July 13, 1926. 1,592,115

F. O. LINDGREN

THREAD CUTTING ATTACHMENT FOR SEWING MACHINES

Filed April 18, 1925 5 Sheets-Sheet 1

Fig. 1

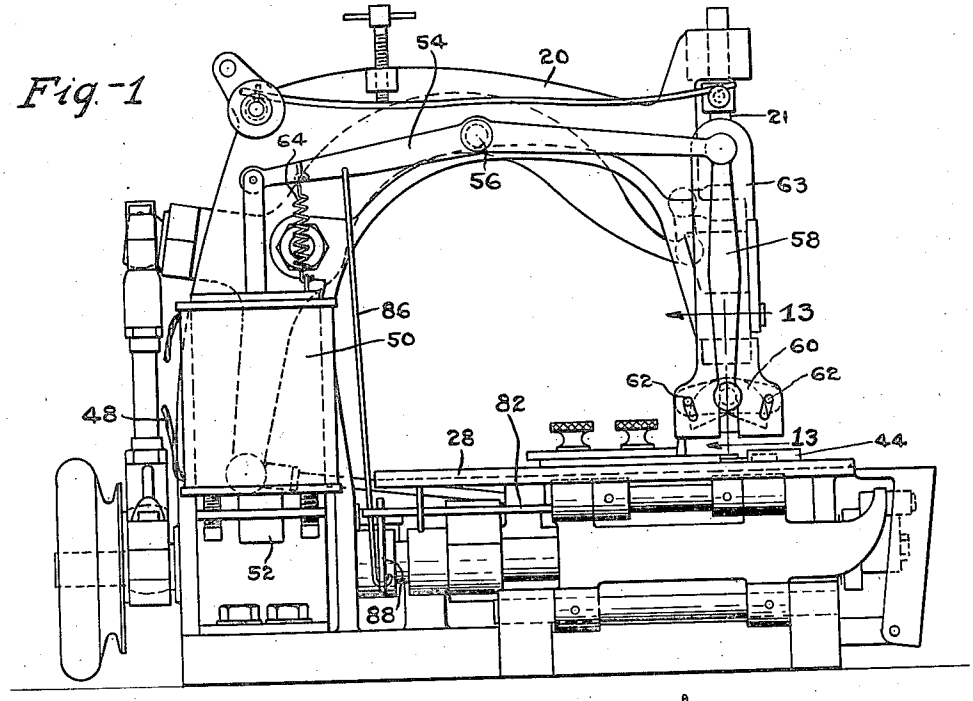
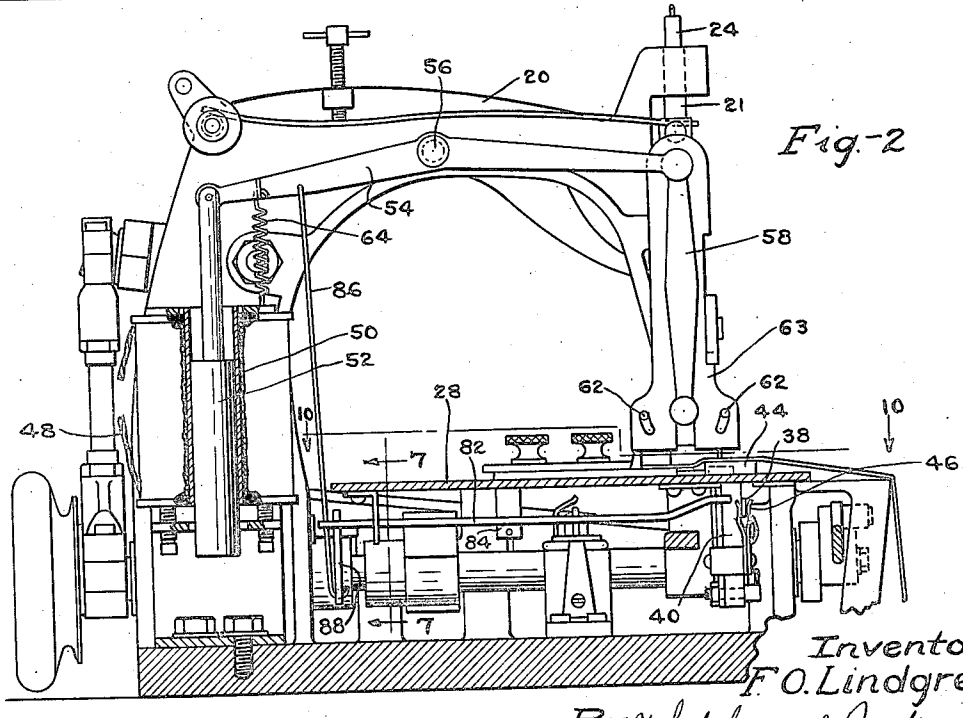


