

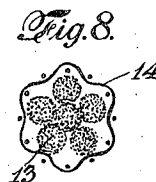
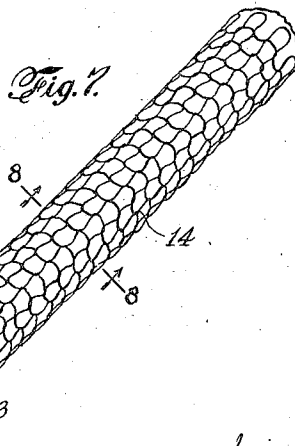
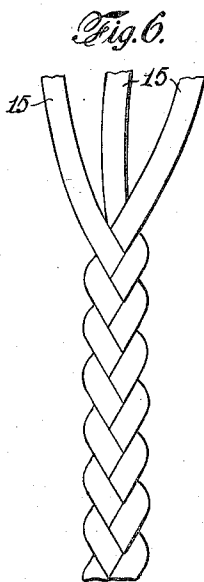
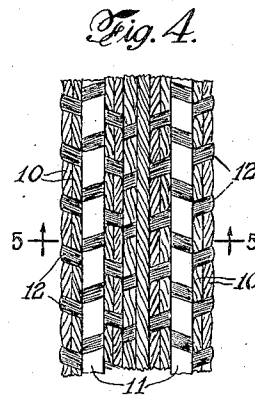
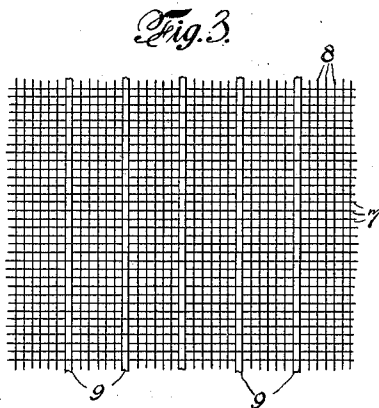
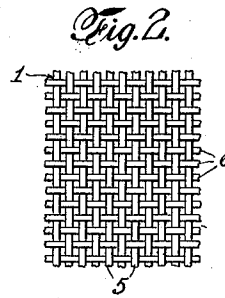
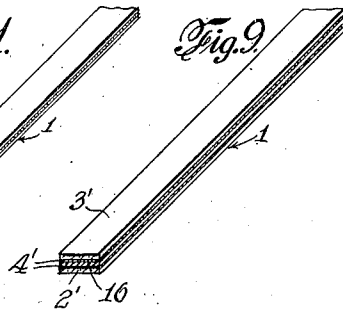
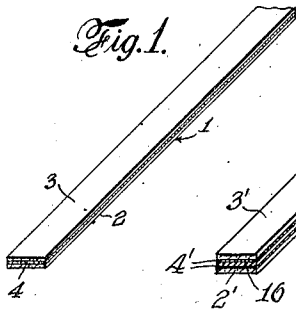
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K. E. PRINDLE

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TEXTILE

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INVENTOR.
KARL E. PRINDLE
BY *Wm. N. Citchard*
ATTORNEY.

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TEXTILE

Karl E. Prindle, Shaker Heights, Ohio, assignor to
The Dobeckmun Company, Cleveland, Ohio, a
corporation of Ohio

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This invention, which is a continuation-in-part of my copending applications Serial Nos. 45,455 and 61,537, relates to textiles. More particularly, the invention relates to textile threads and materials containing the same.

The nature and objects of the invention will become apparent from the following description, appended claims, and accompanying drawing wherein:

Figure 1 illustrates an enlarged perspective view of a textile thread embodying the principles of this invention;

Figure 2 is an enlarged plan view of a fragment of a woven material containing the thread shown in Figure 1;

Figure 3 is an enlarged plan view of a fragment of another type of woven material containing the thread shown in Figure 1;

Figure 4 is an enlarged plan view of a fragment of another type of woven material containing the thread shown in Figure 1;

Figure 5 is an enlarged section taken on the line 5—5 of Figure 4;

Figure 6 is an enlarged plan view of a plaited material formed of the thread shown in Figure 1;

Figure 7 is a perspective view of an article containing a tubular knitted material containing the thread shown in Figure 1;

Figure 8 is a section taken on the line 8—8 of Figure 7; and

Figure 9 is an enlarged perspective view of another embodiment of the textile threads of this invention.

