Oct. 20, 1931. J. A. HEANY 1,828,112

ASBESTOS TAPE AND YARN AND PROCESS OF MAKING THE SAME

Filed May 7, 1927 2 Sheets-Sheet 1

Fig. 1.

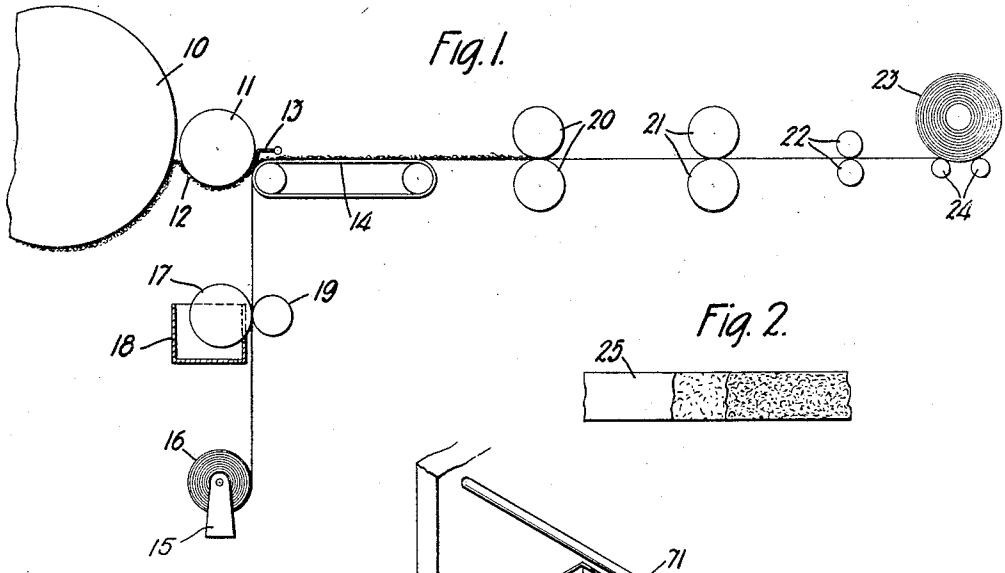


Fig. 2.

Fig. 3.

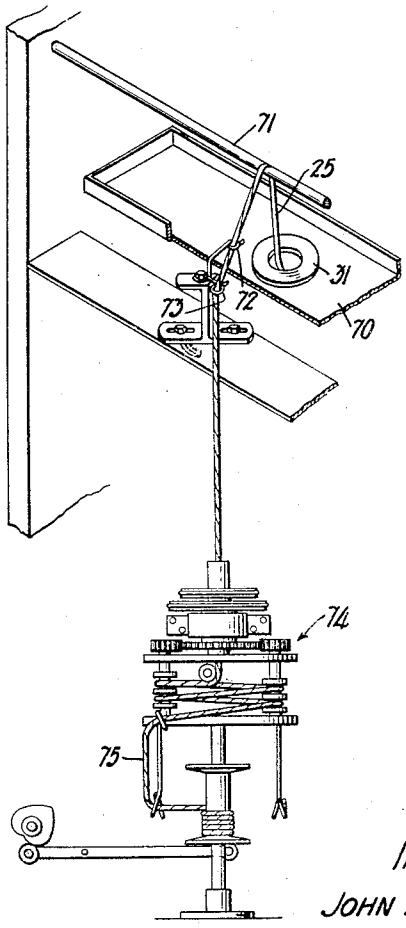


Fig. 4.

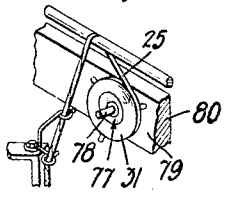
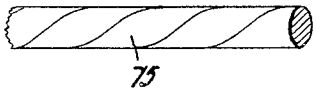


Fig. 5.



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ASBESTOS TAPE AND YARN AND PROCESS OF MAKING THE SAME

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Fig. 6.

