Nov. 14, 1939. R. W. CUTLER 2,179,655

DRIVE BELT FOR TEXTILE SPINDLES

Filed Feb. 8, 1939

Fig. 1

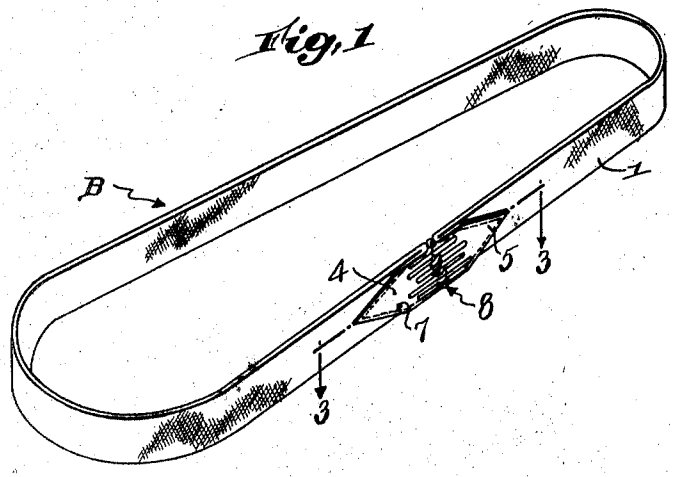


Fig. 2

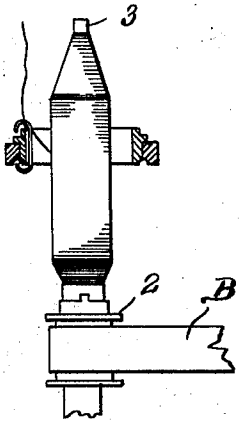


Fig. 3

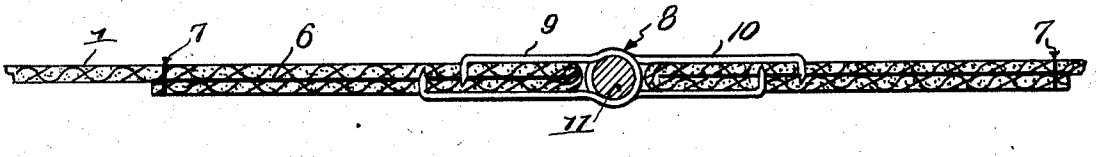


Fig. 4

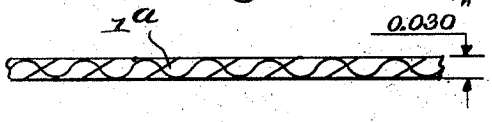


Fig. 5



Fig. 6



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UNITED STATES PATENT OFFICE

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DRIVE BELT FOR TEXTILE SPINDLES

Roger W. Cutler, Boston, Mass.

Application February 8, 1939, Serial No. 255,264

13 Claims. (Cl. 74—231)

This invention pertains to endless drive belts or "tapes" for spinning or twisting spindles, the present application being a continuation-in-part of my copending application for Letters Patent, Serial No. 190,497, filed February 14, 1938.

Such belts or "tapes" are commonly made of textile "narrow-ware" material consisting of yarns intercrossed by weaving or braiding to form a flat textile tape having selvage edges. In making the endless spinning belts or "tapes" a piece of the textile tape of the proper length is cut off and its ends are overlapped, usually with a lap of from 1 to 2 inches and then these lapped ends are united, for example, by sewing.

As the spindle whorl about which the endless belt or "tape" passes is of small diameter, for example 1 inch, and as the spindle is driven at an exceedingly high angular velocity, for instance from 3,000 to 20,000 revolutions per minute, it follows that the material of the tape is subjected to an enormous number of sharp flexings during even a single day's run. Tape thickness as herein referred to is the thickness of the selvaged textile material as measured in substantial accordance with the directions given for measuring cloth thickness found on page 12 of the United States Government publication designated CCC–T–191*a*, April 23, 1937, Federal Standard Stock Catalog, section IV (part 5), Federal Specification for Textiles; General Specifications, Test Methods, reading as follows:

"3. Thickness.—

"3*a*. Unless otherwise specified, thickness shall be measured with the gage and procedure given below.

