

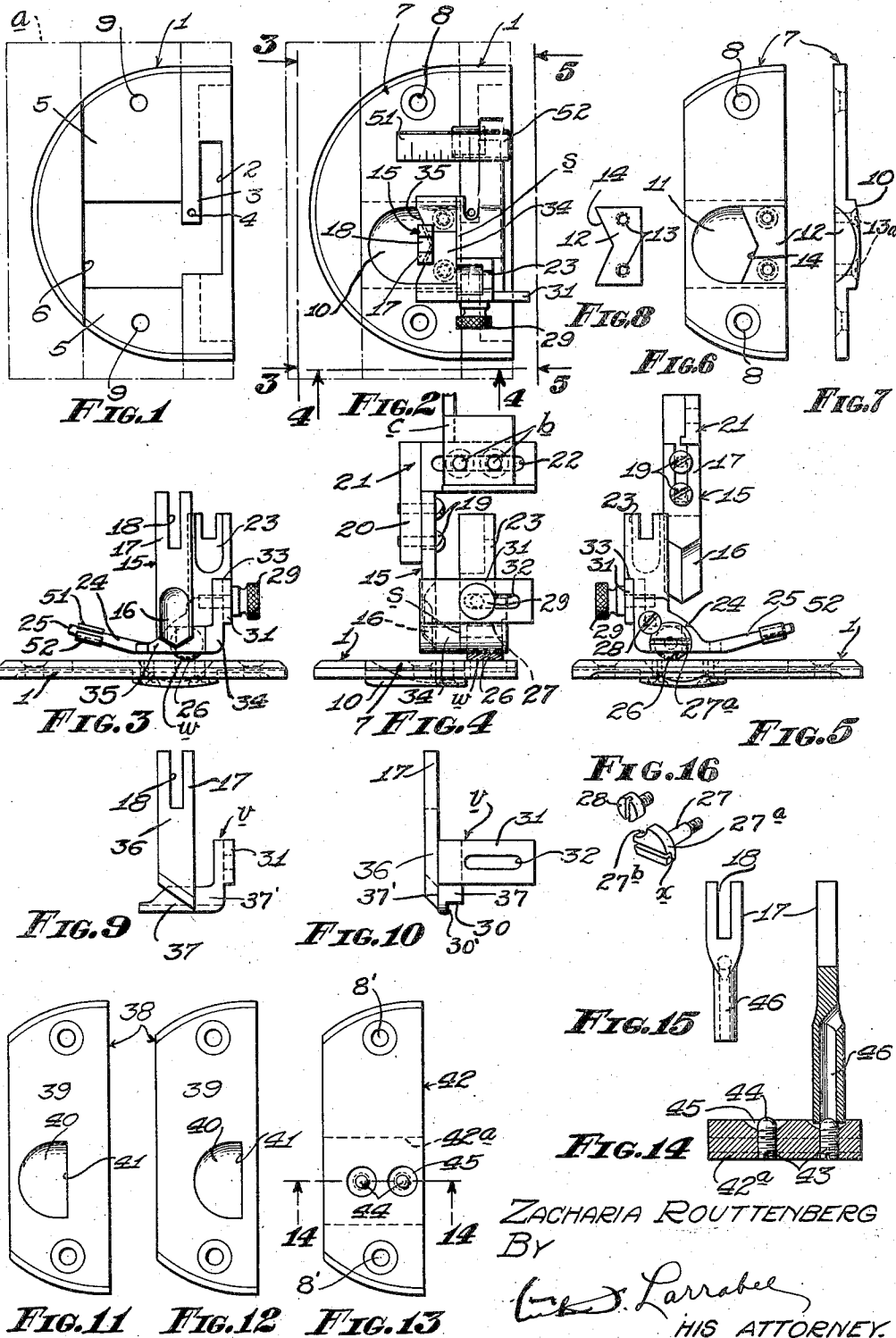
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SEWING MACHINE ATTACHMENT

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## UNITED STATES PATENT OFFICE

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## SEWING MACHINE ATTACHMENT

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This invention relates to sewing machine attachments and more particularly to cutting and punching attachments for sewing machines.

5 An object of my invention is to provide an attachment of this character which may be incorporated in conventional sewing machines, either in the conventional sewing machine, such as used in the home, or in larger commercial machines for specialized purposes.