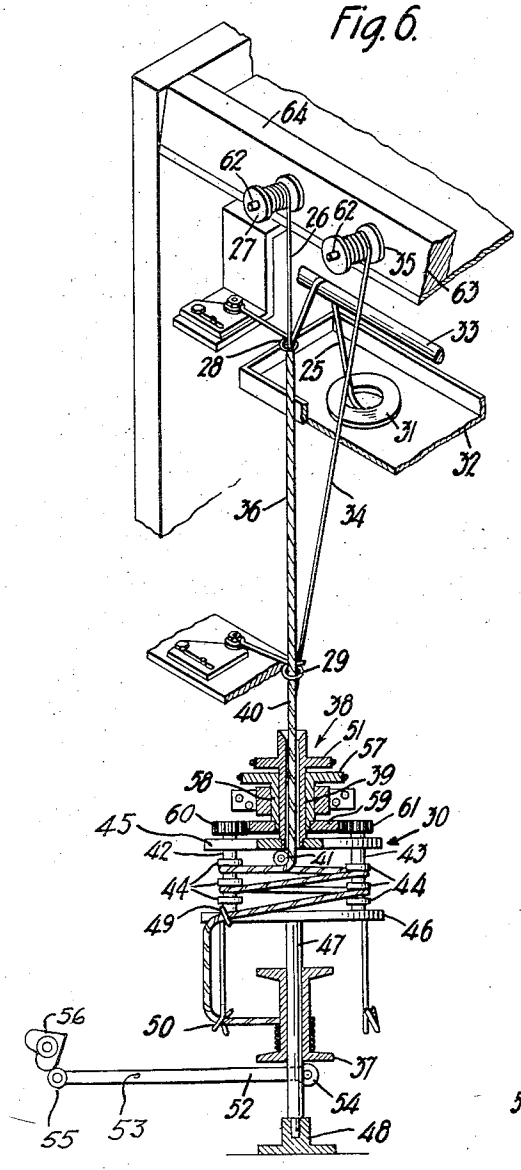


Fig. 7.

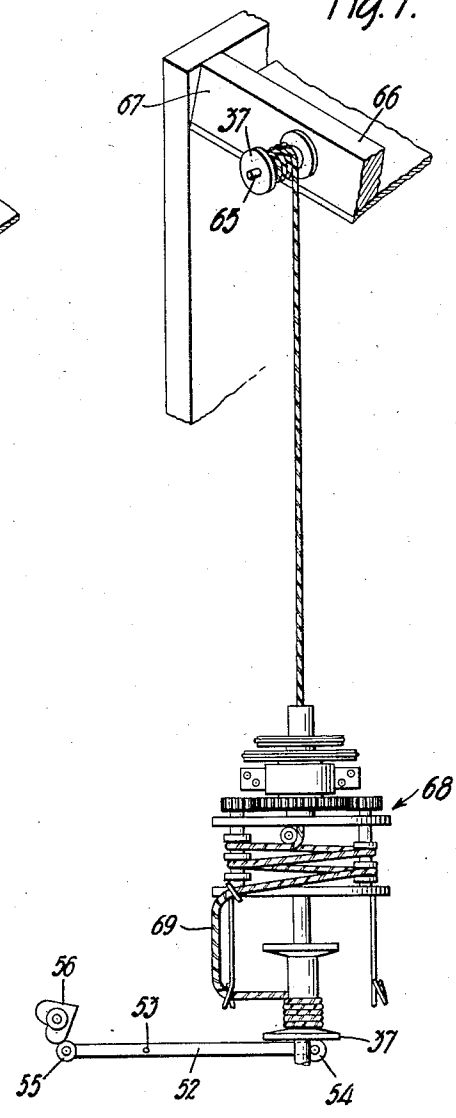


Fig. 8.

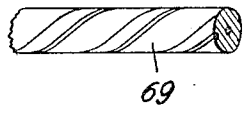


Fig. 9.