"3*b*. The gage shall be of the dead-weight type equipped with a dial graduated to read directly to 0.001 inch. The presser foot shall be circular with a diameter of 0.375 inch, plus or minus 0.001 inch. The presser foot and moving parts connected therewith shall be weighted so as to apply a total load of 6 ounces, plus or minus 0.1 ounce (equivalent to a pressure of 3.4 pounds per square inch) to the specimen. The presser foot and anvil surfaces shall be plane to within 0.0001 inch, and parallel to each other to within 0.0001 inch.

"3*c*. The specimen shall be placed upon the anvil of the gage, smooth, but without tension. The presser foot shall be lowered upon the specimen gradually (without impact), allowed to rest upon it for 10 seconds, and the reading of the dial observed. Similar measurements shall be made at not less than five different places uniformly distributed over the surface of the material, exclusive of the area within one-tenth the width of cloth of either selvage when possible (narrow tapes are measured along the center line) or within 3 yards of either end of a roll or piece. The results of the five or more measurements shall be averaged to obtain the average thickness." It has heretofore been common to use tape of a thickness exceeding 0.050 inch.

Thin tape made of the cheap short-fiber cotton usually employed in making spinning tapes, tends to stretch and is not strong enough to carry the load for a practical period of time without breaking,—it being a prerequisite to the commercial acceptability of spinning tape that it have a life of upwards of a year at least, that is to say, the equivalent of from 2,000 to 4,000 hours of actual operation.

Textile tape such as commonly used for the purpose usually is and heretofore, prior to the present invention, has customarily been made of the cheaper grades of yarn, to wit, yarn spun from carded short-staple cotton, that is to say, cotton from ¾ inch to $1\frac{1}{8}$ inch staple length. To obtain requisite strength when using such material, it was necessary to weave it close and firm, such tape, in ⅝ inch width usually running about 45 yards per pound. Tape of a thickness of 0.050 inch and upwards is relatively stiff and inflexible, and when such a tape is formed into a spinning belt or "tape" and driven at the requisite linear velocity, it offers substantial resistance to the bending stress which is suddenly applied as the tape makes contact with the curved periphery of the small spindle whorl. This resistance to sudden bend is partially due to the inertia of the constituent particles of the tape and partially due to the resistance to stretching and compression of the material at its outer and inner surfaces, respectively. This stiffness of the tape absorbs a substantial amount of power, and the reluctance of the tape instantly to follow the curved periphery of the whorl cuts down the actual arc of contact between the tape and whorl and thus decreases the effective grip of the belt, with resultant further loss of effective drive power through slippage. When the ends of the tape are united by overlapping them one on the other, the point where the tape is overlapped is manifestly even stiffer than the rest of the belt, and when this thickened portion passes over the whorl, the flexure tends to localize at the ends of the stiffened portion, and it has been found that approximately 90% of such spinning tapes fail at

the junction of the tape proper with this two-ply portion.

The parts of spinning frames require frequent lubrication and it is common for oil to drop onto the spinning belts or tapes, but the textile material of which such tapes are usually made is injuriously affected by lubricating oil. Moreover, the hygroscopic character of textile fiber tends to cause ordinary spinning tapes to change in length in accordance with changes in the atmospheric moisture of the spinning room so that even though the tapes may be properly tensioned under one condition, they may become too loose for effective driving when the moisture conditions change.

In accordance with the present invention the endless drive belt or "tape" consists of a single ply of selvaged textile "narrow-ware" material (except that its end portions may be folded or overlapped in forming the joint) and is thin as compared with the tape heretofore generally used in making such spinning belts; that is to say, it is between 0.020 and 0.038 inch in thickness,—preferably from 0.027 to 0.031 inch thick. This thin tape is pliable and hugs the spindle whorl so closely as to avoid slippage thereby greatly increasing spindle speed and yarn production as compared with prior thicker tapes, for example tapes 0.050 inch thick. Moreover, the great pliability of this thin tape as compared with that of the thinnest practical spinning tape known to have been in commercial use prior to the present invention results in a power saving of 7 to 9 per cent or more. However, in this connection it should be noted that mere reduction in thickness is not sufficient in itself, for if tape of the usual short-fiber cotton were so decreased in thickness, a belt made therefrom would stretch and break much too quickly to be acceptable to the trade.

