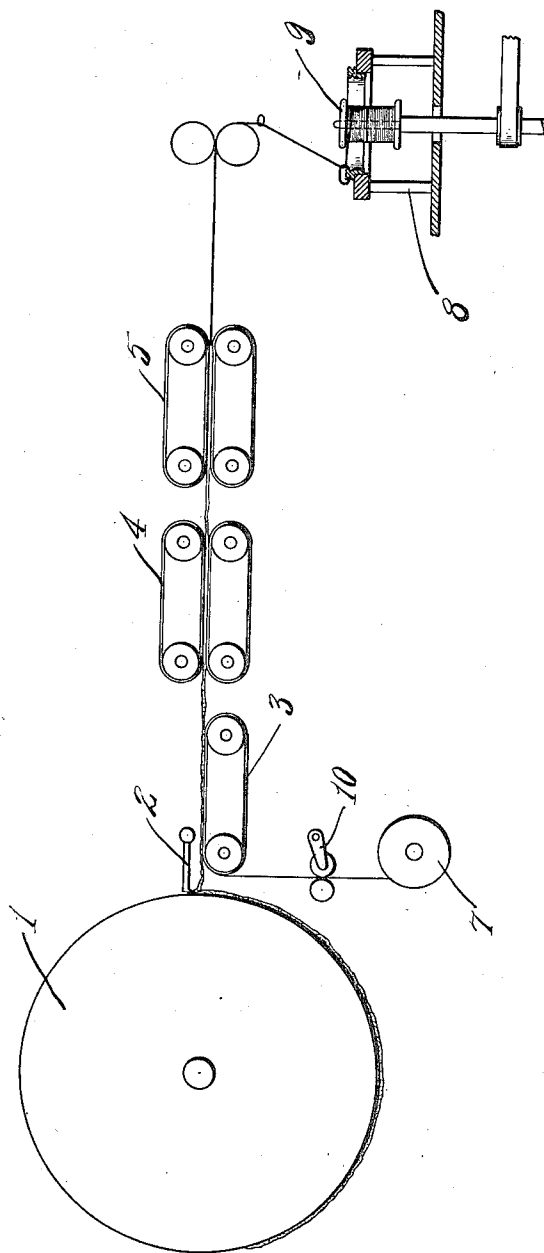


Dec. 19 1922.

1,439,166

J. A. HEANY.
ASBESTOS PRODUCT.
FILED OCT. 7. 1919.



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ASBESTOS PRODUCT.

Application filed October 7, 1919. Serial No. 329,112.

To all whom it may concern:

Be it known that I, JOHN ALLEN HEANY, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Asbestos Products, of which the following is a specification.

This invention relates to a new and improved product made from tenuous metallic bodies, associated with fibrous material, more particularly to an asbestos strand reinforced with metal, and to the process by which the same is made.

Some of the objects of the invention are the provision of an article of the kind to which reference has been made, in which the fibrous material, even although it may be short-fibered and of smooth character, is securely associated with the tenuous metallic body or wire without the use of a binder or other adhesive means, and to produce such an article by a new process which is simple and inexpensive, as compared with the processes now in commercial use. Other objects and features will become apparent as the description proceeds.

The product made in accordance with my invention may be put to a variety of uses; for example, when wires are associated with a fibrous material which is entirely or mainly asbestos, the resulting product makes a superior metal-cored yarn or strand from which articles and fabrics, such as brake linings, gaskets, packings, theater curtains, fireproof masks and gloves, and the like, may be made. The wire serves to reinforce the fibrous material and thus gives strength to the product, while the fibrous material supplies some strength and protects and insulates the wire from heating effects tending to weaken it. When the asbestos product is woven or otherwise formed into articles, such, for example, as some of those mentioned above, the asbestos supplies the body for packing and frictional purposes. The product may also be used as an insulated electric conductor or heat-insulated wire.

Heretofore yarns used for purposes such as those above mentioned have been formed by first subjecting slivers of asbestos carded with from 20% to 50% cotton to a spinning or twisting operation or both of them, and then twisting the resulting strand together

with wires, or winding it onto wires. It is necessary to incorporate the large proportion of cotton in asbestos fiber to make it possible to spin or twist the resulting sliver.

