

Description

This invention relates to a light-reflective slide fastener which comprises a pair of support tapes each carrying on their respective longitudinal inner edges a row of coupling elements in the form of discrete or continuous intermeshing teeth, each of said elements having a coupling head portion, a leg portion and a heel portion; a slider adapted to bring said elements on the respective tapes into and out of engagement; and a continuously longitudinally extending flexible light-reflective strip.

A light-reflective slide fastener of the type mentioned is disclosed in FR-B-2 335 124 in which there is shown a slide fastener having a luminous strip carrying thereon a fluorescent coating or a multiplicity of fine glass beads, the strip being secured to the web of the fastener tape by sewing or with an adhesive compound.

When applying such a slide fastener onto a garment article, this is usually done by sewing the fastener tape closely along its fastener elements to the edges of an opening in the garment fabric, in which instance the luminous strip on the fastener is apt to be masked from view. Alternatively, the fastener may be sewn in place with its element-carrying portion spaced sufficiently apart from the opening of the garment fabric. This would however involve the use of a relatively wide fastener tape, necessarily wider than the standard specification.

The prior art luminous slide fastener has a further drawback in that the sewing needle undergoes wear over short periods of time where it is used in contact with glass beads on the luminous strip.

US-A-2 495 033 discloses a slide fastener whose coupling elements, cast in metal or plastics, are to be superior by their particularly light weight. For this purpose, in the region of the coupling head, the coupling elements are provided with hollows or recesses on both sides. These recesses may be covered by an insert at one or both sides; insert which may comprise a rhinestone or a wax composition or a lubricant-impregnated insert.

US-A-3 255 504 discloses a slide fastener in which the threads for attaching the coupling elements shall be protected by a slider against excessive wear. For this purpose the coupling elements are provided with aligned notches in which a narrow tape is received. The sewing threads for attaching the row of coupling elements to the aperturing support tape go through the strips and are protected from any contact with the slider.

The present invention seeks to provide a slide fastener that has good reflection properties but comprises support tapes of normal width which do not put up excessive resistance to the sticking-in of the sewing needle.

A slide fastener which meets these requirements is characterized in claim 1.

The above and other objects of the invention will be better understood from the following detailed description taken in conjunction with the accompanying drawings in which like reference numerals refer to like and corresponding parts throughout the several views.

Figure 1 is a plan view of a light-reflective slide fastener embodying the invention;

Figure 2 is a view similar to Figure 1 but showing a modified form of the invention;

Figure 3 is a transverse cross-sectional view on enlarged scale of a coupling element having a light-reflective strip embedded therein;

Figure 4 is a view similar to Figure 3 but showing a light-reflective strip mounted on the upper surface of the coupling element;

Figure 5 is a perspective view of a coupling element having a groove formed in its upper surface for receiving a light-reflective strip;

Figure 6 is a cross-sectional view of a portion of the coupling element in Figure 5 in which a light-reflective strip is embedded;

Figure 7 is a longitudinal cross-sectional view on magnified scale of two adjacent coupling elements carrying a light-reflective strip;

Figures 8 and 9 each are a cross-sectional view on magnified scale of a light-reflective zone in a slide fastener according to the invention;

Figure 10 is a plan view on enlarged scale of a portion of a slide fastener stringer carrying meandering coupling elements;

Figures 11 and 12 each are a transverse cross-sectional view of Figure 10; and

Figures 13 and 14 are cross-sectional views of two different forms in which the light-reflective strip is applied to the slide fastener.

Referring now to the drawings and Figure 1 in particular, there is shown a slide fastener 10 embodying the invention which comprises a pair of stringers 11 each including a support tape 12 and a row of coupling elements 13 secured to a longitudinal inner edge of the tape 12. The coupling elements 13 are formed from for example injection-molding a plastics material to and along the tape edges in a discrete formation. The rows of coupling elements 13 on oppositely disposed support tapes 12 are brought into and out of engagement with each other by manipulating a slider 14 in a manner well known to open and close the fastener 10.

The coupling elements 13 may be formed by extrusion of a plastics material or by metal die-casting.

A light-reflective or luminous strip 15 is in the form of an elongate narrow flexible fabric tape which is capable of demonstrating the existence of a slide fastener mounted article by reflecting a light

in a dark environment primarily for safety purposes.

