Aug. 27, 1935. J. A. GOODMAN 2,012,560

SEWING MACHINE FOR AND METHOD OF FORMING STITCHING

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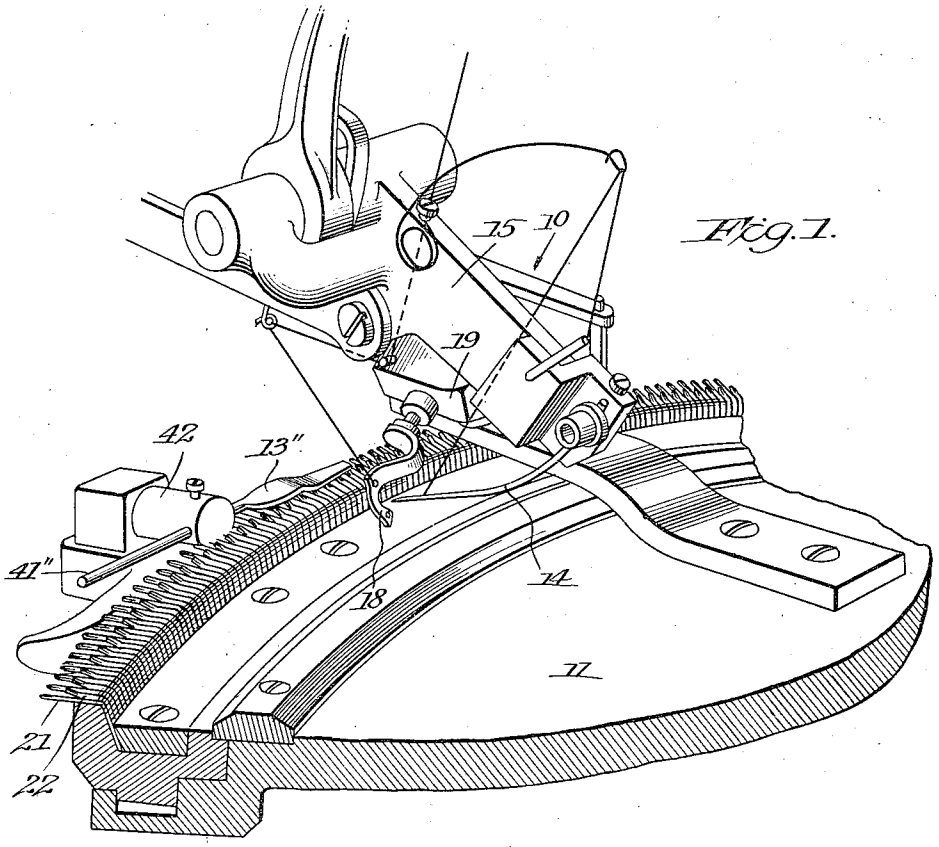


Fig. 1.

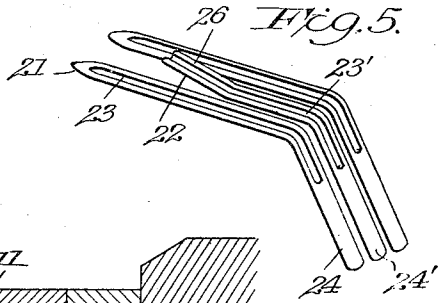


Fig. 5.

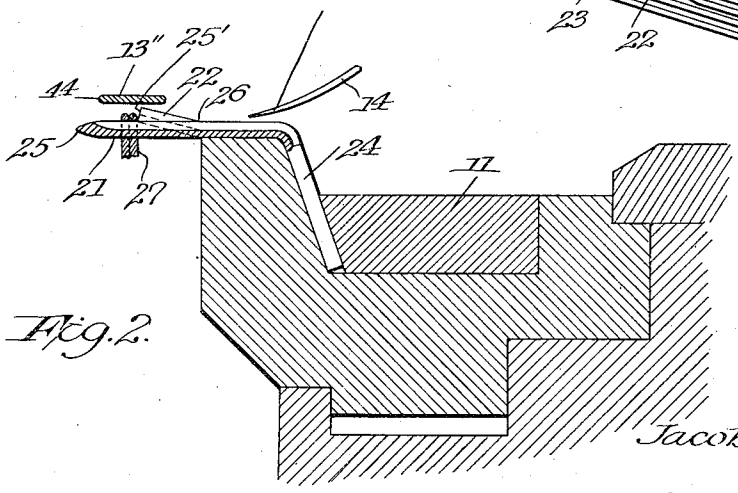


Fig. 2.

Inventor

Jacob A. Goodman

By Edmund A. Parry

Attorney

Aug. 27, 1935. J. A. GOODMAN 2,012,560

SEWING MACHINE FOR AND METHOD OF FORMING STITCHING

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Fig. 3.

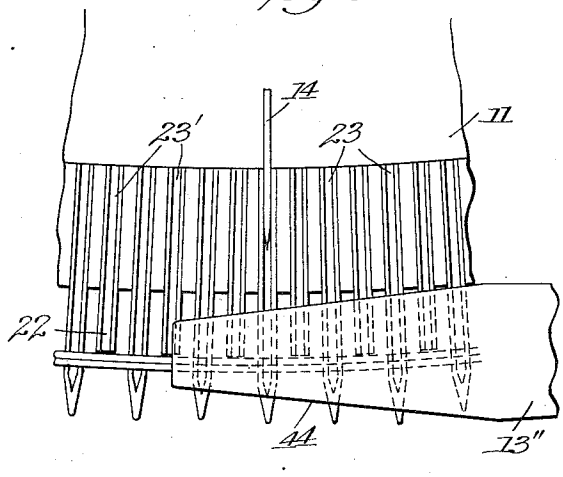


Fig. 8.

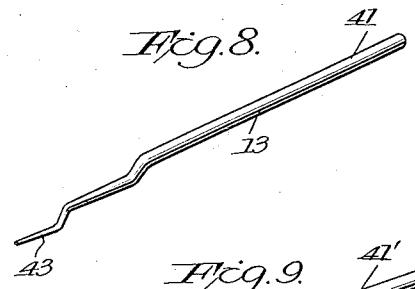


Fig. 9.

