July 10, 1956 L. E. E. GOSSNER 2,753,609

DOUBLE SLIDE FASTENER SEALING CLOSURES

Filed May 29, 1952

Fig. 1.

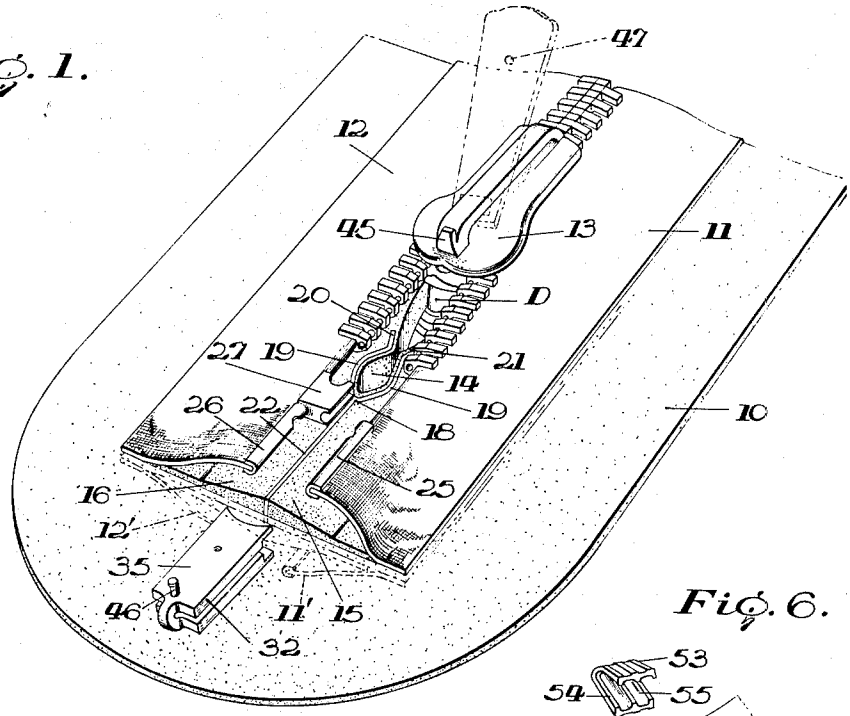


Fig. 6.

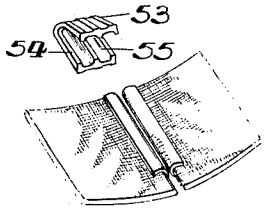


Fig. 2.

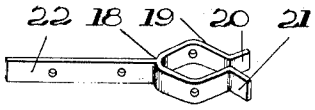


Fig. 4.

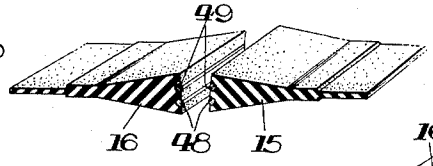




Fig. 5.

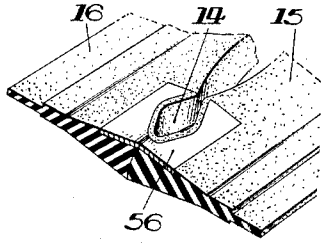


Fig. 3.

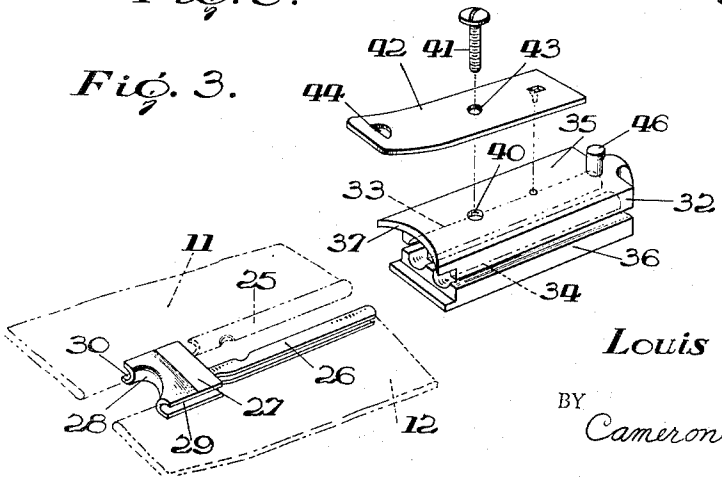


Fig. 7.

