Sept. 19, 1961 E. A. RICHAUD 3,000,169

TUBULAR STRANDING MACHINE

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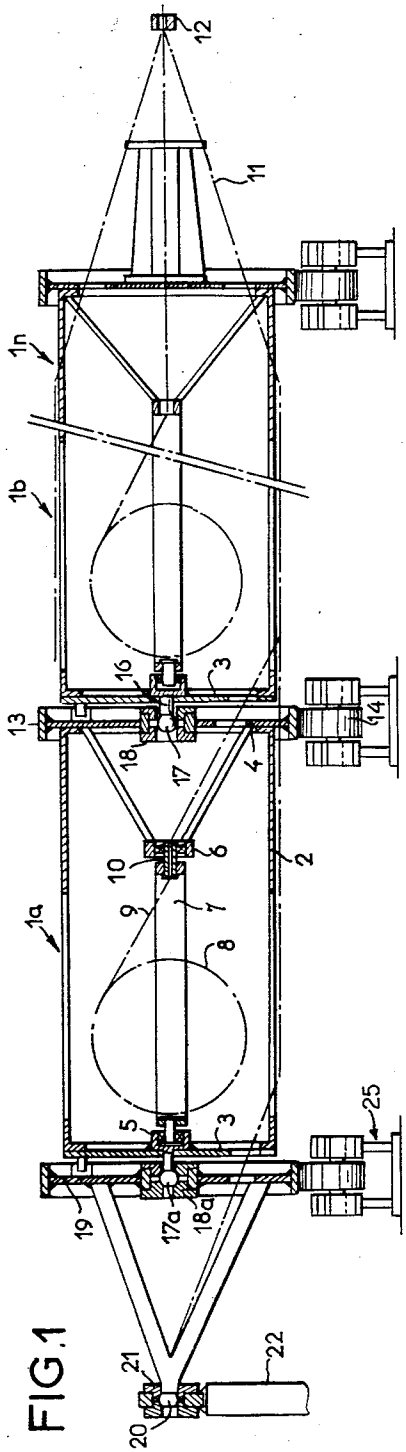


