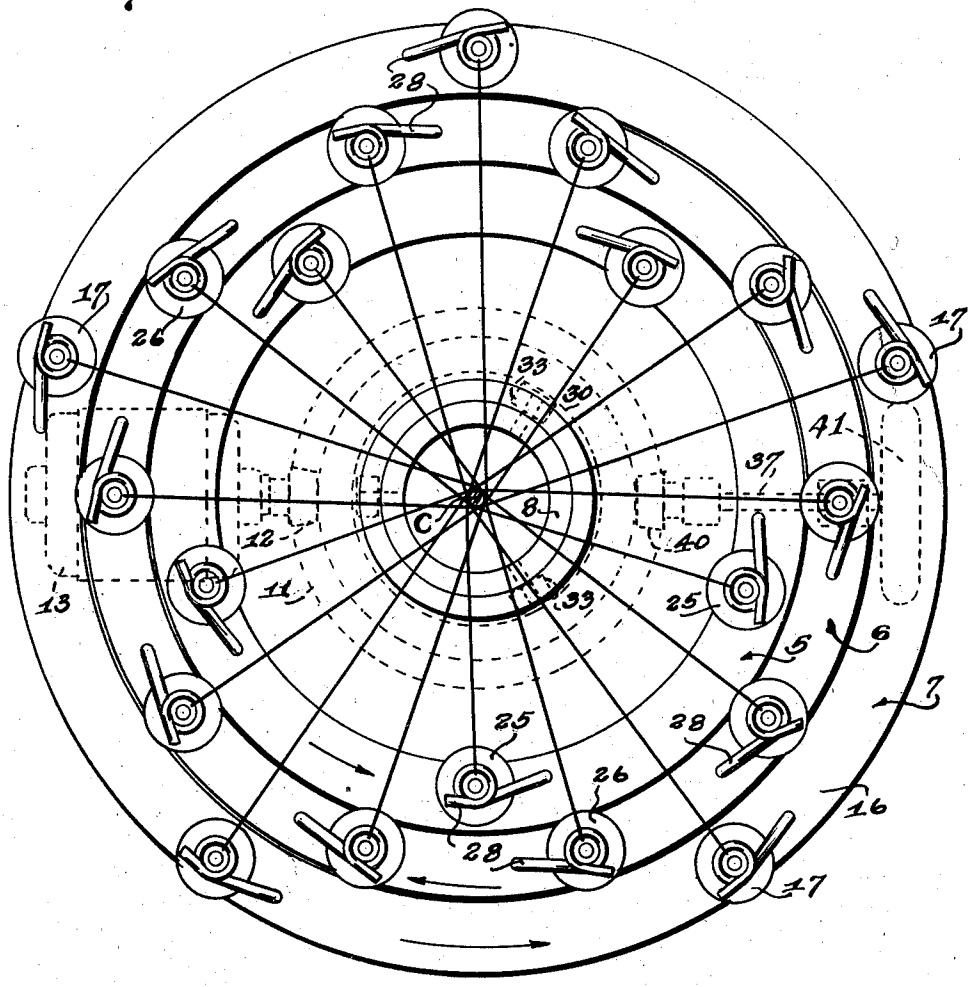
July 1, 1947. C. M. BELLG 2,423,289

WIRE WRAPPING MACHINE

Filed July 17, 1945 2 Sheets-Sheet 1

Fig. 1.



