United States Patent [19]

Sangiacomo

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[54] **CONTROLLED CUTTER FOR CIRCULAR HOSIERY MACHINES**

[76] Inventor: **Fulvio Sangiacomo,** via 0. Villa 13, Brescia, Italy

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[21] Appl. No.: **179,701**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 873,341, Nov. 3, 1969, abandoned.

[30] **Foreign Application Priority Data**

Dec. 5, 1968 Italy 2841/68

[52] **U.S. Cl.** ..... **66/147;** 66/149 S

[51] **Int. Cl.²** **D04B 35/34**

[58] **Field of Search** ..... 66/147, 149 S

[56] **References Cited**

UNITED STATES PATENTS

2,602,313	7/1952	Reading, Jr.	66/147 X
3,667,257	6/1972	Butler	66/147

FOREIGN PATENTS OR APPLICATIONS

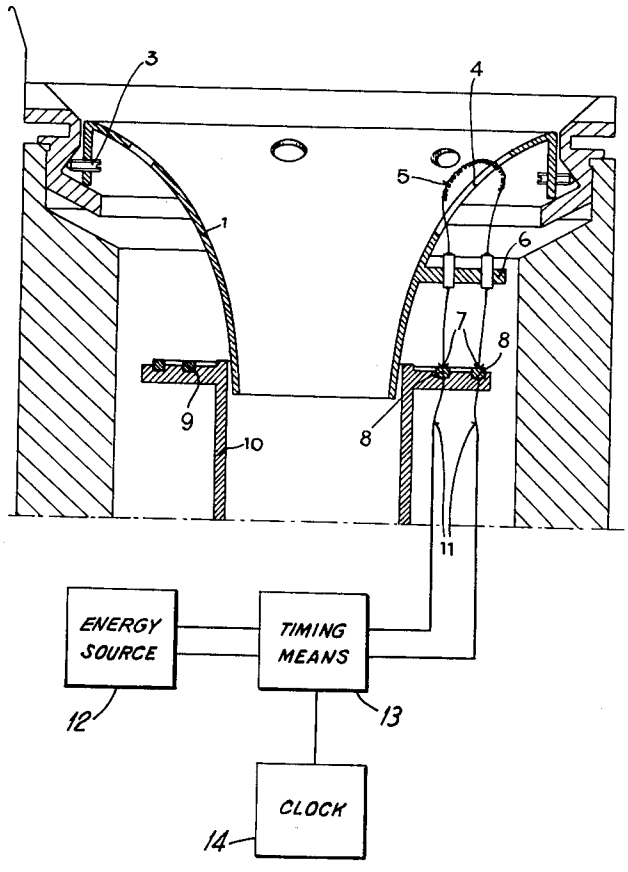
841,972	4/1969	Italy	66/147

Primary Examiner—Robert R. Mackey

[57] **ABSTRACT**

In the manufacture of panty hose or tights, the longitudinal cut of the hoisery is done automatically by means of an attachment to the conventional circular hosiery machine. This attachment comprises an inverted glass-shaped element inserted in the cylinder of the machine and having a lateral slot through which a resistor filament projects and cuts the hosiery sliding thereover when the filament is electrically heated. In one embodiment of the invention, the filament is not moved axially but is selectively energized by electrical means. In a second embodiment mechanical means are employed for selectively energizing the filament which is not moved axially. In a third embodiment, the filament is continuously energized but is displaced axially at preselected times to provide the desired intermittent contact with the article to be cut.