Fig. 10.



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UNITED STATES PATENT OFFICE

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ASBESTOS TAPE AND YARN AND PROCESS OF MAKING THE SAME

Application filed May 7, 1927, Serial No. 189,718, and in Canada October 4, 1924.

This invention relates to asbestos tape and yarn and the process of making the same. This application is a continuation in part of my co-pending application, Serial No. 671,807, filed October 30, 1923.

The invention relates generally to securing to a strip of suitable material such as paper, in any suitable manner as by use of an adhesive, flocculent, fibrous material such as asbestos material, to form a sheet or fabric adapted for use, especially when made from asbestos material, as an insulating tape, a covering for wire, an element for combination with reinforcing wires or the like in forming yarn, an element for forming yarn without reinforcement by other material, and for use for various other purposes.

An important object of the invention is to provide an asbestos tape or strip effective for the desired purposes and economical to manufacture.

Another important object of the invention is to provide an asbestos yarn which meets the requirements for service and may be manufactured easily and economically.

Another object of the invention is to provide a simple and effective process for the manufacture of asbestos tape, without necessitating the employment of expensive apparatus or machinery.

A further object of the invention is to provide a novel, simple and effective process for the manufacture of asbestos yarn.

Other important objects of the invention are to provide a process for making asbestos strip or tape which permits the use of asbestos material containing short fibres without detriment to the product or to articles such as yarns and fabrics formed from such strip or tape; to provide for the employment as a base or holding means for the fibrous asbestos material, material such, for example, as tissue paper or other similar non-filled, simple and inexpensive fabric; and to provide for the simple and economical manufacture of reinforced or non-reinforced asbestos yarns.

Further objects, including objects relating to economy of manufacture and advantageous details of construction, will appear upon consideration of the articles and processes hereinafter set forth, and upon consideration of the accompanying drawings, in which:

Fig. 1 is a diagrammatic view illustrating apparatus used in carrying out the present invention;

Fig. 2 is a view of the strip partly broken away to show the underlying structure;

Fig. 3 is a view of mechanism for making un-reinforced yarn from the asbestos strip material;

Fig. 4 is a fragmentary view illustrating another form of apparatus for supplying the asbestos strip;

Fig. 5 is a view illustrating un-reinforced yarn;

Fig. 6 is a fragmentary view partly in section of apparatus used in forming a reinforced yarn;

Fig. 7 is a fragmentary view illustrating the formation of a final yarn from the yarn formed by the apparatus of Fig. 6;

Fig. 8 is a view illustrating on a larger scale the final yarn of Fig. 7;

Fig. 9 is a cross-sectional view of a yarn in which the core filament is omitted; and

Fig. 10 is a similar view of a yarn in which the binding filament is omitted.

While it should be understood that the invention is not limited to the use of asbestos material, it is of particular advantage in connection with the use of such material and the following description is therefore limited to the manufacture of asbestos tape and asbestos yarn which may be reinforced or unreinforced according to the requirements for the use thereof.

As indicated in Fig. 1, the fibrous flocculent asbestos material, which has been fed to the main cylinder 10 of a carding machine, passes therefrom to the doffer cylinder 11 in the form of a web or sheet 12 of loose fibrous material. This sheet or web 12 is removed from the doffer cylinder 11 by means of one or more reciprocating combs 13 and passes to the conveyer belt 14. The web 12 may be removed as a single sheet and the entire process of securing the same to a supporting sheet, as described hereinafter, may be carried out and the finished web cut or separated into narrow strips or tapes as desired. It is

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obvious, however, that the material may be removed from the doffer cylinder 11 in strips, or that the web after removal from the doffer cylinder 11 may be separated to form a plurality of separate strips. However, for simplicity of illustration, the step of cutting or separating is omitted from the description.