INVENTOR

Louis E. E. Gossner

BY Cameron, Kerkam & Sutton

ATTORNEYS

United States Patent Office 2,753,609 Patented July 10, 1956

2,753,609

DOUBLE SLIDE FASTENER SEALING CLOSURES

Louis Ernest Elwin Gossner, San Francisco, Calif., assignor to Treg, Inc., San Francisco, Calif., a corporation of California

Application May 29, 1952, Serial No. 290,768

6 Claims. (Cl. 24—205.1)

This invention pertains to improvements in double slide fastener sealing closures with particular reference to the terminal end of the closure adjacent and about the nest in the sealing strip faces in which the diamond of the slider seats when the closure is fully closed.

Experiments with sealing closures of this type have established that under certain conditions of torsion and pressure leakage will occur about the diamond in the nest and it is the purpose of this invention to so improve and reinforce the nest, sealing strips, and tape structures that such leakage will be eliminated.

The invention further contemplates the provision of improved reinforcing means for the nest and terminal end of the strip. It further contemplates improved means for maintaining the terminal ends of the tapes closely bonded together at a tension comparable to the tension in the tapes when the teeth are joined. It also contemplates improved tape and sealing strip structure.

It is therefore one object of this invention to provide improved terminal structure for such a sealing strip.

It is another object of this invention to provide an improved reinforced diamond nest in such a sealing strip.

It is a further object of this invention to provide improved clamping structure for maintaining the terminal or free ends of the tapes closely clamped together under a tension comparable to the tension throughout the balance of the tape when the teeth are joined.

It is another object of this invention to provide improved meeting surfaces for the sealing strips.

Other and further objects of this invention will become apparent as this specification proceeds.

Referring to the drawings,

Fig. 1 is a perspective view of the terminal end of a double slide fastener, sealing strip structure, partially in phantom, showing the reinforced nest for the slider diamond and showing the improved binding means and clamping structure for the terminal extremities of the tapes in position to clamp the tapes closely together beyond the nest;

Fig. 2 is a perspective view of the reinforcing insert member which fits about the nest and extends to the terminal end of the line of juncture between the rubber sealing strips;

Fig. 3 is an exploded view of the improved binding and clamping structure for the terminal extremities of the tapes;

Fig. 4 is a cross sectional view of the improved sealing strip structure;

Fig. 5 is a perspective view of an alternative embodiment of the reinforcing insert;

Fig. 6 is a perspective view of an alternative embodiment of the clamp structure; and

Fig. 7 is a fragmentary sectional view of alternative reinforcing means for the nest.

In the drawings, Fig. 1, 10 indicates the margin of the rubber sealing strip structure to which are cemented or otherwise affixed tapes 11 and 12, double slider 13 being shown in position adjacent elliptical nest 14 provided in

the terminal extremities of the meeting faces of the sealing strips 15 and 16. As shown, nest 14 is preferably elliptically shaped to closely fit the diamond D of slider 13. Reinforcing member 18 is shown surrounding nest 14 and extending medially of the sealing strip structure from the nest to its terminal extremity. Reinforcing member 18 is preferably formed of flat spring steel or analogous material and is molded about the outer periphery of nest 14 and extends from the outer extremity of nest 14 to the terminal end of the sealing strip structure. Reinforcing member 18 is preferably provided with an elliptically shaped extremity 19, curved to conform to the curvature of nest 14, and carries two outwardly angularly inclined terminal finger members 20 and 21 at its outer extremity. Affixed at the apex of elliptical extremity 19 is an extended longitudinal member 22 which is molded between the meeting terminal faces of the sealing strips. Reinforcing member 18 is preferably molded into the terminal structure of the sealing strips, about nest 14, as shown, and its upper and lower edges are preferably flush with the surfaces thereof. As shown, a thin layer or segment of rubber is disposed between elliptical head 19 of reinforcing member 18 and nest 14. Reinforcing member 18 may be perforated at intervals, as shown, to improve the bond between it and the terminal faces of the sealing strips. This reinforcing structure is provided for a purpose hereinafter to be discussed in more detail.