Fig. 2



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Fig.-3.

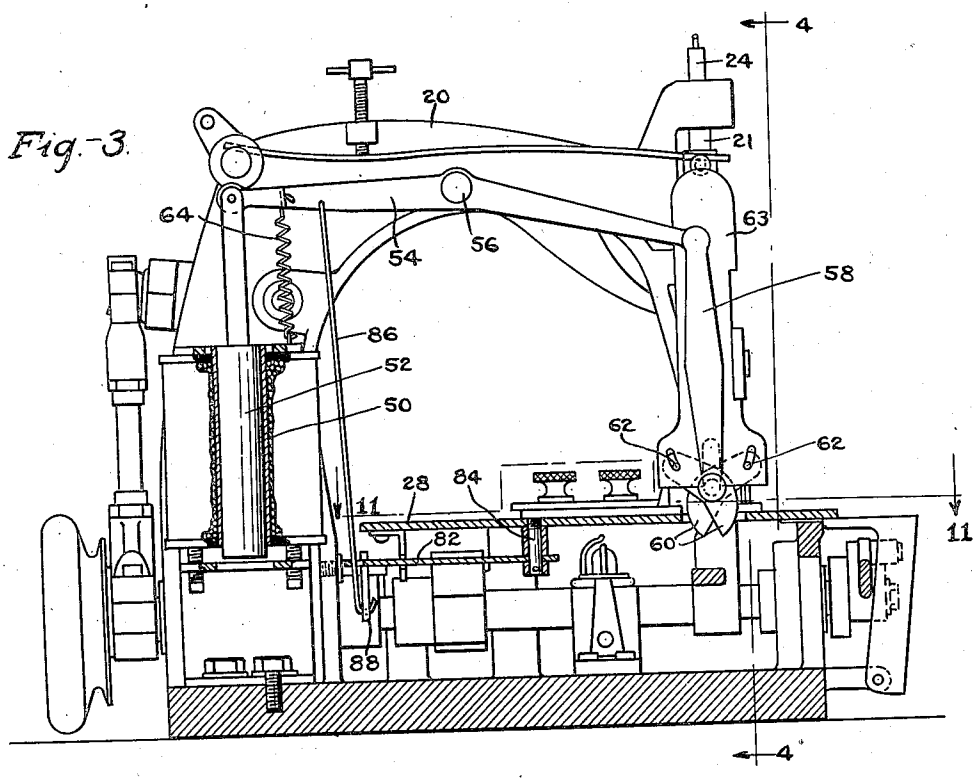
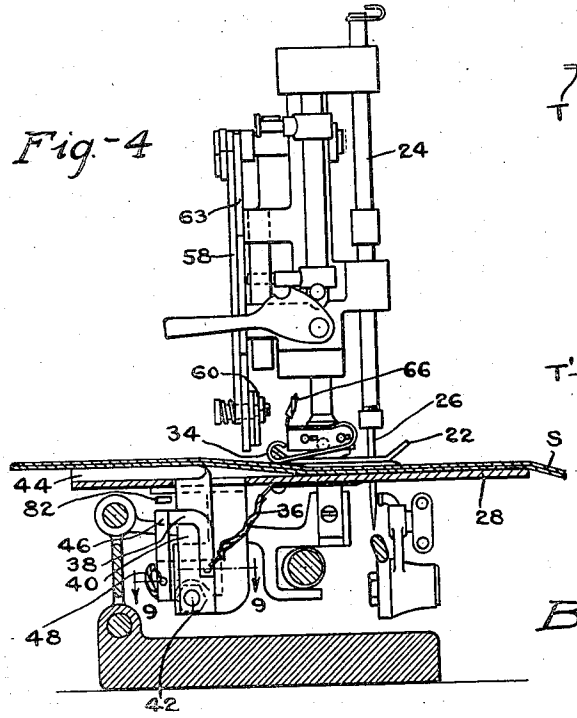


