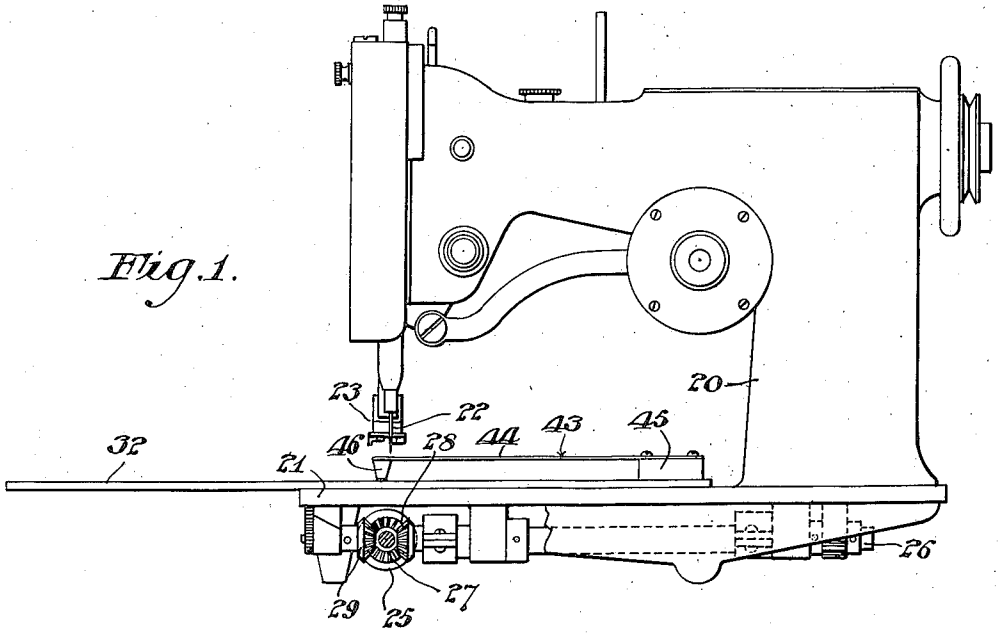
Dec. 15, 1936. H. FABIAN ET AL 2,064,598

CUTTING DEVICE FOR SEWING MACHINES

Filed Dec. 6, 1935 5 Sheets-Sheet 1

Fig. 1.



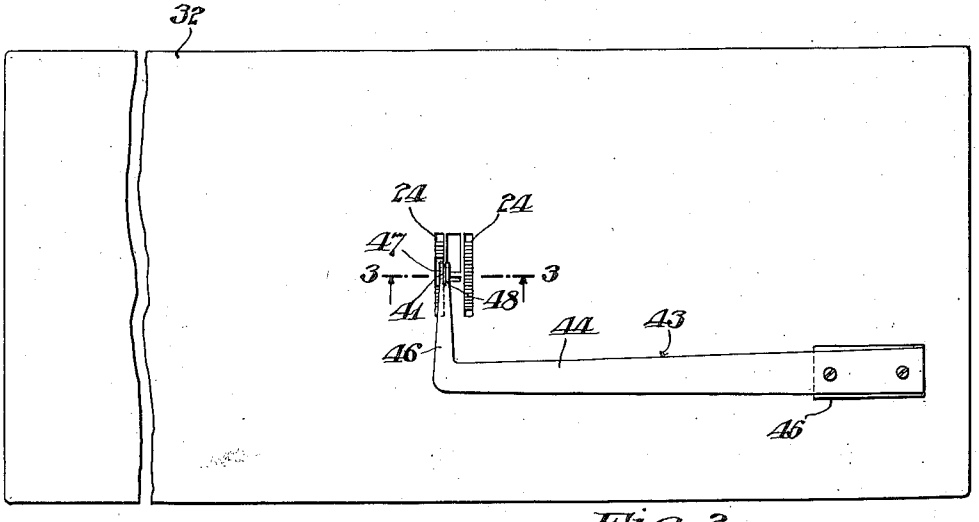


Fig. 2.