10 Another object of my invention is to provide a cutting or punching attachment which may be utilized in conjunction with all kinds of sewing, whether on textile, leather, or other pliable materials.

15 Another object of my invention is to provide a novel, combined needle plate and punching or cutting die having various removable and adjustable parts whereby various shapes and characters of punchings and cuts may be made in textile, leather, or other pliable materials as they are being sewed, and such punchings or cuts are adapted to be made at different spaced relations with the sewing needle, and may be made even though the materials are not to be sewed, and in that event, the needle may be removed to eliminate the needle holes in the materials.

20 Another object of my invention is to provide a cutting or punching attachment for sewing machines which incorporates a novel presser foot guide device which also functions as a guide for proper alinement of the cutting blade or punch with its die, and also to act upon the top of the materials being acted upon to guide the material as it is being moved by the feed dog, the presser foot device being so arranged that it may be operated in the ordinary manner without alteration or adjustment when the machine is used for sewing only.

25 Another object of my invention is to provide a novel attachment for making zig-zag cuts or "pinking" the edge of cloth as it is being stitched so as to prevent raveling, and which attachment may, without adjustment, make larger or smaller zig-zag cuts by merely adjusting the length of stitch of the sewing machine in the customary manner.

30 Another object of my invention is to provide a cutting and punching attachment for sewing machines which is so arranged that the sewing machine may be used for ordinary sewing, or operated in conjunction with the attachment, or the attachment may be used without the sewing operation, so that the sewing machine may be used for sewing, sewing and punching or cutting, or merely punching or cutting.

Another object of my invention is to provide a sewing machine attachment which is particularly designed for operation in conjunction with and constitutes improvements over the structures disclosed in my United States Patents, 1,850,985, 1,850,986, 1,861,068 and 1,947,495, these patents embodying respectively a special presser foot for sewing machines, and a novel cutting blade or punch operating attachment operated from the needle bar of a sewing machine; and a special needle and cutter plate.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detail description and the appended claims.

The accompanying drawing illustrates the invention in some of the forms I at present deem preferable.

Figure 1 is a plan view of my special needle plate or base plate adapted to be substituted for the standard needle or base plate, showing in full lines a circular plate and in dot and dash lines a rectangular plate.

Fig. 2 is another plan view similar to Fig. 1 showing one form of my cutting attachment, presser foot and presser foot guide device in position over the needle plate as it would appear if supported from the sewing head of the machine, however, the supporting part of the sewing machine being omitted.

Fig. 3 is a side elevational view of the attachment as it appears when viewed from the line 3—3, Fig. 2.

Fig. 4 is a rear elevational view of the attachment as viewed from the line 4—4, Fig. 2, showing the supporting bracket for the cutting blade.

Fig. 5 is a side elevational view of the attachment viewed from the line 5—5, Fig. 2 and looking in direction opposite to that of Fig. 3 with the cutting blade and its supporting bracket in a raised position.

Fig. 6 is a plan view of the die plate and adjustable die member in the form illustrated in Figs. 1 through 5 and separated from the needle plate.

Fig. 7 is an edge view of the die plate and die member illustrated in Fig. 6.

Fig. 8 is a plan view of an adjustable die member separated from the die plate.

Fig. 9 is a side elevational view of a modified form of cutting knife and its guide, showing these members in the same positions as the analogous members in Fig. 3.

Fig. 10 is a rear elevational view of the parts shown in Fig. 9.

Figs. 11 and 12 are plan views of modified forms

of die members which are designed for use with the cutting knife and guide illustrated in Figs. 9 and 10.

Fig. 13 is a plan view of a modified form of die member designed for punching operations.

Fig. 14 is an enlarged transverse sectional view on line 14—14, Fig. 13 showing a punching die plunger associated therewith and which is used in place of the cutting knives when it is desired to punch holes.

Fig. 15 is a reduced side elevational view of the punching die plunger as viewed looking from the left to the right in Fig. 14.

Fig. 16 is a combination perspective view of the presser foot roller axle pin and lock screw for said pin.

