

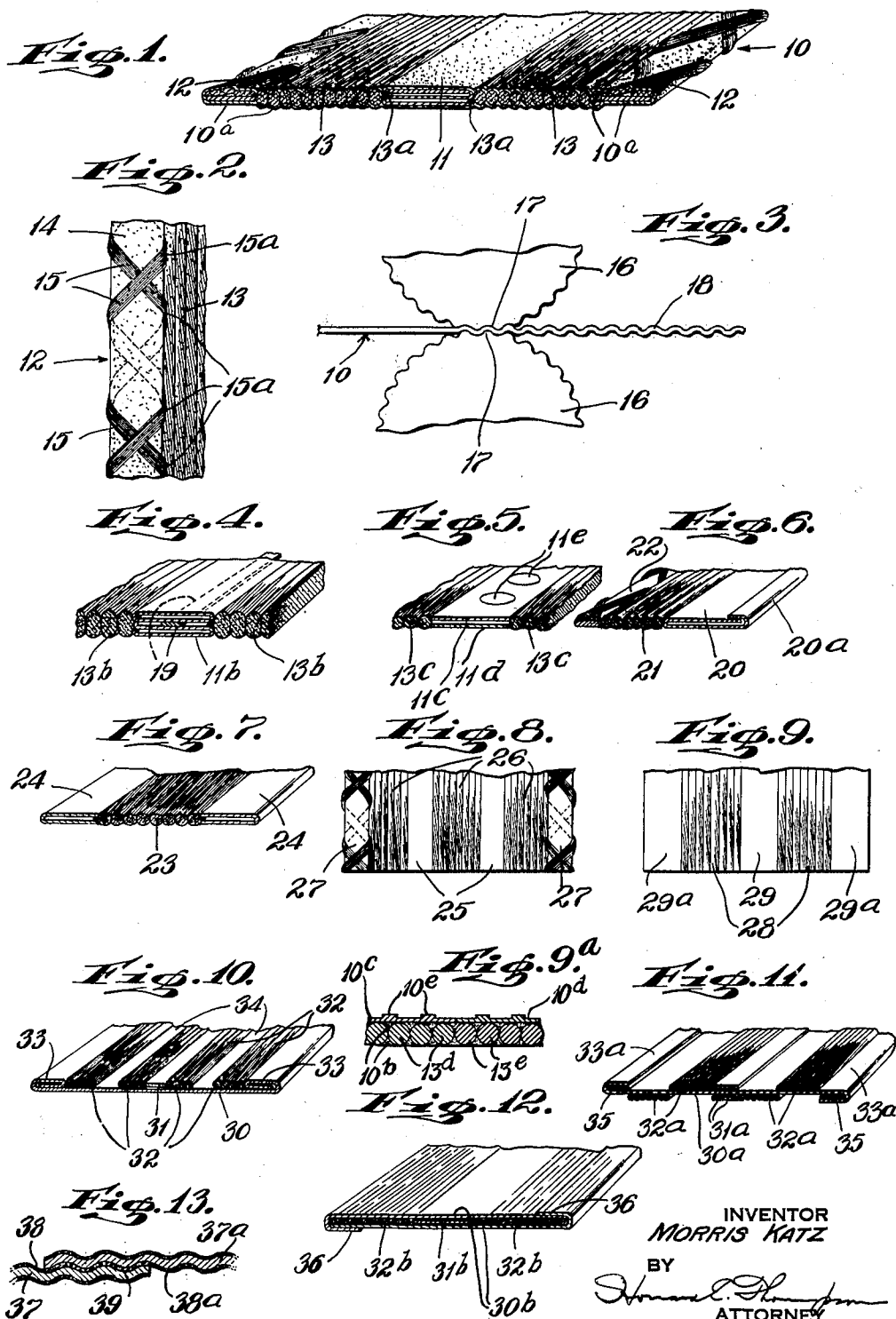
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COMPOSITE RIBBON AND THE METHOD OF MAKING THE SAME

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COMPOSITE RIBBON AND THE METHOD OF MAKING THE SAME

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This invention relates to composite ribbons and to the method of producing the same, and particularly to ribbons composed of a combination of different strip or strand materials arranged in abutting and overlapping relationship, and cemented together to form a composite structure, and the object of the invention is to provide a ribbon of the class described incorporating the properties and characteristics of the separate materials employed in producing the resulting ribbon a multiplicity or in fact unlimited number of artistic arrangements to beautify and enhance the appearance of the ribbon while at the same time producing a ribbon at least part of the cross sectional area of which includes a transparent or translucent portion, a further object being to provide a composite ribbon bonded together by a cement adapted when moistened to firmly adhere contacting portions of ribbon, and with these and other objects in view, the invention consists in a ribbon of the class and for the purpose specified, constructed in accordance with the method more fully hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a perspective view of one form of ribbon diagrammatically indicating the various types of strips and strands employed.

