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SEAMING DETACHERS

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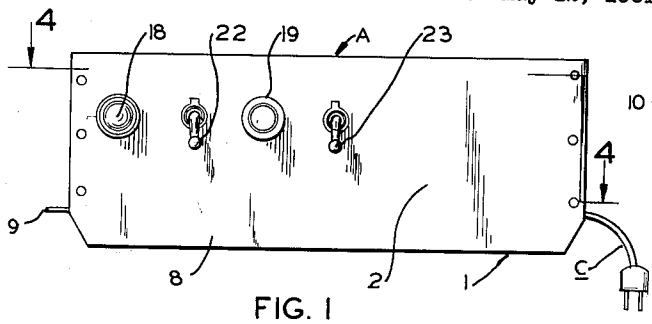


FIG. 1

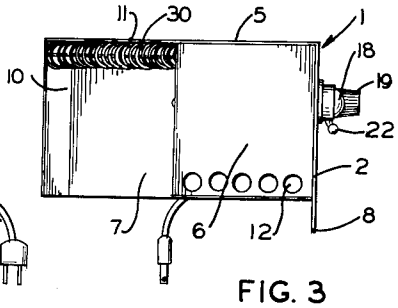


FIG. 3

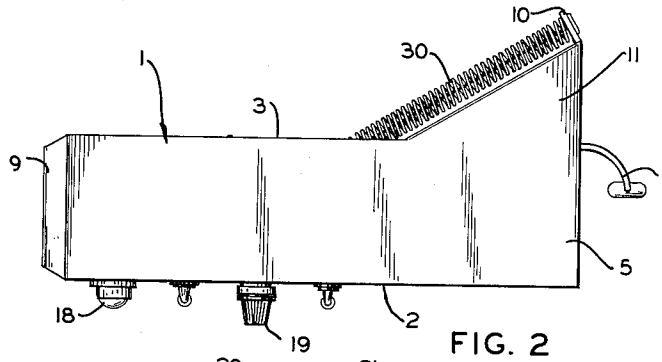


FIG. 2

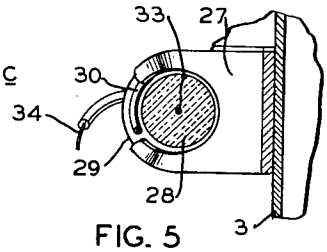


FIG. 5

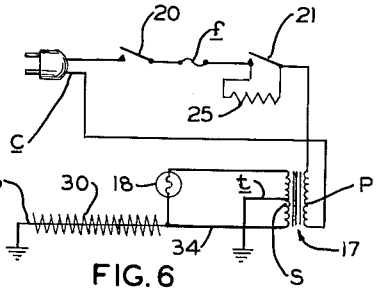


FIG. 6

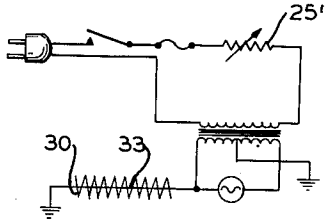


FIG. 7

FIG. 4

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SEAMING DETACHERS

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This invention relates in general to electrical thread or seam-cutting machines and, more particularly, to a seaming detacher for severing and welding the connecting threads between successively seamed stockings or socks.

Relatively inexpensive children's socks are manufactured in two operations. In the first operation, the body of the sock is emitted or sewn with a synthetic yarn, leaving the toe portion open. As soon as a sufficient number of pairs of socks have accumulated, the toe portion is closed by a seaming machine in a second operation. As the socks come off of the seaming machine, they are connected by a thin continuous thread or connecting cord at the toe portion which is referred to as the "seaming" in the knitting industry. To simply cut this connecting cord or so-called "seaming" with a pair of scissors or knife would immediately cause the seam to unravel. Therefore, the connecting cord, after severance, is quickly tied in a knot or otherwise manually secured and, accordingly, the price of the article is materially increased.

It is, therefore, the primary object of the present invention to provide a method for separating stockings and socks which have been joined, during previous manufacturing operations, by a thin connecting cord or so-called "seaming."

It is another object of the present invention to provide a seaming detacher for quickly and efficiently severing the seaming connecting a series of stockings or socks.

It is also an object of the present invention to provide a seaming detacher of the type stated which will sever a thread or cord and fuse the severed portion to prevent raveling.

It is a further object of the present invention to provide a seaming detacher of the type stated which is safe and economical both as to original cost and as to maintenance.

It is an additional object of the present invention to provide a device of the type stated which is simple in construction, sturdy, and simple in operation.

