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(54) PRONG-ATTACHED GARMENT FASTENING DEVICES WITH BACKING MEMBERS



(71) We, THOMAS WALKER LIMITED, a British Company, of St. Paul's Square, Birmingham, B3 1QY, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns garment fastening devices and components thereof, said garment fastening devices being of the kind, hereinafter termed "of the kind referred to", comprising a pronged fastener component, adapted to be applied to one face of a portion of garment fabric material, and a backing member which is adapted to be applied to the opposite face of said portion of garment fabric material, the pronged fastener component having integral attachment prongs which penetrate through the thickness of the garment fabric material and are clenched on said backing member to clamp the latter to the material and thereby firmly secure and anchor the fastener component in place.

The invention is, in one aspect especially concerned with the structure of said backing members and an object of the invention is to provide for such garment fastening devices an improved simple form of effective backing member adapted to cover and conceal the clenched prongs of the pronged fastener component. The pronged fastener component may, for example, be a pronged hook component of a garment hook-and-eye fastener for the waistbands of trousers or skirts.

Various structural forms of backing member have hitherto been proposed which provide a covered internal space forming a clenching recess or recesses to receive the prongs of a pronged fastener component and which have integral interior cam surfaces to clench the prongs into said internal space. But the structural designs of many of these prior proposals have often been bulky and such that the internal space forming the

clenching recess or recesses has been relatively large. Also, the control and guidance provided for the prongs has been insufficiently reliable to avoid an unacceptably high proportion of defective clenchings of the prongs and to ensure a clenched configuration of maximum effectiveness, especially in mass production use.

It will be appreciated that provision for the pronged fastener component of a permanent secure reliable anchorage which will not become loose or unduly weaken the garment material under the stresses of working conditions is a major practicable requirement. Factors important in relation to the above requirement include the ability of the backing member, when provided with integral cam clenching surfaces, to control and influence the manner in which the prongs are clenched, even if the prongs are initially slightly misaligned or distorted; the ability of the backing member to maintain and distribute an effective clamping pressure upon the garment material, and the mechanical strength and rigidity of the backing member which is relevant to the possibility of accidental deformation or distortion before or after use.

Backing members of the general form mentioned, which include integral clenching cam surfaces and which cover and conceal the clenched prongs are particularly preferred when it is required to secure a pronged fastener component to a fully made-up garment so that the prongs are passed through a full thickness of garment material and the backing member is positioned on an exterior surface and may, in use, be exposed to view. Consequently, overall size and shape, bulk, and close fitting against the garment material, are further important characteristics of backing members of this general form which affect the commercial acceptability of the product.

Having regard to all the above factors the

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desirability has been recognised of providing improvements in the overall structural design of such backing members.

According to the present invention, a backing member of a pronged fastener component of a garment fastening device of the kind referred to comprises a sheet-metal body portion of shallow dished configuration in the form of a disc having a substantially spherical curvature extending over substantially its whole area and having folded over integral tongue elements formed by lugs which are inclined inwardly so as to extend towards the centre of said body portion within the recess formed by the concavity of the concave interior surface thereof thereby to lie in closely adjacent and confronting relationship with said concave interior surface, said lugs having prong-receiving apertures opposite to inclined prong-clenching surface portions of said concave interior surface of said body portion and being provided with groove or channel formations extending longitudinally from said apertures towards the centre of the disc body portion, said groove or channel formations in co-operation with said concave interior surface forming pockets for receiving guiding and closely confining the outer end portions of the fastener component prongs when in use for securing the fastener component to garment material.

The depth of the recess formed by the concavity of the concave interior surface adjacent the centre of the disc may be between twice and three times the thickness of the sheet-metal of the disc so that an exceptionally shallow structure is formed, and the dished configuration formed by the substantially spherical curvature which extends over substantially the whole area of the disc thereby provides a structure which has an exceptionally high mechanical strength and which is well adapted to fit flush and neatly against the surface of the garment material. Peripheral free edge surface portions of the body portion which bound and extend between the concave interior surface and the convex exterior surface are preferably adapted to confront obliquely the surface of the garment material to which the backing member is applied when in use so as to bear upon and embed into said garment material under the influence of the clamping pressure from the clenched attachment prongs of the fastener component, thereby enabling and facilitating the convex exterior surface to lie substantially flush with the surrounding adjacent surface of the garment material.