One embodiment of the instant invention resides in a highly lustrous thread of any desired color and which, when woven, knitted, braided, plaited or otherwise fabricated, will produce fabrics, braids, plaited articles, and like materials of highly ornamental and artistic appearance, said fabricated materials constituting another phase of this invention.

The fabricated material may be formed entirely of the threads aforementioned. For example, the threads of this invention may be used as warp and filler threads of a woven fabric, or may constitute the threads (ends) employed in the production of knitted, plaited, braided, and like materials. In another embodiment of the invention, the threads of this invention may be used in the production of materials of the type mentioned in conjunction with other known threads, such as those formed of cotton, rayon, wool, silk, and the like. Thus, for example, in a woven material, the threads of this invention may constitute either the warp or filler threads,

and the other filler or warp threads, as the case may be, may be of any known thread. If desired, only certain predetermined warp or filler threads may be made of said thread. Similarly, in the production of knitted, plaited, braided or like materials, one or more of the ends may be formed of the threads of this invention and the other ends formed of threads of the known types.

The thread constituting one phase of the instant invention, as hereafter more fully explained, may be formed of materials which are not susceptible to and therefore are not colored by various dyestuffs, such as, for example, direct dyes, basic dyestuffs, vat dyes, etc. Thus, in that embodiment of the invention which contemplates utilizing the thread of the instant invention in conjunction with some other known thread as above explained, the latter thread is preferably of a type which is susceptible to and therefore colored by dyestuffs which do not affect the color of the thread of the instant invention. In this manner, a multi-colored material may be produced.

In the production of woven materials, plain weaves or weaves producing designs, as for example jacquard, may be used. Likewise, in the production of knitted material, the latter may be knitted flat or circular, with or without designs therein as desired. Similarly, flat or tubular braided or plaited materials of any stitch, such as ladder, lattice, spaced, with or without designs formed therein, may be produced.

The thread constituting the instant invention is a relatively narrow, cut, laminated continuous material formed of at least two plies of coextensive narrow strips of a normally transparent cellulosic material, and the plies are secured together by an appropriate adhesive. As the preferred normally transparent cellulosic material I employ strips of cellulose acetate. However, strips of other cellulosic materials, such as, for example, regenerated cellulose, cellulose ethers, glycol cellulose, and like materials may be used.

The adhesive for securing the two plies together is one which produces a firm bond therebetween and is capable of bending without cracking so as not to impair the flexibility of the product.

As illustrative examples of adhesives which have given satisfactory results may be mentioned the following:

(1) A plastic resin (natural or synthetic) of the requisite degree of tackiness;

(2) A resin (natural or synthetic) and a plasticizer; and

(3) A resin (natural or synthetic), a plasticizer, and a cellulose derivative, such as nitro-cellulose, cellulose acetate, cellulose ethers, with or without a plasticizer and with or without other modifying ingredients.

It is to be noted that each of the foregoing adhesives is also thermoplastic.

If desired, in each of the foregoing examples a quantity of an appropriate volatile solvent may be included to make the adhesive of the desired viscosity to permit application thereof, the solvent being removed after application and prior to lamination.

The thread produced from the materials previously described will be substantially transparent and possess a high luster.

In the preferred embodiment of this invention, it is desired that the thread be of an appearance that will simulate metal, particularly metallic threads of a golden or silvery appearance. With this in view, any suitable metal foil, such as lead, tin, aluminum, etc., may be interposed between the plies and adhesively secured thereto through the medium of the adhesive. When the plies consist of, for example, cellulose acetate, and aluminum foil (.0045 of an inch thick) constitutes the metal foil and a transparent adhesive is employed, a thread simulating silver is secured. A product simulating gold or copper thread is obtained by adhesively securing the aluminum foil to the cellulose acetate plies through the medium of the transparent adhesives containing the desired coloring agent incorporated therein.

