

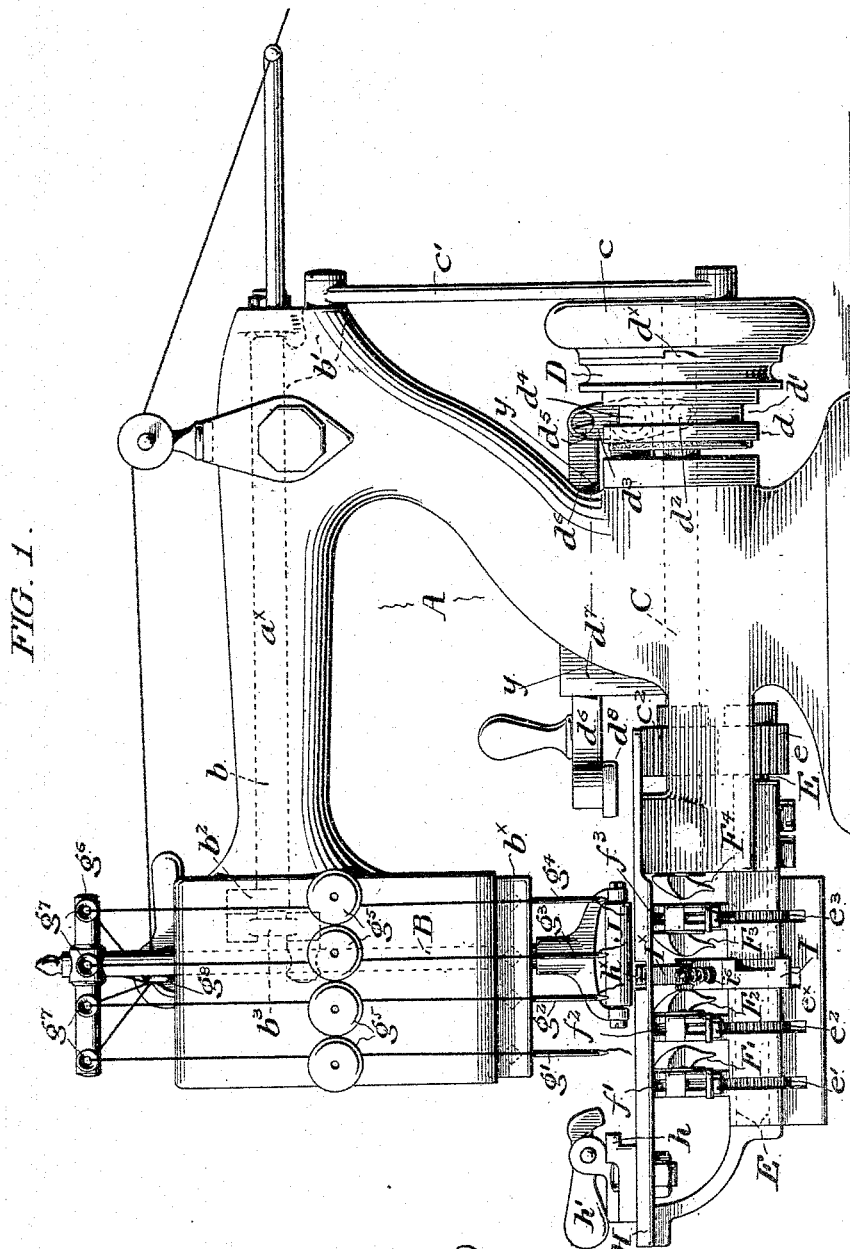
(No Model.)

4 Sheets—Sheet 1.

J. W. GRANGER.
MACHINE FOR CARDING HOOKS AND EYES.

No. 491,281.

Patented Feb. 7, 1893.