With the above and other objects in view, our invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawing (one sheet)—

FIG. 1 is a front elevational view of the seaming detacher constructed in accordance with and embodying the present invention;

FIG. 2 is a top plan view of the seaming detacher;

FIG. 3 is a side elevational view of the seaming detacher;

FIG. 4 is a sectional view taken along line 4—4 of FIG. 1;

FIG. 5 is a fragmentary sectional view taken along line 5—5 of FIG. 4;

FIG. 6 is a diagrammatic view showing the electrical circuitry forming a part of the present invention; and

FIG. 7 is a diagrammatic view of the electrical circuitry in a modified form of the present invention.

Referring now in more detail and by reference characters to the drawings which illustrate practical embodiments of the present invention, A designates a seaming detacher comprising a rectilinear sheet metal housing 1 including a front wall 2, a rear wall 3, a bottom wall 4, a top wall 5, and side walls 6, 7. The front wall 2 has a depending flange 8 and the side wall 6 has a laterally projecting flange 9 by which the housing 1 may be secured to a

work table or other suitable supporting structure (not shown). The side wall 7 is substantially longer from front to rear than the side wall 6 and projects rearwardly beyond the rear wall 3 being provided along its rear margin with an inwardly turned flange 10. The top wall 5 is, accordingly, provided with an integral, somewhat triangular, extension 11 which projects outwardly and rearwardly to join the upper margin of the rearwardly extending portion of the side wall 7 and, in effect, afford reinforcement and support thereto. The side wall 6 is also provided with a series of ventilation apertures 12 and, similarly, the side wall 7 is provided with a matching series of apertures 13 to permit heat-dissipating air-flow through the interior of the housing 1.

Rigidly mounted within the housing 1 by means of bolts 14 are brackets 15 and secured thereto by means of bolts 16 is a power transformer 17 having a primary winding P and a secondary winding S. Suitably mounted in the front wall 2 in aligned relation are a pilot light 18, a fuse receptacle 19 having a conventional replaceable fuse *f*, and two toggle-switches 20, 21, respectively having operating levers 22, 23. Mounted within the housing 1 upon a conventional mounting lug 24 is a resistor 25. As shown in FIG. 6, the toggle-switch 20, fuse *f*, and resistor 25, are in series with one terminal of the primary winding P and the toggle-switch 21 is paralleled across the resistor 25 so that when the switch 21 is closed the resistor 25 is shunted out of the circuit. A conventional two-wire conductor or so-called cord-set *c* is connected across to one terminal of the toggle-switch 20 and the other terminal of the primary winding P so that the seaming detacher A may be connected to a suitable source of electrical power in the usual manner and the primary winding P energized when the switch 20 is closed.

The rear wall 3 is provided with an aperture 26 and bolted or otherwise rigidly secured upon the interior face of the rear wall 3 adjacent to the aperture 26 is a mounting bracket 27 is substantially parallel to the flange 10. Seated securely in and extending through the bracket 27 is a cylindrical dielectric plug 28 having a diametrally enlarged integral collar 29 and being formed of porcelain or other suitable nonconductive material capable of withstanding elevated temperature. Mounted at one end upon the bracket 27 and held in place by the collar 29 is a relatively coarse pitch guard-spiral 30 wound of heavy-gauge wire so that the convolutions thereof are spaced apart. The guard-spiral 30 extends longitudinally through the aperture 26 and, at its other end, is rigidly secured to the flange 10 by an attachment clip 31. Intermediate its ends, the guard-spiral 30 is additionally supported by a small eye 32 which is looped around one of the convolutions of the guard-spiral 30 and is bolted or otherwise fastened to the rear wall 3.

Mounted in and extending coaxially through the dielectric plug 28 is a single strand of high-resistance or so-called "heater" wire 33 which is electrically connected by the conductor 34 to one terminal of the secondary winding S. From the dielectric plug 28, the heater wire 33 extends coaxially outwardly through the guard-spiral 30 and at its outer end is both structurally attached and electrically grounded to the flange 10 which is part of the sheet metal housing 1. The secondary winding S is preferably provided with a center-tap *t* which is also grounded to the sheet metal housing 1 to complete the circuit to the heater wire 33 and, finally, the pilot light 18 is connected across the terminals of the secondary winding S. Thus, the heater wire 33 should have sufficient resistance so that at approximately half normal voltage (i.e. the voltage at which the pilot light 18 operates), the heater wire 33 will reach a temperature sufficient to sever the threads in the seaming. This,

however, is merely a matter of convenience in wiring and the selected voltages as well as the specific resistance of the heater wire **33** may be varied as desired. However, the output of the transformer **17** may be varied by opening or closing the shunting switch **21** so that the resistor **25** is either in or out of the circuit. When the shunting switch **21** is open and the resistor **25** is in the circuit, the heater wire **33** will, as above stated, reach low incandescence, but when the shunting switch **21** is closed, the heater wire **33** will reach a much higher temperature.

