Nov. 22, 1949 T. T. BUNCH 2,489,006

COP-CARRYING DEVICE FOR BRAIDING MACHINES

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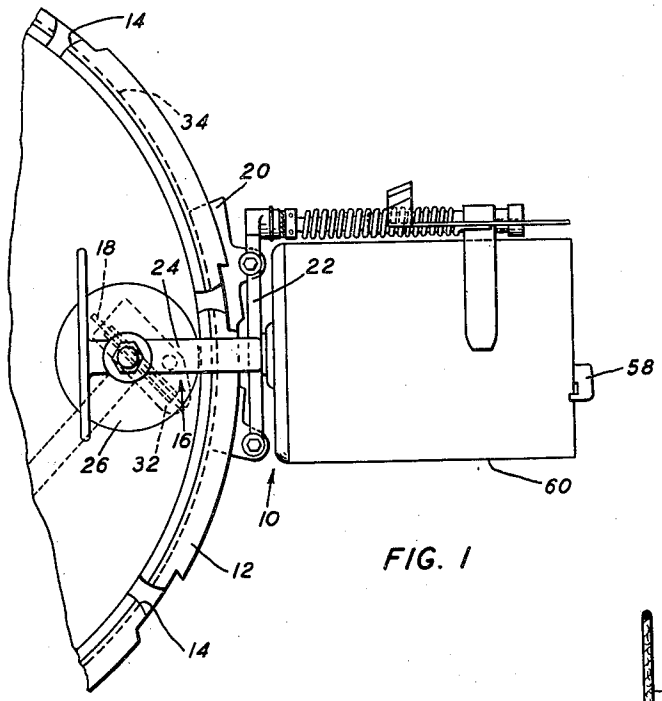