WITNESSES:

W. E. Paige
F. Norman Dixon

John Wm Granger
INVENTOR:

By his Attorneys
Wm C. Strawbridge
Edsonall Taylor

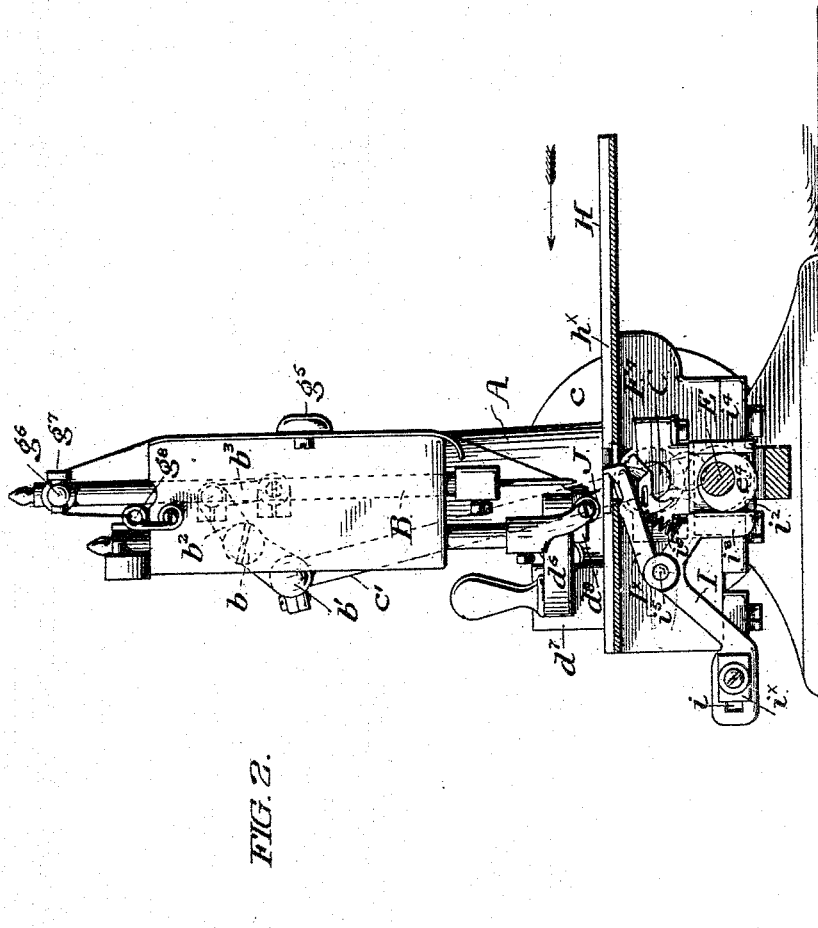
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4 Sheets—Sheet 2.

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WITNESSES:

A. E. Paige
J. Norman Dixon

John W. Granger,
INVENTOR:
By his Attorneys
Wm. C. Strawbridge
Samuel Taylor

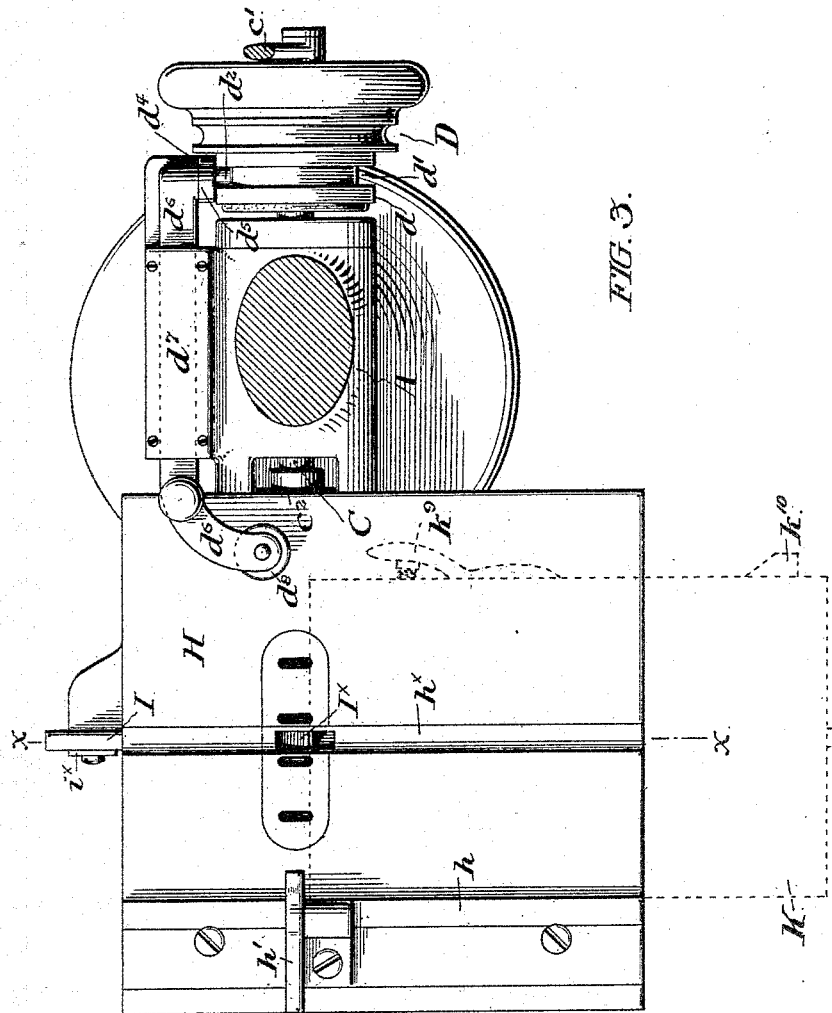
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4 Sheets—Sheet 3.

