

(No Model.)

2 Sheets—Sheet 1.

W. A. O'BRIEN.

UNION GARMENT AND METHOD OF KNITTING SAME.

No. 527,216.

Patented Oct. 9, 1894.

Fig. 2.

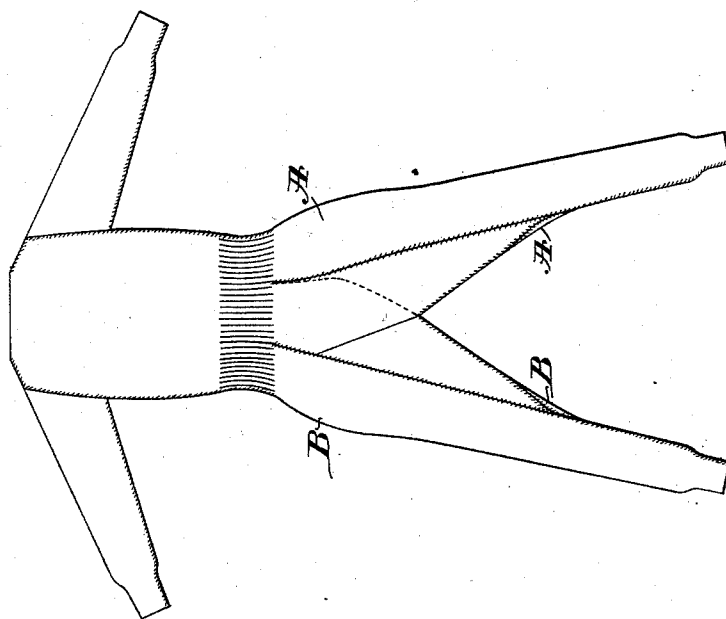
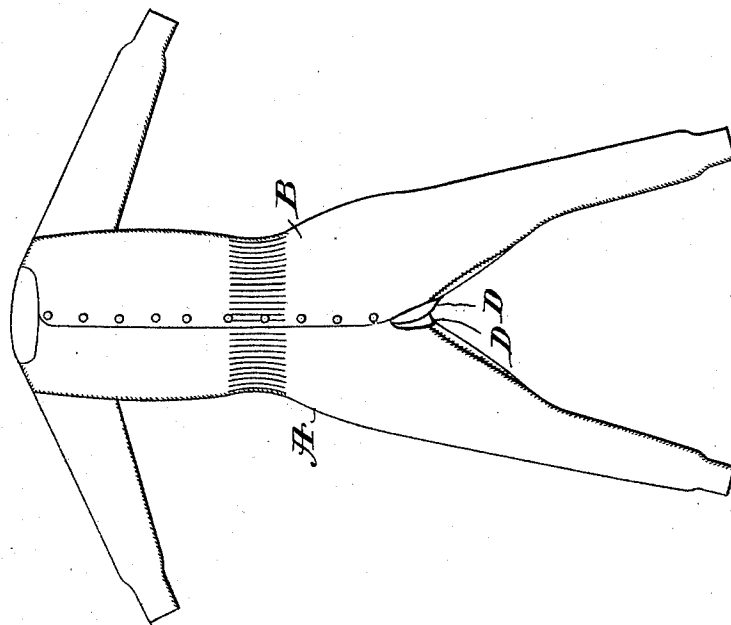


Fig. 1.



Witnesses.
Frederic S. Greenleaf.
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Inventor:
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(No Model.)