The needle or base plate, designated 1, and shown best in Figure 1 is conventional insofar as it relates or coacts to the sewing machine, not shown: that is, said plate is secured on the bed of the sewing machine and is provided with a slot 2 which receives the conventional feed dog of the feeding mechanism, not shown. Although I have shown in full lines a circular base plate nevertheless a rectangular base plate shown in dot and dash lines *a* may be used. Said slot 2 defines in part a tongue 3 at the extremity of which is a needle hole 4. My needle plate is formed on the opposite side of the tongue 3 from the slot 2 with a shallow flat channel 5 extending parallel with the slot 2, that is forwardly and rearwardly with respect to the sewing machine. From a point opposite the needle hole 4 the channel 5 is interrupted by a rectangular aperture 6 that connects with the slot 2.

The channel 5 receives a die plate 7, shown best in Figs. 6, 7, and 11-13 the extremities of which conform to the periphery of the needle plate and the upper surface of which is flush with the upper surface of the needle plate. The die plate 7 is provided near its extremities with countersunk holes 8 adapted to receive screws, not shown, which extend into registering holes 9 provided in the needle plate and then are threaded into holes formed in the base of the machine. The part of the die plate that extends over the aperture 6 is provided with a downwardly directed boss 10 which fits into the aperture 6. The upper side of the die plate 7 opposite the boss 10 is provided with a recess 11 intersecting the edge of the die plate facing the slot 2. Said recess 11 is semi-circular in cross section and rounded at its end terminating within the boundaries of the die plate.

The recess 11 is adapted to receive various die members such as die member 12 shown in Fig. 8. This die member is semi-circular on one side to conform to the recess 11 and is provided with screwthreaded apertures 13 to receive screws 13a extending upwardly through holes provided in the boss 10 as shown best in Fig. 7. The inner or left-hand edge 14, as viewed in Fig. 6, constitutes the operating edge of the die member 12. This cutting or shearing edge 14 of the die member 12 may be V-shaped as shown or may take any other shape desired. Also, the die members are made in different lengths to vary the position of the cutting edge 14 with respect to the needle hole 4.

The die member 12 coacts with a cutting blade 15 having a V-shaped cutting portion 16 and shank portion 17 thereabove. The shank portion 17 is provided with a slot 18 therein which receives screws 19 for attaching the cutting blade to a depending portion 20 of a bracket 21. The bracket 21 also includes a laterally directed slotted

portion 22 which is adapted to be attached by screws *b* to a cutting bar *c* of an operating mechanism such as illustrated in my United States Patent 1,861,068. This mechanism is operated from the conventional needle bar in such a manner that the needle has considerable free travel before the cutting blade is brought into action so that the travel of the cutting blade is no longer than needed. When desired operation of the cutting bar may be disconnected in the manner shown in my said Patent No. 1,861,068, and is held out of the way as disclosed therein. The relatively short movement of the cutting blade is desirable in order to utilize a novel guiding device described hereinafter.

My attachment incorporates a presser foot which is formed of one solid piece of metal and comprises a supporting portion 23 so shaped as to be secured to the lower end of the ordinary presser foot bar, not shown. A presser foot portion 24 extends forwardly from the lower end of the supporting portion in contiguous relation with the needle plate and terminates in an up-turned guide portion 25. The presser foot portion 24 is enlarged at its root end and recessed on its lower side to receive a roller 26 having helical or straight ribs *w* therein, as desired, and is adapted to journal about an axle pin 27 which is provided with a large head 27a and is held from turning by means of a lock screw 28 positioned to one side and having a head fitting a notch or countersunk portion 27b provided in said head 27a.

A screw driver blade may be fitted into the slot *x* in the head 27a of the axle pin 27 to secure its threaded portion in engagement into one side of the presser foot proper 24 which is provided with a threaded opening. A threaded opening is also provided parallel and adjacent to the roller opening therein, and into which the threaded locking screw 28 is adapted to be fitted.

By this construction the roller 26 may be removed and interchanged with rollers having predetermined or varied indentations, ribs, or grooves *w* about their periphery. Also the head of the axle pin may be made thicker and the roller of smaller length so as to thereby vary the length of the roller used and to fill the space ordinarily provided to receive a roller of maximum length and the greater thickness of the head will retain the roller 26 in snug fit against undesirable transverse movement relative to the presser foot 24.

A presser foot guide device *v* includes a laterally directed arm 31 having a slot 32 and is made of flat stock and its upper edge bears against a shoulder 33 formed in the back side of the supporting portion 23 to hold the arm against turning and a knurled head thumb screw 29 threads into the presser foot to secure the guiding device thereto. The guide foot 34 is the guiding device and is connected to the end of the arm 31 toward the cutting knife 15 and extends downwardly and forwardly from the arm 31 along the side of the knife, there being a notch 35 therein conforming to the cutting edge of the cutting knife as best shown in Figs. 2 and 3.