According to a preferred embodiment shown in Figure 1, the strip 15 extends longitudinally partially over and masks the upper surfaces of leg portions 13a of the coupling elements 13 with coupling head portions 13b and heel portions 13c exposed to view when the opposed stringers 11, 11 are coupled together.

Figure 2 shows another preferred embodiment in which the light-reflective strip 15 extends over and masks substantially the entire surface portions of the rows of coupling elements 13 as viewed in the closed disposition of the fastener 10, except for the heel portions 13c which are left intact for sliding contact with the slider 14.

As is known, the fastener stringers 11, 11 yield themselves in conformity with the Y-shaped guide channel of the slider 15 when the fastener 10 is opened or closed and can do so without damage to or separation of the light-reflective strip 15 from the coupling element row 13 as the material of the strip 15 is highly flexible. To help in such yielding behaviour of the strip 15, the latter may be somewhat sagged in between adjacent coupling elements 13 as better shown in Figure 7. This arrangement ensures prolonged service life of the strip 15.

The detailed construction of the light-reflective zone 15' is better shown in Figure 8 which represents an open-type light-reflective strip 15a and also in Figure 9 which represents a closed-type light-reflective strip 15b.

The open-type strip 15a comprises a base layer 16 of a saturated polyester resin, a reflective layer 17 of an aluminum, copper, silver or other suitable metals bonded to the upper surface of the base layer 16 by fusion, plating or coating, an adhesive layer 18 of a polyvinylbutyral laid over the reflective layer 17 and a multiplicity of glass beads 19 embedded halfway in the adhesive layer 18. The reflective layer 17 extends in a wavy configuration, as cross-sectionally observed, providing alternate ridges 17a and grooves 17b so that the lower half of each individual glass beads 19 is received and bonded in such groove 17b by the adhesive layer 18. The upper half of the bead 19 is exposed to view as it protrudes above the surface of the adhesive layer 18. The beads 19 are thus held in place without being superimposed one over another. An adhesive layer 20 preferably of a heat-sensitive type is attached to the lower surface of the base layer 16 and may if necessary be deposited with a releasing paper 21.

The closed type light-reflective strip 15b shown in Figure 9 is substantially the same in construction as the open-type 15a, except that there is provided a transparent cover layer 22 made of acryl or other suitable resins bonded to the adhesive layer 18 and adapted to envelop the exposed upper half

portions of the glass beads 19.

The manner in which the light-reflective strip 15 is bonded to the coupling element row 13 is shown in Figure 3 wherein the strip is embedded in a recess 23 and bonded in place by the application of heat and pressure as by ironing, in which instance the releasing paper 21 is of course removed.

Figure 4 shows adhesively applying the strip 15 directly to the upper leg portions 13a of the coupling elements 13. In either case, it has been found desirable to provide a reservoir 24, as shown in Figures 5 and 6, in each of the coupling elements 13 for retaining an adhesive compound 25 (Figure 6) whereby the strip 15 can be more effectively bonded to the element row 13. While the strip 15 can be bonded with an adhesive received in the recess 23, there is fear that the adhesive may drip out resulting in less adhesive strength and smeared tape.

The light-reflective strip 15 is thin enough to avoid abrasive contact with the slider 14, for which purpose its thickness should not literally exceed a clearance gap between the slider interior wall and the upper surface of the coupling elements 13.

Figure 10 shows applying the light-reflective strip 15 with an adhesive, by fusion or sewing to a meandering type of slide fastener element row which is bonded by fusion to the support tape 12 in a manner shown in Figure 11.

Figure 12 is a view similar to Figure 11 but it shows sewn stitches 26 securing the elements 13 to the tape 12 and embedded in grooves 27 in the upper surfaces of the elements 13 over which strip 15 is effectively bonded in place.

Figure 13 shows applying the strip 15 to the elements 13 by sewing the same through a woven, non-woven or knitted fabric braid 28.

Figure 14 shows applying the strip 15 by sewn stitches 26 to a continuous helical coil element structure.

