A football having stripe members that are secured within channels extending within the outer cover of the football, is disclosed. The stripe members are unitary in nature as opposed to having a layered structure. The unitary structure provides greater durability and life, and avoids the tendency for the stripe to wear off the surface of the football.
SPORTS BALL WITH UNITARY STRIPE MEMBER

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from U.S. Provisional Application Ser. No. 60/583,396 filed on Aug. 30, 2004.

BACKGROUND

[0002] The present disclosure is generally related to sports game balls, including Rugby balls, basketballs, soccer balls, and footballs. The development is particularly directed to improved stripes for footballs.

[0003] The game of American football utilizes a football in the shape of a prolate spheroid. Aspects of the game involve players attempting to throw, catch, or run with, the football. Covers of footballs are commonly formed from leather, rubber, or other materials. It is important that the cover of the football be formed in a manner that facilitates the handling and the feel of the ball.

[0004] The outer surface of a football typically includes a pebble texture that improves the ability to grip the ball. Stripes and other designs are also applied to the surface of the football for aesthetic purposes and to increase visibility of the ball. Maintaining the normal texture, feel, and grip of the football, while also allowing for aesthetic considerations, is important in preserving the character of the game. Applying stripes or other designs to the surface of the football has historically resulted in a deterioration of the player’s ability to grip the football. This reduction in the player’s ability to properly grasp the football can limit that player’s performance. The ability to throw, to catch, to run with, and/or hold on to, the football is negatively impacted. The ability to throw the football accurately and/or for a desired distance also suffers.

[0005] During game conditions, players’ perspiration, weather conditions, and other factors can negatively affect the players’ ability to grasp the football. The presence, on the surface of the football, of a stripe or other design that negatively impacts the feel or the ability to grasp the football, can multiply the negative effects due to moisture, perspiration, weather conditions, or other factors.

[0006] The prior art discloses various enhancements for improving the ability to grasp the football, such as embossing the football with a tactile pattern and further embossment with a second tactile pattern.

[0007] One challenge is to produce a football that has improved gripping and tactile characteristics, while further allowing for aesthetic features such as stripes and designs to be applied to the surface of the football without negatively impacting the game. Similar considerations apply to the production of other type game balls such as Rugby balls, basketballs, and soccer balls. Consequently, an enhancement to a traditional football that will improve the feel and the ability to grip the football without compromising the quality of the construction process is needed. For similar reasons, it is desirable to improve the feel and the ability to grasp other type game balls such as Rugby balls, basketballs, and soccer balls.

[0008] More specifically, in designing improved American style footballs, it is desirable to provide stripes along the outer surface of the ball that not only enhance visual identification of the ball, but also promote gripping of the ball. Prior attempts to increase the visibility of the ball have been made for example, by incorporating whiteners or other optical agents in coating formulations used for forming the stripe. Gripping enhancements have been proposed by utilizing abrasive or other friction enhancing agents in the coating formulations used for forming the stripe. Although satisfactory in many respects, a need remains for an improved approach and one which provides striping having greater durability and wear resistance.

[0009] A significant disadvantage associated with most commercially available footballs relates to the limited life of striping applied to the outer surface of the ball. Since most striping on such balls is initially in a liquid formulation that is sprayed or otherwise applied onto the outer surface of the ball as a thin coating, conventional striping is susceptible to wear and being scratched off the surface of the ball. Even relatively thick coatings are susceptible to wear, particularly if the football is used outdoors, where most footballs are used.

[0010] An approach using a thin striping member that is glued or otherwise coupled by stitching, etc., to the outer surface of the ball was described in U.S. Published Application 2004/0121865. That approach described either applying by glue, stitching, etc., a thin stripe directly to the outer surface of the ball, or placing a thin stripe within a recess in the ball’s cover. However, in the recess-stripe version, the ‘865 application describes the thin stripe as being a multi-layer assembly having an outer layer that is resilient and tactile, and an inner portion that is fixed to the underlying ball surface. The inner layer of the multi-layer stripe is preferably bonded to the ball surface. Although a multi-layer configuration is likely superior to a stripe formed by spraying a liquid coating on the ball surface, a thin multi-layer stripe is still susceptible to wear, scratching, and tearing of the outer layer. In addition, if damage occurs to the outer layer, the inner layer can become exposed. Similarly, if stitching is utilized, the stitching can inflict damage to the player’s hand during play, etc. Typically, the inner layer would not exhibit the same properties and appearance as the outer layer. Moreover, additional manufacturing, materials, and costs are associated with each additional layer of the multi-layer stripe.