Fig.-4



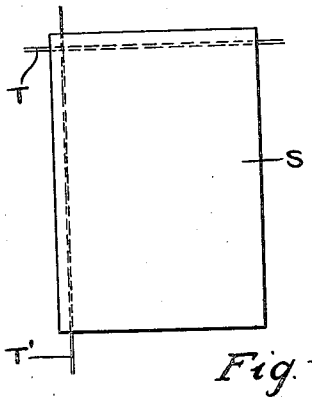


Fig.-5

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THREAD CUTTING ATTACHMENT FOR SEWING MACHINES

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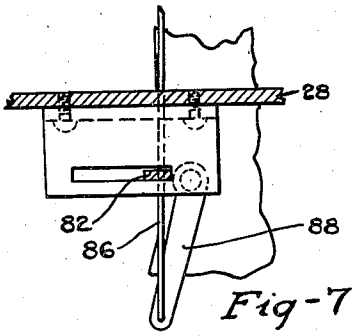


Fig-7

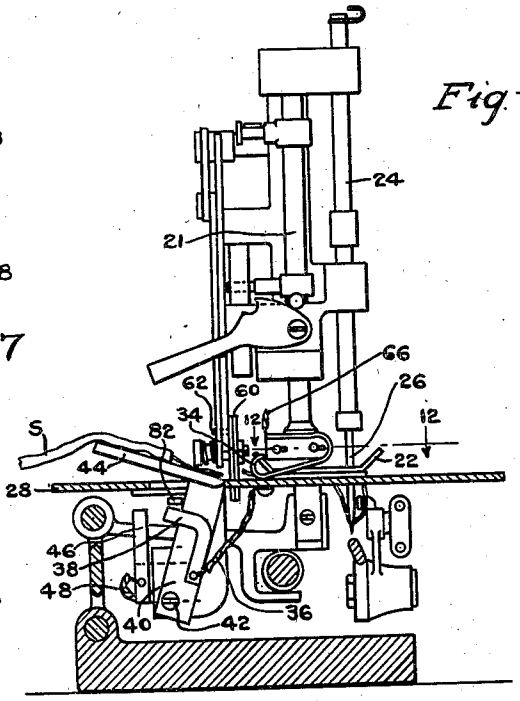


Fig-6

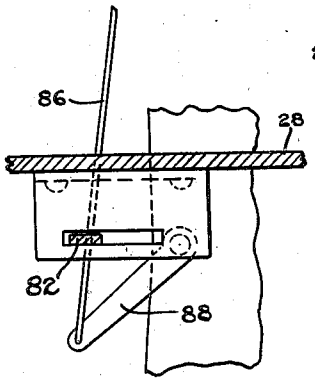


Fig-8

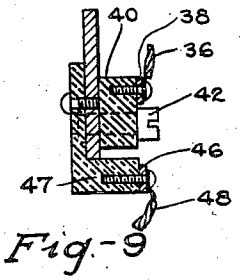


Fig-9

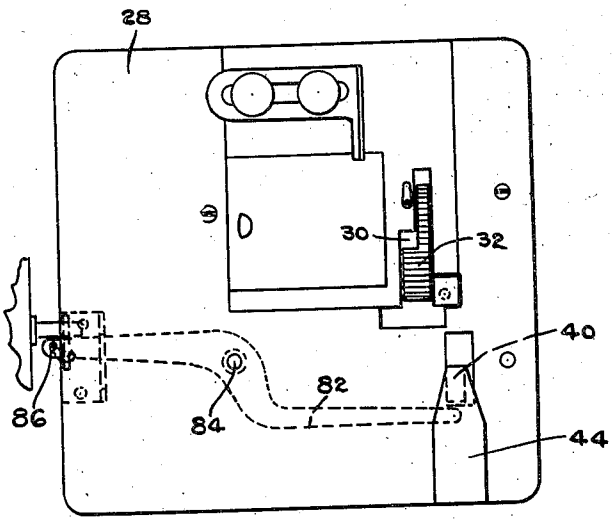


Fig-10

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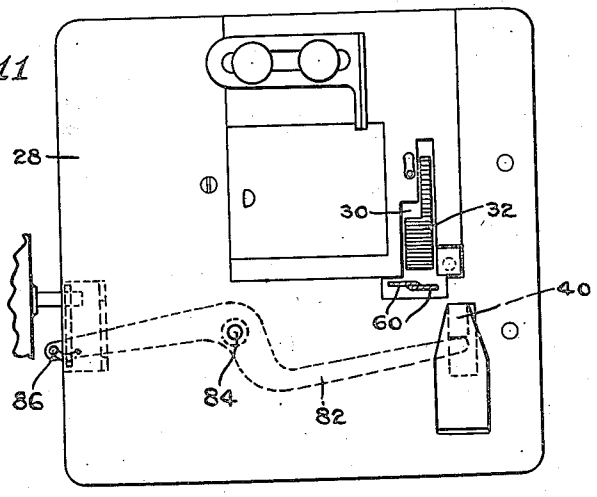
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F. O. LINDGREN