Claims

1. A light-reflective slide fastener (10) which comprises a pair of support tapes (12) each carrying on their respective longitudinal inner edges a row of coupling elements (13) in the form of discrete or continuous intermeshing teeth, each of said elements (13) having a coupling head portion (13b), a leg portion (13a) and a heel portion (13c); a slider (14) adapted to bring said elements on the respective tapes (12) into and out of engagement; and a continuously longitudinally extending flexible light-reflective strip (15); characterized in that said strip (15) lies over the upper surfaces of said leg portions (13a) apart from said head por-



in a dark environment primarily for safety purposes.

According to a preferred embodiment shown in Figure 1, the strip 15 extends longitudinally partially over and masks the upper surfaces of leg portions 13a of the coupling elements 13 with coupling head portions 13b and heel portions 13c exposed to view when the opposed stringers 11, 11 are coupled together.

Figure 2 shows another preferred embodiment in which the light-reflective strip 15 extends over and masks substantially the entire surface portions of the rows of coupling elements 13 as viewed in the closed disposition of the fastener 10, except for the heel portions 13c which are left intact for sliding contact with the slider 14.

As is known, the fastener stringers 11, 11 yield themselves in conformity with the Y-shaped guide channel of the slider 15 when the fastener 10 is opened or closed and can do so without damage to or separation of the light-reflective strip 15 from the coupling element row 13 as the material of the strip 15 is highly flexible. To help in such yielding behaviour of the strip 15, the latter may be somewhat sagged in between adjacent coupling elements 13 as better shown in Figure 7. This arrangement ensures prolonged service life of the strip 15.

The detailed construction of the light-reflective zone 15' is better shown in Figure 8 which represents an open-type light-reflective strip 15a and also in Figure 9 which represents a closed-type light-reflective strip 15b.

The open-type strip 15a comprises a base layer 16 of a saturated polyester resin, a reflective layer 17 of an aluminum, copper, silver or other suitable metals bonded to the upper surface of the base layer 16 by fusion, plating or coating, an adhesive layer 18 of a polyvinylbutyral laid over the reflective layer 17 and a multiplicity of glass beads 19 embedded halfway in the adhesive layer 18. The reflective layer 17 extends in a wavy configuration, as cross-sectionally observed, providing alternate ridges 17a and grooves 17b so that the lower half of each individual glass beads 19 is received and bonded in such groove 17b by the adhesive layer 18. The upper half of the bead 19 is exposed to view as it protrudes above the surface of the adhesive layer 18. The beads 19 are thus held in place without being superimposed one over another. An adhesive layer 20 preferably of a heat-sensitive type is attached to the lower surface of the base layer 16 and may if necessary be deposited with a releasing paper 21.

The closed type light-reflective strip 15b shown in Figure 9 is substantially the same in construction as the open-type 15a, except that there is provided a transparent cover layer 22 made of acryl or other suitable resins bonded to the adhesive layer 18 and adapted to envelop the exposed upper half

portions of the glass beads 19.

The manner in which the light-reflective strip 15 is bonded to the coupling element row 13 is shown in Figure 3 wherein the strip is embedded in a recess 23 and bonded in place by the application of heat and pressure as by ironing, in which instance the releasing paper 21 is of course removed.

Figure 4 shows adhesively applying the strip 15 directly to the upper leg portions 13a of the coupling elements 13. In either case, it has been found desirable to provide a reservoir 24, as shown in Figures 5 and 6, in each of the coupling elements 13 for retaining an adhesive compound 25 (Figure 6) whereby the strip 15 can be more effectively bonded to the element row 13. While the strip 15 can be bonded with an adhesive received in the recess 23, there is fear that the adhesive may drip out resulting in less adhesive strength and smeared tape.

The light-reflective strip 15 is thin enough to avoid abrasive contact with the slider 14, for which purpose its thickness should not literally exceed a clearance gap between the slider interior wall and the upper surface of the coupling elements 13.

Figure 10 shows applying the light-reflective strip 15 with an adhesive, by fusion or sewing to a meandering type of slide fastener element row which is bonded by fusion to the support tape 12 in a manner shown in Figure 11.

Figure 12 is a view similar to Figure 11 but it shows sewn stitches 26 securing the elements 13 to the tape 12 and embedded in grooves 27 in the upper surfaces of the elements 13 over which strip 15 is effectively bonded in place.