Accurate thickness measurement of such a material as textile tape requires great skill and the use of high precision instruments. It is very useful to define the tape of the present invention upon a "yards per pound" basis, since by measuring a long length, accuracy may be obtained even by the unskilled and by the use of usual measuring and weighing devices. Thus, reference is herein made to the number of yards per pound, (a factor which is a very good index of pliability) as well as to thickness, in indicating the novel characteristics of the improved tape. In this connection it is to be noted that thickness and yards per pound are not necessarily equivalent definitions nor in inverse proportion and that one cannot be converted into the other by any simple formula. This is in part due to the fact that the take-up of the warp varies with the number of picks of filling per inch. For example, in the ⅝" width, 24/3 warps and wefts, woven 66 ends and 28 picks, give 72 yards per pound of 0.0334" thickness, while the same yarns woven 63 ends and 18 picks, gives 96 yards per pound of 0.0337" thickness. Thus although the thickness varies but 0.0003", the yardage varies from 72 to 96 per pound.

I am aware that others, since my own conception of and experiments with thin tape, have independently made experimental tests of thin spinning tape measuring 100 or more yards per pound for the purpose of showing that power is saved by the use of thin spinning tape, and that such independent tests confirm my own tests in showing a very substantial saving in power, for instance 14%.

However, even though the power saving resultant from the use of very thin tapes (having a breaking strength of approximately 100 pounds in the ⅝ inch width) theoretically might justify the cost of replacing tapes frequently, there is a great reluctance on the part of practical mill men to adopt tape having a substantially shorter life than that of the tapes customarily employed, to wit, from nine to eighteen months. Thus the present invention further contemplates the provision of a thin and flexible tape of a strength and durability acceptable to the user, to wit, a tape which will not appreciably stretch under the conditions of use and which will carry the power load imposed upon it for a period approximating the expected life of usual commercial spinning tape, for example from nine to eighteen months, that is to say, for a period of from 2,000 to 4,000 hours of actual use. To this end, in accordance with the present invention the tape is made of a strong, stretch-resistant yarn prepared from long fiber or filaments. Combed cotton yarn made from 1½ inch staple, Upper Nile Supersak Egyptian cotton or its equivalent is desirable in order to obtain the desired strength and flexibility. Further to reduce stretch of the thin flexible belt, it is advantageous to use mercerized yarn or tape. As an instance of desirable yarn strength, a yarn of 24/4 cotton-count should have a breaking strength of single strand Suter break of approximately five and one-half pounds, and the woven material in ⅝ inch width should have a tensile breaking strength of approximately 200 pounds or more.

The invention further contemplates the employment of a tape having in general the above characteristics, but which at the same time is resistant to the deleterious and troublesome effects of oil, moisture, etc., and which does not tend to accumulate lint by reason of electrostatic action. Furthermore, the invention provides for so connecting the ends of the tape in forming the endless band, as to ensure high flexibility at the joint.

In the accompanying drawing:

Fig. 1 is a perspective view, to small scale, of a spinning belt or tape made in accordance with the present invention;

Fig. 2 is a fragmentary elevation, partly in vertical section, illustrating a spinning spindle of ordinary type, furnished with a driving "tape" or flat belt;

Fig. 3 is a longitudinal section, to much larger scale, substantially on the line 3—3 of Fig. 1;

Fig. 4 is a diagrammatic transverse section of a piece of tape, suitable for use in making a spinning belt having the characteristics herein set forth;

Fig. 5 is a view similar to Fig. 4, showing the same tape after impregnation; and

Fig. 6 is a view similar to Fig. 4, but showing the tape provided with a surface coating.

Referring to the drawing, the numeral B designates an endless spinning belt or "tape" made in accordance with the present invention from a suitable length of textile material, such for example as woven or braided selvaged cotton fabric. As illustrated in Fig. 2, the belt B is designed to embrace the whorl 2 of a spinning spindle 3 in the customary way. Several "narrow-ware" fabrics suitable for use in the manufacture of the novel spinning belt or tape of the present invention are indicated by way of example as follows, with the understanding that according to customary usage in the textile arts the number of "ends" referred to in a given fabric construc-

tion means the number of warp or longitudinally extending yarns in the entire width of the fabric; "picks per inch" means the number of weft, filling or transversely extending yarns in each linear inch of the fabric; an expression such as "24/4" means that four No. 24 yarns (numbered in accordance with the Cotton yarn system of numbering) have been twisted together to make a single thread or ply-yarn; while the term "count" means the size of the yarn in accordance with the Cotton yarn system of numbering, wherein the number of hanks, each of 840 yards in one pound of the yarn, is the number or count of that particular yarn.

