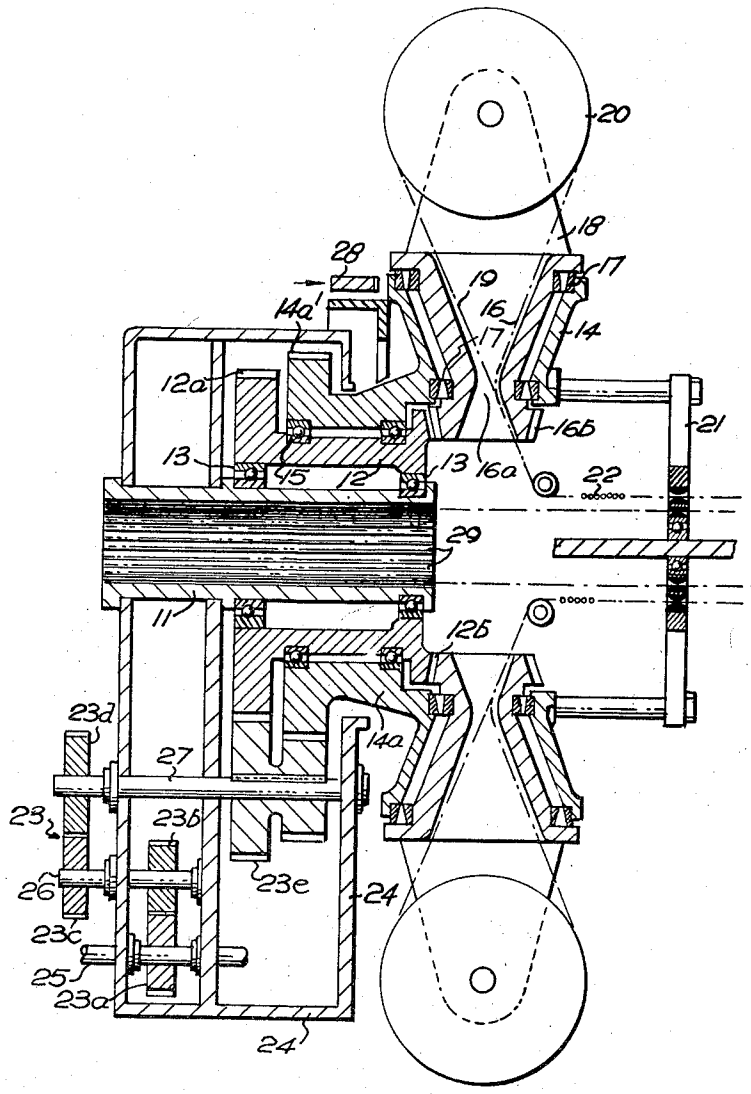
Dec. 1, 1964 E. CARTER 3,158,980

STRANDING MACHINES

Filed July 24, 1962



INVENTOR:
ERIC CARTER

BY
Brumbaugh & Ben

United States Patent Office 3,158,980 Patented Dec. 1, 1964

3,158,980

STRANDING MACHINES

Eric Carter, Lytham St. Annes, Lancashire, England, assignor to B. & F. Carter & Company Limited, a company of Great Britain, Northern Ireland and the Isle of Man

Filed July 24, 1962, Ser. No. 211,988
Claims priority, application Great Britain Aug. 9, 1961
3 Claims. (Cl. 57—13)

The invention concerns stranding machinery and more particularly relates primarily, though not exclusively, to machinery for manufacturing wire-rope, electrical conductors or like assemblies. For convenience such machines will hereinafter be referred to as "a stranding machine of the kind specified."

In conventional machines for manufacturing wire-rope it is usual to have a plurality of bobbin carrying cradles mounted longitudinally of the machine for rotation about an horizontal axis. Each cradle is adapted to be rotated about an axis parallel to the said horizontal axis in order that twist might be imparted to the individual wires as the latter are drawn from their respective bobbins, the said bobbins being mounted transversely of the respective bobbin cradle.

Such conventional machines, although widely used, do suffer from disadvantages. For example, if a large number of wires are to be wrapped, the length of the machine is often excessive. An important consideration is the time taken to recharge the machine with full bobbins. It is usual with conventional machines, particularly in view of their complexity, to recharge the machine from above and, in view of the weight of the full bobbins, it is necessary to provide lifting equipment for this purpose. To recharge machines from below would be advantageous but, with present machines, impracticable.

