April 25, 1933. C. A. NICOLAI ET AL 1,905,046

MACHINE FOR FEEDING COILED SECTIONS

Filed Oct. 8, 1930 2 Sheets-Sheet 1

Fig. 1.

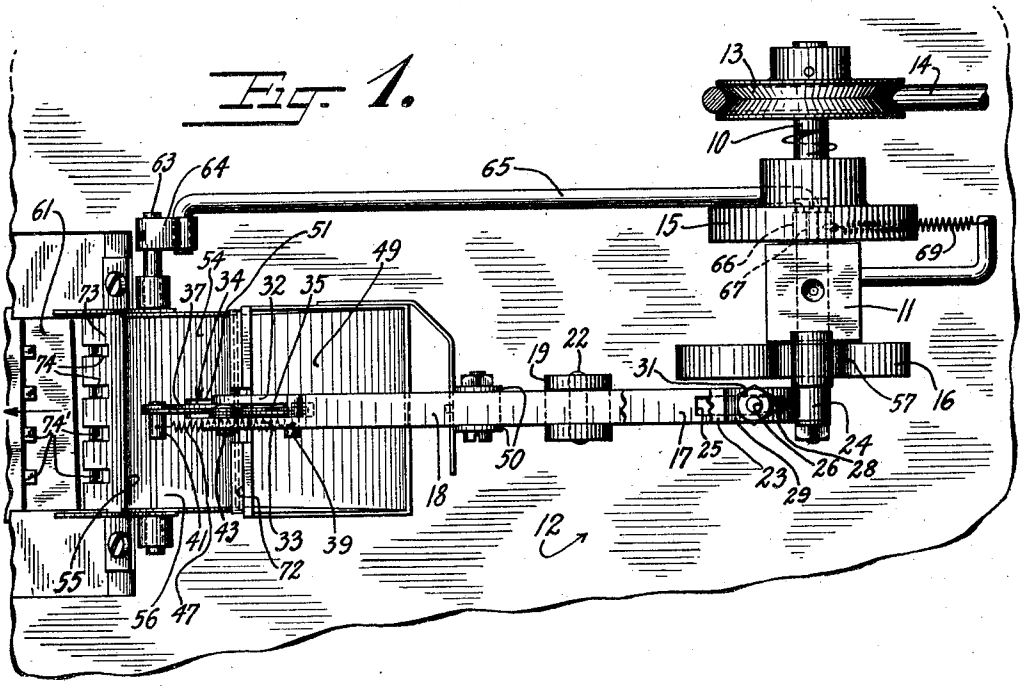
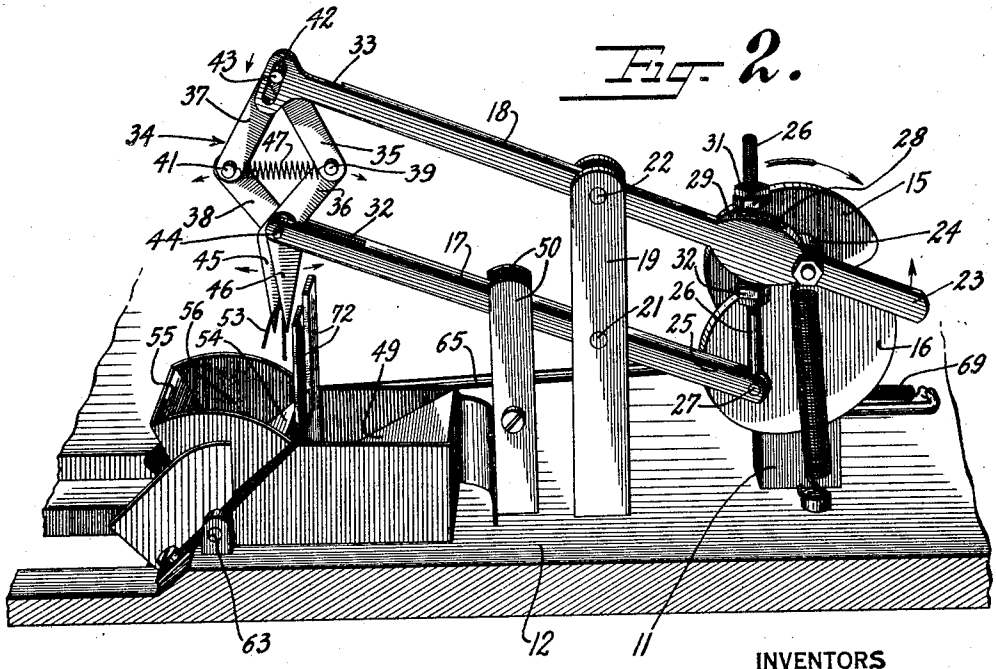


Fig. 2.



