

B. T. LEVEQUE.
 THREAD CUTTING MACHINE.
 APPLICATION FILED APR. 2, 1914.

1,190,307.

Patented July 11, 1916.

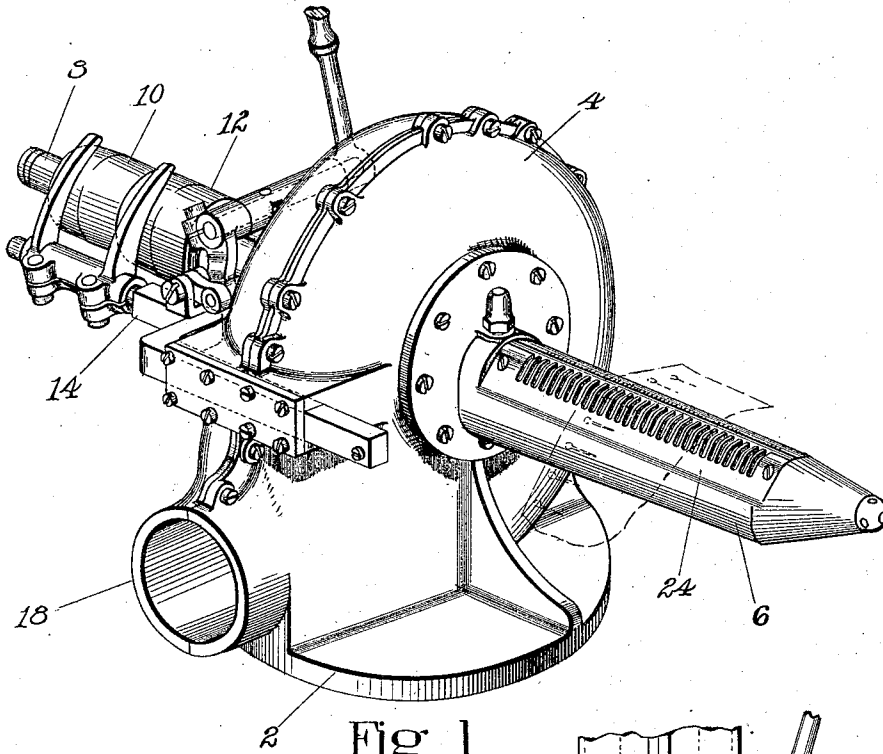


Fig. 1.

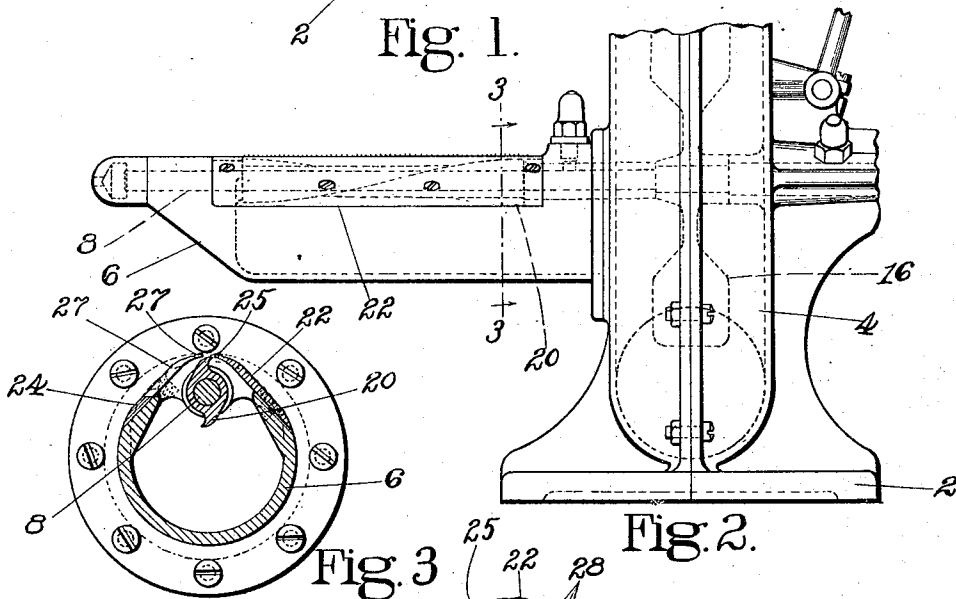


Fig. 2.

Fig. 3.

Fig. 4.

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THREAD-CUTTING MACHINE.

1,190,307.

Specification of Letters Patent.

Patented July 11, 1916.

Application filed April 2, 1914. Serial No. 829,157.