The golden or silvery threads can also be secured without the aid of metal foil. With this in view, an appropriate pigment, such as a metallic powder, is incorporated in the adhesive composition. Due to the transparent characteristics of the cellulosic material constituting the plies of the thread, the colored effect of the adhesive will be visible and the product will have a lustrous metallic appearance closely resembling and simulating metallic foil. Though in the preferred embodiment of the invention, threads simulating metallic threads of golden or silvery appearance are contemplated, it is to be understood that by the use of appropriate colors, pigments or dyestuffs, other colored threads may be produced. Hereafter are set forth several illustrative pigments which will produce the named color:

	Pigment	Color
55	Bronze powder.....	Gold.
	Aluminum powder.....	Silver.
	Titanium oxide.....	White.
	Lead chromate.....	Yellow.
60	Chromic oxide.....	Green.

The quantity of pigment employed is sufficient to impart the desired color and, if desired, also opacity to the adhesive. Usually, I have found that the desired opacity and color are secured when the quantity of coloring agent is in an amount of from 10% to 40% by weight of the other ingredients constituting the adhesive.

Due to the fact that the color of the thread is imparted to the latter through the adhesive interposed between the plies of the selected cellulosic material, the color is substantially permanent. The plies protect it from bleeding or being removed in any subsequent operation to which the material containing the thread may be put, such

as dyeing, washing, cleaning, etc. Also, in the preferred form, the metallic appearance is protected against tarnishing.

The width of the thread usually depends on the product in which it is to be used. Satisfactory results have been secured when the thread is of a width between $\frac{1}{100}$ and $\frac{1}{4}$ of an inch, such as $\frac{1}{60}$, $\frac{1}{64}$, $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$ etc. of an inch.

To produce the thread constituting the instant invention, the selected adhesive is applied to at least one of the opposed surfaces of the two materials to be united, and thereafter laminating the materials in the usual manner under heat and pressure. If desired, this can be accomplished in a continuous procedure wherein, after the adhesive has been applied to at least one of the opposed surfaces of the two materials, the two materials are conducted to a laminating mechanism which may consist of a pair or a plurality of pairs of pressure rolls, the pressure of the rolls being sufficient to bring the two materials into intimate contact. In the procedure aforementioned, the materials to be laminated are relatively wide webs of the selected cellulosic film. Thus, after the laminating operation, the laminated web material is severed or slit into very narrow strands or threads of the desired width. The slitting of the wide laminated web material is preferably longitudinally thereof. The threads may be formed by straight cuts made perpendicular to the plane of the laminated web so that the threads have sharp and well defined longitudinal edges and are substantially rectangular in cross-section. It is to be noted that the cut edges of the threads are free and uncoated. When the thread is of the type which includes a metal foil as one of the plies, then the adhesive is applied to those surfaces of the web of the selected cellulosic film which are to be in contiguous relationship with the foil, and thereafter the materials laminated and slit as previously described.

In order to more fully explain the invention, reference is now made to the accompanying drawing wherein several illustrative embodiments of the invention are shown.

Referring now to the drawing wherein like reference numerals designate like parts, the reference numeral 1 designates the thread constituting one phase of the instant invention. The thread is a laminated material, relatively narrow in width as previously described, in which the plies 2 and 3 are adhesively secured together through the medium of an adhesive 4. As previously explained, the plies 2 and 3 are preferably formed of cut strips of transparent cellulosic material, preferably cellulose acetate. The adhesive 4 is one which preferably contains a metallic pigment, with the result that the thread 1 has a highly lustrous metallic appearance.

As previously explained, the thread 1 may be employed in the production of woven, knitted, plaited, and other textile materials. Hereafter are described several illustrative embodiments of these materials.

Referring now to Figure 2, illustrating one embodiment of a woven material contemplated by this invention, the threads 1, in which the adhesive contains the metallic pigment to give the desired color, i. e. gold or silver, constitute both the warp threads 5 and the filler threads 6, with the result that the fabric resembles a lamé fabric. In the event a multi-colored lamé fabric is desired, the warp threads 5 may have a golden appearance and the filler threads 6 may have a silver

appearance, or vice versa. It is to be understood that both the warp threads 5 and the filler threads 6 may be formed of the same cellulosic material or of different cellulosic materials.