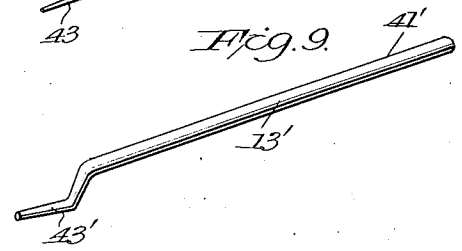


Fig. 4.

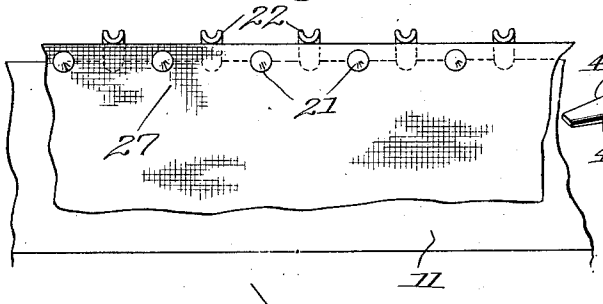


Fig. 10.

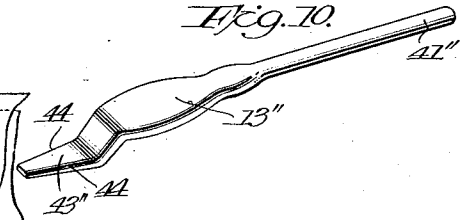


Fig. 6.

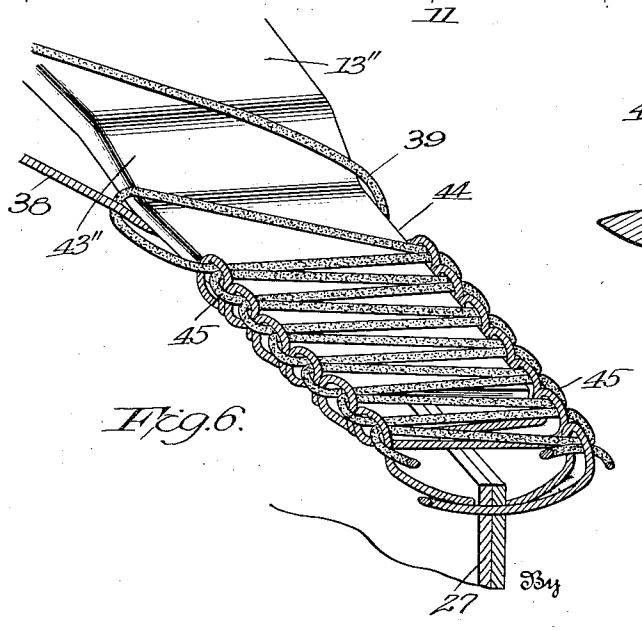
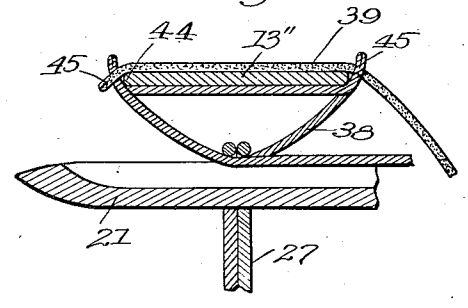


Fig. 7.



Inventor

Jacob A. Goodman,

By

Edmund N. Parrish

Attorney

Aug. 27, 1935. J. A. GOODMAN 2,012,560

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Fig. 11.

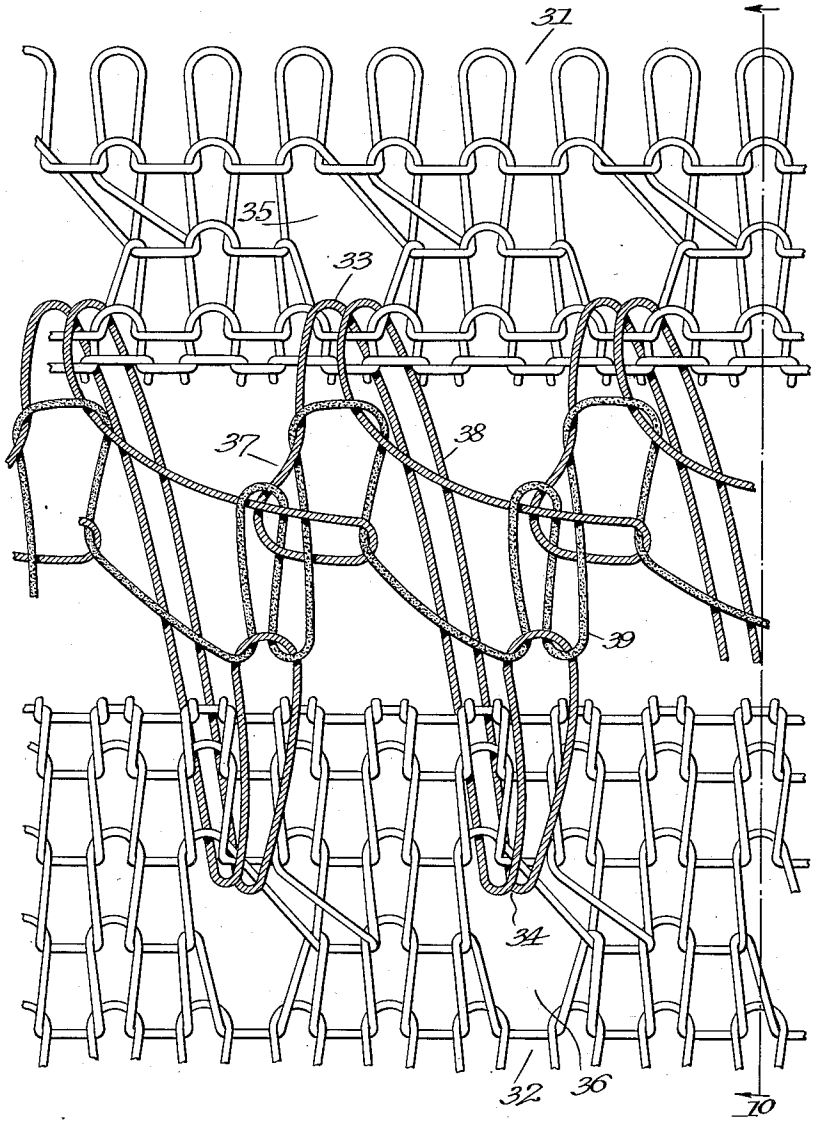
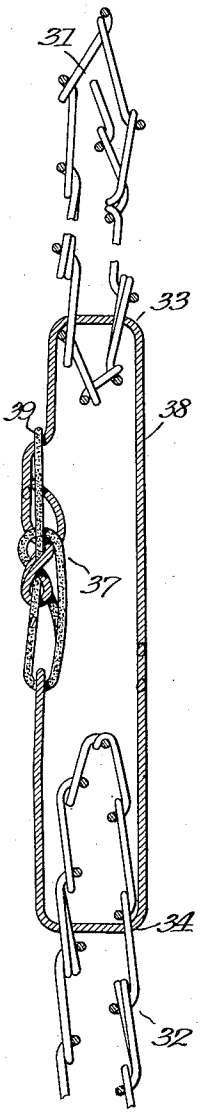