For instance, a ⅝ inch width of the belt, the textile fabric may be woven with fifty ends of 24/4 cotton-count yarn of a soft twist with thirty picks per inch of 24/4 filling, the woven material being approximately 0.031 inch thick and running from 70 to 75 yards per pound. As a second example, sixty-seven warp ends of 24/3 yarn with 32 picks of 24/3 filling per inch may be used or, as a further example, eighty-three warp ends of 20/2 yarn may be woven with thirty-six picks per inch of 20/2 filling,—the resultant material running from 75 to 85 yards per pound. As a further specific example of a very desirable and preferred construction, the warp and filling yarns may both be 24/4 cotton-count, spun from cotton of a minimum staple length of 1½ inch and of the quality of Upper Nile Supersak, the yarn having a breaking strength of 5½ pounds; the tape being woven with fifty-three warp ends and with twenty-eight picks of filling per inch and having a breaking tensile strength of approximately 260 pounds and an average thickness of approximately 0.031 inch and measuring approximately 70 yards per pound.

The above constructions relate to a tape of ⅝ inch width, but it is to be understood that tapes of other widths will be made in corresponding proportions in accordance with the following basic formula as to increase or decrease in the number of warp ends employed in making fabrics of corresponding constructions. This basic formula is as follows:

Obtain the percent increase or decrease in width of tape, then add or subtract the percent figure increase or decrease to the number of warp threads.

Example.—½ inch tape with 50 ends of warp. To obtain ⅝ inch tape (since ⅝ inch is ⅛ inch wider than ½ inch (25%)), add 25% of 50 to 50, which results in 62.5 warp ends for ⅝ inch width tape.

As a basis for arriving at the weight, or yards per pound, of a fabric having a given construction of sley, pick, warp yarn, filling yarn, and width, the standard formula as used by all textile mills producing woven goods is as follows:

Formula

1. Obtain yards of warp yarn needed for 100 linear yards of fabric of given width.
   - A. 100 yards times sley times number of plies in warp yarn.
   - B. Add to result 10% for contraction.
   - C. Sum equals total linear yards warp yarn required.

[The "sley" refers to the number of threads per inch in the warp; the "picks" refer to the number of threads per inch in the filling.]

2. Obtain yards of filling yarn needed for 100 linear yards of fabric of given width.
   - A. 100 yards times picks times number of plies in filling yarn times width in inches.
   - B. Add to result 4% to 5% for contraction.
   - C. Sum equals total linear yards filling yarn required.
3. Add total warp and total filling yarn (total yarn yardage in linear yards of fabric).
4. Divide this total by the yards per pound of the single yarn. Result: number of pounds of yarn for 100 linear yards of fabric.
5. Divide No. 1 by the number of pounds found—answer is yards per pound.

To afford ample strength the yarn should be spun from combed cotton of fine, long staple, for example, peeler cotton of not substantially less than 1⅛ inch staple length. In this connection it is to be noted that "peeler" does not define any particular staple length but refers to a variety of cotton grown in the Lower Mississippi River region, such cotton being of a good average length and of high quality. Any desired weave pattern may be employed. It is common to use what is known as a herringbone weave, but a basket weave is frequently employed. While this tape 1 is preferably approximately 0.031 inch in thickness, it is contemplated that, as respects certain aspects of the invention, the thickness of the tape may be varied to some extent, for example, from 0.020 to 0.036 inch inclusive, in accordance with circumstances and in particular with reference to the material of which the tape is made, the number of yards per pound, and the size of the spindle whorl with which the tape is to be used. The width of the tape should obviously be appropriate to the dimensions of the spindle whorl on which it is to be used.

While it is not essential to the broader aspects of the invention, it is preferred so to treat the material of the tape as to make it resistant to oil and/or moisture and to prevent it from rolling over upon itself. Thus, for example, the tape may be coated, or preferably impregnated, with, for instance, one of the cellulose derivatives, for instance, cellulose acetate; a synthetic rubber, for instance of the polymerized chloroprene type; certain oil and water-resistant isomers of natural rubber appropriate for the purpose; certain synthetic resins; or bituminous or asphaltic materials or derivatives thereof. In fact, any suitable substance which does not materially increase the stiffness of the band when applied thereto and which has the desired oil and/or water-repellant or resistant characteristics, is desirable for the purpose. However, it is desirable to employ a coating or impregnating material which is of a thermoplastic type, normally substantially non-sticky but which, due to the frictional heat generated in operation, may become very slightly tacky so as to grip the spindle whorl without substantial slippage, although the tackiness of the band should not be such as to interfere with the doffing and piecing-up operations.