[0011] Accordingly, there remains a need to provide a football with stripes or other indicia that are highly durable and yet which are simple and inexpensive to produce.

BRIEF DESCRIPTION

[0012] In a first aspect, the present disclosure provides an inflatable sports ball comprising a carcass defining an outer surface. The sports ball also comprises at least one cover panel disposed on and affixed to the outer surface of the carcass. The at least one cover panel defines a depressed region adapted to receive an insert member. The cover panel within the depressed region has a thickness that is less than the thickness of the cover panel immediately adjacent to the region. The cover panel covers the outer surface of the carcass within the region. The sports ball also comprises a unitary insert member disposed in the depressed region. The insert member defines an outer surface and has a thickness such that when disposed in the depressed region, the outer
surface of the insert member is essentially flush with the outer surface of the cover panel immediately adjacent to the region. The insert member includes (i) a fiber matrix and (ii) a polyurethane formulation.

[0013] In another aspect, the present disclosure relates, in various embodiments, to a football comprising an inflatable carcass having an outer surface. The football also comprises a cover disposed on and affixed to the outer surface of the carcass. The cover defines a first region of reduced thickness. The region has a thickness less than the thickness of a second region of the cover adjacent to the first region. The cover entirely covers the outer surface of the carcass. The football also comprises a unitary insert member disposed in the first region. The insert member has an outer surface. The insert member comprises (i) a fiber, (ii) a second fiber forming a fibrous matrix therewith, and (iii) a polyurethane formulation dispersed throughout the fibrous matrix. The insert member has a thickness such that when disposed in the first region, the outer surface of the insert member is essentially flush with the outer surface of the cover in the second region.

[0014] In yet another aspect, the present disclosure provides a method of forming a football with a stripe panel. The method comprises providing an inflatable football carcass. The method also comprises providing a cover material, the cover material having a thickness and defining an outer surface. The method further comprises forming a channel in the cover material. The channel has a depth less than the thickness of the cover material. The method also comprises providing a unitary stripe member. The member defines an outer surface. The method also comprises inserting the stripe member in the channel such that the outer surface of the stripe member is flush with the outer surface of adjacent regions of the cover material. The method further comprises applying the cover material onto the carcass.

[0015] Other systems, methods, features, and advantages of the present disclosure will be or become apparent to one with skill in the art upon examination of the following drawings and detailed description. It is intended that all such additional systems, methods, features, and advantages be included within this description, be within the scope of the present disclosure, and be protected by the accompanying claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Many aspects of the disclosure concerning various embodiments of a composite stripe sportsball can be better understood with reference to the following drawings. The components in the drawings are not necessarily drawn to scale, emphasis instead being placed upon clearly illustrating the principles of the present disclosure. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

[0017] FIG. 1 illustrates a detail of the surface of a traditional football with an applied ink stripe on the cover of the football.

[0018] FIG. 2 illustrates a detail of the surface of a preferred embodiment football comprising a stripe member as described herein.

[0019] FIG. 3 is a perspective view of a preferred embodiment football having a plurality of stripe members.

[0020] FIG. 4 is a partial exploded view of another preferred embodiment football illustrating application of the preferred embodiment stripe members.

[0021] FIG. 5 is a schematic partial cross-section of the cover and carcass section of a preferred embodiment football and stripe member.

[0022] FIG. 6 is a schematic cross-section of the assembled collection of components in FIG. 5.

[0023] FIG. 7 is a perspective view of another preferred embodiment football using the preferred embodiment stripe member.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0024] In response to shortcomings of the prior art, a unique stripe member or other indicia is disclosed. The stripe member exhibits significant durability and excellent wear characteristics. The stripe member also provides superior gripping characteristics on the surface of the football at which the stripe is located. The affixment of the stripe into the cover of the football improves the feel of competitive play footballs without compromising the construction process. The placement of the stripe into the cover of the football also eliminates any need for an ink or painted-on stripe and thus, avoids the problems with those types of stripes.

[0025] In another embodiment, besides a stripe member, any other indicia, shape or design can be placed and affixed into the surface of the football in accordance with the present disclosure.