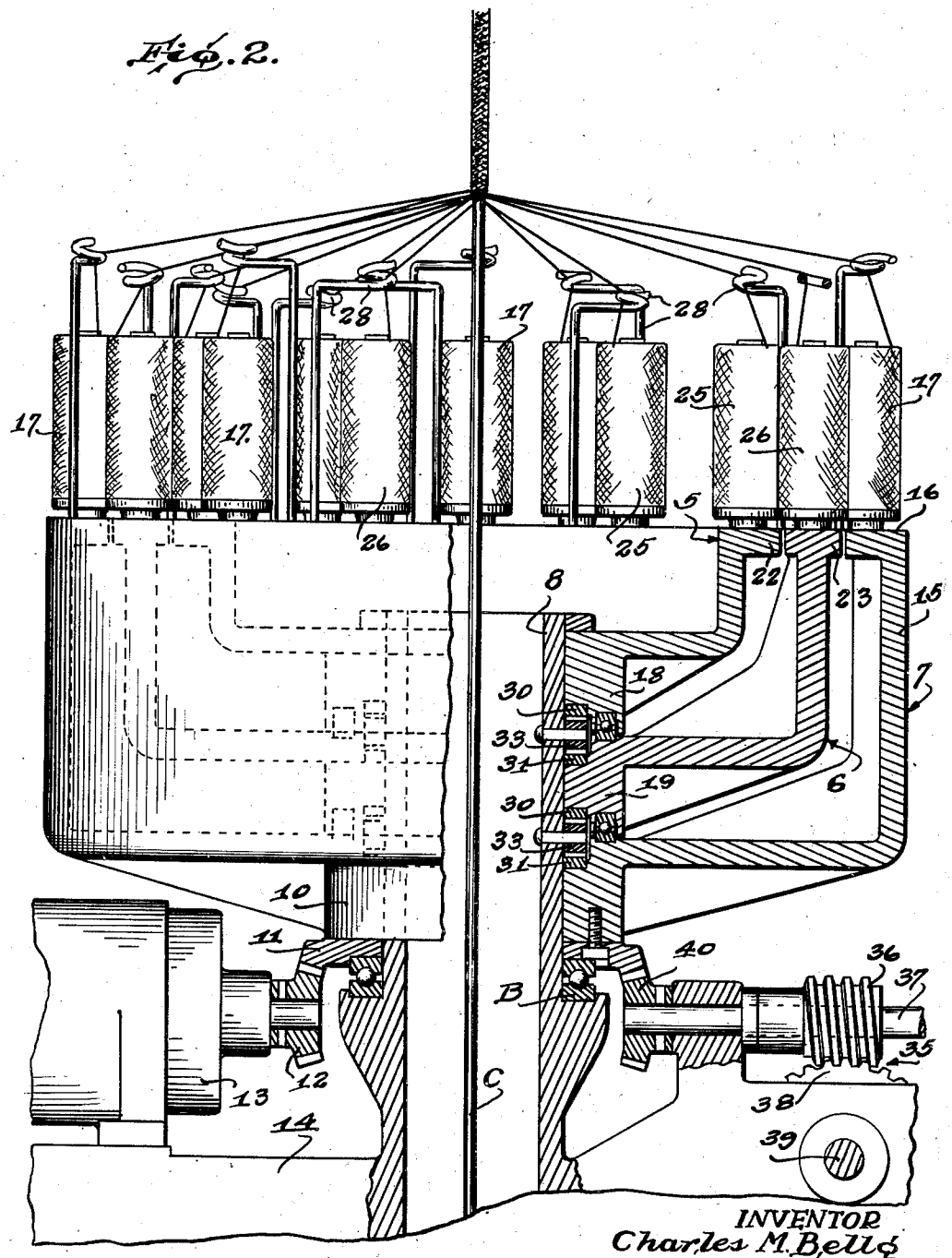
INVENTOR
Charles M. Bellg
By Malcolm W. Pierce
ATTORNEY

July 1, 1947. C. M. BELLG 2,423,289

WIRE WRAPPING MACHINE

Filed July 17, 1945 2 Sheets-Sheet 2

Fig. 2.



INVENTOR
Charles M. Bellg
By Malcolm W. Fraser
ATTORNEY

Patented July 1, 1947 2,423,289

UNITED STATES PATENT OFFICE

2,423,289

WIRE WRAPPING MACHINE

Charles M. Bellg, Toledo, Ohio

Application July 17, 1945, Serial No. 605,520

5 Claims. (Cl. 57—15)

1

The present invention relates to improved mechanism for applying wrappings or servings on wires, cables or stranded continuous bodies of cylindrical or other shape.

