Jan. 19, 1971 R. B. HOWELL 3,555,627

INSTALLATION OF SEAM TYPE ZIPPERS

Filed Oct. 17, 1968 2 Sheets-Sheet 1

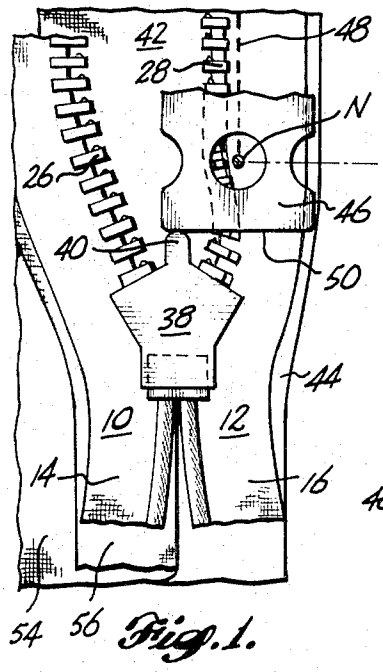


Fig. 1.

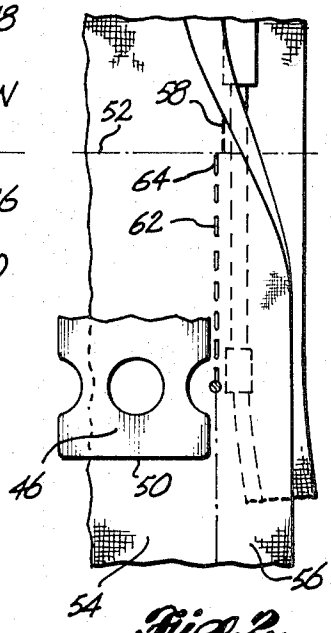


Fig. 2.

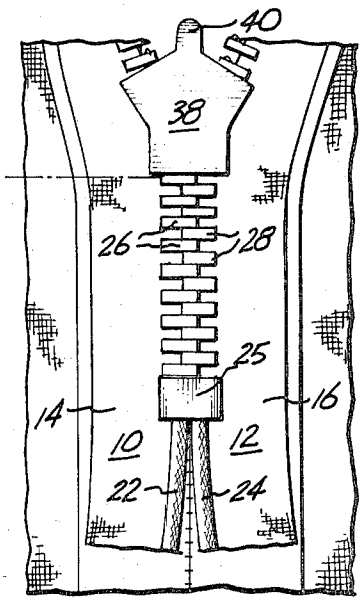


Fig. 3.

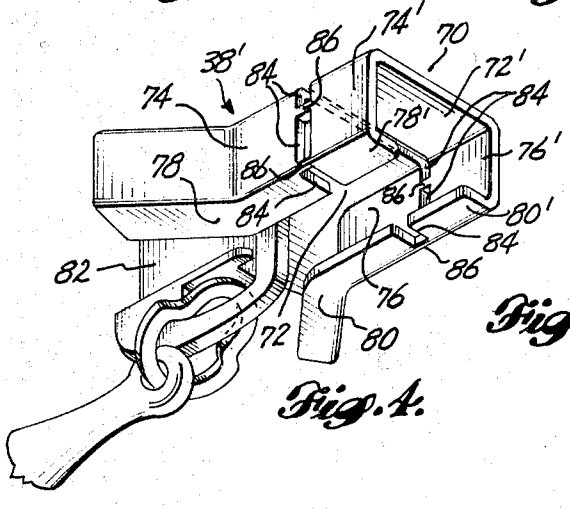


Fig. 4.

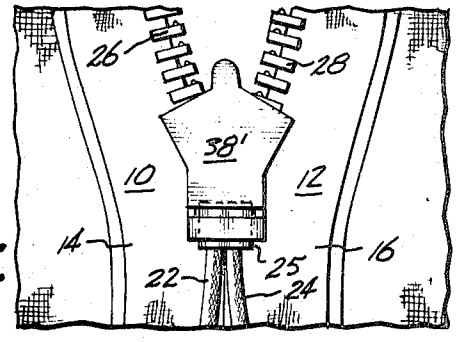


Fig. 5.

Fig. 8.