In use, the cord-set *c* is connected to any common 110 v. receptacle and the switch **20** is closed, thereby energizing the primary winding P of the transformer **17**. The resultant flux produced in the primary winding P will induce a voltage within the secondary winding S. As a result, the pilot light **18** will light up and the heater wire **33** will become hot. In operation, the seaming detacher A is placed along side, or in convenience proximity to, a stitching machine (not shown) and, when the finished product is fabricated, the so-called "seaming" or connecting cord is stretched tight and pulled through one of the convolutions of the guard-spiral **30** into contact with the heater wire **33**. Immediately the connecting cord burns or melts through and is thus severed. Since the yarn is usually nylon, rayon, or some similar material, the severed ends will be melted and resolidified or "fused" into nonraveling ends. It will be noted that the guard-spiral **30** protects the hands or clothing of the user from coming into contact with the heater wire **33** and thereby prevents any possible injury to the user.

The seaming detacher A is generally used with the switch **21** in open position and with the resistor **25** in series with the primary winding P. The resistor switch **21** can be closed if desired. thereby rendering a higher voltage in the primary and secondary coils and in the heater wire **33** for the purpose of burning any accumulation of yarn or knitting fabric that might have formed on the heater wire **33** while being operated at a lower temperature. It should also be noted in connection with the present invention that the resistor **25** may be changed for a resistor of higher or lower value as may be desired, thereby varying the amount of voltage and resulting temperature produced in the heater wire **33**.

It is possible to provide a modified form of the seam detaching machine, the electrical circuitry of which is shown in FIG. 7. The circuitry is substantially similar to that of FIG. 6 except that a variable resistor **25'** may be substituted for the fixed resistor **25** and thereby eliminate the need for the resistor switch **21**.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the seaming detachers may be made and substituted for those herein shown and described without departing from the nature and principle of our invention.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. A machine for severing a synthetic fabric cord and welding the end thereof, said machine comprising a housing with a support element extending outwardly therefrom, a dielectric plug mounted within said housing, a coil spring protective element mounted on the support element externally of said housing and at the other end on the dielectric plug internally of said housing, a heating element disposed within said coil spring element, and electrical supply means for furnishing current to said heating element, whereby said cord may be inserted through a convolution in said spring element and brought into contact with said heating element and thereby be severed and fused into a non-raveling end.

2. A machine for severing a piece of synthetic yarn and fusing the end thereof, said machine comprising a housing with a support element extending outwardly therefrom, a dielectric plug mounted within said housing, a slotted guard element mounted on the support element

externally of the housing and at the other end on the dielectric plug internally of said housing, a straight length of high resistance heating wire disposed within said guard element, and means for supplying current to said heating wire, so that when the yarn is inserted through a slot in the guard element and brought into contact with said heating wire it will be severed and fused into a non-raveling end.

3. A machine for severing a piece of yarn, said machine comprising a housing having an outwardly extending flange, a dielectric plug mounted within said housing, a coil spring element mounted at one end on said dielectric plug internally of said housing and mounted at the other end externally of said housing on said outwardly extending flange, said spring having spaced convolutions, a high resistance heating element disposed within and extending axially through said coil spring, said heating element being mounted on said dielectric plug at one end and being mounted on said flange at its other end, and means for supplying current to said heating element.

4. A machine for severing a piece of yarn, said machine comprising a housing, a support element mounted on said housing and extending outwardly therefrom, a dielectric support means mounted internally of said housing, a coil spring element mounted at one end on said dielectric support means in said housing and mounted at the other end externally of said housing on said outwardly extending support element, said spring having spaced convolutions, a high resistance heating element disposed within and extending axially through said coil spring, said heating element being mounted on said dielectric support means at one end and being mounted on the outwardly extending support element at its other end, and means for supplying current to said heating element.

5. A machine for severing a piece of yarn, said machine comprising a housing having an outwardly extending flange, a dielectric plug mounted within said housing, a coil guard element mounted at one end on said dielectric plug internally of said housing and mounted at the other end externally of said housing on said outwardly extending flange, said coil guard element having spaced convolutions, a heating element disposed with and extending through said coil guard element, said heating element being mounted on said dielectric plug at one end and being mounted on said flange at its other end, and means for supplying current to said heating element.