Synthetic resins such as those of the highly polymerized vinyl halide group mixed with appropriate plasticizers, for example tricresyl phosphate, (among others, those commonly known under the trade names Thiokol, Duprene, Korolac, Koroseal, etc.) are very desirable as the coating or impregnant materials as these substances possess in high degree the desired resiliency, resistant to oil and moisture, and thermoplastic character.

A further novel and highly desirable property of synthetic resins of the class just referred to is that when used for coating or impregnating a drive belt or tape for spinning or twisting spindles, the tapes do not become charged with static

electricity during use, and thus do not accumulate lint or fly as do the tapes heretofore commonly in use.

Ordinarily the impregnation or coating of the tape by means of such substances as those above suggested adds but little to its thickness, but, if desired, when the tape is to be impregnated, or coated, it may initially be made slightly less in thickness than the finished tape to allow for the increase due to impregnating or coating it. Thus, the completed and impregnated tape 1b (Fig. 5) and the coated tape 1x (Fig. 6) is shown as approximately 0.031 inch in thickness as compared with the untreated tape 1a of Fig. 4 which is 0.030 inch thick. As already noted, the impregnant or coating substance should be of such character as not substantially to increase the stiffness of the tape.

As an alternative to such impregnation or coating, as above described, or as a preliminary thereto, the tape may be made of mercerized cotton, the mercerization being carried out either on the yarn before weaving, or on the woven tape. Either complete or partial mercerization of the material of the tape shrinks it so that thereafter it is substantially non-stretching. Thus the spinning belt or "tape," even though thin and flexible, substantially retains its initial length during a long period of use. Not only does mercerization, whether complete or partial, substantially eliminate subsequent stretch, but it also has some effect in resisting the injurious action of oil and moisture.

While long staple cotton is desirable as a material for use in making the tape, it is contemplated that other substances may be employed. Thus, for instance, the tape may be made in whole or in part of long filament synthetic yarn, for example, a cellulose derivative or a synthetic resin yarn; or it may include long fiber elements of inorganic origin, for example, glass or metal. In fact, recent developments in the production of spun glass filaments and fabrics woven therefrom show such enormous strength and ability to endure oft-repeated flexure, that it may be employed, particularly if impregnated as above suggested, in making spinning "tapes" of the minimum thickness above suggested with highly satisfactory results.

In making a belt from the selected material, a piece is cut to the desired length and the ends of this length of material are preferably cut on the bias,—as here illustrated, to V-points as shown at 4 and 5 in Fig. 1.

These V-points are then doubled over so as to overlap the body of the tape and, if desired, temporarily secured by means of a layer 6 of an oil and waterproof adhesive, for example, such a synthetic rubber as above described. After having lapped these ends 4 and 5 over onto the body of the tape so as to form anchorage portions of double thickness, the lapped ends are permanently united to the body of the tape by appropriate fastening means, for example, rows of stitches 7. The length of material thus prepared is now ready to have its ends united, and this is preferably done by the use of a metal-wire belt fastener 8 of a type well known for use in uniting the ends of power belts, such fastener comprising a series of interleaved members 9 and 10 which are provided with prongs designed to be driven into the folded-over end portions, respectively, of the material, and which also comprise loop portions which are so overlapped as to receive a pintle member 11, which may be of metal, rawhide or any other suitable material, thus forming a hinge joint between the folded and thickened ends of the band. These thickened ends, as will be noted, are substantially double the thickness of the impregnated tape 1b from which the belt is made, and thus these thickened ends are substantially 0.062 inch thick, which is approximately the minimum to form a secure anchorage for a metallic fastener 8 of the type described.

It has been observed that at the high linear speeds (27 to 30 miles per hour) at which such belts run, the air tends to lift the extreme end of the tape where it is overlapped to form the joint and thus to increase resistance, but by making the ends of the tape with a V-point, as herein disclosed, this effect is greatly minimized. Moreover, since by the use of the V-point the area of added thickness at the end of the belt gradually diminishes in width, and thus in transverse stiffness, the formation of a sharp bend (which, as above noted, tends to occur at the junction of the body of the band with its double-over portion) is to a large extent eliminated, and thus there is far less danger of breakage of the belt adjacent to the extreme end of the doubled-over portion than is common.