4 Claims, 3 Drawing Figures



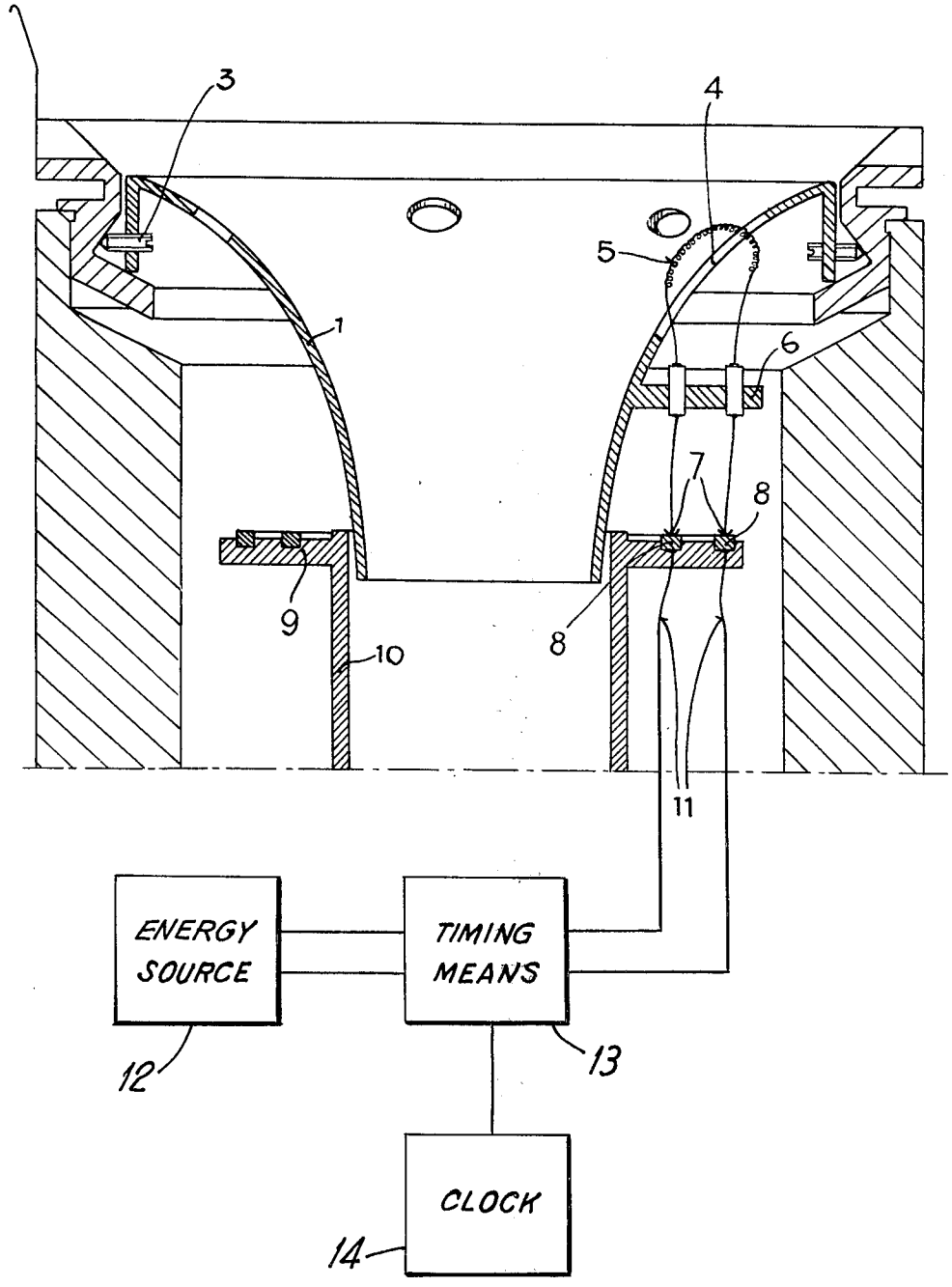