An improved binding and clamping structure for the terminal ends of the tapes is also shown in Fig. 1. The terminal end of tape 11 is preferably provided with a cylindrical metal binding 25, while the extremity of tape 12 is provided with a binding 26 which carries a recessed rectangular head 27 at its inner extremity. As shown, head 27 is preferably smoothly curved at its inner edge at 28 to fit closely against the curved extremity of double slider 13 when the slider is pulled into contact therewith.

The lateral edges of head 27 of binding 26 are preferably grooved at 29 and 30, as shown to receive the edges of tapes 11 and 12. Clamping structure 32 is shown in position to be slid over bindings 25 and 26 of the tape edges and comprises a substantially rectangular body portion laterally slitted for most of its length and provided with two parallel, longitudinal cylindrical recesses 33 and 34 extending most of its length. The upper plate 35 of clamp 32 preferably extends outwardly further than its lower plate 36, and, as shown, upper plate 35 is preferably recessed at its outer extremity 37. The extremities of upper plate 35 and lower plate 36 are preferably recessed to define a rectangular space therebetween into which head 27 of binding means 26 is designed to fit closely, as will be hereinafter discussed in more detail.

Clamp 32 is preferably provided with a vertically extending, medial screw hole 40 into which a screw 41 is designed to be fitted to draw its upper and lower plates 35 and 36 closely together to compress longitudinal recesses 33 and 34 to apply tight clamping pressure to cylindrical bindings 25 and 26 of the edges of the tapes when they are inserted therein.

A spring member 42 is designed to fit over upper plate 35 of clamp 32 and carries a hole 43 in its medial section designed to register with screw hole 40 of clamp 32 whereby it may be held closely to upper plate 35 thereof by screw 41. At its outer extremity spring member 42 is curved upwardly and carries an appropriate recess 44 designed to fit over a small stud 45 at the terminal extremity of the upper surface of slider 13 when the slider diamond is fully seated in nest 14. The curved extremity of spring 42 is designed to slide upwardly over the face of slider 13 to seat stud 45 in its recess 44.

A small vertical pin 46 is also provided at the terminal end of upper plate 35 of clamp 32 to receive a hole 47 in the extremity of the slider tab when the tab is disposed horizontally over clamp 32.

In Fig. 4 an improved face structure for the sealing strips is illustrated, in section. Each of the faces of the sealing strips 15 and 16, which are preferably substantially triangular in cross section, are provided with two parallel imbedded wire members 48 and 49, running longitudinally thereof, respectively. Wires 48 and 49 are imbedded in the faces of the sealing strips and protrude very slightly therefrom to provide a frictionless bearing surface for slider diamond D between the faces of the sealing strips.

As has been previously stated, metal reinforcing member 18 is preferably inserted in the extremity of the sealing strip, surrounding nest 14 thereof, during the molding of the strip and is appropriately vulcanized or otherwise affixed therein. A thin layer of rubber is maintained between elliptical extremity 19 of reinforcing member 18 and nest 14. The primary function of the elliptical extremity 19 of reinforcing member 18 is to provide reinforcement and pressure about the peripheral edges of nest 14 against the outer periphery of diamond D of slider 13 to improve the fluid-tight contact therebetween. The two angular tips 20 and 21 of elliptical extremity 19 of reinforcing member 18 lie in close proximity to each other at the open extremity of nest 14 and are forced apart by the diamond D of slider 13 as the diamond is pulled into nest 14. When the diamond of slider 13 is fully seated in nest 14 tips 20 and 21 spring back toward each other behind the diamond, forcing the edges of nest 14 into close contact therewith.

The extended longitudinal portion 22 of reinforcing member 18 preferably extends from the outer edge of the nest 14 to the terminal end of the sealing strips, as shown, and provides positive rigidity to the terminal end of the sealing strip structure to prevent distortion of nest 14 when the slider diamond is seated therein.