Conveniently positioned relative to the doffer cylinder 11 is a bobbin support 15 for a roll 16 of supporting material such as tissue paper. The paper is fed between a roller spreader 17, dipping into a vat 18 of suitable adhesive such as glue, and a presser roller 19 up to the conveyer belt 14 where it receives on its upper surface the fibrous asbestos material passing from the doffer cylinder 11. The fibrous asbestos material, due to its flocculent condition, rests lightly on the paper until it passes through presser rolls 20 and 21 which compact the fibrous material and force it against the glue or other adhesive on the tissue paper. The compacted sheet is then pressed between rolls 22 and wound into a roll 23 carried by winding rolls 24. In case the material has been wound into a single roll, it may be slit or cut into tapes or strips of any desired width. The tape or strip 25 (Fig. 2), as finally obtained, is flat with the asbestos material in closely matted condition and can readily be handled in connection with the various steps of the manufacturing processes.

The formation of reinforced yarn according to the present invention may be carried out as illustrated in Fig. 6. A filament or strand 26 of any suitable material, such as wire, is drawn from a spool 27 and passed through guiding eyes 28 and 29 into a twister 30. A strip 25 formed according to the present invention is drawn from a roll 31 on a support or tray 32, over a rod 33 and into the eye 28 at the side of the filament 26 around which it is twisted by means of the twister 30, and a second filament or strand 34 is drawn from a spool 35 and brought into engagement, at a point just below the eye 29, with a strand 36 formed by the tape 25 and the filament 26, the strand 36 and the filament 34 being twisted together by the twister 30 and wound upon a spool 37.

The twister 30 comprises what may be called a twisting element 38 and a feeding element 39. The twisting of the strand 36 and the filament 34 forms a strand or preliminary yarn 40 which passes through the twisting element 38 and around a roll 41 thereon, then back and forth around shafts 42 and 43 of the twisting element and between dividing members 44 on said shafts. These shafts 42 and 43 are journaled in a cross bar 45 of the twisting element and engage at their lower ends a cross bar 46 on the top of a shaft 47 supported at its lower end by a base or bearing 48. From the shafts 42 and 43, the preliminary yarn 40 in a more tightly twisted condition passes through an eye 49 on the bar 46 and through the eye 50 in the lower end of a flyer projecting downwardly from the bar member 46, and upon rotation of the twisting element 38 by means of a pulley 51 at the upper end thereof is wound on the spool 37.

The spool 37 is rotatably mounted on the shaft 47 and is raised and lowered during the winding by means of a lever 52 pivoted at 53 and provided at one end with a roll 54 to engage the lower end of the spool 37 and at the other end with a roll 55 to be engaged and actuated by a heart cam 56. The feeding element 39 is driven by means of a pulley 57 at the upper end of a sleeve 58 and through a gear 59 at the lower end of the element 39 and gears 60 and 61 at the upper end of shafts 42 and 43 respectively, the shafts 42 and 43 are turned in a direction to feed the preliminary yarn 40 downwardly through the eyes 49 and 50 to be wound around the spool 37. It will be seen that the pulley 57 may be rotated in such a manner relative to the pulley 51 that the proper rate of feeding of the preliminary yarn is obtained. The spools 27 and 35 are mounted on pins 62 projecting from an inclined face 63 of a stationary member 64 so that the downward pull of the filaments 36 and 34 will cause the spools to press against inclined face 63 to exert a braking action and maintain the filaments 26 and 34 at the proper tension.

It will be seen that the eye 28 serves to bring the strip or tape 25 and the filament 26 into engagement at the desired point and that the eye 29 serves to determine the point at which the filament 34 is twisted with the strand 36 and to prevent the twist of the filament 34 from running above the point determined by said eye 29. After the completion of the operation shown in Fig. 6, the preliminary yarn 40 wound on spool 37 may be given a tighter twist (see Fig. 7) by placing the spool 37 on a pin 65 projecting from the inclined face 66 of a stationary member 67 and passing the preliminary yarn into a twister 68 by which the preliminary yarn 40 is formed into a tightly twisted final yarn 69. (Fig. 8.)