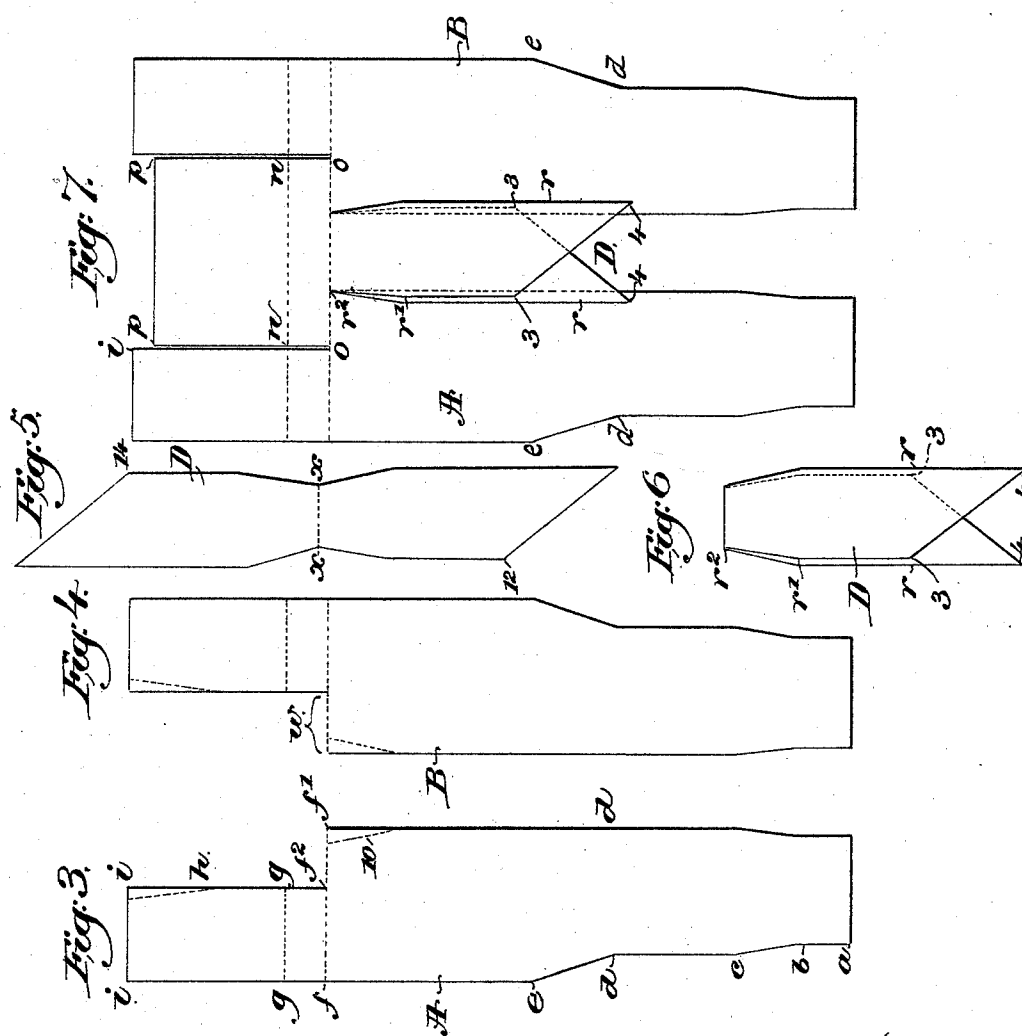
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No. 527,216.

Patented Oct. 9, 1894.



Witnesses:

Fred S. Grumbel.

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UNITED STATES PATENT OFFICE.

WALTER A. O'BRIEN, OF BOSTON, MASSACHUSETTS.

UNION GARMENT AND METHOD OF KNITTING SAME.

SPECIFICATION forming part of Letters Patent No. 527,216, dated October 9, 1894.

Application filed April 27, 1894. Serial No. 509,189. (No model.)

To all whom it may concern:

Be it known that I, WALTER A. O'BRIEN, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Union Garments and Methods of Knitting the Same, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

Underwear when substantially seamless is more desirable and merchantable than underwear with sewed seams, whether cut edge or selvage edge.

Union garments are now coming into favor, and different methods of knitting the same have been devised in order to provide the garment with the necessary fullness where fullness is required, but all such methods known to me necessitated the expenditure of so much time in the knitting of the parts as to make a good union garment too expensive for the use of the general public, and the cost of manufacture is very much enhanced by reason of the great number of widened and narrowed selvages, and the sewing of selvage edges to form seams.

Union garments now commonly found in the market have a vertical seam from the neck down the back to below the waist, or, in other words, the garment is made up in halves sewed together at the back.

In accordance with one method practiced in the production of union garments, the knitting is started at the bottom of the leg, and the selvage edge at one side of the web, produced by knitting one-half of the garment, is prolonged to and through the waist and back, to the neck, and to gain the necessary fullness required at and below the waist-line at the back of the garment, it has been necessary to insert a back flap, and, inasmuch as the selvage edges of the two halves to be united at the back are straight, it has been found necessary to knit the upper ends of the back flaps tapering to a point, and these tapered points have been sewed into the back seam to a point above the waist line. In this class of fabric it has been further common, where additional fullness was desired over the hips, to divide the fabric of each half commencing at a point a little above the knee, and knitting the said fabric as two webs,

widening each at the selvage edges which are to fall at the outer side of the hip, and these widened selvage edges are then narrowed from the top of the hip toward and into the waist to the top of the shoulder, and the said selvage edges are thereafter sewed together, leaving a seam at the outer sides of the hips and under the arm seye.