Figure 13 shows applying the strip 15 to the elements 13 by sewing the same through a woven, non-woven or knitted fabric braid 28.

Figure 14 shows applying the strip 15 by sewn stitches 26 to a continuous helical coil element structure.

Claims

1. A light-reflective slide fastener (10) which comprises a pair of support tapes (12) each carrying on their respective longitudinal inner edges a row of coupling elements (13) in the form of discrete or continuous intermeshing teeth, each of said elements (13) having a coupling head portion (13b), a leg portion (13a) and a heel portion (13c); a slider (14) adapted to bring said elements on the respective tapes (12) into and out of engagement; and a continuously longitudinally extending flexible light-reflective strip (15); characterized in that said strip (15) lies over the upper surfaces of said leg portions (13a) apart from said head por-



tions (13b).

2. A light-reflective slide fastener as defined in claim 1 wherein said light-reflective strip (15) extends longitudinally more extensively over and secured to the upper surfaces of said row of elements (13) so as to mask substantially the entire elements (13) from view when the fastener (10) is closed.
3. A light-reflective slide fastener as defined in claims 1 or 2 wherein said strip (15) is secured to said row of elements (13) by means of fusion, adhesion or sewing.
4. A light-reflective slide fastener as defined in claim 1, 2 or 3, wherein a strip (15) comprises a base layer (16), a reflective layer (17) bonded thereto by fusion, plating or coating of a metal such as aluminum, silver and copper, an adhesive layer (18) laid over said reflective layer and a multiplicity of glass beads (19) embedded halfway in said adhesive layer (18).
5. A light-reflective slide fastener as defined in claim 4 wherein said strip (15) further comprises a transparent cover layer (22) extending over and enveloping said glass beads (19).
6. A light-reflective slide fastener as defined in one of the preceding claims, wherein said strip (15) is disposed in sagged relation to the gaps in between adjacent coupling elements (13).
7. A light-reflective slide fastener as defined in one of the preceding claims, wherein said coupling element (13) is provided with a recess (23) receiving therein said strip (15).
8. A light-reflective slide fastener as defined in one of the preceding claims, wherein said coupling element (13) is provided with a reservoir (24) receiving therein an adhesive compound (25).
9. A light-reflective slide fastener as defined in claim 4 wherein said reflective layer (17) extends in a wavy configuration as cross-sectionally viewed.

Patentansprüche

1. Lichtreflektierender Reißverschluß (10), umfassend zwei Tragbänder (12), die jeweils an ihren inneren Längsrändern eine Kuppelgliederreihe (13) in Form einzelner oder fortlaufender Zähne tragen, wobei jedes Kuppelglied (13)

einen Kupplungskopf (13b), einen Schenkel (13a) und einen Verbindungsbereich (13c) aufweist; einen Schieber (14), um die Kuppelglieder an den betreffenden Tragbändern (12) in und außer Eingriff zu bringen; und einen fortlaufenden, sich in Längsrichtung erstreckenden, flexiblen, lichtreflektierenden Streifen (15); dadurch gekennzeichnet, daß der Streifen (15) auf den Oberseiten der Schenkel (13a) im Abstand von den Kupplungsköpfen (13b) aufliegt.

