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LAMINATED TEXTILE THREADS

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Fig. 2.

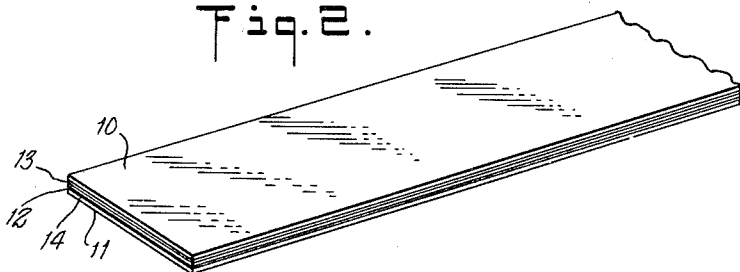


Fig. 1.

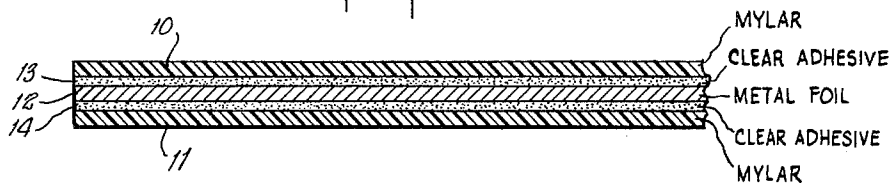


Fig. 3.

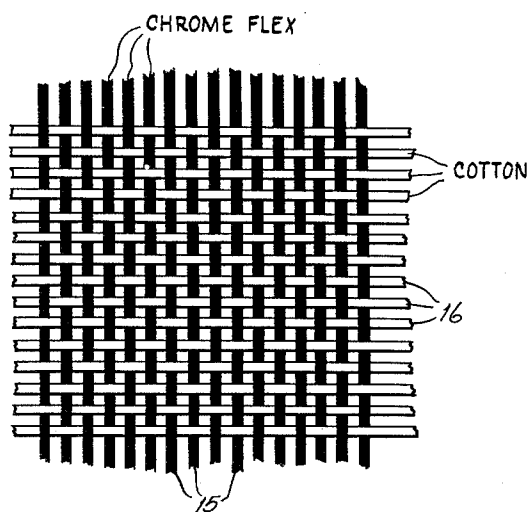
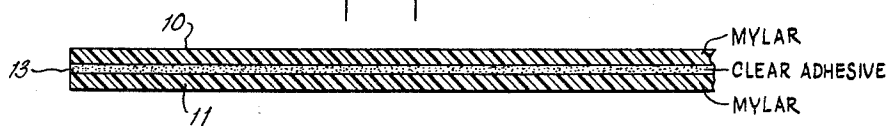


Fig. 4.

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LAMINATED TEXTILE THREADS

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5 Claims. (Cl. 28—80)

The present invention relates generally to textiles and more particularly to laminated textile threads which may be selectively dyed to create variegated decorative effects.

The use of metalized threads in fabric design is of an ancient origin, such threads serving to enhance the beauty of the material and to impart a distinctive glitter thereto. To obviate the drawbacks inherent in metalized threads having a core or base of natural fiber, it has been the practice in recent years to form such threads with thermoplastic materials of superior tensile strength.

In one known commercial form, the thread is constituted by a laminated continuous material made up of at least two normally transparent plastic strips with a strip of metal foil interposed therebetween. The various strips are bonded together by means of an appropriate adhesive. In another form of metalized thread, in lieu of metal foil, a thin deposit of metal is coated on one surface of a base ribbon, a second ribbon being secured by adhesive to the coated surface of the first ribbon. These ribbons may be composed of cellulosic material, such as cellulose butyrate, although non-cellulosic lamina may also be used, such as films of polymerized ethylene glycol terephthalate known industrially as Mylar.

The metalized thread is highly lustrous and when woven, knitted, braided, plaited or otherwise fabricated will produce fabrics of highly ornamental appearance. The fabricated material may be constituted entirely of metalized thread, so that in the case of woven fabrics the metalized threads form both the warp and woof of the fabric. Alternatively, the metalized threads may be combined with other known threads, such as those formed of cotton, rayon, wool, silk and the like.