[0026] As a further embodiment, the stripe member, or any other indicia, shape or design can be placed and affixed into the surface of a Rugby ball, a basketball, a soccer ball or other type game ball.

[0027] Various aspects of the stripe member having been summarized above, reference will now be made in detail to the description of the representative assembly illustrated in the drawings. While the stripe member will be described in connection with these drawings, there is no intent to limit it to the embodiment or embodiments disclosed therein.

[0028] FIG. 1 is a detail of the surface of a traditional prior art football. Specifically, FIG. 1 illustrates a portion of a stripe 20 on the outer surface 10 of the football. The stripe 20 is typically applied by spraying or printing an ink or paint formulation. The stripe 20 is defined by edge lines 12 and 14. As a result of application of the stripe 20 onto the pebbled outer surface of the football, it is typical for the edge lines 12 and 14 to not be crisp and sharp, instead being “fuzzy” or at least somewhat blurry or undefined. Ink or painted-on stripes are also limited because they are relatively slippery and are also more susceptible to eventually fading or wearing off the football surface due to use.

[0029] FIG. 2 is a detail of the surface of a preferred embodiment football in accordance with the present disclosure having a stripe member along a pebbled surface of the football. Preferably, the stripe member is positioned and affixed on a leather cover football. Specifically, FIG. 2 shows a portion of the outer surface 120 of a preferred stripe member positioned and affixed to an outer cover 110 of a football. A significant feature of the stripe members is the
crisp and sharp edge lines 112 and 114. In contrast, spray or painted stripes as known in the prior art often exhibit “fuzzy” edge lines such as 12 and 14 as shown in FIG. 1.

[0030] Preferably, in accordance with the present disclosure, an inlaid, bonded-in stripe is utilized on American style footballs. The stripes can be in the form of panels formed from certain materials and colored or otherwise treated to exhibit a desired appearance, i.e. white colored stripes, etc., and feel. The panels are then physically attached to the adjoining and/or underlying cover panels of the football during manufacture. Attachment of the panels can be performed by using an adhesive. A wide array of adhesives can be used such as rubber or polymeric resin based adhesives.

[0031] A significant feature of the preferred embodiment stripes, is that the stripes are unitary in nature as opposed to having a multi-layer structure. By “unitary” it is meant that the construction of the stripe is relatively constant and uniform at all locations within the stripe and across its thickness. Although, described in greater detail herein, the preferred embodiment stripes can be formed from two or more materials and thus not be entirely homogeneous, the nature and characteristics of the stripe are uniform over its thickness. Also, the stripe is generally a single, integral component or member as opposed to an assembly of layers. These features are described in greater detail herein.

[0032] FIG. 3 illustrates a preferred embodiment football 200 in accordance with the present disclosure. The football 200 comprises an inflatable carcass (not shown) and an outer cover 210 disposed on and covering the carcass. The football 200 also includes laces 230 as is known in the art. One or more preferred embodiment stripe members such as members 220 can be disposed along the outer cover 210. Preferably, stripe members 220 are disposed about each end of the football 200 as shown in FIG. 3. A significant feature of the stripe members 220, particularly when white in color and used on a football having a brown colored cover, are the crisp and sharp lines 212 and 214 that constitute the edges of a corresponding stripe member. The outer surface of the football and/or the outer surface of the stripe members preferably include optional pebbling.

[0033] FIG. 4 schematically illustrates an exploded view of a preferred embodiment football 300 comprising stripe members 320. Corresponding channels or depressed regions 315 are defined or otherwise formed along the outer surface of the football, and specifically the cover. The stripe members 320 are disposed within the channels 315. It will be understood that the depth of the channels 315 has been exaggerated in FIG. 4 to more clearly show their adaptation for receiving stripe members 320.

[0034] FIGS. 5 and 6 schematically illustrate positioning and affixment of a stripe member within a cover panel of a football. Specifically, a cover panel 408 disposed on a carcass 405 is shown. The cover panel 408 defines an outer surface 410. A depressed region 415 is formed or otherwise provided in the cover panel 408. A stripe member 420 having an outer surface 422 and an under surface 424 is disposed in the region 415. The depressed region 415 has a depth A which is equal, or substantially so, to the thickness of the stripe member 420.