It is the usual practice to cover wires or other electrical conductors with insulating coverings, which are wrapped or braided thereon and such insulation often comprises a plurality of layers each impregnated with an electrical varnish. It is at times advisable in the interest of economy to wrap or serve the innermost layers rather than braid them since such operation is more rapidly accomplished. Also when considerable thickness of insulation is desired, heavier material may be more readily applied.

It is the primary object of the present invention simultaneously to apply a plurality of layers of insulation on a wire or the like by wrapping in a single operation.

It is another object of the invention to apply stranded insulating material to a wire in such a way that adjacent layers are wrapped in opposite directions whereby each layer operates to secure the adjacent inner layer against unraveling.

A further object of the invention is to provide an apparatus of relatively simple construction for rapidly and economically applying wire covering.

Other objects and advantages of the invention will become apparent during the course of the following description when considered in view of the accompanying drawings in which:

Figure 1 is a plan view of the apparatus in which the invention is embodied; and

Figure 2 is a side elevational view with parts being shown in section.

Insulation of electrical conductors such as wires has long been the subject of many and various combinations of material. The more common types usually comprise an inner coating or layer of rubber or like material covered with a layer or layers of wrapped or braided textile material, the outer layer being braided and impregnated with an electrical varnish or a bituminous composition such as asphalt, or other material having a high dielectric strength. In order to increase the thickness of the insulation on the conductor, a number of layers are usually applied. This material may be strands or slivers of cotton or other vegetable fibers or of inorganic fibers such as fibrous glass.

I have found that the application of insulating material to a wire may be accomplished rapidly and efficiently by wrapping several layers

2

simultaneously. While I have shown an apparatus for wrapping three layers at a time, it will be understood that a greater number may be applied by a simple duplication of the mechanism soon to be described.

Referring now to the drawings, the apparatus comprises generally three rotatable ring assemblies 5, 6 and 7 respectively forming a turret and concentrically mounted on a column 8, which forms the base support for the apparatus. The outer or drive ring 7 is provided with a hub 10 journaled on the column 8 and has a bevel gear 11 secured thereto and meshing with a pinion 12 carried by a variable speed drive motor 13. Thrust bearings B support the weight of the rings on the column. The motor is mounted on a bracket 14 formed on the column and drives the ring 7 in a counterclockwise direction, as indicated by the arrow in Figure 1.

The ring 7 is formed with an upstanding rim 15 terminating in an inwardly extending radial flange 16 which forms the support for the outer group of bobbins or strand carrying spools 17. The rings 5 and 6 are each provided with hubs 18 and 19 respectively journaled on the column 8 and bearings 20 are provided therebetween for rotataively supporting the rings which are supported in turn on the ring 7.

Inwardly extending radial flange 22 and flange 23 on the rings 5 and 6 respectively lie in the plane of the flange 16 and carry additional groups of bobbins 25 and 26. It will be noted in Figure 1 that the inner ring 5 carrying bobbins 25 rotates in the direction of the ring 7, as indicated by the arrow, and the number of bobbins is the same as that carried by the ring 7. The intermediate ring 6 rotates counter to the direction of the rings 5 and 7 and carries twice the number of bobbins 26 carried by either of the counter rotating rings. This arrangement provides for an equal number of strands being wound in each direction. Stripping guides 28 are provided adjacent each bobbin to assure unwinding and guiding the strand as the rings are rotated.

Rotation of the rings is effected by means of upper and lower ring gears 30 and 31 suitably secured within the hubs of the rings in the manner shown in Figure 2 and pinions 33 rotatably fixed to the column 8 and meshing with the gears 30 and 31. Thus rotation of the outer ring 7 and the ring gear 31 carried thereby, causes rotation of the pinion 33 which meshing with the ring 30 on the hub 19, produces a counter-rotating movement. This motion transmitted through

the gearing between the rings 5 and 6 causes the ring 5 to move in the direction of the ring 7. Gearing indicated at 35 in Figure 2 including a worm 36 mounted on a shaft 37 and worm wheel 38 on a shaft 39, may be employed if desired to drive a wire feed and take-up by means of a bevel gear 40 on the shaft 37 meshing with the driving gear 11. A hand wheel 41 shown in dotted lines in Figure 1, is provided for manually rotating the turret.