Fig. 2 is a plan view of one edge portion of the ribbon shown in Fig. 1.

Fig. 3 is a diagrammatic view indicating one means for forming an irregular surface contour in the ribbon.

Fig. 4 is a view similar to Fig. 1 showing only the central portion of the ribbon and showing a modification.

Fig. 5 is a view similar to Fig. 4 showing another modification.

Figs. 6 and 7 are views similar to Fig. 1 showing other arrangements of the strips and strands.

Figs. 8 and 9 are plan views showing parts of other forms of ribbon made according to my invention showing other compound arrangements of strips and strands.

Fig. 9a is a fragmentary view diagrammatically illustrating a modification.

Figs. 10, 11, and 12 are views similar to Fig. 1 showing other adaptations of the invention, and

Fig. 13 is an edge view of two ribbon sections adhered together in superimposed relation.

In Figs. 1 and 2 of the drawing, I have shown one adaptation of my invention, and in these figures, 10 represents a ribbon having a central transparent or translucent strip 11 of "Cellophane" or similar material. At 12 are shown edge members and intermediate the edge members and the strip are thread-like strands 13 of rayon or other similar material.

The strands 13 are arranged in substantially parallel relation and are bonded together by a suitable adhesive or cement indicated at 10a in Fig. 1. This adhesive also serves to unite the fibres of the strands, and to secure the strands to the edge members 12 and to the central strip 11, in forming the ribbon into a unitary composite body. The strip 11 is folded a number of times to dispose an opening along each side thereof adapted to receive portions of the strands 13 as indicated at 13a in Fig. 1. It will be noted in this connection that the strands 13 are preferably made up of loosely spun rayon fibres and it will be apparent that some of these fibres will extend from the body of the strand to form the protruding portions as illustrated at 13a. By thus arranging portions of the strands between the folded layers of the strip 11 at edge portions thereof, it will be apparent that a firm bond will be formed between the strip 11 and the strands 13 under the action of the adhesive or cement employed. The film 10a of cement has been shown only in Figs. 1 and 13. It will be understood, however, that the film will be present in all the modifications shown, but has been omitted from the other figures to simplify the drawing.

The illustration in the drawing with respect to thicknesses of the various materials and in fact the structure of the strands are exaggerated for clarity in illustration. As a matter of fact, the resulting ribbon, except for the modified construction in Figs. 10 and 11, presents substantially smooth and uniform upper and lower surfaces as in other ribbons of the type and kind under consideration. In this respect the illustration of the bunched fibres forming the strands, for example, as at 13, is simply to portray the fact that a number of the fine fibres of rayon are in the form of what might be termed heavy thread, and the number of these threads are grouped together in the edge to edge relation in forming the strand body of the desired width comparatively with the width of the "Cellophane" and other strips employed. The ribbons may, of course, be made in different widths, but the present invention is primarily

adapted for use in the narrower ribbons of which there is a greater use.

The edge members 12 as more clearly illustrated in Fig. 2 of the drawing include a strip of material 14 of a type to which the cement 10a will not adhere. This strip may comprise a synthetic material or even a metallic or tinsel strip. The strip 14 has a plurality of rayon or cotton strands 15, arranged thereon in a manner to dispose portions of the strands in position to contact the strands 13 at intervals 15a, note Fig. 2, spaced longitudinally of the strip 14. The strands 15 have been indicated as arranged in a double-spiral wrap about the strip 14, but it will be apparent that any other arrangement of the strand 15 may be employed to dispose spaced portions thereof in abutting relation to the strands 13. It will be apparent that the adhesive or cement 10a applied to the composite members of the ribbon forms a bond between the strands 13 and the strands 15, thereby uniting the edge members 12 with the rest of the ribbon.