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M. E. Paige
F. Norman Dixon

INVENTOR:

John Wm Granger,
INVENTOR:
By his Attorney
Wm C Strawbridge
Wm Sall Taylor

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FIG. 4.

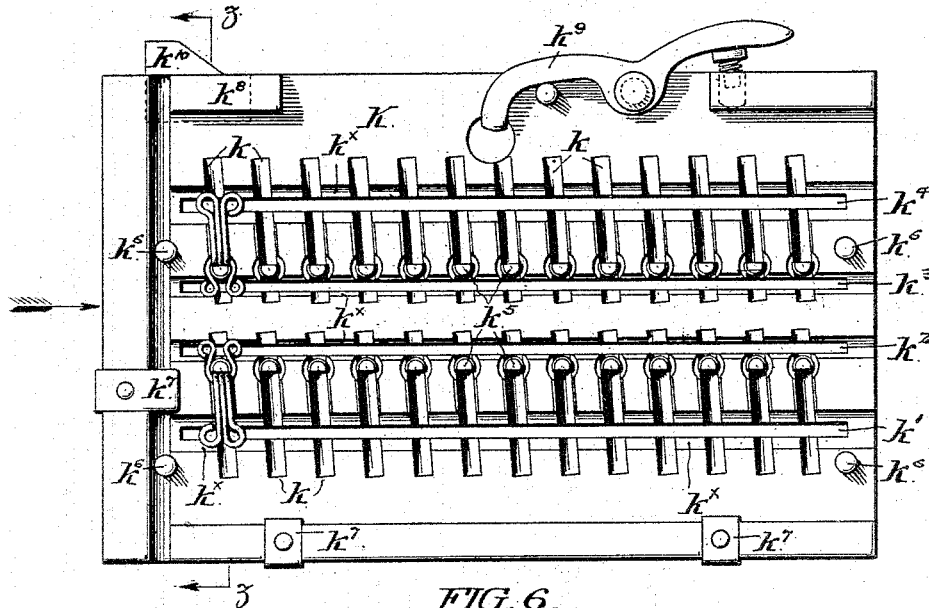


FIG. 6.

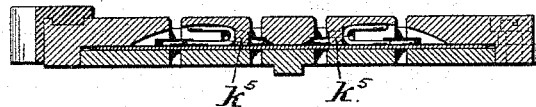
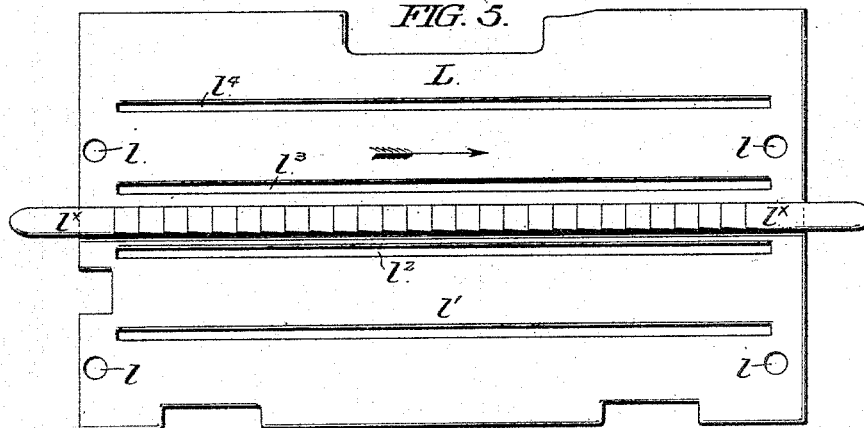


FIG. 5.