While in accordance with the present invention a hinge-type metallic fastener 8 is preferred as a means for uniting the ends of the length of the very flexible tape, it is contemplated as within the broad purview of the invention that the thin and flexible tape, such as herein shown, may, if desired, be united substantially as usual by lapping and seaming, but preferably with the overlapped ends cut to V-points, since the advantages of the very flexible tape are in large measure obtained even though the overlap form of joint is stiffer than the joint provided by a fastener such as shown in Fig. 3.

It has been proven by extended experiment that by the use of the novel spinning tape hereinabove described, for example tape of the order of 0.031 inch thick and running 55 or more yards per pound, it is possible to minimize slippage and thus to increase spindle speed and to make a substantial saving in power consumption as compared with the tapes heretofore customarily employed, and such improved operation and saving in power far more than compensates for the increased cost of the thin, strong tape as compared with thick tapes, for instance, tapes of 0.050 inch made from short staple fiber. In order that the thin tape may not unduly stretch during use, it is preferred to preshrink it as above described, either in the yarn or after fabrication, and it has been discovered that by mercerization of the material of the tape the tendency of the band to stretch while in use is very much lessened as compared with usual cotton tapes so that a thin and flexible belt made of mercerized tape maintains its initial length and tension even better than the thicker and stiffer cotton tapes of prior use.

A further and very important advantage resulting from the present invention is that the resin-impregnated tape does not become charged with static electricity and thus does not gather lint nor generate dangerous sparks.

While certain desirable embodiments of the invention have herein been disclosed by way of example, it is to be understood that the invention is not necessarily limited thereto but is to be regarded as inclusive of all such variations and modifications as fall within the scope of the appended claims.

I claim:

1. An endless textile spinning or twisting belt comprising a single ply of flexible selvaged tape composed of interwoven or interbraided yarns predominantly of cotton, said tape having a thickness of 0.027 to 0.031 inch, and a minimum length of 70 yards per pound in the ⅝ inch width and other widths in proportion, and means flexibly uniting the ends of the tape.

2. Flexible single-ply power belting designed for driving spinning or twisting spindles and consisting of selvaged tape composed of interbraided or interwoven yarns predominantly of cotton, said tape having a thickness of the order of 0.030 inch, and a tensile strength of at least 100 pounds and running from 70 to 100 yards per pound in the ⅝ inch width and other widths in proportion.

3. An endless textile spinning or twisting belt comprising a single ply of flexible selvaged tape composed of interwoven or interbraided yarns of cotton spun from fiber of a staple length of at least 1⅛ inches, said tape having a thickness of between 0.024 and 0.031 inch, and a minimum length of 70 yards per pound in the ⅝ inch width and other widths in proportion, and means flexibly uniting the ends of the tape.

4. An endless textile spinning or twisting belt of acceptable durability for driving spinning and twisting spindles, said belt throughout the major portion, at least, of its length consisting of a single ply of selvaged textile tape made of interwoven or interbraided yarns, characterized in that the tape used in making the belt is made from yarns spun from cotton of at least one inch staple length, the belt being of a thickness less than 0.037 and more than 0.020 inch and running at least 55 yards per pound in the ⅝ inch width and other widths in proportion, and having a tensile strength of at least 180 pounds.

5. Power belting of commercially acceptable strength and durability for driving spinning or twisting spindles and which, in use, forms a flexible endless drive belt, said belting consisting of selvaged single-ply textile tape made from interwoven yarns, characterized in that the tape is of cotton yarn spun from fiber of at least one inch in staple length, the material of the tape being preshrunken by mercerization, and being of a thickness less than 0.037 and more than 0.020 inch, and running at least 55 yards per pound in the ⅝ inch width and other widths in proportion.

6. Flexible single-ply belting of commercially acceptable strength and durability for driving spinning or twisting spindles and which, in use, forms an endless drive belt, said belting consisting of selvaged textile tape made from interwoven or interbraided yarns, characterized in that the tape has a minimum breaking strength, in ⅝ inch width, of at least 100 pounds, and is of a thickness approximating 0.029 inch, and further characterized in that the tape which forms the belt consists of yarn made from fibers or filaments predominantly of cotton of 1⅛ inches or more in staple length.