Fig. 12.



Inventor

Jacob A. Goodman,

By Edmund A. Parry
Attorney

Patented Aug. 27, 1935 2,012,560

UNITED STATES PATENT OFFICE

2,012,560

SEWING MACHINE FOR AND METHOD OF FORMING STITCHING

Jacob A. Goodman, Indianapolis, Ind.

Application May 9, 1932, Serial No. 610,225

42 Claims. (Cl. 112—25)

The invention pertains to sewing in a manner to produce a novel stitch formation. The stitch formation is novel in two important particulars. Whereas, it is conventional, in forming a series of successive stitches, to sew each stitch to pass through the fabric, in producing my novel stitch formation only predetermined stitches are made to engage the fabric. Also whereas it is conventional, in sewing, to form the stitches and thereafter draw them tight against the sewed fabric permitting the interloops or concatenations of the stitches to position themselves wherever they fall against the fabric, in my novel stitch construction during the formation thereof I hold the stitches so as not to be drawn tight and against the fabric surface and govern the position of the concatenations within the stitch. The present invention comprises the method of and machine for producing stitches with one or more of these novel characteristics.

The improved form of stitching in its various embodiments is highly ornamental due to the way in which the same is joined to a fabric and the peculiar form assumed by the various stitches. It may be used in many instances as a substitute for embroidery or lace work as an edging, for joining fabrics and for ornamental work on the surface of fabric.

In order to produce stitching as described above, of which the distinguishing characteristic is the engagement of only predetermined stitches with the fabric, I present the fabric to a stitch forming mechanism during the formation of only predetermined stitches. During the formation of other stitches the fabric is not presented to the stitch forming mechanism, and in the preferred embodiment the fabric is actually withheld from the stitch forming mechanism by positive means which interposes between the sewing needle and the fabric to guide the needle away from the fabric and also to hold the fabric in a position where the sewing needle cannot engage or penetrate the same. This feature alone, without the other novel stitch characteristics mentioned and to be hereinafter more fully described, produces a stitch that is new and very useful in various types of work as will later appear.

To more readily present the fabric to a stitch forming mechanism so as to produce stitching of the desired character novel fabric feeding means is utilized which is adapted to present the fabric to such mechanism during the formation of only predetermined stitches. It will be understood, however, that within the spirit of my invention conventional fabric feeders of various types may be used in association with the stitch forming mechanism and the presentation of the fabric to the stitching mechanism controlled manually or by other mechanical expedients.

Various types of sewing machines are suitable for the practice of my invention when provided with special mechanism which will function to produce stitches of the desired character in the required relation with the fabric to be operated upon. The method of producing the novel stitching and the general character and function of the special mechanical features adapted to carry out such method will become evident from a consideration of an over-edging machine which in its ordinary capacity functions to produce stitching around and along the edge of fabrics. The embodiment of my invention in an over-edging machine of the type known as a "looper" will be specifically described.

A looping machine, as is known to those skilled in the art, comprises a stitch forming and fabric feed mechanism having a base element, usually in the form of a dial. The base element and the stitch forming mechanism are movable relative to each other, and when the base element is a dial such movement is rotary. Located on the base element are designated spaced stations which during the relative motion are brought progressively opposite to the stitch mechanism in timed relation with the formation of successive stitches. Conventionally these stations are equipped with pins on which the fabric is empaled and which present the fabric to the stitch forming mechanism in their respective turns. I equip the base element with such empaling pins only at certain stations in an arrangement determined by the desired sequence in which the respective stitches are to penetrate and miss the fabric. In the preferred embodiment, and in order to insure that the needle does not penetrate the fabric in the formation of certain stitches, I equip stations that have no empaling pins with elements which interpose between the needle and the fabric to guide the needle away from the fabric, and/or hold the fabric away from the needle. These elements are a slight modification of the existing empaling pins and are produced cheaply to add little or nothing to the cost of the machine.

In order to produce a stitch of novel character which is loose, open, and not drawn tight against the fabric, I form the stitch around an elongated free ended element of lateral dimension sufficient to give the desired predetermined looseness to the stitch. This element may have a circular or other cross section but in any case when the

stitch is formed and is being drawn down it is arrested by the surface of the elongated element and is withheld against being drawn tight against the fabric. The completed stitches can slide off of the free end of the elongated element during the subsequent formation of successive stitches. For certain classes of work it is important that within the stitch the interloop or concatenations occupy a definite position and that in successive stitches the concatenations be uniformly positioned and/or in spaced relation. With this in view, adjacent the position where the interloop is formed the elongated element may have an edge which receives the concatenations and holds them during the steps of tightening and completing the stitch.

