

May 28, 1935.

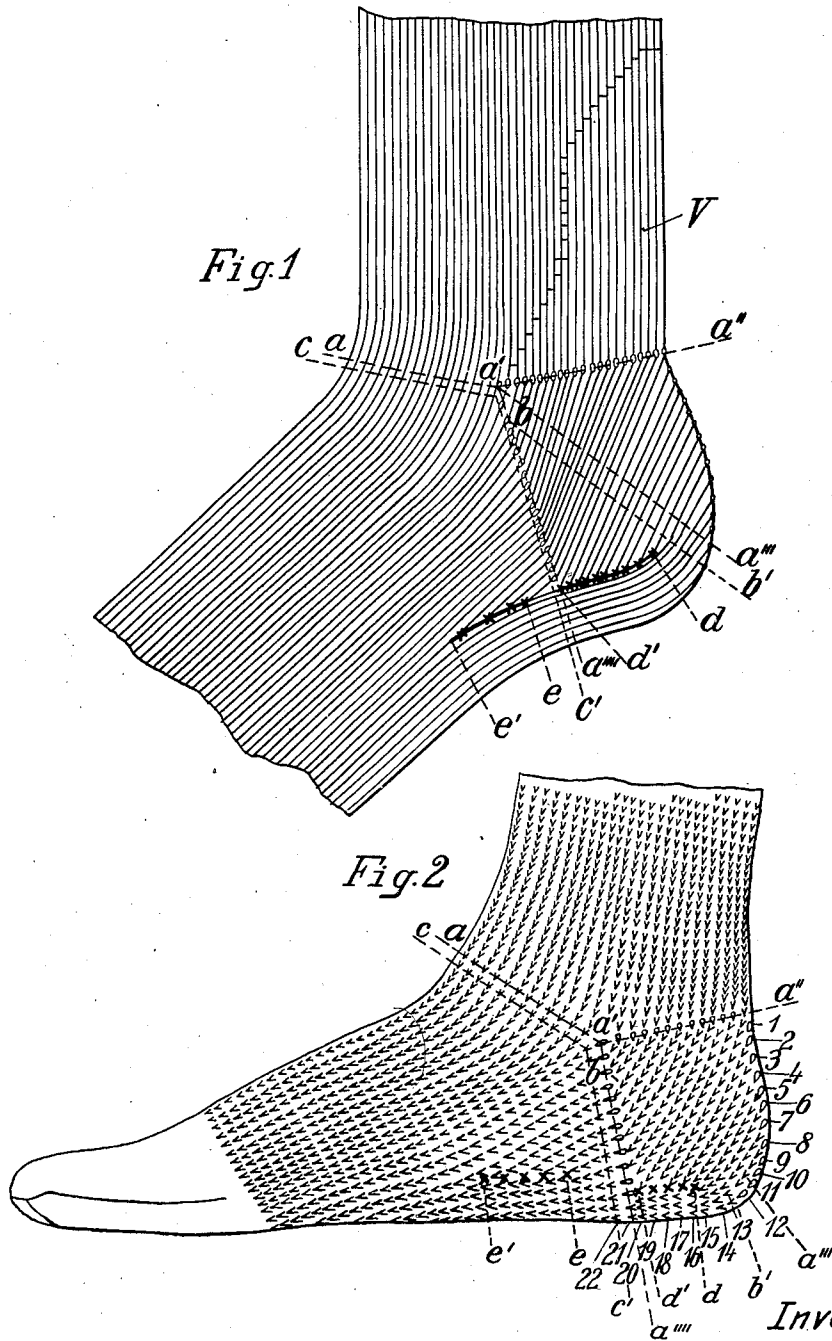
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2,003,189

