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(54) **Slide fastener end stops**

(57) A slide fastener 9' has end stops 21, 22 formed by depositing adhesive resin material onto the fastener tapes 11. The adhesive material adheres to the tapes 11 and coupling elements 12.

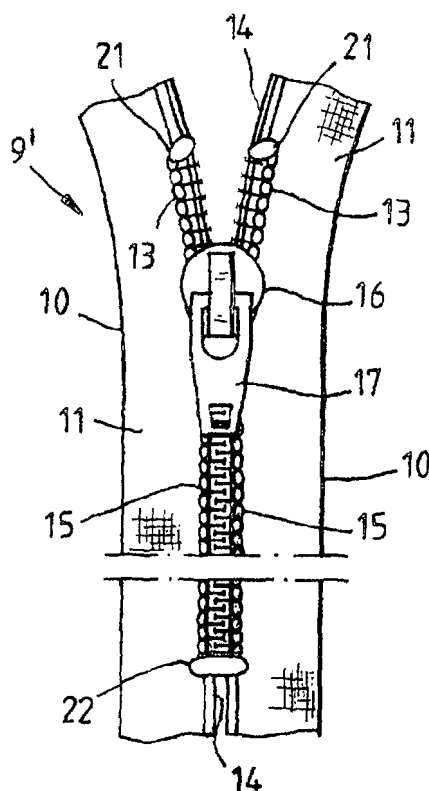


Fig. 2

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Description

[0001] The present invention relates to a slide fastener, and in particular to the provision of end stops on a slide fastener.

[0002] Typically a slide fastener or zip comprises a pair of stringers each having a row of coupling elements along one edge. The coupling elements are engaged and disengaged, to close and open the fastener, by a slider. The travel of the slider along the stringer is limited by end stops placed at ends of the rows of coupling elements. One of the end stops, the bottom end stop, may bridge between the two stringers at one end, to form a permanent connection between the stringers. Otherwise separable parts may be provided at the bottom end to enable to stringers to be connected and disconnected, for example, on a jacket fastening.

[0003] The coupling elements may be discrete elements of metal which are clamped onto a bead at the edge of the stringer tape, plastics elements moulded on to the tape edge, or a continuous monofilament may be woven, or knitted, into the tape edge to form the coupling elements.

[0004] Typically, continuous tapes with elements throughout their length are manufactured. In a finished fastener, coupling elements "below" the bottom end stop and "above" the top stop are removed to improve the appearance of the fastener and facilitate attachment of the fastener to a garment, bag or the like. Typically, the unwanted elements are removed before the end stops are affixed to the stringers.

[0005] Heretofore, the provision of the end stops has been a relatively costly process. End stops must be fabricated, usually of metal, and attached in place on the stringer edge. This requires careful handling of the parts, and machinery allowing access to the stringer from above and below to clamp the end stop onto the edge of the stringer tape.

[0006] EP-A-237 068 mentions that thermoplastic materials may be welded to an edge of the stringer tape, but the resultant bond is not entirely satisfactory, and rough edges can be formed. EP-A-237 068 overcomes this problem by providing a fold of thermoplastics material which embraces the edge of the tape. The tape is a porous structure, and the thermoplastic is heated so that it penetrates the tape material, to fuse the two portions of the thermoplastic together, through the tape. This system still requires the formation and handling of small parts to form the end stops, and the application of heat to fuse the material of the end stops into the stringer tape.

[0007] The present invention provides a slide fastener having an end stop formed by depositing an adhesive material on the stringer. The adhesive material is deposited in an amount sufficient to prevent the travel of the slider past the adhesive. Very preferably, the adhesive is a resin material formed of water insoluble synthetic polymer. The adhesive may be air or heat cured, but a

UV cured resin is preferred to expedite the manufacturing process. A hot melt adhesive may also be used if its properties are suitable.

[0008] The adhesive material needs to bond well to the material of the stringer tape, and to have sufficient inherent strength, when cured or set, to withstand impact by the slider.

[0009] A suitable adhesive material can be found by trial and experiment.

[0010] The adhesive material may be coloured to match the colour of the tape or coupling elements.

[0011] The invention will be further described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a plan view of a prior art slide fastener;

Figure 2 is a plan view of a fastener manufactured in accordance with the present invention,

Figure 3 is a cross-section on line III-III of Figure 2, and

Figure 4 illustrates a manufacturing process of the present invention.