The characteristics of looseness and of definitely positioned concatenations are independent of each other and of the previously described novel arrangement wherein only predetermined stitches engage the fabric. Each of these features of stitch construction is valuable per se, particularly from an ornamental standpoint, and can be used to advantage in various kinds of work, separately or together, depending upon the demands of the particular sewing being done.

To produce loose stitches I use an element similar to the conventional chaining finger of a looping machine, which, may take the place of and perform the functions of a chaining finger when, for example, my invention is applied to a looping machine. It differs from the conventional chaining finger in that it is bigger around. It may be a chaining finger from a machine of a larger gauge than the one to which the invention is applied.

The ordinary looping machine produces the so called double chaining stitch by interlooping two threads alternately on opposite sides of a chaining finger and while forming each interloop drawing the previously formed interloop tight against the side of the chaining finger opposite. Conventionally, the chaining finger is small enough for the particular machine so as not to interfere with the stitch being drawn tight against the fabric. In its preferred embodiment my chaining finger is flat and wide with edges along each side to receive and hold the concatenations of the stitches while they are being drawn tight and completed.

This application is directed to the machine and method of producing my novel stitching and is a companion case to my copending application, Serial No. 610,226, filed May 9, 1932, which is directed to the stitch construction as an article and to its use.

A fuller understanding of my invention will be obtained from the accompanying drawings and the detailed description which follows:

Fig. 1 is a perspective view of a looping machine embodying the mechanical features of my invention;

Fig. 2 is a cross sectional view of a looper dial, further showing the application of my invention to that type of machine;

Fig. 3 is a plan view of the structure shown in Fig. 2;

Fig. 4 is an elevation looking toward the ends of the dial pins in Fig. 3;

Fig. 5 is a detailed perspective view of a group of the looper dial pins;

Fig. 6 is a perspective view of the stitching in the process of formation on the chaining finger;

Fig. 7 is a detailed sectional view of parts shown in Fig. 6 and also showing the stitching in the process of formation;

Figs. 8, 9 and 10 are detailed perspective views showing different types of chaining fingers used in the stitching of my invention; and,

Figs. 11 and 12 are face and cross sectional views, respectively, showing sections of fabric joined by stitching according to my invention.

Fig. 1 shows the operating parts of a looping machine. The stitch forming mechanism is generally designated by the reference character 10. The looper dial is designated by 11 and the chaining finger by 13. For a more detailed showing of the particular type of looping machine in connection with which my invention is herein described, attention is directed to the patent to Davis, No. 1,050,433. As is conventional the needle 14 is mounted on the arm 15 to oscillate radially of the dial during its stitch forming operation. The looping finger 18 is mounted on the carrier 19 to move back and forth with the needle and towards each end of its stroke adapted to interloop its thread with the needle thread, as is well known in the art. As is conventional the needle and looping finger pass respectively under and over the chaining finger 13 in moving from end to end of their strokes.

The dial 11 is mounted to rotate in timed relation with the stitch forming mechanism a fixed circumferential distance during the formation of each stitch. Thus circumferentially spaced stations on the dial come opposite the stitch forming mechanism progressively during the formation of successive stitches, each therefore constituting a stitch forming station. In prior art loopers each station is equipped with a fabric empaling pin 21, each pin having a needle guiding groove 23. The pins lie in a common plane and the needle guiding grooves of the pins collectively describe a plane.

The looping machine as so far described is conventional and the same is commonly used to join a plurality of rows or courses of knitted fabric. Each loop of the rows of knitted loops to be joined is empaled on one of the pins 21, successive loops of a row being empaled on successive pins. The needle 14 in its sewing operation is guided along the groove 23 to pass through any knitted loops empaled on that pin. Successive sewing stitches are made at successive stations so that each loop of the courses being sewed is locked by a sewing stitch. Heretofore, so far as I am aware, no one has ever used a looping machine except to join courses or rows of knitted fabric. The machine was especially designed for that purpose.

According to my invention, I have a new use for a looping machine. I empale a fabric edge on pins only at intermittent stitch forming stations of the dial. The edge may be the terminal edge of the fabric or may be a folded edge. Whereas looping machines were heretofore used only to sew knitted fabric such a machine when constructed according to my invention may be used to join or edge fabrics or work the surface thereof with a novel stitch construction of ornamental character. I can empale the fabric on alternate pins or on pins in some other sequence, and I am not confined to a uniform sequence throughout the width of the fabric. On the contrary, pleasing ornamental effects can be obtained by varying the sequence. By simply empaling the fabric at intermittent stitch forming stations of the dial I depart from prior art practice and obtain a wide variety of ornamental effects. The

needle will pass through the fabric at only those stitch stations where the fabric is empaled. At stations where no fabric is empaled the needle will miss the fabric and a stitch will be produced which is not sewed to the fabric and which is joined to the fabric only through the intermediary of other sewed stitches. It will readily be seen that by the exercise of my invention, and the method above set forth, intermittent stitches in groups of one or more will be passed through the fabric and in the interval therebetween there will be chains of one or more stitches which are free from the fabric.

Fabrics with pleasing ornamental effects can thus be produced. For example if alternate stitches are sewed to the fabric the result will be as shown in Figs. 11 and 12. These figures show knitted base fabrics designated generally by reference characters **31** and **32**. The two fabrics, in this instance are sewed together by my novel stitch, but it should be understood that my invention is not limited to the sewing together of fabric sections. The invention pertains to stitching with novel characteristics produced on a sewing machine and is not limited by the particular use of this stitching.

It will be noted that stitches penetrate the fabric at **33** and **34**. It will be clear to those skilled in the art that the penetrations at **33** and **34** are part of the same stitch produced by empaling one of each of the openings **35** and **36** on certain empaling pins and passing the needle with the needle thread **38** therethrough. This results in the thread **39** of the looping finger interlooping with the needle thread on one face of the fabric as shown. Between successive sewed stitches described there is a chain stitch, indicated generally by the reference character **37**, which does not penetrate the fabric and therefore is not sewed. These unsewed stitches are formed in the same manner as the sewed stitches. It will be clearly seen from Figs. 11 and 12 that these unsewed chain stitches have so merged with the adjacent sewed stitches that individual stitches have lost their identity. The stitches have merged into a mass of interloopings which produce an ornamental effect in the final product far beyond expectations.