THREAD CUTTING ATTACHMENT FOR SEWING MACHINES

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Fig.-11



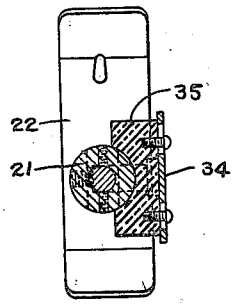


Fig.-12

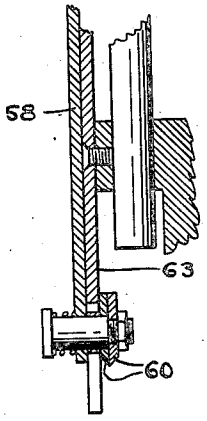


Fig.-13

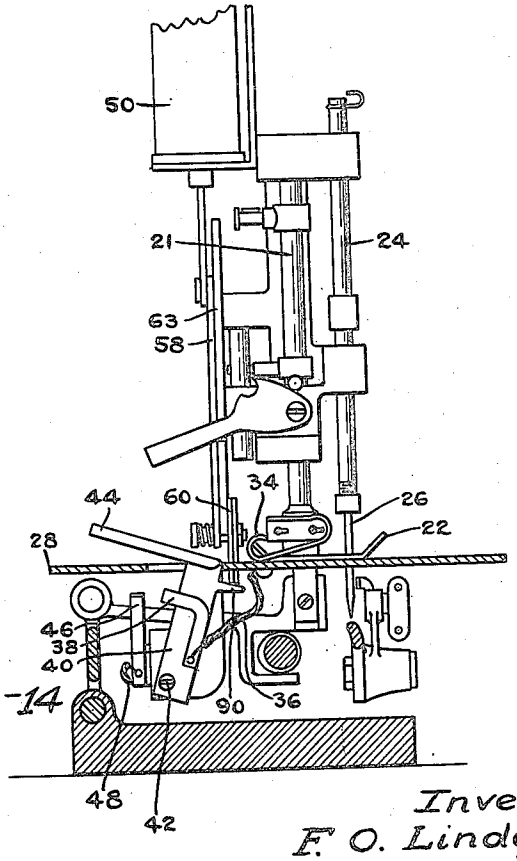


Fig.-14

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THREAD CUTTING ATTACHMENT FOR SEWING MACHINES

