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Slider for fluidtight slide fastener

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FIG. 1

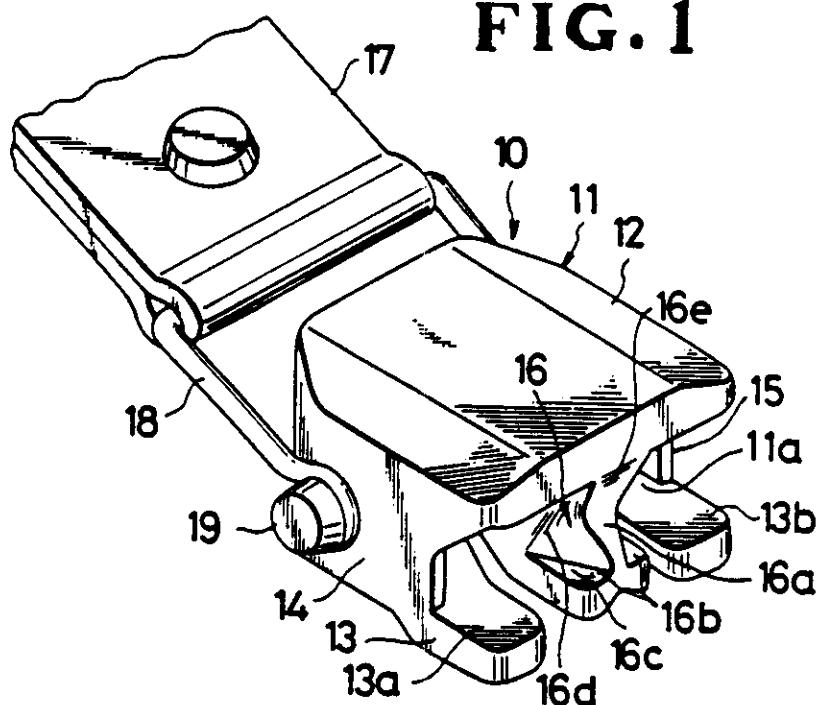


FIG. 2

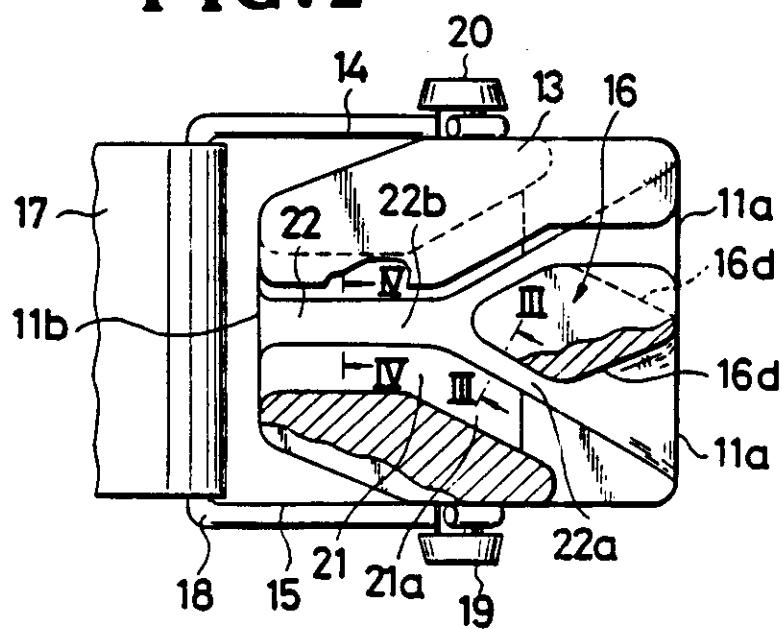


FIG. 3



