

Feb. 5, 1952

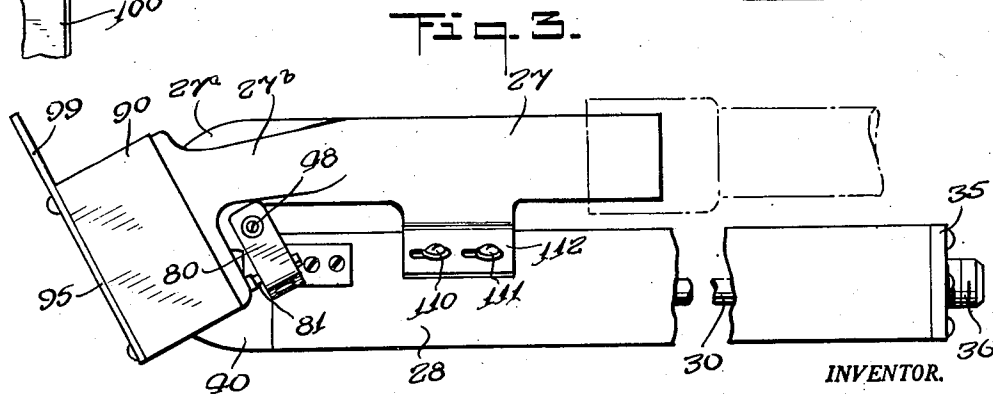
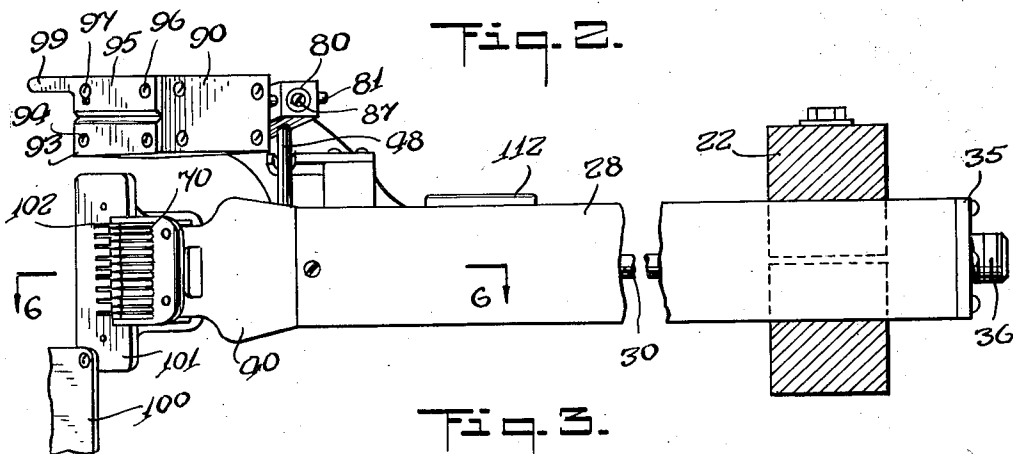
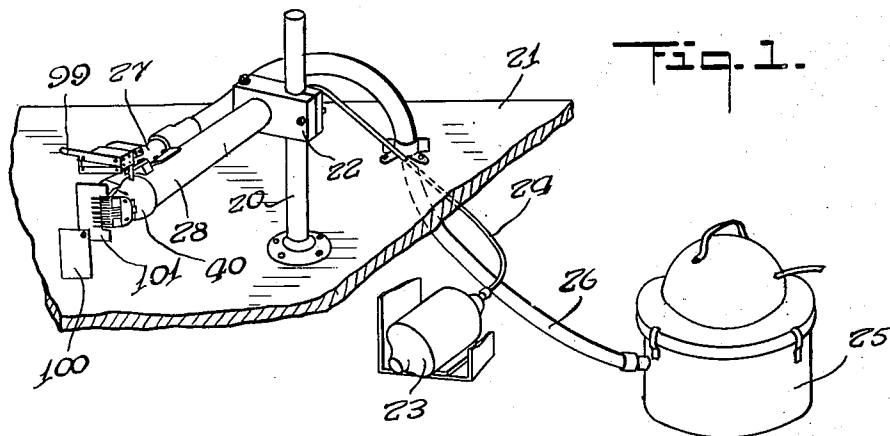
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2,584,620