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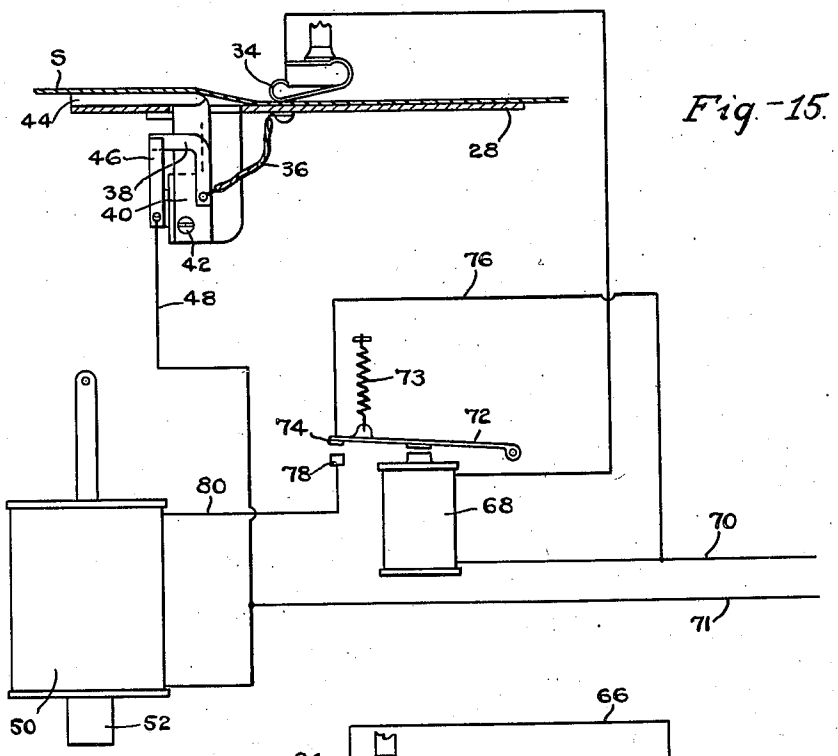


Fig.-15.

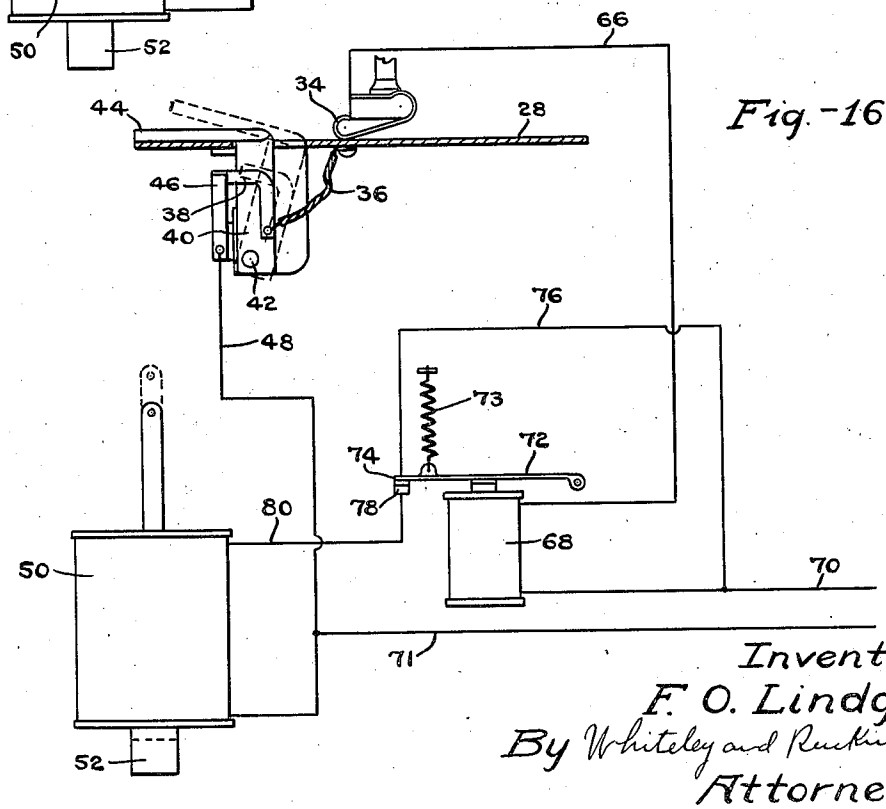


Fig.-16

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UNITED STATES PATENT OFFICE.

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THREAD-CUTTING ATTACHMENT FOR SEWING MACHINES.

Application filed April 18, 1925. Serial No. 24,076.

