

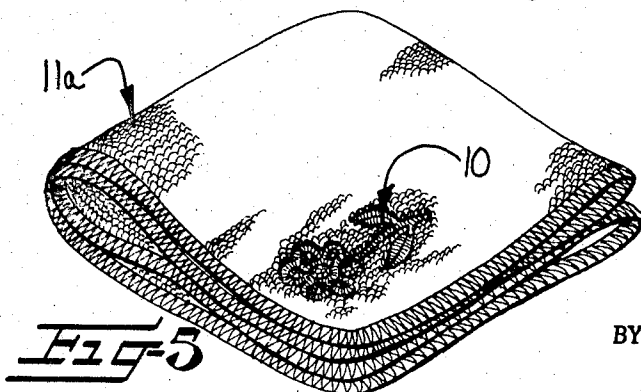
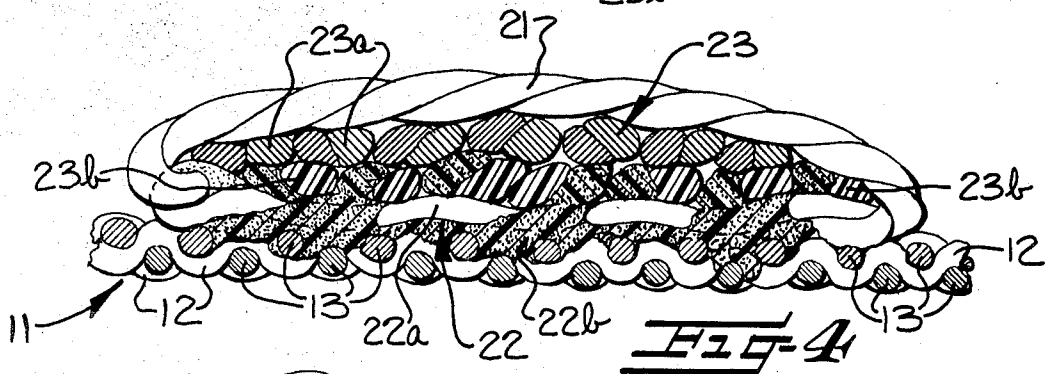
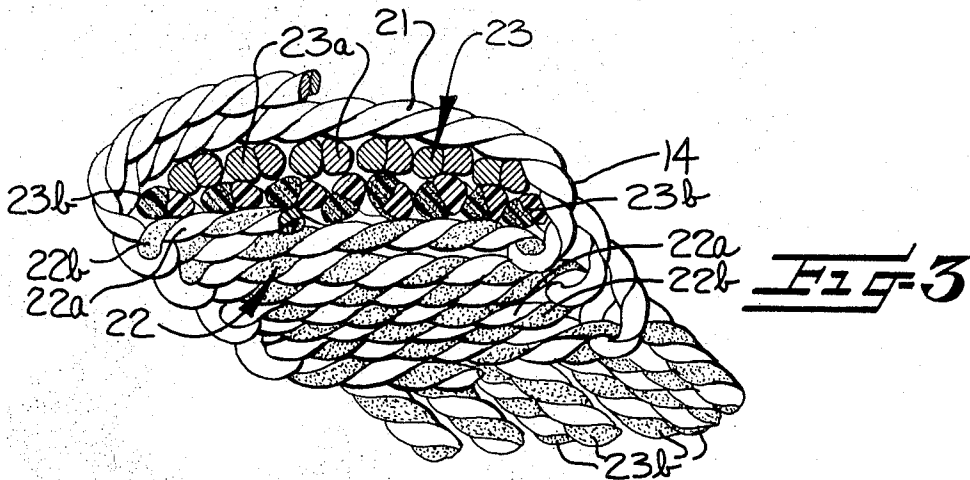
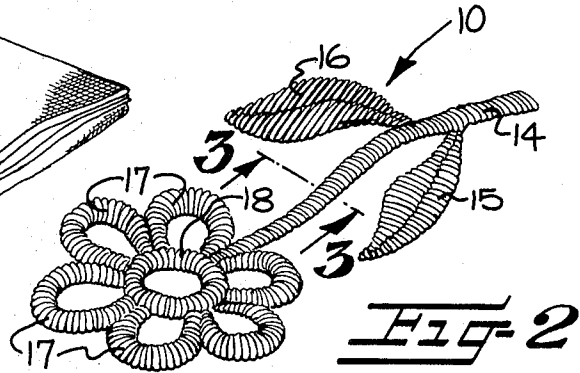
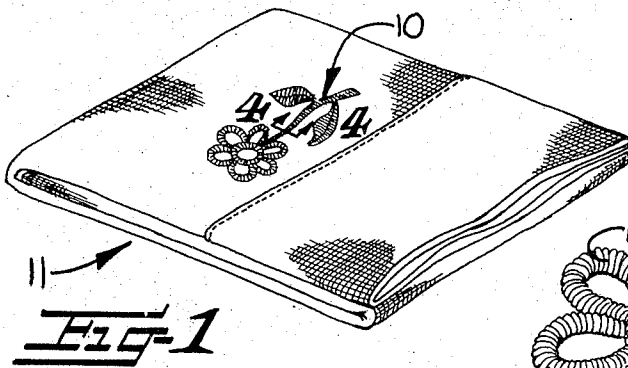
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3,567,567