I have devised a novel union garment, and in doing so I have devised a method of knitting the same which I shall hereinafter describe, by which it is possible to economize very considerable time, and consequently to reduce the cost of manufacture of the garment, and the garment when finished is unlike any other union garment known to me, and is more nearly seamless.

By my improved method of knitting union garments, it is possible to produce such a garment without seam at the back from the bottom of the waist up.

My improved garment has a seam from the bottom of the waist to the arm seye directly over the hip, and from the top of the arm seye across to the neck opening. Having knitted the leg part of a front from the ankle to the line of the bottom of the waist I transfer the stitches near one end or the double row of needles laterally onto other needles, thus providing some of the needles with two stitches. I then knit a course or two on all the needles, and at the next course run the stitches off those needles on which the stitches were consolidated, thus leaving a row of loops, and I continue the knitting on the needles of both rows with a two and one rib until the waist for that half of the front is of the proper length, when the needles left out of action for making two and one rib are returned into action to make one and one rib, knitting from the top of the waist to the top of the garment. Leaving the consolidated series of loops projecting from the front in the course in line with the bottom of the waist, said loops being at that edge of the fabric which is to lie at the back of the waist, is an important part of my invention, and said loops constitute a starting point for the back of the waist. The knitted course containing these loops after starting the waist shows stitches of two characters, that part of the course from which the loops project showing two knitted

wales brought into one. By consolidating said loops to form what I shall designate as the "waist start" it is possible to leave a line of loops sufficiently less in number than the needles on which they were knitted prior to the consolidation, that when the loops of two halves of the garment are picked onto the needles of both rows preparatory to knitting to said loops the back of the waist, and to the waist the back of the garment, there shall be left bare between the waist start loops a sufficient number of needles to receive loops or stitches of a previously knitted double or two-ply back flap to be described, so that the central part of the back of the waist may be knitted directly to the back flap. This consolidation of the loops of the waist start to thus bring the loops extending from the shoulder or projection left at that side of the garment may, and preferably will, be done by a transferring operation before the loops are run off, and the transferring will preferably be preceded by preparing the needles for two and one ribbing, but the loops may be run off of a number of needles without being transferred, and be picked onto a less number of needles when the "waist starts" of the two halves are to have the waist knitted to them and to have the back of the waist knitted to the back flap, but such plan although within the scope of my invention would result in an unnecessary loss of time. The back flap used by me is knitted separately, and preferably in one piece of uniform thickness from end to end, but with two pointed ends so that when used it may be folded transversely the stitches at the line of fold being picked onto needles of the machine in order that the back of the waist may be knitted to it. The back flap piece when doubled upon itself as stated, causes one end to overlap the other, thus forming virtually two flaps, one co-operating with and extending from each leg, and instead of doubling the said back flap strip upon itself and picking its loops onto needles as described, my invention would not be departed from if the said strip was actually severed transversely and made into two separate pieces, each being subsequently applied to the machine needles between those holding the loops of the "waist starts," but for cheapness and expedition of work the one piece doubled over flap is preferred, and by the term "two-ply" as used in connection with the back flap, I mean to cover a back flap whether in one or in two pieces. In the manufacture of my improved garment I knit three separate pieces, two fronts, each having a "waist start" with looped edges pointing toward the top of the garment, and a back flap, such as described, and I then pick the loops at the "waist starts" and at the back flap onto the machine needles, and commence knitting a fourth piece to constitute the back of the waist and back of the garment above it, the knitting of the back of the waist uniting all three pieces without a

seam at the back, and without putting a tapered or any pointed gore in the waist at the back.

In most instances of my invention I prefer to knit the back flap strip a little narrower near its center than at its ends, but in some instances where great fullness is required at the back below the waist, I may knit of full width the part of the back flap which is to be picked onto the machine needles to have the back of the waist knitted to it, and in picking the loops of the back flap on, I may consolidate said loops onto a less number of needles.

By my improved method of knitting union garments, it is possible to form the leg without seam at the side of the hip, and also to make the front of the garment so wide as to fully cover and avoid the use of a so-called front flap, and also of such width to avoid the use of gores at the front where it covers the bust and the garment across and about the hips is free to stretch without any interruption, as in ordinary one and one rib knitting.