It will be appreciated that the convex exterior surface of the body portion can provide a decorative appearance and may, if desired, carry an ornamental pattern, whereby the backing member can be quite suitable and acceptable for applying to an exterior

surface of garment material, such as a garment waistband for example, in a position where it is likely to be exposed to view.

The apertures may conveniently be disposed substantially mid-way between the centre and periphery of the disc so that the backing member may cover a substantially larger area than the area of the surface of the pronged fastener component between the prongs.

In preferred embodiments, the tongue elements are provided by a pair of diametrically opposite lugs integrally connected at their root ends with the body portion at the periphery of the disc, these lugs being folded back so as to extend towards one another within the recess formed by the concavity of the disc, with surfaces of said lugs in substantially abutting engagement or contact with the concave interior surface. Also, the pockets are preferably each adapted to accommodate a single clenched attachment prong of the pronged fastener component disposed longitudinally therein, and the groove or channel formations are provided by grooves or channels having a depth substantially equal to the thickness of the sheet-metal and having opposite side walls forming lateral guide surfaces engageable with opposite side edges of the prongs during clenching so as to restrain twisting or skewing during entry of the prongs into said pockets.

Backing members in accordance with this invention can advantageously be used in conjunction with fastener components in the form of pronged hook members, especially pronged hook members of a kind comprising an elevated cantilever hook tongue integrally connected to a base portion which carries the prongs and provides a surface which lies against the surface of the garment material.

By way of example, the invention will now be more particularly described with reference to the accompanying drawings, in which:

Figure 1 is a rear elevational view of a first form of backing member, in accordance with the invention, for use with a pronged hook fastener component of a garment fastening device;

Figure 2 is a front elevational view of the backing member of Figure 1;

Figure 3 is a section on line III—III of Figure 1 showing the backing member in use for securing the pronged hook fastener component to garment material;

Figure 4 is a sectional view similar to Figure 3 but taken on line IV—IV of Figure 1;

Figure 5 is an elevational view of the hook fastener component attached to garment material by means of the backing ma-

terial by means of the backing member of Figure 1;

Figure 6 is a rear elevational view of a second form of backing member, in accordance with the invention, for use with a modified form of pronged hook fastener component;

Figure 7 is a section on line VII—VII of Figure 6; and

Figure 8 is a section on line VIII—VIII of Figure 6 showing the backing member in use for securing the modified pronged hook fastener component to garment material; and

Figure 9 is a perspective view of the modified form of hook fastener component used with the backing member of Figure 6.

Referring first to Figures 1 to 5 of the drawings, the backing member 10 illustrated therein is designed for use with a hook fastener component 11 of a garment hook-and-eye fastening device suitable for connecting the ends of a waistband of a garment such as a pair of trusers or a skirt. The hook fastener component 11 has a single pair of parallel, transversely spaced integral attachment prongs 12, 12, extending perpendicularly from opposite peripheral edges of a base portion 13 which is integrally connected by a shallow step or chanking 14 to an elevated cantilever hook tongue 15 disposed in longitudinally offset relationship.

The backing member 10 is formed of sheet-metal, for example, sheet brass, and comprises a body portion 17 formed by a disc of the sheet-metal having a dished configuration with a convex exterior surface 18 and a concave interior surface 19. The curvature of the disc forming the body portion 17 is substantially spherical over substantially the whole area, and the concavity of the concave interior surface 19 forms a recess 20. The concave interior surface 19 and the convex exterior surface 18 are bounded by peripheral free edge surface portions 22 of the body portion 17 which extend transversely between said interior and exterior surface 19 and 18 and extend at an oblique angle with respect to the chordal plane of the body portion which contains the boundary edge of said concave interior surface.

The depth of the recess 20 adjacent the centre of the disc of the body portion 17 is, as shown, between twice and three times the thickness of the sheet-metal.

The body portion 17 further has a pair of integral tongue elements 24, 24 formed by a pair of diametrically opposite lugs integrally connected at their root ends with the body portion 17 at the periphery of the disc and folded back so as to be directed towards the centre of the disc and to extend towards one another within the recess 20. Surfaces of the tongue element lugs, 24, 24, confront

and lie in substantially abutting engagement or contact with the concave interior surface 19.

Each tongue element 24 has an aperture 25 disposed substantially mid-way between the centre and periphery of the disc body portion 17, and adjacent this aperture 25 and towards the centre of the disc body portion there is provided a longitudinally extending groove or channel formation 26, formed by a groove or channel of substantially rectangular cross-section, which, in co-operation with the concave interior surface 19, provides a pocket 27 adapted to receive and closely confine the bent-over outer end portion of a prong 12 of the hook fastener component passed through the adjacent aperture 25.

