Nov. 20, 1962 W. SPÜHL 3,064,693

DEVICE FOR SWITCHING-OFF THE FEED OF A COILED SPRING IN A MACHINE FOR THE PRODUCTION OF SPRUNG STRUCTURES

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Fig. 1

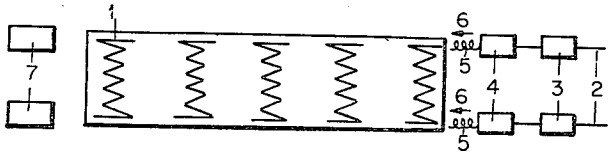



Fig. 2

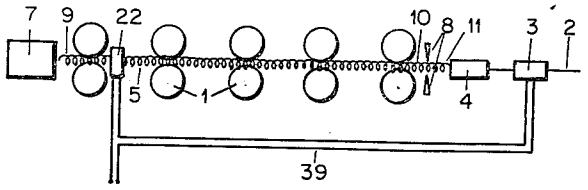



Fig. 3

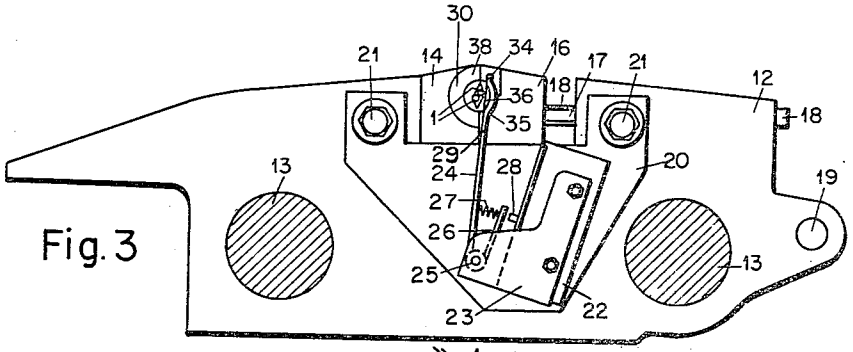



Fig. 4

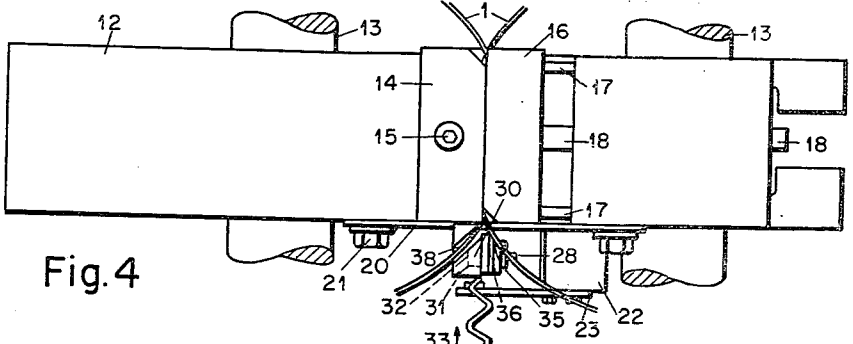
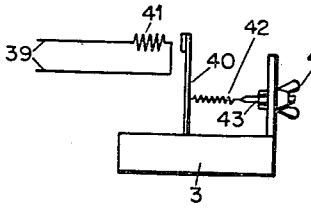