EMBROIDERED FUSIBLE APPLIQUE AND FABRIC

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EMBROIDERED FUSIBLE APPLIQUE AND FABRIC
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11 Claims

ABSTRACT OF THE DISCLOSURE

An embroidered appliqué whose bottom surface is formed from composite yarn having at least two plied strands, the first of which has a relatively low fusion point. The other strand and the applique are nonfusible when subjected to heat at or substantially above the temperature of the fusion point of the first strand so that, even though the continuity of the first strand may be interrupted by having been melted during fusing of the appliqué to a supporting fabric, the second strand remains intact and will maintain the structural integrity of the applique fused to the fabric even after the fabric has been subjected to many launderings.

This invention relates to a new and improved embroidered applique and to the combination thereof with a textile fabric.

Embroidered designs are generally applied to textile articles, such as bed linens, towels, face cloths and the like, by stitching through the fabric concurrently with the formation of the designs. During formation of embroidered designs on the fabric, a nonpatterned labyrinth of embroidery yarn is necessarily formed on the back face of the fabric, which is undesirable; particularly in instances in which both faces of the fabric may be visible either alternatively or simultaneously, when in use.

With a view to avoiding the above and other problems attendant to stitching embroidered designs on textile fabrics; particularly terry fabrics, I have proposed heretofore the use of preformed embroidered appliques having back or bottom surfaces thereof formed from heat-fusible yarn, and have fused such appliques in adhering engagement with the textile fabrics. A pile fabric provided with such an applique fused thereon is disclosed and claimed in my copending application, Ser. No. 650,025, filed June 29, 1967.

As with any new product, textile articles having embroidered appliques of the type described above fused thereon have been subjected to severe tests to determine the quality of the product and especially to determine the ability of the product to withstand the rigors of domestic and industrial use. While the product reacted quite well to such tests, it was found that, by subjecting terry fabrics with such appliques thereon to many commercial launderings (up to one hundred or more), the appliques would become at least partially separated from the fabrics, and the yarns in the appliques would become raveled to some extent.

As is well known, an embroidered appliqué is essentially a series of zig-zag stitches of facing yarn interlaced adjacent perimetrical edges of the appliqué with complementary zig-zag stitches of backing yarn. Accordingly, upon rupture of either yarn, raveling of either or both yarns is likely to occur. Upon close inspection of the thus laundered terry fabrics, I determined that such mutilation of the appliques was induced largely because of the necessary melting of the fusible backing yarn during the application of heat to the appliqué for fusing the same to the textile fabric. More particularly, while the fusible yarn is melting, it loses its original form and may even separate from the nonmelting top facing yarn interlaced

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therewith at marginal perimetrical edges of the appliqué. Even if there should be no separation of the facing and backing yarns during the fusing process, the fusible yarn may rupture thereafter in the course of repeated launderings because the fusible yarn generally becomes hard and brittle following the fusing process.

It is therefore an object of this invention to provide an embroidered appliqué adapted to be fused to a textile fabric and which will retain its structural integrity even when fused to the fabric and substantially throughout the useful life of the fabric, regardless of whether the fabric is a pile fabric or a nonpile fabric.

