalish  
ATTORNEY.

# UNITED STATES PATENT OFFICE

2,201,980

## PLAIT-KNITTED FABRIC

Walter Artzt and Ely Lesavoy, Allentown, Pa.

Application March 25, 1939, Serial No. 264,097

1 Claim. (Cl. 66—200)

The present invention relates to certain new and useful knitted fabric and method of making same, and it relates more particularly to a fabric intended for wearing apparel.

One the objects of the present invention is to make a knitted fabric which will fold itself into predetermined and permanent plaits which are not dependent upon any external means or other processing for their formation or maintenance; that is, which do not depend upon ironing or sizing or stitching or any other means or methods.

With the above and other objects in view which will appear more fully from the following detailed description, the present invention consists of a double-rib knitted fabric formed on a double-needle machine, that is, a machine having two juxtaposed rows of needles with the needles of one row staggered in relation to the other and with the same thread being capable of being fed alternately to the needle of one row and then to the next needle of the opposite row and so on, back and forth. Such double-needle row machines are exemplified by the circular machines made by the Wildman Manufacturing Company of Norristown, Pa., wherein both rows of needles are arranged in a continuous and uninterrupted circle and in which one row of needles is arranged generally vertically and the needles are generally referred to as the cylinder needles, while the other row of needles is arranged generally radially and more or less at a right angle to the first row and the needles of this row are generally referred to as the dial needles. The circular double needle row machines may be either of the type in which the needle banks rotate in relation to non-rotating cams and in relation to non-rotating thread carriers or they may be of the type in which the needle banks do not rotate and instead the actuating cams rotate along with the thread carriers or thread guides.

However, any double-needle row type of machine may be used wherein the same thread may be fed alternately to the needle of one row and then to the needle of the other row, and so on across the length of the needle bar. We have found, however, that circular type machines are more suitable for this purpose because of faster production.

The fabric of the present invention consists more particularly of double-rib fabric made on two sets of needles as aforesaid, in which the thread forming each course forms a loop alternately on opposite sides of the fabric (by being

fed alternately to needles in the two different rows of needles) over a suitable width and then for either two or three stitches only one one face of the fabric and then again on both faces for the same width and then again only on the opposite face for either two or three stitches. The fabric of the present invention is produced by removing or rendering ineffective and inoperative one or two needles at regular intervals in each of the two rows of needles but with the spaces of the removed needles of one row being staggered in relation to the spaces of the removed needles of the other row, and then knitting each thread over all the remaining needles with sufficient tension so as to cause the fabric to fold by itself around the point where the one or the two needles are missing.

For the purpose of illustrating the invention, there is shown in the accompanying drawing one form thereof which is at present preferred, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

In the accompanying drawing in which like reference characters indicate like parts:

Figure 1 represents a much enlarged plan view of a fragmentary portion of a knitted fabric embodying my invention with the fabric shown as held in a flat condition and much stretched laterally so as to bring the successive wales into their original spaced relationship in respect to the uniform needles spaces.

Figure 2 represents a top plan view of the same.

Figure 3 represents a fragmentary section of the fabric shown also much enlarged and schematically, to indicate the direction in which the fabric folds itself at the successive fold lines in relation to the disposition of the knitted loops at these fold lines.

Figure 4 represents a fragmentary portion of the fabric indicating the plaits and also shown somewhat enlarged but not as much enlarged as the preceding figures.

In carrying out the present invention, as for instance, on the circular machines hereinabove referred to, any suitable number of threads may be fed to the circular rows of needles, depending somewhat upon the diameter of the machine; there being a separate feed for each set of

needle-actuating cams. In the particular machines now preferred, namely, the circular machines of the Wildman Manufacturing Company, eight threads are fed to eight circumferentially equally distributed points on the needle rows.