Fig. 5



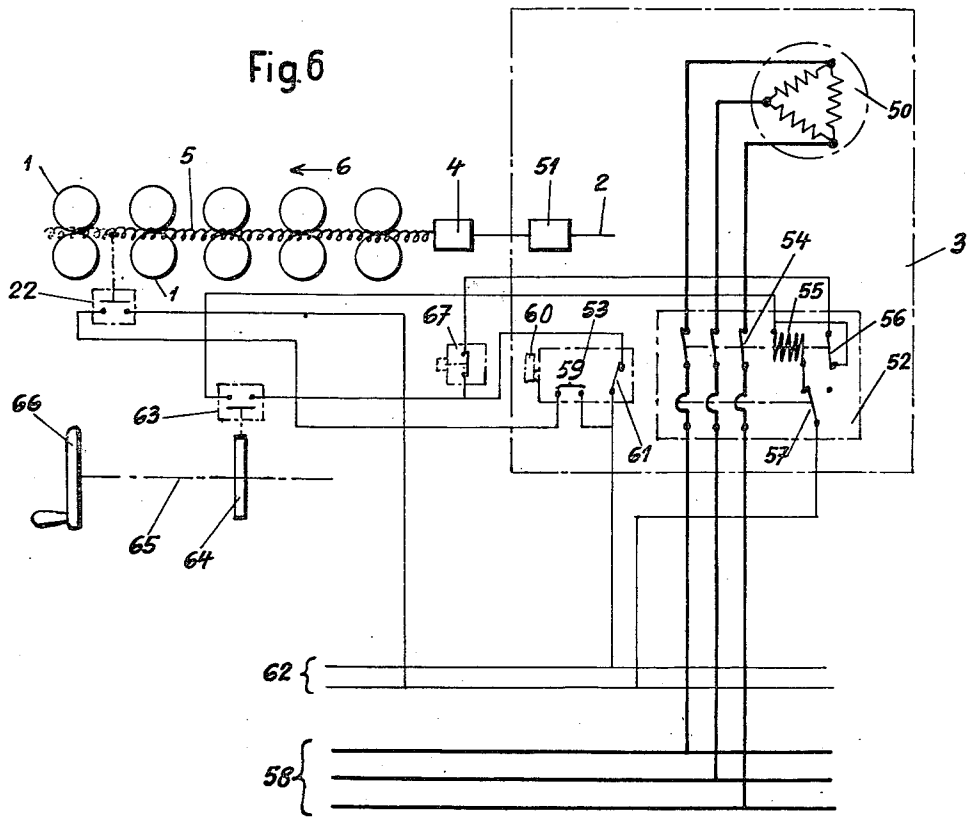

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Fig.6




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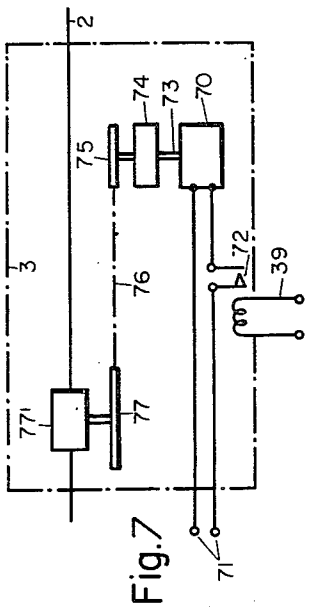



Fig.7

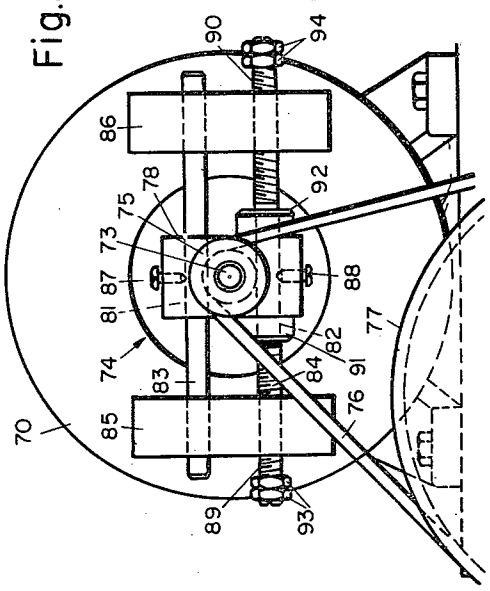



Fig.9

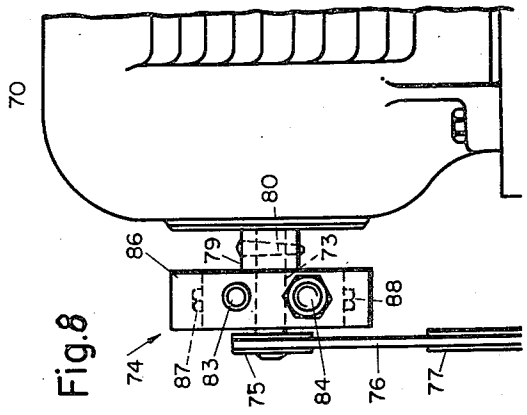



Fig.8

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3,064,693

# DEVICE FOR SWITCHING-OFF THE FEED OF A COILED SPRING IN A MACHINE FOR THE PRODUCTION OF SPRUNG STRUCTURES

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Claims priority, application Germany Nov. 26, 1956
12 Claims. (Cl. 140—92.7)

The present invention relates to a device for switching-off the feed of a coiled spring in a machine for the production of sprung structures such as spring mattresses, for example.