According to the invention, the appliqué is embroidered from a composite backing yarn forming a bottom surface on the appliqué and interlaced with a facing yarn along perimetrical portions of the appliqué. The composite yarn is formed of at least two plied strands, a first of which serves as a binding strand and has a predetermined relatively low fusion point. The other strand and the facing yarn are nonfusible when subjected to heat at or substantially above the temperature of the fusion point of the first strand so that, even though the continuity of the first strand may be interrupted in the fusing process or in subsequent handlings or launderings, the other strand will remain intact to thereby maintain the structural integrity of the appliqué.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a nonpile fabric article, such as a bed sheet, showing the same in a folded condition with an embroidered appliqué fused in adhering engagement with the article in accordance with the present invention;

FIG. 2 is an enlarged perspective view of the appliqué shown in FIG. 1, but removed from the textile fabric;

FIG. 3 is an enlarged cross-sectional perspective view through a portion of the appliqué taken substantially along line 3—3 in FIG. 2, and particularly illustrating the composite yarn forming the bottom surface of the appliqué;

FIG. 4 is an enlarged fragmentary sectional view taken substantially along line 4—4 in FIG. 1 showing the uninterrupted condition of the carrier strand of the composite backing yarn and showing how the binding strand of the composite yarn moves between the carrier strand and the supporting fabric to firmly bind the appliqué to the supporting fabric when the appliqué is subjected to pressure and heat at a predetermined temperature which will not burn or melt the carrier strand but which is equal to or substantially above the fusion point of the binding strand, thereby ensuring that the appliqué is firmly bonded to the supporting fabric without interfering with the structural integrity of the appliqué; and

FIG. 5 is a perspective view of a pile fabric article, such as a terry wash cloth, showing the embroidered appliqué fused in adhering engagement with a pile surface of the article.

Referring more specifically to the drawing, an embodiment of the improved embroidered appliqué, broadly designated at 10, is shown in FIG. 1 fused to a nonpile textile fabric article 11 which, for example, may take the form of a bed sheet or pillow case. The supporting textile fabric 11 may be of any desired construction and is shown in the form of a woven fabric having warp yarns 12 interwoven with weft yarns 13 in FIG. 4.

The embroidered appliqué 10 may be of any desired configuration and is shown in the form of an elongate stem 14 having a pair of leaf-shaped members 15, 16 extending divergently therefrom and having on one end thereof a cluster of outer loop members 17 joined to a common inner loop member 18. The strand-like embroidered struc-

tural members which make up the various elements 14-18 have their own perimetrical edge portions, although it is apparent that portions of such perimetrical edges of adjacent elements 14-18 are interconnected by the stitching of which they are composed. As best shown in FIG. 3, each strand-like structural member is a form of embroidery such as may be produced on a zig-zag type sewing machine, and comprises a top facing yarn 21 arranged in the form of zig-zag loops or stitches forming the upper or top surface of the embroidered appliqué. Each strand-like structural member further comprises a backing yarn 22 which, according to the instant invention, is a composite yarn, and which is also in the form of zig-zag loops interlaced adjacent the perimetrical portions of the strand-like structural member and complementing the zig-zag loops of the upper or top facing yarn 21. Preferably, the zig-zag loops or runs of the facing yarn 21 are each substantially longer than those zig-zag loops or runs formed of the backing yarn 22 so that, when the appliqué 10 is pressed or flattened, the backing yarn 22 is invisible when looking at the top surface of appliqué 10.

The interlaced facing and backing yarns 21, 22 are collectively somewhat in the form of a tube and are interlaced about a suitable core 23 shown in FIGS. 3 and 4 in the form of a plurality of plied body yarns 23a, 23b which serve as a carrier for supporting the facing and backing yarns 21, 22 and also serve to impart bulk or body to the strand-like structural members of appliqué 10.

It is preferred that facing yarn 21 is spun yarn made from cellulosic fibers; e.g., cotton, rayon, acetate, etc., although facing yarn 21 may be a spun or continuous filament yarn made from other natural or man-made fibers, provided that the facing yarn will not melt or become sticky when subjected to the heat necessary to activate and render adhesive the bottom surface of the embroidered appliqué 10. One reason why cellulosic fibers are preferred in the facing yarn 21 is because the heat employed in rendering the bottom surface of the appliqué adhesive during the fusing process quickly penetrates through cellulosic yarns. This is possibly due to the presence of a greater amount of moisture in cellulosic yarns due to their hydrophilic nature.