FIG. 1

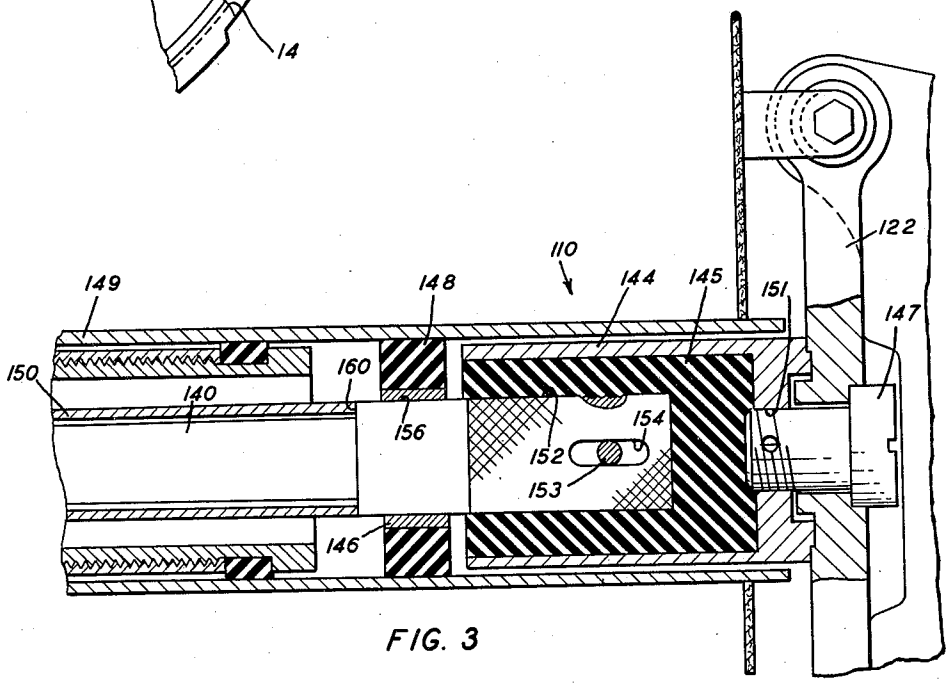


FIG. 3

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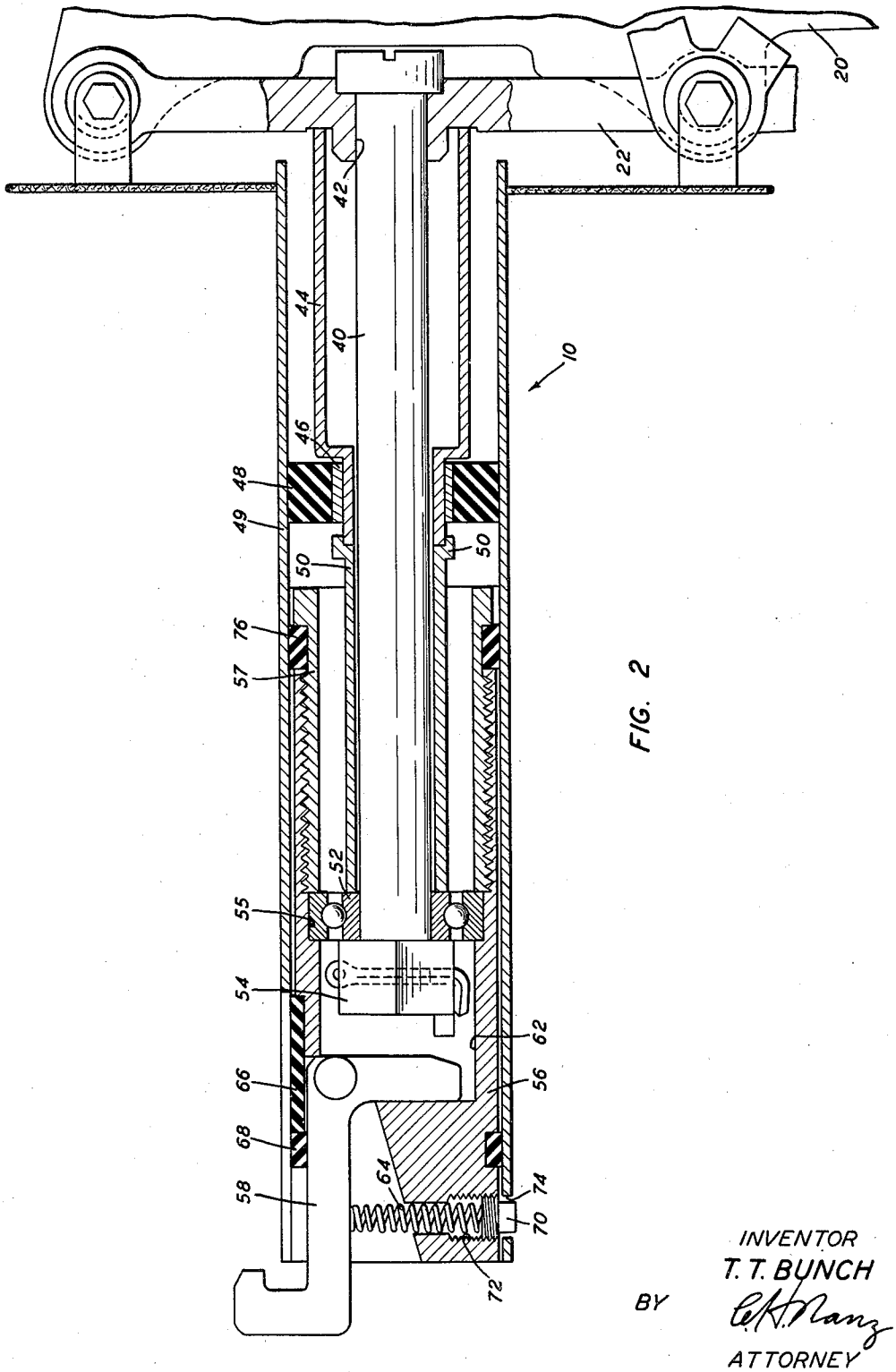


FIG. 2

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2,489,006

COP-CARRYING DEVICE FOR BRAIDING MACHINES

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Application August 9, 1947, Serial No. 767,804

5 Claims. (Cl. 87—55)

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This invention relates to cop-carrying devices for braiding machines, and has for an object the provision of new and improved cop-carrying devices for braiding machines.

A further object of the invention is the provision of new and improved cop-carrying devices for braiding machines which include vibration-damping means to eliminate fatigue failure of the devices.