For the better understanding of the invention it may be firstly described briefly how in the usual manner cushion springs can be connected in rows with one another by means of coiled springs:

FIGS. 1 and 2 of the accompanying drawings represent in quite a diagrammatic manner in elevation and plan view, respectively some essential components of a machine designed for that purpose, FIG. 2 containing an electrical wiring diagram, which however will be referred to but later in connection with a preferred embodiment of the present invention.

The double-conical cushion springs 1 to be interconnected into a spring mattress are arranged in pairs in parallel rows side by side, being held in clamping tongs (not shown). Two spring wires 2 serve for connecting the adjacent upper and lower end turns, respectively, of two adjacent cushion springs 1. For this purpose each wire 2 is engaged by a feeder device 3, which in the usual way comprises two feeder-wheels or rollers (not shown), and is pushed thereby through a coiling or winding device 4, wherein it is guided through a stationary curved groove so that it is shaped helically. The coiled spring 5 thus formed continuously grows in length in the direction of the arrow 6 (FIG. 1) and screws itself in the process about the adjacent end turns of the cushion springs so that at any time two of these springs are connected with one another by the windings of the coiled spring 5, and all pairs of cushion springs are connected by the body of the coiled spring proper. When the coiled spring has reached the end position illustrated in FIG. 2, an eye is formed at its foremost turn by means of an eye-forming device 7. This eye is designed to prevent the coiled spring from unscrewing itself in the course of time out of the turns of the cushion springs by inadvertent movements, and has moreover the purpose of preventing any damage to covering fabrics, and any injuries.

Between the pair of cushion springs 1, which has been reached first by the coiled spring 5, and the winding device 4, knives 8 are arranged, by means of which the coiled spring 5 is cut off after all the pairs of springs have been connected with one another by it. These knives are diagrammatically indicated in FIG. 2 only.

For the switching-off of the feeder device 3 in the known machines an electric switch (not shown in FIGS. 1 and 2) is provided which is operated by the free end 9 of the coiled spring 5, when the latter has reached its end position shown in FIG. 2. With this arrangement however the following difficulties arise:

The feeder device 3 cannot interrupt the feeding process instantaneously, namely not only because of the inertia of its feeder-wheels or rollers and of the advancing spring wire 2 or coiled spring 5, but also because of the inertia of the other members contained therein e.g. of levers and clutches serving for the coupling of the feeder-wheels or rollers to a continuously rotating shaft. Since consequently some more spring wire is advanced after the coiled spring has reached its end position, a stress is set



up in the coiled spring. When the coiled spring is then cut off by means of the knives 8, the coiled spring expands again, whereby the formation of an eye at the rear end 10 of the spring is rendered very difficult. Since not always the same wire material is worked with the machine and also the sluggishness of the feeder device 3 is not quite constant but depends for example on the lubrication, the expansion of the spring is not always the same, so that it is very difficult to grip the extreme turn of the end 10 of the wire safely with an eye forming device. One has therefore hitherto dispensed with the forming of an eye at this end of the coiled spring or had to put up with a rather complicated eye forming device. In some cases one has even to cut off a bit from the end 10 of the spring before the formation of the eye, in order to prevent the eye from lying too far outside the spring assembly.

Moreover the difficulty arises that the end 11 of the coiled spring projecting from the winding device 4 does not in most cases remain truly elastic after the cutting off but keeps a certain permanent deformation. The helical pitch and the diameter of the end 11 of the spring do not therefore correspond accurately to their design dimensions any more, which leads into difficulties at the subsequent operation of the machine, in that this end of the spring does not screw itself correctly into the end turns of the cushion springs any more, or is not allowed to pass at all by the tongs holding these cushion springs.

It is the main object of the present invention to provide a device for the switching-off of the feed of a coiled spring wire in a machine for the production of spring structures wherein cushion springs of the said structure to be connected with one another are arranged in pairs in two parallel rows and the mutually contacting end turns of two adjacent cushion springs are connected with one another by means of the said coil spring wire passing through the same, in which the aforementioned difficulties are overcome.

It is another object of the present invention to provide a device of the kind referred to which is simple, rugged and reliable in operation.