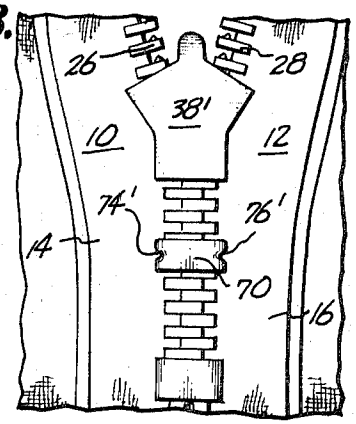
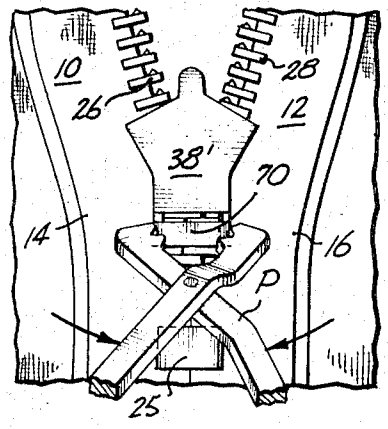


Fig. 6.



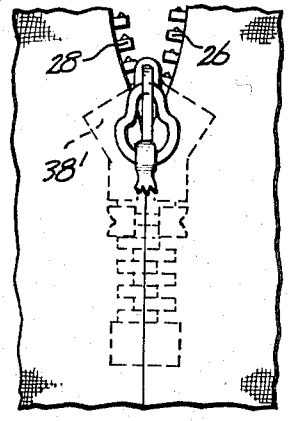


Fig. 7.

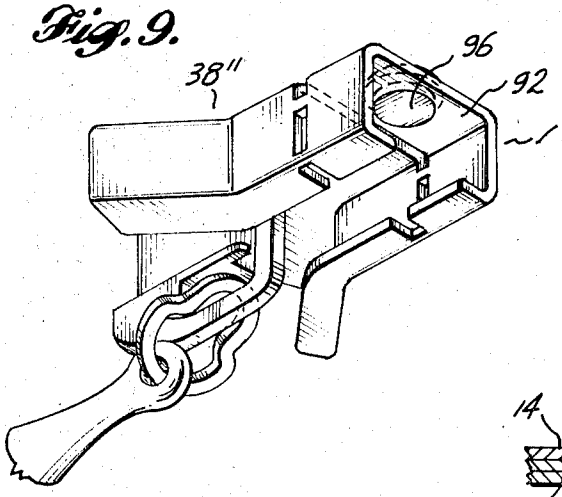
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INSTALLATION OF SEAM TYPE ZIPPERS

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Fig. 9.



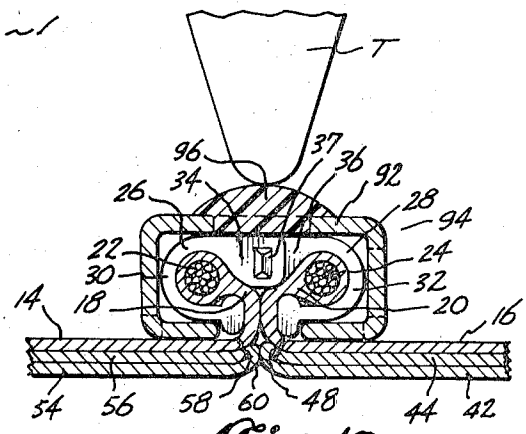


Fig. 10.

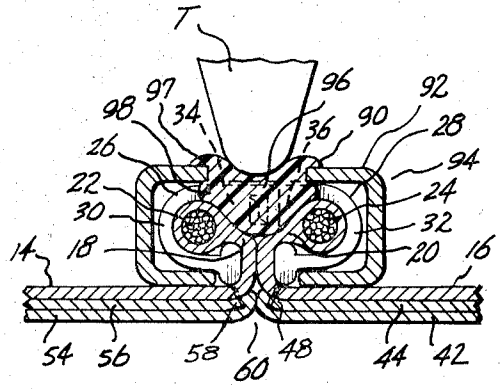
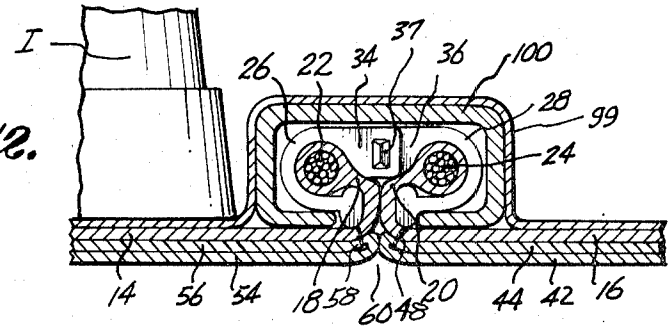


Fig. 11.