WITNESSES:

N. E. Paige
J. Norman Dixon

John Wm Granger,
INVENTOR:
By his Attorneys
Wm C. Strawbridge
Bonsall Taylor

UNITED STATES PATENT OFFICE.

JOHN WILLIAM GRANGER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR
OF ONE-HALF TO RICHARDSON & DE LONG BROTHERS, OF SAME PLACE.

MACHINE FOR CARDING HOOKS AND EYES.

SPECIFICATION forming part of Letters Patent No. 491,281, dated February 7, 1893.

Application filed July 20, 1892. Serial No. 440,575. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAM GRANGER, a citizen of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Carding Hooks and Eyes, of which the following is a specification.

Broadly stated, it is the object of my invention to provide a mechanism by which any desired number of hooks and eyes may be sewed upon a card which serves as a vehicle to convey them to the purchaser.

It is not novel to manually sew hooks and eyes upon cards, and my invention therefore relates to mechanism by which the entire operation can be automatically performed.

Broadly considered, my invention comprehends a sewing machine, of any preferred character, which is equipped with a plurality of needles, and with which is combined a mechanism for presenting and advancing with respect to said needles, a series of hooks engaged with their eyes, and disposed in proper order or relationship to a card to which they are to be attached by stitches.

A machine embodying a good form of my improvements is represented in the accompanying drawings and hereinafter described, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the drawings, Figure 1 is a front elevational view of a machine embodying my improvements, the carrier being removed. Fig. 2 is a left hand elevational view of the machine as shown in Fig. 1, section being supposed through the bed plate of said machine, in the plane of the dotted line $x-x$ of Fig. 3. Fig. 3 is a plan view of the machine shown in Figs. 1 and 2, section being supposed through the supporting standard or arm in the plane of the dotted line $y-y$ of Fig. 1, and the carrier being represented in dotted lines in its initial position of application to the bed plate. Fig. 4 is an inverted plan view of the body of the carrier with its base plate removed. Fig. 5 is a bottom plan view of the base plate of the carrier, and Fig. 6 is a transverse sectional elevation in the plane of the dotted line $z-z$ of Fig. 4, through the carrier and its base plate after they have been placed together

for application to the bed plate of the machine, with the card and hooks and eyes in place.

Similar letters of reference indicate corresponding parts.

My improvements are applicable in connection with any form of sewing machine susceptible of being provided with a plurality of needles, and I do not confine myself to the use of any particular machine. In the drawings I have shown a form of the Singer machine, modified to embody my improvements.

A is the standard or arm of the machine, organized to embody a needle bar shaft b , which extends longitudinally of the horizontal upper member a^x of said arm, and which actuates the needle bar B as hereinafter set forth,—and also to embody a looper-actuating shaft C, horizontally disposed in the basal portion of said standard in parallelism with the needle bar shaft. Each of these shafts is housed, journaled, and applied in any usual manner. At its outer extremity the looper-actuating shaft C is equipped with a rigidly affixed crank wheel c , the inner face of which is provided with a clutch seat d^x , and which drives the pitman c' which at its upper extremity is connected with an outer rocker arm b' , Fig. 2, on the needle bar shaft b to occasion the oscillation of said shaft. Upon the looper-actuating shaft, between the standard and the crank wheel, is loosely mounted a driving pulley D the outer face of which, or that which opposes the inner face of the crank wheel, is provided with a clutch lug d^x for engagement with the clutch seat c^x of the crank wheel when the driving pulley is moved laterally outward against said wheel. Internally the driving pulley is provided with a hub d , formed with a circumscribing channel d' into which is entered a roller-provided pin d^2 upon the lower extremity of a clutch lever d^3 fulcrumed at d^4 to a fixture of the standard, and at its upper extremity pivotally connected at d^5 to a slide-bar d^6 , housed in a bearing d^7 , being a fixture of the standard, and at its inner extremity preferably curved as shown in Fig. 3, and provided with a roller d^8 adapted to be encountered by a deflecting lug h^{10} , Figs. 3 and 4, formed on the carrier so as to be thereby forced outwardly when the car-

rier has completed its transverse movement across the bed plate, to occasion the disengagement of the driving pulley from the crank wheel and effect the stoppage of the machine.