CLOTHING TRIMMING MACHINE

Filed Jan. 5, 1951

3 Sheets-Sheet 1



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GARMENT TRIMMING MACHINE

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3 Sheets-Sheet 2

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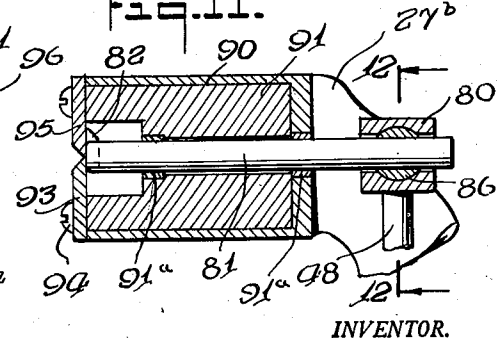
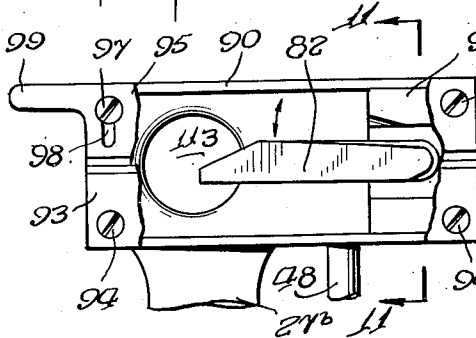
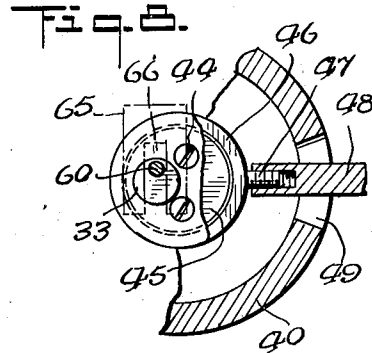
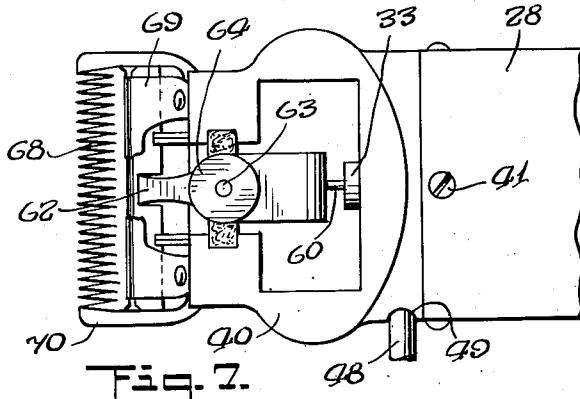
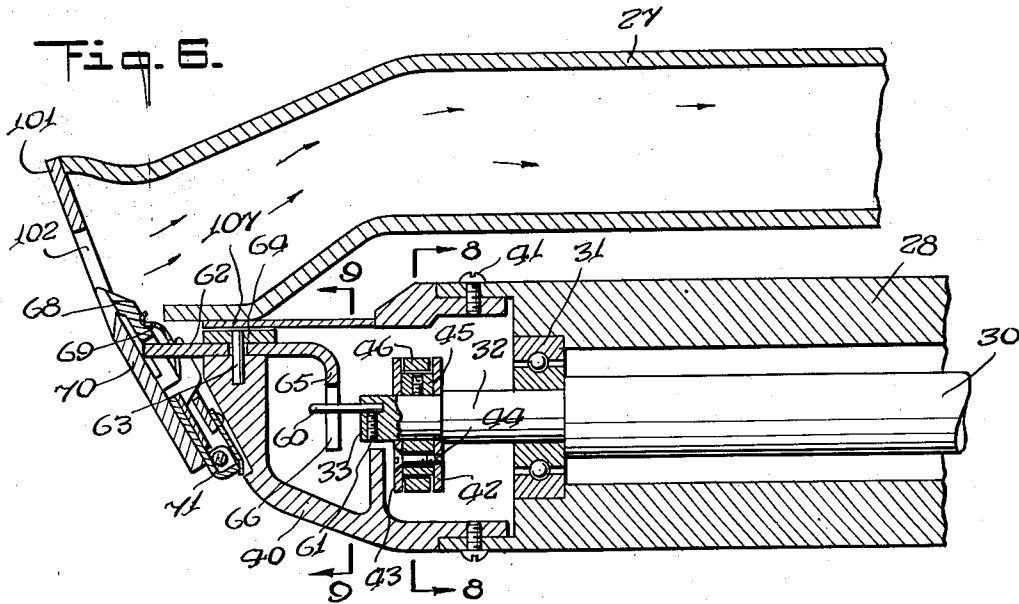
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GARMENT TRIMMING MACHINE