[0035] As illustrated in FIG. 3, in the event the present disclosure sports ball is a football, it is preferred that the football comprises a first stripe in the form of a continuous circle or loop disposed along a first end region of the ball. The football can also include a second stripe in the form of a continuous circle or loop disposed along a second end region of the ball. The present disclosure includes other embodiments for the shape and configuration of stripes. Another preferred configuration is the use of half stripes on the ball. For example, half stripes in the form of hemispheres can be used. The half stripes can be aligned or offset with respect to each other. Half stripes or rather, a non-continuous, stripe may be visually interesting as a result of the effect when the ball is thrown and a spin is placed on the ball.

[0036] FIG. 7 illustrates another preferred embodiment football 500. The football 500 comprises one or more half-stripe members 520 and laces 530. The half-stripe members only extend within one region of the ball, such as region 510 and do not extend within another region such as region 510A.

[0037] Materials for the preferred embodiment stripe panels include a nonwoven fiber matrix or layer of 50% polyester fibers and 50% rayon fibers, impregnated or coated with a particular polyurethane formulation. All percentages noted herein are weight percentages unless noted otherwise. In other embodiments, the fiber matrix includes about 40% to about 60% polyester fibers and the remainder rayon fibers. In certain applications, it is preferred that the fiber matrix be in the form of a highly entangled collection of fibers. The fibers can, in certain embodiments, be bonded to each other at the locations at which they contact one another. Various fiber configurations can be used such as sheath-core arrangements. In addition, fibers can be formed from multiple polymers or materials. For example, if a sheath-core fiber type is used, a first polymer can be selected for the core component, and a second polymer can be selected for the sheath. In certain applications, it is also contemplated that a polymer having a relatively low melting point be used for the sheath component. Then, upon application of an optional heating step, a fiber matrix using such core-sheath fibers can be somewhat bonded together by melting and thermally bonding the fibers at their contacting intersections. The present disclosure also includes woven fiber layers or fabrics for the fiber matrix.

[0038] The preferred embodiment formulation for impregnating or binding the fiber matrix of the stripe members, includes (i) a polyurethane resin, (ii) dimethyl formamide (DMF) as a solvent, (iii) additives for softening the resulting coating, (iv) pigments for achieving the desired white appearance, e.g. titanium dioxide, and (v) additives for increasing surface tack. When forming the stripe polyurethane material, it is preferably in sheet form, and pebbled. The striping sheet is cut out into strips to desired shape of the stripes. Preferably, the pebbled polyurethane stripe material is about 0.35 mm thick. A preferred range of thickness is from about 0.3 to about 0.5 mm, but a depth of about 0.35 mm is most preferred to maintain the outer surface of the stripe even or flush with the leather surface of a particularly preferred football. The pebble height is typically about 0.1 to about 0.15 mm, which is about half the total thickness of the polyurethane stripe.

[0039] It is particularly preferred that the various stripes or insert members as described herein are unitary in nature as opposed to having a multi-layer structure. The use of a
unitary characteristic for the stripes allows the stripe to exhibit remarkable durability and life. And, in the event the outer surface of the stripe is scratched, abraded, or otherwise damaged, the newly exposed surface will exhibit an appearance identical to the previous outer surface of the stripe when new.

[0040] In this regard, channels about 0.4 mm in depth for receiving the preferred inlaid stripe panels are cut or pressed into the leather or other material panels which are utilized to form the external surface or cover of the football. The pebbled polyester/rayon stripe panels impregnated or coated with the polyurethane composition are then mated or joined with the channels and are affixed therewith. Affixment can be performed by use of thermal bonding, or by use of an adhesive. Optionally, but less preferred, the stripe panels can be joined to the channels by other means.

[0041] The stripe panel is laid into the channel or recessed region in the leather cover, such that the outer surface of the stripe panels are flush or maintained even with the leather. In certain embodiments, the edges of the stripe panel are pressed or otherwise positioned below the leather, so that it reduces the likelihood of the stripe panel peeling up from the leather, in that there are no upwardly projecting edges to catch and tear.

[0042] Once the pebbled stripe panels are joined with the channels of the outer panels of the football, the stripe panels can be further pressed to enhance bonding. For example, a force can be applied along with heat, etc., if necessary.