FIG.1

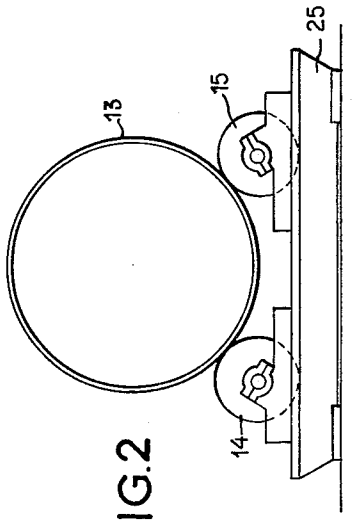


FIG.2

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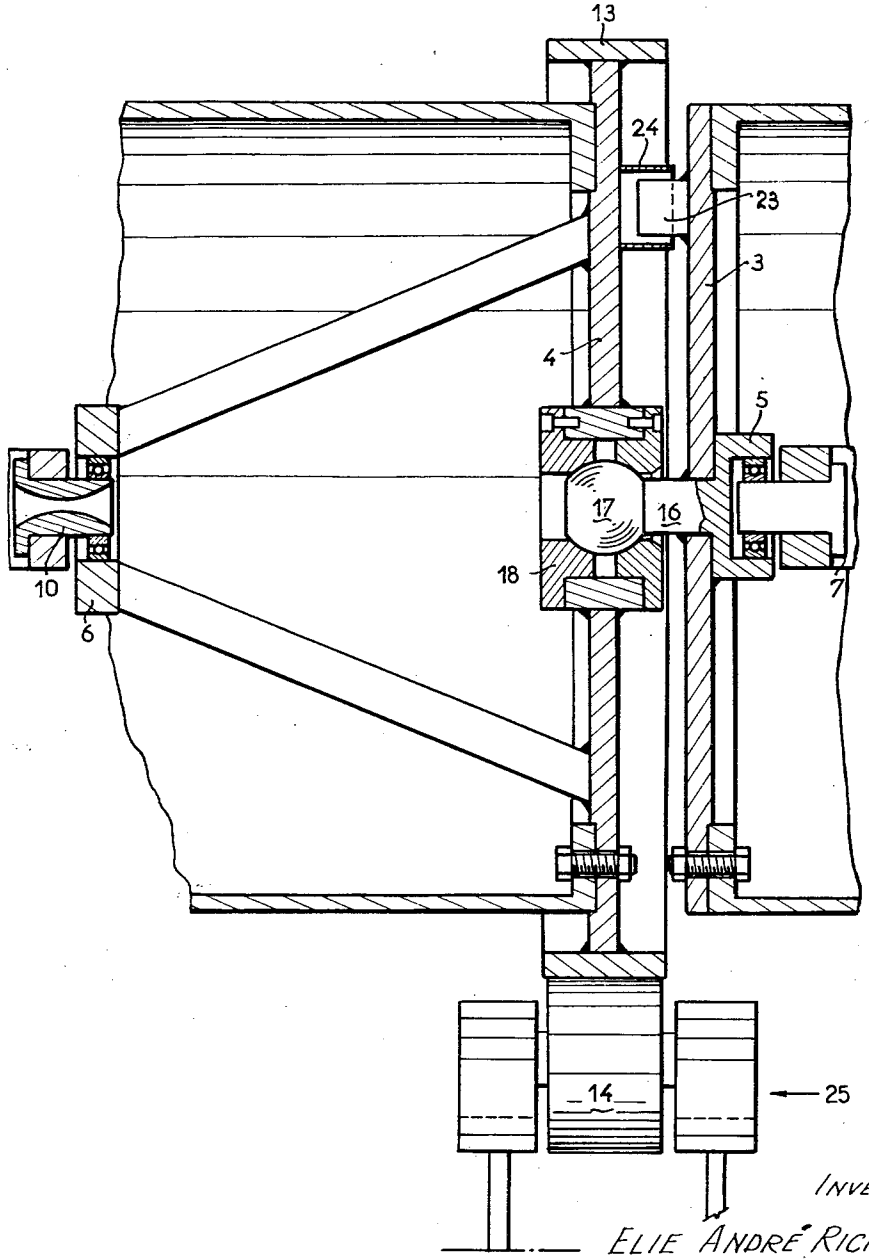
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FIG. 3



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TUBULAR STRANDING MACHINE

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3 Claims. (Cl. 57—58.34)

The present invention has for its object improvements in tubular stranding or cabling machine in which the threads, wires or strands which are delivered by drums or reels supported on rotating tubular members are wound helically in a draw-plate.

As a rule, in machines of this type, the reels of wire are supported by a continuous rigid tubular body resting on a plurality of supporting members, usually pairs of rolls distributed over the entire length of the tube. With this arrangement, on account of the large number of supporting members and of their unequal wear, and also on account of the geometric imperfections of the continuous tubular body, alternate bending stresses occur in the tubular body which are harmful to the good working of the stranding machine and set up vibrations, thus limiting the speed of rotation and consequently the output of the machine.

In order to overcome this disadvantage at least partially, it has been proposed to constitute the tubular body of the stranding or cabling machine by separate members coupled together by means of elastic assemblies. In this form of construction (U.S. Patent No. 2,416,126) each member rests on two pairs of rollers and drives its neighbour by means of a flexible coupling. This arrangement eliminates bending stresses.

This advantage is only achieved, however, at the cost of various serious drawbacks. The faulty adjustment or the wear of one roller puts the tubular member out of line with respect to its neighbours. The elastic joint which couples these members so as to provide a common drive has to be designed so as to take into account this difference of alignment, thereby involving a complication in the construction. Furthermore, the number of rollers is considerable and the driving power needed is considerable.

The present invention has for its object an improvement in the construction of a tubular body having separate elements, which removes these disadvantages.

In accordance with the invention, each member of the tubular body is supported only at three points, namely, two supporting rollers on the ground at one extremity of the member and a knuckle-joint, Cardan joint or the like at the other extremity, this latter being supported by the adjacent member.

With this arrangement, which also eliminates the bending stresses, the axes of the various tubular members are always concurrent in pairs. The displacement of a supporting roller does not result in harmful disalignment. The driving of one tubular member by the adjacent member can be effected in a very simple manner. Since each member only requires one pair of rollers, the construction is simplified and less costly. The energy expended in operation is less.

The accompanying drawings illustrate by way of example only, and not by way of limitation, a form of embodiment of the improvements in accordance with the present invention.

FIG. 1 is a diagrammatic view in axial cross-section of a tubular stranding machine in accordance with the invention.

FIG. 2 is a diagrammatic view looking on the end of the stranding machine.

FIG. 3 is a view on a larger scale, of part of FIG. 1.