This will readily be seen by comparing Fig. 6 which shows the conventional double chaining stitch in the process of formation, and Fig. 11 which shows the stitch structure resulting from sewing only alternate of the stitches shown in Fig. 6.

The fabrics above described can be produced by the method above described on the ordinary looping machine constructed so that each stitch formed will engage the fabric by empaling the fabric only on certain of the dial pins, but I have simplified the process. In doing so I simply remove those empaling pins from the looping dial which are at stitch stations where unsewed chain stitches are to be produced. At these stations there are no means for presenting the fabric to the sewing needle and the needle misses the fabric. I have found the machine so constructed to work satisfactorily. However, to insure better operation of the stitch forming mechanism and to adapt the machine to the speed of mass production, I supply, at each station where unsewed chain stitches are to be produced, positive means, to guide the needle away from the fabric and withhold the fabric from the needle. I will now proceed to describe these means.

At stations where unsewed stitches are to be produced I provide pins **22**, Figs. 2 to 5, with shank portions **24'** the same as the shank portions **24** of the pins **21**, for mounting them in the dial. The active end of the pins **22** are shorter than those of pins **21** so that they project a lesser distance from the periphery of the dial **11**. These pins **22** may thus constitute a guide to determine the distance inwardly to which fabric is empaled on the pins **21**, as shown in Fig. 3. The ends of the pins **22** are made blunt as at **25'** as distinguished from the tapered points **25** of the pins **21**. This prevents fabric being empaled on the pins **22** during rapid production. As will be clear from the drawings the pins **22** are deflected upwards at **26** at an angle towards the stitch forming mechanism and out of the plane of the pins **21**, as best shown in Figs. 2 and 5. This further insures against the fabric being empaled on the pins **22** and has an added function to be described. The pins **22** have a needle guiding groove **23'** like the groove **23** in pins **21**. Because of the deflection of the pins **22** the needle guiding surface **23'** is deflected out of the plane described by the grooves **23** of the pins **21**. The pins **22** are like pins **21** except that their active ends are cut off to a predetermined extent and are inclined or bent as described. Thus it will be seen that pins **22** can be made at little or no extra cost.

The fabric **27**, Figs. 2 and 3, is empaled on pins **21** to an extent defined by the arc formed by the pin ends **25'** of the pins **22**. Between the pins **21** the fabric will hang or it will lie across the ends **25'** of the pins **22**. The sewing needle **14** is flexible and when stitching at a stitch position of one of the pins **22**, because of the deflection of the pin **22** and its groove **23**, will be guided upwards away from the fabric. The deflection of the pins **22** therefore needs not be extensive. To insure the best results the deflection of **22** is great enough to bring the bottom of the groove **23'** above the fabric as seen in Fig. 2, but this is not necessary.

The invention as so far described is concerned with method and means for producing stitching characterized by only predetermined stitches being sewed to the fabric. It has been presumed that the machine is equipped with the normal small chaining finger **13**, as shown in Fig. 8. A machine so equipped will produce a fine gauge stitch which is good for some classes of work. However, it is sometimes desired for particular purposes that the stitching be loose and open. Although the finer gauge stitch is inherently ornamental, by widening and loosening the stitch the ornamental character thereof is enhanced. For this purpose I can use a chaining finger which is unusually large. For example, I can substitute, on a fine gauge machine, a chaining finger **13'** of a coarse gauge machine. Fig. 9 shows such a coarse gauge chaining finger that can be used for my purpose on a fine gauge machine. The chaining finger **13'** has a shank element **41'** which is the same as and functions like the shank element **41** of the fine gauge chaining finger **13**. This shank element is mounted in the standard **42**, as will be clear from Fig. 1. The active end **43'** of the coarse gauge finger differs from end **43** of the finger **13** in that it has a greater circumference. The stitch is formed around the finger in the usual way. An interloop is formed at each end of the needle traverse and as the needle and looping finger return from interloop formation at one end to positions at the other end of their strokes to form another inter-

loop, the previously formed interloop is drawn tight against the surface of the active end of the chaining finger. Conventionally this active end is fine as seen at 43 in Fig. 8 and if positioned close to the surface of the fabric being sewed, presents substantially no surface for stitches to be drawn against, and adds practically no size to the stitch so that the same will be loose when completed. With this in view the fingers are calculated to be of a large size with reference to the particular gauge of the machine used. When an abnormally large finger is used in the machine and is positioned away from the fabric being sewed the stitch formed around it will not be drawn close to the fabric and will be loose and wide. As will be seen from Fig. 1 and from the Davis patent above referred to, as new stitches are being formed, previously formed stitches will slide off the free end of the finger.

The abnormally large round chaining finger described will produce stitches the concatenations of which find positions within the stitch depending upon where they happened to fall on the round surface of the chaining finger. There is likely to be a lack of uniformity in the positioning of the interloops or concatenations in successive stitches. This is satisfactory for certain types of work resulting for example in a product that simulates hand work. When it is desired to produce stitches that are uniform I use the chaining finger shown in Fig. 10. This finger 13'' has a shank end 41'', similar to and functioning as the shanks 41 and 41', to mount the finger in the standard 42. The finger 13'' has an active end 43'' similar to 43 and 43'. However, the end 43'' is wide and thin as will be seen from Figs. 2, 7 and 10. At each side of the end 43'' towards the respective ends of the needle travel there is an edge 44. After the needle and the looping finger have cooperated to form an interloop and the needle, passing below the chaining finger, and the looping finger, passing above the chaining finger, move toward the other end of their strokes, the concatenations 45 will find their way to the edge 44 and will be arrested thereby in spite of the respective tensions on the looping finger and needle threads tending to pull the concatenation around the chaining finger during the formation of the next interloop at the other end of the needle and looping finger stroke. The manner in which the edges 44 engage and hold the concatenations 45 is best illustrated in Figs. 6 and 7. The edges 44 effectively hold the concatenations until a stitch is set and finished and falls off the end 43'' after the usual and previously described accumulation of stitches.