If it is desired to trim or cut the material along lines paralleling the line of stitching, even when the stitching line may curve, a straight or flat cutting blade 36 having a beveled and sloping lower cutting edge *r* as shown in Figs. 9 and 10 is substituted for the V-shaped cutting blade 15. Like the cutting blade 15, the blade

36 is provided with a shank portion 17 and slot 18 for attachment to the bracket 21. The cutting blade 36 is guided by a guide foot 37, which is otherwise similar to the guide foot 34 except that it has a flat guiding surface 37' instead of the V notched surface 35, and is also provided with an arm 31 and slot 32 to permit of attachment to the presser foot device.

The flat cutting or trimming blade 36 coacts with a straight sided die element which may be a modification of the die member 12 or formed integral with the die plate as shown in Figs. 11 and 12. The die elements or plates, designated 38, and illustrated in Figs. 11 and 12, each comprise a body portion 39 in which is formed a recess 40 one side of which is vertical forming a shearing edge 41 adapted to coact with the cutting blade 36. Fig. 11 shows the recess positioned to leave a relatively wide strip of goods between the stitching and the cut, while Fig. 12 shows the recess positioned closer to the stitching thereby leaving a relatively narrow strip of goods between the stitching and the cut. The cutting knife or blade 36 by its bracket 21, and the guide foot by its arm 31 may be adjusted laterally to properly position the knife and guide foot relative to the various shearing or cutting edges 41.

With very little modification in the attachment punching operations may be accomplished. For this purpose a punch plate 42 is provided. This plate is similar in form to the die plate 7 being adapted to fit in the channel 5 of the needle plate and is thickened by a boss 42a to be received in the aperture 6, and is provided with countersunk screwholes 8' for connection to said needle plate. At a suitable point or points within the margins of the boss 42a, said punch plate 42 is provided with one or more screwthreaded apertures which receive a punch element 44 in the form of a set screw with a rounded recess 45 formed in the upper side of the punch plate 42. The punch element coacts with a die element 46 in the form of a tube formed at the lower end of a shank 17' so that it may be attached in the manner of the cutting blades 15 and 36 to the bracket 21. By providing several punch elements 44 in the punch plate and arranging them in a row as shown in Figs. 13 and 14 lateral adjustment of the die element 46 enables the die element to coact with any of the punch elements therein and obtain various distances between the stitching and the punched holes.

The guide foot 37 is provided on its under-surface with a cut-away portion 30 that leaves a shoulder 30' therein which forms a guide member to act upon the top of the material passing underneath the presser foot and guide, so as to engage a fold in the material, if there be one, or to prevent raising of the presser foot over the seams on the garment when the foot is used to operate parallel to such seams, so as to guide the material as it is being moved by the feeding mechanism, to uniformly maintain the edge of the material relative to the folds or seams therein.

The presser foot may be provided with a smooth surface on its inner side with which the knife 36 may be associated and the guide foot 37 may then be eliminated, and I thereby am enabled to obtain a cut of the material very close to the needle hole.

The forward or upturned end 25 of the presser foot is adapted to receive a removable gauge 51 by means of a clip portion 52. The gauge ex-

tends in front of the needle or the cutting or punching attachment. Said gauge 51 is provided with markings whereby the operator of the machine may readily guide the material, particularly when sewing and cutting the material in a straight line apart from the needle hole.

Operation of the attachment is as follows:

Whether the attachment is used to make zig-zag or "pinked" edges, or to trim parallel with the stitching of the sewing machine, or to punch holes in spaced relation contiguous to a line of stitching, the manner of operation is the same. The cutting knife or punching die element is moved vertically downwardly during the last portion of the needle's movement and raised as the needle finishes its upward movement by mechanism and connections similar to that shown in my United States Patent No. 1,861,068. It should be noted that the cutting blade at all times remains in engagement with the side of its guide foot and never rises to the height shown in Fig. 5, this position of the cutting blade being shown merely to aid the illustration.

When the cutting or punching operations are not desired, in conjunction with stitching operations to be performed by the machine to which my invention may be attached, the operation of the cutting blades may be disconnected in a manner apparent by the mechanism disclosed in said Patent No. 1,861,068.