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3 Sheets-Sheet 3



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2,584,620

GARMENT TRIMMING MACHINE

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14 Claims. (Cl. 26-7)

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This invention relates to cutters for threads and fabric strips or the like such as may be found on dresses or other clothing after a sewing operation, which threads or fabric strips must be removed.

It is well understood that in a garment making factory, the parts of the garment are sewn together on various types of high speed sewing machines, and such operations generally leave threads or fabric strips dangling from the sewn garment. An operator must then trim such threads or strips and may do so with an ordinary scissors. In the case of threads, the industry has begun considerable use of trimming machines which comprise cutters having a plurality of teeth similar to devices used by barbers in trimming hair. However, such machines are inadequate for trimming strips such as ribbons, piping or elastic because the teeth will not accept such larger pieces of material. As a result, the trimming of such strips requires time and attention which adds to the cost of producing the garments and reduces production.

In accordance with the instant invention, a machine is provided which not only trims hanging threads or the like but which is formed so as to further trim such strips as normally are found in the garment after leaving the sewing machines. The foregoing is accomplished by providing a special cutter assembly which reciprocates by virtue of the same motive power which drives the thread cutter and in which the vacuum or suction which ordinarily draws the threads into the thread cutter is also applied to the strip cutter, either selectively or simultaneously with its application to the thread cutter. A special train of mechanism for transferring the motive power to both the thread cutter and the strip cutter is provided. The respective cutters are so disposed in the mechanism that a garment is very speedily and conveniently trimmed of all its superfluous hanging parts while providing an apparatus therefor which is economical in construction and efficient in use. It has been found that a machine of this type speeds production to a gratifying extent while saving on labor costs as will be evident. The particular mechanism shown is of importance in that it ensures an efficient and reliable machine at a minimum of production cost.

The invention will be further understood from the following description and drawings in which:

Fig. 1 is a perspective view in somewhat diagrammatic form illustrating the complete apparatus and the power equipment therefor,

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Fig. 2 is an elevational view of the right-hand side of the machine.

Fig. 3 is a top plan view.

Fig. 4 is an elevational view of the left-hand side of the machine.

Fig. 5 is a bottom plan view.

Fig. 6 is an enlarged cross-sectional view as taken along the lines 6-6 of Fig. 2.

Fig. 7 is a fragmentary plan view of the underside of the thread cutter, with its top plate removed.

Fig. 8 is a fragmentary cross-sectional view as taken along the lines 8-8 of Fig. 6.

Fig. 9 is a cross-sectional view as taken along the lines 9-9 of Fig. 6.

Fig. 10 is a front elevational view, partly broken away, of the strip or ribbon cutter.

Fig. 11 is a cross-sectional view as taken along the lines 11-11 of Fig. 10.

Fig. 12 is a cross-sectional view as taken along the lines 12-12 of Fig. 11.

Fig. 13 is a cross-sectional view as taken along the lines 13-13 of Fig. 12.

Fig. 14 is a cross-sectional view as taken along the lines 14-14 of Fig. 4.

Fig. 15 is a cross-sectional view as taken along the lines 15-15 of Fig. 4.

When in use, the machine is generally mounted on a standard 20 which may be secured to a work table 21. In the form shown, the mounting includes a split block 22 which is tightened around the standard 20 as well as the machine to support it in any desired position. Motive power is derived by means of an electric motor which drives a conventional form of flexible shaft 24. Shaft 24 drives the main shaft of the machine as will be hereinafter described.