2. Lichtreflektierender Reißverschluß nach Anspruch 1, wobei sich der lichtreflektierende Streifen (15) in Längsrichtung weiter über die Oberseite der Kuppelgliederreihe (13) erstreckt und an dieser befestigt ist, um im wesentlichen die gesamten Kuppelglieder (13) vor einer Sicht zu verdecken, wenn der Reißverschluß (10) geschlossen ist.
3. Lichtreflektierender Reißverschluß nach Anspruch 1 oder 2, wobei der Streifen (15) durch Verschweißen, Verkleben oder Vernähen an der Kuppelgliederreihe (13) befestigt ist.
4. Lichtreflektierender Reißverschluß nach Anspruch 1, 2 oder 3, wobei ein Streifen (15) eine Trägerschicht (16), eine mit dieser durch Verschweißen, Plattieren oder Beschichten verbundene reflektierende Schicht (17) aus einem Metall, wie z.B. Aluminium, Silber und Kupfer, eine auf die reflektierende Schicht aufgebraachte Klebstoffschicht (18) und eine Vielzahl von Glasperlen (19) umfaßt, die zur Hälfte in die Klebstoffschicht (18) eingebettet sind.
5. Lichtreflektierender Reißverschluß nach Anspruch 4, wobei der Streifen (15) ferner eine durchsichtige Deckschicht (22) umfaßt, die sich über die Glasperlen (19) erstreckt und diese bedeckt.
6. Lichtreflektierender Reißverschluß nach einem der vorhergehenden Ansprüche, wobei der Streifen in den Lücken zwischen benachbarten Kuppelgliedern (13) durchhängt.
7. Lichtreflektierender Reißverschluß nach einem der vorhergehenden Ansprüche, wobei die Kuppelglieder (13) mit einer den Streifen (15) aufnehmenden Ausnehmung (23) versehen sind.
8. Lichtreflektierender Reißverschluß nach einem der vorhergehenden Ansprüche, wobei die Kuppelglieder (13) mit einer einen Klebstoff (25) aufnehmenden Vertiefung (24) versehen



sind.

9. Lichtreflektierender Reißverschluß nach Anspruch 4, wobei sich die reflektierende Schicht (17) im Querschnitt wellenförmig erstreckt.

Revendications

1. Fermeture à glissière (10) réfléchissant la lumière comprenant une paire de rubans-supports (12) supportant chacun sur leurs bords intérieurs supérieurs longitudinaux respectifs une rangée d'éléments d'accouplement (13) sous la forme de dents discrètes ou continues venant en prise mutuelle, chacun desdits éléments (13) comportant une partie tête d'accouplement (13b), une partie jambe (13a) et une partie talon (13c); un curseur (14) adapté pour accoupler et désaccoupler lesdits éléments se trouvant sur les rubans respectifs (12); et une bande flexible (15) s'étendant de façon continue dans le sens longitudinal et réfléchissant la lumière, caractérisé en ce que ladite bande (15) est disposée sur les surfaces supérieures des parties jambe (13a) à distance des parties tête (13b).

2. Fermeture à glissière réfléchissant la lumière selon la revendication 1, dans laquelle la bande (15) réfléchissant la lumière s'étend dans le sens longitudinal d'une façon plus extensive sur les surfaces supérieures de la rangée d'éléments (13) et est fixée à ses surfaces supérieures de manière à masquer substantiellement les éléments complets (13) à la vue lorsque la fermeture à glissière (10) est fermée.

3. Fermeture à glissière réfléchissant la lumière selon les revendications 1 ou 2, dans laquelle ladite bande (15) est fixée à la rangée d'éléments (13) par fusion, adhérence ou couture.

4. Fermeture à glissière réfléchissant la lumière selon la revendication 1, 2 ou 3, dans laquelle ladite bande (15) comprend une couche de base (16), une couche réfléchissante (17) liée à cette dernière par fusion, placage ou revêtement d'un métal tel que l'aluminium, l'argent ou le cuivre, une couche adhésive (18) déposée sur la couche réfléchissante et une multiplicité de perles (19) en verte noyées à mi-épaisseur dans la couche adhésive (18).

5. Fermeture à glissière réfléchissant la lumière selon la revendication 4, dans laquelle ladite bande (15) comprend, en outre, une couche de revêtement transparente (22) s'étendant sur les

billes (19) en verte et enveloppant ces billes.

6. Fermeture à glissière réfléchissant la lumière selon une des revendications précédentes, dans laquelle ladite bande (15) est disposée de façon cintrée dans les intervalles séparant les éléments d'accouplement adjacents (13).

7. Fermeture à glissière réfléchissant la lumière selon l'une des revendications précédentes, dans laquelle ledit élément d'accouplement (13) est pourvu d'un évidement (23) dans lequel est reçue la bande (15).

8. Fermeture à glissière réfléchissant la lumière selon l'une des revendications précédentes, dans laquelle ledit élément d'accouplement (13) est pourvu d'un réservoir (24) dans lequel se trouve un composé adhésif (25).

9. Fermeture à glissière réfléchissant la lumière selon la revendication 4 dans laquelle ladite couche réfléchissante (17) s'étend avec une configuration ondulée vue en section droite.