In order to permit fusing the appliqué 10 to a textile fabric without interrupting the continuity of the backing yarn and to thereby maintain the integrity of the appliqué during the useful life of the fabric to which it is fused, composite backing yarn 22 is formed of first and second coextensive components in the form of plied textile strands, each strand of which may be in the form of a single strand component or in the form of multiple inter-twisted or plied strand components. As shown in FIGS. 3 and 4, for illustrative purposes only, the composite yarn includes a pair of coextensive primary and secondary plied strands 22a, 22b of respectively different types. Primary strand 22a serves as a carrier strand for the secondary strand. Secondary strand 22b, being fusible, serves as a binder strand to bind the appliqué to the fabric 11. In other words, the primary strand 22a and facing yarn 21 are nonfusible when subjected to heat at a predetermined temperature about equal to or substantially greater than the fusion point of the secondary strand such as to fuse or melt secondary strand 22b.

Secondary strand 22b may be formed of one or more types of thermoplastic fibers, e.g., nylon, polyvinylchloride, acrylic, or other thermoplastic fibers. It is preferred that the strands in the composite yarn 22 are continuous filament thermoplastic strands, since spun yarns are difficult and expensive to produce as fine as the 70 to 90 denier continuous filament yarns desired to be used as backing yarns in embroidered appliqués. Also, continuous filament yarns normally have greater tensile strength than spun yarns in such relatively small sizes.

In a nonlimiting example, the appliqué 10 was embroidered from a 50s two-ply cotton facing yarn 21, and a two-ply backing yarn 22 formed from a 70 denier

"nylon 66" continuous filament primary strand 22a plied with a 90 denier "nylon 11" continuous filament secondary strand 22b. The fusion or melting point of "nylon 66" is about 480° Fahrenheit, and the fusion or melting point of "nylon 11" is about 367° Fahrenheit. It is apparent that there should be a sufficient difference between the fusion points of the carrier and binding strands when both are of thermoplastic material so that the amount and duration of the heat and pressure employed in the fusing process need not be so critical as to be impractical.

It is preferred that the weight of the secondary strand 22b, having the relatively low fusion point, constitutes at least about 40% of the total weight per unit length of the composite yarn 22, although as high as 80% of the yarn 22 may be formed of the binding or secondary strand 22b, if desired.

The composite yarn 22 may also be in the form of a core yarn in which the secondary or binding strand, having the relatively low fusion point, is spirally wound or core spun in the form of a sheath around a spun or continuous filament primary or carrier strand 22a of non-fusible material or, at least, of textile material which will not fuse or melt when the appliqué formed therefrom is subjected to heat at or substantially above the fusion point of the binding strand.

If desired, the yarns 23a, 23b in the core 23 of the appliqué may be arranged in layers with the body yarns 23a adjacent the facing yarn 21 being of substantially the same type as the facing yarn, and with the body yarns 23b adjacent the backing yarn 22 being of substantially the same type as the backing yarn 22. In other words, top body yarns 23a and at least one of the plurality of strands in each bottom yarn 23b may be of textile material which will not fuse or melt when subjected to heat at or substantially above the fusion point of the other strand or strands in the bottom body yarns 23b and strand 22b of the backing yarn 22.

In applying the embroidered appliqué 10 thus formed to the supporting fabric of FIG. 1, appliqué 10 is simply placed in the desired position on the fabric 11, whereupon the fabric with the appliqué thereon is subjected to heat and pressure, usually by means of a suitably heated platen moved into engagement therewith.

During the application of heat and pressure to appliqué 10 and fabric 11, the fusible material in the yarns 22 and 23b becomes sufficiently soft to be moved into the interstices between adjacent sections of the backing yarn 22 and between the yarns 12, 13 of the supporting fabric 11. Thus, the appliqué is adhesively secured to the supporting fabric and also is interlocked with the supporting fabric without interrupting the continuity of the backing yarn strand 22a. It can thus be seen that the structural integrity of the appliqué is maintained even when the appliqué is fused to a textile article.

Referring to FIG. 5, the embroidered appliqué 10 is shown applied to the pile surface of a textile article 11a embodied in a terry wash cloth, wherein it will be noted that, not only is the appliqué fused in adhering engagement with the pile surface, but because of the fabric and the appliqué being subjected to pressure during the process of fusing, those pile tufts which are engaged by the bottom surface of the appliqué are displaced somewhat and are forced to occupy lower positions with respect to the base of the fabric 11a. This results in the appliqué 10 being embedded in the pile surface with the pile tufts surrounding the structural members of the appliqué 10 projecting upwardly relative to such structural members. Thus, the tufts project upwardly about the entire perimeter of the appliqué and also project upwardly through the interstices of the open network of embroidery comprising the appliqué 10.