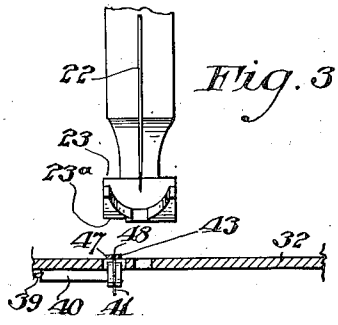


Fig. 3.

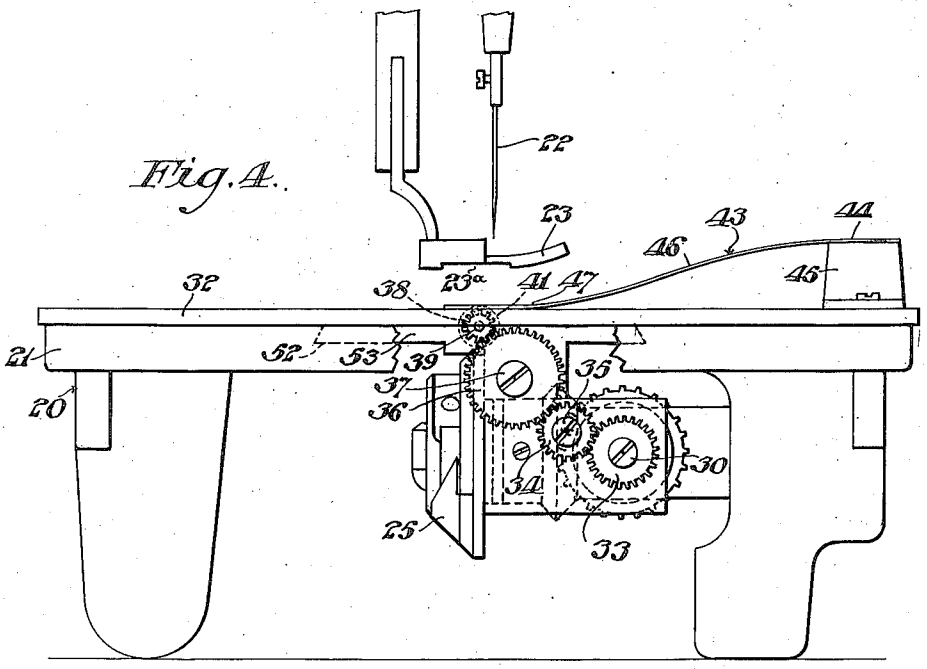
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CUTTING DEVICE FOR SEWING MACHINES

Filed Dec. 6, 1935 5 Sheets-Sheet 2

Fig. 4.



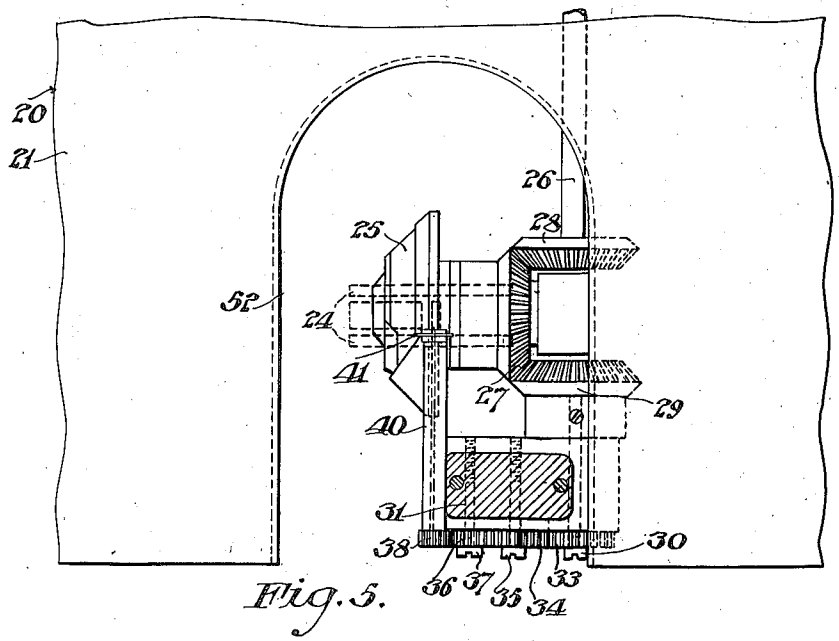


Fig. 5.