In the manufacture of filamentary articles wherein tubular sleeves are formed by braiding a plurality of strands together, cops of such strands are rotated in opposite directions by two groups of cop-holders of a braiding machine. In a machine of one type, one of the groups of cop-holders is rotated around an annular guide track, and this group of cop-holders are carried along the guide track by carriers which slide on the guide track. The guide track is provided with a series of slots to provide clearance for the strands of the other group of cop-holders during the interweaving of the strands; and as the carriers are moved over the slots at high rates of speed, vibrations in the carriers and the cop-holders are set up. These vibrations sometimes are great enough to cause fatigue failure of the cop-holders and carriers during a high speed operation thereby causing considerable damage to the braiding machine.

A cop-carrying device illustrative of certain features of the invention includes a draw bar, a cop-supporting tube, means including vibration-damping material for mounting the tube rotatably on the draw bar, and a latch secured to the draw bar for retaining a cop on the tube.

A complete understanding of the invention may be obtained from the following detailed description of a cop-carrying device forming a specific embodiment thereof, when read in conjunction with the appended drawings, in which:

Fig. 1 is a fragmentary, top plan view of a cop-carrying device illustrative of certain features of the invention;

Fig. 2 is an enlarged, fragmentary horizontal section of a portion of the device, and

Fig. 3 is an enlarged, fragmentary vertical section of a cop-carrying device forming another embodiment of the invention.

Referring now in detail to the drawings, a plurality of cop-holders, illustrated by cop-holder 10, of a braiding machine are moved around an annular guide track 12 having strand-clearing slots 14—14 therein by carriers illustrated by a carrier 16, which are moved along the guide track by mutilated discs, illustrated

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by a mutilated disc 18. Except for certain features of the cop-holders and the carriers, the braiding machine is substantially identical to those disclosed and claimed in G. E. Henning Patent 1,895,462 and G. E. Henning Patent 1,895,463, to which patents reference is made for a disclosure of the general features of the machine.

The carrier 16 includes a fiber guide shoe 20 (Fig. 2) carried by a shoe-holder 22 fastened to a bridge 24 (Fig. 1). The bridge connects the shoe-holder to a fiber roller 26 and a slotted fiber driving shoe 32. The mutilated disc 18 pushes the driving shoe 32 to move the carrier 16 along the guide track 12 at a high rate of speed, and, as the carrier is moved along the guide track, the shoe 20 slides along an outwardly facing groove 34 formed in the guide track and the roller 26 rolls along the inside of the guide track. When the shoe 20 and the roller 26 are moved over the slots 14—14 in the guide tracks, vibrations are set up in the shoe, the roller and the bridge 24, all of which are strong enough to withstand the stresses resulting from the vibrations.

The cop-holder 10 includes a draw bar 40 (Fig. 2) fitted into a bore 42 in the shoe-holder 22 and a tubular post 44 projecting from the shoe-holder. A bushing 46 is rotatably mounted on the necked down outer end of the tubular post, and has therearound a damping ring 48 for mounting a cop-supporting sleeve 49 resiliently. The damping ring 48 is composed of a cured polymerized chloroprene (neoprene) compound or other resilient cured elastomer material having high internal friction, such as vulcanized rubber or synthetic rubber-like compound.

A spacer 50 extending from the tubular post 44 spaces a radial-and-thrust bearing 52 on the draw bar 40, which has a nut 54 keyed to the outer end thereof. The bearing 52 is mounted in a counterbore 55 formed in a latch body 56, and is secured therein by an internal nut 57. A latch 58 for securing a cop 60 (Fig. 1) on the sleeve 49 (Fig. 2) is mounted pivotally in a slot 62 formed in the latch body, and is urged to a latching position by a compression spring 64. A plate 66 composed of the same material as that of the damping ring 48 damps vibration of the latch and eliminates noise therefrom, and a ring 68 composed of the same material as the plate 66 and the ring 48 supports the outer end of the sleeve 49. A threaded plug 70 screwed into a tapped bore 72 formed in the latch body 56 extends loosely through a bore 74 formed in the

sleeve to secure the sleeve to the latch body. A ring 76 composed of the same material as the ring 48 also supports the sleeve.