Variegated effects may be secured in various other manners. For example, the warp threads 5 may be formed of the threads 1 in which the plies 2 and 3 are formed of cellulose acetate and the adhesive contains the desired coloring pigment, and the filler threads 6 formed of threads 1 wherein the plies 2 and 3 are formed of regenerated cellulose and the adhesive is free of a coloring agent. After such a material is woven, the fabric is subjected to a dye bath containing, for example, a direct color, an acid dyestuff, a vat dye, or some other dyestuff which will color the regenerated cellulose but will not color the cellulose acetate. As a consequence, the regenerated cellulose threads will be dyed with the color of the selected dyestuff, which will not affect the color of the cellulose acetate threads. It is to be understood that in this modification the warp threads 5 may be made of threads responsive to the dyestuffs and that the filler threads 6 may be made of threads which are not responsive to said dyestuffs.

Referring now to Figure 3, wherein there is illustrated a fabric woven in a known manner, the reference numeral 7 designates filler threads formed of viscose rayon and the reference numerals 8 and 9 designate the warp threads. The warp threads 8 in this embodiment are formed of viscose rayon and the warp threads 9 formed of threads identical with thread 1, in which the plies are formed of cellulose acetate, and a metallic pigment, either aluminum or bronze, is incorporated in the adhesive. After the fabric has been woven, it is subjected to a dye bath which dyes viscose rayon and does not affect the color of cellulose acetate. Due to the fact that the warp threads 9 are spaced from each other, the resulting fabric has the appearance of a material having metallic spaced stripes extending throughout the length of the fabric. It is to be understood that if the stripes are desired to extend horizontally in the fabric, this can be secured by making certain spaced filler threads formed of threads 1 and the other filler threads and the warp threads of viscose rayon.

The appearance of the fabric illustrated in Figure 3 may be enhanced, for example, by imparting crepe effects thereto. This can be secured by utilizing highly twisted filler threads 7 which at some stage in the preparation or finishing of the fabric, preferably after the dyeing thereof or simultaneously with the dyeing thereof, are given a treatment to produce the crepe effects.

Instead of making the aforementioned threads of viscose rayon, they may be made of cotton, silk, wool, and the like.

The thread 1 may also be used in the production of trimmings, such as, for example, braids. Such an embodiment of the invention is illustrated in Figures 4 and 5.

Referring now to Figures 4 and 5, the reference numeral 10 designates cords formed of, for example, viscose rayon, cotton, wool, silk, and the like and constituting warp threads in the product. At spaced intervals intermediate the cords 10 there are provided threads 11 of the form and construction shown in Figure 1. The warps 10 and 11 are secured together by means of the lacing 12 constituting a weft thread which extends spirally through the product and passes over and under the warp threads 10 and 11, as illustrated.

The warp threads 10 and the lacing 12 may be made of previously colored material. Alternatively, the warp threads 10 and the lacing 12 may be uncolored, in which case the warp threads 11 are of the same construction as the warp threads 9 of Figure 3, and the material, after being woven, is subjected to a dyeing operation, substantially as hereinbefore described in connection with the embodiment illustrated in Figure 3, wherein the warp threads 10 and the lacing 12 are dyed while the warp threads 11 are unaffected as to color by the dye.

Another embodiment of the invention is shown in Figure 6. In this form of the invention, a plurality of ends (threads) 15 of the form and construction of the thread 1 and appropriately colored are plaited together to give a flat strand material. If desired, the plaiting operation may be carried out around an appropriate filler to give a tubular braid. Also, one or more of the ends 15 may be of different colors or different materials than the other.

Referring now to Figures 7 and 8, there is disclosed an article of manufacture which can be used as a pull string for drapes, curtains, electric lights, etc. In this form of the invention, the threads 1 appropriately colored by the use of the appropriately colored adhesive 2, are loosely knitted on a circular knitting machine around a filler 13 of any suitable material. In the form shown, the filler 13 is formed of a plurality of strands of a fluffy material loosely twisted together. By loosely knitting the threads, an open mesh fabric effect 14 is secured. If desired, the threads 1 may be differently colored.

