E. F. NANFELDT.

PROCESS OF MAKING ASBESTOS YARN.

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1,437,438. Patented Dec. 5, 1922.

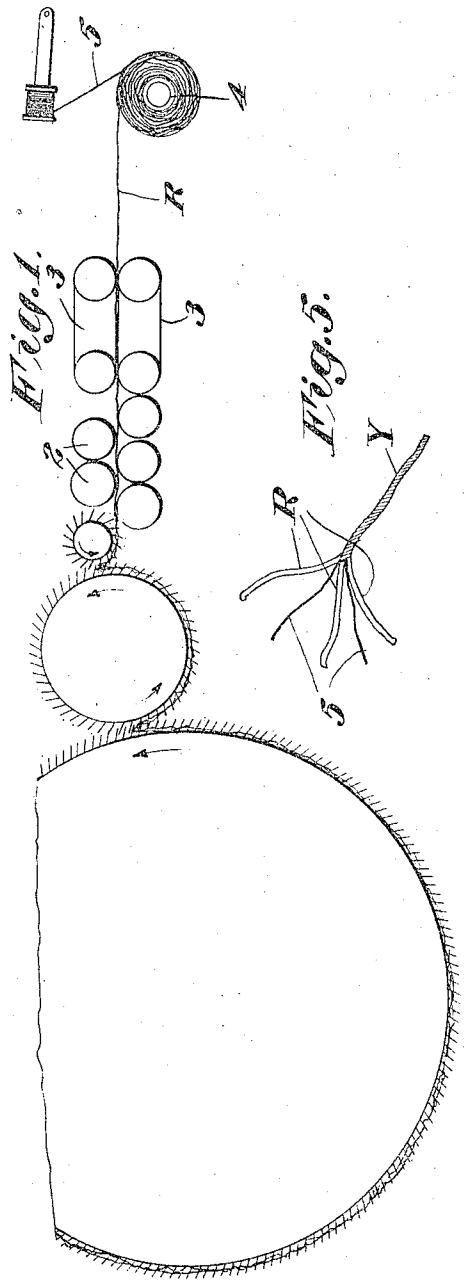


Fig. 1.

Fig. 5.

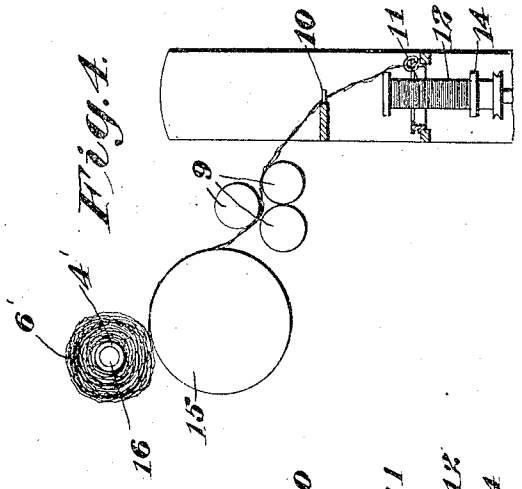


Fig. 4.

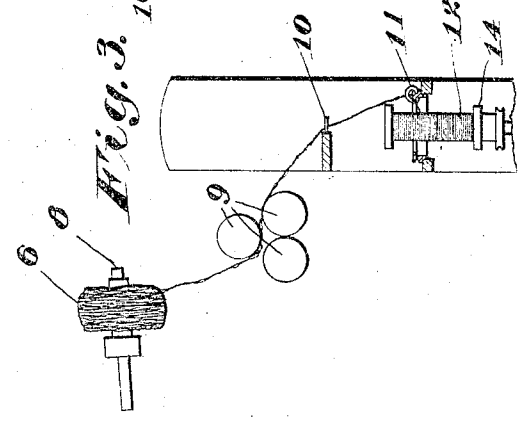


Fig. 3.

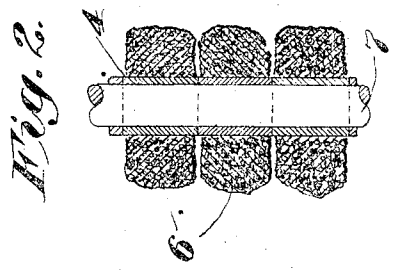


Fig. 2.

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UNITED STATES PATENT OFFICE.

ERNEST F. NANFELDT, OF NEW HAVEN, CONNECTICUT.

PROCESS OF MAKING ASBESTOS YARN.

Application filed January 20, 1920. Serial No. 352,731.

To all whom it may concern:

Be it known that I, ERNEST F. NANFELDT, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain Improvements in a Process of Making Asbestos Yarn, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to processes of making asbestos yarn and is particularly concerned with reinforced asbestos yarn of the type used in manufacturing brake linings and clutch facings.

As is well understood by those skilled in this art, asbestos fibre has very little mechanical strength and in making asbestos yarn it is customary, therefore, to mix with the asbestos fibre a small percentage of cotton in order to facilitate the spinning and weaving operations. It is also the usual practice to reinforce the yarn with one or more strands of fine wire, usually brass or copper wire.