Reference being made to FIG. 1, the stranding machine

is composed of tubular sections such as 1*a*, 1*b*, . . . 1*n* coupled end to end in alignment, or at least substantially in alignment; each of these sections is constituted by a cylindrical casing 2 with a front base wall 3 and rear wall 4. Between a roller-bearing 5 mounted on the front end wall 3 and a roller-bearing 6 rigidly fixed to the rear end wall 4, there is mounted a freely rotating cradle 7 co-axial with respect to the cylindrical casing 2 and on which is fixed a reel of wire 8, the axis of which is at right angles to the axis of rotation of the cradle 7.

The wire 9 delivered by the reel 8 passes through a guide 10 which is co-axial with respect to the cradle 7, passes through the front end-wall 3 and the external cylindrical casing of the following section and is guided towards the front along a generator line of the stranding machine from one section to the next up to the last section, at which point the different wires or threads are formed into a rotating converging sheaf 11, advancing towards a cable die 12.

A roller-ring 13 is welded to the external periphery of the end-wall 4 of each section, said roller-ring being co-axial with respect to the casing of the section and intended to rest on two rollers 14 and 15 arranged symmetrically with respect to the axial vertical plane of each section and supported on the ground by supporting members 25. On the front face of each section is mounted a shaft 16 which terminates externally in a knuckle-joint 17 which is mounted in the spherical housing of a casing 18 rigidly fixed to the rear end-wall of the adjacent section. However, in the case of the section 1*a* the knuckle-joint 17*a* is mounted in the spherical housing of the casing 18*a* rigidly fixed to a wheel 19 supported on two lower rollers and applied by the knuckle-joint 20 to the casing 21 on a base-plate 22.

The coupling between two adjacent sections is effected through the intermediary of a device constituted by a lug 23 rigidly fixed to the bottom wall of a section and engaging with suitable play in the interior of a sleeve 24 rigidly fixed to the bottom wall of the adjacent section.

The suspension of each section of the stranding machine is ensured by three points of support, namely, two rollers 14 and 15 and a knuckle-joint 17. In fact each of these rollers 14 and 15 can be assumed to form a single point of support, in view of its small dimension in the axial direction and the knuckle-joint 17 also constitutes a single point of support. Since the coupling device 23—24 does not transmit any bending stress, the suspension of each section is therefore equivalent to only three points of support.

It is clearly understood that the present invention is not restricted to the form of construction as hereinbefore described and illustrated. It follows from this, for example, that the point of support on the adjacent section can be constituted by any arrangement equivalent to a pivotal point of the knuckle-joint type, such as a universal ball-bearing, a Cardan-type coupling, etc., or any other device having two degrees of freedom. The means for coupling in rotation between two adjacent sections can also be constructed in different ways: either elastic coupling with a spring, spring-blade, or with interposition of elastic members such as cushions of rubber of the "silent-block" type, pivotally mounted connecting-rods, etc.

What I claim is:

1. A cabling machine composed of a rotating tubular body of separate members assembled together, said members carrying wire reels which deliver wire thereon to a cabling unit, means for supporting said rotating tubular body in which each member is supported at only three points and consisting of two rollers mounted in rotation about their axes on said supporting means and arranged in a same transverse section and carrying one extremity

of the member, and a coupling of the knuckle-joint type supported by the adjacent member at the other extremity of the member.

2. A cabling machine composed of a rotating tubular body of separate members assembled together, said members carrying wire reels which deliver wire thereon to a cabling unit, means for supporting said rotating tubular body in which each member is carried at only three points of support and consisting of two rollers mounted in rotation about their axes on said supporting means and arranged in a same transverse section and carrying one extremity of the member, and a coupling of the knuckle-joint type resting on the adjacent member at the other extremity of said member, the two adjacent members being additionally coupled by means of a device for driving in rotation with freedom of longitudinal movement.

3. A cabling machine composed of a rotating tubular body of separate members assembled together, said members carrying wire reels which deliver wire thereon to a

cabling unit, means for supporting said rotating tubular body in which each member is carried at only three points of support and consisting of two rollers mounted in rotation about their axes on said supporting means and arranged in a same transverse section and carrying one extremity of the member, and a coupling of the knuckle-joint type supported on the adjacent member at the other extremity of said member, one of said members being provided with a lug, the other member with a sleeve, said lug being engaged with play inside said sleeve thus ensuring that the two adjacent members are driven in rotation.

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