With these and other objects, which will become apparent hereinafter, in view I provide a device of the kind referred to, comprising in combination: a feeder device advancing the said spring wire, an electric switch arranged before the last pair of the said cushion springs in the path of the said helically advancing coiled spring wire, an electric motor in mechanical driving connection with the said feeder device and controlled by said switch, and control means adapted to adjust the sluggishness of the said feeder device in responding to the switching-off of the said motor by the advancing end of the said coiled spring wire actuating the said switch to such a magnitude that after the initation of the said switching-off operation the said coiled spring wire comes to a standstill only after having passed through the said end turns of the said last pair of cushion springs.

In a preferred modification the feeder device for the spring wire serving for the production of the connecting coiled spring comprises an inertia device with an adjustable moment of inertia kinematically coupled to the said feeder device.

With reference to FIGS. 3 to 9 of the accompanying drawings three embodiments of the device according to the present invention will now be described by way of example:

FIG. 3 is a side elevation of a clamping tongs with a switch mounted thereon;

FIG. 4 is a plan view to FIG. 3;

FIG. 5 is a diagrammatic illustration of means for adjusting the time lag of the feeder device;

FIG. 6 diagrammatically shows another embodiment of the switching-off device;

FIG. 7 is a diagrammatic illustration of a modified feeder device, and

FIGS. 8 and 9 are a side and an end elevation, respectively on an inertia device having an adjustable inertia moment.

In FIGS. 3 and 4, **12** is the body of a pair of tongs which serves for the clamping-in of the upper or lower end turns of the two last cushion springs **1**, i.e. of those on the extreme left of FIG. 2. This body **12** is in the usual manner mounted slidably on two supports **13** in order that the distance between the pairs of cushion springs may be varied. The tongs have a fixed jaw **14** which is attached to the body **12** thereof by means of a countersunk screw **15**. The moveable jaw **16** is slidable on guides **17** and is connected with an actuating bar **18**. A lever (not shown) pivotally mounted at **19**, which is operated pneumatically in the usual manner, bears on the protruding end of the bar **18** so as to bring the jaw **16** into the closing position shown in the FIGS. 3 and 4 against the force of a spring (likewise not shown).

On the body **12** of the tongs a mounting plate **20** is fixed by means of two screws **21**. On this mounting plate a switch **22** is fixed which in turn carries a small bearing bracket **23** for a switch lever **24**, which is pivotally mounted on a pin **25**. A follower lever **26** is pivotally mounted on the same pin and is connected to the lever **24** by a spring **27** indicated diagrammatically. Opposite the follower lever **26** the actuating button **28** of the switch **22** is arranged. The switch lever **24** is biased in the anti-clockwise sense (FIG. 3) by a spring (not shown) so that in the rest position it abuts at **29** a projection **30** of the fixed jaw **14**.

The projection **30** has an inlet surface **31** which is conically reduced towards the jaw, and an adjoining semi-cylindrical surface **32**, in order to guide the coiled spring in its advance in the sense of the arrow **33** (see FIG. 4) between the two jaws **14** and **16**. The upper end **34** of the switch lever **24** has a bulge **35** which forms a cambered ramp surface **36** for the coiled spring **5**, which ramp surface of the bulge **35** has firstly a larger and then a smaller distance from the axis of the spring. The projection **30** is cut away at **38** to accommodate the end turn of the cushion spring **1** concerned.

The jaws **14** and **16** have at their insides in the usual manner such a shape that the end turns of both cushion springs **1** lie quite closely to one another in the clamped position, without thereby preventing the coiled spring from passing through the closed jaws when advancing helically.

When the end of the coiled spring **5** advances from the position of FIG. 4 it comes into contact with the ramp surface **36** of the end of lever **34** so that upon a further helical advance, the lever **24** is turned in the clockwise direction. Consequently the follower lever **26** hits the actuating knob of the switch **22** which closes the circuit **39** (see FIG. 2), whereby the switching-off operation of the feeder device **3** is initiated. The sluggishness of this device is so chosen that the feed stops only after the coiled spring **5** has passed also through the end turns of the two last cushion springs **1**, which are contained in the tongs. FIGS. 3 and 4, whereafter it comes to a standstill in the end position according to FIG. 2. When the coiled spring **5** is then cut-off by the knives **8**, the spring is stationary and its two ends **10** and **11** are completely free from stresses: no rebound of the end **10** takes place, and the end **11** shows the normal helical pitch and normal diameter whereby the difficulties mentioned hereinabove are overcome.