[0043] In some embodiments, it may be preferred to utilize one or more embossing operations to (i) form or assist in forming the stripe, (ii) position and affix the stripe within a channel or recessed region in a cover, (iii) further seal and join the stripe panel with adjacent cover material, or two or all of (i), (ii), and (iii). The term “emboss” as used herein refers to an operation in which a raised pattern such as pebbling is formed on the outer surface of the stripe panel or member, and/or the cover of the ball. The embossing operation can be performed in conjunction with the application of heat and/or pressure to assist in forming the pebbling or other surface pattern. The application of heat and/or pressure can also serve to assist in bonding the stripe panel or member within the channel defined in the cover. In certain embodiments, the formation of pebbling on the cover and on the stripe panel is performed during the same operation so that the pebbling appears continuous along the surface of the ball. Thus, the pattern of pebbling on the stripe will match the pattern of pebbling on adjacent cover areas on the ball. This is desirable from an aesthetic viewpoint.

[0044] The present disclosure also provides methods of forming sports balls, and particularly footballs, with one or more unitary stripe members. Generally, the methods involve providing an inflatable carcass. The methods also include providing a cover material such as formed from leather or synthetic leather. The cover material has a relatively uniform thickness and defines an outer surface. A channel or depression is formed in the cover panel. The channel has a depth less than the thickness of the cover material. A unitary stripe member, as described herein, is provided and inserted into the channel. After proper positioning and/or placement, the stripe member is rendered flush with the outer surface of adjacent regions of the cover material. The stripe member may optionally be further bonded or affixed within the channel. The cover material is applied to the ball carcass.

[0045] The disclosure includes many variations from the foregoing noted method. The cover material can be applied onto the ball carcass either before or after insertion of the stripe member into the cover. The methods can also include one or more embossing operations in which pebbling or other patterns are applied to the cover material or stripe member. Additionally, heat and/or pressure can be applied to either or both of the cover material and the stripe member. Such application of heat and/or pressure can serve to bond or otherwise couple the stripe member to the ball cover material. The methods can also include application of adhesive within the channel and/or on the outer regions of the stripe member.

[0046] It is significant to note that the stripe panels are placed on, or within depressions formed within, the football cover and are not affixed to the carcass. That is, the cover or a portion of the thickness of the cover is disposed between the stripe panels and the football carcass. And so, the stripe panels do not, in any fashion, contact the football carcass or underlying bladder. This strategy further promotes the integrity of the carcass and bladder.

[0047] Ink or painted-on stripes are slippery and are susceptible to eventually wear off with use of the football. Reducing the slipperiness of an ink or painted-on stripe by instead using the preferred embodiment stripes described herein, improves the feel of the football surface, and also improves the ability to grasp the football. This improves the player’s ability to control the football and allows players to throw, to catch, to run with, or hold on to, the football with greater accuracy and use of their athletic abilities. The ability to throw the football accurately and/or for a desired distance is also improved.

[0048] In another embodiment, it is to be appreciated that the stripe which is embedded in the football can be any other shape or design which may be impressed on the football.

[0049] In yet another embodiment, it will be appreciated that the stripe, or any other shape or design, can be embedded in the surface of a Rugby ball, a basketball, a soccer ball, or any other type game ball.

[0050] Although it is generally preferred that the stripe member be formed from a fibrous matrix impregnated with a polyurethane, the present disclosure includes other materials for the stripe member. For instance, the stripe member can be formed from rubber(s), polyvinylchloride, leather, nylon(s), other synthetic or natural materials, or combinations thereof. In addition, besides utilizing the preferred fiber matrix, the stripe member can utilize a mesh configuration. Instead of, or in addition to, the noted polyurethane formulation, other compositions can be utilized as an impregnating agent for the fiber matrix. Contemplated compositions include, but are not limited to liquid rubber compositions, polymeric materials, and other flowable formulations that can be cured or otherwise solidified.

[0051] It should be emphasized that the above-described embodiments of the present disclosure, particularly, any “preferred” embodiments, are merely possible examples of implementations, merely set forth for a clear understanding of the principles of the stripe. Many variations and modifi-
An inflatable sports ball comprising:

1. A carcass defining an outer surface;

2. The sports ball of claim 1 wherein the fiber matrix includes polyester fibers and rayon fibers.

3. The sports ball of claim 2 wherein the fiber matrix includes about 40% to about 60% polyester fibers and the remainder rayon fibers.