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CUTTING DEVICE FOR SEWING MACHINES

Filed Dec. 6, 1935 5 Sheets-Sheet 3

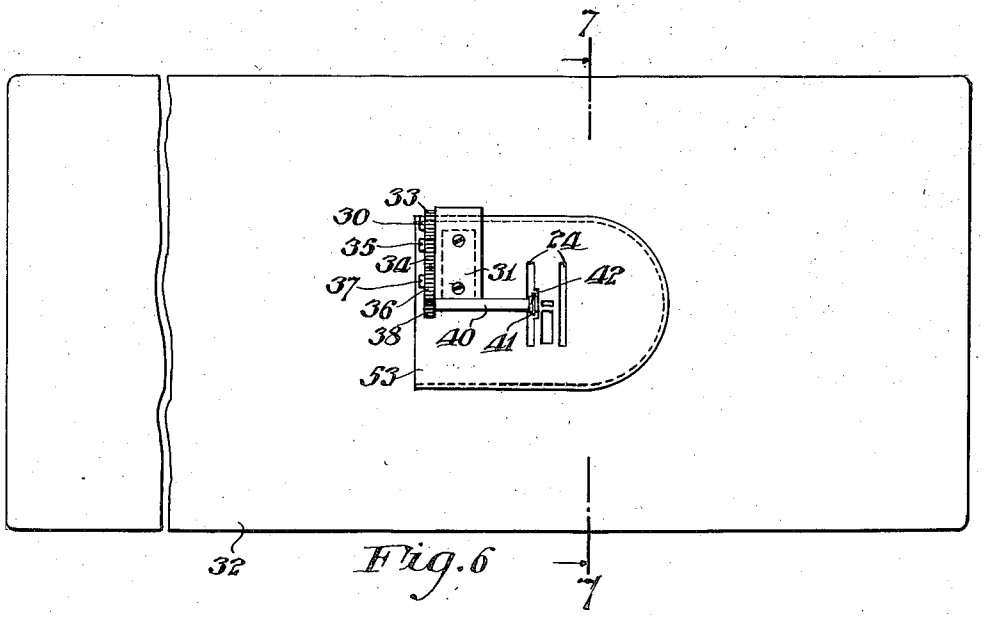


Fig. 6

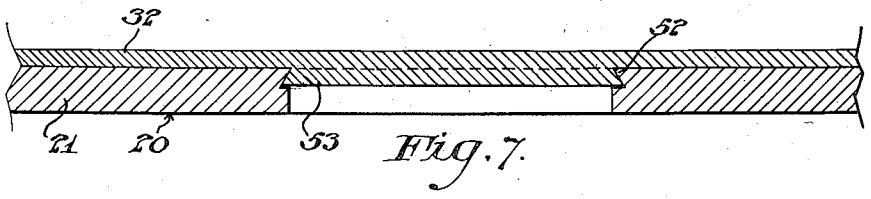


Fig. 7.

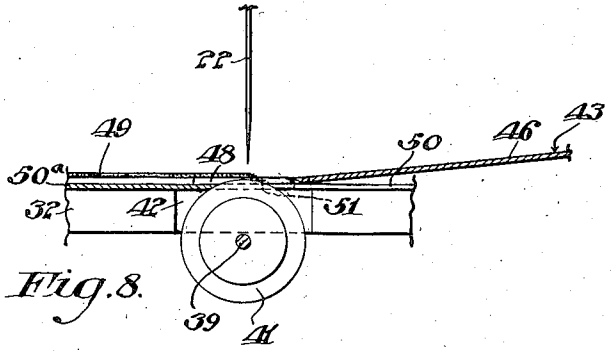


Fig. 8.