In assembling the composite ribbon the strip 11, the edge members 12 and the intermediate strands 13 are simultaneously fed from separate spools or other sources of supply and are brought together in the desired parallel abutting relation. It will be apparent that the members 12 may be assembled by wrapping the strands 15 about the strip 14 while the members are being thus fed into position; or on the other hand, the members 12 may be preformed and merely fed from a suitable storage spool or reel. The members thus arranged in parallel abutting relation are treated with the cementing saturant in any desired manner such, for example, as by passing the assembling members through a bath of the saturant, by spraying both surfaces of the assembled members with the saturant, or by passing the same between applicator rollers. It is important that sufficient adhesive be applied to thoroughly penetrate between the strands 13 and at least partially into the folds of the strip 11. From this standpoint it will be apparent that in some instances it may be advantageous to apply adhesive to the strands 13 or to the strip 11 or to both of these component parts of the ribbon before assembling these component parts. In other words the strands 13 and the strip 11 may be passed through a bath of adhesive or sprayed with the adhesive while being fed from storage spools or reels to the point where the component parts of the ribbon are assembled.

When the cement or adhesive has hardened, a thin bonding film will remain enveloping substantially the entire ribbon. This film is colorless and invisible to the eye and has been indicated merely diagrammatically in the drawing. It will be apparent that the film extending between and around the strands 13 serves to unite the individual fibres thereof, thereby preventing objectionable fraying. The cementing together of interengaged fibres of adjacent loosely spun strands imparts to the ribbon added resistance to transverse stress. It will be noted, however, that when the ribbon is subjected to excess transverse stress, the strands will separate not along definite lines between the strands but at spaced points to produce a net-like or web-like effect in the strained and extended ribbon. Thus in all uses of the ribbon the general structure of the ribbon is maintained, and it will be apparent that in some uses the ribbon may be intentionally extended as above described to produce desirable ornamental effects.

After the cement has hardened, the ribbon may be used without further treatment, but a superior product is produced by passing the substantially flat ribbon between rolls 16 having corresponding irregularities 17 on the surface thereof adapted to form irregularities of predetermined contour in the ribbon. The ribbon assumes a permanent irregular contour as diagrammatically illustrated at 18. It will of course be apparent that any desired contour may be provided in the rolls 16 to produce various ornamental effects in the ribbon.

The formation of the irregularities in the ribbon serves another useful purpose in providing slight longitudinal stretch or elasticity in the ribbon. This elasticity is highly advantageous as will be apparent especially from the standpoint of making the ribbon more resistant to the stresses encountered in tying the ribbon. It has been pointed out that the formation of the irregular surface contour of the ribbon as at 18 enhances the appearance thereof. It will be apparent in this connection that many ornamental effects may be produced, not only in the formation of the irregularities, but also in the selection of colors to be used in the various component parts 11, 13, 14 and 15 of the ribbon, as shown in Figs. 1 and 2 and in the corresponding component parts shown in the other figures. Here two or more strand bodies 13 are employed that may be of same or different colors and this is also true of the strips 11 and 14.

As a further means for characterizing and ornamenting the ribbon, there is shown in Fig. 4 a section of a ribbon indicating the rayon strands 13b and a folded "Cellophane" strip 11b comparable to the parts correspondingly numbered in Fig. 1 of the drawing. Between the folds of the strip 11b there is arranged a narrow strip 19 of tinsel or other material not having a common solvent with the rayon and "Cellophane." When a tinsel strip is employed, it will be apparent that the metallic sheen will be visible through the transparent folds of the strip 11b and produce an interesting effect in the ribbon. It will of course be apparent that the strip 19 may be composed of "Cellophane" or other material.

As another means for varying the appearance of the ribbon there is indicated in Fig. 5 a small section of ribbon including rayon strands 13c and a pair of "Cellophane" strips 11c and 11d cemented or otherwise secured together. One of the strips, 11c, is provided with markings, apertures, or other means, 11e for producing variegated designs at intervals along the ribbon. It will of course be apparent that the variations in this decorative effect are almost limitless and may be applied as advertising matter or as designs otherwise appropriate to particular uses of the ribbon. Ribbons incorporating the features shown in Figs. 4 and 5 will be assembled in the manner previously described in connection with Figs. 1 and 2. It will of course be apparent that the strips 11c and 11d may be composed of two or more thicknesses and these strips may be of different colors.