It has been known in thread cutters to employ suction for sucking loose threads toward the cutter to facilitate and expedite operations. The general principle thereof is employed in the instant machine where a conventional vacuum apparatus 25 having a hose 26 applies a suction not only to the thread cutting elements but also to the strip cutting portion in a manner which will hereinafter be described. In the form shown, the machine comprises two adjacent tubular housings 27 and 28. It is to housing 27 that hose 26 is applied so that said housing is the vacuum or suction portion of the machine. The other housing 28 contains most of the operating mechanism for both cutters.

The thread cutter largely comprises a hair clipper as used in barbering, although special and important modifications have been made therein to

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render it suitable to the instant invention. Referring to Fig. 6, the flexible shaft 24 drives the main shaft 30 which extends through the elongated housing 28. Anti-friction bearing 31 supports shaft 30 at the reduced portion 32 thereof. A further reduced portion 33 is employed for driving both cutters as will hereinafter be described. The rear end of shaft 30 is supported by an anti-friction bearing 34 as illustrated in Fig. 15. The rear end of housing 28 is enclosed by a back plate 35 having a threaded fitting 36 which facilitates the coupling of the flexible shaft 24 to the driving shaft 30, through the keyway 37 thereof.

The cutter assembly is enclosed within or supported by the head 40 which is secured as by bolts 41 to the housing 28. Reduced portion 33 supports the rear eccentric disc 42 which abuts against the shoulder forming such reduced portion. Front eccentric disc 43 is connected by bolt 44 to disc 42. An eccentric spacer 45 is disposed between the front and rear discs, the bolt 44 extending through an opening in said spacer 45. A free collar or sleeve 46 is maintained between the discs and around the eccentric spacer 45. It will be recognized therefore that the sleeve 46 has imparted to it an eccentric motion by virtue of the eccentric assembly comprising discs 42, 43 and spacer 45. Sleeve 46 has connected thereto a threaded stem 47 which supports the post 48. Post 48 extends out of slot 49 formed in the head 40. Whereas post 48 has a tendency to rotate pursuant to the rotation of shaft 30, being free within the eccentric assembly, such rotation is limited by the slot 49 so that the post 48 actually oscillates within the slot. It also reciprocates vertically because of the eccentric motion thereof, and it is such vertical reciprocation that is employed to drive the strip cutter as will hereinafter be described.

Reduced shaft portion 33 is further extended to serve as a support for pin 60 which is eccentrically mounted therein by set screw 61 as noted in Figs. 6 and 8. A dog 62 is pivotally mounted to head 40 by pivot pin 63 which may include an integral head 64 and such dog 62 includes a depending apron 65 which is formed with a vertical slot 66. The disposition of pin 60 in relation to slot 66 is best illustrated in Fig. 8. It will be seen therefrom that as the eccentrically mounted pin 60 revolves, it reciprocates apron 65 laterally which causes the dog 62 to pivot at 63. The forward end of dog 62 is received in a slot of movable cutter blade 68. The details of the cutter or clipper are conventional, and no claim to the construction thereof is made herein. However, it may be noted that the cutter includes top plate 107, leaf spring 69 for holding the movable cutter blade 68 in position, and a stationary cutter blade 70 which is mounted on a hinged plate 71 so that it can be swung away for servicing or the like. Movable cutter blade 68 is slidably maintained against the stationary cutter blade 70 by the leaf spring 69 so that these parts are handled as a unit. Reference may be made to the well known "Oster" clippers for further details of the thread cutter mechanism. Essentially, the cutter operates by reciprocation of the movable, toothed cutter blade 68 which cuts threads against the bottom, stationary, toothed cutter blade 70. Toothed plate 101 is connected across the open end of housing arm 27a and serves as a guide for the thread cutter.

Next to be described is the actuation of the strip cutter. This is effected through the vertical reciprocation of post 48 as hereinabove described. Post 48 drives a block 80 which is a link between it and the shaft 81 which actuates the strip cutter

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blade 82. Inasmuch as post 48 tends to oscillate, it is connected to block 80 through the pivotally mounted collar 83 which functions as a type of universal coupling.