Fig. 12.



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3,555,627

INSTALLATION OF SEAM TYPE ZIPPERS

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Filed Oct. 17, 1968, Ser. No. 768,466
Int. Cl. A44b 19/26, 19/32, 19/36
U.S. Cl. 24—205.1 6 Claims

ABSTRACT OF THE DISCLOSURE

An extension of lipped channel form extends endwise of the straight channel end portion of the slider of a seam type zipper and is attached to the slider proper by means of a plurality of splice strips separated from each other by serrations. A pliers-like tool is used to both sever the extension from the slider and to crimp it onto certain of the fastener elements, to thereafter serve as a stop member for the slider.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates to a technique of installing an invisible or seam-type zipper, and to improvements in zippers of this type related to such installation method.

Description of the prior art

My U.S. Pat. No. 3,349,736 relates to a type of zipper foot usable for sewing invisible or seam type zippers into garments or other fabric objects. As a step preparatory to installation of the zipper the slider is moved to a completely open position so that the two chains of fastener elements are separated. The zipper foot is used to first sew one tape of the zipper to one of two fabric panels to be joined, and then to sew the opposite tape of the zipper to the second panel. The zipper foot includes guide avenues through which the chains of fastener elements travel. The guide avenues are shaped to properly orient the fastener elements and to in other respects properly guide the zipper tapes past the sewing machine needle. The sewing machine is used to sew the two tape assemblies of the zipper in place until the closed end of the zipper approaches the needle and the slider of the zipper makes contact with the zipper foot. In the region below where slider interference with the zipper foot prevents further machine sewing through the sewing tapes of the zipper it is necessary to bypass the zipper and directly seam sew together two fabric parts which the zipper connects together in the region thereof adjacent the loose lower portion of the zipper. The lower loose tail portion of the zipper which extends below the end points of the stitching through the sewing tapes is not used.

It is conventional to rely on the beginning stitches of the finishing seam in the fabric to define the new fully opened position of the zipper. A disadvantage of this practice is that most users open a zipper by rapidly moving its slider in the zipper opening direction as far as it will go. The slider makes an abrupt stop at the end of its run and exerts a significant force on the beginning stitches of the finishing seam. Throughout a period a repetitious opening of the zipper in this fashion there is a repeated hammering on the stitches by the slider which tends to either part the thread, the cloth, or both, or to force the thread out from its engagement with the cloth.

SUMMARY OF THE INVENTION

According to the present invention the slider of the seam type zipper is equipped with an extension that is severable from the slider proper and is securable (by crimping or other methods) to the closed fastener elements in the region where the stitching through the zipper tapes stops and the finishing seam stitching through the fabric panels begin. It thereafter serves as a slider stop.

In the preferred embodiment, the slider extension is manufactured to initially be an integral part of the slider. It is an extension of the straight-channel end portion of the slider which is separated from the normal end position of the slider by a girth pattern of serrations, and is initially connected to the slider by relatively thin and narrow splice sections of material remaining between the serrations. The extension is crimped onto the fastener element by a pliers-like tool. The crimping action serves to break the splice members and in that maner sever the extension from the slider.

These and other features of the invention are exemplified by the embodiments described below with reference to the drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a fragmentary top plan view taken in the needle region of a sewing machine, showing one side tape of a zipper being sewn to one side part of a fabric object, and showing the slider of the zipper in a fully open position and its separator end in contact with the toe end of a zipper foot, preventing further relative movement of the two parts being sewn together relative to the needle;

FIG. 2 is a top plan view showing a manner of completing the seam in the region below the bottom stitches through the zipper tapes;

FIG. 3 is a view taken toward the rear side of the installed zipper and showing the slider in a new fully open position established by the beginning stitches of the completion seam;

FIG. 4 is an isometric view of a slider typifying one aspect of the invention, said view looking toward the front, one side and the straight channel end of the slider, and taken from an aspect below the slider;

FIG. 5 is a view similar to the lower portion of FIG. 1, showing the slider of FIG. 4 in use and in a fully open position;

FIG. 6 is a view similar to FIG. 3, showing the slider of FIGS. 4 and 5 in a new fully open position established by the starting stitches of the completion seam in the fabric below where slider contact with the zipper foot prevented further sewing through the zipper tapes, and showing a pliers-like tool being used to simultaneously sever the extension from the slider and crimp such extension onto the closed zipper teeth, to thereafter serve as an end stop to transmit the bottoming slider forces to the zipper;