Referring to the clamping structure and improved binding means for the edges of the terminal ends of the tapes, this structure is preferably applied as follows: Cylindrical binding 25 is first applied over the edge of tape 11 and binding 26 is applied over the edge of tape 12, with its recessed face 28 lying in close proximity to the outer extremity of nest 14. With the two binding strips in place they are drawn downwardly and inwardly and clamp 32 is slid thereover, binding strip 25 fitting into cylindrical recess 33 and binding strip 26 fitting into cylindrical recess 34. Clamp 32 is slid inwardly on strips 25 and 26 until head 27 of strip 26 is firmly seated in the rectangular recess at its inner extremity. With the clamp 32 in place spring member 42 is applied thereover, hole 43 thereof registering with screw hole 40 of clamp 32. Screw 41 is then inserted through hole 43 into hole 40, which is appropriately threaded at its lower extremity in plate 36, and screw 41 is then turned downwardly to draw upper plate 35 and lower plate 36 of clamp 32 tightly over binding strips 25 and 26 of the tapes. By this means the tapes are drawn tightly together and maintained in clamped position under considerable tension approximating the tension throughout the length of the joined tapes.

Recess 28 at the inner extremity of head 27 of strip 26 is preferably closely aligned with the outer extremity of nest 14 and receives the upper rounded face of slider 13 when the slider is seated in nest 14. Hole 44 in the curved inner extremity of spring 42 is designed to fit over a stud 45 on the upper forward extremity of the slider 13 to hold the slider firmly in nest 14. Further, terminal pin 46 is provided at the outer, upper surface of upper plate 35 of clamp 32 to receive the hole 47 of the slider tab when it is forced into horizontal position over clamp 32.

Similar binding strips and clamping means are provided for the extremities of lower tapes 11' and 12' at the underside of the structure. It will be understood that in this lower tape binding and clamping structure it is not necessary to provide spring 42 or any means to "lock" slider 13 in nest 14.

Referring to Fig. 5, an alternative embodiment of reinforcing insert 18 is illustrated. In this embodiment, reinforcing insert 18 is provided at its extremity 22 with an upstanding, headed pin 52 which extends upwardly above the surface of the sealing strip and is designed to receive the hole 47 in the extremity of the slider tab when the tab is in horizontal position over extension 22. When this embodiment of reinforcing member 18 is utilized the clamp 32 is not used, a clamp as shown in Fig. 6 being utilized. Alternative clamp 53 is preferably formed of strong metal and is grooved longitudinally, as at 54 and 55, to receive bindings 25 and 26 of tapes 11 and 12. In this embodiment binding 26 does not carry head 27. Clamp 53 is preferably applied over the bound edges of tapes 11 and 12 behind pin 52 and is firmly clamped down thereover to hold them in close registration at the terminal end of the tapes. In this embodiment "locking" of slider 13 in nest 14 is obtained by swinging the slider tab horizontally over extension 22 and fitting its hole 47 over pin 52.

An alternative reinforcing structure for nest 14 is shown in Fig. 7. In this embodiment, insert 56, of metal or other resilient material is molded and vulcanized about nest 14, as shown, flush with the surface of the strips, when the sealing strips are molded. This insert at its inner periphery conforms to the shape of nest 14 and may be rectangular, as shown, at its outer edge, or of any other desired shape. Its function is to reinforce nest 14 and rigidify its walls to prevent distortion thereof when diamond D of slider 13 is seated therein. As shown, a margin of rubber is maintained between the inner edge of insert 56 and nest 14. If desired, insert 56 may be extended in length from nest 14 to the end of the sealing strip.

Where the present closure is designed to be used at high altitudes, or under great pressures, it has been found to be advisable to form tapes 11 and 12 of wire mesh or other extremely strong material to prevent distortion and stretching of the tapes and attendant leakage. Wire mesh tapes may be molded directly into the sealing strips at the time of forming the strips.

This entire structure, comprising the reinforcing members, binding strips 25 and 26 and the clamping members is designed to provide a completely rigid and unitary terminal structure for the sealing strips and tapes to prevent distortion of the nest when the slider diamond is seated therein to eliminate all leakage about the diamond in the nest. In the past, distortion at this point caused leakage about the diamond, but when the present improved terminal structures are utilized leakage is positively prevented under any circumstances.

The extended longitudinal end 22 of reinforcing member 18 provides stiffness throughout the terminal end of the sealing strip and serves to eliminate distortion of nest 14. To further reinforce and rigidify this terminal structure, the lower plate 36 of clamp 32 fits downwardly in close contact with the upper surface of reinforcing member 22 to provide a completely rigid and undistortable terminal structure for the sealing strips and the ends of the tapes.

It will be understood that similar clamping means are utilized to clamp the bound edges of lower tapes 11' and 12' to hold them in close engagement at the underside of the closure beyond the nest.