In use, as indicated particularly in Figures 3 and 4, in attaching the hook fastener component 11 to a portion of garment material 28, the prongs 12, 12, are forced through the garment material 28 from one side and then passed through the registering apertures 25, 25, of the backing member 10 positioned at the opposite side. Under pressure exerted by a suitable press, the prongs forcibly engage at an oblique angle with the concave interior surface 19 opposite to the apertures 25, 25, and are deflected and bent-over towards the centre of the disc body portion so as to enter the pockets 27 formed by the groove or channel formations 26 in co-operation with the confronting portion of the concave interior surface 19.

Thereby, the backing member 10 is clamped to the garment material 28 with the peripheral edge surface portions 22 of the disc body portion 17, which obliquely confront the opposed surface of the garment material 28, bearing upon and embedding into said material under the influence of the clamping pressure from the clenched attachment prongs. Clamping pressure is also transmitted to the garment material by confronting surface portions of the tongue elements 24, 24, and the hook fastener component 11 is firmly secured or anchored in place with the attachment prongs 12, 12, fully shielded and concealed from view. Also, the convex exterior surface 18 lies substantially flush with the surrounding adjacent surface of the garment material 28, and a very effective and neat manner of fixing is achieved. As indicated in Figure 2, the convex exterior surface 18 may be provided with a decorative ornamental pattern.

It will be seen that the groove or channel formations 26 of the tongue elements 24, 24, each have a substantially rectangular cross-section and have a depth substantially equal to the thickness of the sheet-metal of the backing member. This thickness is also substantially equal to the thickness of the sheet-metal forming the pronged fastener component so that the prongs are forced to lie

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substantially flat in the pockets 27 and substantial curling of the prongs within the pockets, which leads to potential weakness in the anchorage, is prevented. Also, the opposite side walls 29, 29, of the groove or channel formations 26 form lateral guide surfaces engageable with opposite side edges of the prongs 12, 12, during clenching so as to restrain twisting or skewing during entry of the prongs into said pockets.

When the hook fastener component 11 is secured to the garment material 28, a surface provided by the base portion 13 seats upon the surface of the material within an area opposite to the tongue elements 24, 24, and lies fully within the area defined by the periphery of the backing member body portion 17. A relatively large area of the garment material is thereby involved in providing the anchorage for the hook fastener component, and, as indicated in the drawings, a segment *s* of the body portion 17 projects beyond the periphery of the base portion 13 so as to lie opposite to and in spaced relationship with the cantilever hook tongue 15 thereby to co-operate with said hook tongue in providing opposed relatively rigid jaws at opposite sides of the garment material to engage and confine the eye of a complementary staple or eye member.

The portion of garment material 28 illustrated may represent the end portion of the waistband of a pair of trousers or a skirt, for example, the side of the material to which the backing member 10 is applied being the exposed exterior surface of said waistband.

The second form of backing member illustrated in Figure 6 to 8 shows the manner in which the structure can be modified to suit a modified pronged hook component of the form shown in Figure 9. The hook component shown in Figure 9, which is indicated by reference 11a is generally similar to the first form of hook component 11 in that it has a cantilever hook tongue 15a integrally connected through a cranked step 14a to a longitudinally offset base portion 13a, but it differs in that the base portion 13a has two spaced apart pairs of side-by-side prongs 12a, 12a, in parallel relationship.

The modified form of backing member, which is indicated by reference 10a, again comprises a sheet-metal disc, constituting a body portion 17a, of shallow dished configuration, spherically curved over substantially its whole area. Again, the disc body portion 17a has a convex exterior surface 18a, a concave interior surface 19a defining by its concavity a recess 20a, and free peripheral edge surface 22a. And, again, a pair of tongued elements, 24a, 24a, provided by a pair of lugs integrally joined to the disc

body portion 17a at the periphery which are folded back to extend towards one another, lie within the recess 20a in closely adjacent substantially abutting confronting relationship with said concave interior surface 19a. Apertures 25a, located approximately mid-way between the periphery and the centre of the disc body portion, are formed in the tongue elements 24a, 24a, adjacent groove or channel formations 26a extending longitudinally towards the centre. In this modified form, the apertures 25a are each wide enough to receive a side-by-side pair of the prongs 12a and each groove or channel formation 26a comprises two separate side-by-side grooves or channels, of substantially rectangular cross-section, which in co-operation with the opposed concave interior surface 19a provide two side-by-side pockets 27a, 27a, for the individual prongs 12a of each side-by-side pair which are restrained from twisting or skewing during entry into the pockets by opposite side walls 29a, 29a, of the grooves or channels which form lateral guide surfaces.