It should be understood that it is within the scope of the present invention to form yarn by combining one or more asbestos strips or tapes as disclosed with one or more core filaments and with one or more outer or binding filaments; or by combining one or more asbestos strips or tapes with one or more core elements, omitting the outer or binding filaments (yarn 69*b* of Fig. 10); or by combining one or more asbestos strips or tapes with one or more binding filaments omitting the core filaments (yarn 69*a* of Fig. 9). It should also be understood that the filaments may be metallic, or wire, or of other

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material such as vegetable fibre in the form of thread.

It should be understood that the tape or strip 25 may also be used to form an un-reinforced yarn, that is un-reinforced by any additional elements of different character. For this purpose, a strip 25 is led, as shown in Fig. 3, from a roll 31 resting in a tray 70, over a rod 71 and downwardly through eyes 72 and 73 to a twister 74 where the strip 25 is formed into a yarn 75 (Fig. 5). Instead of being drawn from the inside of roll 31 as shown in Fig. 3, the tape 25 may be led from a roll 31 (Fig. 4) carried by a reel 77 rotatably mounted on a pin 78 projecting from the face 79 of a fixed bar 80. Although the showing of Fig. 3 and the corresponding description relates to the making of yarn from a single strip 25, it should be understood that a plurality of such strips may be combined to form the yarn.

It will be evident that an important use of the tape or strip of the present invention is is in connection with the manufacture of asbestos yarns wherein one or more tapes or strips is combined with one or more core filaments and one or more outside or binding filaments. As already pointed out, it should also be understood that in the reinforced yarn of the present invention, the core filaments may be omitted or the outside or binding filaments may be omitted and that for certain purposes both core and binding filaments may be omitted. Although reference has been made more particularly to wire filaments, it should be understood that use may ge made of filaments of any other suitable material such for example as threads of vegetable fibre, cotton for example.

The simplicity of the process and of the product manufactured thereby, and the cheapness of the materials entering into the articles manufactured therefrom, contribute to make the invention of highest utility in the asbestos and in the asbestos yarn and fabric manufacturing industries.

While the various forms of the process and product have been described in detail as applied to asbestos material and tissue paper, it should be understood that the claims appended hereto are limited only by the scope of the invention and that equivalent processes and structures of asbestos strips and yarns are included in the reference of the present application. It should be understood that various changes may be made without departing from the true scope and spirit of the invention.

Having thus described my invention, I claim:

1. A process of making asbestos yarn which includes securing a layer of asbestos material to a sheet of supporting material by means of adhesive material, separating said sheet into strips, and twining said strips with filaments to form yarn.

2. An asbestos yarn for the manufacture of fabrics and other purposes, comprising one or more elements each consisting of a strip of tissue paper and fibrous asbestos material secured thereto by an adhesive and one or more filaments, combined in twined relation.

3. An asbestos yarn for the manufacture of fabrics and other purposes, comprising one or more elements each consisting of a strip of tissue paper and fibrous asbestos material secured thereto by an adhesive and one or more core filaments, combined in twined relation.

4. An asbestos yarn for the manufacture of fabrics and other purposes, comprising one or more elements each consisting of a strip of tissue paper and fibrous asbestos material secured thereto by an adhesive and one or more binding filaments, combined in twined relation.

5. A process of making asbestos yarn which includes depositing a layer of floccular asbestos material on a sheet of supporting material having an adhesive material thereon, pressing said floccular asbestos material onto said sheet, separating said sheet into strips and combining said strips with filaments to form yarn.

6. A process of making asbestos yarn which includes coating tissue paper with an adhesive, depositing a layer of floccular asbestos material on the coating of adhesive material, pressing the asbestos material on the said tissue paper, separating said sheet into strips, and combining said strips with filaments to form yarn.

In testimony whereof, I affix my signature.

JOHN ALLEN HEANY.