Conventionally, the color of a metalized thread is determined by the nature of the metal layer, or by color effects produced by pigmentation added to the plastic base on which the metal is deposited and the plastic layer laminated to the metal. Since the sparkle of the thread is determined largely, by the metal, the dyestuff imparted to the plastic strips tends to dull the resultant coloration, and the thread is lacking in brilliance or richness.

Another drawback to colored metalized threads resides in the fact that since the thread is furnished to the converter in colored form, the pattern possibilities are distinctly limited. The converter is unable, as with ordinary threads, to weave the threads in the greige, and thereafter to dye or cross-dye the material so as to obtain desired ornamental effects. The converter therefore is restricted in his color effects to the range of colors available in metalized threads.

In view of the foregoing, it is the principal object of the present invention to provide a laminated textile thread which may be selectively dyed to create variegated decorative effects.

More particularly it is an object of the invention to provide a laminated thread in which the plies of the thread are bonded together with a clear adhesive, the structure of the thread being such that when subjected to a dye bath, color is picked up solely by the adhesive. A feature of the invention resides in the fact that when the laminated thread is interwoven with threads of conventional construction and the woven fabric is thereafter cross-dyed, the laminated threads and the conventional threads are caused to exhibit different color effects.

Briefly stated, the thread in accordance with the inven-

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tion is constituted by a relatively narrow laminated continuous material formed of at least two plies of a transparent strip secured together by clear adhesive having an affinity for a dye which is incompatible to the ply material. The thread may alternatively be constituted by a metal foil strip bonded by clear adhesive to plastic strips.

The laminated thread is interwoven with a conventional yarn such as cotton or rayon, such that by cross-dyeing different colors may be imparted to the laminated thread and the background yarn.

For a better understanding of the invention as well as other objects and further features thereof, reference is had to the following detailed description to be read in conjunction with the accompanying drawing wherein:

FIG. 1 is a sectional view of one preferred form of laminated thread in accordance with the invention.

FIG. 2 is a perspective view of the thread shown in FIG. 1.

FIG. 3 is a sectional view of a second preferred embodiment of a laminated thread in accordance with the invention.

FIG. 4 is a plan view of a woven fabric including threads of the type shown in FIGS. 1 and 2.

Referring now to FIGS. 1 and 2, the thread shown is constituted by relatively narrow plies 10 and 11 of transparent plastic material bonded to either side of a strip of metal foil 12 by layers of adhesive 13 and 14. Plies 10 and 11 are preferably formed of polymerized ethylene glycol terephthalate known commercially as Mylar. The metal foil 12 interposed between the plies may be formed of lead, tin or aluminum, whereby the laminated thread in absence of further pigmentation has a silvery appearance.

Among the types of adhesive which are suitable are plastic, synthetic or natural resins of the requisite degree of tackiness, or resins in conjunction with a plasticizer. To the resin and plasticizer may be added a cellulose derivative, such as nitrocellulose or cellulose ethers with other modifying ingredients. A quantity of an appropriate volatile solvent may be included to impart the desired viscosity to the adhesive.

To produce the thread shown in FIGS. 1 and 2, the selected adhesive is applied to at least one of the opposed surfaces of the two materials to be united, the materials then being laminated under heat and pressure. This can be accomplished in a continuous manner by a laminating mechanism including pairs of pressure rollers adapted to bring the webs into intimate contact. In this procedure the materials to be laminated are initially in the form of relatively broad webs of the selected film and foil. After lamination, the material is slit into narrow strands or threads of the desired width. The threads are formed by straight cuts made perpendicular to the plane of the web so that they have sharp and well-defined longitudinal edges whereby the edges of the adhesive layers are exposed.

To color the thread, it is dyed with one of a number of different types of dye which does not affect the clear Mylar plies but is picked up by the adhesive layers. This results in a yarn of metallic color representing the combined effect of the silvery foil and the dye. Due to the transparent character of the Mylar plies and the fact that the color is restricted to the adhesive, the resultant yarn will have a lustrous metallic appearance closely resembling and simulating pure metallic foil.