FIG. 1

INVENTOR
FULVIO SANGIACOMO

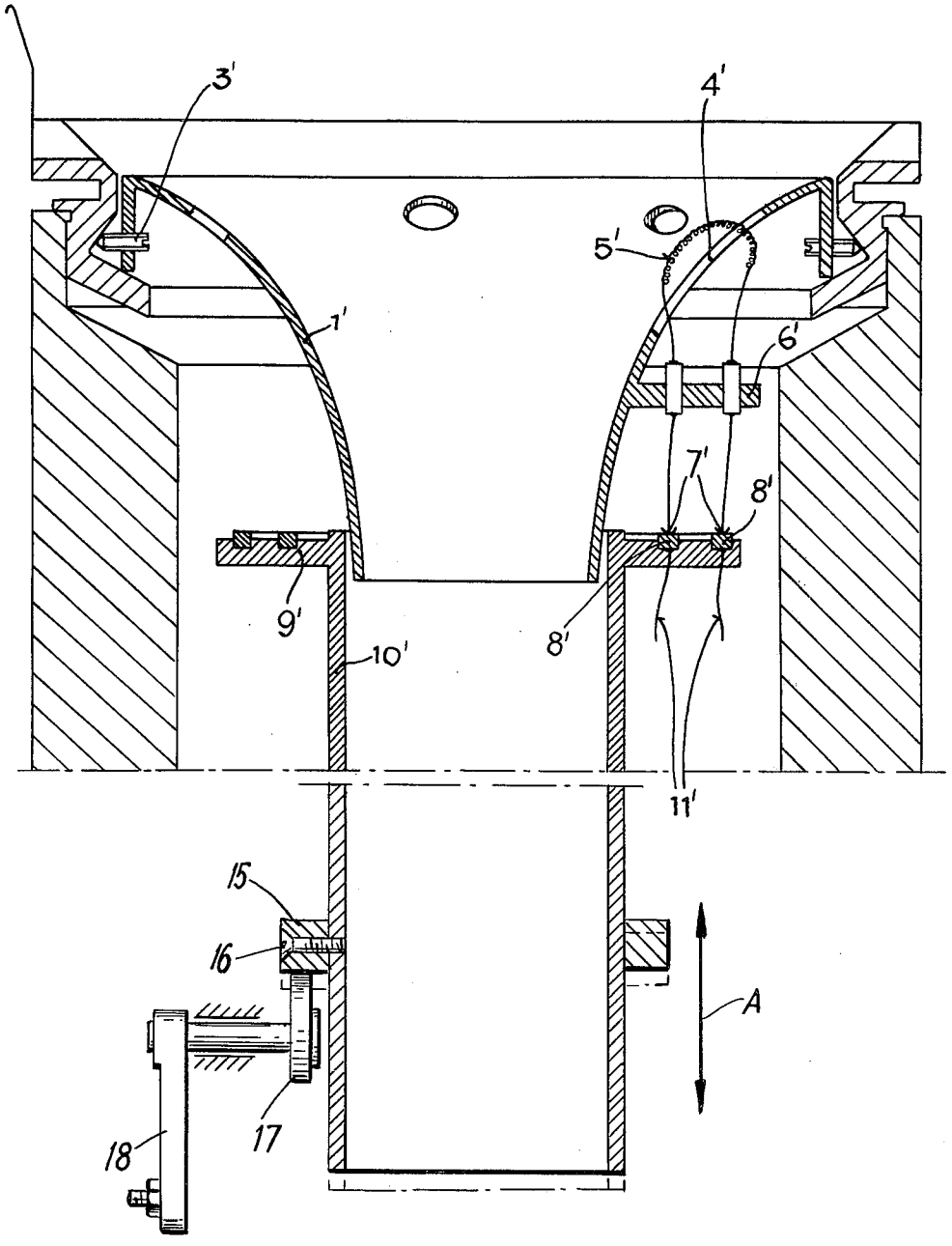
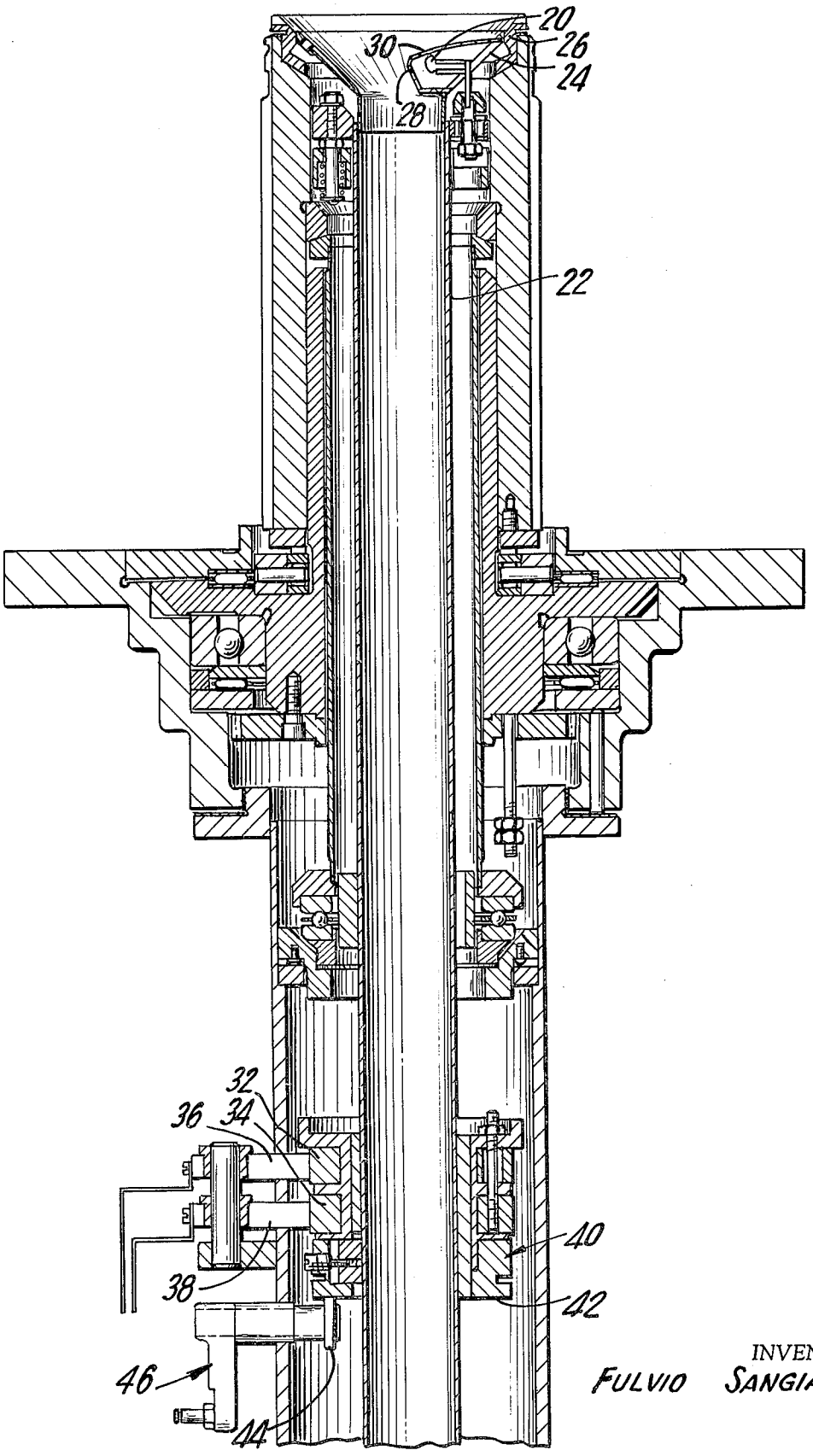