FIG. 4

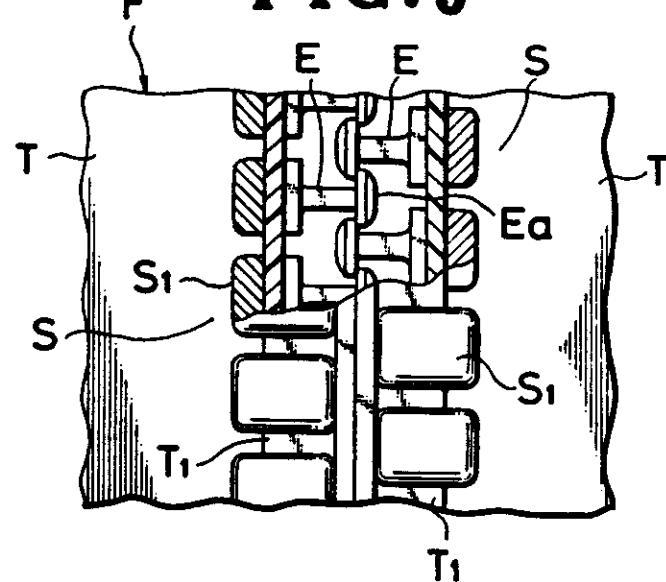


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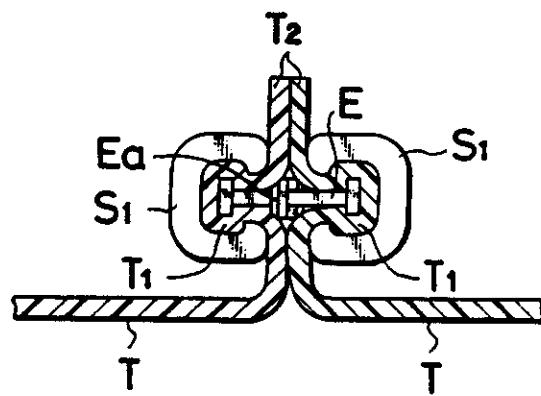
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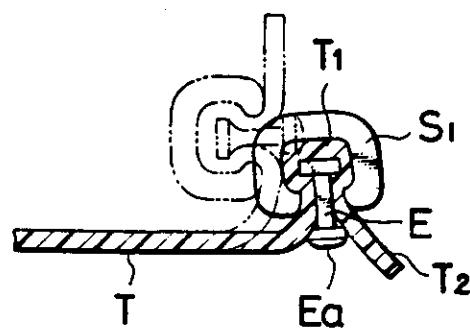
**FIG. 5**