The new chaining fingers for making the new loose and widened stitches described can be used in such sewing in which every stitch is sewed through the fabric. A stitch, for example a double chaining stitch as normally produced by a looping machine, can be produced wide and loose for joining fabric sections or for other purposes, without incorporating therein the characteristic of intermittent chaining stitches which are not sewed to the fabric. Such a stitch is neat and ornamental and has properties not heretofore attained and is applicable to certain types of work.

In Figs. 11 and 12, however, I show two of the novel stitch characteristics of my invention incorporated together. As previously described the sewing is characterized by certain stitches only penetrating the fabric. This stitch has been made with the wide chaining finger 13'' shown in Fig. 10 to hold the concatenations in definite position and to insure that an equal amount of the respective sewing threads is contributed to each stitch. As the fabric is taken from the machine and is put to use there is the relocation of the threads of the stitches and a reformation which causes the merging of unsewed chaining stitches with adjacent sewed stitches to give the result shown in Figs. 11 and 12. In my copending application, Serial No. 595,349, filed February 26, 1932, I disclose this stitch as used for making stockings that can be shortened. As will be seen from that application I make turned welts constituting the fabric sections 31 and 32, and join them together with my novel stitch. In the fabric I may produce openings, as for example are shown at 35 and 36 which facilitate empaling the fabric on the looper dial. Although I show these openings as transferred knitted loops they need not be provided or can be produced in other ways to fit the needs of the particular fabric being sewed. Although I show my invention as applied to the joining of turned knitted welts, my invention can be used on other than knitted fabrics and can be used for joining other than two ply fabric or can be used for other purposes than joining fabric. Figs. 11 and 12 show a specific use for the invention and are not to be construed as limiting the invention. As will be seen in my copending application, Serial No. 610,226, filed May 9, 1932, the stitch characteristics herein described can be resorted to separately or together to produce a wide variety of stitch structures to be used in a number of different ways in fabric. The ornamental effect may be enhanced by using threads of different color in producing the stitches.

Although I have described my invention as carried out on a particular kind of sewing machine that merely constitutes one embodiment and the invention is of broader scope.

I claim:

1. In a sewing machine, a stitch forming mechanism including a sewing element engageable with a fabric in its normal path of operation together with means to deflect the element out of its normal path to cause the element to sew predetermined recurrent stitches out of engagement with the fabric, said means including a support carrying a series of needle-deflecting projections arranged in spaced relation to each other and adapted to be brought successively during formation of recurrent stitches into operative engagement with the sewing element.

2. In a sewing machine, a stitch forming mechanism including a sewing needle, means for advancing the fabric past the operating path of the sewing needle and shielding means movable with the fabric presenting a series of spaced needle-engaging surfaces and operable to deflect the needle out of its normal operating path during the formation of recurrent spaced stitches.

3. In a sewing machine, a stitch forming mechanism including a sewing element, a movable support for advancing the fabric to be sewed past the operating path of the sewing element, and means carried by and movable with said fabric support intermittently operative to deflect the sewing element out of its normal operating path.

4. In a sewing machine, a stitch forming mechanism including a sewing element, means supporting the fabric for engagement by the sewing element during the formation of certain intermittent stitches, and spaced apart means carried by said fabric support interposing between the sewing element and fabric during the formation of other intermittent stitches.

5. In a sewing machine, a stitch forming mechanism including a sewing element, a support for a fabric presenting an edge of the fabric to be sewed by said sewing element, and means for interposing between the edge of the fabric and the sewing element at spaced apart points along the fabric.

6. In a sewing machine, synchronized stitch forming mechanism and fabric feed mechanism, the feed mechanism including means engageable with the stitch forming mechanism for preventing engagement with the fabric of the stitch forming mechanism during the formation of predetermined intermediate stitches.

7. In a sewing machine, a stitch forming mechanism including a sewing element and a fabric feed mechanism operative in synchronism, the feed mechanism including means for presenting the fabric to the stitch forming mechanism during the formation of predetermined stitches and also including means engageable with and adapted to deflect the sewing element for withholding the stitch forming mechanism from the fabric during the formation of other predetermined stitches.

8. In a sewing machine, a stitch forming mechanism including a sewing element and a fabric feed mechanism operative in synchronism, the feed mechanism including means for presenting the fabric to the stitch forming mechanism during the formation of alternate stitches, and means interposing between the sewing element and the fabric during the formation of the remaining stitches.

9. In a sewing machine, stitch forming mechanism and fabric feed mechanism movable relative to each other, stations on the feed mechanism positionable opposite the stitch forming mechanism progressively in time with the formation of successive stitches, means on the feed mechanism at predetermined stations for presenting the fabric to the stitch forming mechanism in their respective turns, and means at other stations of the feed mechanism to prevent engagement of the fabric by the stitch forming mechanism.

10. In a sewing machine, stitch forming mechanism and fabric feed mechanism movable relative to each other, a sewing needle on the stitch forming mechanism, spaced apart stations on the feed mechanism positionable opposite the stitch forming mechanism progressively in time with the formation of successive stitches, pins at predetermined stations for presenting the fabric to the stitch forming mechanism and guiding the needle to the fabric so presented, and guide pins at other stations to guide the needle away from the fabric.

11. In a sewing machine, a stitch forming mechanism and a fabric feed mechanism timed in synchronism, the feed mechanism including means for presenting the fabric to the stitch forming mechanism during the formation of predetermined stitches and means for withholding the fabric from the stitch forming mechanism during the formation of other predetermined stitches, the fabric presenting means comprising a plurality of pins laterally spaced apart, fabric withholding pins intermediate the presenting pins spaced laterally from each other and from the presenting pins, a pin carrier for holding the pins in spaced relationship and positioning them in the path of the stitch forming mechanism progressively during the formation of successive stitches.