Post 48 is secured to collar 83 by set screws 84 and 85 as illustrated in Fig. 13. Thus, although post 48 may oscillate, the result of such oscillation is only the rotation of collar 83 in block 80, and block 80 is nevertheless vertically reciprocated at the end which receives post 48. The other end of block 80 is connected to strip cutter shaft 81 through the collar 86, the set screw 87 securing shaft 81 relative to said collar. Collar 86 may have a slight degree of sliding movement relative to block 80 although such movement is limited by the width of slot 88 of block 80 in which the post 48 is received. It will be evident, therefore, that as the post receiving end of block 80 is vertically reciprocated, the other end, being connected to the shaft 81, will oscillate said shaft and produce a corresponding oscillation or reciprocation of the strip cutter blade 82.

Strip cutter housing 90 contains an end block 91 which is centrally bored and provided with bearings 91a for rotatably receiving the shaft 81. At the outer end of shaft 81 is the strip cutter blade 82 which may be integral with the shaft 81 if desired. Blade 82 functions with a scissor action against the stationary lower blade 93 which is secured to end block 91 as by screws 94. Blade 82, due to its shearing action, moves laterally as well as vertically, and this lateral movement is taken up by collar 83 in block 80.

In order that a proper scissors or shearing action may be achieved, blade 82 is set at a shearing angle relative to the cutting edge of blade 93 as will be understood by those skilled in the art. The strips or other material to be cut are introduced directly above the cutting edge of blade 93 and the reciprocation of blade 82 will sever such strips. The opening for permitting such introduction may be covered or uncovered by the upper plate 95 which is pivoted to block 91 by the pivot bolt 96, the extent of such pivoting action being limited by bolt 97 which rides in slots 98. A handhold member 99 facilitates adjustment of the upper plate 95. It will be understood that actuation of handhold member 99 in an upward direction will expose the opening through which strips may be cut and that downward adjustment thereof will close the opening as illustrated in Figs. 10 and 11 so that the strip cutting mechanism is effectively disabled. The reason therefore is, as will hereinafter be explained, to render the suction applied to the other cutter head more effective. In addition, the thread cutter includes a pivoted plate 100 which can be swung upwardly and maintained in place by spring 100a and bolt 100b so as to cover the face of the thread cutter for a related purpose, that is, the blocking off of suction from the thread cutter when it is desired to confine it to the strip cutter. Plate 100 is pivotally connected to the apron plate 101 which is secured to tubular housing 27. Plate 101 extends outwardly of the thread cutter blades and is provided with teeth 102 which limit the size and type of materials which can be cut by the thread cutter blades and which also transmit suction from housing 27 to the thread cutter teeth. Apron plate teeth 102 are spaced away from the thread cutter teeth, such spacing being in the order of $\frac{1}{8}$ inch so that threads can be more easily introduced therein. This spacing or cutter

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opening may be adjusted both vertically and horizontally.

The tubular housing 27 serves as the air conduit for providing suction to both of the cutter mechanisms. Accordingly, housing 27 is yoked or Y-shaped as will be evident from Fig. 4 so as to provide two arms 27a and 27b. Arm 27a is a substantial continuation of the body of housing 27 and it is inclined inwardly so that it directly overlies the top plate 107 of the thread cutter assembly. It is further secured by bolts 108 in slots 109 of the arm 27a to the apron plate 101 for vertical adjustment of the thread cutter opening. Housing 27 is adjustably secured to housing 28 by bolts 110 and 111 which may be adjusted in longitudinal slots formed in the connection member 112 so that the housing 27 may be longitudinally adjusted relative to the housing 28. One of the purposes thereof is to regulate the cutter opening of the thread cutter since the apron 101 which adjusts such opening is connected to the housing arm 27a while the blades themselves are connected to the housing 28.