FIG. 7 is a front view of the fabric object and the installed zipper, showing the slider and the other hidden zipper elements below it by broken or hidden lines;

FIG. 8 is a rear side view of the assembly of FIG. 7, showing the slider in a position upwardly somewhat from the crimped-on stop member;

FIG. 9 is a view similar to FIG. 4, but of a modified form of slider which includes an opening in the back of its extension and a plug of a meltable plastic substance in such hole;

FIG. 10 is a cross-sectional view taken through the slider extension in the region of the opening and the plastic plug, showing the tip of a heating iron being brought into contact with the plastic plug;

FIG. 11 is a view similar to FIG. 10, showing the plastic plug in the process of reforming as heated, and of flowing into the spaces between the zipper teeth located inside the slider extension; and

FIG. 12 is a view similar to FIGS. 10 and 11, but of a further form of slider incorporating an extension which carries a strip of iron-on tape, such view showing a frag-

mented portion of an iron being used to heat bond a side portion of the iron-on tape onto the zipper tape associated therewith.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1 and 2 show two different stages of installing an invisible or seam type zipper in a garment or other fabric object. The zipper itself is shown to comprise a pair of tape assemblies **10**, **12**. Each assembly **10**, **12** includes a fabric stitching tape **14**, **16** having a rearwardly turned inner edge portion **18**, **20** (FIGS. 10–12). The term "fabric" is used herein in the broad sense. Thus, it includes materials that might be more specifically classifiable as a cloth, a plastic, a paper, etc.

As best shown by FIGS. 10–12, a welt or edge bead **22**, **24** is incorporated into each of the inner edge portions **18**, **20**. A chain, roll or series of fastener elements or teeth **26**, **28** are crimped about the welts **22**, **24** and the immediately adjoining part of the inner edge portions **18**, **20**, or are otherwise firmly secured to said edge portions **18**, **20**. The fastener elements **26**, **28** are illustrated as having hook portions **30**, **32** which substantially surround and clamp onto the welts **22**, **24**, and coupling head portions **34**, **36**. A projection **37** is formed on one side of each coupling head portion **34**, **36**, and a complementary shaped recess (not shown) is formed on the opposite side of each coupling head portion **34**, **36**. When the projections **37** are mated within the recesses the fastener elements are coupled together and the inner edge portions **18**, **20** of the tapes **14**, **16** are held in abutting contact at the bight or fold regions thereof (FIGS. 10–12).

The zipper shown by FIGS. 1–3 includes a slider **38** having a straight channel end portion and a branched end portion. The slider engages the fastener elements **26**, **28** and is arranged to couple such fastener elements **26**, **28** together when moved in a direction with its branched end leading, and to decouple such elements **26**, **28** when moved in the opposite direction. The branched end portion of the slider **38** includes a separator **40** which normally projects endwise of the slider proper somewhat.

Referring to FIG. 1, the zipper itself is shown to be laid out substantially flat on the sewing machine table with its inner or concealed side directed upwardly. The fabric panel **42** to which the sewing tape **16** is being attached is spread out on the sewing table with its seam or front side directed upwardly, and its inner edge portion **44** located below the sewing tape **16**. The sewing machine is equipped with a zipper foot **46** shown to be of the type disclosed in my aforementioned U.S. Pat. No. 3,349,736. Reference is made to said Pat. No. 3,349,736 for a detailed description of the zipper foot attachment and of a manner of using it for installing an invisible or seam type zipper. The disclosure of Pat. No. 3,349,736 is hereby expressly incorporated herein by reference.

Referring again to FIG. 1, the zipper foot **46** is used to properly guide the assembly which includes the sewing tape **12** and the fabric panel **42** relatively past the needle N, so that the needle N can stitch through both the tape **16** and the panel edge portion **44** along a generally straight path or stitch line **48** closely bordering the connector elements **28**. As clearly shown by FIG. 1, when contact occurs between the toe end **50** of the foot component **46** and the outer end of the separator **40** no further movement of the zipper and the fabric object is possible and the stitching through the sewing tape **12** must be stopped at the location marked generally by the line **52** extending transversely across FIGS. 1, 2 and 3.