12. In an overedge sewing machine, stitch forming mechanism and fabric feed mechanism timed in synchronism, spaced stations on the feed mechanism positionable opposite the stitch forming mechanism progressively in time with the formation of successive stitches, fabric empaling pins at predetermined stations adapted to present an edge of the fabric to the stitch forming mechanism, pins at other stations positioned out of alignment with the empaling pins adapted to project beyond the edge of the fabric held by the empaling pins and guide the stitch forming mechanism away from the fabric.

13. In an overedge sewing machine, stitch forming mechanism including a sewing element and fabric feed mechanism timed in synchronism, means on the fabric feed mechanism to present the edge of fabric to be sewed to the stitch forming mechanism, and pins on the feed mechanism at selected intervals coactive with the sewing element projecting in a direction out of line with the fabric presenting means so as to overlie the fabric edge and interpose between the fabric and the stitch forming mechanism.

14. In a sewing machine, a stitch forming mechanism and a fabric feed mechanism, the fabric feed mechanism comprising a dial, pins radiating from the periphery of the dial in spaced relationship, certain pins terminating in a point to receive fabric empaled thereon to be presented to the stitch forming mechanism during the formation of predetermined stitches, other pins with blunt ends for withholding the fabric from the stitch forming mechanism during the formation of other predetermined stitches.

15. In an overedge sewing machine, stitch forming mechanism, fabric feed mechanism rotatable in time with the stitch forming operation, means associated with the fabric feed mechanism to present a fabric edge to the stitch forming mechanism during the formation of predetermined stitches, and further means to deflect the stitch-forming mechanism away from the fabric during formation of other stitches.

16. In an overedge sewing machine, stitch forming mechanism including a sewing element, fabric feed mechanism rotatable in time with the stitch forming operation, means operating with the fabric feed mechanism to present a fabric edge to the stitch forming mechanism during the formation of predetermined stitches and means engageable with the surface of the sewing element to withhold the stitch forming mechanism from the edge during the formation of other predetermined stitches.

17. In an overedge sewing machine, stitch forming mechanism, fabric feed mechanism rotatable in time with the stitch forming operation, means operating with the fabric feed mechanism to present a fabric edge to the stitch forming mechanism during the formation of predetermined stitches and means on the fabric feed mechanism to deflect the stitch forming mechanism away from the edge during the formation of other predetermined stitches.

18. In a looping machine, stitch forming mechanism and fabric feed mechanism movable relative to each other, the stitch forming mechanism including a sewing element, stitch forming stations on the feed mechanism adapted to be positioned in proximity to the stitch forming mechanism by the relative motion progressively in time with successive stitch forming operations, a series of pins coactive with the sewing element and including fabric empaling pins at predetermined stations collectively describing a plane and

pins coactive with the sewing element at other positions deflected out of the plane so as to provide a different path of movement for the sewing means when coacting with said pins.

19. In a looping machine, stitch forming mechanism and a fabric feeding dial rotatable relative to each other, sewing means on the stitch forming mechanism, stitch forming stations on the fabric feeding dial positionable opposite the stitch forming mechanism progressively in time with successive stitch forming operations by the relative rotation, peripherally projecting pins at predetermined stations for empaling the fabric and presenting the same to the sewing means, the pins describing a plane, peripherally projecting pins at other stations coactive with the sewing means deflected out of the plane so as to provide a different path of movement for the sewing means when coacting with said pins.

20. In a looping machine, stitch forming mechanism and a fabric feeding dial rotatable relative to each other, a sewing needle on the stitch forming mechanism, stitch forming stations on the fabric feeding dial positionable opposite the stitch forming mechanism progressively in time with successive stitch forming operations by the relative rotation, peripherally projecting pins at predetermined stations for empaling the fabric, needle guiding grooves in said pins describing a plane, peripherally projecting pins at other stations, needle guiding grooves in the last named pins deflected out of the plane so as to provide a different path of movement for the sewing means when coacting with said pins.

21. Fabric feeding mechanism for a sewing machine comprising a fabric support element, spaced apart stations of stitch formation on the fabric support element, means at predetermined stations for presenting the fabric to the stitch forming mechanism, and means at other stations to interpose between the fabric and stitch forming mechanism.

22. Fabric feeding mechanism for a sewing machine comprising a fabric support element, spaced apart stitch stations on the fabric support element, means at predetermined stations for presenting the fabric to stitch forming mechanism, means at other stations to interpose between the fabric and stitch forming mechanism, said two types of means being arranged in alternate relationship.

23. Fabric feed mechanism for a sewing machine comprising a fabric support element, spaced apart stations of stitch formation on the fabric support element, fabric empaling pins at predetermined stations for presenting the fabric to stitch forming mechanism and pins at other stations to interpose between the fabric and stitch forming mechanism.

24. Fabric feed mechanism for a looping machine comprising a rotatable fabric supporting dial, circumferentially spaced stations of stitch formation on the dial, peripherally projecting fabric empaling pins at predetermined stations on the dial, and pins at other stations for withholding the fabric from stitch forming mechanism.

25. Fabric feed mechanism for a looping machine, comprising a rotatable supporting dial, circumferentially spaced stitch stations on the dial, aligned fabric empaling pins at predetermined stitch stations, projecting pins at other stations deflected in a common direction out of alignment with the other pins.

26. Fabric feeding mechanism for a looping machine comprising a rotatable fabric supporting dial, circumferentially spaced stitch stations on the dial, pins at predetermined stations projecting to a predetermined extent for empaling the fabric thereon and describing a plane, pins at other stations projecting to a lesser extent and deflected out of the plane of the empaling pins.

27. Fabric feeding mechanism for a looping machine comprising a rotatable fabric supporting dial, circumferentially spaced stitch stations on the dial, fabric engaging pins at predetermined stations, tapered ends on said pins to facilitate empaling the fabric thereon, pins at other stations in general alignment with the empaling pins, blunt ends on the latter pins to prevent empaling fabric thereon.

28. Fabric feeding mechanism for a looping machine comprising a rotatable fabric supporting dial, circumferentially spaced stitch stations on the dial, pins at predetermined stations projecting to a predetermined extent for empaling the fabric thereon, pins at other stations projecting to a lesser extent adapted to bear against the fabric and determine the position the fabric occupies on the empaling pins.