An enlarged cross-sectional detail of the pile fabric 11a with the appliqué 10 thereon is not shown, since it is apparent, by reference to FIG. 4, that the fusible component in the yarns 22 and 23b will be moved into the

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interstices between adjacent tufts of the pile surface of the supporting pile fabric 11a during the application of heat and pressure thereto so as to adhesively secure the appliqué to the pile surface and also to cause the bottom surface of the appliqué to become interlocked with the pile surface without interrupting the backing yarn strand 22a thereof. By this arrangement, tests have shown that fabrics with the corresponding appliques 10 thereon may be subjected to a number of launderings far exceeding the normal number of launderings to which such fabrics might be subjected during their useful life without the appliques becoming separated from the corresponding fabrics and without interfering with the structural integrity of such appliques.

All the yarns 23a, 23b forming the core 23 of the embroidered appliqué 10 may be of a type which is non-fusible at the fusion point of strand 22b, if desired. In some instances, it may be desirable to omit the yarns 23a, 23b and to simply form the appliqué by stitching the same through a suitable web material, not shown, so that all of the composite yarn 22 will appear on the bottom face of the web material and the opposite end portions of each run of the facing yarn 21 will penetrate such web material. Additionally, if desired, such web material may be common to all the strand-like embroidered structural members of the appliqué and may close the openings defined by the cluster of loop members 17, 18 of FIG. 2. In any event, the completely formed appliqué is applied to and adheres to the supporting fabric in the manner described earlier herein.

In the drawings and specification there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. An embroidered appliqué adapted to be fused to a textile article and characterized by having structural integrity even when the appliqué is fused to a textile article; said appliqué comprising a facing yarn forming the top surface of the appliqué, a composite backing yarn forming the bottom surface of the appliqué and interlaced with the facing yarn along perimetrical portions of the appliqué, said composite yarn comprising first and second coextensive components, said first component being a continuous strand, said second component being fusible at a predetermined temperature, and said strand, as well as said facing yarn, being nonfusible at said predetermined temperature.

2. An appliqué according to claim 1, in which said second component also is a continuous strand, and wherein said strands are plied together.

3. An appliqué according to claim 2, in which both of said strands in the composite yarn are thermoplastic, and wherein said strand of said first component has a substantially higher fusion point than that of said strand of said second component.

4. An appliqué according to claim 3, in which said facing yarn is a nonthermoplastic nonfusible yarn.

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5. An appliqué according to claim 1, wherein said facing and backing yarns are interlaced in the form of tubular strand-like structural members, a plurality of body yarns forming a core within said tubular structural members, there being a first layer of said body yarns adjacent said facing yarn and a second layer of body yarns adjacent said backing yarn, each of the body yarns of said second layer comprising two strands plied together, one of which is fusible at said predetermined temperature, and the other of which is nonfusible at said predetermined temperature.

6. The combination with a textile fabric of an embroidered appliqué fusibly secured thereto and characterized by having structural integrity even after being subjected to many launderings, said appliqué comprising a facing yarn forming the top surface of the appliqué, a composite backing yarn forming the bottom surface of the appliqué and interlaced with the facing yarn adjacent perimetrical portions of the appliqué, said composite backing yarn comprising first and second coextensive components, said first component being a continuous first strand, and only said second component being fused and providing fusible securement of the appliqué to the fabric whereby the interlaced condition of said strand of said first component and said facing yarn is unaffected to preserve the structural integrity of the appliqué, even though said fused component may be interrupted.

7. The combination as claimed in claim 6, in which said component is a second strand plied with said first strand.

8. The combination as claimed in claim 7, wherein said fabric is of woven construction, and wherein fused portions of said second strand extend into the interstices of said fabric for enhancing the fusible securement of the appliqué to the fabric.

9. The combination as claimed in claim 6, in which said textile fabric has a pile surface against which said appliqué is positioned.

10. The combination as claimed in claim 7, in which both of said strands in the composite yarn are thermoplastic, and wherein said first strand has a substantially higher fusion point than that of said second strand.

11. The combination as claimed in claim 10, in which said facing yarn is a nonthermoplastic nonfusible yarn.

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U.S. Cl. X.R.

161—39, 53, 63, 66, 92, 94, 97

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,567,567 Dated March 2, 1971

Inventor(s) Ernest Kohn Sherrill

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, Line 62, "edegs" should be --edges--. Column 4, Line 33, after "bottom" insert --body--. Column 6, Line 29 in CLAIM 7, after "said"; first occurrence, insert -- second

Signed and sealed this 1st day of June 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents