May 18, 1926.

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J. A. HEANY

YARN AND PROCESS FOR MAKING THE SAME

Original Filed Jan. 9, 1924

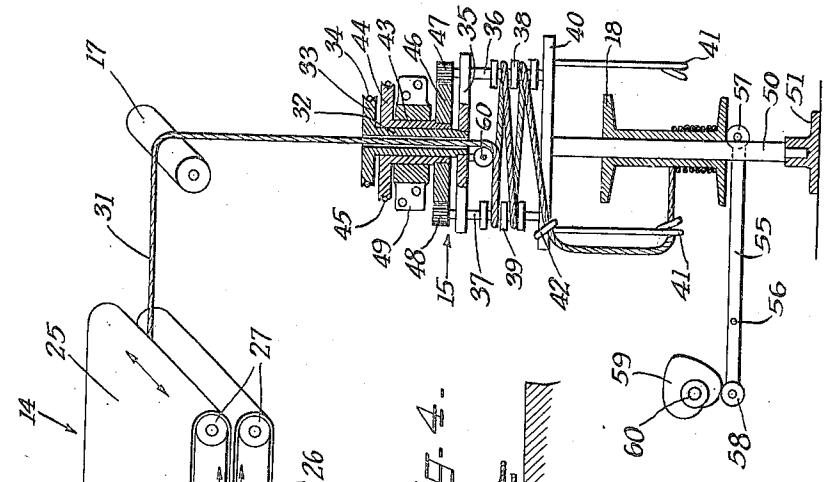


Fig. 4.

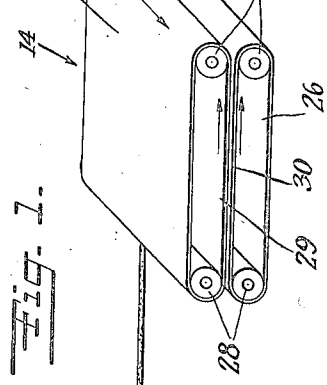


Fig. 1.

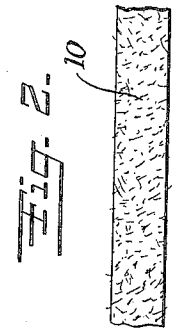


Fig. 2.

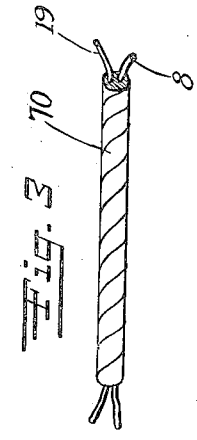


Fig. 3

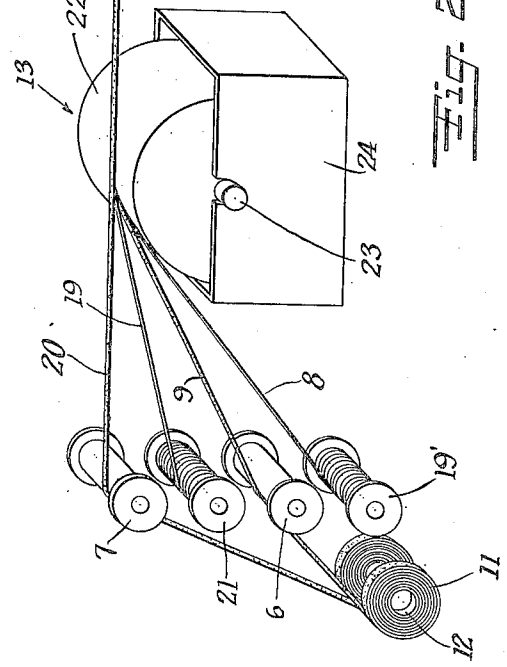


Fig. 5.



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UNITED STATES PATENT OFFICE.

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YARN AND PROCESS FOR MAKING THE SAME.

Application filed January 9, 1924, Serial No. 685,092. Renewed January 25, 1926.

This invention relates to the manufacture of yarn particularly applicable to paper strip formed of fibrous asbestos material.

Generally considered, the invention consists in the utilization in a single yarn strand of a plurality of filament elements and a plurality of paper strips, the whole being passed together through a rubbing or condensing mechanism and the strand subsequently being twisted upon itself to form the final yarn product.

In the manufacture of yarn from short-fibred stock or stock such as asbestos, one of the important problems involved has been the determination of means whereby the fibres may be maintained in a closely bound and coherent relationship with other constituent parts of the yarn. Particularly in the case of short fibres such as asbestos which are seemingly deficient in the properties requisite to produce a coherent agglomeration it has been difficult to provide an effective means for forming a coherent complex yarn structure of sufficient strength to withstand tensile and frictional strain. An important feature in the manufacture of asbestos yarn, according to the present invention, consists in binding and forming asbestos material into a paper-like strip or band of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations.

In my co-pending application, Serial Number 516,129, there are disclosed means and process by which a yarn is constructed of a single filamentary body and a single paper strip, the same being subjected to a rubbing action and finally twisted together to form a yarn. In the present invention, there is employed a modification of the process of the co-pending case in that a plurality of separate elements entering into the composition of the yarn are simultaneously and as a single unit passed through the various mechanisms requisite to the carrying out of the process, thereby producing a final yarn of markedly greater stability and tensile strength.

Among the objects of the invention, therefore, is the provision of means including a process whereby a plurality of yarn fabricating elements may be simultaneously passed through a mechanism and manipulated to form a yarn. Another important object is the provision of means by which a yarn formed of normally non-coherent material, such as asbestos fibre, is compacted and bound together to form a highly stable and tenacious product. An additional object of the invention is the provision of a simplified process in which the number of steps requisite in the formation of a stable yarn from non-coherent, pulpy base material may be accomplished readily and easily. An object also contemplated is the utilization of an effective means whereby paper strip may be combined with a metallic core so that the fibres are all retained properly in position in the completed yarn and properly compacted one with the other. An important object of the invention is to provide a method of making asbestos yarn from asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which comprises bringing together such paper-like material and one or more reinforcing filaments, softening or moistening the paper-like material, and mechanically uniting or combining said paper-like material and said filaments, preferably in a generally helical arrangement. Another object of the invention is to provide a process for making yarn comprising bringing together such paper-like material with a plurality of reinforcing filaments separated by said paper-like material, moistening the paper-like material and combining, as by mechanical means, the paper-like material with said reinforcing filaments to form a strand or yarn. A further object is to provide a process which includes bringing together a plurality of strips or bands of such paper-like material with one or more reinforcing filaments located between said strips or bands, and of combining, as mechanically, said strips or bands with said filament or filaments. Additional objects will become apparent from a consideration of the description hereinafter detailed and of the accompanying drawings showing an embodiment of the invention, which may be preferred.

Referring to the drawings:

Fig. 1 is a view partly in section showing the various mechanism requisite to the carrying on of the process of the invention.

Fig. 2 is a view of a portion of the paper strip employed in the process;

Fig. 3 is a view of the completed yarn

showng the core elements extending outwardly from the ends of the sections.

Fig. 4 is a detailed section of the yarn elements at the point of contacting with the moistener; and

Fig. 5 is a section through the completed yarn.

According to the process of the present invention, the fibre stock making up the body of the yarn structure is fabricated in the form of paper strip which may be made in accordance with the process described in my copending application, Serial Number 692,947, filed February 15, 1924, the various fibres being held together by a binder, such as starch. The paper strip indicated at 10 in Fig. 2 of the drawings is wound in a roll 11 and mounted upon a reel 12 in juxtaposition with the other apparatus of the process.

The principal apparatus utilized in the carrying out of the process include a moistener 13, a rubber 14 and a twister 15, these being placed in such relationship with each other that a continuous progression of the yarn forming constituents may be carried on.

The various steps of the process include a movement of the paper strip or band 9 from the reel 12 over the moistener 13 through the rubber 14 over a guide roller 17 and into the twister 15 after passage through which the final yarn is wound upon a spool 18. There is provided also a spool 19' holding a roll of filamentary material 8 such as wire or cotton thread which forms a continuous support or core for the paper strip. The filament 8 and strip 9 are passed together simultaneously with an additional filament 19 and strip 20, the filament 19 being unwound from a second reel or spool 21 and the strip 20 being unwound over a guide roller 7 from a second roll of strip mounted upon the spindle 12.

As illustrated, there are shown only the two paper strips and two filamentary cores, but it is evident that the number of filaments and the number of strips may be varied in accordance with the requirements of the final product. The four constituent parts of the yarn are passed together over the roller 22 of the moistener 13, the strip 20 being above the filament 19 and the strip 9 being above the filament 8. In passing over the roller 22 of the moistener 13, the paper is moistened by liquid carried up from the tank of the moistener 13. In the present instance, the moistener is shown as a roller 22, the end pins 23 of which are rotatably mounted in the bowl of a tank or vat 24, the same being filled with liquid to such a depth as will permit the roller 22 in rotating to dip into the liquid and carry some of the same on its surface up into contact with the paper strips.

The combined elements of the yarn coming from the roller 22 are passed into the roller mechanism 14, this mechanism consisting of two adjacent belt structures 25 and 26, the same being mounted upon adjacent rollers 27 and 28. The belt surfaces 29 and 30 are adapted to have parallel forward movement and at the same time lateral reciprocating movement, one surface moving opposite to that of the other so that the yarn material carried between these surfaces is subjected to a rolling or condensing movement which compacts the yarn into a single rounded strand, emerging at the point 31. This strand is then passed over the roller 17 and into the twister 15 where it is subjected to a predetermined number of twists per unit length determined by the nature of the material employed and the demands to be put upon the finished product. It will be evident that, as indicated in Fig. 1, the twist put in by the twister 15 is, due to the resistance to twist furnished by the roller 17, relatively tight between the roller and the twister and relatively loose between the rubber 14 and the roller 17. This condition results in the formation of a relatively loosely twisted preliminary yarn before passing the roller 17 and the formation of said preliminary yarn into a relatively tightly twisted yarn after passing the roller 17.

The twister 15 is of a type employing a feed device and a twist device. The twist device is composed of a sleeve element 32, showing at its upper end a pulley 33, adapted to be driven by a cord 34 seated in a groove on the periphery of the wheel. The sleeve 32 terminates in a cross bar 35 carrying at its end stub shafts 36 and 37. These stub shafts, in addition to serving as a portion of the drive connection, also carry the rollers 38 and 39 for the passage of the yarn strands. The base of the stub shafts 36 and 37 rest in a second cross bar 40 from the ends of which depend the guide loops 41 for the yarn strands. An additional guide loop is shown at 42 positioned on the cross bar 40.

The feeding device of the twister includes a sleeve 43 surrounding the twist sleeve 32, the upper end of which carries a pulley 34 grooved at its periphery to receive a drive cord 45. The lower end of the sleeve 43 carries a gear 46 which is adapted to mesh with pinions 47 and 48 carried on the upper end of the stub shafts 36 and 37, respectively. A bracket 49 is adapted to hold the feed mechanism in position.

The twisting mechanism as a whole is supported by a rod 50, the base of which rests on a plate 51 and the top of which engages the cross bar 40 at its middle point. Adapted to have slidable engagement with the rod 50 is a spool 18 upon which the final yarn is wound. This spool is mounted so as to have both rotatable movement about

the rod 50 as well as vertical reciprocation thereupon. The mechanism producing reciprocation of the spool 18 consists of a lever 55 pivoted at 56 and carrying at the ends thereof contact rollers 57 and 58, the contact roller 57 being adapted to bear against the base of the spool 18 and the roller 58 being adapted to have contact with the heart-shaped cam 59 rotatably mounted upon the pivot 60. Inasmuch as the arm of the lever carrying the roller 57 is relatively longer than the arm carrying the roller 58, it is apparent that upon rotation of the cam 59, an appreciable movement of the spool 18 is obtained, the reciprocation resulting being sufficient to bring about a winding in layers, along the whole length of the spool, of the completed yarn as fed from the guide loop 41.

It is now apparent that the strand 31 in passing through the twister 17 enters the hollow sleeve 32, passes around the guide roller 60, is led about the feed rollers 38 and 39 through the guide loops 42 and 41, and then wound about the spool 16 as a final yarn, such as is indicated at 50 in Fig. 3.

The above description makes clear the operation of forming a yarn from stock material, but a summary of the requisite steps of the process may be helpful. The paper in the form of a strip and a core in the shape of a filamentary body are pressed together with a second core and a second strip, all in contacting relation and alternately superimposed one upon the other and passed successively over a moistening apparatus in order to loosen the binder of the paper, through a rubbing mechanism, containing forwardly moving and laterally reciprocating surfaces in which the materials are rubbed and condensed and compacted to form a strand of practically circular cross section and finally into a twisting mechanism where a certain number of twists is given to the strand per unit of length, the resulting product forming the final yarn as illustrated in Fig. 3.

The ends of the filaments 18 and 19 are shown projecting from the end of the yarn 17 and it is apparent that due to the layer of paper intermediate the two filaments that they are separated to a slight extent although embedded in the strip material. This distribution or separation of the core elements of the yarn brings additional coherence and strength thereto and in the twisting operation tends to compact and bind the material in a manner to increase the strength of the structure. It should be understood that, preferably, the arrangement is such that single filaments alternate with single strips or bands.

The filaments 8 and 19 may be either of the same material or of different materials. One form of filament used with success is that of a metallic wire such as brass, which has the requisite flexibility and strength for yarns of the type indicated. It may however, be expedient depending somewhat upon the use to which the final yarn is to be put, to employ a filament of vegetable fibre such as thread and in some instances, it may be desirable to use one wire filament and one filament formed of thread or similar material so as to increase the flexibility of the final yarn. It is obvious that various other combinations employing one or more filaments of non-metallic or vegetable material such as cotton in place of a single filament, or one or more metallic filaments such as brass wire, in place of a single filament, may be used.

The final yarn, as shown in Fig. 3, is usable particularly in such connections as require considerable tensile strength and high resistance against frictional wear as, for example, in connection with brake linings or clutch surfaces. In such uses when woven into the fabric, the material shows maximum strength and resistance to wear.

I do not claim broadly herein the process of making yarn from a plurality of strips or bands of asbestos material or from asbestos paper-like material and a plurality of reinforcing filaments, nor broadly to the yarn formed thereby, as these constitute the subject matter of my co-pending application, Serial No. 685,300, filed January 10, 1924. Nor do I claim broadly the process of manufacturing asbestos yarn by bringing together simultaneously or substantially simultaneously asbestos paper-like material or one or more strips or bands of asbestos material and a plurality of reinforcing filaments and directly forming the same into a yarn as that constitutes the subject matter of my co-pending application, Serial No. 687,938, filed January 23, 1924.

It should be understood that the term "asbestos material", wherever it appears in the specification and claims, is intended to refer to material having a substantial percentage of asbestos fibres, such as to give more or less the characteristics of asbestos as far as working and handling are concerned, and the term "asbestos material" where used in the specification and claims shall be considered as thus defined.

Various modifications of the invention may be made by those skilled in the art and therefore the disclosure herein made is not intended to be definitive, but rather illustrative of the invention involved, the features of the invention being determined by the claims hereto appended.

What is claimed is:

1. A process of making yarn out of paper like strip which comprises loosening the binder in a plurality of paper strips, rubbing said loosened strips on a plurality of

filaments separated from each other by material of said strips, and twisting the resulting strand to form a compact yarn.

2. A process of making yarn out of paper like strip which comprises bringing said strip material between and overlying a pair of separated filaments and moistening said strip material, rubbing and compacting said strip on and between said filaments, and twisting said filaments together to grip said strip thereon.

3. A process of making yarn out of paper like strip which comprises bringing said strip material between and overlying a pair of separated filaments, moistening said strip, and rubbing and compacting said strip on and between said filaments.

4. The process of making yarn out of paper strip which comprises rubbing the strip with and between a plurality of threads to form a strand, and twisting the strand to form a yarn.

5. The process for making yarn out of paper strip which comprises moistening the strip, passing the strip with and between a plurality of filaments through a compressing and rubber mechanism, and finally twisting the combined elements to form a yarn.

6. A process of making yarn out of paper strip which comprises simultaneously passing a paper strip with a plurality of reinforcing cores over a moistening device, whereby the strip is drawn into intimate contact with the cores, subjecting the combined strips and cores to the action of rubbing and compacting mechanism to compact the material of said strip about and between said cores and form a strand, and finally twisting the strand to form a yarn.