Upon the looper-actuating shaft C, to the inside of the standard, is mounted a toothed driving pinion c^2 which engages with a counterpart toothed driven pinion e mounted upon a supplemental shaft E, housed in a shaft boxing e^x supported below the bed plate, in parallelism with the shaft C at an equal speed with which it runs. Upon this supplemental shaft is mounted a series of looper driving toothed pinions $e' e^2 e^3$ which engage with a corresponding series of counterpart driven pinions $f' f^2 f^3$ upon or connected with the loopers $F' F^2 F^3$, which latter are of any usual construction and applied in any usual manner, and which, together with a fourth looper F^4 upon the inner end of the looper-actuating shaft C, co-operate in the usual manner with four eye-pointed needles $g' g^2 g^3 g^4$ affixed to a needle cross head b^x secured to the lower extremity of the needle bar B, the vertical reciprocation of which is occasioned by an inner rocker arm b^2 , Fig. 2, affixed to the needle bar shaft and linked by a link b^3 to the needle bar. Four needles and a corresponding number of loopers are represented and described, for the reason that the machine under consideration is organized to sew upon a card a double row of hooks and eyes. A greater or less number of needles can, however, manifestly be applied if it is desired to sew a greater or less number of rows of hooks and eyes.

It is the usual bed plate of the machine, which, according to my invention, is provided with a lateral carrier guide h of any preferred description, and which serves to guide the travel of the carrier transversely across the bed plate. The bed plate is also formed with a transverse channel h^x to which is adapted a ratchet bar l^x formed on the under face of the carrier base plate, and through an opening in which, conveniently centrally disposed, projects a spring controlled pawl I^x adapted to effect the transverse feed of the carrier relatively to the bed plate. This pawl may be formed and applied in many ways. I find it convenient to pivot it upon what I term a pawl frame I, Fig. 2, the same being a metal framing conveniently of the form represented in said figure, provided at its rear portion with a slot i mechanically adapted to a block bearing i^x supported beneath the bed plate, and serving to sustain and permit of the fore and aft travel of said frame, and provided at its front portion with a cam boxing i^2 , between the front and rear walls or shoulders $i^3 i^4$ of which is embraced and plays a cam e^4 on the supplemental shaft E, through the throw of which the pawl frame as an entirety is caused to take on a predetermined forward and back movement sufficient to occasion the stroke of the pawl. The pawl as shown in Fig. 2 is piv-

oted at i^5 to its frame, and is normally held upward to duty by a compressing spring i^6 . Obviously, each complete rotation of the supplemental shaft will occasion one complete stroke of the pawl.

J is a roller presser foot to maintain the carrier, when applied, upon the bed plate.

g^5 are tension devices for the thread.

g^6 is an eye-bar carried by the needle bar, and provided with eyes g^7 through which the threads of the respective needles are led conveniently after having been led through a common eye g^8 from their spools, which it is unnecessary to represent.

h' , Figs. 1 and 3, is a pivoted stop, adapted to be tilted to present in the path of the carrier as the latter is introduced upon the bed plate in order to occasion its stoppage before it encounters the needles if down. It is, however, but a type of a stop device to insure the stoppage of the carrier at a predetermined point in advance of the needles.

The mechanism invented by me by the aid of which a series of hooks engaged with their respective eyes may be assembled and properly presented with reference to the card to which they are to be sewed and to the mechanism by which such sewing is to be effected, is constituted by the casing or carrier represented in Figs. 4, 5, and 6. This device is termed by me a carrier because it carries the hooks and eyes and the card to which they are to be sewed, to the sewing mechanism; but it is essentially a casing composed of a lower and an upper member relatively separable but adapted to be placed and maintained together, and formed to receive between them the hooks and eyes and the card. It is composed of a base plate and of a cover or body in which the socket seats or recesses for the hooks and eyes are preferably formed.