To all whom it may concern:

Be it known that I, BERNARD T. LEVEQUE, a subject of the King of England, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in Thread-Cutting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

In the manufacture of many articles on which a number of sewing or stitching operations are performed, as for instance where buttonholes are worked, buttons sewed on, or similar operations performed, the work usually is left after these operations with a multitude of thread ends of considerable length hanging to it. These threads must be cut off close to the surface of the work before it is completed and it has heretofore been necessary to perform this operation by hand with the aid of a pair of scissors. It is the primary object of the present invention to devise a machine with the aid of which this operation can be performed much more rapidly than has been possible heretofore.

An important feature of the invention consists in a cutter-inclosing guard over which the work is guided during the thread trimming operation. Such a guard presents the advantage of compact construction and combines a practicable work guard with a work guide which presents the work properly to the cutter. It dispenses with heavy and costly work feeding mechanism and permits the work to be effectively guided by hand and to be passed over the guide at any desired speed with safety to the operator and to the work.

Another important feature of the invention consists in the construction of the guard to cooperate with the work and with the suction creating means to lift the threads from the face of the work to which they may be clinging so that they may be drawn from the work face to extend transversely from the face and into the cutting plane.

A convenient embodiment of the invention will now be described, reference being made to the accompanying drawings, in which,

Figure 1 is a perspective view of a machine designed particularly for use in cutting off the threads that are left hanging to a shoe upper after the various sewing or stitching operations have been performed on it, although the machine also is adapted for use on other kinds of work; Fig. 2 is a side elevation of the machine shown in Fig. 1; Fig. 3 is a cross-sectional view on the line 3—3, Fig. 2; and Fig. 4 is an angular view of a detail of construction.

The machine shown comprises a base having cast integrally therewith a casing for an exhaust or centrifugal fan of the usual type. Secured to one side of the casing 4 is a long, hollow horn 6. A rotary shaft 8 extends transversely through the casing 4 and longitudinally through the horn 6, the horn being provided at each end with a bearing for this shaft and the casing having another bearing on the side opposite to the horn. Fast and loose pulleys 10 and 12, respectively, are mounted on this shaft on the side of the casing opposite to the horn 6 and a belt shifter 14 is provided to throw the belt from one of these pulleys to the other. Mounted on the shaft 8 within the casing 4 is a fan 16 which, when the shaft is in motion, serves to force air by centrifugal action from the central part of the casing 4 out of the discharge nozzle 18.

A long rotary cutter 20 is mounted on the shaft 8 within the casing 6 and is positioned along the upper part of the casing, as best shown in Fig. 3, so that a large space or chamber is provided within the horn below the cutter. This chamber opens into the central or intake part of the casing 4 near the hub of the fan 16 so that the fan tends to draw air from this chamber and force it out of the nozzle 18.

The horn 6 has a long wide slot formed in its upper side and the outer faces of the horn adjacent to the edges of the slot are inclined upwardly and are machined to receive two plates 22 and 24, respectively, which are secured thereto by screws. The upper edges of these plates are separated by a long narrow slot 25; and the plate 22 has its edge positioned very close to the path of the cutter 20 so that it forms a shearing blade for the cutter, although the adjustment preferably is such that the cutter

does not actually touch the plate. The opposite plate 24 has a series of slots 23 cut therein which open into the slot 25 at right angles thereto and the cutting of these slots forms a series of teeth 26 that extend upwardly and forwardly to a point directly over the cutter, the ends of these teeth forming the left hand edge of the slot 25, as the machine is shown in Figs. 1, 3 and 4. The screws that hold the plate 22 on the horn 6 pass through slots in the plate, as indicated in dotted lines in Fig. 3, which permit the plate to be adjusted on the inclined face of the horn, toward or from the cutter 20 to compensate for wear.

It will now be evident that, when the shaft 8 is revolved rapidly, thus rotating the fan 16 at a high rate of speed, the suction created by the fan will produce a partial vacuum in the chamber of the horn below the rotating cutter 20. A rapid flow of air thus will be produced through the slots 23 and 25 and through the horn 6. Consequently, when an article, as for instance a shoe upper, having a number of thread ends hanging therefrom, is passed over the horn 6, the rapid inrush of air will catch the threads and carry them through the slots into the path of the cutter where they will be severed from the upper. The pieces of thread severed from the work will be carried by the current of air through the chamber in the horn 6 into the casing 4 and discharged out of the nozzle 18. Any contact of the work with the cutter is prevented by the fact that the slots 23 and 25 are too narrow to permit the accidental entrance of any part of the work as it is passed over the horn in the usual manner. The work could only be damaged by carefully inserting it edgewise into one of the slots. The horn 6 and the plates 24 and 22 thus constitute a guard for protecting the work from contact with the cutter, this guard, however, being so constructed that it permits the passage therethrough of the threads into the path of the cutter. The guard is so thin at the portion engaged by the work that it allows the surface of the work to pass very closely to the path of the cutter and, consequently, enables the cutter to sever the threads close to the surface of the work.

