G. HORN.

ROPE MACHINE.

APPLICATION FILED APR. 16, 1913.

1,093,053. Patented Apr. 14, 1914.

Fig. 1.

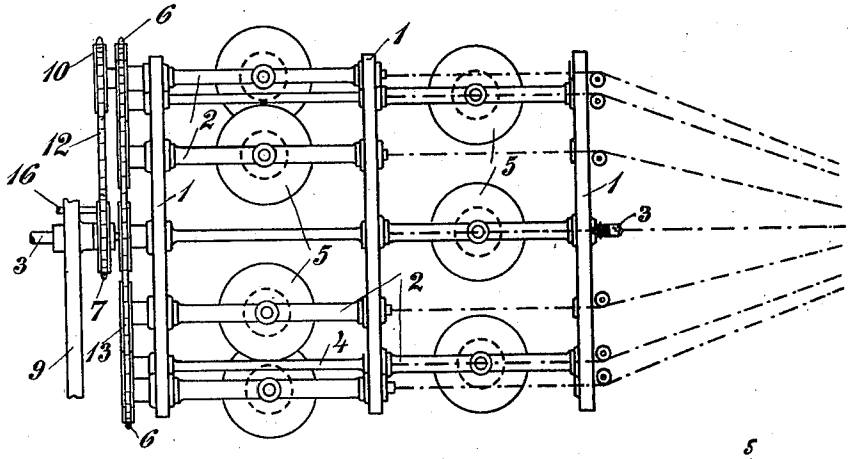


Fig. 2.

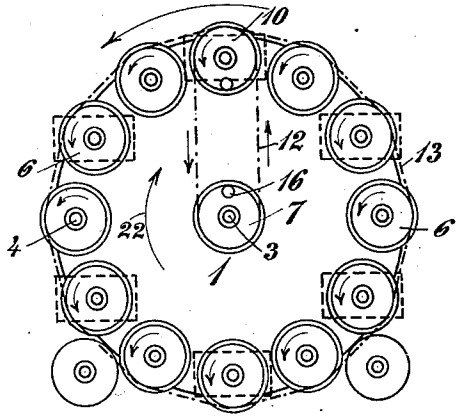


Fig. 6.

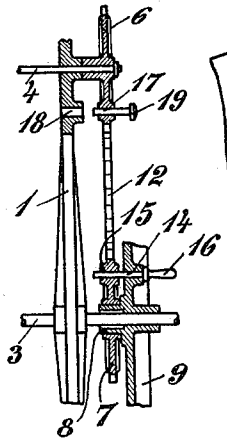


Fig. 5.

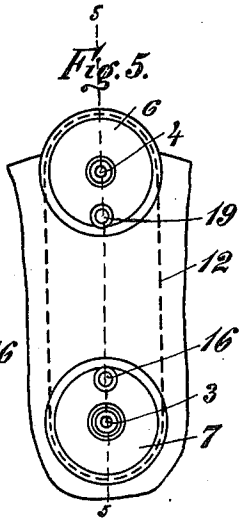


Fig. 3.

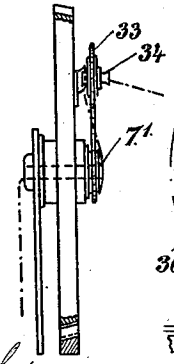


Fig. 4.

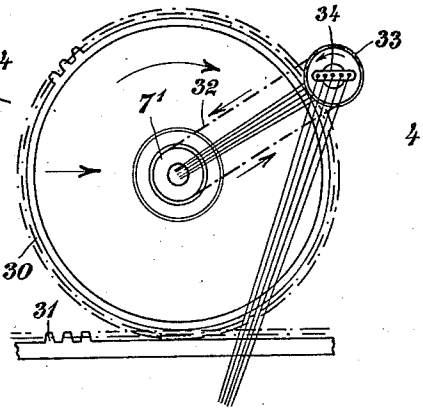
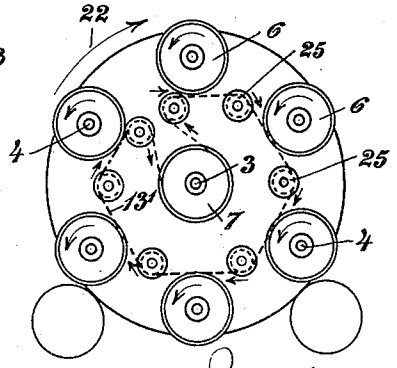


Fig. 7.



Witnesses
Ben R. Newcomb.