STOCKING MADE IN A SINGLE OPERATION AND METHOD FOR MAKING SAME

Filed Nov. 15, 1934

2 Sheets-Sheet 1



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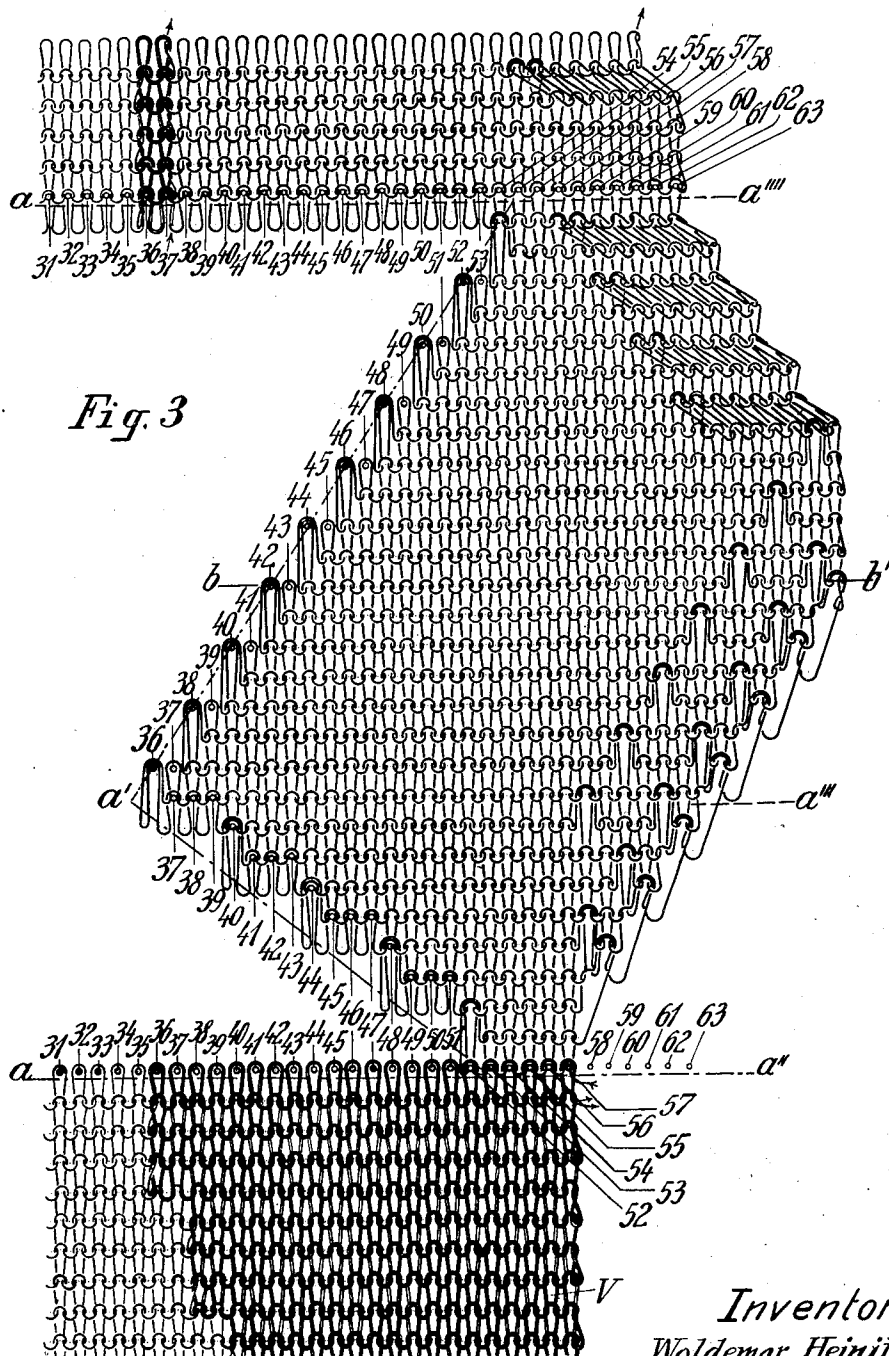
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STOCKING MADE IN A SINGLE OPERATION AND METHOD FOR MAKING SAME

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UNITED STATES PATENT OFFICE

2,003,189

STOCKING MADE IN A SINGLE OPERATION
AND METHOD FOR MAKING SAMEWoldemar Heinitz, Chemnitz, Germany, as-
signor to Schubert & Salzer Maschinenfabrik
Aktiengesellschaft, Chemnitz, GermanyApplication November 15, 1934, Serial No. 753,225
In Germany November 16, 1933

4 Claims. (Cl. 66—187)

The present invention relates to a method of making stockings in a single operation on a flat knitting machine as well as to stockings thus manufactured.