Figure 1 shows in front view a garment embodying my invention; Fig. 2, a back view; Fig. 3, a view of one of the separate pieces of my improved garment, it constituting the leg and the front of one half of the garment. Fig. 4 shows a corresponding piece for the other half of the garment. Fig. 5 shows the back flap in the condition in which it is preferably left by knitting. Fig. 6 shows the back flap doubled on itself in the line *x*. Fig. 7 shows the back flap and sides shown in Figs. 3 and 4, as brought together and as having had the back of the garment, including the back of the waist, knitted to them.

My garment will preferably be knitted on a machine containing two rows of sliding needles adapted to cross each other, a machine, say, of what is commonly known as the Lamb type, it being run for my work to knit a flat web, the web being, however, widened and narrowed, as will be described.

For the production of my novel union garment, I select a machine having two rows of needles, as stated, a machine having as many needles as there are loops to be made in the widest course of knitting to be produced in either of the three separate pieces of fabric entering into the garment to be made, the widest courses being in what I denominate the fronts or front halves of the fabric, and at substantially the bottom line of the waist.

My improved garment has a right front and a left front, made separately and commonly set up at different ends of the rows of needles, and as the right front and the left front are produced in like manner and differ only in that the waist start of one front projects from the right hand edge, and the waist start of the other front from the left hand edge, I need, therefore, specifically describe but one front, and in so doing shall refer chiefly to the front shown in Fig. 3.

By my improved method, and to reduce to

the minimum the labor of knitting, I set up on both rows of needles in usual manner enough loops to start the bottom of the ankle, and I knit from the end *a* to the point *b*, which forms the top of the ankle. I then add at each side the needles first employed, additional needles to widen the web from *b* to *c*, to thus fit the calf of the leg, and from the point *c* to the point *d* I may knit the web of substantially uniform width, but at the point *d* I commence again to widen, adding gradually preferably at one selvage edge, viz:—the edge which is to constitute the open edge of the front of the garment, additional needles, to thus widen the fabric from *d* to *e*, so that the web when united in a garment will amply cover the larger part of the thigh and front of the body. From the point *e* to the line *f*, *f'*, I may knit the web, as shown, of substantially uniform width, or I may narrow the same slightly at that selvage which is to come at the back of the garment below the waist, as represented by the dotted line 10. On arriving, however, at the line *f*, *f'*, I have brought into operation, it may be supposed, all the needles which I need for the broadest course in the front, and at that point in most instances I shall have in use substantially all the needles of the machine. Now an important step of my invention comes in, viz: I want to make a "waist start" or to leave a portion of the fabric or web to project as a shoulder or corner and present a consolidated series of loops, so that at a later period after the front half of the garment has been finished and run off the needles I may again commence knitting at the waist starts and knit to the loops thereof the back of the waist. The fabric produced between the points *d* and *e* and from *e* to *f*, *f'*, is without seam, and it is made sufficiently broad by widening at the desired points to fit about the hip and afford all the room required, and to gain desired size the fabric may be widened more or less from *d* to *e*.

Prior to my invention I am not aware of any union garment which in the process of its production has ever presented a "waist start," the term used by me to cover the corner or space included within the bracket *w*, Fig. 4, it presenting a set of loops consolidated to present loops of less number than the needles used to make the shoulder from which said loops project, said loops being adapted, as stated, to be picked onto needles.

As further illustrating my invention, let it be assumed that I am knitting a size 34 garment and that in the course *f*, *f'*, I had brought into action substantially all the needles of both rows of needles in the machine, that is, two hundred and seventy-six needles, or one hundred and thirty-eight needles in the front row and one hundred and thirty-eight needles in the back row, and, desiring to make the "waist starts" and then continue the knitting for the front of the waist and the bust covering portion above it, I stop