For the purpose of inserting and taking out the spring it is necessary to be able to turn the switch lever **24** further in the clockwise direction than effected by the end of the coiled spring. Owing to the fact that not the switch lever **24** itself but the follower lever **26** acts on the button **28** this is possible without difficulty in that further clockwise turning of the lever **24** merely compresses the spring **27**.



In order to allow the sluggishness or overtravel of the feeder device **3** to be adjusted accurately to the correct magnitude, the feeder device **3** is preferably constructed in the manner diagrammatically shown in FIG. 5. This device comprises an actuating lever **40** which is designed as the armature of an electro-magnet including an operating winding **41**. When this electro-magnet which is connected into the circuit **39**, is energised by closing the switch **22**, the lever **40** is turned against the bias of a spring **42**, which is attached on the one hand to the lever **40**, and on the other hand to a threaded bolt **43**. On the latter a wing nut **44** is fitted, by means of which the loading of the spring **42** can be adjusted in that the bolt is restrained from rotating in any known way, e.g. by a stationary projection engaging a longitudinal groove of the bolt. The mechanical members of the feeder device include a clutch operated by the said lever and are of well known type so that they do not need any further explanation (see U.S. Patent No. 2,663,038 filed October 26, 1948, by Charles H. Gail, Los Angeles, California). It may be added, however, that when the lever **40** is moved against the bias of the spring **42** that the clutch operated thereby disengages the feeder **3** from the wire **2** and that by adjusting the loading of the spring **42**, the moment at which the wire **2** stops advancing after the closing of the switch **22** may be regulated with exactness.

The stronger the spring **42** is loaded the more sluggishly reacts the feeder device, i.e. the larger will be the time lag between the excitation of the electro-magnet **41** and the stand-still reached by the feeder-wheels or rollers. It has been found that in this manner the sluggishness of the feeder device can be adjusted extremely accurately to the value desired, so that the switching-off device always functions faultlessly in the manner described, even upon changes of the material, diameter or helical pitch of the coiled wire (when exchanging the coiling device **4**).

Accordingly it is also possible without difficulty to provide the end **10** of the coiled spring in a simple manner with an eye. The ways and means how the eyes are formed at one and the other side are, however, not of importance to the present invention.

The feeder device described hereinabove, while inherently working very satisfactorily, has yet some disadvantages. In the first place it cannot be built up from normal commercially available components. In particular the lever, electro-magnet and adjustable spring have to be combined into a special unit which in turn has to be combined with a clutch. A further disadvantage consists in that comparatively involved measures have to be taken lest the clutch be immediately re-engaged when the said switch opens as is the case in the operational cycle of the machine before the feeder device may work again.

These disadvantages have been overcome by the embodiment according to FIG. 6. In this figure again two adjacent cushion springs **1** are connected to one another by the coiled spring **5**, which is produced in the coiling device **4** and advances helically in the direction of the arrow **6**. The spring wire **2** of which the coiled spring **5** is formed is again pushed into the winding device **4** by a feeder device **3**.

The feeder device **3** comprises a motor **50**, a feeder gear **51**, a motor switch **52** and a delayed action relay **53**. The motor **50** is a conventional three-phase motor which may be provided with a conventional brake-device which becomes effective automatically when switching off the motor. The feeder gear **51** driven by the motor **50** comprises in the usual manner feeder-wheels or rollers for advancing the spring wire **2**.

The motor switch **52** comprises three mutually coupled switch arms **54**, a switch coil **55**, a holding contact **56**

and a bi-metal overload contact 57. The switch arms 54 are connected to the three-phase mains. The delayed action relay 53 comprises an input impedance 59 formed e.g. by a rectifier, an adjustment lever 60 and a contact 61; its time lag is adjustable in the known manner, e.g. by adjusting a resistor through which a condenser is charged the voltage of which controls the igniting of a thyratron valve in series with a magnet coil. (A relay of this type is the REZ 1–4 relay of Sprecher und Schuh, Aarau.)

The input impedance 59 is connected in series with a switch 22, which is closed by the spring 5 advancing helically, to a source of control voltage 62. In another circuit connected to this source 62 there is a relay contact 61, a switch 63, the said switch coil 55 and the bi-metal contact 57. The switch 63 is operated by a cam 64 mounted on a control shaft 65 which may be turned by means of a hand wheel 66. On the said control shaft 65 there are also further cams (not shown) which serve for the control of other operational motions of the machine when the hand wheel is turned. A circuit breaker contact 67 is connected in series with the holding contact 56.

