July 15, 1924. 1,501,064

G. B. ROESCH

COIL BENDING DEVICE

Filed June 18, 1921

FIG. 1.

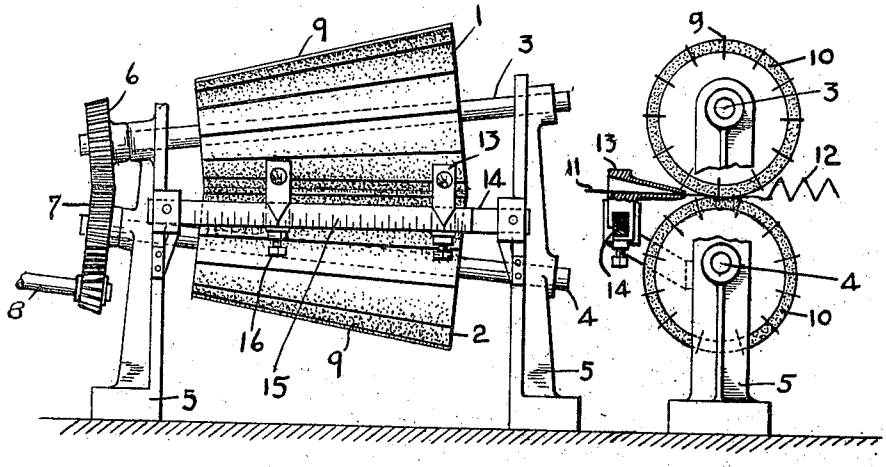


FIG. 2.

FIG. 3.

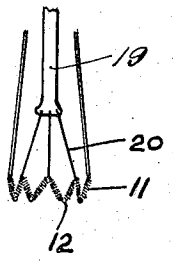
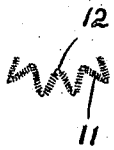


FIG. 4.



FIG. 5.



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GEORGE BANCROFT ROESCH, OF BLOOMFIELD, NEW JERSEY, ASSIGNOR TO WESTINGHOUSE LAMP COMPANY, A CORPORATION OF PENNSYLVANIA.

COIL-BENDING DEVICE.

Application filed June 18, 1921. Serial No. 478,543.

To all whom it may concern:

Be it known that I, GEORGE BANCROFT ROESCH, a citizen of the United States, and a resident of Bloomfield, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Coil-Bending Devices, of which the following is a specification.

This invention relates to an apparatus for shaping or bending filamentary material, and more particularly it has to do with means for bending incandescent lamp filaments into desired shapes for mounting.

An object of this invention is to provide a novel apparatus for forming bends in filamentary material such as coiled filaments without injuring the filaments; for simultaneously forming the bends in a plurality of wires fed to the apparatus; for forming such bends at uniform distances throughout the lengths of the several wires; and for varying the distances between bends in any two wires.

Other objects of the invention will be apparent from the following description.

In some types of incandescent lamps, it is desirable to employ coiled filaments bent into certain shapes such, for instance, as the "saw tooth" or "star" shape; both shapes being well known to persons skilled in this art. In making the bends in the coiled filament employed in such a lamp, particular attention is required to prevent the circular filament from becoming squeezed and set in an oval shape. Certain machines have been designed and successfully operated to accomplish this bending operation.

However, these machines are not susceptible to adjustment so as to change the spacing between the bends in the filament and for this reason lack flexibility.

The present invention contemplates a machine capable of forming bends at uniform distances in a filament, either of the coiled or uncoiled type and also being adapted to change the spacing between bends without special adjustment of the machine.

In understanding the invention, reference is to be made to the accompanying drawings in which;

Fig. 1 is a side view of my coil bending machine,

Fig. 2 is an end view of the machine with a portion of one of the standards broken away.

Fig. 3 is a view in elevation of a coiled filament mounted upon the supports of an electric incandescent lamp;

Fig. 4 is a view of a section of a coiled filament before bending; and

Fig. 5 shows a portion of bent filament.

The machine illustrated in the drawings is provided with two co-operating rollers 1 and 2 mounted on shafts 3 and 4 which in turn are mounted in suitable standards 5. The rollers are driven in synchronism by a suitable power transmitting means such as beveled gears 6 and 7 operated by a shaft 8 driven by any suitable source of power (not shown). The filament wire is formed or bent as it passes between the rollers by being moved into contact with dies 9 carried by the rollers. These dies are uniformly spaced as shown and are positioned to extend beyond resilient surfaces 10 which are usually formed of rubber. The action of the co-operating rollers in forming the bends is readily appreciated by reference to Fig. 2 wherein there is illustrated a filament 11 passing between the rollers. It is to be noted that one of the dies in roller 1 is engaging the resilient surface of roller 2 and is pressing the filament against the rubber surface to form a bend therein. The bend being formed corresponds to bends 12 already formed in the part of the filament which has passed from between the rollers. Preferably, the rollers are assembled to co-operate in a manner to have the dies in one roller engage the resilient surfaces of the other roller at points midway between the dies thereof. By reason of such co-operation of the rollers bends are formed in the filament at uniform distances.

The rollers in the machine are tapered and are arranged to have a line engagement. The dies carried by the rollers are positioned lengthwise of the rollers and in converging relationship to each other. With this type of co-operating rollers, filament wires may be fed between the rollers at any desired point along their engaging surfaces. Since the dies are converging from the right hand end of the rollers illustrated in Fig. 1 to the left hand end, it will be appreciated that the filament wires fed at the right hand end will have bends formed therein at greater distances apart than filament wires fed between the rollers at the left hand end. Such a design of the co-operating rollers

provides for simultaneously feeding a plurality of filament wires between the rollers to have bends simultaneously formed therein, and the space between the bends in any given wire will be different from that of the others.