The asbestos product made in accordance with my invention need not have any cotton mixed with it and the asbestos is firmly associated with the wire in a process involving but two steps, and without first spinning and twisting the asbestos into a strand.

I achieve the objects of my invention by rubbing, rolling or packing a sliver of carded fibrous material directly on the wire and then twisting the wire with its coating of fibrous material until the two are firmly associated together. In the first-mentioned step the sliver is preferably rubbed, rolled or packed hard on the wire so that it is matted or compacted about the wire.

The resulting product is a wire with a coating of fibrous material and the two are so associated that the coating is smoothly, evenly and securely fastened and held to the wire.

As a modification, the fibrous material is rubbed onto each of a plurality of wires, after which the fiber-covered wires are twisted together. As a further modification, a single sliver of fibrous material is rubbed onto a plurality of associated wires and the coated wires are then twisted. During these twisting operations the fibrous material becomes securely associated with and fastened to the wires.

The asbestos product in any of its modifications made in accordance with the invention disclosed herein is of practicable utility for the purposes for which it is intended, and the fibrous coating is firmly and strongly associated with and secured to the wire because of the twist it receives in the process.

A suitable form of apparatus for carrying out the invention is illustrated in the accompanying drawing, in which the said apparatus is represented more or less diagrammatically in side elevation.

The reference character 1 designates the doffer roll of a carding machine, which doffer roll is preferably of the "ring doffer" type. An oscillating comb 2 or an equivalent device is arranged to remove, in the form of slivers, asbestos or other fibrous material from the doffer roll of the carding

machine. A conveyer belt 3 is arranged to receive the sliver of fibrous material from the comb, and adjacent to it is located the condenser, which, in this instance, comprises two sets 4 and 5. Each of the condenser sets 4 and 5 comprises a pair of rub motion belts, upper and lower, and each belt is arranged to reciprocate laterally while traveling in a direction to carry the sliver away from the conveyer. Each belt travels at the same rate of speed and in a direction so that the adjacent surfaces of the belts of a set advance in the same direction but reciprocate laterally in opposite directions. A reel 7 is arranged to hold the supply of wire to be fed into the machine. A pair of rolls 6 are located near the end of the last set of rub-motion belts and below the rolls is the twisting and winding device 8. The twister 8 is of any suitable construction, such, for example, as that of the well-known "ring twister," and is arranged to carry the spool 9 upon which the finished product is wound.

In operation, the sliver of fibrous material is removed from the doffer roll 1 by the comb 2. The fibrous material may be substantially pure asbestos, but if desired, cotton may be used with the asbestos, in which case the cotton and asbestos are mixed before carding and the coating of the resulting product has, of course, the same percentage of cotton in it as the asbestos which is run through the carding machine. The wire is strung over the conveyer 3 and between the belts of the condenser, the rolls 6, and to the spool 9 of the twister 8. If necessary, a tension device 10 is arranged to hold the wire in proper tension. As the wire is drawn over the conveyer 3 and condenser against the tension of the reel 7 and tension device 10, the comb 2 deposits a sliver of fibrous material on the wire and the latter is compacted, matted, or rolled down on and around the wire by the condenser 4, 5. The condensing or rolling down preferably takes place with considerable pressure between the rolls so that the fibrous material is matted as tightly as possible together and around the wire. The coated wire is led through the rolls 6 to the twister 8, which I have shown as a ring twister having the spool 9 mounted on it upon which the finished product is wound. One or both of the rolls 6 are driven at a peripheral speed equal to that of the condenser and conveyer belts to draw the fiber-covered wire through the apparatus. Between the point where the fiber-covered wire emerges from between the rolls 6 and the spool 9 the wire and its fibrous coating are twisted by the twister 8 so that the finished product which is wound on the spool 9 comprises a wire having a coating of fibrous material firmly fastened, held, and secured upon it.