29. Fabric feeding mechanism for a looping machine comprising a rotatable fabric supporting dial, circumferentially spaced stitch stations on the dial, pins at predetermined stations projecting peripherally to a predetermined extent, tapered ends on the pins to facilitate empaling fabric thereon, pins at other stations projecting peripherally to a lesser extent to determine the position of the fabric on the empaling pins, blunt ends on said shorter pins to prevent fabric being empaled thereon.

30. Fabric feed mechanism for a looping machine comprising a rotatable fabric supporting dial, circumferentially spaced stitch stations on the dial, peripherally projecting pins at predetermined stitch stations describing a plane, tapered ends on said pins to facilitate empaling the fabric thereon, peripherally projecting pins at other stitch stations deflected in the same direction out of the plane of the fabric empaling pins, blunt ends on said deflected pins to prevent fabric from being empaled thereon.

31. Fabric feeding mechanism for a looping machine comprising a rotatable fabric supporting dial, circumferentially spaced stitch stations on the dial, pins at predetermined stitch stations projecting peripherally to a predetermined extent and collectively describing a plane, tapered ends on said pins to facilitate empaling the fabric thereon, pins at other stitch stations projecting peripherally to a lesser extent than the first mentioned pins and deflected in a common direction from the plane of the other pins, blunt ends on said shorter pins, whereby the shorter pins prevent fabric from being empaled thereon, determine the position of the fabric on the first mentioned pins and withhold the fabric from stitch forming mechanism.

32. A looper dial pin comprising, a shank portion for mounting the pin in a dial and an active end to project from the dial, said active end being blunt and adapted to prevent the pin from penetrating a fabric to be looped.

33. A looper dial pin comprising a shank portion for mounting the pin in a dial and an active end to project from the dial, a groove longitudinally of the pin along the active portion, a

deflection in the active portion towards the side which has the groove.

34. A looper dial pin comprising a shank portion for mounting the pin in a dial, and an active portion to project from the dial, said active portion having a blunt end, a groove longitudinally of the pin along the active portion and a deflection in the active portion towards the side which has the groove.

35. In a sewing machine, fabric feeding means, stitch forming mechanism including a threaded needle, mechanism for operating the needle to pass back and forth through the fabric transversely to the direction of fabric feed, the stitch forming mechanism including also a threaded interlooper, means to operate the interlooper in synchronism with the needle to position it at each end of the needle travel to interloop the interlooper thread with the needle thread, a chaining finger directed longitudinally of the fabric feed, the chaining finger having a flat broad outer end and the stitch formation position to said end in the direction of the fabric feed having a stitchwise or lateral dimension greater than its vertical dimension and being so positioned relative to the fabric that the concatenations of the interlooped threads are held spaced apart at respectively each side of the line of stitches and away from the fabric.

36. In a looping machine, fabric feed mechanism including a spaced apart row of fabric empaling pins, stitch forming mechanism including a threaded needle coactive with said pins to penetrate the fabric and a threaded interlooper coactive with the needle to form stitches having concatenations on each side of the fabric, means to operate the needle, interlooper, and fabric feed mechanism in synchronism, and a flattened chaining finger extending along the fabric empaling pins having spaced apart lateral edges overlying said pins and lying beyond the opposite sides of the fabric empaled on the pins and also having a broad outer end substantially wider than the thickness of the fabric to be sewed, said chaining finger having a fixed position relative to the stitch forming mechanism and adapted to be encompassed in the stitches formed thereby so that the edges of the finger will hold the stitches open and prevent the stitches from being drawn down against the fabric.

37. In a sewing machine, fabric supporting means, double chain stitch forming mechanism, the fabric supporting means including means for presenting the fabric to the stitch forming mechanism during formation of predetermined stitches and means to interpose between the fabric and stitch forming mechanism during formation of other stitches, and means for holding the concatenations of all of the stitches extended and away from the fabric until completed.

38. In a sewing machine, fabric supporting means, double chain stitch forming mechanism, the fabric supporting means including means to present the fabric to the stitch forming mechanism during formation of predetermined intermittent stitches and means to deflect the stitch forming mechanism away from the fabric during formation of other stitches, and means for holding all of the stitches extended and away from the fabric during formation.

39. In a sewing machine, fabric supporting means, double chain stitch forming mechanism, the fabric supporting means including means to present the fabric to the stitch forming mechanism during formation of predetermined intermittent stitches and means to deflect the stitch forming mechanism away from the fabric during formation of other stitches, and means for positioning the concatenations of all of the stitches in spaced relation to the fabric and holding them in such extended position until completed.

40. In a sewing machine, stitch forming mechanism, including a threaded needle, mechanism for operating the needle to pass back and forth through the fabric transversely to its direction of feed, the stitch forming mechanism including also a threaded interlooper, means to operate the interlooper in synchronism with the needle to positions at each end of the needle travel to interloop the interlooper thread and the needle thread, a chaining finger directed longitudinally of the fabric feed, the chaining finger having spaced apart lateral edges for holding the concatenations of the interlooper threads spaced apart at respectively each side of the stitch, and a fabric feed mechanism timed in synchronism with the stitch forming mechanism, the feed mechanism including means for presenting the fabric to the stitch forming mechanism during the formation of only predetermined intermittent stitches, and means engageable with and deflecting the needle away from the fabric during formation of the other stitches.

41. The method of disposing fabric on a looper dial having a series of pins coactive with the needle of the looper which comprises empaling the fabric on only certain of the dial pins and leaving other pins intermediate the first mentioned pins free from engagement with the fabric.

42. The method of sewing fabric on a looping machine having a series of pins cooperative with the sewing needle of the machine which comprises applying the fabric to only designated intermittent of the pins and disposing the portions of the fabric opposite the remaining pins so as not to be engaged by the sewing needle when coacting with the latter pins, and causing the machine to operate to produce a stitch at each successive pin.

JACOB A. GOODMAN.