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Dec. 15, 1936. H. FABIAN ET AL 2,064,598

CUTTING DEVICE FOR SEWING MACHINES

Filed Dec. 6, 1935 5 Sheets-Sheet 4

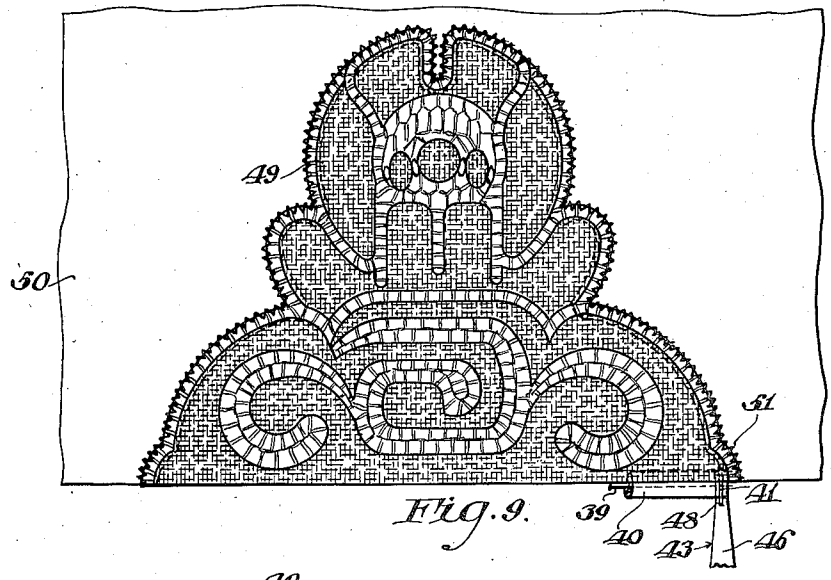


Fig. 9.



Fig. 10.

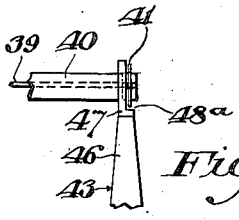


Fig. 13.

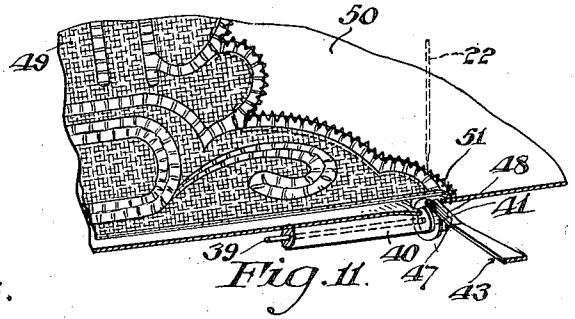


Fig. 11.

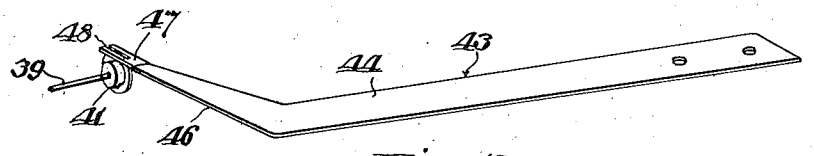


Fig. 12.

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CUTTING DEVICE FOR SEWING MACHINES

Filed Dec. 6, 1935 5 Sheets-Sheet 5

Fig. 14.

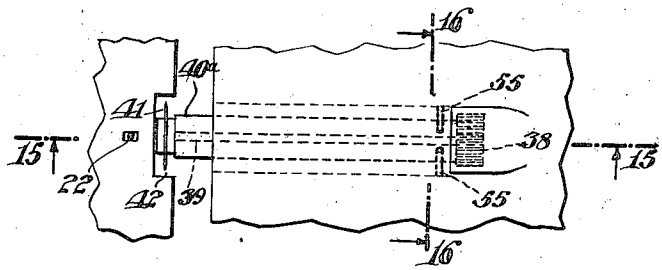


Fig. 15.

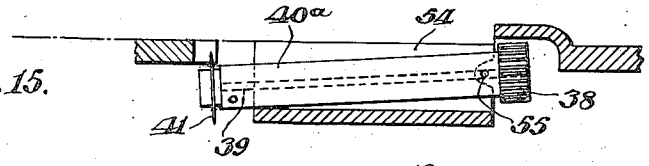


Fig. 16.