**FIG. 6**



**FIG. 7**

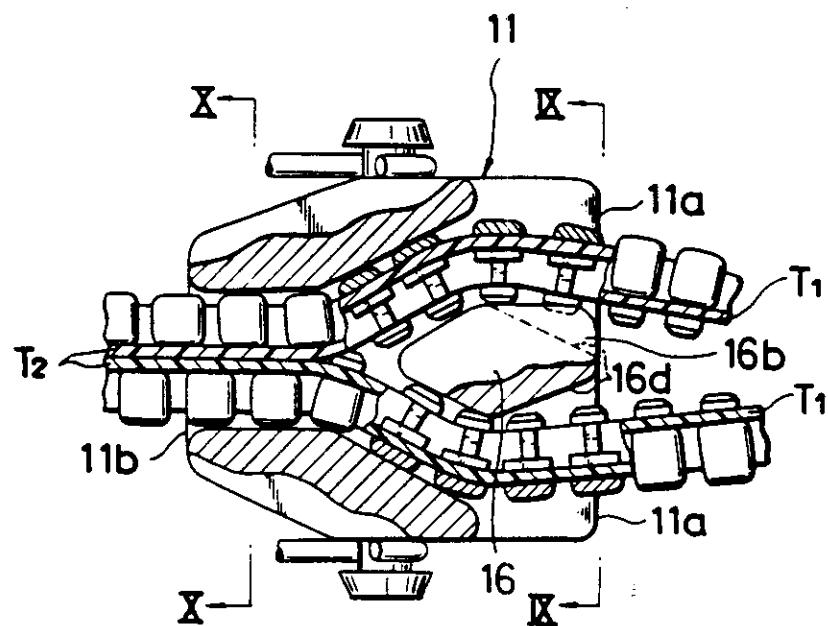


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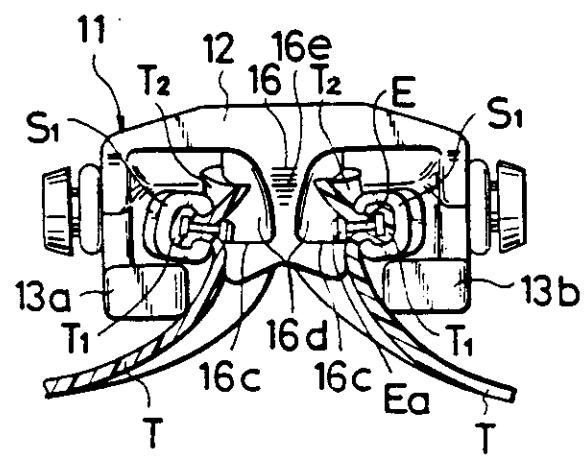
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**FIG. 8**



**FIG. 9**



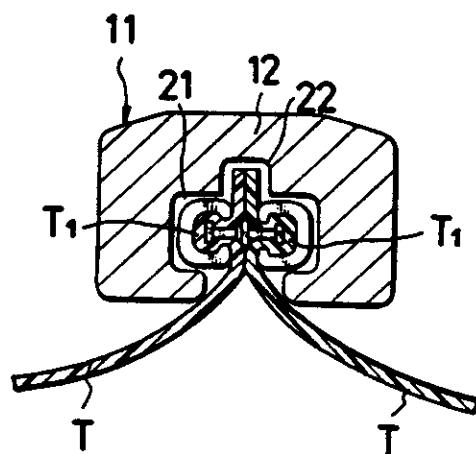
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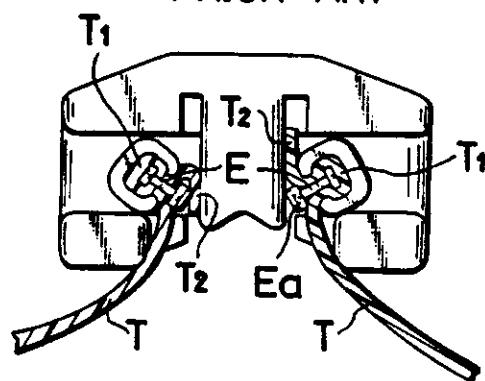
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**FIG.10**



**FIG. 11**

PRIOR ART



SLIDER FOR FLUIDTIGHT SLIDE FASTENER

Description:-

This invention relates to sliders for slide fasteners and more particularly a slider for a 5 fluidtight slide fastener used on waterproof garments and covering devices.

Prior Art

Numerous fluidtight slide fasteners have been proposed for use on overshoes, diving suits, storm 10 covers, tents and other waterproof articles.

A typical form of conventional slide fastener chain comprises a pair of support tapes rendered waterproof as by a coating of rubber or plastic resin and two rows of interlocking coupling elements mounted 15 closely along confronting longitudinal edges of the respective tapes, which tape edges are enveloped by sealing or clamping strips with extensions of the tape edges projecting beyond the strips, the extensions of the tape edges being brought together in abutting 20 relation to establish fluidtightness of the fastener.

A slider for opening and closing such a fluidtight fastener is disclosed in Japanese Patent Publication 35-9296, the slider comprising a slider body and a chain separator or what is commonly known as 25 a diamond head vertically depending centrally from the upper wall of the slider body at one end thereof for separating the fastener chain into identical halves.

In the inner surfaces of the slider body is formed a pair of guide slits on opposite sides of the diamond head for receiving the extensions of the confronting tape edges. The prior slider of such a construction however has a drawback in that the fastener stringers are apt to be jammed and stuck within the guide passage of the slider due primarily to the extensions of the tape edges being deflected and squeezed between the diamond head and the coupling elements of the fastener instead of being properly oriented and inserted into the guide slits. Considerations are given to hold the tape edges in properly oriented position by for example creasing the tapes, but the tapes tend to restore on their own resiliency.