In order to facilitate the entrance of the threads into the slots, I prefer to form at each side of the slot 25 a series of small tooth-like projections. This construction is best shown in Fig. 4, which is an angular view on a large scale of a portion of the plates 22 and 24. In this view the projections on the left hand side of the slot 25 are indicated by the numeral 27, one of these projections being formed on the end of each tooth 26. The projections at the right hand side of the slot 25 are formed on the plate 22 and are indicated at 28. In using the ma-

chine, the work preferably is moved back and forth over the horn in a direction substantially parallel to the slots 23; and these small projections 27 and 28 serve, during this movement, to comb or straighten out any threads that happen to be lying diagonally to the slots 23 and 25, into positions substantially parallel to the slots 23, where they will be drawn through these slots by the current of air passing therethrough, and will be carried into the path of the cutter 20 and extend transversely of its cutting edge. These tooth-like projections 27 and 28 thus aid mechanically the action of the air currents passing through the slots 23 and 25. They are of particular value in operating on work in which, due to some peculiarity of the work or the threads, the threads tend to adhere to the surface of the work. These projections, by loosening the threads from the work, enable the air currents to pick up or lift the threads easily away from the surface of the work and carry them through the guard.

The invention has been above described as embodied in a machine designed particularly for operating upon work having loose ends or loops of threads hanging thereto. It is obvious, however, that the machine is adapted for cutting off thread like filamentous appendages whether they are actually in the form of threads or otherwise. Consequently, it will be understood that the terms "threads", "thread ends" and "threads attached to the work" are used herein in a generic sense to include appendages of a similar character.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a thread cutting machine, the combination of means for producing a current of air to lift the threads away from the face of the work, mechanical means for aiding the action of the air on the threads, and means for severing the threads from the work while they are held in such lifted position.

2. In a thread cutting machine, the combination of a cutter, means for producing a current of air to carry the threads attached to the work away from the face of the work and into the path of said cutter, a guard for protecting the work from contact with said cutter, and mechanical means for acting on the threads to aid the current of air in carrying them into the path of the cutter.

3. In a thread cutting machine, the combination of a cutter, a guard therefor over which the work is guided, said guard being constructed to protect the work from contact with the cutter but having a plurality of transverse apertures therein to permit the passage therethrough of threads only,

and means for producing a partial vacuum around the cutter to cause the air currents produced thereby to carry the threads attached to the work through the apertures in the guard into the path of the cutter.

4. In a thread cutting machine, the combination of a cutter, a guard therefor constructed to protect the work from contact with the cutter but apertured to permit the passage therethrough of threads, means for producing a current of air through the guard to carry the threads attached to the work through the apertures in the guard into the path of the cutter, and means for acting on the threads as the work is passed over the guard to facilitate their passage through the guard.

5. In a thread cutting machine, the combination of a cutter, a guard therefor constructed to protect the work but apertured to permit the passage through the guard of threads attached to the work, means for producing a current of air through the apertures of the guard to carry the threads therethrough into the path of the cutter, and means for combing the threads as the work is passed over the guard to facilitate their entrance into the apertures of the guard.

6. In a thread cutting machine, the combination of a rotary cutter, a hollow guard encircling said cutter and over which the work is guided, said guard being constructed to protect the work from contact with the cutter but having a plurality of apertures therein transversely of the cutting plane and of sufficient width to permit the passage therethrough of threads attached to the work, means for driving said cutter, and an air exhaust mechanism connected to said guard.

7. In a thread cutting machine, the combination of a rotary cutter, a hollow guard encircling said cutter, said guard being constructed to protect the work but being apertured to permit the passage therethrough of threads attached to the work, an exhaust fan casing to which said guard is secured with the interior of said guard in communication with the intake opening of said casing, a rotary shaft supporting said cutter and extending through said guard and casing, and an exhaust fan mounted on said shaft within said casing.

8. In a thread cutting machine, the combination of a cutter, a guard over which the work is guided constructed to protect the work from the action of said cutter but having a plurality of slots extending transversely of the cutting plane and of sufficient width to permit the passage therethrough only of threads attached to the work, and means for producing a current of air through the slots of the guard to carry the thread through the slots of the guard, said cutter being arranged to cooperate with the surface

of said guard opposite to that engaged by the work to shear off the threads as they are drawn through the slots of the guard.

9. In a thread cutting machine, the combination of a cutter, a guard constructed to protect the work from the action of said cutter but slotted to permit the passage therethrough of threads attached to the work, means for producing a current of air through the slots of the guard to carry the threads through the slots of said guard, and a series of projections on said guard adjacent to the slots constructed to guide the threads into the slots as the work is passed over the guard.