As should be evident, the opposite tape assembly **10** is sewn to the opposite fabric panel **54** in much the same fashion. That is to say, the panel **42** is moved out of the way and the panel **54** is laid out flat on the sewing table, with its seam or front side directed upwardly. The tape assembly **10** is placed on the inner edge portion **56** of panel **54**, with its sewing tape portion **14** directed outwardly and the connector elements **26** directed upwardly. The connector elements **26** are then guided relatively through the second channel in the foot component **46** (on the right side of the needle N, as shown in FIG. 1), and the tape **14** is sewn to the edge portion **56** along a stitch line **58** until contact between the separator **40** and the foot component **46** prevent any further sewing towards the slider **38** beyond a position on line **52**.

As shown by FIGS. 10–12, when the slider is moved upwardly through the region of the stitching **48**, **58**, such stitch lines **48**, **58** are brought together inwardly of where the two fabric panels **42**, **54** form a seam **60**. During the process of making the garment or other object of which the zipper is a part it is necessary to continue the seam effect below the ends of the stitch lines **48**, **58**, i.e. in the region below line **52**. This is done by moving the slider **38** upwardly into the region above line **52**, and then placing the two panels **42**, **54** substantially flat together, with the seam sides thereof facing each other (FIG. 2). The foot component **46** is then adjusted laterally and employed as a presser foot, and the stitch line **62** is established through the two panels **42**, **54** and along a path that is substantially colinear with the stitch lines **48**, **58** (FIG. 2).

Referring to FIGS. 2 and 3 together, following completion of the seam the beginning stitches **64** (FIG. 2) serve as a stop for the slider **38**. However, experience has showed that repetitious movement of the slider **38** rather forcibly into its open position eventually results in the slider **38** breaking the stitches **64**, or the force on the stitches **64** cause them to leave the openings in the cloth or to tear or break through the cloth.

FIG. 4 illustrates a slider **38'** which includes a severable extension **70**. The slider proper includes a rear wall or web **72**, a pair of side walls or flanges **74**, **76**, a pair of front lips **78**, **80**, and a separator **82**. At one end of the slider **38'** the side walls **74**, **76** are parallel with each other, the lips **78**, **80** are in coplanar parallelism and are in spaced parallelism with the back panel **72**, and the back panel **72**, the side walls **74**, **76** and the lips **78**, **80** together form a generally straight lipped channel of rectangular proportions in cross section. The fastener elements **26**, **28** pass through such straight channel portions coupled together. At the opposite end of the slider the slide walls **74**, **76** and the lips **78**, **80** diverge apart as they extend outwardly from where they join the straight channel portion of the slider, and the rear panel **72** widens accordingly as it extends outwardly. The separator **82** divides the interior of this end portion of the slider into two separate branch channels throuhg which the fastener elements **26**, **28** pass separately. This end of the slider is herein termed the "branch end portion."

According to the invention the extension **70** is also made of straight channel form and is made to initially be an integral part of the slider **38'**. This may be done by extending the rear panel **72**, the side walls **74**, **76** and the front lips **78**, **80**, and then providing a girth pattern of serrations **84** in the slider at about the location of the normal end surface of the straight channel portion of the slider **38'**. Short and narrow interconnecting pieces of metal **86**, herein termed "splice strips," are left between the serrations **78**. On the extension side of the serrations **78** the rear panel is designated **72'**, the side walls are designated **74'**, **76'**, and the front lips are designated **78'**, **80'**. As shown by FIG. 5, when the slider **38'** is down in a position against the end stop the extension **70** surrounds and houses the end stop **25**.

In installation of the zipper the steps described above in conjunction with FIGS. 1–3 are performed as before. Following completion of the finishing seam (FIG. 2 operation) the slider **38'** is moved downwardly or in a zipper opening direction until stopped by the upper stitches **64**. Thereafter a pliers-like tool P (FIG. 6) is used for crimping the extension **70** into tight engagement with the several elements **26**, **28** which are then within exten-

sion **70**. Preferably, the tool P has gripping jaw portions which are shaped to squeeze inwardly the central portions of the side walls **74'**, **76'**, so as to move some of the metal (or other material from which the slider **38'** and the extension **70** may be made) inwardly into the spaces between the fastener elements **26**, **28**, on at least one side of the zipper. The squeezing or gripping action by the pliers P also serves to break the splice strips **80**, thereby severing the extension **70** from the slider proper. Thereafter, during use of the zipper the extension **70** serves as a stop member which is rigidly secured to the fastener elements **26**, **28** and which serves to transmit the bottoming force of the slider **38'** evenly to the zipper throughout a relatively large zone, rather than concentrating such slider forces on the stitches **64**. Accordingly, repetitious operation of the zipper will not result in a disturbance of the seam formed by stitch line **62**.

