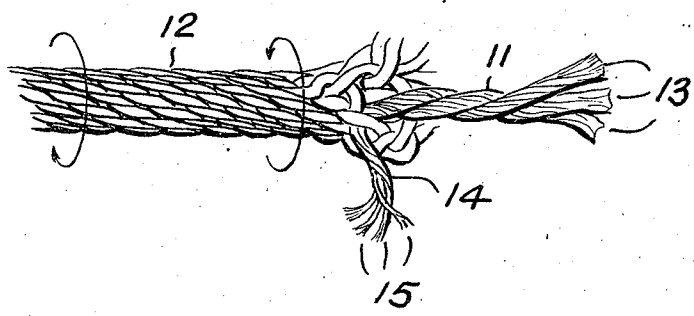
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ROPE.

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ROPE.

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To all whom it may concern:

Be it known that I, EDWARD MILTON ADAMS, Jr., a citizen of the United States, and resident of the city of Sherbrooke, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Ropes, of which the following is a full, clear, and exact description.

This invention relates to improvements in rope, and the object of the invention is to provide a rope of extremely strong and durable construction which may be easily and cheaply manufactured and which will not stretch to any appreciable extent.

Rope is divided generally into two classes, namely, twisted rope and woven rope. The woven rope is largely cotton and the great advantage possessed is a reduction in the stretch of the rope as compared with a twisted rope. One of the principal reasons why rope stretches is that when put under tension, it unwinds to a certain extent, thus straightening out to a certain extent the circuitous path of each of its strands. In woven rope, this tendency to unwind is very largely overcome but the woven rope nevertheless has a certain unwinding tendency due to the relative arrangement of the loops where the various strands pass over one another. This may be demonstrated by the fact that woven rope may be twisted to a limited extent about its own axis in one direction but not to any appreciable extent in the opposite direction. This is due to the fact that twisting in one direction loosens the loops while twisting in the opposite direction draws the already tight loops more tightly. It may thus be said that ordinary woven rope has to a very limited extent a twist which when untwisted will permit a small amount of elongation.

According to this invention, the rope is provided with a tightly twisted core and a tightly woven or braided covering over said core, the twists of the core and covering being opposite, so that when under tension any untwisting tendency of the covering produces a twisting tendency in the core and vice versa.

In the drawings which illustrate the invention;—

The figure shows an elevation of a fragment of rope constructed according to this invention, the covering being unbraided at one end.

Referring more particularly to the drawings, 11 designates a core and 12 a covering. The core is preferably formed of three twisted strands 13 twisted together in the usual manner, the twist of each strand being opposite to the twist of the core itself. The covering 12 is woven or braided and consists of any suitable number of strands 14 formed of a suitable number of threads 15 twisted together. The twist of the fibres in these threads is opposite to the twist of the strand 14 similarly to the core. The covering 12 is braided tightly upon the core in such a manner that all strands pass in helices around the core in one direction giving a definite twist to the covering which is opposite to the twist of the core, as clearly indicated in the drawing. By grasping remote portions of the covering along and rotating them in the direction shown by the arrows, a certain untwisting and elongation of the braided covering will occur. As this untwisting movement causes a tightening of the twist of the strands 14 it is very greatly limited in extent by the ultimate tightening of the loops of the braid causing a contraction of the cover upon the core. The untwisting action of the core is clearly shown to be in the opposite direction. If the direction of rotation be reversed in the covering, the already tight loops are immediately drawn against one another and any twisting is prevented. When the core and covering are dealt with together, any untwisting action applied to the covering is communicated to the core and a twisting or tightening action takes place therein. As the core is already tightly twisted, no movement results and the covering is thus held against untwisting. If the core were grasped by its ends and untwisting attempted, this would be immediately resisted by the covering which resists tighter twisting. It will thus be seen that both the covering and the core support one another and each resists the untwisting action of the other. The covering being woven or braided very tightly on the core, there is always sufficient friction between the two to prevent any slipping and consequent failure of the one part to support the other part. The various strands of the covering may if desired be composed of a suitable number of

threads in parallel in place of twisted together.

Another object in forming woven or braided rope is to secure smoothness and for this purpose cotton is generally employed, although cotton has not the same strength as good hemp fibre.

According to this invention, it is preferred to make the core of a rope of hemp fibre and the covering of woven or braided cotton, thus combining in one rope the strength of the hemp and the smoothness and non-stretching qualities of the braided rope. This combination of materials is particularly advantageous as the finely fibred cotton covering gets a very firm grip on the coarsely fibred and comparatively rough hemp core, so that in addition to the ordinary friction of the close contact, there is a definite interengagement of the fibres of the core and covering due to projecting ends of hemp fibres becoming interwoven with the covering, with the result that slippage between the two is entirely prevented.

In order to ensure the durability of the rope, either the core or covering or both may be impregnated with any suitable preserving or waterproofing compound before, during or after the manufacture of the rope. One method which has been found very satisfactory is to immerse the finished rope in molten paraffine for such a length of time as is necessary for the air to be driven out of the interstices of the rope and replaced by the molten paraffine. The rope may be then withdrawn in such a manner as to remove all surplus paraffine from the surface. A rope so constructed will be entirely waterproof and therefore will not be subject to rotting from exposure to the weather. The rope will furthermore not be subject to the shrinkage common to both hemp and cotton ropes when wet, as every fibre of the rope will be individually coated or impregnated with the paraffine. While paraffine has been specifically mentioned, it will be understood that the invention is not limited to the use of this particular material, as any other suitable material or compound may be used.

Commercially the rope may be made on a machine such as a twelve strand solid cord machine, such as is manufactured by New England Butt Co. of Providence, R. I. Such a machine comprises briefly a revolving dial through the centre of which the core is fed. The carriers are mounted on the dial holding bobbins. These bobbins work preferably in sets of three with a revolving motion of their own distinct from that of the dial to twist the different plys of yarn. The actual braiding or weaving of the cover is carried out in the well known manner of operation of such machines and the helical arrangement is obtained by increasing the speed of revolution of the dial relatively to the speed of the core, so that the cover is braided helically around the core instead of substantially parallel therewith as is ordinarily done.

Having thus described my invention, what I claim is;—

1. A rope comprising a twisted core and a braided cover having a definite twist in one direction and opposite to the twist of the core.

2. A rope comprising a twisted core and a braided cover having a limited untwisting movement in one direction, the cover being arranged to positively resist twisting in the untwisting direction of the core, and the core arranged to positively resist twisting in the untwisting direction of the cover.

3. A rope comprising a twisted core and a braided cover having limited untwisting movement in one direction, the core comprising a plurality of strands twisted in themselves in one direction and twisted together in the opposite direction and in a direction corresponding to the untwisting movement of the cover.

4. A rope comprising a twisted core and a covering of braided strands, the strands passing helically around the core all in a direction opposite to the twist of the core.

5. A rope adapted to maintain a predetermined length and comprising a twisted core and a braided covering having a definite untwisting movement in one direction only, said core and covering having untwisting movement in opposite directions to support one another in resisting elongation, and an impregnating material protecting said rope against shrinkage due to absorption of water.

6. A rope comprising a core twisted in one direction and a braided cover having a definite twist opposite to the twist of the core, the cover strands being arranged to hold the cover against twisting in the untwisting direction of the core and the strands of the cover having in themselves a twist in the same direction as the core and co-operating with the core to resist twisting of the rope in the untwisting direction of the cover.

In witness whereof, I have hereunto set my hand.

EDWARD MILTON ADAMS, Jr.