Dec. 29, 1959 V. M. GINWRIGHT 2,918,887

THREAD SEVERING STRUCTURE FOR SEWING MACHINES

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FIG. 1.

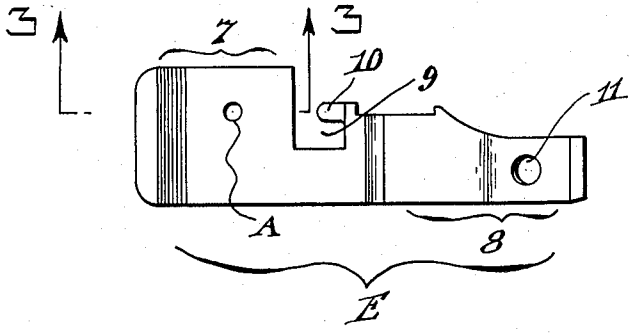


FIG. 2.

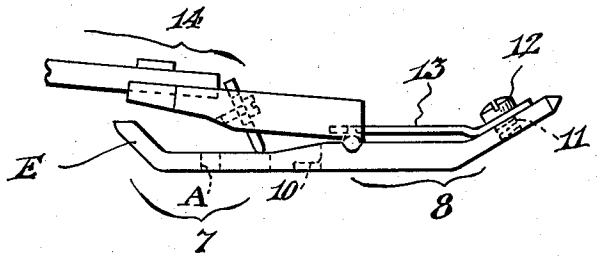
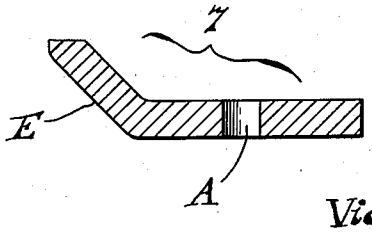


FIG. 3.



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THREAD SEVERING STRUCTURE FOR SEWING MACHINES

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FIG. 4.

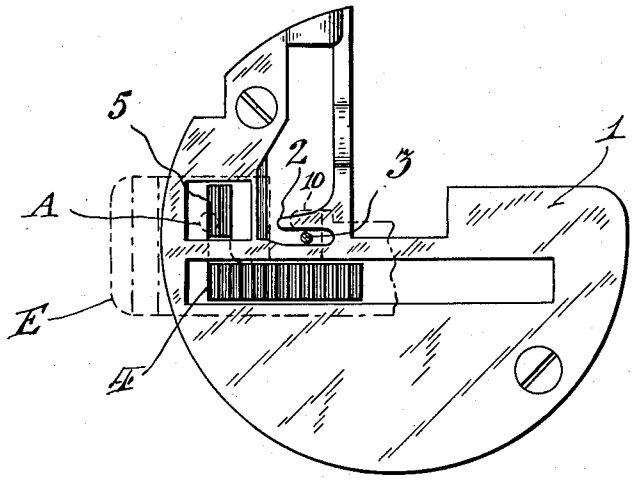
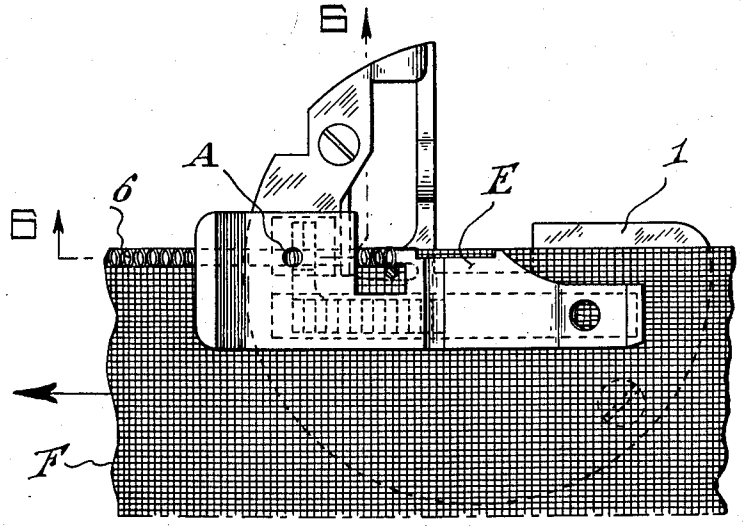


FIG. 5.



