Jan. 14, 1936. W. C. BROADWELL 2,027,513

BUTTON ELEMENT

Filed June 8, 1935

Fig. 1.

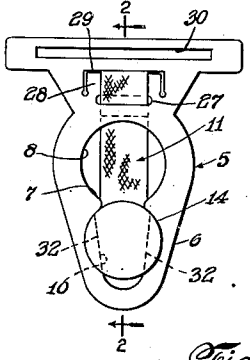


Fig. 2.

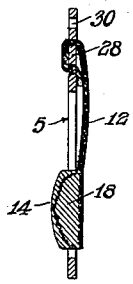


Fig. 5.

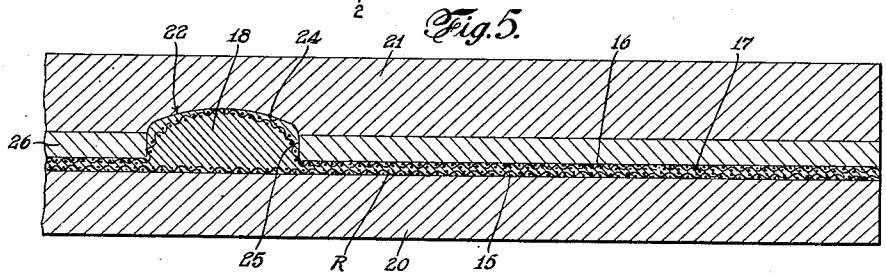


Fig. 6.

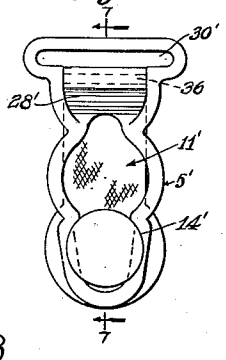


Fig. 7.

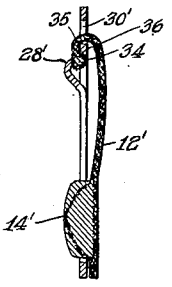


Fig. 3.

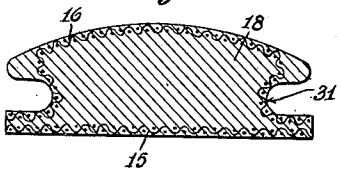


Fig. 8.

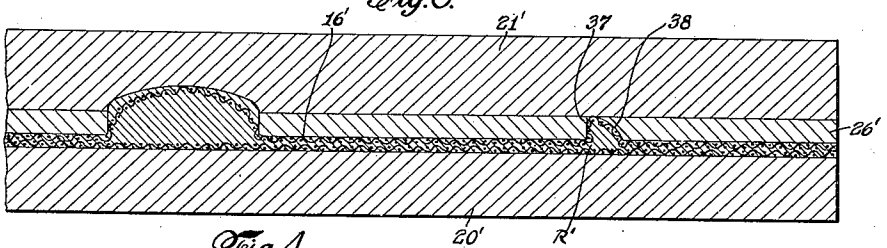
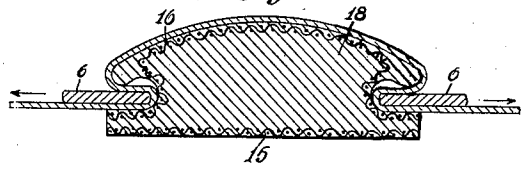


Fig. 4.



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BUTTON ELEMENT

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Application June 8, 1935, Serial No. 25,593
In Canada October 26, 1934

16 Claims. (Cl. 24—245)

This invention relates to button elements of the type shown and described in my copending application Serial No. 698,139, now Patent No. 2,006,535, dated July 2, 1935, with respect to which the present application is a continuation in part.

An important object of this invention is to provide a generally improved button element which is simple in construction, reliable in use, inexpensive to manufacture, and adapted to so function in conjunction with a companion loop member of the type shown and described in said copending application as to effect a pronounced impinging action on a garment at points where it is confined between the overlying flange-like margins of the button head and the underlying portions of the loop member.

Other objects and advantages of the invention will become apparent from the following description, taken in connection with the accompanying drawing, in which—

Fig. 1 is a face view showing one form of button element associated with a companion loop member; Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1; Fig. 3 is an enlarged transverse sectional view of the button element and its associated retaining strap; Fig. 4 is a view similar to that of Fig. 3 and illustrating the manner in which the flange-like margins of the button head are deflected into impinging engagement with a garment under tension; Fig. 5 is a view showing in section a mold by which the button element of Figs. 1 to 4 may be formed; Fig. 6 is a face view showing a modified form of button element in association with another form of loop member; Fig. 7 is a transverse sectional view taken on line 7—7 of Fig. 6, and Fig. 8 is a view showing in section a mold by which the button element of Figs. 6 and 7 may be formed.