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Filed Oct. 8, 1930 2 Sheets-Sheet 2

Fig. 4.

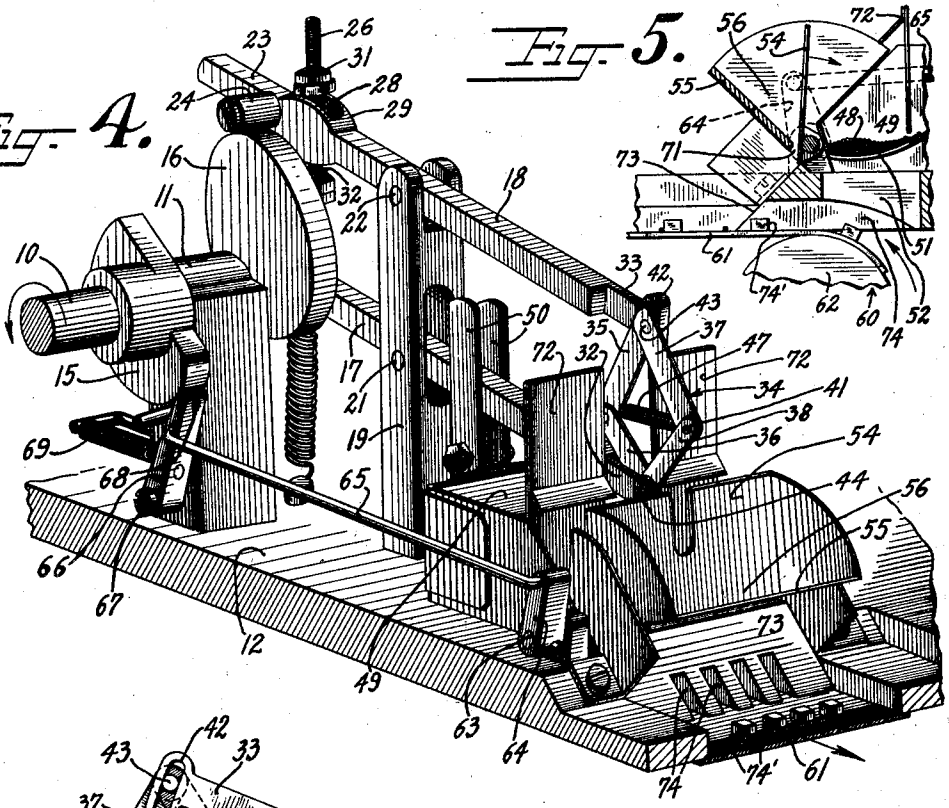
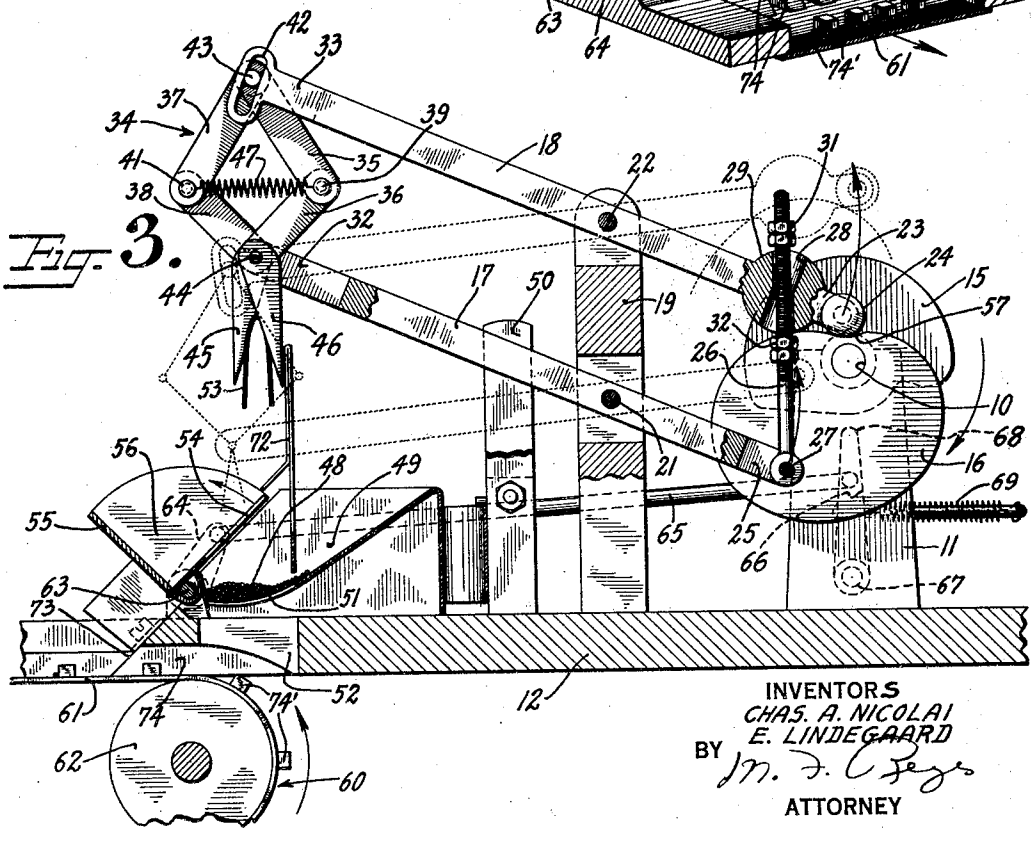


Fig. 5.

Fig. 3.



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UNITED STATES PATENT OFFICE

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MACHINE FOR FEEDING COILED SECTIONS

Application filed October 8, 1930. Serial No. 487,238.

This invention relates to a device for feeding coiled filamentary sections and relates more particularly to a machine for selecting and removing a coiled section from a plurality of such sections.

In the manufacture of incandescent lamps it has been found desirable to provide helically coiled filaments of given lengths to be used as the light source. Machines are provided for coiling fine filamentary wire to helical form and for cutting the coiled wire into sections of suitable lengths as for example as shown in Patent No. 1,670,499.

These filaments or coiled sections are of minute proportions and extremely difficult to handle as for example when it is desirable to feed them to a machine such as is shown in copending application Serial No. 368,311 filed June 4, 1929 and assigned to the same assignee as is the present invention. The machine disclosed in the said application operates to stretch the coils to uniform lengths and means must be provided for feeding coils thereto individually. This may be accomplished by hand but owing to the difficulty encountered in handling the coils attempts at hand feed result in a tedious and time consuming operation.

The present invention therefore has for its object to automatically select a coiled section from a group and deliver the same to a given position.

Another object of the invention is to provide manipulated coil gripping tongs which will pick up a coiled section and transport the same without injury thereto.

The invention will be more fully understood by reference to the accompanying drawings in which,

Fig. 1 is a plan view of a coil feeding mechanism constructed in accordance with the present invention;

Fig. 2 is a perspective view of a portion of the machine shown in Fig. 1;

Fig. 3 is a side elevational view of the machine partly in section where hatched;

Fig. 4 is a perspective view of the mechanism shown in Fig. 1, and

Fig. 5 is a detail view of a portion of the machine showing a hopper and conveyor.

The selected embodiment of the invention may comprise a main driving shaft 10 journaled in a bearing 11 secured to a table or bed plate 12, one end of the shaft 10 is provided with a pulley 13 and a belt 14 leading to any suitable source of power, as for example, a motor (not shown).

Mounted on the shaft 10 and at one side of the bearing 11 is a cam member 15 at the opposite side of the bearing and also mounted on the shaft 10 is a cam member 16. The cam member 16 operates to actuate a pair of rocker arms or bars 17 and 18 pivoted on a post 19 at 21 and 22 respectively. One end 23 of the bar 18 is provided with a roller 24 which traverses the surface of the cam 16. An end 25 of the bar 17 is provided with a link 26 pivotally connected with the said bar at 27 and extending through a passage 28 provided in an enlargement 29 on the bar 18. The passage 28 is provided with oppositely tapered portions converging toward the center of the passage to allow for a rocking movement of the bar 18 while the same is linked to the bar 17.

For the purpose of retaining the bars in given parallel relation, pairs of lock-nuts 31 and 32 are provided at opposite sides of the enlargement 29. The ends 23 and 25 of the bars 18 and 17 are thus held in fixed relation. Opposite ends 32 and 33 of the bars 17 and 18 are connected by a double toggle mechanism 34 comprising links 35 and 36 and links 37 and 38. The links 35 and 36 are pivotally connected at 39 and the links 37 and 38 are pivotally connected at 41.