According to the present invention, there is provided a slider for a fluidtight slide fastener having a pair of fluidtight support tapes each carrying along one of its longitudinal edges a row of coupling elements and a corresponding row of sealing strips securing the elements to the tape, said support tapes having extremities of their respective edges extending beyond the region of said sealing strip, said slider comprising a slider body including an upper shield and a lower shield joined sideways by side flanges, and a diamond head dependent from said upper shield centrally at a front end of the slider body, said upper shield having a guide groove for receiving said tape edge extremities, characterized in that said diamond head has a nose portion progressively thickened toward the upper shield and rounded off to provide an arcuate path for said tape edge extremities, and a pair of horizontal portions with flat upper surfaces on opposite sides of said nose portion for receiving the coupling elements of the fastener chain.

It is believed possible by means of the present invention to provide a slider for a fluidtight slide fastener which is capable of smoothly closing and opening the slide fastener.

It is further believed possible by means of the present 5 invention to provide a slider which has certain structural features whereby the fastener chain is guided in proper orientation so that the extensions of the confront tape edges can be brought tightly together in face-to-face abutting relation to establish a complete seal against leakage.

10 The invention will be described by way of example with reference to the accompanying drawings, wherein like references refer to like parts unless the context requires otherwise and wherein:-

Figure 1 is a perspective view of a slider for a fluidtight slide fastener embodying the invention;

15 Figure 2 is a partly broken away bottom view of the slider of Figure 1;

Figure 3 is a cross-sectional view taken on the lines III-III of Figure 2;

Figure 4 is a cross-sectional view taken on the

lines IV-IV of Figure 2;

Figure 5 is a partly broken away plan view of a fluidtight slide fastener chain for which the slider of Figure 1 is used;

5 Figure 6 is a transverse cross-sectional view of the fastener chain of Figure 5;

Figure 7 is a transverse cross-sectional view of one of the two identical fastener stringers which is utilized to explain the tendency of the stringer to  
10 restore its flat position;

Figure 8 is a view similar to Figure 2 but showing the fastener chain threaded through the slider;

Figure 9 is a cross-sectional view taken on the lines IX-IX of Figure 8;

15 Figure 10 is a cross-sectional view taken on the lines X-X of Figure 8; and

Figure 11 is a front elevational view of a prior art slider for a fluidtight slide fastener.

Referring now to the drawings and Figure 1 in  
20 particular, there is shown a slider 10 for a fluidtight slide fastener, the slider 10 comprising a slider body 11 including an upper shield 12 and a lower shield 13 connected sidewise by a pair of side flanges 14 and 15 and a diamond head 16 depending centrally from the  
25 upper shield. A pull tab 17 is pivotally connected by a link 18 to a pair of hubs 19 and 20 secured to the side flanges 14 and 15, respectively.

The lower shield 13 is bifurcated at an inlet or front end 11a of the slider body 11 to provide a pair of leg portions 13a and 13b spaced across the diamond head 16.

5 As shown in Figure 2, there is formed within the slider body 11 a sliding guide channel 21 of substantially Y-configuration which is defined by the upper shield 12, the side flanges 14, 15, the legs 13a, 13b of the lower shield 13 and the diamond head 16 to 10 extend throughout the length of the slider body 11 from the front end 11a to an outlet or rear end 11b.

The guide channel 21 consists of convergent portions 21a which converge to a point about halfway of the Y-shaped channel 21, from where they run straight 15 in parallel with each other toward the rear end 11b.

As shown in Figures 2, 3 and 4, there is formed in the inner wall of the upper shield a Y-shaped guide groove 22 extending longitudinally throughout the length of the slider body 11. The guide groove 22 20 includes narrow bifurcate slot portions 22a (Figure 3) which are separated by the diamond head 16 and converge along the contour of the diamond head 16 (which is triangular toward the rear end 11b as shown in Figure 2) merge into a wide, straight slot portion 22b (Figure 25 4).

Figure 5 shows a portion of a fluidtight slide fastener chain F which comprises a pair of stringers S

each consisting of a fluidtight support tape T, a row of coupling elements E secured along a longitudinal inner edge or element-carrying edge  $T_1$  of the tape T and sealing strips or clamp members  $S_1$  securing the 5 elements E to the tape T. The extremities  $T_2$  of confronting tape edges extend beyond the region of the sealing strip  $S_1$  and are held intimately in abutting engagement with each other in the proper operation of the slide fastener F as better shown in Figure 6.