In Figs. 6 to 9 are shown four variations of the form of construction shown in Fig. 1 of the drawing; and while these variations are illustrative of some of the various ways in which the invention may be applied to ribbon construction, it is understood that the invention is not limited to the particular arrangements and combinations shown. Fig. 6, for example, illustrates a ribbon having a strip portion 20, a strand por-

tion 21, and an edge band portion 22, similar to the edge member 12 in Fig. 1. The "Cellophane" portion 20 may include a reinforced edge 20a formed by folding the material and it will be apparent that any desired multiple fold of the strip may be employed.

Fig. 7 indicates a ribbon construction including a central strand portion 23, and edge portions comprising strips 24. The strip portions have been shown as of uniform thickness but it will be apparent that if desired, the extremities thereof may be reinforced in a similar manner to the reinforced portion 20a as seen in Fig. 6.

Fig. 8 shows a multiple construction including two strip portions 25, three strand portions 26, and opposed edge band portions 27 similar to the edge members 12 shown in Fig. 1. Fig. 9 shows still another combination including two strand portions 28, a central strip portion 29 and edge strip portions 29a. The composite ribbons illustrated in Figs. 6 to 9 will be assembled in the manner previously described in connection with Fig. 1 and any desired surface contour may be imparted to the ribbon by passing the same through suitable rolls as will be apparent.

Fig. 9a diagrammatically illustrates a section of ribbon showing a modified construction. The section includes a lay of strand members arranged in abutting relation and has been indicated in the drawing as comprising two groups of strands 13d and 13e, which are characterized differently as to color or other properties. The strands are secured together by a cement or adhesive 10b which penetrates and envelops the strands in the manner previously described in connection with Figs. 1 and 2. A film is applied to at least one surface of the ribbon by what might be termed a printing operation. For purposes of illustration the film has been shown as comprising separate sections 10c and 10d coinciding with the groups 13d and 13e of the strand members and characterized differently as to color. Thus the film forms a means for enhancing the appearance of the ribbon either by amplifying the color characteristics in the strand members or by adding additional color to predetermined surface portions of the ribbon. It will also be noted that the film materially increases the resistance of the ribbon to transverse stresses tending to separate the strand members thereof. In some instances a uniform film may be employed throughout the ribbon or in other instances the film may be applied in variegated pattern arrangements having a plurality of different colors. The film 10c, 10d is preferably applied in a manner to produce an embossed effect in the surface thereof as diagrammatically indicated by the raised portions 10e.

It will be noted that the use of a characterizing and reinforcing film as above mentioned, facilitates the production of large quantities of ribbon having a neutral or ground color characterization. Smaller quantities of specially characterized ribbon may then be quickly and inexpensively produced by the above mentioned printing operation, thereby meeting the demands of the trade in an efficient and economical manner.

In Figs. 10 to 12 of the drawing there is shown another adaptation of the invention wherein the strands and the strips are arranged in parallel relation and joined to each other directly and/or through the medium of a strip of "Cellophane" extending the full width of the ribbon. In Fig. 10, for example, there is shown a wide strip 30

of "Cellophane" or similar material having a central strip 31 arranged thereon and a plurality of longitudinally extending strands 32 arranged in groups spaced transversely of the strip 30. Edge portions of the strip 30 have been shown reinforced by folding the strip inwardly upon itself. It will be apparent, however, that other reinforcing means may be employed, as is taught, for example, in Fig. 11.

With a structure similar to that shown in Fig. 10 and others of this type and kind, as the strip 30 is composed of one solid color, then the folded edge portions 33 and also the longitudinal ribbon portions 34 will be of one color, the edge portions 33 being slightly darker by virtue of the superimposed layers of the material. However, this strip may be printed in a manner to provide different colors in the edge portions 33 as well as in the sections 34. It is presumed that the strip 31 will be of a different color than the strip 30, thus a further contrast will be provided centrally of the ribbon. In like manner the separate groups of the strands 32 may be of different color.

Fig. 11 shows a slight variation of the construction shown in Fig. 10 including a strip 30a similar to the strip 30 having other strips 31a arranged upon and secured to opposed surfaces thereof, and strands 32a exposed at spaced intervals, on opposed sides of the strip 30a. The edges 33a of the ribbon are indicated as comprising portions of the strip 30a folded over several strands 35 of rayon or other reinforcing material. Fig. 12 illustrates another variation of the construction wherein two wide strips 30b are employed, having another strip 31b as well as spaced groups of strands 32b arranged therebetween. Each of the strips 30b has been shown as including an edge 36 folded around the opposed edge of the other strip.