FIGS. 9–11 illustrate a modified form of the slider, designated **38''**. In this form an opening **90** is manufactured into the back panel portion **92** of the extension **94** and a plug **96** of a meltable plastic material is fitted in this opening **90**. The extension **94** is secured to the fastener elements **26**, **28** of the zipper by applying heat to the plastic substance **96**, as shown in FIGS. 10 and **11**. The heating tool having a generally pointed tip T may be used to apply heat directly on the plastic plug **96**. In response to the heat the plastic **96** melts and a portion of it flows downwardly into the spaces between the several fastener elements **26**, **28** which are inside the extension. The remaining portion of the plastic substance **96** remains secured to the extension **94** by virtue of it being locked into the opening **90**. As shown by FIG. 11, lips **97**, **98** are formed about the opening **90** on both sides of the back panel **92** and these lips **97**, **98** serve to grip the portions of the back panel which border the opening **90**.

FIG. 12 discloses a further modified form of the invention. In this form a strip **99** of fabric impregnated with an "iron-on" type of adhesive is in some fashion secured to the extension **100**. Such strip is formed to include two oppositely directed side parts **102**, **104** which are securable to the sewing tape portions **14**, **16** of the zipper by use of an ordinary hand iron I, for example. In FIG. 12 a portion of hand iron I is shown in the process of heating the heat sensitive adhesive incorporated in one of the side parts of the "iron-on" strip **99**. The opposite side part is shown to have already been heat secured to the tape on its side of the zipper.

According to the invention the extension equipped sliders **38'**, **38''**, **100** may be used to aid manufacture of a plurality of zippers as a continuous strip. The sliders are installed on the zippers, a slider is moved to a position placing its extension at the desired location for a bottom stop, the extension is then secured to the zipper, and thereafter the strip is cut below the extension.

The foregoing description and the accompanying drawing together describes specific embodiments which are within the scope of the present invention. The following claims actually define the scope of the invention.

What is claimed is:

1. In a slider for a seam type zipper having a rear wall, a pair of opposite side walls connected to the rear wall, and a lip extending from each side wall laterally inwardly towards the other lip, with the rear wall, the side walls and the lips together forming a generally straight channel at one end of the slider through which the fastener parts of the zipper pass coupled together, with said side walls and said lips diverging apart as they extend from said generally straight channel to the opposite end of the slider, with the rear wall widening out in its extent in the same direction, and with said slider further including a partition extending from the rear wall forwardly and dividing the interior of the diverging portion of the slider into two separate branch channels through which the two fastener parts pass separately, the improvement comprising:

a slider extension disposed axially endwise outwardly of the straight channel portion of said slider and attached thereto by a splice means in the form of at least one breakable strip, said extension comprising a back wall, side walls, and front lips, together forming a channel which is substantially like the straight channel portion of said slider, said extension being separable from said slider by breaking said splice means, and said extension being provided for securement to said zipper upwardly from the closed end thereof, to serve as a slider stop.

2. The improvement of claim **1**, wherein said extension is initially connected to the slider by said splice means, so that the extension and the slider can be initially installed on the zipper together, and can be moved together to place the extension in a desired position for separation from the slider and securement to the zipper.

3. The improvement of claim **2**, wherein said extension is formed integrally with said slider, and said splice means comprise narrow pieces of material bridging between, and integral parts of both, the extension and the slider, and separated by a pattern of serrations.

4. The improvement of claim **1**, wherein the seam type zipper includes means for positively closing its closed end, and both the straight channel portion of the slider and the extension are sized to be larger than the closing means, so that the slider can be moved downwardly into a bottom position in which internal parts of the slider at least substantially contact the closure means and said straight channel portion and said extension loosely surround said closure means.

5. The improvement of claim **1**, further including a normally solid substance which is heat meltable anchorable on said extension, so that said extension can be secured to the zipper by application of heat to such substance so as to cause it to melt and flow into and interlock with portions of the zipper inside said extension.

6. The improvement of claim **1**, further including an iron-on type strip connected to the extension and including at least one panel part positioned to be set in juxtaposition with fabric, so that the extension can be secured to the zipper by merely applying heat to said panel to cause it to adhere to said fabric.

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U.S. Cl. X.R.

24—205.11, 205.15; 114—265