5 Prior to this invention the heel portions of stockings manufactured in a single operation were made either with continued rows of loops, i. e. simultaneously in continuous rows of loops with the instep connecting them, whereby a
10 bending of the foot sufficiently corresponding to a human's foot could not be obtained and loop accumulations would result in the instep, or the heel portions were made with discontinued rows of loops, i. e. with the instep loops placed in sus-
15 pense in which case the outward extension of the heel portions begins with the inner bending of the foot near the ankle, whereby loop distortions result in the bending of the foot.

It has also already been proposed to form a heel
20 of a stocking by placing the instep loops in suspense and working rows of loops the width of which gradually increases inwardly from the beginning of the heel to about the middle of same, whereupon the width at the inside always pro-
25 gressively decreases again to the end of the heel. In carrying out this method, however, no widening was made at the outside so that a very bad fit of the heel was obtained. According to the invention this disadvantage is obviated by the
30 fact that with the instep loops placed in suspense the upper part of the heel portions is formed by loop wales progressively and simultaneously added at the inside and at the outside, the number of such loop wales progressively de-
35 creasing at the outside and at the inside in the lower part of the heel.

The method according to the invention of manufacturing a stocking of this kind is carried out in such a manner, that with the beginning
40 of the heel portions the instep loops and the loops of the heel portions, with the exception of a few selvedge loops, are placed in suspense, whereupon, during the formation of the upper part of the heel portions, the number of loops
45 placed in suspense is progressively decreased from the selvedge to the inside. Simultaneously new loop wales are steadily formed at the outside in any suitable manner.

The new method of making stockings accord-
50 ing to the invention is further improved by the fact that the formation of new loop wales at the outside is continued for some rows of loops while the number of loops placed in suspense at the inside is not further reduced but enlarged.

55 To obtain a good fit of the heel the formation

of new loop wales at the outside may cease during the time the number of loops placed in suspense is further progressively increased at the inside, whereupon heel loops are narrowed simul-
taneously with further increase of the num-
ber of loops placed in suspense.

The connecting loops or nooses thus formed on the progressively operative or inoperative needles can, of course, be made in any suitable manner. These loops or nooses may, for in-
stance, form, together with the loop heads hang-
ing on the inoperative needles, interlaced sel-
vedge, split, narrowed or tuck loops.

A stocking according to the invention shows a change line between the high heel and the heel
15 coinciding about with the upper edge of the shoe and, moreover, such a stocking obviates the disadvantages of known stockings made in a single operation on flat knitting machines. In this way it is possible, for ornamenting purposes only,
20 to reinforce the high heel in silk and to form the heel proper with any other suitable material. The new stocking simultaneously shows a substantial enhanced bending of the foot.

In the accompanying drawings heel portions of
25 a stocking according to the invention as well as a diagram of loops are shown by way of example.

Fig. 1 shows a side elevation of the heel portion of a stocking according to the invention
30 having a pocket heel with high heel splicing.

Fig. 2 is a view showing the position of the loops of a portion of a stocking having a pocket heel without high heel splicing fitted to a human's foot.

Fig. 3 illustrates the formation of the loops of
35 some courses.

As shown in Fig. 1 the stocking is made in well known manner up to the line $a-a'-a''$ with or without the usual high heel splicing V.

To obtain the bending of the foot during the formation of the heel, the instep loops and the loops of the heel portions, except a few selvedge loops, are, from the line $a-a'-a''$, placed in suspense, the number of the loops placed in sus-
45 pense being progressively decreased and new loop wales are formed at the outside. From line $a-a'-a'''$ new loop wales are formed at the outside, while now the number of loops placed in suspense is increased at the inside.

In line $b-b'$ the formation of new loop wales at the outside is finished. Some rows of loops now follow in which only the number of loops placed in suspense is further increased at the inside. From point d heel loops are narrowed simul-
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taneously with a further increase of the number of loops placed in suspense at the inside.

In this way the change line $a'-a''$ between the leg or the high heel and the heel and the change line $a'-a'''$ between the heel and the sole and the narrowing line $d-d'$ in the heel are formed. Of course, the narrowing line $d-d'$ may, instead of running at a right angle to the change line $a'-a'''$ in the manner of a pocket heel, also run at an acute angle or otherwise to this change line in the manner of the French narrowing.

After the line $a'-a'''$ continuous rows of loops for the formation of the foot portion are worked from line $c-c'$, whereby in well known manner the usual gusset narrowing (line $e-e'$) may be effected.