FIG. 2

INVENTOR
FULVIO SANGIACOMO



INVENTOR.
FULVIO SANGIACOMO

FIG. 3

CONTROLLED CUTTER FOR CIRCULAR HOSIERY MACHINES

This application is a continuation-in-part of my co-pending application, Ser. No. 873,341 filed Nov. 3, 1969, now abandoned.

FIELD OF INVENTION

The present invention relates to attachments to circular hosiery machines for cutting longitudinally the article produced thereby and, more particularly, to attachments for cutting the hosiery which is subsequently employed in the manufacture of such articles as panty hose or tights.

BRIEF DESCRIPTION OF THE PRIOR ART

The combination of stockings and underwear is commonly referred to as panty hose or tights, depending on the thickness of the yarn employed. Heretofore, the manufacture of these articles has been effected by sewing together the two stockings of the ensemble obtained separately on the conventional and known circular machines and being, thereafter, cut manually by expert operators. Regardless of the expertise of the cutter, the stockings cannot, however, be cut precisely and uniformly, and furthermore, such operation adds to the overall manufacturing costs.

SUMMARY OF THE INVENTION

To overcome the deficiency of the conventional manufacturing process, the present invention provides an attachment for automatically and directly cutting the hosiery during the manufacturing operation, the cutting being effected in the precisely predetermined location in the hosiery and for a length predetermined precisely equally.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 in a fragmentary, partially schematic, elevational view in longitudinal cross-section illustrating one embodiment of the present invention;

FIG. 2 is a view similar to FIG. 1 but illustrating a mechanical alternative thereto; and

FIG. 3 is a longitudinal, sectional elevational view illustrating an alternative embodiment of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The apparatus comprising this invention includes, in one embodiment an element **1**, shaped like a truncated and inverted glass which is suitably fixed within the inner cavity of the cylinder of the circular hosiery machine. Element **1** may be fixed, for example, by means of screws **3**, as shown, or by means of any equivalent fastener. There is provided in the element **1**, laterally, a slot **4**, in the most suitable location, and through said slot **4** there is provided an electrical resistance filament **5**. Filament **5** is so positioned as to project inside the inverted-glass element **1** and is electrically insulated and mounted on a support **6** which is an integral part of said element **1** and, consequently, rotates therewith and with the cylinder of the machine.

The electrical resistance has suitable contact terminals **7** which in turn brush against contact rings **8** mounted on a support **9**. Support **9** is an integral element of the fixed opening **10** for the passage and guiding of the hosiery produced by the machine. To the contact rings **8** there are connected the wires **11** for the electrical circuit feeding to the resistance filament **5**.

Using the arrangement hereabove described, when the resistance filament **5** is not electrically energized, the stocking made on the circular machine moves automatically and in the conventional manner downwardly through opening **10**, sliding harmlessly over the electrical resistance filament **5**. However, when at the predetermined moment, the resistance filament **5** is energized, it becomes incandescent and heated so that a portion of the sliding stocking, during this interval of time, is substantially fused and, therefore, cut. The length of heating of the resistance filament **5** is predeterminedly adjusted to correspond to an equally preestablished length of cut.

As shown in FIG. **1**, the resistance filament **5** is connected to an electrical energy source **12** which provides current by which the resistance filament **5** is heated to the desired temperature. The period during which the resistance filament **5** is heated is controlled by timing means **13** such as an astable or monostabile monovibrator that is connected in series with the energy source **12**, the monovibrator **13** being triggered by the pulses of a clock **14**. The aforementioned timing and energizing means are well known in the art. For example, the astable monovibrator **13** is a conventional product for intermittently controlling the output of an energy source such as that shown schematically by reference character **12** and clock pulses are a well known expedient for triggering an astable or a monostable monovibrator at predetermined intervals. Accordingly, these last mentioned elements form part of the invention only in a generic sense and in combination with certain other elements, as defined in the appended claims.

Referring now to FIG. **2** there is shown an alternative embodiment of this invention wherein prime reference characters are used to denote identical parts. Whereas the embodiment shown in FIG. **1** used electrical means for selectively energizing a non-axially movable resistance element **5'**, the embodiment illustrated by FIG. **2** uses functionally similar mechanical means to accomplish the same purpose as regards the resistance filament **5'** which, similarly, does not move axially.