The switching-off device described is shown in the drawing in that switching condition which prevails at the moment preceding the abutting of the end of the coiled spring on the still open switch 22. The switch arms 54 are closed since the switch coil 55 is excited by the control current source 62 on the one hand over the bi-metal contact 57 and on the other hand over the holder contact 56, the circuit breaker contact 67 and the relay contact 61. The motor 50 is accordingly in operation and effects the advance of the spring wire 2 by means of the feeder gear 51.

As soon as the end of the coiled spring 5 has closed the switch 22 in the manner described in more detail hereinabove, the input impedance 59 is energised, which after the time lag adjusted to, entails an opening of the contact 61. The switch coil 55 is accordingly de-energised, the switch arms 54 are opened by a spring (not shown), and the motor 50 is brought to a standstill. During the time lag of the relay 53 and during the running-out time of the motor 50 and the gearing 51 the coiled spring 5 keeps advancing screw-wise, and thereby passes also through the mutually contacting end turns of the last two cushion springs 1, as indicated in the drawing in chain-dotted lines. The sluggishness of the feeder device 3, which depends mainly on the delayed action of the relay 53, the inertia and friction of the motor 50 and of the gearing 51, may be adjusted by controlling the time lag of the relay easily in such a manner that the coiled spring after actuating the switch 22 keeps advancing a stretch of predetermined length.

The motor 50 then keeps at a standstill until the cam 64 closes the switch 63 upon turning the hand wheel 66. Since in the meantime the interconnected cushion springs have been removed from the tongs in which they were clamped during the operation described, and since consequently the switch 22 has been opened again, the input impedance 59 had been de-energised in the meantime which caused the relay contact 61 to be closed. When closing the switch 63, accordingly the switch coil 55 is energised again which involves the closing of the switch arms 54 and of the holding contact 56. The motor 50 accordingly drives again the feeder gear 51, and two new rows of cushion springs 1 are connected with one another by a new coiled spring 5.

By means of the circuit breaker contact 67 the circuit of the switch coil 55 can be interrupted in case for one reason or another, e.g. upon a breakdown of the switch 22 or of the relay 53, it is desired to bring the motor 50 to a standstill outside the normal operational cycle. The bi-metal contact 57 heats up in the case of excessive current in the windings of the motor, and then disconnects the switch coil 55 from the source of exciter current 62, so that the motor is brought to a standstill.

The advantage of this second embodiment as compared with the embodiment described first, consists in that the motor switch and the delayed action relay of the kind described are readily obtainable. Since a motor switch has to be provided anyway and moreover a disengageable clutch is dispensed with, the feeder device 3 becomes particularly simple and inexpensive. Moreover the restarting of the motor at the right moment of the working cycle is effected in a very simple manner. Obviously the delayed action relay need not be necessarily of the thyratron type.

Referring now to FIGS. 7 to 9, a modified feeder device is illustrated in FIG. 7. It comprises a direct current- or alternating current-motor 70, which is supplied from the mains terminals 71 through a relay switch 72 which is opened as soon as the circuit 39 is closed by the switch 22. On the shaft 73 of the motor 70 an inertia device 74 with adjustable inertial moment and a driving pulley 75 are attached which through an endless driving member 76, e.g. a chain or a belt, and a driving pulley 77 drives a feeder gearing 77'. The feeder gearing comprises in the usual way feeder rollers, which advance the wire 2 clamped between them.

FIGS. 8 and 9 show the structural design of the inertia device 74. The same has a block 78 bored through, which is provided with a hub 79 and mounted on the shaft 73 to which it is connected by means of a pin 80. The block 78 has two parallel bores 81 and 82 in which round rods 83 and 84 are inserted serving for the guiding of counterpoises 85 and 86 holding one another in equilibrium, and secured in their position by clamping screws 87 and 88. The rod 84 is provided with opposite screw threads 89 and 90, which are screwed into corresponding tapped bores of the counterpoises 85 and 86. Moreover on both sides of the block 78 two adjustable collars 91 and 92 are mounted on the rod 84. On the ends of the screw threads 89 and 90 nuts 93 and 94, respectively, are screwed.

It is clear that by turning the preferably knurled adjustable collars 91 and 92 the rod 84 can be turned and thereby the distance of the counterpoises 85 and 86 from the shaft 73 can be varied in the opposite direction, the counterpoises sliding on the rod 83 and being restrained by the nuts 93 from moving away too far.