Inventor
Guido Horn.
by B. Singer Atty

UNITED STATES PATENT OFFICE.

GUIDO HORN, OF WEISSENSEE, NEAR BERLIN, GERMANY.

ROPE-MACHINE.

1,093,053. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed April 16, 1913. Serial No. 761,621.

To all whom it may concern:

Be it known that I, GUIDO HORN, a citizen of the German Empire, residing at Weissensee, near Berlin, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Rope-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in rope machines and the like, and more particularly in the apparatus for preventing twisting of the rope yarns which are being twisted to form a strand, or the strands which are being laid up to form a rope. And the object of the improvements is to provide an apparatus of this class which permits the use of the same elements in machines of different sizes, which does not require very exact fitting of the parts, and which can readily be thrown out of operation, when it is desired to twist the individual rope yarns or strands, as may be the case for example when twisting wires of particular cross-sections, or when applying strands as a covering to cables, etc.

With this object in view my invention consists in mounting driving members such as sprocket wheels on the bobbin frames, and connecting the same by a flexible member or members with each other and with a driving member which is mounted coaxially of the axis of revolution of the bobbins, and which can be fixed in position, so that when rotating the frame on which the bobbin frames are mounted the bobbin frames are rotated in the opposite direction and in such a way, that each of the axes of the bobbins remains parallel to its original position.

For the purpose of explaining the invention several examples embodying the same have been shown in the accompanying drawing in which the same letters of reference have been used in all the views to indicate corresponding parts.

In said drawing—Figure 1 is a side view of a frame which carries the bobbin frames and bobbins, Fig. 2, is an end view of Fig. 1 seen from the left, Fig. 3, is a side view of the apparatus for preventing twisting as applied in a braiding machine of the type shown in the patent of the United States to Lundgren No. 695,746 granted March 18th, 1902, Fig. 4, is a plan view of the machine shown in Fig. 3, Fig. 5, is a front view of a detail showing the device for throwing the apparatus for preventing twisting into or out of operation, Fig. 6, is a sectional view along line 5—5 of Fig. 5, and Fig. 7, is an end view similar to that shown in Fig. 2 and showing a modification of the apparatus for preventing twisting of the rope yarns or strands.

In the drawing only so much of the rope machine has been shown as is necessary for explaining the invention. As the invention may be embodied in various forms of rope making machines or the like, and such forms are known in the art, a description of the machine is unnecessary.

In the example shown in Figs. 1 and 2, a rotary main shaft 3 carries a main frame or laying head 1 on which a plurality of bobbin frames 2 are rotatably mounted by means of shafts 4. Each of the bobbin frames carries a bobbin 5 which is adapted to receive the strands or rope yarns to be laid up into a rope or twisted into a strand, as the case may be. Each of the shafts 4 of the bobbin frames has a sprocket wheel 6 keyed thereto, and coaxially of the main shaft 3 a sprocket wheel 7 is loosely mounted on a trunnion 8 provided on the standard 9 which supports the frame 1, as is best shown in Fig. 6. Furthermore one of the shafts 4 carries a second sprocket wheel 10 which is disposed in the same plane with the sprocket wheel 7. The sprocket wheels 7 and 10 have the same diameter, and also the sprocket wheels 6 have the same diameter, and preferably the diameter of all the sprocket wheels 6, 7, and 10 is the same. On the sprocket wheels 7 and 10 a chain 12 is trained, and all the sprocket wheels 6 are connected by a common chain 13. The sprocket wheel 7 can be locked in position by any suitable locking means. To show what may be done, the standard 9 which provides a bearing support for the main shaft 3 is made with a bore 14, and the sprocket wheel 7 is formed with a similar bore 15 which is adapted to be brought in register with the bore 14 by rotating the wheel 7, and when the said bores have been brought in register the sprocket wheel 7 can be locked in position by means of a locking bolt 16 adapted to be passed into the bores 14 and 15. In a similar way one of the sprocket wheels 6 is pro-

