No. 828,121. PATENTED AUG. 7, 1906.

F. A. KAISER.

ROPE UNTWISTING MACHINE.

APPLICATION FILED SEPT. 18, 1905.

FIG. 1.

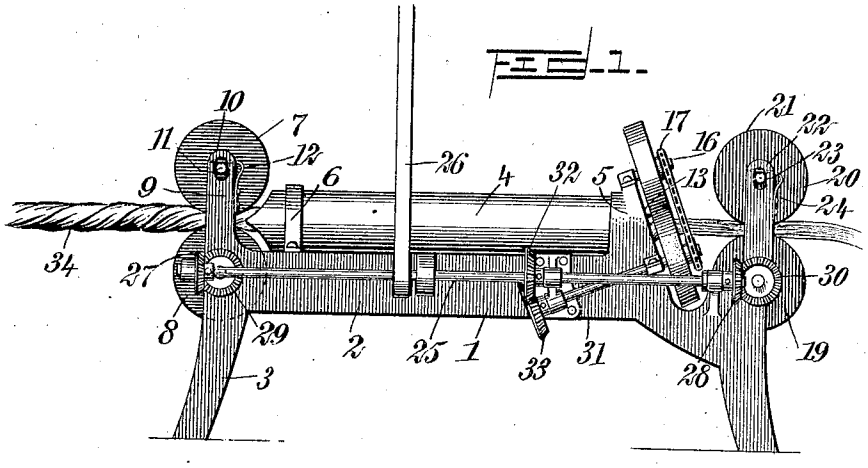


FIG. 2.

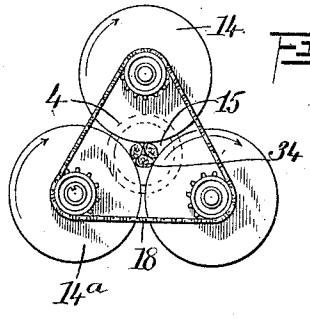
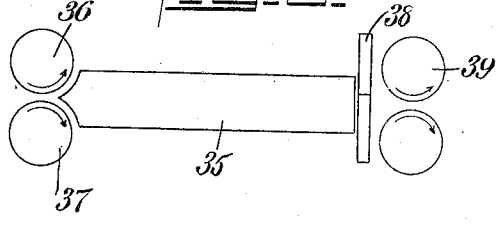


FIG. 3.



WITNESSES:

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ROPE-UNTWISTING MACHINE.

No. 828,121. Specification of Letters Patent. Patented Aug. 7, 1906.

Application filed September 18, 1905. Serial No. 278,913.

To all whom it may concern:

Be it known that I, FRANK ANDREW KAISER, a citizen of the United States, and a resident of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and Improved Rope-Untwisting Machine, of which the following is a full, clear, and exact description.

This invention relates to such machines as are used for untwisting twisted strands or fibers.

The object of the invention is to produce a machine of this class which is simple in construction and which will operate with speed and efficiency.

The invention is intended to be used especially for the purpose of untwisting African fiber, which is a commercial product in the form of a rope.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a machine constructed according to my invention and representing the same in operation. Fig. 2 is a front elevation showing the faces of the hackling rollers or wheels, and Fig. 3 is a diagrammatic view showing a modified arrangement of the hackling-rollers.

African fiber is made from the leaves of the palm in northern Africa. The fibers are about a foot long and are twisted into a one-strand rope about three-fourths of an inch in diameter. Two of these strands are then twisted into a two-strand rope. In order to separate the fibers, it is customary to separate the two strands and then untwist each strand separately on a swivel-hook.

Referring more particularly to the parts, 1 represents the frame of the machine, which preferably comprises a body 2 of elongated form supported at its ends on suitable legs 3. Upon the body 2 I provide a guide-tube 4, which is supported in a horizontal position, as shown, the same being seated at one extremity in a housing 5, which projects up from the body 2, as shown, and at its opposite extremity it is preferably held in position by means of a strap passing over it, as indicated. Adjacent to the extremity of the guide-tube 4, which lies remote from the housing 5, I provide a pair of feed-rollers 7 and 8, disposed one above the other, as indicated. The lower roller 8 is rotatable upon a fixed axis. The upper roller 7 is slidably mounted in a post 9, which projects up from the body, as shown, the said post being provided with a slot 10, elongated vertically, and into this slot 10 projects the trunnion or gudgeon 11 of the roller 7, as will be readily understood. A spring 12, having a bent extremity, is arranged at this point which is rigidly attached to the post and which bears upon the gudgeon 11, as shown, tending to force the roller 7 downwardly. In this way the roller 7 is yieldingly pressed toward the roller 8. As shown in Fig. 1, the faces of the rollers are disposed slightly apart, and the point midway between the rollers lies substantially on the axis of the tube 4.

At the opposite extremity of the machine the outer face 13 of the housing 5 is preferably inclined, as shown, and upon this face I mount untwisting-rollers 14, preferably three in number, as shown, of equal diameter and disposed at an equal distance apart. By this arrangement a substantially triangular space 15 is formed between the faces of the rollers, and the rollers are so located that this space 15 lies substantially on the axis of the tube 4, as will be readily understood. These rollers 14 have rigid studs 16, which are centrally disposed thereupon and which project upwardly, as shown, and upon these studs sprocket-wheels 17 are rigidly attached. These sprocket-wheels 17 are of the same diameter and are connected by a continuous sprocket-chain 18, which passes continuously about the sprocket-wheels, as indicated most clearly in Fig. 2. It should be stated, further, in connection with these wheels that their faces do not touch, although they lie very close together.