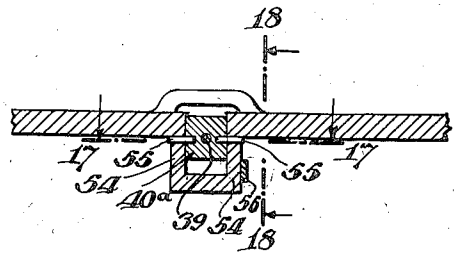


Fig. 17.

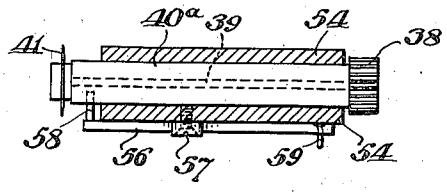
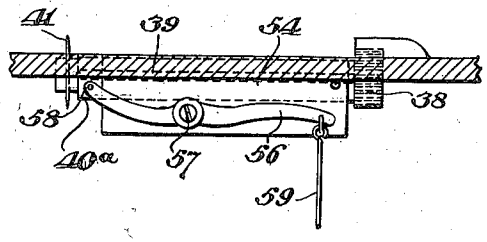


Fig. 18.



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Patented Dec. 15, 1936 2,064,598

UNITED STATES PATENT OFFICE

2,064,598

CUTTING DEVICE FOR SEWING MACHINES

Harry Fabian and Alfred K. Edwards,
Philadelphia, Pa.

Application December 6, 1935, Serial No. 53,194

4 Claims. (Cl. 112—127)

Our invention relates to a new and useful cutting device for sewing machines and one of its objects is to provide apparatus for simultaneously stitching superimposed layers of material and cutting out a portion of the lower layer of material.

Another object of the invention is to stitch together a number of layers of material and cut out a portion of the lowermost layer of material simultaneously by a new method.

Another object of this invention is to provide a circular cutter driven by the mechanism of a sewing machine to which it is attached and employ means to hold a layer or layers of material above the cutter to permit one layer of material to be cut without damage to the other layer or layers of material.

A further object of the present invention is to provide in combination with a sewing machine, means to maintain layers of material in partially separated condition adjacent or in close proximity to the sewing machine needle and means to cut only the lowermost material layer during the stitching operations.

A still further object of our invention is to provide a simple and effective arrangement of parts whereby the cutter may be retracted when desired, as when only the sewing operations are to take place or the material is being withdrawn from the machine.

With these and other objects in view, the invention consists of the details of construction, the combination of elements and the steps of the method hereinafter set forth and then pointed out in the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, we will describe its construction and operation in detail, referring by numerals to the accompanying drawings forming a part of this application, in which;—

Fig. 1 is a view in elevation of a sewing machine with our invention applied thereto, a portion of the machine frame being broken away.

Fig. 2 is a slightly enlarged top plan view of the plate carrying the cutter mechanism.

Fig. 3 is a fragmentary sectional view of only the plate, cutter, material support, separator or guard, presser foot and needle, illustrating the relation on approximately the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary end view of the machine looking toward the left hand end of Fig. 1 and with a portion of the bed plate or table broken away to illustrate the cutter driving mechanism.

Fig. 5 is a fragmentary top plan view of the machine table with the plate which carries the cutter mechanism broken away and the hanger shown in section where it connects with said plate.

Fig. 6 is a bottom plan view of the plate and the associated cutter mechanism.

Fig. 7 is an enlarged fragmentary section on the line 7—7 of Fig. 6.

Fig. 8 is also an enlarged sectional view of parts of the apparatus illustrating the manner in which the cutting is accomplished.

Fig. 9 is a plan view of a piece of work showing it at the completion of the simultaneous sewing and cutting operations.

Fig. 10 is an edge view thereof.

Fig. 11 is a fragmentary perspective view of the same.

Fig. 12 is a perspective view of the material support, separator or guard and cutter.

Fig. 13 is a fragmentary top plan view of a modified form of support, separator or guard and cutter.

Fig. 14 is a top plan view of the cutter showing one construction whereby said cutter may be retracted.

Fig. 15 is a section on the line 15—15 of Fig. 14 with the cutter and component parts left in elevation.