For example, dispersed acetate dyes, such as those produced commercially by Geigy Laboratories under the names "Setacyl" and "Gycoluce" have an affinity for the resinous adhesive layers and are absorbed thereby. These dyes do not however affect the Mylar plies. On the other hand, direct dyes, such as Geigy's Diphenyl, Solophenyl and Cuprophenyl have no effect on the laminated thread

and are picked up neither by the Mylar nor the adhesive. Such direct dyes will however be picked up by cotton, rayon and other cellulose.

Thus cross-dyeing effect can be produced by interweaving the laminated thread, represented by threads 15 in FIG. 4, with ordinary threads 16 such as cotton or rayon. The laminated thread may be of the type known commercially as "Chrome Flex." The woven fabric is first dyed with Gycoluce colors which are picked up by the adhesive in the laminated threads 15. The cotton or rayon is then cleared with a suitable solution such as sodium hydrosulphite. Finally, the cellulosic fibers are dyed with direct dyes without affecting the appearance of the laminated threads. It will be appreciated that a wide range of decorative effects is thus made possible and the converter is not limited to particular colors in the metalized threads as in the past. The dyeing operation after weaving may be in accordance with well known cross-dyeing, over-dyeing or union-dyeing techniques.

As shown in FIG. 3, the metal foil may be eliminated and the thread composed merely of Mylar plies 10 and 11 bonded together by an adhesive layer 13. As in the case of FIG. 1, the adhesive is constituted by a material having an affinity for a dye not picked up by the Mylar plies.

Acetate dyes, such as Gycoluce and Setacyl are also compatible with Dacron and nylon as well as the resinous adhesive layers in the laminated thread disclosed above. Thus when dyeing nylon as a background, certain limitations exist. Whatever dye goes onto the laminated thread also is taken up by the nylon, hence an effect to be produced must carry with it the base shade of the laminated thread. For example, if the laminated thread is dyed red, then the nylon background cannot be yellow or green, but must be a shade which carries red as a component, such as orange, blue, purple or a red shade of navy. If the depth of shade on the laminated thread is light, then there can be larger ranges of contrasting shades. But if the depth is heavy, then the possibilities are more limited.

While there has been shown what is considered to be a preferred embodiment of the invention, it will be manifest that many changes and modifications may be made therein without departing from the essential spirit of the invention. In lieu of metal foil a metallic layer may be formed on the base web by the well known evaporation technique. It is intended, therefore, in the annexed claims to cover all such changes and modifications as fall within the true scope of the invention.

What is claimed is:

1. A cross-dyed fabric comprising a first yarn consti-

tuted by two plies of transparent plastic material and a layer of clear adhesive disposed between said plies and having an affinity for a predetermined first dye which is incompatible with said plies, and a second non-laminated yarn interwoven with said first yarn and formed of a material unaffected by said dye and responsive to a second dye, said fabric being selectively colored by said dyes.

2. A cross-dyed fabric comprising a first yarn constituted by two plies of transparent Mylar, a ply of metal foil and layers of clear adhesive bonding said Mylar plies to opposite sides of said foil, said adhesive having an affinity for a predetermined dye which does not affect said Mylar, and a second non-laminated yarn interwoven with said first yarn and formed of a material unaffected by said predetermined dye and responsive to a second dye, said fabric being selectively colored by said dyes.

3. A fabric as set forth in claim 2, wherein said second yarn is formed of cellulosic fibers.

4. A cross-dyed fabric comprising a first yarn constituted by two plies of transparent Mylar bonded together by a layer of clear adhesive having an affinity for a predetermined dye which is incompatible with said plies, and a second non-laminated yarn interwoven with said first yarn and formed of a material incompatible with said predetermined dye and responsive to a second dye, said fabric being selectively colored by said dyes.

5. A fabric as set forth in claim 4, wherein said adhesive is constituted by a resin in conjunction with a plasticizer to which is added a cellulose derivative.

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