Suitable means for properly feeding the filament wires between the rollers are provided in the form of guides 13 which are slidably mounted on a suitable support 14 carried by standards 5. For purpose of illustration, two of the guides are shown in Fig. 1 although it is to be understood that any number may be provided if desired. The support 14 carries a suitable calibrated scale 15 which is calibrated to indicate the distance between bends formed in a filament wire which may be fed between the rollers at a particular calibration point. The guides after being adjusted to a desired position, may be firmly affixed on the support 14 by tightening suitable set screws 16.

An illustration of a coiled filament wire shaped in a saw tooth form as an example of one of the shapes, is shown in Fig. 3 where an arbor 19 carries supporting wires 20 which in turn support the coiled filament wire at the bends

Although the present apparatus has been illustrated in connection with forming bends in coiled filaments, it is obvious that the filamentary material may consist of a straight length of wire or be in ribbon form.

The apparatus illustrated for accomplishing the objects of the invention, is subject to modifications and changes, and such modifications and changes are considered as being within the scope of the invention as defined by the appended claims.

What is claimed is:

1. In an apparatus for shaping filamentary material, co-operating rollers adapted to form bends in a filament fed therebetween and means for feeding said filament between said rollers at different points of their engagement to vary the distance between the bends.

2. An apparatus for shaping filamentary material having co-operating rollers and means for feeding a plurality of spaced filaments simultaneously therebetween, to cause the distance between said bends in any two of the filaments to be unequal.

3. In an apparatus for shaping metallic filaments, co-operating tapered rollers having protruding dies positioned lengthwise for forming bends in filament lengths fed between said rollers and means for feeding filament thereto at selected points thereon.

4. In an apparatus for shaping filamentary material, co-operating tapered rollers provided with resilient external surfaces and dies carried by said rollers and protruding through the resilient surfaces for forming bends in filament lengths fed between said rollers, and means for feeding filament thereto at any desired points therealong.

5. In an apparatus for shaping filamentary material, the combination of two tapered co-operating rollers having resilient surfaces and a plurality of slidable members for guiding filament lengths into contact with said rollers at different points along the engaging portions of said rollers.

6. In an apparatus for shaping filamentary material, tapered rollers co-operating to form bends in filament lengths passed therebetween, the distances between the bends in the several filament lengths being dependent upon the points at which they are fed between said rollers and means for feeding filament thereto at desired points.

7. In an apparatus for shaping wires, the combination of tapered rollers having line engagement, said rollers having protuding dies for making bends in wire fed therebetween and a scale juxtapositioned to said rollers for indicating distances between bends made in wires inserted at a given calibration.

8. In an apparatus for shaping wires, tapered co-operating rollers, dies carried by said rollers in converging relation for forming bends in wires fed therebetween transversely of their length and means for feeding wires thereto at desired positions.

9. In an apparatus for bending a filament, the combination of two tapered co-operating rollers, each of said rollers having a rubber covering intercepted at predetermined intervals by protruding dies positioned lengthwise of the rollers, means for driving said rollers in synchronism, a filament guide slidably mounted on a support and a calibrated scale to indicate distances between bends formed in the filament fed between said rollers.

10. A machine for bending filamentary material comprising converging shafts geared together, cooperating conical rollers on said shafts and provided with resilient surfaces, dies positioned on said surfaces along elements thereof and uniformly spaced, with the dies on one roller adapted to engage the surface of the other midway between the dies thereon, whereby the material may be bent alternately in opposite directions.

11. A machine for bending wire comprising converging shafts arranged to operate in synchronism, cooperating conical rollers thereon provided with resilient surfaces carrying straight dies arranged at uniform angular distances, the dies on one roller adapted to engage the surface of the other approximately midway between the dies thereon, whereby wire may be bent alternately in opposite directions and the

distance between bends regulated by passing the wire between the rollers at different points along the length thereof.

12. A wire forming machine comprising cooperating conical rollers rotatively mounted and provided with straight dies on the conical surfaces thereof adapted to form bends in wire or the like in opposite directions and uniformly spaced, the distance between bends depending on the location of the wire along the length of the rollers, while the same is being bent, means for guiding the wire to the rollers at a definite location and calibrated means cooperating therewith for indicating the distance between bends on the wire to be formed.

13. A machine for shaping a plurality of wires simultaneously comprising rotatively-mounted, cooperating conical rollers, provided with straight dies spaced uniformly around the perimeter thereof and each adapted to engage the surface of the opposite roller at points approximately midway between the dies on the other roller, said dies converging toward a point, whereby wires fed between said rollers at different points along the length thereof, are simultaneously bent, when the rollers are operated, the distance between the bends in a wire being uniform, but different from those in other wires.

14. A machine for simultaneously shaping a plurality of filaments comprising conical rollers mounted for cooperative relative rotary motion with substantially line engagement, straight dies mounted on each roller and uniformly spaced thereabout, the dies of one roller adapted to engage the surface of the other roller approximately midway between dies on said surface, a plurality of filament guides mounted along the length of the rollers whereby a plurality of filaments may be simultaneously fed to and bent when the rollers are operated, the distance between the bends in one wire differing from that in another.

In testimony whereof, I have hereunto subscribed my name this 17 day of June, 1921.

GEORGE BANCROFT ROESCH.