Fig. 16 is a section on the line 16—16 of Fig. 14.

Fig. 17 is a section on the line 17—17 of Fig. 16, and

Fig. 18 is a section on the line 18—18 of Fig. 16.

In carrying out our invention as herein embodied 20 represents a sewing machine including the usual bed plate or table 21, the needle 22 with its driving mechanism, the presser foot 23, which in this instance has a recess 23^a in its under surface, the feed bar or bars 24, the bobbin case 25 and the driving mechanism for said feed bar or bars and the bobbin case. This latter driving mechanism includes a drive shaft 26 which in any suitable manner transmits motion to a gear 27. In the particular mechanism illustrated, the drive shaft 26 has a gear 28 thereon meshing with the gear 27 whereby the latter is revolved.

Meshing with the gear 27 is another gear 29 mounted on a counter shaft 30 journalled in the block 31 which may be in the form of a hanger and while said block is herein shown as depending from the plate 32, said block is in effect supported by the machine frame and we contemplate use of the device as an attachment or as a part of the sewing machine. On the opposite end of the counter shaft 30 is mounted a gear 33 which is one of a train of gears for properly timing the

revolutions of the circular cutter to be presently described.

The other gears of the train include gear **34** meshing with gear **33** and mounted on a trunnion **35** assembled in the block **31**, gear **36** meshing with gear **34** and mounted on a trunnion **37** assembled in said block **31**, and gear **38** meshing with gear **36** and mounted on the cutter shaft **39** journalled in the block **31** a portion of which may be extended to provide a bearing **40** for the entire length of the cutter shaft as shown in Fig. 5. This bearing **40** may be separate from the block proper if desired and is so produced in some instances as will appear from the succeeding description.

On the inner end of the cutter shaft is mounted the revolving circular, disc or wheel cutter **41**, and a portion of the periphery of said cutter projects upwardly through an aperture in the plate **32** which may be a separate element or a part of the machine. In fact this plate may be the bed plate or table of the machine and is to be considered as an equivalent thereof. For purposes of illustration the aperture through which the cutter projects is shown as a notch **42**, Fig. 6, produced in a wall of one of the slots for the feed bars **24**.

A material separator, support or guard **43** is fashioned from relatively rigid material, preferably metal, and comprises a body **44** having one end attached to an elevation or block **45** while from the opposite end projects a leg **46** at an angle to the body and declined toward the top face of the plate **32** where it terminates in a bifurcated foot **47**.

The construction of the foot of the separator, support or guard **43** provides an aperture **48** in the form of a longitudinal slot or notch into which the cutter projects but said foot **47** is thick enough or is positioned so that the cutter does not protrude above the top surface of the foot of the separator, support or guard as shown in Fig. 8.

In lieu of the slot, the aperture **48a** may be produced as a notch in one side edge of the foot **47** as shown in Fig. 13 and this will immediately suggest that the foot of the separator, support or guard **43** can be solid and positioned to one side of the cutter and we consider such a construction the equivalent of what has been illustrated. The function of the separator, support or guard is to provide a surface above the cutting edge of the cutter so as to separate a lower layer of material from anything above it or to support one or more layers of material in spaced relation to a lower layer of material whereby the cutter cannot contact the upper layer or layers of material. This makes it possible to cut a complete section of the lower layer of material from within the boundaries thereof without affecting the upper layer of material. Actually a complete section of said lower layer of material can be cut out of the center thereof and the lower layer of material surrounding said cut out piece or the upper layer of material will not be damaged in any way.

In actual practice the foot **47** of the guard **43** is spaced from the top surface of the bed plate or table of the sewing machine a sufficient distance to permit the lower layer of material being operated upon to be moved about without interference. In other words, the work must be free to be shifted without any drag on the section being cut out and so that any outline can be readily followed.