The operation of the machine may be briefly described as follows:

The motor 23 is energized so as to actuate flexible shaft 24 which will drive both cutter mechanisms as above described. Vacuum apparatus 25 is also put into operation. As a result thereof, the suction will be induced in housing 27 and will be branched off through the arms 27a and 27b to the thread cutter through teeth 102 and to the strip cutter through open end 113 of arm 27b. This suction will, of course, pull threads or strips to the cutter blades so that they can be sheared or severed and the cut pieces will be further sucked in to a depository therefor in the vacuum apparatus. An operator, when receiving a sewn garment, will place loose or dangling threads adjacent the teeth of the thread cutter so that such threads will be pulled inwardly and cut or trimmed. Strips will be cut by directing such strips toward the strip cutter where they will be severed and trimmed as above described. Thus, the operation of trimming a sewn garment will be considerably expedited and simplified, the single apparatus herein meeting substantially all trimming requirements. Costs of production are reduced, and the production of garments is increased to a considerable extent.

The provision of swingable cover plates 95 and 100 is of importance in that when either of the cutter mechanisms are not in use, the other can be supplied with an increased suction by blocking off the mechanism not in use. It will be understood that all the suction will be directed toward the mechanism which is uncovered and in use rather than to the one that is covered.

Whereas I have described the housing 27 as being Y-shaped, it is evident that its form could be L-shaped or the like as long as one of its arms diverges to apply suction to the other cutter. In addition, it will be recognized that numerous changes and omissions may be made without departing from the spirit of the invention.

What is claimed is:

1. A combination strip and thread cutting machine comprising two hollow, elongated and adjacent housings, a thread cutter at one end of one of said housings, one end of the other housing being Y-shaped, and a strip cutter at one end of one arm of the Y, said thread cutter being adjacent to said strip cutter, the end of the other arm of the Y being disposed in contact with said thread cutter, said strip cutter housing being adapted to

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have a suction applied at its other end whereby said suction may be directed through its Y-shaped end to both the thread cutter and the strip cutter.

2. A machine according to claim 1 and wherein said other arm of said Y-shaped end is a longitudinal continuation of said strip cutter housing, and said end of the other arm of the Y being biased inwardly to effect contact with said thread cutter so that the suction may be applied thereto, the other arm of the Y branching outwardly relative to said strip cutter housing.

3. A combination strip and thread cutting machine comprising two hollow, elongated and adjacent housings, one end of one of said housings being Y-shaped, a thread cutter, a strip cutter, said thread cutter being disposed at one end of the other housing and in contact with the end of one of the arms of the Y and the strip cutter being connected to the end of the other arm of the Y, said one housing being adapted to have applied to its other end a suction, both of said cutters including a movable cutter blade, and power transmission mechanism for actuating both of said cutter blades disposed in the other housing.

4. A machine according to claim 3 and including movable cover plates on each of said cutters for selectively blocking off the suction whereby all the suction may be applied to either cutter.

5. A machine according to claim 4 and wherein the strip cutter cover plate comprises an elongated bar, an actuating handhold member at one end of said bar, and a pivot for swinging said bar to suction opening or closing position, said bar being formed with a slot adjacent said handhold member and a bolt on the strip cutter which is slidable relative to said slot for limiting and determining the open and closed positions of said bar.

6. A combination strip and thread cutting machine comprising a strip cutter, a thread cutter, elongated tubular cutters at respective ends of which said cutters are secured, both of said cutters including a reciprocating cutter blade, power transmission mechanism for actuating both of said cutter blades disposed in one of said housings, and means for applying a suction through one of said housings to said thread cutter for sucking in threads to be cut, said means including a diverging channel for applying said suction to said strip cutter.

7. A combination strip and thread cutting machine comprising a strip cutter, a thread cutter, elongated tubular housings at respective ends of which said cutters are secured, both of said cutters including a reciprocating cutter blade, power transmission mechanism for actuating both of said cutter blades disposed in one of said housings, said power transmission mechanism comprising an elongated shaft axially disposed in said one housing, means at one end of said shaft for coupling a power source thereto, an eccentrically disposed pin at the other end of said shaft, means to reciprocate said thread cutter blade through the revolutions of said eccentrically mounted pin when said shaft is rotated, and an eccentric disc mounted around said other end of said shaft and adjacent said pin, and means for transmitting reciprocating motion of said eccentric disc to the strip cutter blade for reciprocating it.