In Figs. 1 and 2, one form of the present invention is illustrated in association with a loop member 5, of suitable material such as sheet metal, the leg portions 6 of which present a pair of inwardly projecting lugs 7 at opposite sides of the loop opening 8 and at points substantially midway of the length of that opening and further present immediately adjacent the lugs 7 a pair of downwardly and inwardly inclined button-engaging walls 10.

The form of button element 11, which embodies the present invention and which is shown in Figs. 1 to 5, includes a retaining strap 12 and a button 14, the strap being adapted for connection to the loop member 5 by means hereinafter more particularly described.

As to the button element 11, it will be noted that the retaining strap 12 thereof comprises a suitable fabric 15, such as a non-stretchable "sheeting", in association with a suitable fabric 16, such as a stretchable "stockinet" material, the two fabrics being permanently united to each other throughout the length of the strap by an interposed layer of rubber 17. It will be also noted that the button 14 includes a mass of rubber 18, which is in physical union with the layer of rubber 17 and which is disposed intermediate a portion of the non-stretchable fabric 15 and that portion of the stretchable fabric 16 which is so distorted in the button-element-forming operation, hereinafter more particularly described, that it conforms generally, as shown most clearly in Figs. 3, 4 and 5, to the contour of the button within which it is embedded.

The button elements 11 may be produced in quantities by the aid of a suitable mold, which includes a pair of mold members 20 and 21, the latter of which is provided with a plurality of mold cavities 22, only one of which is herein shown but each of which has a configuration conforming to the desired surface contour of the button 14 of the finished button element. Each of the mold cavities 22 is formed by reason of the fact that the mold member 21 is so recessed as to provide therein a pocket 24, which registers with an opening 25, provided in a face plate 26, secured to the lower face of the mold member 21.

In carrying on the method employed in producing the button element 11, a strip or sheet of non-stretchable fabric 15 is placed on the upper face of the mold member 20, while the mold members 20 and 21 are separated, whereupon a quantity of rubber compound R is applied to that fabric. After applying the rubber compound, a strip or sheet of stretchable fabric 16 is placed on top of the rubber compound, whereupon the mold member 21 is moved downwardly, by suitable means, into engagement with the uppermost fabric, with the result that, as the mold member 21 assumes its position shown in Fig. 5, the rubber compound is forced upwardly into the mold cavity 22, carrying with it a portion of the stretchable fabric 16, thus forming the buttons 14, each of which is characterized by the fact that the displaced portion of the fabric 16 assumes such a position, as shown in Figs. 3, 4 and 5, that it serves as a reinforcing element for the button. As the mold member 21 assumes its position shown in Fig. 5, the rubber compound is not only displaced in the manner described but it is also caused to enter and fill the spaces between the threads of the fabrics so that the fabrics and

the rubber compound are firmly united into a unitary structure to be subjected to vulcanization within the mold.

Upon completing the molding operation just described, the button elements 11 may be blanked or otherwise removed from the unitary structure, each button element being reinforced with respect to its included strap 12 as well as with respect to its included button 14 by reason of the presence of the fabrics 15 and 16.

In order that the button element 11 and loop member 5 may be easily combined and thereafter held in an assembled relation, the latter is formed with an aperture 27 and is provided with a struck-up anchor-tongue 28, between the end of which and the adjacent portion of the loop member is afforded a slot 29 which is contiguous to the usual support-receiving opening 30 and the width of which, when the tongue is moved into the plane of the loop member, is slightly less than the normal thickness of the retaining strap 12 of the button element. By utilizing the tongue 28, the button element 11 may be effectively anchored to the loop member 5 and in doing so the retaining strap 12 is passed through the slot 29 from the rear of the loop member, thence downwardly over the tongue 28 and into the aperture 27, whereupon the tongue 28 is moved into the plane of the loop member where it exerts an impinging action on the retaining strap whereby the button element and loop member are permanently held in an assembled relation.