Only for purposes of illustration we have shown in Figs. 8 to 11 inclusive one use of the invention. Here a piece of lace, the upper layer of material, is being sewn to a piece of fabric, the lower layer of material, such as a piece of silk, and the fabric or lower layer of material is being cut out under the lace or upper layer of material so that the finished article will be transparent in the area of the lace. In practice, the upper layer of material **49** is positioned on top of the lower layer of material **50** and the two fed into the sewing machine in the usual manner except that said lower layer of material is caused to pass beneath the foot **47** of the separator, support or guard **43** and the upper layer of material is directed on top of said foot **47**. Now as the two layers of material are sewn together by the stitches **51** the unwanted piece **50a** of the lower layer of material will be severed by the cutter **41** and as soon as the sewing is completed the piece **50a** of the lower layer of material will be fully cut off and therefore both operations are accomplished simultaneously.

Sewing machines are generally provided with an access opening **52** in the bed plate or table **21** so that certain parts of the mechanism may be examined and side edges of such opening are fashioned to accommodate a sliding cover. Where the present invention is made as an attachment, the plate **32** is provided with a boss **53** to register with the access opening **52** for attaching the plate **32** and the elements of the invention to the sewing machine.

In order to provide for retraction of the cutter **41**, the shaft **39** thereof may be journalled in a bearing **40a** that is pivoted at the end opposite the cutter between walls **54** by means of pins **55** or their equivalent. Any suitable means may be utilized for actuating the bearing **40a** to raise and lower the cutter and for purposes of illustration we have shown a lever **56** pivoted intermediate its ends, as at **57**, to the outer surface of one of the walls **54**. One end of said lever is connected to the free end of the bearing **40a**, as at **58** and to the opposite end of said lever is connected a link **59** by which the lever may be oscillated. Said link **59** may be manually operated or it may be connected to a knee actuated mechanism.

With this arrangement, when it is desirable or necessary to withdraw the work or when a part of the work is to be left uncut, the cutter can be readily retracted as in Fig. 15 by lowering the same and then returned to its normal cutting position when the operator is ready to resume operations.

The gear **38** on the cutter shaft **39** will not move such a distance as to disengage it from its co-acting gear **36** because in actual practice the movement of the end of the bearing **40a** adjacent to the pivots **55** will be very slight relative to the movement of the opposite end of said bearing.

Of course we do not wish to be limited to the exact details of construction as herein shown, as these may be varied within the limits of the appended claims without departing from the spirit of our invention.

Having thus described our invention what we claim as new and useful is:—

1. The combination with a sewing machine, of a plate, a bearing block supported by said plate, a shaft journalled in said block, a gear on each end of said shaft one of which meshes with a gear of the machine mechanism, a cutter shaft journalled in said block, a cutter on the inner end of said cutter shaft and projecting through an aperture in the plate adjacent the sewing machine needle, a train of gears including the other

one on the first named shaft and one on the cutter shaft for transmitting motion to the cutter from the machine mechanism, and a material separator having a foot located in the region of the cutter with the upper surface of said separator above the cutter to maintain an upper layer of material out of contact with the cutter during the time the two layers are being sewn together.

2. The combination with a sewing machine, of a cutter shaft bearing pivoted at one end to a portion of the machine, a cutter shaft journalled in said bearing, a cutter on the end of said shaft which is farthest removed from the pivot point and projecting from underneath of the machine bed plate through an aperture therein adjacent the machine needle, means to transmit motion to the other end of the shaft from the machine mechanism, means to oscillate the bearing whereby the cutter may be selectively retracted, and means to hold two superimposed layers of material in separated relation in the region of the cutter during sewing operations whereby a portion of the lower layer will be severed therefrom while the upper layer remains intact.

3. The combination with a sewing machine, of a revolving disc cutter mounted underneath of the machine table and projecting through and above said table adjacent the sewing machine needle, means on top of said table to hold superimposed layers of material in separated relation in the region of said cutter, whereby a portion of the lower layer may be severed during and within the boundary of the sewing operation, and means to bodily retract the cutter to permit continuance of the sewing operations without cutting operations.

4. The combination with a sewing machine, of a revolvable cutter shaft mounted underneath of the machine table, means to pivot said shaft adjacent one end thereof, a disc cutter on the other end of the shaft and projecting through and above said table, means on top of the table to hold a bottom layer of a pile in separated relation in the region of the cutter, and means to tilt the shaft to move said cutter into an inoperative position.

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