By the term carrier I include both the body or casing proper, and the base plate; and while I prefer to form the sockets for the hooks and eyes in the body or cover, I can equally well form them in the base plate. A suitable arrangement of these devices, being that represented in the drawings, is of the following construction:

K designates the body or casing of the carrier, the under face of which is represented in Fig. 4, and which is a flat plate of metal traversed in the direction of its length by four parallel needle slots $k' k^2 k^3 k^4$, spaced a sufficient distance apart to cause them to register with the needles of the machine, and to enable the operator automatically to present the thread eyes of each inserted hook and its engaged eye through said slots to said needles.

k are transverse slots suitably conformed to constitute sockets for the hooks and eyes. Two series of these slots, each series bisecting and overlapping an adjoining pair of needle slots, are formed in the casing represented. Their conformation is difficult to describe except by saying that they are sunken segmental grooves, and that they are in the

region where the thread eyes of the inserted hooks and eyes respectively occur, enlarged, conveniently by the formation of longitudinal channels k^x , to receive said thread eyes, and that in the region where the eyes (not the thread eyes) occur, they are formed with studs k^5 , which serve, as shown in Fig. 4, to maintain the eye-engaging bends of the hooks in bite upon the said eyes. While these sockets may be formed in the above manner they may also be formed in any other preferred manner, and the casing as an entirety may, if desired, be a casting. I prefer to arrange the sockets of each series in the opposite disposition represented, the hooks inserted in each series of sockets being outside and the eyes inside.

k^6 are studs or lugs projecting from the under face of the body and adapted to register with respect to holes in the base plate to insure the correct application of the two members to each other, when said members are as shown in the drawings simply laid together and not hinged together or grooved or dovetailed to slide the one with respect to the other.

k^7 are gages, adjustable if desired, to insure the accurate placing of the card to which the engaged hooks and eyes are to be sewed after said engaged hooks and eyes have been manually inserted in their sockets. These gages co-operate with fixed sides or walls k^8 , and preferably also with a spring controlled lever gage k^9 , Fig. 4, which serves to frictionally grasp its edges to retain the card rectilinearly in position.

k^{10} is a deflecting lug, which, as already explained, co-operates with the roller-provided slide bar d^6 to insure the stoppage of the machine after the carrier as an entirety has been caused to complete its traverse across the bed plate.

L is the base plate of the carrier, shown in Fig. 5, the same being a flat plate conformed to be fitted within the sides and gages of the carrier body, as shown in Fig. 6, and in the construction represented provided with holes l to fit the studs k^6 on the body. This base plate is provided with a series of parallel needle slots l^1 l^2 l^3 l^4 which respectively correspond with the needle slots k^1 k^2 k^3 k^4 in the body, and respectively register with them when the base plate is in place, in order that each needle may pass through a pair of the slots. The under face of the base plate is provided with a ratchet bar l^x , which, when the base plate is closed in place with respect to the body and both are in place upon the bed plate of the machine, registers with the transverse channel h^x of said bed plate, and occasions the presentation of the ratchet teeth to the pawl to effect, in the operation of the pawl, and at each of its strokes, the predetermined advance of the carrier as an entirety with its contained cards and engaged hooks and eyes to the needles. It is, of course, to

be understood that the hooks in engagement with their eyes are first inserted in their sockets and the card laid over them, before the base plate is applied to or closed upon the body, and the carrier as an entirety presented to the action of the sewing mechanism.

Having now described a machine embodying a good form of my improvements, it is proper for me to add, that while I have described a bed plate H strictly as such, I do not confine myself to the exact form of the same shown, as any surface or surfaces which would support and with respect to which the carrier could have movement would be the equivalent of the aforesaid bed plate;—that while I have with some particularity described the usual loopers in a series correspondent with the series of needles employed, yet that the needles and the loopers together and the means for operating them, are but a type of a sewing mechanism embodying a plurality of needles and adapted to effect the making of stitches to stitch the hooks and eyes to the card;—that while I have described a specific construction of carrier in which longitudinal slots corresponding with the needles are employed, yet that such slots are but types of appropriate needle openings or passages through the carrier, and would be present in equivalent form if a series of holes or other openings made to register with the teeth of the ratchet bar l^x , replaced them;—that while I have described a specific ratchet and pawl feed for occasioning the traverse of the hook carrier with respect to its supporting bed plate and the needles, yet that other mechanism for advancing the carrier relatively to the needles could be substituted in the stead of the particular contrivances set forth;—and that while I have described a specific mechanism for stopping the machine at the end of the traverse of the carrier, yet that said mechanism is not of the essence of the invention, and may, if desired, be dispensed with, or stop contrivances of other forms substituted in its stead. I assert these qualifications in order that the real invention may be understood, and that undue stress may not be laid upon devices which are purely mechanical, and which, while important and well organized when organized in the manner described, are not to be considered as of the essence of the invention.