My invention relates to thread-cutting attachments for sewing machines. An object is to provide an electrically operative cutting device which is caused to automatically cut the thread when the sewing operation which is being performed on an article is completed. While my device is susceptible for use with various articles which are to be sewed, it is intended more particularly for use in sewing the bottoms and margins of sacks which are fed through the sewing machine in succession but in spaced relation so that the thread may be cut between the successive sacks. I accomplish the objects of my invention by providing a cutting device, an electrical device, a circuit therefor, and means for automatically completing the circuit through the electrical device to cut the thread when the sewing of an article is completed.

The full objects and advantages of my invention will appear in connection with the detailed description thereof, and the novel features of my inventive idea will be particularly pointed out in the claims.

In the accompanying drawings, which illustrate practical embodiments of my invention in two forms,—

Fig. 1 is a view of the machine in rear elevation. Fig. 2 is an elevational sectional view showing the cutter operating arm in raised position. Fig. 3 is a view similar to Fig. 2 but showing the cutter operating arm in lowered position. Fig. 4 is a view in section on the line 4—4 of Fig. 3, the circuit being broken. Fig. 5 is a view showing a sack and lines of stitching. Fig. 6 is a view similar to Fig. 4 but showing the circuit completed and the thread cut. Fig. 7 is a view in section on the line 7—7 of Fig. 2. Fig. 8 is a view similar to Fig. 7 but showing the movable parts in a different position. Fig. 9 is a view in section on the line 9—9 of Fig. 4. Fig. 10 is a view in section on the line 10—10 of Fig. 2. Fig. 11 is a view in section on the line 11—11 of Fig. 3. Fig. 12 is a view in section on the line 12—12 of Fig. 6. Fig. 13 is a view in section on the line 13—13 of Fig. 1. Fig. 14 is a view similar to Fig. 6 but showing a multiple mounting of the solenoid. Fig. 15 is a wire diagram showing the circuit broken. Fig. 16 is a wire diagram showing the circuit completed.

My invention is applied to any well-known or customary form of sewing machine having a head 20 which supports a yielding presser rod 21 on the lower end of which is a presser foot 22 and which also supports a reciprocating rod 24 to the lower end of which a needle 26 is attached and which also has a metallic table 28 containing a slot 30 in which a 4-way feeding device 32 is operative. A spring contact 34 secured to an insulating block 35 attached to the presser rod 21, as shown in Fig. 12, engages the metal of the table 28 except when it is lifted by the fabric being sewed with the presser foot down. The table is connected by a wire 36 with a contact piece 38 carried by a hard fiber or similar lever 40 pivoted at 42. This lever has an arm 44 extending out at right angles from the body portion and normally occupying an upwardly-inclined position as shown in full lines in Fig. 6 and in dotted lines in Fig. 16. The lever 40 tends to swing by gravity into the position just mentioned on account of the fact that the pivot 42 is off-set from the centerline of the lever. When the lever arm 44 is held down by the fabric as shown in Figs. 4 and 15, the contact piece 38 engages between spring contact fingers 46 secured to an insulating block 47 and which are connected by a wire 48 with one end of the coil of a solenoid 50 having a core 52 whose upper end is reduced and connected to one end of a lever 54 intermediately pivoted at 56 to the head 20, the other end of this lever being pivotally attached to a cutter operating arm 58. A pair of scissor blades 60 are pivoted to the lower end of the arm 58, the outer ends of these blades carrying pins 62 which work in slots formed in a strip 63 carried by the head 20 so that when the arm 58 is depressed the scissor blades will be lowered and brought together as shown in Fig. 3 to cut the thread. When the solenoid is not energized its core 52 and the attached end of the lever 54 are held down as shown in Fig. 2 by a spring 64. Connected with the spring contact 34 is a wire 66 which leads to an electro-magnet 68 shown in Figs. 15 and 16 and which may be placed on the