A pronounced peculiarity of the button element 11, herein disclosed, resides in the fact that as the garment is subjected to tension incident to the downward pull exerted thereon when worn, the relatively soft flange-like margins of the button head are deflected or urged into impinging engagement with the garment, at the points where it is confined between such margins and the underlying leg portions 6 of the loop member 5, and exert on the garment a holding effect which increases in intensity as the downward pull on the garment is increased. Deflection of the flange-like margins of the button head in the manner described may be readily accounted for when it is taken into account that such gripping action as is exerted on the garment, by reason of its being impinged between the shank portion 31 of the button and button-engaging walls 10 of the loop member, is insufficient to so hold the garment as to prevent the transmission of tension through it to the garment material overlying the button head, it being understood that any tension so transmitted to said overlying material will, of necessity, react on the relatively thin and yieldable margins of the button to urge them into intimate and effective restraining engagement with the garment at points directly therebeneath as illustrated most clearly in Fig. 4.

In order that a relatively large area of the button element 11 may be utilized to grip the garment between the shank portion 31 of the button 14 and the button-engaging walls 10 of the loop member 5, such shank portion is shaped, as shown by the dotted lines 32 in Fig. 1, to conform to the inclination of the button-engaging walls, when the button is positioned as shown in that figure, with considerable space remaining between itself and the lower end of the inner wall of the loop opening 8. Despite the fact that the distance between the lugs 7 is slightly less than the transverse width of the shank portion 31 of the button 14, which is required to pass intermediate such lugs when attaching a garment to the loop member 5, these lugs do not unduly restrain such passage of the button shank therebetween but yet serve to guard against undue displacement of the button in a reverse direction, as when tension is applied to the garment transversely of the retaining strap 12 and in a path across its associated button 14.

Referring to the form of invention shown in Figs. 6 to 8, it will be noted that the button element 11' differs from the button element 11 hereinbefore described in that its retaining strap 12' in the immediate vicinity of its associated button 14' is somewhat wider than and extends laterally beyond the same, as shown most clearly in Fig. 6, and in that the retaining strap is formed at its outer end with a transversely disposed retaining rib or bead 34 which presents a retaining shoulder 35 extending longitudinally thereof and transversely of the strap.

As to the form of loop member 5' shown in Figs. 6 and 7, it will be noted that it differs from from the loop member 5, hereinbefore described, in that its retaining tongue 28' is curved so as to, in effect, shorten it sufficiently to allow between itself and the adjacent portion of the loop member, from which it is sheared in the die-forming operation, ample space to accommodate the ribbed or beaded end of the retaining strap 12'. By utilizing the retaining tongue 28', the button element 11' may be effectively anchored to the loop member 5', and in doing so the retaining strap 12' is passed from the rear of the loop member through the usual support-receiving opening 30', intermediate which and the retaining tongue 28' is formed a rib-engaging gusset 36, and is thereafter so introduced into the space or slot afforded between the tongue 28' and the gusset 36 as to enable the retaining shoulder 35 to engage the gusset as shown in Fig. 7, whereupon the tongue 28' is moved into engagement with the strap 12' in the vicinity of the retaining rib 34 where it exerts an impinging action on the strap, whereby the loop member 5' and the button element 11' are permanently held in an assembled relation.

The button elements 11' may be produced in quantities by the aid of a suitable mold, which includes a pair of mold members 20' and 21', the former of which is identical with the mold member 20, hereinbefore described, and the latter of which is identical with the mold member 21, also hereinbefore described, except that it is provided with a plurality of auxiliary mold cavities 37, only one of which is herein shown but each of which has a configuration conforming to the desired surface contour of the retaining rib or bead 34 of the finished button elements. Each of the mold cavities 37 is formed by reason of the fact that the face plate 26', with which the mold member 21' is provided, is so recessed as to afford therein a pocket 38 into which a portion of the rubber compound R', employed in the molding operation, is forced, carrying with it a portion of the stretchable fabric 16'.

In carrying on the method employed in producing the button elements 11', the procedure is identical with that described in connection with the production of the button elements 11, it being observed, however, that according to the latter method the retaining ribs or beads 34 are formed incident to the molding operation and that each of such beads or ribs is characterized by the fact that the displaced bead-forming portion of the fabric 16' assumes such a position, as shown most clearly in Fig. 8, that it serves as a reinforce-

ment for the bead generally and for its retaining shoulder **35** in particular, thus enabling the bead to effectively function, in association with the retaining tongue **28'** and the rib-engaging gusset **36** as means for retaining the button element **11'** against undue displacement when attached to the loop member **5'** as shown in Figs. 6 and 7.

It will be understood that various changes other than those herein described may be resorted to without departing from the spirit of the invention or the scope of the following claims.