Though in the foregoing the only design described was stripes, it is to be understood that the invention is not restricted thereto. The threads 1 may be used in the production of materials having numerous other designs by the use of appropriate known apparatus and settings therefor. The threads may also be used in making ornamental embroidery or appliqué work, either by machine or hand.

Referring now to Figure 9, the thread 1' therein illustrated comprises a narrow strip of aluminum foil 16 adhesively secured to the plies 2' and 3', formed of cellulose acetate, through the medium of a thermoplastic adhesive 4' which may be clear and transparent, and optionally colored, as desired. This thread may be used precisely in the same manner as the thread 1, and previously described.

In the appended claims the expression "a textile fabric" is intended to cover woven, knitted, plaited, embroidered, appliquéed, etc. materials.

I claim:

1. A textile fabric containing threads formed of a flat, relatively narrow, cut, laminated material containing a narrow strip of metal foil interposed between narrow strips of transparent cellulose acetate, the cut edges of said laminated material being uncoated, said strips being coextensive and thermoplastically secured together by a transparent and flexible adhesive.

2. A textile fabric containing threads formed of a flat, relatively narrow, cut, laminated material containing a narrow strip of metal foil interposed between narrow strips of transparent cellulose acetate, the cut edges of said laminated material being uncoated, said strips being coextensive and thermoplastically secured together with an adhesive composition containing a coloring agent, said adhesive composition being transparent, flexible and thermoplastic.

3. A textile fabric containing threads formed of a flat, relatively narrow, cut, laminated material containing a narrow strip of metal foil interposed between narrow strips of transparent cellulose acetate, the cut edges of said laminated material being uncoated, said strips being coextensive and thermoplastically secured together by a transparent, flexible and thermoplastic adhesive, said fabric also containing threads formed of a material which is sensitive to dyes which do not affect the color of the cellulose acetate, said textile fabric being dyed with a dyestuff which colors the threads sensitive thereto and does not color the cellulose acetate threads.
4. A textile fabric having spaced metallic-appearing stripes therein produced by predetermined spaced threads formed of a flat, relatively narrow, cut, laminated material containing a narrow strip of metal foil interposed between narrow strips of transparent cellulose acetate, the cut edges of said laminated material being uncoated, said strips being coextensive and thermoplastically secured thereto by a transparent, flexible and thermoplastic adhesive.
5. A woven fabric having certain of its warp threads at predetermined spaced intervals formed of a flat, relatively narrow, laminated material containing a narrow cut, strip of metal foil interposed between narrow strips of transparent cellulose acetate, the cut edges of said laminated material being uncoated, said strips being coextensive and thermoplastically secured together by a transparent, flexible and thermoplastic adhesive, the other warp threads and filler threads

being formed of a material which is sensitive to dyes which do not affect the color of the cellulose acetate, said textile fabric being dyed with a dyestuff which colors the said other warp and filler threads sensitive thereto and does not color the cellulose acetate threads.

6. A tubular knitted fabric containing threads formed of a flat, relatively narrow, cut, laminated material containing a narrow strip of metal foil interposed between narrow strips of transparent cellulose acetate, the cut edges of said laminated material being uncoated, said strips being coextensive and thermoplastically secured thereto by a transparent, flexible and thermoplastic adhesive.

7. A plaited material containing threads formed of a flat, relatively narrow, cut, laminated material containing a narrow strip of metal foil interposed between narrow strips of transparent cellulose acetate, the cut edges of said laminated material being uncoated, said strips being coextensive and thermoplastically secured thereto by a transparent, flexible and thermoplastic adhesive.

8. A textile fabric containing threads formed of a flat, relatively narrow, cut, laminated material containing a narrow strip of aluminum foil interposed between narrow strips of transparent cellulose acetate, the cut edges of said laminated material being uncoated, said strips being coextensive and thermoplastically secured together by a transparent, flexible and thermoplastic adhesive.

KARL E. PRINDLE.