wall or any other suitable support. A return wire 70 leads from the electro-magnet to the source of electrical energy which is connected by a wire 71 with an intermediate portion of the wire 48. The electro-magnet has an armature 72 normally held retracted by a spring 73 when the electro-magnet is not energized. This armature has a contact end 74 which is connected by a wire 76 with the return wire 70. When the electro-magnet is energized the contact 74 engages a contact 78 which is connected by a wire 80 with the second end of the solenoid coil. A lever 82 is mounted below the table 28 so as to be capable of rocking in a horizontal plane on a pivot 84. A rod 86 is attached at its upper end to the lever 54 near the place of attachment of the spring 64 thereto, while the lower end of the rod 86 is attached to a pivot arm 88. The rod 86 passes through an opening in the left-hand end of the lever 82 so that when the solenoid is energized and the rod 86 is lifted the movement of the latter will swing the lever 82 from the position shown in Figs. 7 and 10 into that shown in Figs. 8 and 11. As will be apparent from this latter figure, and also from Figure 2, the right-hand end of the lever 82, when actuated, engages the fiber lever 40 and moves it so that the contact piece 38 is disengaged from the contact fingers 46, thereby breaking the circuit and permitting the spring 64 to lift the cutter arm 58 and retract the scissor blades. Fig. 14 shows a slight modification in which the solenoid 50 is mounted at the other end of the head and the cutter operative arm 58 is attached directly to the solenoid core so that when the latter is moved downwardly by energization of the solenoid the cutter operating arm will be lowered and the thread cut in the manner previously described. In order to disengage the contact piece 38 from the contact fingers 46 the lever 40 in this form of the invention is provided with a lug 90 which is struck by the blades 60 when they are moved to cut the thread.

The operation and advantages of my invention will now be obvious. When a sack is fed under the presser foot the spring contact 34 is lifted and the weight of the sack depresses the arm 44 of the lever 40 and causes the contact piece 38 to engage the contact fingers 46. The parts are now in the position shown in Fig. 15, with the circuit broken. When the sack has been fed from under the spring contact 34 the latter engages the metal of the table 28 and a circuit is completed so that current flows from the wire 71 through the upper portion of the wire 48, through the contact members 46 and 38, through the wire 36, through the spring contact 34, through the wire 66 and then around the coil of the electro-magnet 68, thereby energizing the latter and causing the armature 72 to be attracted so that the contact member 74 engages the contact member 78 as shown in Fig. 16. Another circuit is completed by this operation and current now flows from the wire 71 through the lower portion of the wire 48, through the coil of the solenoid 50 and through the wires 80 and 76, thereby causing the solenoid to be energized and moving the core 52 to operate the cutters. In the form shown in Figs. 2 and 3, the left-hand portion of the lever 54 is lifted and the cutter operating arm 58 is depressed, thereby cutting the thread when the sewing operation has been completed on a sack. The lifting of the left-hand portion of the lever 54 also lifts the rod 86 and causes the lever 82 to swing from the position shown in Fig. 10 into that shown in Fig. 11. This removes the contact member 38 from engagement with the fingers 46 and opens the switch so that current no longer flows through the electro-magnet 68. The armature 72 is retracted by the spring 73, and the contacts 74 and 78 being thereby disengaged current can no longer flow through the solenoid and the cutters are lifted by the action of the spring 64. The parts are thus restored to original position, ready for the sewing of another sack. In the form shown in Fig. 14, the energization of the solenoid 50 causes its core to be depressed and operate the cutters 60, which, as previously explained, move downwardly at the same time that they are closing. The cutters during this movement engage the lug 90 which moves the lever 40 and disengages the contact piece 38 from the fingers 46, thereby opening the switch. It will be understood from Fig. 5 that the sacks, one of which is designated by S, may be sewed along the bottom by a line of stitching indicated at T, and also along an edge by a line of stitching designated T′, and that the thread-cutting device will operate the same in both cases.

I claim:

1. A thread-cutting attachment for sewing machines comprising a mechanical cutting device, an electrical device, a circuit for said electrical device, and means for automatically completing the circuit through said electrical device to cause said cutting device to cut the thread when the sewing of an article is completed.

2. A thread-cutting attachment for sewing machines comprising a movable mechanical cutting device, an electrical device for operating said cutting device, a circuit for said electrical device, and means for automatically completing the circuit through said electrical device to cause said cutting device to cut the thread when the sewing of an article is completed.

3. A thread-cutting attachment for sewing machines comprising a movable cutting device, an electrical device for operating said

cutting device, a circuit for said electrical device, and a normally-closed switch which is held in open position by the article being sewed, said switch being automatically closed when the sewing of said article is completed whereby said cutting device is operated to cut the thread.