By adjusting the inertia device 74 the deceleration rate and stopping period of the motor 70 and of the feeder gearing 77' driven by it can be adjusted in a very precise manner, it being apparent that the counterpoises 85 and 86 act in the manner of a flywheel and when moved apart will cause the shaft 73 to rotate (due to the pressure of such counterpoises) for a longer period than when they are moved to a position nearer to each other. This stopping period is so regulated that the coiled spring 5 continues advancing after the actuation of the switch 22 until its free end comes into the end position shown in FIG. 2, in which it can be engaged by the eye-forming device.

The switching-off device described with reference to FIGS. 7 to 9 is mechanically extremely rugged and very reliable in operation, since it does not comprise any sensitive components liable to break-downs.

While I have herein described and in the accompanying drawings have illustrated what may be considered typical and particularly useful embodiments of my said invention, I wish it to be understood that I do not limit myself to the particular details and dimensions described and illustrated, for obvious modifications will occur to a person skilled in the art.

What I claim as my invention and desire to secure by Letters Patent, is:

1. A device for automatically switching-off the feed of a coiled spring wire in a machine for the production of sprung structures wherein cushion springs of the said

structure to be connected with one another are arranged in pairs in two parallel rows and the mutually contacting end turns of two adjacent cushion springs are connected with one another by means of the said coiled spring wire passing through the same, comprising in combination: a feeder device helically advancing the said spring wire, an electric switch arranged in the path of the said coiled spring wire before the last pair of the said cushion springs, an electric motor in mechanical driving connection with the said feeder device and in electrical wiring connection with the said switch, and control means including an inertia device having an adjustable moment of inertia operable by the advancing end of said wire into contact with said switch to open the latter to adjust the sluggishness of the said feeder device in responding to the switching-off of the said motor to such extent that after the opening of said switch the said coiled spring wire comes to a standstill only after having passed through the said end turns of the said last pair of cushion springs.

2. A device as claimed in claim 1 comprising a pair of tongs having a fixed jaw and a moveable jaw, between themselves clamping the said end turns, the said switch being attached to the said fixed jaw.

3. A device as claimed in claim 2, comprising a projection of the said fixed jaw guiding the said coiled spring wire, a switch lever pivoted on the said switch and provided with a cambered ramp surface to be contacted by the advancing end of the said coiled spring wire, the said lever being spring-biased against the said projection in the rest position, and turned in the sense of actuating said switch by the said advancing end of the coiled spring wire.

4. A device as claimed in claim 3, comprising a follower lever pivoted freely relative to the said switch lever, a spring spacing the said follower lever resiliently from the said switch lever, and an actuating button provided on the said switch in operative relation to the said follower lever, the said switch lever when contacted by the advancing end of the said coiled spring wire transmitting its movement to the said follower lever through the said spring.

5. A device as claimed in claim 3, comprising an electro-magnet electrically connected to the said switch, an armature spring-biased in opposition to the attraction of the said electro-magnet, and adjustment means adapted to vary to strength of this spring biased opposition, the said armature forming an actuating lever operatively connected with and adapted to arrest the said feeder device.

6. A device for automatically switching-off the feed of a coiled spring wire in a machine for the production of sprung structures wherein cushion springs of the said structure to be connected with one another are arranged in pairs in two parallel rows and the mutually contacting end turns of two adjacent cushion springs are connected with one another by means of the said coiled spring wire passing through the same, comprising in combination: a feeder device advancing the said spring wire, an electric switch arranged before the last pair of said cushion springs in the path of the said coiled spring wire advancing screw-wise, an electric motor in mechanical driving connection with the said feeder device and in electrical wiring connection with the said switch, a delayed action relay with adjustable time lag electrically connected between the said switch and the said motor, the said relay being adapted to adjust the sluggishness of the said feeder device in response to the actuation of the said switch by the advancing end of the said coiled spring wire to such an extent that after the initiation of the said switching-off operation the said coiled spring wire is brought to a standstill only after having passed through the said end turns of the said last pair of cushion springs.

