A. GEE.

ATTACHMENT TO KNITTING MACHINES FOR ORNAMENTING HOSIERY.

APPLICATION FILED MAR. 23, 1911.

1,014,753. Patented Jan. 16, 1912.

FIG. 1.

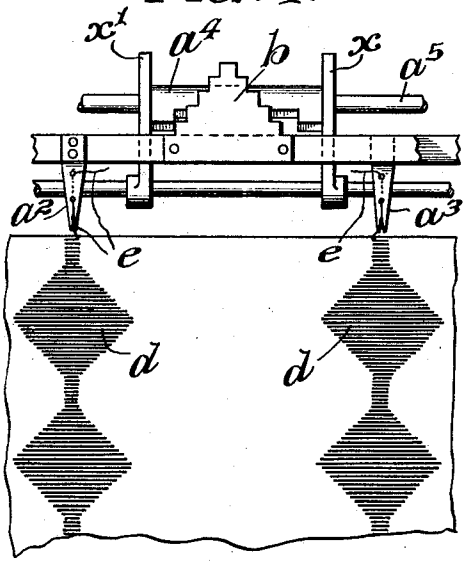


FIG. 2.

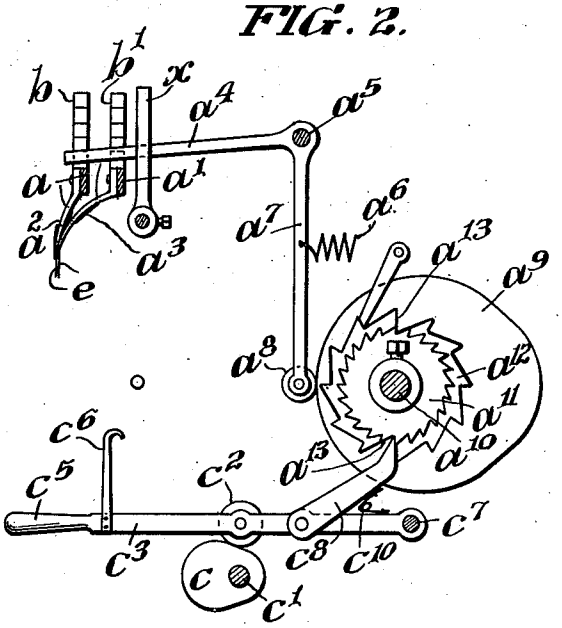


FIG. 3.

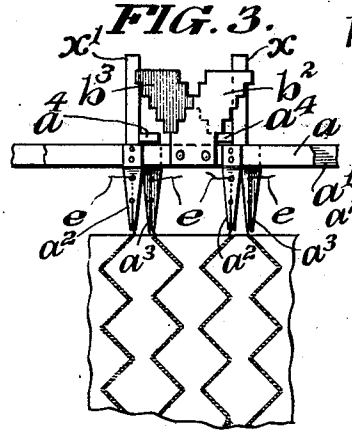
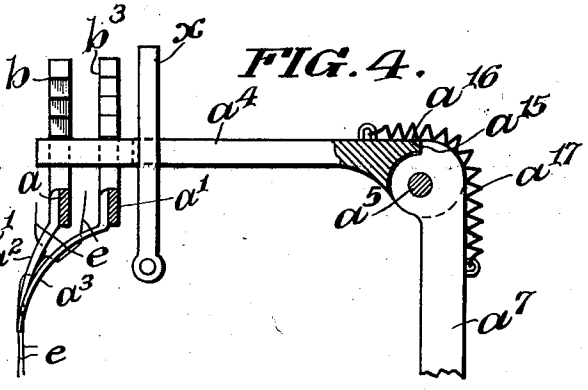


FIG. 4.



INVENTOR

Albert Gee,

BY J. Walter Douglass.

ATTORNEY

WITNESSES

Thomas M. Smith

Elisabeth A. Sholdrake

UNITED STATES PATENT OFFICE.