In operation, a conductor C which may be either a bare wire or one having previous coatings already applied, is fed axially upward through the column 8 by any suitable feeding and take-up means (not shown). Strands or slivers from the bobbins 17, 25 and 26 are started thereon. A coating of adhesive may first be applied to the conductor if desired.

As the strands are wound, the conductor is fed upwardly at a sufficient rate to produce a uniformly helical lay of the strands. This feeding speed may be so regulated that with the number of strands shown, that is five in the first layer, ten in the second and five in the third, a simulated woven pattern results. This effect may be produced by regulating the feed rate of the conductor so that the greater number of strands of the intermediate group forms a continuous layer and the strands of the outer group laying in the opposite direction, being less in number are consequently spaced apart a slight distance.

Machines of the present type may be arranged in multiple to apply additional layers continuously or combined with mechanism for impregnating the layers already applied.

Modifications may be resorted to without departing from the spirit of the invention or the scope of the appended claims.

What I claim is:

1. In an apparatus for covering wire including a rotatable turret, a stationary column supporting said turret, said turret comprising a plurality of concentrically arranged ring-like members adapted for rotation independently of each other, each ring having a hub and supported by the ring next below, means operatively connecting said rings, and responsive to rotation of said lowermost ring for driving said ring in opposite directions, a series of strand carrying bobbins on each ring member, and means for rotating the turret.

2. In an apparatus for covering wire including a rotatable turret, a stationary column supporting said turret, said turret comprising a plurality of concentrically arranged ring-like members adapted for rotation independently of each other, each ring having a hub and supported by the ring next below, means operatively connecting said rings including pairs of ring gears meshing with pinions mounted on said column, and responsive to rotation of said lowermost ring for driving said ring in opposite directions, a series of strand carrying bobbins on each ring member, and means for rotating the turret.

3. In an apparatus for covering wire including a rotatable turret, a stationary column supporting said turret, said turret comprising a plurality of concentrically arranged ring-like members adapted for rotation independently of each other, each ring having a hub and supported by the ring next below, means operatively connecting said rings including pairs of ring gears meshing with pinions mounted on said column, and responsive to rotation of said lowermost ring for driving said ring in opposite directions, a series of strand carrying bobbins on each ring member, stripping guides for each bobbin for guiding the strand on the wire as it is wound, and means for rotating the turret.

4. In an apparatus for covering wire including a rotatable turret, a stationary column supporting said turret, said turret comprising separately rotatable members each formed with a hub providing a bearing on said column, each of said members including radially extending portions having upstanding annular flanges concentrically arranged and terminating in a common plane, a plurality of strand carrying bobbins on each of said flanges, a driving gear secured to the lowermost of said hubs, vertically arranged pairs of ring gears cooperatively disposed between the hubs of adjacent members and secured thereto, pinions meshing with said pairs of ring gears secured to said column whereby movement of one rotatable member in one direction produces movement of the next adjacent member in the opposite direction, means for driving said lowermost member whereby strands drawn from the bobbins carried by each member are wrapped in opposite directions around a wire passing through said turret, and means for guiding the strands as they are drawn from the bobbins.

5. Apparatus for wrapping an insulating material about a continuously moving wire including a rotatable turret, said turret comprising concentric strand carrying members adapted for rotation, said members being mounted about a central hub, means forming a part of said mounting interconnecting said members in a manner concomitantly to transmit the rotational movement of one member to reverse rotational movement to the members adjacent, and means for imparting rotational movement to one of said members.

CHARLES M. BELLG.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,209,903	Subers	Dec. 26, 1916
1,445,651	Subers	Feb. 20, 1923