Otherwise, the structure and manner of use of the backing member 10a in securing the pronged hook component 11a to garment material 28a is substantially the same as with the first embodiment.

WHAT WE CLAIM IS:—

1. A backing member for a pronged fastener component of a garment fastening device of the kind referred to, said backing member comprising a sheet-metal body portion of shallow dished configuration in the form of a disc having a substantially spherical curvature extending over substantially its whole area and having folded over integral tongue elements formed by lugs which are inclined inwardly so as to extend towards the centre of said body portion within the recess formed by the concavity of the concave interior surface thereof thereby to lie in closely adjacent and confronting relationship with said concave interior surface, said lugs having prong-receiving apertures opposite to inclined prong-clenching surface portions of said concave interior surface of said body portion and being provided with groove or channel formations extending longitudinally from said apertures towards the centre of the disc body portion, said groove or channel formations in co-operation with said concave interior surface forming pockets for receiving, guiding, and closely confining the outer end portions of the fastener component prongs when in use for securing the fastener component to garment material.

2. A backing member as claimed in Claim 1, wherein the peripheral free edge surface portions of the body portion extend

substantially flat in the pockets 27 and substantial curling of the prongs within the pockets, which leads to potential weakness in the anchorage, is prevented. Also, the opposite side walls 29, 29, of the groove or channel formations 26 form lateral guide surfaces engageable with opposite side edges of the prongs 12, 12, during clenching so as to restrain twisting or skewing during entry of the prongs into said pockets.

When the hook fastener component 11 is secured to the garment material 28, a surface provided by the base portion 13 seats upon the surface of the material within an area opposite to the tongue elements 24, 24, and lies fully within the area defined by the periphery of the backing member body portion 17. A relatively large area of the garment material is thereby involved in providing the anchorage for the hook fastener component, and, as indicated in the drawings, a segment *s* of the body portion 17 projects beyond the periphery of the base portion 13 so as to lie opposite to and in spaced relationship with the cantilever hook tongue 15 thereby to co-operate with said hook tongue in providing opposed relatively rigid jaws at opposite sides of the garment material to engage and confine the eye of a complementary staple or eye member.

The portion of garment material 28 illustrated may represent the end portion of the waistband of a pair of trousers or a skirt, for example, the side of the material to which the backing member 10 is applied being the exposed exterior surface of said waistband.

The second form of backing member illustrated in Figure 6 to 8 shows the manner in which the structure can be modified to suit a modified pronged hook component of the form shown in Figure 9. The hook component shown in Figure 9, which is indicated by reference 11a is generally similar to the first form of hook component 11 in that it has a cantilever hook tongue 15a integrally connected through a cranked step 14a to a longitudinally offset base portion 13a, but it differs in that the base portion 13a has two spaced apart pairs of side-by-side prongs 12a, 12a, in parallel relationship.

The modified form of backing member, which is indicated by reference 10a, again comprises a sheet-metal disc, constituting a body portion 17a, of shallow dished configuration, spherically curved over substantially its whole area. Again, the disc body portion 17a has a convex exterior surface 18a, a concave interior surface 19a defining by its concavity a recess 20a, and free peripheral edge surface 22a. And, again, a pair of tongued elements, 24a, 24a, provided by a pair of lugs integrally joined to the disc

body portion 17a at the periphery which are folded back to extend towards one another, lie within the recess 20a in closely adjacent substantially abutting confronting relationship with said concave interior surface 19a. Apertures 25a, located approximately mid-way between the periphery and the centre of the disc body portion, are formed in the tongue elements 24a, 24a, adjacent groove or channel formations 26a extending longitudinally towards the centre. In this modified form, the apertures 25a are each wide enough to receive a side-by-side pair of the prongs 12a and each groove or channel formation 26a comprises two separate side-by-side grooves or channels, of substantially rectangular cross-section, which in co-operation with the opposed concave interior surface 19a provide two side-by-side pockets 27a, 27a, for the individual prongs 12a of each side-by-side pair which are restrained from twisting or skewing during entry into the pockets by opposite side walls 29a, 29a, of the grooves or channels which form lateral guide surfaces.