the machine and with a transferring comb transfer the loops from each alternate needle in the back row of needles upon the adjacent needle in the back row, and I then pull down or out of action the needles which have been divested of their loops, and then, coming to the front row of needles, one hundred and thirty-eight in number, and, supposing that the loops on fifty-two of said front row of needles are to be utilized in the production of the "waist starts," I transfer, as above described, the loops from alternate needles of the fifty-two needles laterally, and put them onto, say, twenty-six needles, thus leaving twenty-six needles bare from *f'* to *f''* on both rows of needles, and I then start the machine and knit on all the needles left in action in both rows between the points *f*, *f'*, one or two courses, and I then run the loops off of the said twenty-six needles in the front row and in the back row from *f'* to *f''* and continue knitting on the remaining needles of the front and back rows, eighty-six at front and forty-six at back, for the production of the waist I preferring at that point to knit a two and one rib, as such a rib effects a contraction of the fabric for the waist, and I knit the web or fabric from *f*, *f''* to *g*, the line of the top of the waist, and then I preferably return into action the forty-three needles previously drawn down in the back row, and let them come into operation in knitting the bust covering part of the front to the top of the garment, that part of the web being preferably a one and one rib, but if desired I may give more space at the arm scye by narrowing one selvage of the bust covering part, as from *h* to *i*.

The back flap D, see Fig. 5, where it is laid out flat, may be commenced at one end and be gradually widened and then knitted for some distance of substantially uniform width, and then be again narrowed and widened, and then be knitted again of substantially uniform width, and be again narrowed rather abruptly to make a second pointed end tapered, however, oppositely from the taper of the end at which the knitting was commenced, see Figs. 6 and 7, said back flap when to be used, being overlapped in the line *x* Fig. 5, so that its loops at that point may be picked onto those needles of the machine which are located between the needles upon which are picked the loops at the waist starts. The back flap need not, however, be narrowed and widened centrally as indicated in Fig. 5, but may be knitted of uniform width from 12 to 14, and separated or not, as desired, in the line *x*, the loops, however, at that line being picked onto a less number of needles of the machine preparatory to knitting the back of the waist.

The back flap in the line *x*—*x*, when narrower at the middle of its length, as shown in Fig. 5, may have about fifty-two stitches requiring fifty-two needles, and it will be obvious that if the stitches of the "waist starts"

were not consolidated, the operator could not put the loops of two "waist starts" onto the needles used in the front row and yet leave bare between the two waist starts enough needles out of the one hundred and thirty-eight in the front row to receive the fifty-two loops of the back flap, and it is to get these needles bare for the reception of the back flap loops between the loops of the waist starts, that the compacting of the loops at the "waist starts" is done, and I preferably transfer and compact these loops before running them off the needles, for otherwise the loops would have to be picked on separately to the needles when the back of the waist was to be commenced, and then transferred systematically onto the proper number of needles, all of which would require a very considerable expenditure of time.

The consolidated loops of the waist starts having been picked onto a number of needles of the machine less than the number holding yarn at that point when the widest course was knitted in the line f, f' , and the loops of the upper end of the back flap, preferably one and one ribbed knitted having also been picked onto the two rows of needles so that the back flap loops occupy the space between the loops of the waist starts of the two fronts or halves of the fabric, said loops all having been picked onto the needles in the line $o-o$ Fig. 7, the knitting will be commenced, and the waist from o to n will be knitted with preferably a two and one rib as a continuation not only of the waist starts, but also of the upper end of the back flap, and a waist having been knitted for the proper length, the knitting will preferably be continued as a one and one rib from n to p , to constitute the back or shoulder covering portion of proper length for the garment. The back of the waist and the back above it having been knitted to the back flap and waist starts, as represented in Fig. 7, I complete the garment as follows: I stitch together the legs, the selvage at one edge of a leg to the selvage at its other edge from about the line a to d . Then I stitch the outer edges r, r' of the flap to the selvage edges from d to f' of the two leg portions, knitted rights and lefts, and preferably the selvage edge of the overlying half of the flap from r' to r'' is connected to the selvage edge of the leg below the center of the waist, I having shown, as I prefer, the connections as made wholly below the fabric constituting the waist of the garment. The edges of the flap from 3 to 4, see Figs. 6 and 7, are joined each to the proper leg from about the point e down to at or a little below d .

Fig. 7 shows the edges of the flap unattached and the fabric for the legs laid out flat, but said edges will be brought together and united, as specified, and shown in Figs. 1 and 2. Seams must then be made to unite the back of the waist to the front parts of the waist under the arm scye, and the edges of the back to the edges of the fronts to the

bottom of the arm scye, and then the upper ends of the two front parts may be united to the back to form the shoulders, leaving suitable openings or spaces for the neck. The sleeves, made in usual manner, may be then united to the body of the garment at the arm scye.