It will be apparent that the illustrations in Figs. 10 to 12 inclusive are simply to teach generally the idea of utilizing one strip of "Cellophane" or similar material as a mounting upon which the strands may be applied either on one or both surfaces of "Cellophane" strip or within the boundaries of at least two layers of "Cellophane." With this type of construction more substantial joining of the strand material is produced. That is to say, it will be substantially impossible to separate or sever the separate strands one from the other, without first rupturing the "Cellophane" strip. However, ribbons of the type and kind under consideration are not as a rule susceptible to stresses or strains tending to pull apart the fibres transversely of the ribbon. The stresses are more often longitudinally of the ribbon, therefore, structures of the type and kind shown in Figs. 1 to 9 inclusive fulfill all the requirements of ribbons. The structures illustrated in Figs. 10 to 12 inclusive would be desirable in producing wider ribbons or in fact in producing sheets of material according to my invention, and particularly in producing package-wrapping sheets such as are commonly employed.

The strands employed in the various adaptations of the invention constitute preferably loosely-spun thread-like strands of synthetic fibres, and particularly fibres adapted to impart a soft silky sheen to the ribbon. It will be apparent, however, that for special purposes in various adaptations of the invention natural fibres of various types may be incorporated either separately or together with the synthetic fibres.

The cement film enveloping the ribbon is pref-

erably of a type which is adapted when moistened with water to adhere to other contacting portions of the ribbon, thus when separate ribbon sections 37, 37a having a cement film 38, 38a enveloping the same, are moistened and brought into contact as seen in Fig. 13, the contacting portions of the film become firmly united as at 39, thereby forming a strong bond between the ribbon sections. From this standpoint it will be apparent that the adhesive or cement employed will be of a water soluble type and kind. In Fig. 13 the ribbon sections have been indicated as having corresponding irregular contours which are adapted to interfit one with the other, thereby further increasing the strength of the bond between the sections. It will, of course, be apparent that any desired irregularities may be employed in the ribbon. On the other hand, ribbon sections having a substantially flat or smooth surface contour may also be firmly united through the cementing action of the films thereof.

The use of a film having cementing properties when moistened as indicated in Fig. 13 has many practical adaptations, as will be apparent. For example, being able to secure ribbon sections together by merely moistening the same will greatly simplify the binding and wrapping of articles for gift, display, and other similar purposes. It will be noted in this connection that the joined ribbon sections produce the effect of continuity in the ribbon, and in most instances it is almost impossible to determine where the sections have been joined.

It will be apparent that the use of a cement having the above-mentioned properties, is applicable to and advantageous in all the forms of construction previously mentioned, whether the construction be applied to narrow ribbon or to wider ribbon or sheet material. Furthermore, the cement film may be employed for joining ribbon sections of similar material, such for example, as two "Cellophane" sections or two rayon strand sections, or on the other hand, may be employed for joining dissimilar sections. In each instance, the joint formed between the contacting or superimposed ribbon sections will be strongly resistant both to stress longitudinally of the sections and to transverse stress tending to lift one superimposed layer from the other.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A composite product of the character described comprising a plurality of strands of synthetic fibrous material and at least one strip of a translucent cellulosic base material arranged in edge to edge abutting relationship, and means involving a film-like deposit of a cement adapted to adhere to said strands and strip uniting the same in forming a unitary sheet-like product.

2. A composite product of the character described comprising a plurality of strands of synthetic fibrous material and at least one strip of a translucent cellulosic base material arranged in edge to edge abutting relationship, means involving a film-like deposit of a cement adapted to adhere to said strands and strip uniting the same in forming a unitary sheet-like product, and the cement in said film-like deposit being water soluble whereby when moistened with water will adhere contacting portions of said composite product.

3. A composite product of the character described comprising a plurality of strands of syn-

thetic fibrous material and at least one strip of a cellulosic base material arranged in edge to edge abutting relationship, and means involving a film-like deposit of a cement adapted to adhere to said strands and strip uniting the same in forming a unitary sheet-like product, said composite product including at least one other strip arranged in abutting relation to said strands, said cement being non-adhesive to said last-named strip, and means incorporated with said last-named strip adapted to form a bond with the strands adjacent said strip under the action of said cement.