7. A device as claimed in claim 6, comprising in combination: a motor switch having switch arms controlling the electrical connection of the said motor to the mains and spring biased towards the opening position, a switch coil electro-magnetically moving when energised the said arms towards the closing position, a source of a control voltage adapted to be electrically connected to the said switch coil, a contact of the said delayed action relay controlling the electrical connection of the said source to the said switch coil and an input impedance of the said relay electrically connected to the said switch actuated by the said advancing end of the coiled spring wire the said input impedance being energised upon actuation of the said switch in the sense of de-energising said switch coil and thereby opening the said switch arms.

8. A device for automatically switching-off the feed of a coiled spring wire in a machine for the production of sprung structures wherein cushion springs of the said structure to be connected with one another are arranged in pairs in two parallel rows and the mutually contacting end turns of two adjacent cushion springs are connected with one another by means of the said coiled spring wire passing through the same, comprising in combination: a feeder device advancing the said spring wire, an electric end switch arranged in the path of the said spring wire advancing helically before the last pair of the said cushion springs, an electric motor having an output shaft in mechanical driving connection with the said feeder device and in electrical wiring connection with the said end switch, and an inertia device having an adjustable inertia moment, kinematically connected to the said feeder device and adapted to adjust the sluggishness of the said feeder device in responding to the switching-off of the said motor by the advancing end of the said coiled spring wire actuating the said end switch to such a magnitude that after the initiation of the said switching-off operation the said coiled spring wire comes to a standstill only after having passed through the said end turns of the said last pair of cushion springs.

9. A device as claimed in claim 8, wherein the said inertia device is mounted on the output shaft of the said electric motor.

10. A device as claimed in claim 8, comprising a relay switch in electrical wiring connection both with the said electric end switch and with the said electric motor, the said relay switch being energised by the closing of the said end switch and when energised switching off the current supply to the said electric motor.

11. A device for automatically switching-off the feed of a coiled spring wire in a machine for the production of sprung structures wherein cushion springs of the said structure to be connected with one another are arranged in pairs in two parallel rows and the mutually contacting end turns of two adjacent cushion springs are connected with one another by means of the said coiled spring wire passing through the same, comprising in combination: a feeder device advancing the said spring wire, an electric end switch arranged in the path of the said spring wire advancing helically before the last pair of the said cushion springs, an electric motor having an output shaft in mechanical driving connection with the said feeder device and in electrical wiring connection with the said end switch, and an inertia device having an adjustable inertia moment, kinematically connected to the said feeder device and adapted to adjust the sluggishness of the said feeder device in responding to the switching-off of the said motor by the advancing end of the said coiled spring wire actuating the said end switch to such a magnitude that after the initiation of the said switching-off operation the said coiled spring wire comes to a standstill only after having passed through the said end turns of the said last pair of cushion springs, said inertia device comprising a rod having opposite screw threads at its two ends and mounted transversely of the said output shaft on the same rotatably about its own axis, and two counter-poises each in screw-

connection with one end of the said rod and restrained from rotating about the axis thereof, the said two counterpoises being adjustable in opposite directions relative to the said output shaft by turning the said rod, in such a manner as holding one another always in equilibrium.

12. A device for automatically switching-off the feed of a coiled spring wire in a machine for the production of sprung structures wherein cushion springs of the said structure to be connected with one another are arranged in pairs in two parallel rows and the mutually contacting end turns of two adjacent cushion springs are connected with one another by means of the said coiled spring wire passing through the same, comprising in combination: a feeder device advancing the said spring wire, an electric end switch arranged in the path of the said spring wire advancing helically before the last pair of the said cushion springs, an electric motor having an output shaft in mechanical driving connection with the said feeder device and in electrical wiring connection with the said end switch, and an inertia device having an adjustable inertia moment, kinematically connected to the said feeder device and adapted to adjust the sluggishness of the said feeder device in responding to the switching-off of the said motor by the advancing end of the said coiled spring wire actuating the said end switch to such a magnitude that after the initiation of the said switching-off operation the said coiled spring wire comes to a standstill only after having passed through the said end turns of the said last pair of cushion springs, said inertia device comprising a block fixedly mounted on the output shaft of the said electric motor, a rod oppositely screw-threaded at both ends rotatably fitted into the said block transversely of the said output shaft, a guide rod fitted into the said block parallel to the said screw-threaded rod, two counterpoises each with a screw-tapped bore in screw-engagement with one end of the said screw-threaded rod, and a smooth bore in sliding fit over the said guide rod, the distance of the said counterpoises from the said output shaft being variable by turning the said screw threaded rod, and arrester means adapted to restrain the said screw-threaded rod from rotating.

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