10 The sliding guide channel 21 is utilized as a path for the reciprocal movement therethrough of the element-carrying edges  $T_1$  including the sealing strips  $S_1$  of the stringers S, wherein the stringers S in confronting relation are separated as they move along 15 the diamond head 16 toward the front end 11a of the slider body 11 and are interengaged as they move past the diamond head 16 in the opposite direction toward the rear end 11b, as is well known in the art.

The guide groove 22 is utilized as a path for 20 the tape edge extremities  $T_2$  of the stringers S to follow during the opening and closing operation of the slide fastener F. In order to ensure smooth orderly movement of the slider 10 relative to the slide fastener chain F with the element-carrying tape edges 25  $T_1$  properly oriented in and along the guide channel 21 and the tape edge extremities  $T_2$  snugly received in the guide groove 22 as shown in Figures 8, 9 and 10,

special considerations are given to the form and construction of the diamond head 16. Firstly, the diamond head 16 is provided centrally at its front end with a nose portion 16a and a pair of horizontal ear portions 16b on opposite sides of the nose 16a each having an upper flat horizontal surface 16c parallel with the plane of the lower shield 13, the flat horizontal surface 16c serving to receive thereon the coupling head portion Ea of the element E so as to re-orientate the element-carrying tape edge  $T_1$  (from the position of Figure 7) properly to be smoothly threaded in and along the guide channel 21 as shown in Figure 9. The flat upper horizontal surfaces 16c, 16c are upwardly offset with respect to upper surfaces of the leg portions 13a, 13a of the lower shield 13. Secondly, the nose portion 16a of the diamond head 16 is divergent toward the rear end 11b of the slider body 11 as at 16d and thickened toward the upper shield 12 as at 16e, the thickened portion 16e being rounded off to provide an arcuate path to permit the tape extremities  $T_2$  to flexibly progressively rise into the slit portions 22a of the guide groove 22, as shown in Figure 10.

As the slide fastener chain F thus is threaded through the slider 10 from the front end thereof, the two stringers S can be coupled together upon entry of their element-carrying edges  $T_2$  into the straight run of the guide channel 21 to provide fluidtight closure

as desired, and this is done without encountering the trouble of "jamming" of the fastener chain F experienced with the prior art slider as shown in Figure 11.

As seen in Figure 9 particularly, but also visible in Figure 5 1. the underside of the diamond 16 is not flat but has the general cross-section of an inverted Vee with round apex and rounded sides. The thickness of each horizontal ear portion 16b increases accordingly from the middle towards the respective side of the diamond 16.

CLAIMS:

1. A slider for a fluidtight slide fastener having a pair of fluidtight support tapes each carrying along one of its longitudinal edges a row of coupling elements and a corresponding row of sealing strips securing the elements to the tape, said support tapes having extremities of their respective edges extending beyond the region of said sealing strip, said slider comprising:

10 (a) a slider body including an upper shield and a lower shield joined sidewise by side flanges, said upper shield having a guide groove for receiving said tape edge extremities; and

15 (b) a diamond head dependent from said upper shield centrally at a front end of the slider body; said diamond head having a nose portion progressively thickened toward the upper shield and rounded off to provide an arcuate path for said tape edge extremities, and a pair of horizontal portions with flat  
20 upper surfaces on opposite sides of said nose portion for receiving the coupling elements of the fastener chain.

2. A slider for a fluidtight slide fastener according to claim 1, said nose portion of the diamond head being divergent toward a rear end of the slider body.

25 3. A slider for a fluidtight slide fastener according to claim 1 or 2, said flat upper surfaces of said horizontal portions

being upwardly offset with respect to an upper surface of said lower shield.

4. A slider for a fluidtight slide fastener according to any preceding claim, said flat upper surfaces of said horizontal portions each being parallel to an upper surface of said lower shield.

5. A slider for a fluidtight slide fastener according to any preceding claim, said guide groove extending throughout the length of a Y-shaped guide passage defined in said slider body.

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