8. A machine according to claim 7 and wherein said thread cutter includes a pivoted dog having a depending apron and a vertical slot formed therein, said pin being received in said vertical slot whereby revolving of said eccentric pin re-

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reciprocates said apron and pivots said dog for actuating the thread cutter blade, a sleeve freely disposed around said eccentric disc, a post extending from said sleeve, said post being vertically reciprocated pursuant to the rotation of said eccentric disc which is transmitted to said sleeve, and an oscillatory block one end of which is connected to said post, a shaft for the strip cutter blade, the other end of the block being connected to said strip cutter blade shaft for reciprocating it.

9. A machine according to claim 8 wherein said block is elongated, a collar rotatably mounted in said block, said post being secured to said collar so that said collar may oscillate in said block pursuant to oscillation of said post but will nevertheless transmit vertical motion of said post to said block.

10. A machine according to claim 8 and wherein one of said housings is adapted to have applied thereto a suction for acting against both of said cutter blades to draw threads or strips thereagainst to be cut and for sucking in the cut articles to a depository therefor, and movable cover plates against the exterior of each of said cutter blades for selectively blocking off the suction whereby all the suction may be applied to either cutter.

11. A combination strip and thread cutting machine comprising two hollow, elongated and adjacent housings, a thread cutter at one end of one of said housings, one end of the other housing being Y-shaped, and a strip cutter at one end of one arm of the Y, said thread cutter being adjacent to said strip cutter, the end of the other arm of the Y being disposed in contact with said thread cutter, each of said cutters including a reciprocating cutter blade, power transmission mechanism for actuating both of said cutter blades disposed in said one housing, said other Y-shaped housing being adapted to have a suction applied to the end of the lower or center arm of the Y whereby said suction may be directed through the diverging upper arms of the Y to both the thread cutter and the strip cutter, said power transmission mechanism including a main shaft axially disposed in said one housing, an eccentrically disposed pin on the inner end face of said shaft, said thread cutter including a pivoted dog for reciprocating its cutter blade, said dog having a depending apron and a vertical slot formed therein, said pin being received in said vertical slot whereby revolving of said eccentric pin reciprocates said apron and pivots said dog for actuating the thread cutter blade, a sleeve freely disposed around said eccentric disc, a post extending from said sleeve, said post being vertically reciprocated pursuant to the rotation of said eccentric disc which is transmitted to said sleeve, and an oscillatory block one end of which is con-

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nected to said post, a shaft for the strip cutter blade, the other end of the block being connected to said strip cutter blade shaft for reciprocating it, and movable cover plates against the exterior of each of said cutter blades for selectively blocking off the suction whereby all the suction may be applied to either cutter.

12. A combination strip and thread cutting machine comprising two hollow, elongated and adjacent housings, one end of one of said housings being Y-shaped, a thread cutter, a strip cutter, said thread cutter being disposed at one end of the other housing and in contact with the end of one of the arms of the Y and the strip cutter being connected to the end of the other arm of the Y, said one housing being adapted to have applied to its other end a suction, both of said cutters including a movable cutter blade, power transmission mechanism for actuating both of said cutter blades disposed in the other housing, said thread cutter movable blade being toothed, a stationary toothed blade cooperating therewith to cut threads, and an apron plate disposed immediately adjacent said thread cutter blades, said apron plate having teeth which are laterally spaced from the teeth of said thread cutter blades, said apron plate being connected to said one end of said one arm of the Y-shaped housing, said Y-shaped housing being longitudinally adjustable relative to said other housing whereby said apron plate spacing from said thread cutter blades may be adjusted by longitudinally adjusting the housings relative to each other.

13. A combination strip and thread cutting machine comprising a strip cutter, a thread cutter, elongated tubular housings at respective ends of which said housings are secured, both of said cutters including a reciprocating cutter blade, power transmission mechanism for actuating both of said cutter blades disposed in one of said housings, a plate having an opening formed there across connected at the end of the strip cutter so that its opening is maintained adjacent the thread cutter blade, said housings being intersecured and being adjustable longitudinally relative to each other so that said plate may be moved longitudinally under said thread cutter blade, said plate opening defining the thread cutter opening whereby longitudinal adjustment of the respective housings varies the extent of said thread cutter opening relative to said thread cutter blade.

14. A machine according to claim 13 and wherein said plate is adjustable vertically on the end of said strip cutter housing for adjusting the opening of said thread cutter vertically.

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No references cited.