Where the closure is not subjected to extraordinary strains or pressures the reinforcing means for the nest may be dispensed with, if desired, though the preferred embodiment incorporates such reinforcing means.

Mechanical modifications of the foregoing elements

of the structure may be made without departing from the spirit of this invention.

Attention is directed to the appended claims for a limitation of the scope of the invention.

What is claimed is:

1. In an improved sealing closure structure of the double slide fastener, sealing strip type provided with aligned rows of closure teeth above and below the sealing strips connected to the lateral extremities thereof by tapes, a nest provided in the terminal ends of the faces of the sealing strips to receive the diamond of the slider, a vertically disposed reinforcing member surrounding said nest and extending centrally of the strip to the end of the strips and clamping means fitted over the extremities of the tapes and bearing against the upper surface of said reinforcing means.

2. In an improved sealing closure structure of the double slide fastener, sealing strip type provided with aligned rows of closure teeth above and below the sealing strips connected to the lateral extremities thereof by tapes, a nest provided in the terminal ends of the faces of the sealing strips to receive the diamond of the slider, vertically disposed, flattened metal reinforcing means surrounding said nest and extending therefrom centrally of the strips to the end of the strips to prevent distortion of the extremity of the strips and clamping means fitted over the extremities of the tapes and bearing against said reinforcing means.

3. In an improved sealing closure structure of the double slide fastener, sealing strip type provided with aligned rows of closure teeth above and below the sealing strips connected to the lateral extremities thereof by tapes, a nest provided in the terminal ends of the faces of the sealing strips to receive the diamond of the slider, vertically disposed flattened reinforcing means surrounding said nest and extending to the end of the strips along the medial line thereof to prevent distortion of the end of the strips and clamping means fitted over the extremities of the tapes in close contact with said reinforcing means.

4. In an improved sealing closure of the double slide fastener, sealing strip type provided with aligned rows of closure teeth above and below the sealing strips connected to the lateral extremities thereof by tapes, a nest provided in the terminal faces of the sealing strips to receive the diamond of the slider, elliptically curved reinforcing means vertically disposed in said sealing strips about said nest, a longitudinally extending, vertically disposed reinforcing member extending from said curved reinforcing means to the extremity of said sealing strips,

clamp means disposed over the terminal ends of the tapes and bearing closely against said reinforcing member.

5. In an improved sealing closure of the double slide fastener, sealing strip type provided with aligned rows of closure teeth above and below the sealing strips connected to the lateral extremities thereof by tapes, a nest provided in the terminal faces of the sealing strips to receive the diamond of the slider, elliptically curved reinforcing means vertically disposed in said sealing strips about said nest, a longitudinally extending, vertically disposed reinforcing member extending from said curved reinforcing means to the extremity of said sealing strips between the strips, bindings on the terminal edges of the tapes, longitudinally grooved clamping means fitted over said bindings and holding said tapes closely together over said reinforcing member.

6. In an improved sealing closure of the double slide fastener, sealing strip type provided with aligned rows of closure teeth above and below the sealing strips connected to the lateral extremities thereof by tapes, a nest provided in the terminal faces of the sealing strips to receive the diamond of the slider, a flattened resilient reinforcing member vertically disposed within said sealing strip about said nest conforming to the curvature of said nest and of a height equal to the central thickness of said sealing strips, an elongate, vertically disposed flattened extension extending from said nest reinforcing member to the outer extremity of said strips between said strips to prevent distortion thereof adjacent the nest and horizontally disposed flattened clamping means binding the terminal ends of the tapes and bearing closely against said flattened extension.

References Cited in the file of this patent

UNITED STATES PATENTS

1,296,248	Williamson	Mar. 4, 1919
2,002,001	Beard	May 21, 1935
2,013,071	Sipe	Sept. 3, 1935
2,119,621	Ferrone	June 7, 1938
2,296,468	Feist	Sept. 22, 1942
2,316,787	Gould	Apr. 20, 1943
2,321,926	Marinsky	June 15, 1943
2,338,535	Pfleumer	Jan. 4, 1944
2,454,214	Sapp	Nov. 16, 1948
2,494,249	Krupp	Jan. 10, 1950
2,496,878	Krupp	Feb. 7, 1950
2,535,391	Clarke	Dec. 26, 1950