4. A composite product of the character described comprising a plurality of strands of synthetic fibrous material and at least one strip of a cellulosic base material arranged in edge to edge abutting relationship, and means involving a film-like deposit of a cement adapted to adhere to said strands and strip uniting the same in forming a unitary sheet-like product, said composite product including at least one other strip arranged in abutting relation to said strands, said cement being non-adhesive to said last-named strip, and means incorporated with said last-named strip adapted to form a bond with the strands adjacent said strip under the action of said cement, said last-named means comprising strand material arranged in spiral fashion on said strip.

5. A composite product of the character described comprising a plurality of strands of synthetic fibrous material and at least one strip of a cellulosic base material arranged in edge to edge abutting relationship, means involving a film-like deposit of a cement adapted to adhere to said strands and strip uniting the same in forming a unitary sheet-like product, and the cross section of said sheet-like product longitudinally of the component strip and strand members thereof having a predetermined irregular contour imparting slightly resilient properties to said product.

6. A composite product of the character described comprising a plurality of strands of synthetic fibrous material and at least one strip of a cellulosic base material arranged in edge to edge abutting relationship, means involving a film-like deposit of a cement adapted to adhere to said strands and strip uniting the same in forming a unitary sheet-like product, the cement in said film-like deposit being water soluble whereby when moistened with water will adhere contacting portions of said composite product, the cross section of said sheet-like product longitudinally of the component strip and strand members thereof having a predetermined irregular contour imparting slightly resilient properties to said product, and the irregularities in said product being symmetrically arranged, whereby said irregularities will interfit in adhered portions of said product to increase the strength of the bond therebetween.

7. A composite product of the character described comprising a plurality of strands of synthetic fibrous material and a plurality of strips of a cellulosic base material arranged in parallel abutting relationship, means involving a film-like deposit of a cement adapted to adhere to said strands and strips uniting the same in forming a unitary sheet-like product, at least one of said strips extending throughout the entire width of said sheet-like product thereby forming a mounting member for said strands and other strip or strips.

8. A composite product of the character described comprising a plurality of strands of synthetic material and a plurality of strips of a cellulosic base material arranged in parallel abutting relationship, means involving a film-like deposit of a cement adapted to adhere to said strands and strips uniting the same in forming a unitary sheet-like product, at least one of said strips comprising superimposed strip sections arranged to form unattached edge portions adapted to receive fibres of the strands arranged adjacent thereto.

9. A composite product of the character described comprising a plurality of strands of synthetic material and a plurality of strips of a cellulosic base material arranged in edge to edge abutting relationship, means involving a film-like deposit of a cement adapted to adhere to said strands and strips uniting the same in forming a unitary sheet-like product, at least one of said strips comprising a multifolded member, the folds of said member being arranged to form unattached edge portions adapted to receive fibres of the strands arranged adjacent thereto, and means incorporated within the folds of said member and extending longitudinally of the strip for imparting a predetermined ornamental effect thereto.

10. A composite product of the character described comprising a plurality of strands of synthetic fibrous material and a plurality of strips of a cellulosic base material arranged in parallel abutting relationship, means involving a film-like deposit of a cement adapted to adhere to said strands and strips uniting the same in forming a unitary sheet-like product, at least one of said strips comprising a plurality of superimposed

strip members, and one of said members being adapted to characterize said strip.

11. In a ribbon of the class described a lay of synthetic fibrous strands arranged in parallel abutting relationship, an adhesive film on at least one surface of said strands and penetrating therethrough uniting the same to form a unitary ribbon and a spirally wrapped strip arranged longitudinally of and secured to at least one outer strand of said lay by said adhesive adhering to the wrapped portion of said strip.

12. A composite ribbon of the class described comprising a plurality of cellulosic strands and at least one folded strip of transparent cellulosic material arranged in edge to edge abutting relationship, and a cement film enveloping said strip and strands and penetrating through said strands and into the folds of said strip to form a unitary ribbon.

13. In a ribbon of the class described, a lay of strands arranged in parallel abutting edge to edge relationship, strips arranged longitudinally of the outer strands of said lay, said strips having spiral wrappings extending longitudinally thereof, and an adhesive uniting said strands and the spiral wrap of said strips in forming the resulting unitary ribbon.

14. In a ribbon of the class described, a lay of strands arranged in parallel abutting edge to edge relationship, strips arranged longitudinally of the outer strands of said lay, said strips having spiral wrappings extending longitudinally thereof, an adhesive uniting said strands and the spiral wrap of said strips in forming the resulting unitary ribbon, and said strips being metallic.

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