The end 33 of the bar 18 is provided with a slot 42 in which a pin 43 is slidable which pin pivotally connects links 35 and 37. The end 32 of the bar 17 is provided with a shaft 44 upon which links 36 and 37 are pivotally mounted. As shown the end 32 of the bar 17 is bifurcated to provide space to mount the links and blades. The link 36 is provided with a blade 45 integral therewith and the link 38 is provided with a blade 46 integral therewith. A helical spring 47 connects the central pivots 39 and 41 of the toggle device, causing them to move toward each other and thus tending to close the

blades which operate in the manner of a pair of shears, the edges of the blades, however, are relatively dull so that when closed they grip instead of cut any object therebetween.

The toggle device 34 maintains the ends 32 and 33 of the bars 17 and 18 in a normal parallel relation but by reason of the toggle a slight variation in the difference between the positions of the ends of the bars may be effected to open and close the blades 45 and 46. The blades require only a very slight movement which may be attained by a slight play between the lock nuts 31 and 32 and by reason of the flexibility of the toggle mechanism 34. Coiled sections 48 are placed in a hopper 49 in a pile with their longitudinal axes parallel so as to be readily picked up by the gripper members.

As the gripper members are moved downwardly into the group of filamentary sections 48 disposed in the hopper 49, a friction clip 50 engages the bar 17 and retards its movement thus slightly collapsing the toggle mechanism 34 and effecting an opening of the gripping members. This opening operation is merely the changing of the relative positions of the gripper members so as to allow them to have a reverse movement to grip a coil.

By reason of the friction clip or brake 50 the jaws are positioned to grip a coiled section and are moved into the mass of sections, one of which will be forced against the intersecting edges of the blades or gripper members. For the purpose of permitting the gripper blades to pass through the quantity of coiled sections a slot 51 in the hopper and an opening 52 in the table are provided. As the cam 16 continues to operate to effect a reverse movement of the bar 17 and 18 the movement of the bar 17 will be retarded by the brake 50 thus the bar 18 will lift, lengthening the toggle mechanism 34 and causing the members 45 and 46 to close and grip a coiled section 53 as shown in Figs. 2 and 3.

The coiled section will thus be held and elevated as the bars 17 and 18 move upwardly.

When the coiled section is in its uppermost position a rocker plate 54 is moved (by means to be presently described) beneath the elevated coiled section. The plate 54 in conjunction with a plate 55 forms a trough-shaped receptacle 56 to receive the coiled section when released from the gripper members.

A release of the coiled section is effected by the action of the cam 16 which is provided with a depression 57 into which the roller 24 drops causing a slight change in the relative positions of the ends 32 and 33 of the bars 17 and 18 bringing them in slightly closer relation causing the toggle mechanism to collapse slightly and open the gripper members to release the elevated coiled section which will then drop into the receptacle 56.

As the coiled section makes contact with the surface of the plate 54 it straightens out and rolls down to the bottom of the trough at which time it is discharged onto a conveyor 60 which may comprise an endless belt 61 mounted on suitable rollers 62 and positioned to transport coiled sections to another machine.

Means for discharging the coils may comprise the plate 54 which is rockable on a shaft 63. One end of an arm 64 is secured to the shaft 63 and a link 65 is pivotally connected to the other end of the arm 64 and one end of an arm 66 which latter is rockable on a pin 67 projecting from the lower portion of the bearing 11. An upper end 68 of the arm 66 is held engaged with the face of cam 15 by a helical spring 69. Thus as the shaft 10 rotates the cams 15 and 16 the cam 16 actuates the mechanism for operating the gripper members and the cam 15 oscillates the plate 54. This plate when rocked about the shaft 63 provides a slot or passage 71 (see Fig. 5) through which the coiled segment may drop into the conveyor.

The movement of the rocker plate 54 is so timed as to be in position to receive a coiled segment when it drops from the gripper members and guide plates 72 are provided at each side of the said members so that as the segment drops and straightens out it will be guided to the plate 54. When the segment leaves the trough-shaped receptacle 56 it travels down an inclined surface 73 which is provided with slots 74 to permit the passage of spacer blocks 74′ on the conveyor. These blocks are arranged in rows disposed in spaced relation and as they pass beneath the surface 73 they engage a segment which is then carried away by the conveyor.

It will be understood that the coiled filamentary sections are of fine hair-like proportions and that the movement of the gripper blades need be only very slight so that the resilient connection between the ends of the rocker arms afforded by the toggle connections, makes it possible to insert the gripper blades into a quantity of coiled filamentary bodies to select and remove a single body. The blades as they press into the pile of coils are slightly forced apart and as soon as there is only space at the gripping portion of the blades for one coil, the blades operate to remove the coils individually from a mass. The removed coil when lifted is held in a loop shaped position but when the coil is dropped on to the guide plate it immediately straightens out and as it travels down the guide plate and is discharged it has assumed its natural position and drops on to the conveyor ready to be moved to another machine for a different operation.