Having thus described my invention, I claim:

1. In combination with a sewing machine provided with a plurality of needles, complementary stitch-forming mechanism, and a bed plate,—a carrier which is formed with openings through which said needles pass, and which has means to contain within it in fixed but temporary relationship both a card and a number of hooks and eyes to be sewed to said card, and to present said card and hooks and eyes, as so contained and related, to the action of the needles,—and means for occasion-

ing the predetermined traverse of said carrier relatively to said needles,—substantially as and for the purposes set forth.

2. In combination with a sewing machine provided with a plurality of needles, complementary stitch-forming mechanism, and a bed plate,—a carrier which is formed with openings through which said needles pass, and which has means to contain within it in fixed but temporary relationship both a card and a number of hooks and eyes to be sewed to said card, and to present said card and hooks and eyes, as so contained and related, to the action of the needles,—means for guiding the traverse of said carrier relatively to the bed plate,—and means for occasioning the predetermined traverse of said carrier relatively to said needles,—substantially as and for the purposes set forth.

3. In combination with a sewing machine provided with a plurality of needles, complementary stitch-forming mechanism, and a bed plate,—a carrier formed with openings through which said needles pass, and which is composed of two members relatively separable and embodying between them spaces adapted to contain hooks and eyes and a card to which said hooks and eyes are to be sewed,—and means for occasioning the predetermined traverse of said carrier relatively to said needles,—substantially as and for the purposes set forth.

4. In combination with a sewing machine provided with a plurality of needles, complementary stitch-forming mechanism, and a bed plate,—a carrier formed with openings through which said needles pass, and which is composed of two members relatively separable and embodying between them spaces adapted to contain hooks and eyes and a card to which said hooks and eyes are to be sewed,—means for guiding the traverse of said carrier relatively to the bed plate,—and means for occasioning the predetermined traverse of said carrier relatively to said needles,—substantially as and for the purposes set forth.

5. In combination with a sewing machine provided with a plurality of needles, complementary stitch-forming mechanism, and a bed plate,—a carrier formed with openings through which said needles pass, and which has means to contain and present to the action of the needles a card and a number of hooks and eyes to be sewed to said card,—a ratchet bar formed upon or connected with said carrier,—a feed pawl presenting through the bed plate,—and mechanism for occasioning the stroke of said pawl,—substantially as and for the purposes set forth.

6. In combination with a sewing machine provided with a plurality of needles, com-

plementary stitch-forming mechanism, and a bed plate,—a carrier formed with openings through which said needles pass, and which has means to contain and to present to the action of the needles a card and a number of hooks and eyes to be sewed to said card,—means for occasioning the predetermined traverse of said carrier relatively to said needles,—and stop mechanism operated by the carrier upon the completion of its traverse to occasion the stoppage of the machine,—substantially as and for the purposes set forth.

7. A carrier for a sewing machine for sewing hooks and eyes upon a card,—composed of two relatively separable members which embody between them spaces adapted to contain hooks and eyes, and also a space within which a card may be placed so as to be presented to the hooks and eyes,—and which members are respectively formed with corresponding rows of vertically extending parallel needle openings,—substantially as and for the purposes set forth.

8. A carrier for a sewing machine for sewing hooks and eyes upon a card,—composed of two relatively separable members one of which members is provided with sockets to contain hooks and eyes, between which members there is a space for a card, and both of which members are provided with parallel rows of vertically extending corresponding needle openings,—substantially as and for the purposes set forth.

9. A carrier for a sewing machine for sewing hooks and eyes upon a card,—composed of two relatively separable members one of which is provided with sockets to contain hooks and eyes, between which members there is a space for a card, which members are formed with parallel rows of vertically extending corresponding needle openings, and one of which members is provided with gages to adjust the set of the card,—substantially as and for the purpose set forth.

10. A carrier for a sewing machine for sewing hooks and eyes upon a card,—composed of a body formed with one or more rows of internal sockets bisecting one or more series of rows of needle openings,—and of a cover removably applicable to said body and formed with one or more corresponding series of rows of needle openings,—substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 19th day of July, A. D. 1892.

JOHN WILLIAM GRANGER.

In presence of—

J. BONSALE TAYLOR,
F. NORMAN DIXON.