[0012] Referring now to the drawings and firstly to Figure 1, there is shown a slide fastener 9 which comprises a pair of stringers 10 formed of identical, woven stringer tapes 11, 11 each carrying a continuous row of coupling elements 13 along its inner longitudinal edge 14. The coupling elements 13 are formed by a continuous monofilament 15 which is woven into the tape edge during weaving of the tape. Tape 11 and monofilament 15 may be of nylon, polyester, or other materials as commonly used in the art. A slider 16 has a pull tab 17 with which the slider is normally moved along the rows of coupling elements 13 in one direction to open and the other direction to close the slide fastener 10 in a manner well known in the art. The reciprocal movement of the slider 16 in a direction to close the fastener 10 is limited or stopped at the top end of the fastener 10 by a pair of top end stops 18, 18 as the slider is brought into abutting engagement with the end stops 18. Movement of the slider 16 in a direction to open the fastener 10 is limited or stopped at the bottom end of the fastener 10 as it comes into contact with a bottom end stop 20. Bottom end stop 20 secures the two stringers 11 together. As mentioned above, bottom end stop 20 could be replaced by separable parts to allow complete separation of the stringers.

[0013] In place of the continuous monofilament 15, the coupling elements 13 may be formed by discrete metal elements clamped to the tape edge 14, or plastics elements moulded in place.

[0014] The elements above the top end stops 18 and below the bottom end stop 20 have been removed from the tape prior to fitting the end stops, by cutting the el-

ements from the tape, as is well known in the art.

[0015] Referring to Figures 2 and 3, the slide fastener 9' corresponds to the slide fastener 9 of figure 1, with like parts being given like reference numerals. In the fastener 9' of Figures 2 and 3, the top end stops 21 are formed by a deposit or drop of adhesive resin material. The adhesive resin material is deposited at the end of the row of elements 13, preferably contacting the end element or elements. The resin is deposited at or near the edge of material and needs to be deposited in sufficient quantity to form a mound which will prevent movement of the slider 16 past the stop 21. The resin may be injected onto the surface of the tape 11 so as to impregnate the weave of the tape, to enhance the bond to the tape.

[0016] A bottom stop 22 is also formed by a deposit of resin material. The material is deposited on the joined stringers 10, across the coupled elements 13 and also onto the tapes 11.

[0017] The resin material may be any suitable material forming a sufficiently strong bond to the tape 11 and/or elements 13. The resin material will form a solid mass, and fillers may be incorporated into the material as is known in the resin art. Also, the resin material may incorporate a pigment to match the colour of the tape or coupling elements. An epoxy resin or acrylate resin may be suitable. A suitable methacrylate resin is marketed by Three Bond Co. Ltd of Tokyo, Japan under reference No 3052C..

[0018] Referring to Figure 4, this shows schematically a method of depositing a drop of resin onto the stringer tape 11. Suitable application equipment 23 for depositing a metered drop of resin through a nozzle 24 is readily available from the Three Bond Company. As mentioned above, the resin is preferably a UV cured resin. The stringers 11 are supported on a flat guide 25. They are passed under the nozzle 24, for application of resin to form an end stop 11, and then under a UV lamp 26 to cure the resin. Nozzle 24 may be lowered close to the stringer tape 13 so that the metered dose of resin is urged into intimate contact with the tape.

[0019] Various modifications will be apparent to those skilled in the art.

es joined stringers.

4. A slide fastener as claimed in claim 1, 2 or 3, wherein the coupling elements are formed by a continuous monofilament.
5. A method of forming an end stop on a slide fastener, the method comprising depositing an amount of adhesive material on the fastener adjacent an edge of a fastener tape.
6. A method as claimed in claim 5, wherein the adhesive material is cured subsequent to deposition to form a hardened deposit.

Claims

1. A slide fastener comprising a stringer having a tape and coupling elements on an edge of the tape, wherein an end stop is formed on the stringer by a deposit of adhesive material adjacent the edge of the tape.
2. A slide fastener as claimed in claim 1, wherein the end stop is a top end stop.
3. A slide fastener as claimed in claim 1 or 2, wherein the or an end stop is a bottom end stop which bridg-