What is claimed is:

1. A button element for use with a companion loop member comprising a non-stretchable fabric serving as a retaining strap, a button of relatively soft rubber having a bonded union with said strap and including a shank portion and having a head presenting relatively thin flange-like margins extending laterally beyond said shank and adapted to be flexed toward the leg portions of said loop member and into impinging engagement with a garment at points underlying such margins and overlying such leg portions as when the loop member and button element are cooperatively attached to a garment and such garment is subjected to tension in the vicinity contiguous to the underlying head of said button.

2. A button element for use with a companion loop member comprising a strip of non-stretchable fabric, a strip of stretchable fabric disposed in a contiguous relation to the first-mentioned fabric, and a mass of relatively soft rubber disposed intermediate said fabrics and in bonded union therewith, said rubber being shaped to present a button at one end of said non-stretchable fabric and the corresponding end of said stretchable fabric being embedded in said button and conforming generally to the contour thereof.

3. A button element for use with a companion loop member comprising a strip of non-stretchable fabric, a strip of stretchable fabric disposed in a contiguous relation to the first-mentioned fabric, and a mass of relatively soft rubber disposed intermediate said fabrics and in bonded union therewith, said rubber being shaped to present a button at one end of said non-stretchable fabric and the corresponding end of said stretchable fabric being embedded in said button and conforming generally to the contour thereof, said button including a shank portion and having a head presenting relatively thin flange-like margins extending laterally beyond said shank and adapted to be flexed toward the leg portions of said loop member and into impinging engagement with a garment at points underlying such margins and overlying such leg portions as when the loop member and button element are cooperatively attached to a garment and such garment is subjected to tension in the vicinity contiguous to the underlying head of said button.

4. A button element for use with a companion loop member comprising a non-stretchable fabric serving as a retaining strap, a retaining bead carried at one end of said strap and including a mass of rubber in bonded union with said fabric, a button carried at the other end of said strap and including a mass of rubber shaped to a definite contour and in bonded union with said fabric, a stretchable fabric disposed in a contiguous relation to said non-stretchable fabric intermediate said retaining bead and said button and embedded at its opposite ends in and there conforming generally to said retaining bead and said button, and a layer of rubber disposed intermediate said non-stretchable fabric and said stretchable fabric intermediate said retaining bead and said button and there in bonded union with said fabrics.

5. A button element for use with a companion loop member comprising a non-stretchable fabric serving as a retaining strap, a retaining bead carried at one end of said strap and including a mass of rubber in bonded union with said fabric, a button carried at the other end of said strap and including a mass of rubber shaped to a definite contour and in bonded union with said fabric, a stretchable fabric disposed in a contiguous relation to said non-stretchable fabric intermediate said retaining bead and said button and embedded at its opposite ends in and there conforming generally to said retaining bead and said button, and a layer of rubber disposed intermediate said non-stretchable fabric and said stretchable fabric intermediate said retaining bead and said button and there in bonded union with said fabrics, said layer of rubber being integral with the rubber of said retaining rib and of said button.

6. A button element comprising a non-stretchable fabric, a button including a mass of rubber shaped to a definite contour and in bonded union with said fabric, a stretchable fabric embedded in said button and conforming generally to the contour thereof and in bonded union with said non-stretchable fabric adjacent the base of said button and forming in conjunction with said non-stretchable fabric an envelope within which is confined the button core comprising a portion of the button forming rubber.

7. A button element comprising a strip of non-stretchable fabric, a button including a mass of rubber shaped to a definite contour and in bonded union with said fabric, a strip of stretchable fabric, a tab-forming portion of which overlies and is in bonded union with a corresponding portion of said non-stretchable fabric and another portion of which is embedded in said button and conforms generally to the contour thereof and is in bonded union with said non-stretchable fabric adjacent the base of said button and forms in conjunction with said non-stretchable fabric an envelope within which is confined the button core comprising a portion of the button-forming rubber.

8. A button element comprising a strip of non-stretchable fabric, a button including a mass of rubber shaped to a definite contour and in bonded union with said fabric, a strip of stretchable fabric, a tab-forming portion of which overlies and is in bonded union with a corresponding portion of said non-stretchable fabric and another portion of which is embedded in said button and conforms generally to the contour thereof and is in bonded union with said non-stretchable fabric adjacent the base of said button and forms in conjunction with said non-stretchable fabric an envelope within which is confined the button core comprising a portion of the button-forming rubber, a retaining rib including a mass of rubber shaped to a definite contour and in bonded union with the tab-forming portions of said fabrics and within which is embedded a rib-reinforcing portion of said stretchable fabric, said rib-reinforcing portion conforming generally to the contour of said rib and between which and said non-stretchable fabric is confined the rib core comprising a portion of the rib-forming rubber.