Although a preferred embodiment of the invention may be made as shown and described herein, it is to be understood that modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A machine for feeding coiled sections comprising a hopper for supporting a plurality of sections, lifting means for removing a section from said hopper, a rocker plate, means for moving said lifting means over said plate for the deposit of a section on said plate and means for actuating said plate to discharge said section.

2. A machine for removing a coiled filamentary section from a group comprising a pair of cooperating gripper blades, means for moving said blades into a group of sections, means for actuating said blades to secure a section, means for elevating said blades, a rocker plate, means for moving said plate beneath said elevated blades and means for actuating said blades to release said section for deposit on said plate.

3. A machine for removing a coiled filamentary section from a group comprising a pair of cooperating gripper blades, means for moving said blades into a group of sections, means for actuating said blades to secure a section, means for elevating said blades, a rocker plate, means for moving said plate beneath said elevated blades, means for actuating said blades to release said section for deposit on said plate and means for actuating said plate to discharge said section.

4. A machine for removing a coiled filamentary section from a group comprising a pair of cooperating gripper blades, means for moving said blades into a group of sections, means for actuating said blades to secure a section, means for elevating said blades, a movable member, means for moving said member beneath said elevated blades, means for actuating said blades to release said section for deposit on said member, a conveyor, and means for actuating said member to discharge said section onto said conveyor.

5. A machine for feeding coiled filamentary sections comprising a hopper for a quantity of said sections, a pair of cooperating gripper members, means for actuating said members to grip and remove a coiled section from said hopper, a receptacle, means for moving a portion of said receptacle to position beneath said members and means for actuating said members to release said gripped section for deposit in said receptacle.

6. A machine for feeding coiled filamentary sections comprising a hopper for a plurality of coiled sections, a pair of rocker bars, a pair of gripper blades mounted on one of said bars, means connecting said blades with the other bar, means for actuating said bars to move said blades into said coiled sections and means operating to move said bars at different rates of movement to cause an actuation of said blades to grip a coiled section.

7. A machine for feeding sections of filamentary coils comprising a hopper for a plurality of said coils, an upper and a lower rocker bar mounted in parallel relation, means at ends of said bars for causing an oscillatory movement thereof, coil gripping means at the other ends of said bars, and means intermediate said last mentioned ends for actuating said gripping means upon an oscillation of said bars to grip a coil.

8. A machine for feeding sections of filamentary coils comprising a hopper for a plurality of said coils, upper and lower rocker bars mounted in parallel relation, means at ends of said bars for causing an oscillatory movement thereof, coil gripping means at the other ends of said bars, means intermediate said last mentioned ends for actuating said gripping means upon an oscillation of said bars to grip a coil, a conveyor, and means for releasing said coil for deposit on said conveyor.

9. A machine for feeding sections of filamentary coils comprising a hopper for a plurality of said coils, upper and lower rocker bars mounted in parallel relation, means at ends of said bars for causing an oscillatory movement thereof, coil gripping means at the other ends of said bars, means intermediate said last mentioned ends for actuating said gripping means upon an oscillation of said bars to grip a coil, a receptacle, and means for releasing said coil for deposit in said receptacle.

10. A machine for feeding sections of filamentary coils comprising a hopper for a plurality of said coils, upper and lower rocker bars mounted in parallel relation, means at ends of said bars for causing an oscillatory movement thereof, coil gripping means at the other ends of said bars, means intermediate said last mentioned ends for actuating said gripping means upon an oscillation of said bars to grip a coil, a receptacle, means for releasing said coil for deposit in said receptacle and means for opening said receptacle to discharge said coil.

11. A machine for feeding sections of filamentary coils comprising a hopper for a plurality of said coils, upper and lower rocker bars mounted in parallel relation, means at ends of said bars for causing an oscillatory movement thereof, coil gripping means at the other ends of said bars, means intermediate said last mentioned ends for actuating said gripping means upon an oscillation of said bars to grip a coil, a conveyor, a rocker plate adjacent to said conveyor,

means for releasing said gripped coil for deposit on said plate and means for rocking said plate to discharge said coil onto said conveyor.

In testimony whereof, we have hereunto subscribed our names this 23d day of September 1930.

CHARLES A. NICOLAI.
ERIK LINDEGAARD.