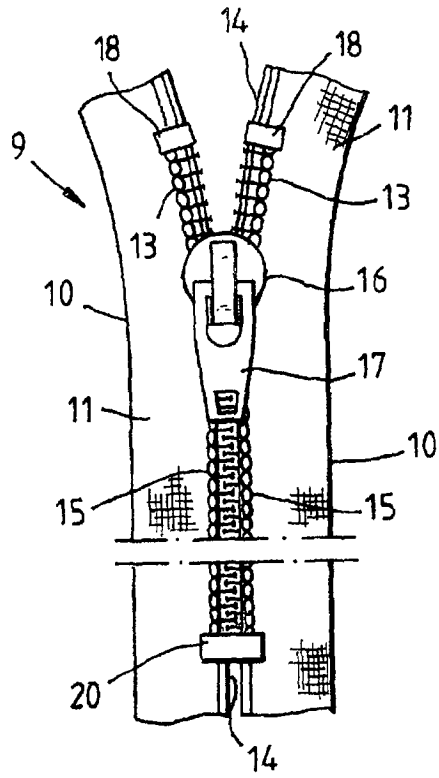


Fig. 1

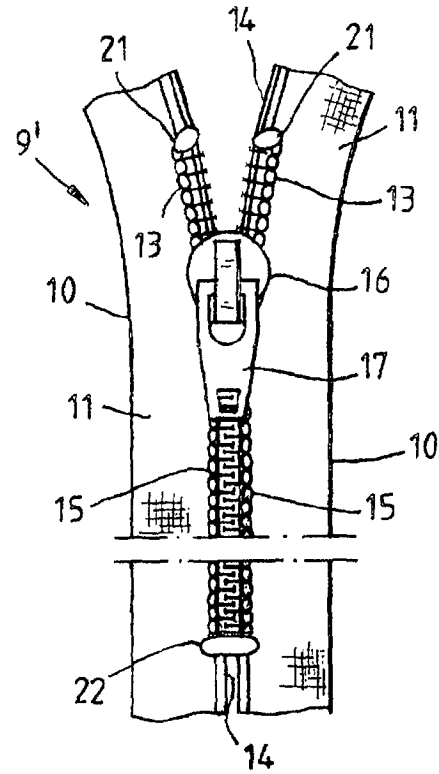


Fig. 2

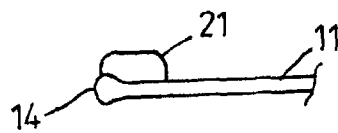


Fig. 3

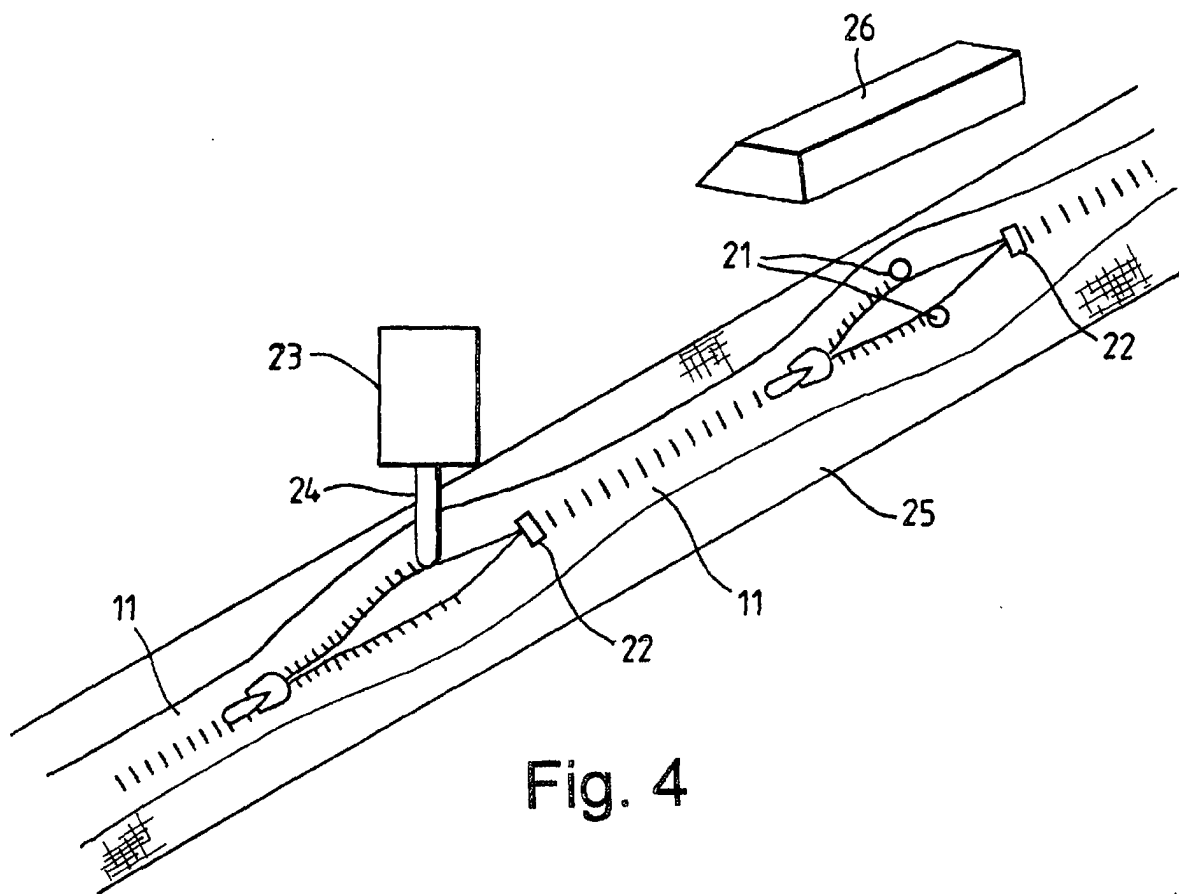


Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 6723

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A44B
Place of search		Date of completion of the search	Examiner
MUNICH		16 November 2001	Kock, S
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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