A ring **15** is suitably secured to the tubular member **10'**, such as by welding, soldering, brazing or the like. For convenience, fasteners **16** are used for purposes of illustration. A cam **17**, connected to a crank arm **18** is driven by any suitable power source, such as a motor (not shown). A direct gear train may also be used, for this purpose, as is well known in the art. Thus as the cam **17** is turned, the ring **15** will move up and down, as shown by arrow A, between the positions thereof shown in solid and phantom outline. Since the support **9'** is integral with the tubular member **10'** the contact rings **8'** will be selectively moved into and out of contacting engagement with the terminals **7'**. The length of time of contacting engagement is of course determined by the configuration of the cam **17**.

FIG. **3** illustrates still another embodiment of this invention wherein the resistance filament is continuously heated and, in addition, is displaced axially so as to provide intermittent contact with the article that is to be cut. For purposes of simplicity, only those elements directly concerned with the concept of this invention will be described in connection with FIG. **3**.

Resistance filament **20** is rigidly mounted at the upper end of a tubular member **22**. The resistance

filament **20** extends through a slot **24** formed in an inverted, truncated element **26.** A cover **28,** having a slot **30** therein is also mounted on the element **26** and serves to protect the resistance filament **20** in the retracted position thereof that is shown in FIG. **3.**

At some suitable position below the resistance filament **20,** a pair of contact rings **32** and **34** are coupled to the tubular member **22** and are connected to a source of power (not shown) by means of terminals **36** and **38,** respectively. The resistance filament **20** is electrically connected to the contact rings **32** by means of conductors (not shown) that extend longitudinally along the exterior of the tubular member **22.** A block **40,** that is connected to the tubular member **22** and which also supports the contact rings **32** and **34,** is provided with a cam surface **42** that is engaged by a cam **44.** A crank arm **46,** connected to means such as a motor or the like (not shown), rotates the cam **44** so as to axially displace the assembly comprising the block **40,** the tubular member **22** and the resistance filament **20.** When the assembly just described moves upwardly, the resistance filament **20** will pass through the slot **30** in the cover **28** and thereby intermittently contact the article as the article moves past.

What is claimed is:

1. In a circular hosiery machine having a central cylinder, improved means for cutting the article manufactured by the machine, said improved means comprising;

a. an inverted, truncated, tubular element secured to a rotatable portion of the machine, said element being coaxially telescoped within and positioned proximate the upper end of the cylinder of the machine, said element having a slot in the wall thereof;

b. an electrical resistance filament of the type adapted to be coupled to and heated by a source of electrical energy;

c. means for supporting said filament adjacent said element at a position exterior thereof;

d. means for locating at least a portion of said filament within the interior of said element such that said filament makes contact along a predetermined path with the article being made by the machine; and

e. means for energizing and thereby heating said filament such that said heated filament is in contact with the article during selected time periods for effecting a longitudinal cut in the article as the article moves over said filament.

2. The improved means in accordance with claim **1** wherein said support means are integral with said element and wherein said portion of said filament is fixedly located within the interior of said element whereby the article continuously slides in contact therewith, said energizing means comprising timing means connected in series with the source of electrical energy for controlling the length of the period during which said filament is heated and means for intermittently triggering said timing means.

3. The improved means in accordance with claim **1** wherein said support means are integral with said element and wherein said portion of said filament is fixedly located within the interior of said element whereby the article continuously slides in contact therewith, said energizing means comprising movable contact means for coupling said filament to the source of electrical energy and means for selectively displacing said contact means at such times as no cut is to be made in the article.

4. The improved means in accordance with claim **3** wherein said contact means comprises a pair of slip rings integrally secured to the cylinder of the machine and a pair of contacts electrically connected to said filament and arranged to engage said slip rings, said displacing means comprising cam follower means secured to the cylinder of the machine and cam means arranged to axially displace said cam follower means whereby said slip rings intermittently engage said contacts.

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