7. A process of making yarn out of a plurality of paper strips and reinforcing filaments which comprises loosening the binder of the strip, passing the combined strips and filaments through rubbing and compressing mechanism to form a strand, and finally twisting the strand to form a yarn.

8. As an article of manufacture, comprising a plurality of paper strips and a plurality of filaments positioned within and enclosed by said strips.

9. A process of making yarn from paper-like strip which consists in bringing together a plurality of strips and reinforcing filaments, loosening the binder of the strip material, rubbing the parts together, and twisting the resulting strand.

10. A yarn comprising a pair of reinforcing filaments and a mass of felted fibrous asbestos twisted between said filaments and compacted about said filaments.

11. A yarn comprising a pair of reinforcing filaments twisted about each other and a mass of felted asbestos fibres in paper-like form gripped between and compacted about said filaments.

12. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, combining simultaneously a plurality of said strips or bands and a plurality of reinforcing filaments to form a strand, loosely twisting said strand to form a preliminary yarn, and thereafter twisting said preliminary yarn to form a final yarn.

13. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, bringing together a plurality of said strips or bands and a plurality of reinforcing filaments, moistening said strips or bands, and combining said moistened strips or bands with said reinforcing filaments to form a yarn.

14. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, bringing together a plurality of said strips or bands and a plurality of reinforcing filaments, simultaneously combining said strips or bands and said filaments to form a strand, and twisting said strand to form a yarn.

15. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, bringing together a plurality of said strips or bands and a plurality of reinforcing filaments, moistening said strips or bands, combining said moistened strips or bands and said filaments to form a moistened strand, and twisting said moistened strand to form a yarn.

16. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises the steps of binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, simultaneously combining a plurality of said strips or bands with a plurality of filaments to form a strand, and thereafter twisting said strand to form a yarn.

17. In a method of making asbestos yarn for the manufacture of fabrics and other purposes, the steps which consist in binding

and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand forming operations, and combining a plurality of said strips or bands with a plurality of filaments alternately superimposed upon one another to form a strand.

18. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, alternately arranging a plurality of strips or bands and a plurality of reinforcing filaments in contacting relation with one another, and combining said strips or bands and reinforcing filaments in this relation to form a yarn.

19. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, bringing together in contacting relation a plurality of strips or bands and a plurality of reinforcing filaments with the strips or bands alternating with the filaments, and twisting said strips or bands with said reinforcing filaments while in this relation to form a yarn.

20. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, bringing together in contacting relation a plurality of strips or bands and a plurality of reinforcing filaments with the strips or bands alternating with the filaments, moistening said strips or bands while in this relation, and twisting said moistened strips or bands with said reinforcing filaments in this relation to form a yarn.

21. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, bringing together a plurality of strips or bands and a plurality of reinforcing filaments with the strips or bands alternating with said reinforcing filaments, moistening at least one of these strips or bands while in this relation, and thereafter combining said strips or bands with said reinforcing filaments to form a yarn.

22. An asbestos yarn comprising a twisted group of filaments and, arranged alternately with said filaments, strips or bands of asbestos material bound into paper of sufficient cohesiveness and tenacity to undergo strand and yarn forming operations.

23. An asbestos yarn comprising strips or bands of asbestos material bound into paper of sufficient cohesiveness and tenacity to undergo strand and yarn forming operations, and reinforcing filaments arranged alternately with said strips or bands, twisted therewith, and embedded therein.

24. An asbestos yarn comprising reinforcing filaments and strips or bands of asbestos material bound into paper of sufficient cohesiveness and tenacity to undergo strand and yarn forming operations, said strips or bands being arranged alternately with said filaments and twisted therewith in a substantially solid mass while retaining the strip formation.

25. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, bringing together and advancing a plurality of said strips or bands and a plurality of reinforcing filaments, moistening at least one of said strips or bands as they advance, and thereafter forming said advancing strips or bands and filaments into a twisted yarn.

26. A method of making asbestos yarn for the manufacture of fabrics and other purposes, which comprises binding and forming asbestos material into thin uniform paper-like strips or bands of sufficient cohesiveness and tenacity to undergo subsequent strand and yarn forming operations, bringing together and advancing a plurality of said strips or bands and a plurality of reinforcing filaments, moistening said strips or bands as they advance, combining said moistened strips or bands and said filaments to form a moistened strand, and twisting said moistened strand to form a yarn.