Fig. 2 shows the position of the loops of a portion of the stocking according to Fig. 1. For the sake of clearness a great gauge has been assumed. In practice, of course, the number of loops is much greater.

From the example shown it is obvious that after the leg portion has been finished to the line $a'-a''-a'''$ the instep loops and the loops of the heel portions, except a few selvedge loops, are placed in suspense, whereupon the number of the loops of the heel portions placed in suspense is progressively reduced up to the line $a'-a'''$, whereby the number of the active heel needles is increased. By this means a bending of the foot results already at the inside and simultaneously widening is effected at the outside by forming new loop wales in any suitable manner. According to Fig. 2 it has been assumed that the formation of the upper part of the heel, i. e. the part of the heel which in the finished stocking lies above the row of loops extending in the finished stocking about above the ankle, this bending of the foot by decreasing the number of loops placed in suspense, and this widening by forming new loop wales has been effected in eleven rows of loops 1-11.

For obtaining further bending of the foot the number of loops placed in suspense is again increased from line $a'-a'''$, that is to say from this line the number of the active heel needles is decreased. At the outside, however, the formation of new loop wales is continued for the purpose of obtaining further widening. It is assumed that this is effected in the rows of loops 12 and 13.

On line $b-b'$ the enlargement of the heel is completed. No more new loop wales to obtain the heel rounding are now formed at the outside, whereas at the inside the number of the loops placed in suspense is further progressively increased. This is assumed to be done in the rows of loops 14 and 15. The number of the loops placed in suspense is, from the row of loops 16, further progressively increased, but simultaneously, for the purpose of obtaining the heel narrowing, narrowing is effected in the rows of loops 16 to 20, whereby the narrowing line $d-d'$ is formed.

Fig. 3 shows the formation of the loops of some courses of the right hand portion of a heel. In practice, of course, the number of rows of loops for the formation of a heel is considerably greater.

The example shows the same operation as described in Fig. 2 with the exception, however, that it has been assumed that now at the beginning of the heel formation all loops except five selvedge loops are placed in suspense instead of one in the example shown in Fig. 2. The line markings used in Figs. 1 and 2 are also used in Fig. 3, so that it is not necessary to again explain in detail the several operations. On line $a'-a''$ and $a'-a'''$ and on the obliquely extending lines from the line $a'-a''$ to a' and from a' to the line $a'-a'''$ the needles are represented by rings which carry the numbers 31-63. The loops hanging on the needles designated by the same reference number hang on the same needles in the knitting machine which in the machine are arranged in one row.

What I claim is:

1. A stocking made in a single operation on a flat knitting machine in which the upper part of the heel portions comprises loop wales progressively and simultaneously formed at the inside and outside with the instep loops placed in suspense, the number of said loop wales being progressively decreased at outside and inside in the lower heel portion.

2. In a method of making stockings in a single operation on a flat knitting machine, placing in suspense all instep loops and all heel loops except a few selvedge loops, at the beginning of the heel part, progressively decreasing from the selvedge to the interior the number of said loops placed in suspense while simultaneously and steadily forming new loop wales at the outside in any suitable manner during the formation of the upper parts of the heel.

3. In a method of making stockings in a single operation on a flat knitting machine, placing in suspense all instep loops and all heel loops, except a few selvedge loops, at the beginning of the heel part, progressively decreasing from the selvedge to the interior the number of said loops placed in suspense, simultaneously and steadily forming new loop wales at the outside in any suitable manner during the formation of the upper parts of the heel, stopping decreasing the number of loops placed in suspense at the inside, increasing the number of said loops placed in suspense at the inside and continuing the formation of new loop wales at the outside for a few rows of loops.

4. In a method of making stockings in a single operation on a flat knitting machine, placing in suspense all instep loops and all heel loops, except a few selvedge loops, at the beginning of the heel part, progressively decreasing from the selvedge to the interior the number of said loops placed in suspense, simultaneously and steadily forming new loop wales at the outside in any suitable manner during the formation of the upper parts of the heel, stopping decreasing the number of loops placed in suspense at the inside, increasing the number of said loops placed in suspense at the inside, stopping the formation of new loop wales at the outside and then narrowing heel loops simultaneously with a further increase of the number of loops placed in suspense.

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