6. A machine for severing a piece of yarn, said machine comprising a housing having a front wall and a back wall, a support flange extending outwardly from said back wall, said back wall having an aperture, a dielectric plug mounted within said housing, a coil spring element extending through said aperture and being mounted at one end on said dielectric plug internally of said housing and being mounted at the other end externally of said housing on said outwardly extending support flange, said spring having spaced convolutions, a high resistance heating element disposed within and extending axially through said coil spring, said heating element being mounted on said dielectric plug at one end and being mounted on said flange at its other end, and means for supplying current to said heating element.

7. The device of claim 3 wherein the machine for severing a piece of yarn is provided with means for varying the temperature of the heating element.

8. The machine for severing cord of claim 1 where the electrical supply means includes a transformer having a primary winding and a secondary winding, an off-on switch and fuse connected in series with the primary winding, a pilot light connected in series with the secondary winding, a current-carrying conductor connected at one end to one terminal of the secondary winding and at the other end to the heating element, the opposite end of the heating element being grounded to the housing, and a center tap on the secondary winding which is grounded

to the housing for completing a circuit to the heating element.

9. The machine for severing cord of claim 1 where the electrical supply means includes a transformer having a primary winding and a secondary winding, an off-on switch, a resistor switch and fuse connected in series with the primary winding, a fixed resistor shunting said resistor switch, a pilot light connected in series with the secondary winding, a current-carrying conductor connected at one end to one terminal of the secondary winding and at the other end to the heating element, the opposite end of the heating element being grounded to the housing, and a center tap on the secondary winding which is grounded to the housing for completing a circuit to the heating element.

10. The machine for severing cord of claim 1 where the electrical supply means includes a transformer having a primary winding and a secondary winding, an off-on switch, a variable resistor and fuse connected in series with the primary winding, a pilot light connected in series with the secondary winding, a current-carrying conductor connected at one end to one terminal of the secondary winding and at the other end to the heating element, the opposite end of the heating element being grounded to the housing, and a center tap on the secondary winding which is grounded to the housing for completing a circuit to the heating element.

11. A machine for severing a piece of yarn, said machine comprising a housing having an outwardly extending flange, a dielectric support means mounted within said housing, a coil spring element mounted at one end on said dielectric support means internally of said housing and mounted at the other end externally of said housing on said outwardly extending flange, said spring having spaced convolutions, a high resistance heating element disposed within and extending axially through said coil spring, said heating element being mounted on said dielectric support means at one end and being mounted on said flange at its other end, and means for supplying current to said heating element.

12. A machine for severing a piece of yarn, said machine comprising a housing having a front wall and a back wall, a support flange extending outwardly from said back wall, said back wall having an aperture, a dielectric support means mounted within said housing, a coil spring element extending through said aperture and being mounted at one end on said dielectric support means internally of said housing and being mounted at the other end externally of said housing on said outwardly extending support flange, said spring having spaced convolutions, a high resistance heating element disposed within and extending axially through said coil spring, said heating element being mounted on said dielectric support means at one end and being mounted on said flange at its other end, and means for supplying current to said heating element.

13. A machine for severing a piece of synthetic yarn and fusing the end thereof, said machine comprising a housing, a slotted guard element mounted on the housing, a straight length of high resistance heating wire disposed within said guard element, a transformer mounted within said housing and having a primary winding and a secondary winding, an off-on switch, a resistor switch and fuse connected in series with the primary winding, a fixed resistor shunting said resistor switch, a pilot light connected in series with the secondary winding, a current-carrying conductor connected at one end to one terminal of the secondary winding and at the other end to the heating element, the opposite end of the heating element being grounded to the housing, a center tap on the secondary winding which is grounded to the housing for completing a circuit to the heating element, and means for supplying electrical current to said primary winding so that said heating element can be energized.

14. A machine for severing a piece of synthetic yarn and fusing the end thereof, said machine comprising a housing, a slotted guard element mounted on the housing, a straight length of high resistance heating wire disposed within said guard element, a transformer mounted within said housing and having a primary winding and a secondary winding, an off-on switch, a variable resistor and fuse connected in series with the primary winding, a pilot light connected in series with the secondary winding, a current-carrying conductor connected at one end to one terminal of the secondary winding and at the other end to the heating element, the opposite end of the heating element being grounded to the housing, a center tap on the secondary winding which is grounded to the housing for completing a circuit to the heating element, and means for supplying electrical current to said primary winding so that said heating element can be energized.

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