27. A method of making asbestos yarn from strips or bands of asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together a plurality of said strips or bands and one or more reinforcing filaments, moistening said strips or bands, and mechanically uniting said moist strips or bands with said filament or filaments in helical arrangement to form a yarn.

28. A method of making asbestos yarn from strips or bands of asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes the steps of mechanically bringing together a plurality of said strips

or bands and one or more reinforcing filaments, of softening said strips or bands, and of mechanically combining said softened strips or bands with said filament or filaments to form a strand.

29. A process of making asbestos yarn from strips or bands of asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together and advancing a plurality of said strips or bands with one or more reinforcing filaments, moistening the strips or bands as they advance, and mechanically combining the moist advancing strips or bands with the reinforcing filament or filaments to form a yarn.

30. A process of making asbestos yarn from strips or bands of asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically advancing one or more filaments with one or more of said strips, moistening said strip or strips while advancing with said filament or filaments, mechanically combining said moist strip or strips with said filament or filaments to form a strand, and thereafter mechanically twisting said strand to form a yarn.

31. A process of making asbestos yarn from asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes the steps of mechanically bringing together and advancing said paper-like material with one or more reinforcing filaments, of moistening said paper-like material as it advances with said filament or filaments, and of thereafter mechanically forming such moist paper-like material and filament or filaments into a strand or a yarn.

32. A method of making asbestos yarn from asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together said paper-like material and a metallic reinforcing filament, moistening the paper-like material, and mechanically continuing said moistened paper-like material with said reinforcing filament to form a yarn.

33. A method of making asbestos yarn from asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together said paper-like material and one or more metallic reinforcing filaments, moistening the paper-like material, and mechanically combining said moistened paper-like material with said metallic reinforcing filament or filaments to form a twisted yarn.

34. A method of making asbestos yarn from asbestos paper-like material of sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together and advancing said paper-like material and one or more metallic reinforcing filaments, moistening the paper-like material, mechanically combining said moistened paper-like material with said metallic reinforcing filament or filaments to form a moist strand, and mechanically twisting said moist strand to form a yarn.

35. A method of making asbestos yarn from asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together and advancing said paper-like material and a plurality of reinforcing filaments separated by said paper-like material, moistening the paper-like material and mechanically combining the moistened paper-like material with said reinforcing filaments to form a yarn.

36. A method of making asbestos yarn from asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together and advancing said paper-like material and a plurality of metallic reinforcing filaments separated by said paper-like material, moistening the paper-like material, and mechanically combining said moistened paper-like material with said metallic reinforcing filaments in helical arrangement to form a yarn.

37. A method of making asbestos yarn from asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together and advancing said paper-like material and a plurality of reinforcing filaments separated by said paper-like material, moistening the paper-like material, mechanically combining the moistened paper-like material with said reinforcing filaments to form a moist strand, and mechanically twisting said moist strand to form a yarn.

38. A method of making asbestos yarn from strips or bands of asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together a plurality of said strips or bands and one or more reinforcing filaments located between said strips or bands, moistening said strips or bands, and mechanically uniting said moist strips or bands with said filament or filaments in helical arrangement to form a yarn.

39. A process of making asbestos yarn from asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which in-

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cludes the steps of mechanically bringing together and advancing a plurality of said strips or bands and one or more reinforcing filaments located between said strips or bands, of moistening said strips or bands as they advance with said filament or filaments, of mechanically forming such advanced strips or bands and filament or filaments into a moist strand, and of mechanically twisting said moist strand to form a yarn.

40. A method of making asbestos yarn from strips or bands of asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes the steps of mechanically bringing together a plurality of said strips or bands and one or more reinforcing filaments located between said strips or bands, and of mechanically combining said strips or bands with said filament or filaments to form a strand.

41. A process of making asbestos yarn from strips or bands of asbestos paper-like material bound with sufficient cohesiveness and tenacity and adapted for yarn manufacture, which includes mechanically bringing together a plurality of said strips or bands and one or more reinforcing filaments located between said strips or bands, mechanically combining the strips or bands with the reinforcing filament or filaments to form a strand, and mechanically twisting the strand to form a yarn.

In testimony whereof, I affix my signature.

JOHN ALLEN HEANY.