I do not desire to limit myself to the precise form and construction shown in the drawing, as it may be obvious that many minor changes might be made thereto without departing from the spirit of the invention as described and claimed.

I claim:

1. In a sewing machine attachment; a needle plate having a superficial channel thereacross; and a slot interrupting said channel; a die plate mounted in said channel having a portion offset into said slot; and a readily removable fixed die element mounted in said offset.

2. In a sewing machine attachment; a needle plate having a superficial channel thereacross and a slot interrupting said channel; a die plate mounted in said channel having a portion offset into said slot; a readily removable fixed die element mounted in said offset; a movable die element; and a bracket for variously attaching said movable die element to a moving part of a sewing machine.

3. In a sewing machine attachment; a needle plate having a superficial channel thereacross and a slot interrupting said channel; a die plate mounted in said channel having a portion offset into said slot; a readily removable fixed die element mounted in said offset; a movable die element; a bracket for variously attaching said movable die element to a moving part of a sewing machine; and a guide for said movable die element carried by the presser foot of said sewing machine.

4. The combination with a sewing machine having a bed and a reciprocal needle, and a presser foot; of a fixed die element mounted on the bed of the sewing machine; a movable die element operatively associated with the needle; and a guide for said movable die element carried by the rear face of said presser foot.

5. In a sewing machine attachment; a fixed die element supported from the bed of a sewing machine; a movable die element connected with a movable portion of said sewing machine; and a guide means for said movable die element sup-

ported from the rear face of the presser foot of said sewing machine.

6. In a sewing machine attachment; a fixed die element supported from the bed of a sewing machine and having a V-shaped shearing edge; a movable die element operatively associated with the needle bar of the sewing machine to reciprocate in timed relation with the sewing needle, said movable die element having a V-shaped cutting edge arranged to coact with the shearing edge of the fixed die member; said die elements arranged to make repeated spaced cuts in material passing through the sewing machine to form a zig-zag or pinked edge thereto; and a V-shaped guide for said movable die element carried by the presser foot of the sewing machine.

7. In a sewing machine attachment; a fixed die element supported from the bed of a sewing machine and having a V-shaped shearing edge; a movable die element operatively associated with the needle bar of the sewing machine to reciprocate in timed relation with the sewing needle, said movable die element having a V-shaped cutting edge arranged to coact with the shearing edge of the fixed die member; said die elements arranged to make repeated spaced cuts in material passing through the sewing machine to form a zig-zag or pinked edge thereto; a V-shaped guide for said movable die element carried by the presser foot of the sewing machine; and laterally adjustable bracket means for said movable die element and said guide; said fixed die element being readily removable and replaceable to vary the position of the edge of the material trimmed by said die elements.

8. In a sewing machine attachment; a fixed die element supported from the bed of a sewing machine; a movable die element connected with a movable portion of said sewing machine; a presser foot for the sewing machine including a roller means adapted to ride upon material fed through said sewing machine; and a guide means

for said movable die element supported from the rear face of said presser foot.

9. In a sewing machine attachment, in combination with a presser foot; having a shoulder on its rear surface; a guide device having a laterally directed arm secured to said presser foot so that its upper edge bears against said shoulder and being adjustable along said shoulder; and a guiding foot connected to said arm and being provided along one side thereof with a cutting knife guiding surface.

10. In a sewing machine attachment, in combination with a presser foot; having a shoulder on its rear surface; a guide device having a laterally directed arm secured to said presser foot so that its upper edge bears against said shoulder and being adjustable along said shoulder; and a guiding foot connected to said arm and being provided along one side thereof with a cutting knife guiding surface; the undersurface of said guiding foot being provided with a cutaway portion forming a shoulder adapted to act on the top of material passing under said presser foot and to serve as a guide in conjunction with said material.

11. In a sewing machine attachment, in combination with the needle-bar and bed of a sewing machine having an adjustable feeding mechanism; a presser foot associated with said feeding mechanism; a variable die element secured to said bed; a cutting bar operatively connected to said needle-bar; a guiding device supported from said presser foot; a cutting knife connected to said cutting bar and adapted to be guided by said guiding device and cooperate with said variable die element; said cutting knife and die element being substantially V-shaped on their coacting cutting surfaces to cut serrations on the edge of material being passed under said presser foot, the size of said serrations being controlled by adjustment of the feeding mechanism of said sewing machine.

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