9. A button element for use with a companion loop member comprising a retaining strap, a button of relatively soft rubber having a union

with said strap and including a shank portion and having a head presenting relatively thin flange-like margins extending laterally beyond said shank and adapted to be flexed toward the leg portions of said loop member and into impinging engagement with a garment at points underlying such margins and overlying such leg portions as when the loop member and button element are cooperatively attached to a garment and such garment is subjected to tension in the vicinity contiguous to the underlying head of said button.

10. A button element for use with a companion loop member comprising a retaining strap, a strip of stretchable fabric disposed in a contiguous relation to said strap, and a mass of relatively soft rubber disposed intermediate said strap and said fabric and in union therewith, said rubber being shaped to present a button at one end of said strap and the corresponding end of said stretchable fabric being embedded in said button and conforming generally to the contour thereof.

11. A button element for use with a companion loop member comprising a retaining strap, a strip of stretchable fabric disposed in a contiguous relation to said strap, and a mass of relatively soft rubber disposed intermediate said strap and said fabric and in union therewith, said rubber being shaped to present a button at one end of said strap and the corresponding end of said stretchable fabric being embedded in said button and conforming generally to the contour thereof, said button including a shank portion and having a head presenting relatively thin flange-like margins extending laterally beyond said shank and adapted to be flexed toward the leg portions of said loop member and into impinging engagement with a garment at points underlying such margins and overlying such leg portions as when the loop member and button element are cooperatively attached to a garment and such garment is subjected to tension in the vicinity contiguous to the underlying head of said button.

12. A button element for use with a companion loop member comprising a retaining strap, a retaining bead carried at one end of said strap and including a mass of rubber in union with said strap, a button carried at the other end of said strap and including a mass of rubber shaped to a definite contour and in union with said strap, a stretchable fabric disposed in a contiguous relation to said strap intermediate said retaining bead and said button and embedded at opposite ends in and there conforming generally to said bead and said button, and a layer of rubber disposed intermediate said strap and said stretchable fabric intermediate said retaining bead and said button and there in union with said strap and said stretchable fabric.

13. A button element for use with a companion loop member comprising a retaining strap, a retaining bead carried at one end of said strap and including a mass of rubber in union with said strap, a button carried at the other end of said strap and including a mass of rubber shaped to a definite contour and in union with said strap, a stretchable fabric disposed in a contiguous relation to said strap intermediate said retaining bead and said button and embedded at opposite ends in and there conforming generally to said retaining bead and said button, and a layer of rubber disposed intermediate said strap and said stretchable fabric intermediate said retaining bead and said button and there in union with said strap and said stretchable fabric, said layer of rubber being integral with the rubber of said retaining rib and of said button.

14. A button element comprising a retaining strap, a button including a mass of rubber shaped to a definite contour and in union with said strap, a stretchable fabric embedded in said button and conforming generally to the contour thereof and in union with said strap adjacent the base of said button and forming in conjunction with said strap an envelope within which is confined the button core comprising a portion of the button-forming rubber.

15. A button element comprising a retaining strap, a button including a mass of rubber shaped to a definite contour and in union with said strap, a strip of stretchable fabric, a tab-forming portion of which overlies and is in union with a corresponding portion of said strap and another portion of which is embedded in said button and conforms generally to the contour thereof and is in union with said strap adjacent the base of said button and forms in conjunction with said strap an envelope within which is confined the button core comprising a portion of the button-forming rubber.

16. A button element comprising a retaining strap, a button including a mass of rubber shaped to a definite contour and in union with said strap, a strip of stretchable fabric, a tab-forming portion of which overlies and is in union with a corresponding portion of said strap and another portion of which is embedded in said button and conforms generally to the contour thereof and is in union with said strap adjacent the base of said button and forms in conjunction with said strap an envelope within which is confined the button core comprising a portion of the button-forming rubber, a retaining rib including a mass of rubber shaped to a definite contour and in union with the tab-forming portion of said strap and said stretchable fabric and within which is embedded a rib-reinforcing portion of said stretchable fabric, said rib-reinforcing portion conforming generally to the contour of said rib and between which and said strap is confined the rib core comprising a portion of the rib-forming mass.

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