Fig. 2 shows the fabric united to form my improved garment, the series of vertical lines showing the two and one rib waist.

Figs. 1 and 2 show the fashion or shape that the separate parts in Figs. 3 to 7 assume when knitted as described, and united to complete the garment.

By the term "two-ply" when used with relation to the back flap, I mean one layer of back flap overlapping another layer.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A union garment comprising a piece A containing one leg and part of the front of the garment, a piece B containing the other leg and the other part of the front of the garment, the back, and a back flap folded upon itself and united to the waist portion at its line of fold and also united to the leg portions along opposite edges and having its adjacent sides overlapped, substantially as described.

2. A union garment comprising a piece A containing one leg and part of the front of the garment, a piece B containing the other leg and the other part of the front of the garment, the back, and a back flap terminating in oppositely tapered ends and folded upon itself and united to the waist portion at its line of fold and also united to the leg portions along opposite edges and having its adjacent sides overlapped, substantially as described.

3. The herein described union garment, it being composed essentially of two halves or fronts, each presenting fabric to surround and cover a leg and substantially one-half of the front of the waist and bust above, and each half having a waist start presenting a series of loops consolidated in the line of the bottom of the waist; a two-ply back flap having its upper end in the line of the bottom of the waist, and a piece of fabric knitted to the waist starts and to the upper end of the back flap to constitute the back of the waist and the back and shoulder covering portion above it, said piece of fabric having selvage edges adapted to be joined with the selvage edges of each part of the front under the arm scye, all substantially as shown and described.

4. The herein described method of knitting union garments, which consists in knitting separately the two halves A, B, of the garment of the proper width and shape substantially to the bottom of the waist line at the back, running the loops off from some of the needles to make "waist starts" having loops, continuing the knitting at one side of the "waist

starts" toward the top of the garment to form a bust covering portion, running the loops of the bust covering portion off the needles, knitting a back flap, picking the loops thereof and of the "waist starts" of the two halves of the fabric onto needles in the same row, knitting the fabric to cover the back from the "waist starts" to the neck, and uniting the back flap doubled upon itself to the leg covering portions of the two halves, and thereafter uniting portions of each leg to other portions thereof from the ankle up to the lower ends of the back flap, substantially as described.

5. The herein described steps in the method of knitting union garments which comprehends knitting separately the two halves A, B, of the garment, each of the proper width and shape up substantially to the bottom of the waist line at the back, running the loops off from some needles to leave loops to constitute "waist starts," continuing the knitting at one side the "waist starts" toward the top of the garment to form a bust covering portion, running the loops of the bust covering portion off the needles, knitting a two-ply back flap, picking the loops of the back flap onto needles, picking the loops of the "waist starts" onto other needles in the same row, said needles being less in number than the needles the said loops were made upon, knitting the back of the garment to the said "waist starts" and to the said back flap, and thereafter uniting the edges of the back flap to each leg covering portion, uniting the selvages of the leg covering parts of the two halves each to the other from the ankle to the lower end of the back flap, and uniting the main part of the back and of the bust covering portion to the arm scye, substantially as described.

6. The herein described method of knitting union garments, which consists in knitting separately the two halves A, B, of the garment of the proper width and shape up sub-

stantially to the bottom of the waist line at the back; consolidating some of the loops onto a less number of needles than were required to knit the loops and thus form "waist starts" to leave loops; continuing the knitting at one side the "waist starts" toward the top of the garment to form a bust covering portion; knitting a two-ply back flap; picking the loops of the back flap onto needles; picking the loops of the "waist starts" onto other needles in the same row and upon a less number of needles than the said loops were made upon; knitting the back of the waist to the said "waist starts" and to the said back flap, and knitting the back of the garment to the back of the waist, and thereafter uniting the two front halves each to itself for a part of its length to form suitable legs; uniting the edges of the back flap to each leg, and uniting the main part of the back and of the back of the waist to the fronts above the bottom of the waist, substantially as described.

7. In the manufacture of union garments, the method of knitting the web or fabric for a leg and front, which comprehends knitting the leg, widening the web as described to substantially the widest course for the top of the hip, then transferring part of the loops to change the character of the knitting for the waist, and consolidating the loops for part of the width of the web, running the loops off for part of the width of the web to leave a "waist start," and then continuing the knitting for the front of the waist and the bust covering part of said front, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER A. O'BRIEN.

Witnesses:

LAURA T. MANIX,
EMMA J. BENNETT.