It should be understood that the African fiber or similar material which is to be untwisted is fed to the machine from left to right, as indicated in Fig. 1, so that the right-hand end of the machine is the delivery end. At this end I provide delivery-rollers 19 and 20, the former of which is mounted to rotate in the frame of the machine like the roller 8 and has a fixed axis of rotation. The roller 20 is mounted in a post 21, similar to the post

9, already described, and this post 21 is likewise provided with a vertical slot 22, in which is received a gudgeon 23, carried by the roller 20. A spring 24 is provided similar to the spring 12, the same being attached to the post 21 and pressing against the gudgeon 22, so as to force the roller 20 downwardly, as will be readily understood. In this way the roller 20 is yieldingly pressed toward its mate 19 in the same manner as the roller 7 is pressed toward its mate 8.

I provide means for driving all of the rollers continuously. For this purpose I provide a horizontal shaft 25, which is disposed longitudinally and rotatably mounted at the side of the frame, as indicated. This shaft is rotated continuously by means of a belt 26 of common form. At its extremities the shaft 25 carries bevel gear-wheels 27 and 28, which mesh, respectively, with corresponding bevel-gears 29 and 30. The bevel-gear 29 is rigidly attached to the roller 8, while the bevel-gear 30 is rigidly attached to the roller 19. The arrangement of the bevel-gears at each end of the shaft is the same, so that a rotation of the shaft 25 will produce a rotation in the same direction for the rollers 8 and 19.

In order to enable the shaft 25 to drive the untwisting-rollers 14, I provide an inclined shaft 31, which connects, by means of bevel-gears 32 and 33, with the shaft 25. To this shaft 31 is rigidly attached one of the wheels 14, which wheel is designated specifically by the reference-numeral 14ª. The arrangement of the bevel-gears 32 and 33 is such that when the shaft 25 is rotated in a direction which will advance the material through the machine the wheels 14 will then be rotated in the direction indicated by the arrows shown thereupon in Fig. 2. The untwisting-rollers 14 are preferably composed of hard rubber, and if found desirable in practice their faces will be roughened so as to grasp the material as it passes through the machine. The rollers 19 and 20 are preferably also of hard rubber or similar material.

In operating the machine the fiber having the form of rope 34 is fed between the feed-rollers 7 and 8 and advanced thereby through the guiding-tube 4. From the guiding-tube 4 the rope passes through the triangular opening 15, at which point it is squeezed between the adjacent faces of the rollers 14. Beyond this point the fiber passes between the delivery-rollers 19 and 20. When the rope is passing between the rollers 14 by reason of the rotation of these rollers, it is subjected to a twisting movement which is in a direction which will operate to untwist the rope, so that as the fibers pass beyond this point they lie substantially parallel to each other. In this condition they pass outward from the delivery-rollers 19 and 20. By reason of the inclined position of the rollers 14 they not only exert a twisting action upon the rope, but they also operate to draw the same along in the direction in which the feeding is taking place. In this way they assist the feeding operation.

While I prefer to place the rollers 14 in an inclined position, as shown, I may mount them in a plane substantially at right angles to the axis of the tube, as indicated diagrammatically in Fig. 3. In this figure 35 represents the tube, 36 and 37 represent the feed-rollers, while the numeral 38 represents, collectively, the untwisting-rollers. Beyond these are located the delivery-rollers 39. Except as to the changed relation of the hackling-rollers, the construction of the machine in this instance is the same as before.

By reason of the fact that the untwisting of the fiber virtually increases its length it is necessary in practice to drive the delivery-rollers 19 and 20 at a slightly-increased peripheral speed with respect to the feed-rollers 7 and 8.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

1. In a machine of the class described, in combination, rollers presenting adjacent faces, means for guiding a twisted fiber between said rollers, and means for continuously rotating said rollers in a direction to untwist said fiber.

2. In a machine of the class described in combination, rollers presenting adjacent faces, means for guiding a twisted fiber between said rollers, means for continuously rotating said rollers in a direction to untwist said fiber, and feed-rollers adapted to advance the fiber to said rollers.

3. In a machine of the class described in combination, rollers presenting adjacent faces, means for guiding a twisted fiber between said rollers, means for continuously rotating said rollers in a direction to untwist said fiber, feed-rollers adapted to advance the fiber to said rollers, and a guide-tube between said feed-rollers and said rollers.

4. In a machine of the class described, in combination, means for longitudinally advancing a twisted fiber, rollers disposed in a plane inclined with respect to the direction of advance of said fiber and having adjacent faces between which said fiber passes, and means for continuously driving said rollers.

5. In a machine of the class described in combination, a plurality of untwisting-rollers disposed adjacent and presenting an opening therebetween, means for advancing a twisted fiber through said opening and in contact with the faces of said rollers, mechanism connecting said rollers for driving the same in unison, and means for continuously driving one of said rollers.

6. In a machine of the class described in combination, a guide-tube, a feed-roller at

one extremity of the said tube and having a fixed axis of rotation, a second feed-roller cooperating with the first, means for resiliently forcing said second roller toward said first roller, untwisting-rollers at the opposite extremity of said tube and adapted to operate upon a twisted fiber passing through said tube, means for continuously driving said untwisting-rollers, a delivery-roller beyond said untwisting-roller, a second delivery-roller cooperating with the first, and means for forcing said second delivery-roller toward said first delivery-roller.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK ANDREW KAISER.

Witnesses:

M. A: JUDGE,

M. A. BARNEY.