7. Flexible power belting designed for driving spinning or twisting spindles consisting of a single ply of flexible, selvaged textile tape, the belting being of acceptable durability for driving spinning or twisting spindles and having a minimum breaking strength of 100 pounds and running more than 55 yards to the pound in the ⅝ inch width and other widths in proportion, the belting being of a thickness less than 0.037 inch, the belting being substantially non-stretching under the conditions of use, the warp yarns at least being made from fibers or filaments predominantly of cotton of at least one inch in staple length, said belting being adapted to be converted into an endless spinning or twisting belt by severing to proper length and uniting the ends of such length.

8. An endless textile spinning or twisting belt of acceptable strength and durability for driving spinning or twisting spindles, said belt throughout the major portion, at least, of its length consisting of a single ply of selvaged textile tape made from interwoven or interbraided yarns, characterized in that the tape which forms the belt is of a thickness from 0.020 to 0.036 inch, and that in the ⅝ inch width the tape runs more than 55 yards per pound with other widths in proportion, and further characterized in that the tape which forms the belt consists of yarn spun from combed cotton of at least 1⅛ inches staple length.

9. An endless spinning or twisting belt of acceptable strength and durability for driving spinning or twisting spindles, said belt throughout the major portion at least of its length consisting of a single ply of selvaged textile tape made from interwoven or interbraided yarns, characterized in that the tape which forms the belt is of a thickness of from 0.020 to 0.036 inch, and that in the ⅝ inch width it runs at least 60 yards per pound with other widths in proportion, and further characterized in that the tape which forms the belt consists of yarn spun from fibers or filaments predominantly of cotton of more than 1⅛ inches staple length.

10. Power belting of acceptable durability for driving spinning or twisting spindles when formed into an endless drive belt which, throughout the major portion at least of its length, consists of a single ply of the belting material, said belting material being made from interwoven warp and weft yarns, the warp yarns at least being spun from combed cotton of 1⅛ inches or more staple length, the belting being of a thickness of from 0.020 to 0.036 inch and, in the ⅝ inch width, having a minimum breaking strength of 180 pounds and running more than 55 yards per pound with other widths in proportion.

11. An endless textile spinning or twisting belt of acceptable durability for driving spinning or twisting spindles, said belt, except adjacent to the point where its ends are joined, consisting of a single ply of selvaged textile tape made from interwoven or interbraided yarns, characterized in that the tape which forms the belt is of a thickness between 0.024 and 0.031 inch, and in the ⅝ inch width runs 70 or more yards per pound, with other widths in proportion, and further characterized in that the tape which forms the belt is substantially non-stretching under conditions of use and comprises yarn spun from combed cotton of at least one inch staple length, thereby to impart the requisite strength, and has combined therewith a material which tends to prevent electrical accumulation of lint upon its surface.

12. Flexible power belting designed for driving, spinning or twisting spindles consisting of a single ply of flexible, selvaged textile tape, the belting being of acceptable durability for driving, spinning or twisting spindles and having a minimum breaking strength of 100 pounds and running more than 55 yards to the pound in the ⅝ inch width, and other widths in proportion, the belting being of a thickness less than 0.037 inch and being substantially non-stretching under the conditions of use, the warp yarns at least being made from fibres or filaments predominantly of cotton

of at least one inch in staple length, said belting having combined therewith a flexible synthetic resin of such a nature as substantially to prevent the belt from becoming charged with static electricity when in use, the belting being adapted to be converted into an endless spinning or twisting belt by severing to proper length and uniting the ends of such length.

13. Flexible power belting designed for driving, spinning or twisting spindles consisting of a single ply of flexible, selvaged textile tape, the belting being of acceptable durability for driving, spinning or twisting spindles and having a minimum breaking strength of 100 pounds and running more than 55 yards to the point in the ⅝ inch width, and other widths in proportion, the belting being of a thickness less than 0.037 inch and being substantially non-stretching under the conditions of use, the warp and weft yarns at least being made from fibres or filaments predominantly of cotton of at least one inch in staple length, said belting being impregnated with resin of the vinyl halide group and adapted to be converted into an endless drive belt for spinning or twisting spindles wherein the resin substantially prevents the belt from becoming charged with static electricity.

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