4. A thread-cutting attachment for sewing machines comprising a movable cutting device, an electrical device for operating said cutting device, a circuit for said electrical device, a normally-closed switch which is held in open position by the article being sewed, said switch being automatically closed when the sewing of said article is completed, whereby said cutting device is operated to cut the thread, and means for breaking said circuit when said cutting device has been operated.

5. A thread-cutting attachment for sewing machines comprising a normally-closed switch which is held in open position by the article being sewed, a normally-open switch which is held in closed position by said article, a movable cutting device, an electrical device for operating said cutting device, a circuit for said electrical device, said first-mentioned switch being automatically closed when the sewing of said article is completed, whereby said cutting device is operated to cut the thread, and means for opening said second switch when said cutting device has been operated.

6. A thread-cutting attachment for sewing machines comprising a spring contact underneath which the article being sewed passes, said spring contact being held in disengaged position by said article, a movable cutting device, an electrical device for operating said cutting device, a circuit for said electrical device, and means associated with said spring contact which completes said circuit for causing the thread to be cut when the sewing of the article is completed.

7. A thread-cutting attachment for sewing machines comprising a spring contact attached to the presser foot of the machine, a cooperating contact beneath said spring contact and the article being sewed, a movable cutting device, an electrical device for operating said cutting device, and a circuit for said electrical device, said spring contact engaging said cooperating contact to complete said circuit when the sewing operation is completed, whereby said cutting device is operated to cut the thread.

8. A thread-cutting attachment for sewing machines comprising a spring contact attached to the presser foot of the machine, a cooperating contact beneath said spring contact and the article being sewed, a movable cutting device, a solenoid having its core operatively connected with said cutting device, and a circuit for said solenoid, said spring contact engaging said cooperating contact to complete said circuit when the sewing operation is completed, whereby said cutting device is operated to cut the thread.

9. A thread-cutting attachment for sewing machines comprising a spring contact attached to the presser foot of the machine, a cooperating contact beneath said spring contact and the article being sewed, a movable cutting device, a solenoid having its core operatively connected with said cutting device, a circuit for said solenoid, said spring contact engaging said co-operating contact to complete said circuit when the sewing operation is completed, whereby said cutting device is operated to cut the thread, and means for breaking said circuit when said cutting device has been operated.

10. A thread-cutting attachment for sewing machines comprising a spring contact attached to the presser foot of the machine and held disengaged from the table of the machine by the article being sewed, a lever which is depressed by the article being sewed, a contact piece carried by said lever, a wire connecting said contact piece and said table, a spring finger contact engaged by said contact piece when said lever is depressed, a movable cutting device, a solenoid having its core operatively connected with said cutting device, an electro-magnet, two contacts brought into engagement with each other by the attraction of the armature of said electro-magnet, a circuit in which said lever contacts, said spring contact and said electro-magnet are included, a second circuit which includes said solenoid and said armature contacts, said spring contact engaging said table to energize said electro-magnet when the sewing operation is completed, whereby the circuit through said solenoid is completed to operate said cutting device and cut the thread, and means for lifting said lever when said cutting device has been operated.

11. A thread-cutting attachment for sewing machines comprising a spring contact attached to the presser foot of the machine and held disengaged from the table of the machine by the article being sewed, a lever which is depressed by the article being sewed, a contact piece carried by said lever, a wire connecting said contact piece and said table, a spring finger contact engaged by said contact piece when said lever is depressed, a solenoid, a wire connecting said spring finger device with one end of the coil of said solenoid, a feed wire connected with said last-mentioned wire, an electro-magnet, a return wire connected with one end of the coil of said electro-magnet, a wire connecting said spring contact with the other end of said last-mentioned coil, a contact carried by the armature of said electromagnet, a wire connecting said contact with said return wire, a contact for cooperating with

said last-mentioned contact, a wire connecting said cooperating contact with the second end of said solenoid coil, a movable cutting device operatively connected with the core of said solenoid, said spring contact engaging said table to energize said electromagnet when the sewing operation is completed, whereby the circuit through said solenoid is completed to operate said cutting device and cut the thread, and means for lifting said lever when said cutting device has been operated.

In testimony whereof I hereunto affix my signature.

FRANK O. LINDGREN.