10. In a thread cutting machine, the combination of a guard having a long slot formed therein, and a series of slots opening laterally therefrom, said lateral slots being of a width sufficient to admit threads attached to the work but of insufficient width to admit the work, means for producing a current of air through said slots to carry the threads therethrough, and a cutter arranged to sever the threads from the work as they are drawn through the slots, the part of said guard at one edge of said longitudinal slot forming a shearing blade to cooperate with said cutter.

11. In a thread cutting machine, the combination of a cutter, a guard constructed to protect the work from the action of said cutter but having a long slot formed therein and a series of slots opening laterally from said longitudinal slot, said slots being of a width sufficient to admit threads attached to the work, means for producing a current of air through said slots to carry the threads therethrough, said cutter being arranged to sever the threads from the work as they are drawn through said slots, and a series of tooth-like projections on said guard at each side of said longitudinal slot serving to guide the threads into the slots as the work is passed over the guard.

12. In a thread cutting machine, the combination of a hollow guard having a series of narrow, parallel slots formed therein, means for creating a current of air through said slots to carry the threads attached to the work through the slots as the work is moved over the guard, and a cutter arranged to sever the threads from the work as they are drawn through said slots.

13. In a thread cutting machine, the combination of a power operated cutter, a guard inclosing said cutter at least in part, constructed and arranged to guide to the cutter work fed over the guard by hand, said guard being arranged to protect the work from the action of the cutter but constructed to permit the passage therethrough of threads attached to the work, and means operative to cause the threads attached to the face of the work to be lifted from the face of the work

and carried through the guard into the path of movement of said cutter.

14. In a thread cutting machine, the combination of a hollow guard constructed and arranged to guide work fed over the guard by hand, said guard having a series of narrow, parallel slots formed therein, means for creating a current of air through said slots to carry the threads attached to the work through the slots as the work is manually moved over the guard, and a power operated cutter within said guard arranged to sever the threads from the work as they are drawn through said slots.

15. In a thread cutting machine, the combination of a cutter, a hollow, tubular guard over which the work is guided, constructed to protect the work from the action of said cutter but having a longitudinal slot formed therein and a series of slots opening laterally from said longitudinal slot, said slots being of a width sufficient to admit threads attached to the work, means for producing a current of air through said slots to carry the threads therethrough, said cutter being arranged to sever the threads from the work as they are drawn through said slots, and a series of tooth-like projections on said guard at each side of said longitudinal slot serving to guide the threads into the slots as the work is passed over the guard.

16. In a thread cutting machine, the combination of a cutter, a curved guard over which the work is guided constructed to protect the work from the action of the cutter but slotted to permit the passage therethrough of threads attached to the work, means for producing a current of air through the slots of the guard to carry the threads away from the face of the work and through said slots, and projections on said guard adjacent said slots constructed to engage and guide threads into line with said slots as the work is passed over the guard.

17. In a thread cutting machine, the combination of a cutter, a guard for the cutter over which the work is manually fed to the cutter, said guard being constructed to protect the work from contact with the cutter, but having a plurality of transverse apertures therein to permit the passage of threads only, and means for producing a current of air to carry the threads attached to the work through the apertures in the guard into the path of the cutter.

18. In a thread cutting machine, the combination of a movable cutter, a guard inclosing said cutter at least in part, constructed to provide a stationary shear edge

and arranged to protect the work but having a plurality of narrow elongated apertures therein to permit the passage through the guard of threads attached to the work, and means to produce a current of air through the apertures in the guard to carry the threads through the guard and into the path of the cutter.

19. In a thread cutting machine, the combination of a power operated cutter, a guard inclosing said cutter at least in part, constructed and arranged to facilitate manual feeding of work thereover to the cutter, said guard having a slot therein extending longitudinally of the guard and having a series of slots therein opening laterally from said longitudinal slot and of a width sufficient to admit threads attached to the work but insufficient to admit the work, and means for producing a current of air through said slots to carry the threads there- through for severance by said cutter.

20. A device for severing loose threads attached to work fed to the device by hand comprising in combination a power driven cutter, a guard inclosing said cutter at least in part, constructed and arranged to guide to the cutter work fed over said guard by hand, said guard being slotted to permit threads attached to the work to pass through the guard for severance by the cutter but constructed to prevent the passage of the work through the guard, and means for producing a current of air through the slotted portion of the guard to carry the threads through the guard for severance by the cutter.

21. A device for severing loose threads attached to work fed to the device by hand comprising in combination, a power rotary shaft, a cutter on said shaft, a tubular guard inclosing said cutter constructed and arranged to guide to the cutter work fed over said guard by hand, said guard having a plurality of narrow slots therein, of a width to admit the threads only into the cutting plane and to prevent admission of the work into the cutting plane, and means mounted on said shaft for producing a current of air through the slots in the guard to carry the threads through the guard into the cutting plane of the cutter.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BERNARD T. LEVEQUE.

Witnesses:

CHESTER E. ROGERS,
JOHN H. MCCREADY.