vided with a bore 17 which is adapted to be brought into register with a bore 18 made in the frame 1, and the wheels 6 are adapted to be locked in position relatively to the frame 1 by means of a locking bolt 19 fitting in the bores 17 and 18. If it is desired to operate the machine in such a way, that twisting of the strands or yarns is prevented, the locking bolt 16 is put into position for locking the wheel 7, as is shown in Fig. 6. If now rotary movement is imparted to the main frame 1, the sprocket wheel 10 is rotated relatively to the main frame from the stationary wheel 7 and through the intermediary of the chain 12. Such rotary movement is transmitted through the chain 13 to all the shafts 4 of the bobbin frames 2. After the main frame has completed one revolution, all the bobbin frames have performed a complete revolution relatively to the main frame 1, and such relative movement is opposite to the direction of the movement of the main frame, that is, if for example the main frame is rotated in a clockwise direction, as has been indicated in Fig. 2 by the arrow 22, the bobbin frames are rotated in an anti-clockwise direction. Therefore during the revolution of the bobbin frames 2 the shafts of the bobbins are always parallel to their original positions, or in other words, the strands coming from the bobbins 5 are not twisted during the revolution of the bobbins. If on the other hand it is desired to operate the machine in such a way, that the strands or rope yarns are twisted during the revolution of the bobbins, the wheel 7 is unlocked by removing therefrom the bolt 16, and the wheel 6 is locked in position relatively to the main frame by inserting the locking pin 19 in the bores 17 and 18. Now the rotary movement of the main frame 1 has no effect on the shafts 4, and the wheel 7 is idle on its shaft. It will readily be understood, that by providing the chains 12 and 13, and the sprocket wheels 6, 7 and 10 the bobbin frames 2 are positively driven from the wheel 7, so that slipping of the frames is impossible and each frame performs exactly one complete rotation for each revolution of the main frame 1.

In the modification shown in Fig. 7 a single chain 13′ is provided for driving all the bobbin frames from the wheel 7. As shown at opposite sides of each of the wheels 6 guide rollers 25 are located which are in such positions, that the chain 13′ trained over the wheel 7 and the guide rollers engages in the sprockets of the wheels 6. The operation of the apparatus is substantially the same as that of the apparatus described with reference to Figs. 1 and 2. If it is desired to prevent twisting of the strands, the wheel 7 is locked in position by means of the locking pin 16, and if it is desired to twist the strands while revolving the main frame 1, the wheels 6 are locked by means of the bolt 19. The construction of the locking bolts 16 and 19 will be understood from the detail views shown in Figs. 5 and 6.

To show, that my invention may also be embodied in machines of other class, I have illustrated in a diagrammatical way in Figs. 5 and 6 a braiding machine of the type shown in the patent of the United States to Lundgren, No. 695,746, granted March 18, 1902. If it is desired to make braids of a considerable thickness, for example braids for hose made up of several tarred strands, or braids made from wire, the outer strands are twisted in a similar way as the strands of the ropes. In the said braiding machine the driving member is provided by a spur gear 30 which by rolling on a toothed rack 31 guides the outer threads along a cycloidal path. As the threads are alternately guided along an edge in opposite directions they are twisted during the rotation if the tension of the threads is high, which is objectionable in the manufactured article. By providing means for preventing twisting, this objection is removed. As shown in Figs. 3 and 4 a central wheel 7^1 is connected by an endless flexible member, such for example as a chain 32, with a wheel 33 which is fixed to a thread guide 34 and has the same diameter as the wheel 7^1. The threads are guided through apertures or slits provided in the guide 34, so that they are always in the braiding plane, and a good article is obtained.

While in describing the invention reference has been made to certain machines in which it may be embodied and to particular constructions which in my opinion serve the purpose best, I wish it to be understood, that my invention is not limited to the embodiment in the machines shown in the drawings, and that various changes may be made in the construction and general arrangement of the parts within the gist of my invention.

I claim herein as my invention:

1. In a machine of the class described, the combination with a rotary member, and bobbin frames rotatably mounted on said member, of rotating means for said bobbin frames comprising a driven member on each of the bobbin frames and a driving member operatively connected with said driven members and mounted axially of the rotary frame, and means to lock at will either said driving member or driven members in position.

2. In a machine of the class described, the combination with a rotary member, and bobbin frames rotatably mounted on said member, of rotating means for said bobbin frames comprising a driven member on each of the bobbin frames and a driving member

mounted axially of the rotary frame, flexible means providing an operative connection between said driving and driven members, and means to lock either said driven members or said driving member in position.

3. In a machine of the class described, the combination with a rotary member, and bobbin frames rotatably mounted on said member, of rotating means for said bobbin frames comprising sprocket wheels on each of said bobbin frames, a sprocket wheel located axially of the rotary member, a chain connection between said sprocket wheels, and means to lock at will either said sprocket wheels on the bobbin frames or said axially located sprocket wheel in position.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

GUIDO HORN.

Witnesses:
HENRY HASPER,
ELISABET FAETHKENHAUER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."