ALBERT GEE, OF PHILADELPHIA, PENNSYLVANIA.

ATTACHMENT TO KNITTING-MACHINES FOR ORNAMENTING HOSIERY.

1,014,753. Specification of Letters Patent. Patented Jan. 16, 1912.

Application filed March 23, 1911. Serial No. 616,417.

To all whom it may concern:

Be it known that I, ALBERT GEE, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Attachments to Knitting-Machines for Ornamenting Hosiery, of which the following is a specification.

My invention has relation to an attachment adapted for employment with a full fashioning flat knitting machine to variably ornament hosiery during production thereof; and in such connection it relates to the particular constructive arrangement of such an attachment to the knitting machine for the defined purpose.

The nature and scope of my present invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, in which—

Figure 1, is a front elevational view of an attachment to a flat knitting machine to ornament hosiery during production, embodying main features of my said invention. Fig. 2, is a vertical sectional view of said attachment. Fig. 3, is a front elevational view of a modified arrangement of said attachment to obtain different ornamental effects in the hosiery, during production; and Fig. 4, is an enlarged sectional elevation of actuating parts of the said attachment, as shown in Fig. 3.

Referring to the drawings, a and a^1, are the reciprocating bars of a flat knitting machine provided with thread-carriers a^2 and a^3. On each of the bars a and a^1, is secured the pattern forming step-like devices b and b^1. These devices are preferably arranged in pyramidal form and so as to regulate movements of the bars a and a^1, as well as the thread carriers a^2 and a^3.

a^4, is a bifurcated bar held in guides x and x^1, of the machine. The bar a^4, as shown, is mounted on a shaft a^5, of the machine and is also provided with a depending extension a^7, held under tension by means of a spring a^6. This extension also carries a terminal roll a^8, operated by a cam a^9, with which it is held in engagement by means of a spring a^6. The cam a^9, is secured to a shaft a^{10}, of the machine. On this shaft a^{10}, is secured a ratchet-wheel a^{11}, and loosely carried on the same shaft adjacent to the ratchet-wheel a^{11}, is a second ratchet-wheel a^{12}. As shown, the teeth of these ratchet-wheels a^{11} and a^{12}, preferably differ in number with respect to each other, as clearly shown in Fig. 2, although they could be arranged each with a like number of teeth and equally good results be obtained. The ratchet-wheel a^{12}, loosely mounted on the shaft a^{10}, has a lesser number of teeth than the ratchet-wheel a^{11}, fixed to the said shaft. In the ratchet-wheel a^{12}, one or more of the teeth for example a^{13}, is deeper than the rest of the teeth of this ratchet-wheel.

c, is a cam mounted on a shaft c^1, of the machine, which, actuates a roll c^2, journaled to a bar c^3, carrying a handle c^5, and hook c^6, for lifting the same out of the way, when required, that is, when simply plain knitting, by the machine is to be done. The bar c^3, is mounted at its forward end on a shaft c^7, of the machine and between its forward pivotal connection and the roll c^2, carried thereby, is arranged a pawl c^8, in pivotal connection therewith and normally arranged to engage the ratchet-wheel a^{12}, and held in engagement therewith, by means of a spring c^{10}, until a deep tooth of said ratchet-wheel is brought into position with the same, when the said pawl engages with teeth of both ratchet-wheels of the shaft a^{10}, to revolve the latter and the cam a^9, to operate the roll a^8, of the bar a^4, and thereby cause the bifurcated portion of said bar to step up, notch by notch or down, notch by notch of the pyramidal step-devices b and b^1. These devices so arranged one in advance of the other as shown in Fig. 2, control the successive throw movements of the bars a and a^1, and also the carriers a^2 and a^3, of the ornamenting thread or yarn in producing the particular ornamental design in the hosiery and during ordinary knitting of the stocking blank, as indicated for example, at d and d^1, in Fig. 1. In the operation of the thread-carriers a^2 and a^3, the thread or yarn e, drawn therethrough and controlled by the devices b and b^1, effect the said results through the bifurcated portion of the bar a^4, being caused to successively step up notch by notch and thus to increase step by step the throw of the bars a and a^1, to gradually increase or widen the design in the stocking, while ordinary knitting of the same is going on. A reverse movement of the bifurcated bar a^4, produces a gradual narrowing of the design, in the stocking and during knitting thereof. This

is effected by the step by step movement downward of the said bar along the steps of the pyramidal devices b and b^1, shortening the throw of the bars a and a^1, as descending, as will be apparent from Fig. 1.