In practice the apparatus is arranged so that a plurality of wires are coated and twisted at once. A sliver of the fibrous material is taken from each ring of the doffer roll 1 and rubbed onto a wire or a plurality of them, and each resulting combination of wire and fiber is twisted and wound on the spool 9 provided for it. The thickness of the coating of fibrous material depends upon the rate at which the sliver is removed from the doffer roll relative to the speed of travel of the conveyer and condenser. A plurality of wires can be used with a single sliver, and if desired two or more coated wires can be twisted together by a single twister and wound as a single strand on a spool 9. A reel can be substituted for the rolls 6, in which case the coated wire is wound thereon. The reel of coated wire is then twisted on a twister of any approved type. I have formed such reels of coated wire with a single, or two or more parallel strands of coated wire on them and have twisted the plurality of strands together from one or more reels, the resulting product varying in strength and size in accordance with the number of strands used.

I claim:

1. That method of forming a reinforced asbestos yarn which consists in passing a filament and a sliver of asbestos fibers together between laterally reciprocating and longitudinally advancing surfaces to thereby coat the filament with asbestos, and then in twisting the asbestos-coated filament.
2. That method of forming a reinforced asbestos yarn which consists in passing a wire and a sliver of asbestos fibers together between laterally reciprocating and longitudinally advancing surfaces to thereby coat the wire with asbestos, and then in twisting the asbestos-coated wire.
3. That method of forming a reinforced asbestos yarn which consists in passing a filament and a sliver of asbestos fibers together between laterally reciprocating and longitudinally advancing surfaces to thereby coat the filament with asbestos, then in passing the asbestos-coated filament between gripping rollers having the same speed of travel as that of the advancing surfaces, and in twisting the coated filament as it emerges from the rollers.
4. That method of forming a reinforced asbestos yarn which consists in passing a wire and a sliver of asbestos fibers together between laterally reciprocating and longitudinally advancing surfaces to thereby coat the wire with asbestos, then in passing the asbestos-coated wire between gripping rollers having the same speed of travel as that of the advancing surfaces, and in twisting the coated wire as it emerges from the rollers.
5. That method of forming a reinforced asbestos yarn which consists in carrying a

filament along a moving support and between laterally reciprocating and longitudinally advancing rub motion belts, in depositing a sliver of asbestos on the moving filament whereby the sliver is carried with the filament between the surfaces to thereby coat the filament with asbestos, then in passing the asbestos-coated filament between gripping rollers having a speed of travel equal to the speed of advancing travel of the rub motion belts, and in twisting the asbestos-covered filament directly as it emerges from the rollers.

6. That method of forming a reinforced asbestos yarn which consists in carrying a wire along a moving support and between laterally reciprocating and longitudinally advancing rub motion belts, in depositing a sliver of asbestos on the moving wire whereby the sliver is carried with the wire between the surfaces to thereby coat the wire with asbestos, then in passing the asbestos-coated wire between gripping rollers having a speed of travel equal to the speed of advancing travel of the rub motion belts, and in twisting the asbestos-covered wire directly as it emerges from the rollers.

7. That improvement in the art of making reinforced asbestos yarn which consists in continuously working the asbestos into the form of a roving, associating a wire reinforcement with said roving, and immediately twisting said roving and wire reinforcement together as fast as the roving is formed and thereby producing a reinforced asbestos yarn.

8. That improvement in the art of making asbestos yarn which consists in carding the asbestos and thereby producing simultaneously a plurality of continuous strands of roving, associating a wire reinforcement with a plurality of said strands of roving, and immediately twisting said reinforcement and roving together at a point adjacent to the point of delivery of the roving and at substantially the rate at which the roving is formed whereby the roving passes continuously from its point of completion to the point at which it is twisted.

9. That improvement in the art of making reinforced asbestos yarn which consists in working the asbestos into the form of a continuous roving, twisting the roving so produced while the roving is continuously transferred directly from the point at which it is formed to the point at which it is twisted, and associating a reinforcement with said roving prior to the twisting operation whereby said twisting operation unites said reinforcement with the asbestos and produces a reinforced asbestos yarn.

JOHN ALLEN HEANY.