It is among the objects of the present invention to provide a stranding machine of the kind specified which avoids some, at least, of the before-mentioned disadvantages.

According to the invention a stranding machine of the kind specified includes at least one wheel-like member mounted for rotational motion about the axis thereof, a plurality of bobbin carriers mounted upon each said wheel-like member and means for rotating said wheel-like member and said bobbin carriers, each said bobbin carrier having a through hole in the body thereof disposed in a direction corresponding to the rotational axis of the carrier and through which a strand from the bobbin supported by the carrier passes.

In a preferred embodiment of the present invention a stranding machine of the kind specified includes at least one wheel-like member mounted for rotational motion about the axis thereof, a plurality of bobbin carriers mounted upon each said wheel-like member for rotational motion about an axis directed substantially radially of such member, means for rotating said wheel-like member and means for rotating the said bobbin carriers.

More particularly, according to the present invention each said wheel-like member is mounted co-axially with and supported upon a fixed, rigid tube and the means for rotating the carriers includes a bevel gear mounted for rotation about the axis of the tube and adapted to mesh with a complementary bevel gear on said carrier.

In a preferred embodiment each carrier is adapted to allow passage of a wire from the bobbin mounted on said carrier radially inwardly towards the axis of rotation of the tube.

The invention will now be described further, by way

of example only, with reference to the single figure of the drawings which illustrates, in diagrammatic view, one embodiment thereof.

Referring now to the drawings a stranding machine for the manufacture of an electrical conductor element or a steel-wire rope includes a rigid tube **11**, a sleeve-like member **12** mounted on bearings **13** for rotational motion about the tube **11**, a wheel-like member **14** having an axial flange **14***a* disposed radially outwardly of the sleeve-like member **12** and rotatably mounted thereon through bearings **15**, a plurality of bobbin carriers **16** carried by the wheel-like member **14** for rotational motion in bearings **17** about an axis directed transversely of the tube **11**.

The sleeve-like member **12** has a pinion gear **12***a* at one end thereof and a bevel gear **12***b* at the opposite end. The remote end of the axial flange **14***a* carries a pinion gear **14***a'*.

To the bobbin carrier **16** are secured bobbin mounting lugs **18**, and the said carrier is provided with a central passageway **16***a* to permit passage of a wire **19** from a bobbin **20** towards a guide-plate **21**. Suitable guides, indicated at **22**, will be provided to assist in controlling the wire. A bevel gear **16***b* is formed at the inner end of the carrier **16** and is in engagement with the bevel gear **12***b* on the sleeve-like member.

Drive to the sleeve-like member **12** and the wheel-like member **14** is effected through a gear train **23** mounted in bearings in the machine framework **24**. A pinion gear **23***a* on a drive shaft **25** is in mesh with a further pinion gear **23***b*, the latter being keyed to a shaft **26**. The shaft **26** carries a second gear **23***c* which is in engagement with a pinion gear **23***d* on shaft **27**. Keyed to shaft **27** is a multiple gear **23***e*, such gear **23***e* being operatively engaged with the pinion gear **12***a* on the sleeve-like member **12** and with the pinion gear **14***a'* on the flange **14***a*. It is readily apparent that the gears **23***a*, **23***b* may be readily changed thus to give a different rate of rotation of the multiple gear **23***e* for a given input shaft speed.

In operation rotation of the sleeve-like member **12** will cause the bobbin carrier **16** to rotate, and simultaneously the wheel-like member **14** will be rotated about the axis of the tube **11**. Thus during the wrapping operation wire drawn from the bobbin will be twisted or untwisted depending upon the sense of rotation of the carrier. It will, of course, be evident that the machine may be operated without imparting any rotational motion to the carrier by driving only the pinion gear **12***a* from the compound gear **23***e*.

It is to be understood that the assembly such as has been described will normally be used in conjunction with other like assemblies placed in tandem therewith and thus a multiplicity of separate and distinct layers of wires may be introduced. If a considerable number of wires are to be used to form a single layer and it would not be practicable to provide a single head carrying a sufficient number of bobbins, a number of the assemblies illustrated may be grouped and wires led from one assembly to another along the inside of the tube all wires passing through a die prior to application to the core.

In order to facilitate the guiding of the wires between successive heads it has been found convenient to provide a nest of tubes **29** longitudinally of the tube **11**, each such tube guiding an individual wire.