From the foregoing it will be understood that the action of the bars a and a^1, in connection with the devices b and b^1, induced by the operating mechanism of the machine described, will cause during knitting on a flat machine ornamental designs or configurations corresponding in shape or form to those illustrated in plan Fig. 1. Further, that in order to vary the designs, as shown, it is only necessary to change the form of the devices b and b^1, and this can be readily accomplished by simply removing the type of said devices b and b^1, of Fig. 1, from the bars a and a^1, and replacing by others having different pyramidal pattern forming conditions.

In Figs. 3 and 4, are shown, a modified arrangement of the pyramidal pattern forming devices b^2 and b^3. In this instance they are arranged in reverse relationship to each other from the respective bars a and a^1, and are engaged by the bifurcated portion of the bar a^4, and moved step-by-step upward to cause the bars a and a^1, to be moved in opposite directions and at the same time limited as to their oscillations to thus correspondingly operate the thread-carriers a^2 and a^3, manipulating the ornamenting thread or yarns back and forth rapidly to variably produce a zig-zag ornamental design, such as is shown in plan, in Fig. 3, during knitting of the hosiery on a full fashioning flat knitting machine. In Fig. 4, the bifurcated portion of the bar a^4, is pivoted to the extension a^7, and is provided with a shoulder a^{15}, which bears against an offset a^{16}, held normally in engagement therewith, by a spring a^{17}, as shown in Fig. 4. The bifurcated bar a^4, is held in contact with a set of steps of the devices b^2 and b^3, by means of the spring a^{17}. A cam a^9 causes the bar a^7, to rotate on the pivot a^5, to free the shoulder a^{15}, from the said offset a^{16}, of the bar a^4, and at the same time to bring the spring a^{17}, under such tension as that when a set of steps of the said devices b^2 and b^3, are alined under the influence of the spring a^{17}, the bifurcated portion of the bar a^4, is lifted into engagement with the set of steps of the devices b^2 and b^3, to thereby cause the bars a and a^1, to be spaced farther apart, during their oscillations and so on, in order to continue the production of zig-zag designs of the character for example, as shown in Fig. 3, during ordinary knitting of the stocking blank on the flat or straight knitting machine, in which the said devices are particularly adapted for use.

Having thus described the nature and objects of my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a knitting machine, two horizontal reciprocating bars, thread carriers supported by said bars, two step-like pattern forming devices secured to said bars and arranged one in advance of the other, a pivoted bifurcated bar provided with roller-means, said bar arranged to step up or down, notch by notch, of said pattern forming devices and a cam controlled pawl and ratchet mechanism to actuate said bifurcated bar and thereby to permit of reciprocations of said horizontal bars, substantially as and for the purposes described.

2. In a knitting machine, two horizontal reciprocating bars, thread carriers supported by said bars, two step-like pattern forming devices secured to said bars, and arranged one in advance of the other and a jointed bifurcated bar provided with roller-means, said bar arranged to step up or down, notch by notch, of said pattern forming devices, a spring connected with both members of said bifurcated bar and a cam controlled pawl and ratchet mechanism for actuating said bifurcated bar and thereby to permit of reciprocations of said horizontal bars, substantially as and for the purposes described.

In witness whereof, I have hereunto set my signature in the presence of two subscribing witnesses.

ALBERT GEE.

Witnesses:
CHAS. A. SIMONDET,
HARRY WRIGHT.