In the operation of the braiding machine, the cop-holder 10 is revolved around the axis of the braiding machine, and the cop 60 is urged against the latch 58 by centrifugal force. The latch transmits this force through the latch body 56, the internal nut 57, the bearing 52 and the nut 54 to the draw bar 40 so that none of this force is placed on the sleeve 49, which is relatively light in construction.

The rings 48, 68, and 76 and the plate 66 damp vibrational and shock forces between the draw bar 40 and the sleeve 49 having the cop 60 thereon so that fatigue failure of any of the elements of the cop-holder 10 and the carrier 16 is prevented. Furthermore, these damping elements quiet the operation of the braiding machine.

A cop-holder 110 (Fig. 3) forming an alternative embodiment of the invention is substantially identical with the cop-holder 10 (Figs. 1 and 2) except for a draw bar 140, a tubular container 144, a filler 145 composed of resilient material having high internal friction, such as a cured polymerized chloroprene (neoprene) compound or other material having similar characteristics, and a bolt 147. The bolt 147 is screwed into a tapped bore 151 formed in the tubular container 144 to secure the container to a shoe-holder 122. The filler 145 is molded adhesively over a knurled portion 152 of the draw bar 140, and permits relative longitudinal movement between the draw bar and the container. A pin 153 secured to the container extends loosely through a slot 154 in the draw bar to connect them together loosely.

A bushing 146 is rotatably mounted on an enlarged portion 156 of the draw bar 140, and a damping ring 148 identical with the damping ring 48 (Fig. 2) mounts a cop-supporting sleeve 149 (Fig. 3) resiliently. One end of a spacer 150 substantially identical with the spacer 50 (Fig. 2) abuts a shoulder 160 formed on the draw bar 140 (Fig. 3).

In the operation of the cop-holder 110, longitudinal vibrations and shocks are dissipated by the filler 145 in passing between the draw bar 140 and the container 144, and radial vibrations are dissipated in passing between the sleeve 149 and the draw bar 140. Hence, vibrations and shocks to or from the draw bar 140 as well as vibrations and shocks to and from the sleeve 149 are dissipated.

The above-described cop-carrying devices are quiet in operation, and have much longer operating lives than cop-carrying devices hitherto known. Thus, the maximum operating speeds of braiding machines including devices embodying the invention may be higher than has been feasible in the past.

What is claimed is:

1. A cop-carrying device, which comprises a tube for supporting a cop, a support, antifriction means mounted rotatably on the support, and means including an element composed at least partially of vibration-damping material for connecting the tube to the antifriction means, whereby vibrations transmitted between the tube and the support are damped.

2. A cop-carrying device for braiders, which comprises a revolvable carrier, a post carried rigidly by the carrier, a tube for supporting a cop, a cylindrical support carried by the carrier, a thrust bearing mounted on the support, a latch body connected to the outer race of the thrust bearing, a latch carried by the latch body for holding a cop on the tube, a plurality of rings composed of vibration-damping material for supporting the tube on the latch body, a radial bearing mounted on the support, and a ring composed of vibration-damping material for connecting the tube to the radial bearing.

3. A cop-carrying device for braiders, which comprises a carrier, means for supporting a cop, a post provided with a roughened end portion for mounting the cop-supporting means rotatably, a tubular container secured to the carrier, and a filler composed of vibration-damping material formed in the tubular container around the roughened portion of the post for connecting the post resiliently to the container, whereby the cop-supporting means is connected resiliently to the carrier and forces therebetween are damped.

4. A cop-carrying device for braiders, which comprises a carrier, means for supporting a cop, a post provided with a roughened end portion for mounting the cop-supporting means rotatably, a tubular container secured to the carrier, and a filler composed of a cured polymerized chloroprene compound formed in the tubular container around the roughened portion of the post for connecting the post resiliently to the container, whereby the cop-supporting means is connected resiliently to the carrier and forces therebetween are damped.

5. A cop-carrying device for braiders, which comprises a carrier, means for supporting a cop, a post provided with a roughened end portion for mounting the cop-supporting means rotatably, a tubular container secured to the carrier, and a filler composed of a cured elastomer compound formed in the tubular container around the roughened portion of the post for connecting the post resiliently to the container, whereby the cop-supporting means is connected resiliently to the carrier and forces therebetween are damped.

TILLMAN T. BUNCH.

No references cited.