4. The sports ball of claim 1 wherein the insert member is white in color.

5. The sports ball of claim 1 wherein the at least one cover panel is formed from leather.

6. The sports ball of claim 1 wherein the sports ball is a football.

7. The sports ball of claim 1 wherein the depth of the depressed region is from about 0.3 to about 0.5 mm.

8. The sports ball of claim 7 wherein the depth of the depressed region is about 0.35 mm.

9. The sports ball of claim 1 wherein the thickness of the insert member is from about 0.3 to about 0.5 mm.

10. The sports ball of claim 9 wherein the thickness of the insert member is about 0.35 mm.

11. The sports ball of claim 1 wherein the outer surface of the at least one cover panel is pebbled.

12. The sports ball of claim 1 wherein the outer surface of the insert member is pebbled.

13. The sports ball of claim 1 wherein the ball is a football and the football comprises a first stripe forming a continuous loop around a first end region of the football and a second stripe forming a continuous loop around a second end region of the football.

14. The sports ball of claim 1 wherein the ball is a football and the football comprises a first stripe forming a hemicircle disposed on a first end region of the football and a second stripe forming a hemicircle disposed on a second end region of the football.

15. A football comprising:

   a. an inflatable carcass having an outer surface;

   b. a cover disposed on and affixed to the outer surface of the carcass, the cover defining a first region of reduced thickness, the region having a thickness less than the thickness of a second region of the cover adjacent to the first region, the cover entirely covering the outer surface of the carcass; and

   c. a unitary insert member disposed in the first region, the insert member having an outer surface, the insert member comprising: (i) a first fiber, (ii) a second fiber forming a fibrous matrix therewith, and (iii) a polyurethane formulation dispersed throughout the fibrous matrix, the insert member having a thickness such that when disposed in the first region, the outer surface of the insert member is essentially flush with the outer surface of the cover in the second region.

16. The football of claim 15 wherein the first fiber is a polyester fiber.

17. The football of claim 15 wherein the second fiber is a rayon fiber.

18. The football of claim 17 wherein the first fiber is a polyester fiber.

19. The football of claim 18 wherein the fibrous matrix includes about 40% to about 60% of the polyester fiber.

20. The football of claim 15 wherein the insert member is white in color.

21. The football of claim 15 wherein the cover is leather.

22. The football of claim 15 wherein the insert member has a thickness of from about 0.3 to about 0.5 mm.

23. The football of claim 22 wherein the insert member has a thickness of about 0.35 mm.

24. The football of claim 15 wherein the outer surface of the cover in the second region is pebbled and the outer surface of the insert member is pebbled.

25. The football of claim 24 wherein the pebbled of the outer surface of the insert member and the pebbled of the outer surface of the cover in the second region is continuous.

26. The football of claim 15 wherein the football comprises a first stripe forming a continuous loop around a first end region of the football and a second stripe forming a continuous loop around a second end region of the football.

27. The football of claim 15 wherein the football comprises a first stripe forming a hemicircle disposed on a first end region of the football and a second stripe forming a hemicircle disposed on a second end region of the football.

28. A method of forming a football with a stripe panel, the method comprising:

   a. providing a cover material, the cover material having a thickness and defining an outer surface;

   b. forming a channel in the cover material, the channel having a depth less than the thickness of the cover material;

   c. providing a unitary stripe member, the member defining an outer surface;
inserting the stripe member in the channel such that the outer surface of the stripe member is flush with the outer surface of adjacent regions of the cover material; and

applying the cover material onto the carcass.

29. The method of claim 28 wherein the applying of cover material to the carcass is performed after inserting the stripe member in the channel.

30. The method of claim 28 wherein the applying of cover material to the carcass is performed prior to inserting the stripe member in the channel.

31. The method of claim 28 further comprising:

embossing a pebbled pattern on the outer surface of the cover material.

32. The method of claim 28 further comprising:

embossing a pebbled pattern on the outer surface of the stripe member.

33. The method of claim 28 further comprising:

applying pressure to the stripe member after inserting the stripe member in the channel.

34. The method of claim 28 further comprising:

heating the stripe member after inserting the stripe member in the channel.

35. The method of claim 28 wherein the stripe member includes (i) a fiber matrix and (ii) a polyurethane formulation dispersed therein.

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