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THREAD SEVERING STRUCTURE FOR SEWING MACHINES

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FIG. 6.

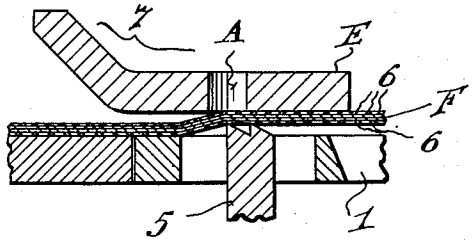


FIG. 7.

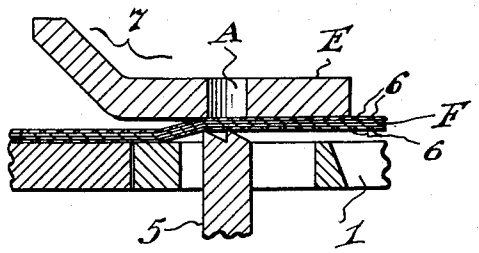
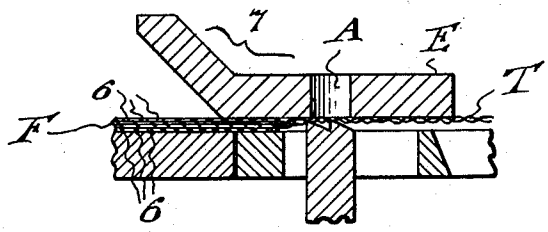


FIG. 8.



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THREAD SEVERING STRUCTURE FOR SEWING MACHINES

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FIG. 9.

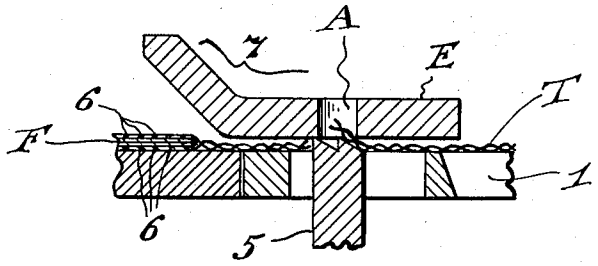


FIG. 10.

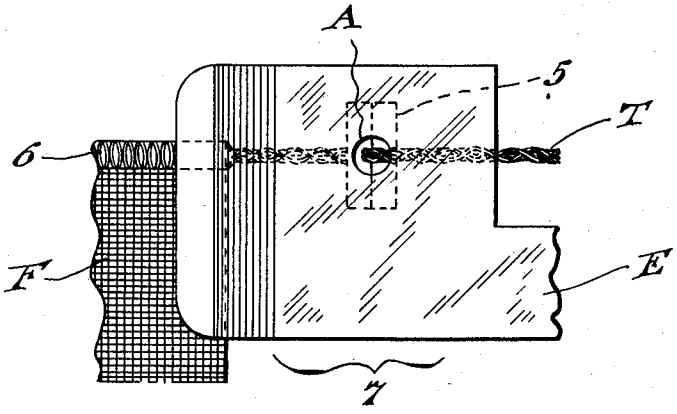
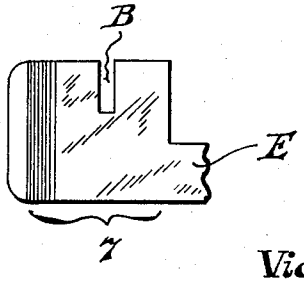


FIG. 11.



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THREAD SEVERING STRUCTURE FOR SEWING MACHINES

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Application January 7, 1958, Serial No. 707,541

6 Claims. (Cl. 112—252)

This invention concerns a unique automatic thread severing structure for sewing machines and the like, which structure is adapted to sever the sewing thread close to the work piece at the completion of an edge seaming or thread applying operation performed by the machine.

The automatic thread severing means heretofore available for sewing machines, comprise special elements and parts, as well as structural and functional characteristics that make such prior art means more or less costly, complicated and otherwise unsatisfactory from a practical, commercial, or operational standpoint.

One object of my invention is to provide a novel automatic thread severing structure for sewing machines and the like, which substantially overcomes the indicated and other detrimental and undesirable features and characteristics of the similar prior art automatic thread severing means.

Another object is to provide such a structure in which simplicity of design, construction and operation are achieved to a substantially maximum extent.

An additional object is to provide such a structure which can be produced by simply modifying the standard or conventional presser foot of a sewing machine, so that a certain portion thereof cooperates in a new thread severing manner with one of the teeth of the feed dog element of the machine, after completion of the thread applying operation to the work piece acted on by the machine.

It is also an object to provide such a structure which includes a new presser foot having a flat case hardened bottom surface portion that is interrupted by a space area defined by a special wall formation arranged to effect a cutting edge in crosswise overextending relation to the sewing thread that normally contactingly travels along said bottom surface portion directly above the teeth of the feed dog element of the machine.

Another object is to provide a new presser foot of the type indicated in which the said special cutting edge including wall formation is effected by the provision of an aperture, slot, recess, cavity, or the like, that is arranged to extend upwardly from a bottom surface portion of the presser foot, so that the cutting edge is formed at the juncture area of said wall formation and bottom surface portion.

Another feature of the invention resides in the provision of a new presser foot of the type indicated which can be readily substituted for the standard, or conventional type presser foot of certain sewing machines, in such manner as to effect automatic severance of the sewing thread at the completion of an edge seaming or thread applying operation performed by the machine.

Another object is to provide a new presser foot of the type indicated which comprises a flat bottom surface portion along which contactingly travels the applied thread of the work piece acted on by the machine, and a presser foot bottom surface portion interrupting wall formation arranged to effect a cutting edge in crosswise overextending relation to said thread at a certain location in its path of travel along said bottom surface portion.

Another object is to provide a novel automatic thread severing structure for sewing machines and the like having a stationary needle plate provided with a chaining finger and a reciprocably operable work feed dog member arranged in spaced axially aligned relation forwardly of said chaining finger, which comprises the combination with the foregoing elements, of a vertically movable presser foot having a flat bottom surface portion adapted to be placed in contacting relation on the work piece area to which the thread is applied by the machine and which is acted on by said feed dog member, a wall formation on said presser foot which in configuration may be circular, straight, etc., and arranged so as to provide an interrupting space area in said bottom surface portion above the feed dog member, and a cutting edge on said wall formation arranged in juncture forming relation with said bottom surface portion.

With these and other objects in view, which will become more apparent from the following detailed description of the practical and illustrative embodiments of my novel developments shown in the accompanying drawings, the invention comprises the new automatic thread severing structure for sewing machines and the like, the elements, features of construction and arrangement of parts in cooperative relationship, as more particularly indicated and defined by the hereto appended claims.

In the drawings:

Figure 1 is an enlarged top plan view of one form of foot shoe, or presser foot element for seamer type sewing machines, that forms part of my invention.

Fig. 2 is a side elevational view of the presser foot element shown in Fig. 1, as it appears when attached to the usual or standard operating arm of a certain seamer type sewing machine.

Fig. 3 is an enlarged elevational sectional view, taken substantially as indicated by the arrows 3—3 in Fig. 1.

Fig. 4 is an enlarged top plan view of a standard needle plate for a certain seamer type sewing machine, with a conventional sewing machine needle indicated in cross section at its usual point of operation and the presser foot element of Fig. 1 partly indicated in superimposed relation by dot-and-dash lines to show its proper positional and operational location in relation to said usual sewing machine parts.

Fig. 5 is a view similar to Fig. 4, but with the presser foot element of Fig. 1 shown in full lines and a fabric work piece having an edge seam applied thereto between the presser foot element and needle hole piece, as during the operation of the sewing machine.

Fig. 6 is an enlarged elevational sectional view taken substantially as indicated by the arrow 6—6 on Fig. 5.

Fig. 7 is a view similar to Fig. 6, but showing the fabric work piece and feed dog element in an advanced position.

Fig. 8 is a view similar to Figs. 6 and 7, but showing the fabric work piece advanced beyond the feed dog element and the seam thread formation schematically indicated in trailing relation.

Fig. 9 is a view similar to Figs. 6, 7, 8 and 9, but with the parts shown when automatic severance takes place of the trailing seam thread formation.

Fig. 10 is a top plan view of Fig. 9, and

Fig. 11 is a partial view of the presser foot element, as depicted in Fig. 1, showing a modified feature of the invention.

For purposes of practical illustration, or exemplification, the present invention is herein disclosed as applied to, or embodied in, a sewing machine known as a "Superlock" machine, which is made and sold by Wilcox & Gibbs Sewing Machine Co., Ltd. of London, England. How-

ever, only those well known parts of such a standard or conventional sewing machine are shown in the drawings as are deemed necessary to make clear the construction and operation of my invention. For more detailed information concerning the parts, construction and operation of said "Superlock" sewing machine, reference may be had to the literature, publications and patents publicly available relative thereto and more particularly to the booklet entitled "Instruction Book and Parts List" made available by the Wilcox & Gibbs Sewing Machine Co. and copyrighted by the latter in 1940. From this practical exemplification of my invention, it will be readily apparent to those skilled in this art how the invention can be embodied in, or applied to, other types of sewing machines, in the same or in a similar manner, for the purpose of accomplishing substantially corresponding purposes, advantages and results.

It will facilitate an understanding of my invention to first identify those usual and well known parts disclosed in the drawings which constitute certain standard elements and means of the said "Superlock" sewing machine. In this connection it is, of course, to be understood that all the other parts which make said machine complete and operative, but which are not disclosed in the drawings, are assumed to be present to perform their usual functions in cooperative relation with the parts shown and likewise, in relation with the disclosed form of my invention, so that the latter will be effective in its intended purpose of automatically severing the sewing thread after the machine has completed its sewing, or thread applying operation, on a fabric work piece.

Assuming that such a "Superlock" sewing machine is set up to apply a chain stitch formation along two combinedly aligned fabric edges that are arranged in superimposed relation with each other so that the said stitch formation will effect a seam, or juncture, at this location of the fabric work piece acted on by the machine, then certain of the standard "Superlock" machine parts shown in Fig. 4 will come into play, such as a needle plate 1 which is provided with a chaining finger 2, a needle 3, and a feed dog 4 having integrally combined therewith an auxiliary feed dog element 5. By referring to Fig. 5, it will be apparent how a two-ply fabric work piece, schematically indicated by the letter F, is positioned relative to the sewing machine parts shown in Fig. 4, and moves in the direction of the arrow in Fig. 5, to effect application of the chain stitch formation, or edge seam schematically indicated at 6, that originates at the chaining finger 2 by cooperative movement of the needle 3 and the primary and secondary looper elements and mechanisms, not shown. Also active in this standard arrangement of the "Superlock" sewing machine is a conventional foot shoe, or presser foot element E, which is made of steel and is similar to, but not exactly like that shown in Fig. 5. One of the functions normally performed by the element E is to yieldingly press the fabric F against the feed dog elements 4 and 5 during the said edge seam applying operation.

However, the foot shoe, or presser foot element E shown in Fig. 5, differs from a standard type foot shoe of the said "Superlock" sewing machine in that it embodies two important structural changes. That is to say, it is provided with (1) a vertically extending circular aperture A, and (2) the metallic wall area surrounding said aperture, particularly where the wall formation of the aperture is in juncture forming relation with the bottom surface of the element E, is subjected to a case hardening process, so that a sharp and hardened cutting edge is provided at least at the front juncture forming edge section of said wall formation and bottom surface.

The inclusion of the said two new structural features in the foot shoe, or presser foot element E, is consequently carried out in accordance with my invention. Otherwise, the foot shoe E in design, structure and size corresponds exactly with the standard foot shoe of the

"Superlock" sewing machine and which standard foot shoe is utilized in cooperative combination with the other elements of the "Superlock" machine for the purpose of applying a chain stitch formation, or juncture seam, to a fabric work piece, as previously explained. It is noted that the said standard foot shoe of the "Superlock" machine is identified as part 182,015 in the previously referred to "Instruction Book and Parts List" published and distributed by the Wilcox & Gibbs Sewing Machine Co.

The new foot shoe E is shown in Figs. 1, 2 and 3 of the drawings and will next be more particularly described. The foot shoe E of my invention is preferably formed of steel, the same as the said "Superlock" foot shoe, and after the hole or aperture A has been provided therein, it is subjected to the case hardening process, as explained. The foot shoe E generally comprises a front section 8, a rear section 7, an intermediate section provided with an indentational space 9 into which extends an integral chaining finger or element 10, adjacently to which the needle of the sewing machine is normally vertically reciprocated, as will be apparent from Fig. 4 in which the foot shoe E is partly disclosed in dot-and-dash lines when arranged in its superimposed cooperative relation with the needle plate 1 and the feed dog elements 4 and 5. The upwardly inclined portion of the front foot shoe section 8 is provided with a threaded aperture 11, as usual, in which is seated a machine screw 12 arranged to fixedly secure the foot shoe E to a standard foot hinge spring 13 of the usual vertically movable foot shoe operating arm structure 14 of the "Superlock" sewing machine. The structure 14 is arranged to facilitate vertical movement of the foot shoe E by a control element, not shown, so that the bottom flat surface of the foot shoe E can be brought, at will, into yielding pressure exerting contact with the top surface of the fabric work piece, directly above the feed dog elements 4 and 5, as indicated in Fig. 4 and as well known.

The vertically extending circular aperture A is so located in the rear section 7 of the foot shoe E, that the center point thereof lies in the longitudinal axial line of the chaining finger 2 of the needle plate 1 and the similar element 10 of the foot shoe E. The usual sharp upper edge of the hardened steel front tooth of the auxiliary feed dog 5 is in diametrical alignment with the aperture A when the said feed dog element 5 is in its rearward position. By referring to Figs. 5 and 6 it will be noted that, in accordance with this arrangement of the aperture A, the seam 6 of the fabric work piece F will be constantly maintained in line with the aperture A and between the teeth of the auxiliary feed dog element 5 and the flat bottom surface of the rear section 7 of the foot shoe E, when the said teeth are raised during the forward or feeding movement of the work piece F. At the starting, or initial position, of the auxiliary feed dog element 5, the sharp upper edge of the front tooth of the latter is in diametrical alignment with the aperture A, as clearly shown in Figs. 4, 5 and 6. When the auxiliary feed dog element 5 has completed a single work piece advancing forward step or movement, as usual, its position in relation to the aperture A will be as shown in Fig. 7.

Fig. 8 shows the position of the work piece F after the rear edge thereof has advanced or has passed immediately beyond the teeth of the auxiliary feed dog element 5. At this point in the operation of the sewing machine, the seam formation or tail T that is formed only by the sewing thread, idly trails in a straight line behind the seam 6 that has been applied to the fabric work piece F, at a location between the bottom surface of the foot shoe section 7 that includes the surface interrupting space area, or zone, established by the wall structure that defines the aperture A, and the teeth of the auxiliary feed dog element 5. It will be noted that the diameter of the aperture

A is such, that the semi-circular rear section of the wall formation that establishes the presser foot bottom surface portion interrupting space area, or zone, is arranged to effect a cutting edge in crosswise overextending relation to the sewing thread, or seam **6**, at a certain point in its travel along said bottom presser foot surface portion.

Immediately after the fabric work piece F passes beyond the rear end **7** of the bottom surface of the presser foot E, as shown in Fig. 9, the said presser foot drops slightly and the bottom surface thereof then comes into contacting relation with the top edges of the teeth of the feed dog **4** and the teeth of the auxiliary feed dog element **5**, during that portion of the feed dog operating cycle where the teeth thereof are in raised position. This will cause the portion of the seam tail T, that is of reduced width in relation to the seam **6** and lies above the teeth of the auxiliary feed dog element **5**, to be moved upwardly into the aperture A. A shearing or severing action is then exerted on the bent portion of the seam tail T located between the sharp semi-circular edge formed at the juncture of the rear wall portion that partly defines the aperture A and the bottom surface of the foot shoe section **7**, and the sharp upper edge of the first or front tooth of the auxiliary feed dog element **5**, so that the tail T is automatically cut off. By referring to Fig. 10, in conjunction with Fig. 9, the relationship of the indicated parts during the thread severing operation, will be clearly understood.

Operation

From the foregoing description and explanation of a preferred embodiment of my invention, as applied to a "Superlock" sewing machine, it will be apparent that the sewing thread is applied, as usual, in seam forming chain stitch formation, along an outer edge of the fabric work piece acted on by the machine, as indicated in Fig. 5, wherein the fabric work piece and the seam forming stitch formation are respectively and schematically indicated by the letter F and the numeral **6**.

During operation of the machine in usual manner, the fabric work piece F moves forwardly in the direction of the arrow shown in Fig. 5, until the seaming operation has been completed in the usual and well known manner and until the rear edge of the fabric work piece passes beyond the flat bottom surface of the rear section **7** of the foot shoe, or presser foot element E, substantially as shown in Figs. 9 and 10. At this point in the operation of the machine, the foot shoe E will automatically drop, or move in downward direction, as usual, so that a certain portion of the sewing thread formation which trails the fabric work piece in the form of the seam tail T of reduced width in relation to the seam **6**, will be positioned between the bottom rear semi-circular cutting edge established at the juncture of the vertical wall that defines the aperture A, and the sharp upper cutting edge of the front tooth of the auxiliary feed dog element **5**, during the raised forward movement of said tooth, thereby automatically severing, cutting, or shearing off the said portion of the seam tail forming thread at this point, substantially as indicated in Figs. 9 and 10.

Modifications

While I have shown the foot shoe E provided with a circular aperture E, in conjunction with certain other structural and functional features of my invention, to accomplish the indicated results and advantages, it will be readily understood by those skilled in this art that the foot shoe bottom surface portion interrupting wall formation thus established to effect a cutting edge in crosswise overextending relation with the sewing thread, can be attained in various other ways. For example, the aperture A may be otherwise adjustably located in relation to the teeth of the auxiliary feed dog element **5**, or may have a different wall defining configuration, or shape, such as triangular, square, elliptical, etc., or the foot shoe

E may be provided with a substantially rectangular slot B as shown in Fig. 11. Therefore, it is to be understood that the improvements, as herein specifically shown and described, can be changed and modified in various ways without departing from my invention, the scope of which is more particularly indicated and defined by the hereto appended claims.

I claim:

1. In a presser foot for sewing machines and the like having a needle opening therein, said presser foot having a flat bottom surface portion along which contactingly travels the work piece part to which a seam is to be applied when advancingly acted on by the teeth of a feed dog member of the machine, an aperture formed in the presser foot rearwardly of the needle opening and having a wall portion presenting a cutting edge on the bottom surface of the presser foot, said wall portion extending crosswise of the path of the seam thereunder, and being of a width to contact one of the feed dog teeth in such manner that said cutting edge and the said one of the feed dog teeth will be cooperatively related to effect automatic severance of the thread tail of the seam rearwardly beyond the work piece.

2. In a presser foot for sewing machines and the like having a needle opening therein, said presser foot having a flat bottom surface portion along which contactingly travels the work piece part to which a seam is to be applied when advancingly acted on by the teeth of a feed dog member of the machine, a substantially circular aperture formed in the presser foot rearwardly of the needle opening and having a wall portion presenting a cutting edge on the bottom surface of the presser foot, said wall portion extending crosswise of the path of the seam thereunder, and being of a width to contact one of the feed dog teeth in such manner that said cutting edge and the said one of the feed dog teeth will be cooperatively related to effect automatic severance of the thread tail of the seam rearwardly beyond the work piece.

3. In a presser foot for sewing machines and the like having a needle opening therein, said presser foot having a flat bottom surface portion along which contactingly travels the work piece part to which a seam is to be applied when advancingly acted on by the teeth of a feed dog member of the machine; of a slot-forming aperture in the presser foot rearwardly of the needle opening and having a wall portion presenting a cutting edge on the bottom surface of the presser foot, said wall portion extending crosswise of the path of the seam thereunder, and being of a width to contact one of the feed dog teeth in such manner that said cutting edge and the said one of the feed dog teeth will be cooperatively related to effect automatic severance of the thread tail of the seam rearwardly beyond the work piece.

4. In a presser foot for an edge seam applying sewing machine which presser foot has a needle opening therein, said presser foot having a flat bottom surface portion along which contactingly travels the work piece to which a seam is to be applied when advancingly acted on by the teeth of a feed dog member of the machine, an aperture formed in the presser foot rearwardly of the needle opening and having a wall portion presenting a cutting edge on the bottom surface of the presser foot, said wall portion extending crosswise of the path of the seam thereunder, and being of a width to contact one of the feed dog teeth in such manner that said cutting edge and the said one of the feed dog teeth will be cooperatively related to effect automatic severance of the thread tail of the seam rearwardly beyond the work piece.

5. In a sewing machine having a thread applying needle, a stationary needle plate over which the work piece travels, and a work piece advancing feed dog member arranged to extend through an opening in said needle plate so as to engage the work piece part to which a seam is to be applied; of a vertically movable presser foot

having a needle opening therein, said presser foot having a flat bottom surface portion adapted to be placed in contacting relation on the work piece part to which a seam is to be applied when advancingly acted on by the teeth of said feed dog member; an aperture formed in said presser foot rearwardly of the needle opening and having a wall portion presenting a cutting edge on the bottom surface of the presser foot, said wall portion extending crosswise of the path of the seam thereunder and being of a width to contact a certain tooth of the feed dog member in such manner that automatic severance of the thread tail of the seam will be effected beyond the work piece by the cooperative action of said cutting edge and said one tooth of the feed dog member.

6. In an edge seam sewing machine having a thread applying needle, a stationary needle plate provided with a chaining finger, and a reciprocably operable work piece advancing feed dog member arranged to extend through an opening in said needle plate in spaced axially aligned relation rearwardly of said chaining finger so that the feed dog member will engage the underside of the work piece part to which the thread is applied in chain formation; of a vertically movable presser foot having a needle opening therein, said presser foot having a flat bottom surface portion adapted to be placed in contacting relation on the top surface of the work piece part to which the thread is applied in chain formation, an aperture formed in said presser foot rearwardly of the needle opening and having a wall portion presenting a cutting edge on the bottom surface of the presser foot, said wall portion extending crosswise of the path of the seam thereunder and being of a width to contact one of the teeth of the feed dog member in such manner that automatic severance of the thread tail of the seam will be effected beyond the work piece by cooperative action of said cutting edge and the said one tooth of the feed dog member.

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