The process of making this yarn as usually practised commercially consists in crushing the crude asbestos, grading the fibre, mixing the fibre with cotton, and then running this mixture through a carding machine to form a roving. This roving is wound on tubes as fast as it is delivered from the condensor or rub rolls of the carding machine and the tubes after being filled are transferred to a spinning machine, usually of the mule type, which spins the roving into yarn. This yarn is neither strong enough nor large enough to be woven into brake linings or clutch facings and consequently it is customary to twist a plurality of strands of this yarn with one or more strands of reinforcing wire to produce the yarn from which the brake lining or clutch facing fabric is woven. Usually three strands of small yarn produced by the spinning operation are twisted with two strands of fine brass wire to form the yarn used in weaving the asbestos fabric.

This process requires an expensive equipment, the interruptions due to breaking of the yarn are frequent and the labor cost is comparatively high. Accordingly it is the chief object of the present invention to devise a process of manufacturing yarn of this character more economically.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings and the novel features will be particularly pointed out in the appended claims.

Referring now to the drawings,

Figure 1 is a diagrammatic view illustrating one step in the present process;

Fig. 2 is a cross sectional view illustrating the manner in which the roving and reinforcing wires are wound preparatory to twisting them together;

Fig. 3 shows diagrammatically an apparatus for performing the twisting operation;

Fig. 4 is a diagrammatic view showing a slightly different step in the process of making yarn; and

Fig. 5 is a view illustrating the manner in which the roving and reinforcing wires are twisted together.

According to the present process the asbestos fibre is first carded. This operation may conveniently be performed in the usual carding machine, as illustrated in Fig. 1, the asbestos issuing from between the condensing rolls 2 and the rub belts 3 in the form of a roving R. As fast as this roving is delivered by the carding machine it is wound on a tube 4 and the reinforcing wire which is to form a part of the yarn is wound with the roving. Usually the yarn is made from three strands of roving and two strands of fine reinforcing wire and, accordingly, in winding the roving on the tube 4 three strands of roving are associated with two strands of wire. As is well understood by those skilled in this art, the usual carding machine forms a series of strands of roving, and the roving, therefore, is wound in a series of cylindrical masses or rolls 6, as best shown in Fig. 2. The tube may be supported on a suitable arbor 7 while this winding operation is being performed.

After this operation has been completed the tube is cut into sections, as indicated by the dotted lines in Fig. 2, or the tube may consist of sections placed end to end on the winding arbor. These individual sections 6 are then transferred to a twisting machine where each section is supported on a suitable pin 8, Fig. 3. The roving and reinforcing wire are then unwound and led between the rolls 9 of the twister, through the guide 10 to the flyer 11 and thence to the spool 12. An ordinary ring twister may be used to perform this step of the proc-

ess. This machine operates to twist together the three strands of roving and two strands of wire, thus producing a finished strand of yarn and, at the same time, winding this yarn on the spool 12. Care should be taken in starting this operation to keep the three strands of roving associated with the two strands of wire as they are being unwound. This operation completes the process.

It will now be clear that this process eliminates the necessity for spinning which heretofore has been regarded as an essential step of the yarn making process. It, therefore, eliminates not only a very expensive part of the equipment but it also reduces substantially the labor cost of the yarn.

Instead of winding the roving and wire on separate sections of tubing 4, as shown in Fig. 2, the roving may be wound on a long tube 4', Fig. 4, and this tube then transferred to a twister provided with a large drum 15 and with an arbor 16. The tube 4' carrying the roving is slipped on to the arbor 16 and each set of strands from the rolls 6' are brought over the drum 15, through the rolls 9 and guide 10 to the flyer 11 of the ring twister, the cylindrical mass 6' of roving wire resting on the periphery of the drum. This drum is rotated at a slow speed and its peripheral contact with the roving 6' rotates this roll of roving about the arbor 16 at the proper speed to feed it to the flyer of the twister. This arrangement, therefore, has the advantage of relieving the roving from any strain while it is being unwound in the twisting machine.

It is obvious that cotton may be mixed with the asbestos, if desired, as in the processes heretofore practised, but it is not essential in this process that cotton be used since the cotton is useful chiefly in spinning the yarn and this operation is eliminated by the present process. Furthermore, the reinforcing wire with the roving immediately after the roving is formed relieves the roving from any substantial strain. It will also be understood that, if desired, the reinforcing wire could be associated with the roving before the roving emerges from between the rub belts 3—3 and thus tend still further to eliminate strain on the roving. Usually, however, this is unnecessary and it is somewhat more convenient from the standpoint of operation to bring the association of the reinforcing wire into contact with the roving after the roving has passed through the rub belts.

What is claimed as new is:

1. That improvement in the process of making reinforced asbestos yarn which consists in working asbestos into the form of roving, winding together a number of strands of roving and wire while said wire and roving are otherwise dissociated, and then unwinding the strands so wound and twisting them together to produce a reinforced asbestos yarn.

2. That improvement in the process of making reinforced asbestos yarn which consists in carding the asbestos to work it into the form of roving, winding the desired number of strands of said roving with a wire reinforcement as fast as the roving is produced, and subsequently unwinding the strands of wire and roving so associated and twisting them together to produce a reinforced asbestos yarn.

In testimony whereof I have signed my name to this specification.

ERNEST F. NANFELDT.