For a plait of approximately one-eighth to three-sixteenth of an inch along each of the flat surfaces using comparatively thin rayon or mercerized cotton yarn or the like, on a gauge latch needle machine, we remove one out of every eight needles from the cylinder row, that is, every eighth needle and two out of eight needles in the dial row, that is, every seventh and eighth needle; the needle positions of the removed needles in one row being equidistantly staggered in relation to the needle positions of the removed needles in the other row.

In Figures 1 and 2, the loops are in alignment with each other and the short dotted lines indicate the needle positions in each of the two rows. Merely for purposes of illustration, the positions of the missing dial needles have been marked 7 and 8 with the intervening dial needles called 1 to 6 inclusive while the missing cylinder needles have been arbitrarily marked 8 with intervening cylinder needles called 1 to 7 inclusive.

Thus, it will be seen that flanking each of the positions of a missing needle is a short stretch of double-rib knitted fabric formed equally on both sets of needles, as indicated by the portions or sections surrounded by the fine dotted lines in Figure 2.

In the actual fabric, the stitches are much more closely or tightly drawn than that indicated in Figures 1 and 2, so that the successive wales on each face are more closely adjacent to each other and completely obscure the view of the staggered wale on the opposite face of the fabric, and also more or less obscure or obliterate the gap indicated in Figure 2, for instance, where the one or two needles have been removed; that is, they obliterate the gap on the surface of the fabric where there is a continuity of needles but not on the surface where the needle is missing. On the surface where the needle is missing, however, the fabric folds around this gap to form the plait so that in the plaited condition this gap is also practically obliterated by reason of the folding of the fabric.

The frequency with which the one or two needles are removed from each of the two rows of needles may vary according to the width of plait desired and according to the gauge of the machine and the thickness of the yarn desired to be used. The threads, however, are maintained under sufficient tension so as to cause the thread to pull together the adjacent wales or ribs including also at the points or along the lines where the one or two needles are missing on opposite sides of the fabric.

For many garments such as waists and skirts, it is desirable only to create this plaited formation over a portion of the width of the fabric, and so we contemplate forming the fabric with any

predetermined portion of the width plaited and the other portions of the width plain knitted, that is, double rib knitted without any plaiting. This is accomplished by leaving in all the needles in both needle banks over such portions of the total circumference as are desired to be left without plaits and applying the hereinabove described plaiting, that is, by the removal of the needles as hereinabove described, only to such part or parts of the whole circumference of the fabric as are desired to be plaited.

By this means a wide variety of partly plaited fabrics may be produced so that in cutting the fabric to make any predetermined garments such as ladies' waists and skirts, some of the styling or ornamentation of the garment may be produced by cutting the garment in definite relation to the plaited and unplaited portions of the width of the fabric; the widths and succession of these plaited and unplaited portions having been predetermined in the knitting more or less according to the garment pattern or design.

Thus, in the accompanying drawing, we have shown, merely for purposes of illustration, a garment in which an integral piece of fabric forms the front of the garment and in which successive sections or portions of the integral piece of fabric are plait-knitted as hereinabove described, while other portions are plain double rib knitted as hereinabove indicated. Likewise, too, for waists and skirts, and indeed, for other garments, it is possible to make the whole garment without cutting open the tubular formation of the fabric, by knitting the fabric more or less to predetermined diameters on machines of corresponding diameters; cutting only the top and bottom of the two to conform to the necessary shaping of the garment to fit the various body portions such as arms, neck, etc.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiments be considered in all respects as illustrative and not restrictive, reference being had to the appended claim rather than to the foregoing description to indicate the scope of the invention.

Having thus described the invention, what is hereby claimed as new and desired to be secured by Letters Patent, is:

A self-plaiting circular rib knitted fabric having one wale missing on one surface at every eighth wale position and having two adjacent wales missing in the other surface at every seventh and eighth wale position with the missing wales on one surface being generally equidistantly staggered in relation to the missing wales of the other surface, and with the thread forming said fabric being sufficiently tight in relation to the gauge and thickness of the thread as to cause the fabric to fold itself along the lines of said missing wales.

WALTER ARIZT.  
ELY LESAVOY.