Otherwise, the structure and manner of use of the backing member 10a in securing the pronged hook component 11a to garment material 28a is substantially the same as with the first embodiment.

WHAT WE CLAIM IS:—

1. A backing member for a pronged fastener component of a garment fastening device of the kind referred to, said backing member comprising a sheet-metal body portion of shallow dished configuration in the form of a disc having a substantially spherical curvature extending over substantially its whole area and having folded over integral tongue elements formed by lugs which are inclined inwardly so as to extend towards the centre of said body portion within the recess formed by the concavity of the concave interior surface thereof thereby to lie in closely adjacent and confronting relationship with said concave interior surface, said lugs having prong-receiving apertures opposite to inclined prong-clenching surface portions of said concave interior surface of said body portion and being provided with groove or channel formations extending longitudinally from said apertures towards the centre of the disc body portion, said groove or channel formations in co-operation with said concave interior surface forming pockets for receiving, guiding, and closely confining the outer end portions of the fastener component prongs when in use for securing the fastener component to garment material.

2. A backing member as claimed in Claim 1, wherein the peripheral free edge surface portions of the body portion extend



transversely between the concave interior surface and the convex exterior surface of the body portion, and extend at an oblique angle with respect to the chordal plane of the body portion which contains the boundary edeg of said concave interior surface, thereby to facilitate, when in use for securing the fastener component to garment material, embedding of said free edge surface portions into said garment material.

3. A backing member as claimed in any of the preceding Claims, wherein the depth of the recess formed by the concavity of the concave interior surface adjacent the centre of the body portion is between twice and three times the thickness of the sheet-metal of said body portion.

4. A backing member as claimed in any of the preceding Claims, wherein said apertures are disposed substantially midway between the centre and the periphery of the body portion.

5. A backing member as claimed in any of the preceding Claims, wherein the lugs forming the tongue elements are integrally connected at their root ends with the periphery of said body portion, said lugs being folded back so as to extend towards one another within said recess.

6. A backing member as claimed in any of the preceding claims, wherein the groove or channel formation of each tongue element comprises a single longitudinal groove or channel, said backing member thereby being adapted for use with a fastener component having a single pair of parallel, spaced-apart prongs.

7. A backing member as claimed in any of Claims 1 to 5, wherein the groove or channel formation of each tongue element comprises a pair of side-by-side longitudinal grooves or channels, said backing member thereby being adapted for use with a fastener component having two spaced-apart pairs of side-by-side prongs in parallel relationship.

8. A backing member as claimed in any of the preceding Claims, wherein the groove or channel formations are provided by grooves or channels having a depth substantially equal to the thickness of the sheet-metal, opposite side walls of said grooves or channels forming lateral guide surfaces engageable with opposite side edges of the prongs during clenching so as to restrain twisting or skewing during entry of the prongs into said pockets.

9. A backing member as claimed in Claim 8, wherein the grooves or channels

each have a substantially rectangular cross-section.

10. A backing member for a pronged fastener component of a garment fastening device, said backing member having a structure substantially as herein illustrated and described with reference to Figures 1 to 5 or Figures 6 to 8 of the accompanying drawings.

11. A garment fastening device comprising a pronged fastener component in combination with a backing member as claimed in any of the preceding Claims.

12. A garment fastening device as claimed in Claim 11, wherein the pronged fastener component is composed of sheet-metal having a thickness substantially equal to that of the sheet-metal forming the backing member.

13. A garment fastening device as claimed in Claim 11 or 12, wherein the pronged fastener component is a hook member comprising a cantilever hook tongue integrally connected in non-coplanar relationship to a base portion which carries the integral attachment prongs and provides a surface which seats, in use, upon the surface of the garment material within an area opposite to the tongue elements of the backing member applied to the opposite surface of the garment material with a segment of the body portion of said backing member projecting beyond the periphery of said base portion of the hook member so as to lie opposite to and in spaced relationship with the cantilever hook tongue thereby to co-operate with said hook tongue in providing opposed jaws to engage and confine the eye of a complementary staple or eye member.

14. A garment fastening device as claimed in Claim 13, wherein the attachment prongs of the hook member are spaced transversely with respect to the longitudinal axis of the hook tongue and extend perpendicularly from opposite peripheral edges of the base portion so as to fold, during clenching, about axes parallel to said longitudinal axis.

15. A garment having a waistband fitted with a garment fastening device according to any of Claims 11 to 14, wherein the backing member is applied to an exposed exterior surface of said waistband.

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