Furthermore, wire tensioning means will be incorporated either at each bobbin or at a point remote therefrom. Again, an automatic stop motion will be incorporated if desired, such stop motion being connected to a pneumatic or other brake acting on the wheel-like member, for example as at **28**.

It is thought that the machine proposed will be such as to be capable of being loaded from below and thus the recharging of the machine will be greatly facilitated, and speeded up.

It is also thought that the rate of production of the machine proposed will be in excess of a conventional machine. A further advantage of the new machine lies in the reduction of the number of loose parts and in the facility of leaving inoperative particular units when not required for use.

In an alternative embodiment it is proposed to have a multi-ring of bobbin carriers in a cage or like assembly and to rotate said carriers in a manner analogous to that hereinbefore set out.

A machine constructed in accordance with the present invention will possess some or all of the following advantages:

(*a*) Since the wires, initially, are directed radially of the head and subsequently lie parallel to the axis of the machine at only a small distance therefrom, excessive ballooning is avoided and thus the tension applied is not modified by rotation of the head;

(*b*) The machine can be operated at a higher rotational speed than can conventional machines since the cradles or cones exert outward thrust only—unlike the cradles on conventional planetary machines which rotate on a layer common radius and must, therefore, produce more out of balance load;

(*c*) The windage on the machine according to the invention is less than on known machines, the present machine being devoid of discs or heavy cradles;

(*d*) The reloading can be effected from floor level and thus heavy lifting tackle is not required; and

(*e*) Individual heads may be left stationary if desired and thus the machine is economical in power consumption.

What is claimed is:

1. A stranding machine of the character described comprising, a support, a tube fixedly supported thereby and through which wires are guided, a rotatable sleeve mounted around the tube and supported by bearings interposed between the tube and sleeve, a wheel-like member having a hub portion disposed around the sleeve and supported on bearings interposed between the sleeve and said hub portion, the sleeve including a gear and the hub portion including a gear, gearing engaging with both of said gears and acting to rotate both the sleeve and the wheel-like member co-axially, the wheel-like member carrying a plurality of bobbin carriers, each of said bobbin carriers being rotatable about an axis transverse to the axis of the fixed tube, each bobbin carrier including lugs for receiving a bobbin with the axis of such bobbin disposed transverse to the axis of the bobbin carrier on which it is mounted, each bobbin carrier including a passage extending through it and through which wire drawn from its bobbin is passed, each bobbin carrier having a gear, and the sleeve having a bevel gear engaging the gears on the bobbin carriers to thereby rotate said bobbin carriers around their axes.

2. A stranding machine as provided for in claim 1, wherein each of the bobbin carriers is bodily carried by the wheel-like member around an axis co-inciding with the axis of the rotatable sleeve, said bobbin carriers being rotated around axes transverse to the axis of the wheel-like member, the passages through the bobbin carriers having their axes co-inciding with the axes of the bobbin carriers and the axes of the bobbins transported by said bobbin carriers being transverse to the axes of the passages.

3. A stranding machine comprising, a supporting frame, a drive shaft and means for rotating the same, drive gearing on said shaft, a fixed tube supported by the frame and through which wires are guided, a sleeve disposed around and co-axially situated with respect to the tube, bearings interposed between the tube and sleeve, the sleeve being provided at one end with a gear in mesh with the drive gearing, a wheel-like member having a hub disposed around the sleeve and arranged co-axially therewith, bearings interposed between the sleeve and the hub, the sleeve being provided at one end with a gear in mesh with the drive gearing, the sleeve having a bevel gear at its opposite end, the wheel-like member carrying a plurality of rotatable bobbin carriers, each bobbin carrier having a gear in mesh with the bevel gear, each bobbin carrier having a bobbin support and having a wire-guiding passage through which the wire drawn from its bobbin is passed.

References Cited in the file of this patent

UNITED STATES PATENTS

275,743	Zellers	Apr. 10, 1883
395,363	Splitdorf	Jan. 1, 1889
727,751	Coriasco	May 12, 1903
1,784,859	Weston	Dec. 16, 1930
1,788,641	Sunderland	Jan. 13, 1931
1,990,849	Wagon	Feb. 12, 1935
2,504,020	Hanson	Apr. 11, 1950
2,873,569	Schinke et al.	Feb. 17, 1959
2,907,164	Grieve et al.	Oct. 6, 1959
2,931,162	Klein et al.	Apr. 5, 1960