

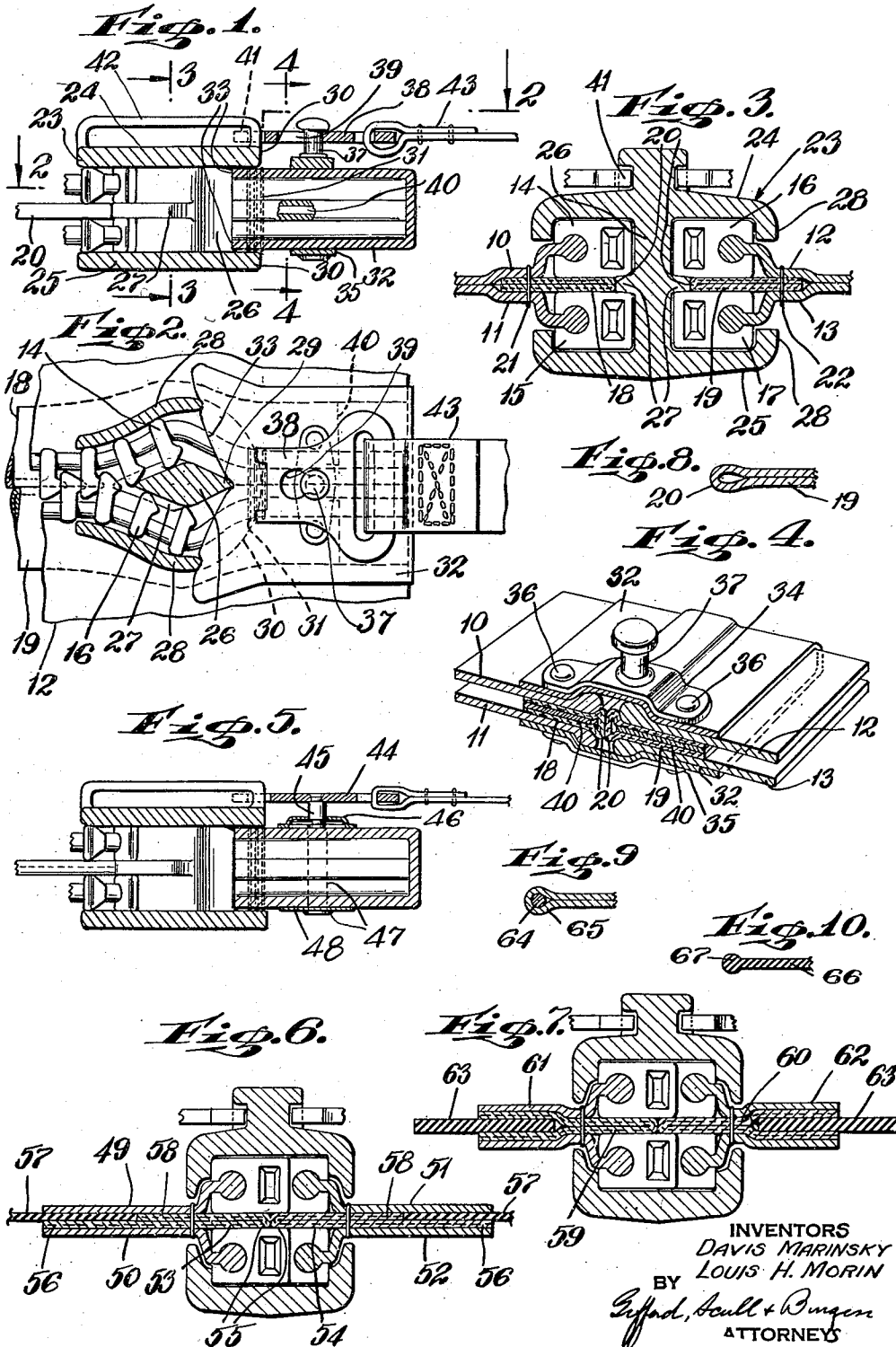
June 15, 1943.

D. MARINSKY ET AL

2,321,926

HERMETIC SEPARABLE FASTNER

Filed Sept. 5, 1941



INVENTORS
DAVIS MARINSKY
LOUIS H. MORIN
BY
Erford, Acull & Bingen
ATTORNEYS

UNITED STATES PATENT OFFICE

2,321,926

HERMETIC SEPARABLE FASTENER

Davis Marinsky and Louis H. Morin,
Bronx, N. Y.

Application September 5, 1941, Serial No. 409,634

15 Claims. (Cl. 24—205)

This invention relates to separable fasteners of the type employing stringers coupled and uncoupled by a slider movable longitudinally of the stringers. More particularly, the invention relates to hermetic fasteners of this type and kind having means on the stringer tapes and slider effecting a seal through the full length of the fastener when the fastener is in fully closed position, as well as to retain the slider in closed position, to adapt the device to such uses where a complete seal of an opening is desirable. The novel features of the invention will be best understood from the following description when taken together with the accompanying drawing in which certain embodiments of the invention are disclosed and in which the separate parts are designated by suitable reference characters in each of the views; and in which:

Fig. 1 is a section view through one end portion of a fastener and the slider arranged thereon showing the slider in retained position.

Fig. 2 is an irregular sectional plan substantially on the irregular line 2—2 of Fig. 1.

Fig. 3 is a cross sectional view, substantially on the line 3—3 of Fig. 1, on an enlarged scale.

Fig. 4 is a perspective section of the joined stringer tapes substantially on the line 4—4 of Fig. 1.

Fig. 5 is a view similar to Fig. 1 showing another form of slider retaining means.

Fig. 6 is a cross sectional view through the small end of the slider showing the coupled stringers and illustrating a modification.

Fig. 7 is a view similar to Fig. 6 showing another modification.

Fig. 8 is a sectional detail view of the inner end portion of one form of sealing strip which is employed; and,

Figs. 9 and 10 are views similar to Fig. 8 showing other forms of strip.

In our prior application Ser. No. 367,698, filed November 29, 1940, the hermetic fastener is adapted for uses where the necessity of sealing both ends of the fastener was not essential; that is to say, in applying fasteners of the type and kind of various types of waterproof shoes, boots, and similar footwear, as well as to body garments wherein it is only essential to carry the seal to the point of closure of a fastener. It is one of the purposes of our present invention to provide a tape construction which is adaptable to all types and kinds of fasteners of the kind under consideration while at the same time providing a fastener structure which employs an end stop construction and a slider structure which effects a

seal at the end of the fastener and around the slider when the fastener is in closed position. This type of construction is suitable for forming a closure to openings of any type or kind, such for example, as pockets of various garments, the closure of various types and kinds of containers, such for example, as gas mask containers, or in any use where a hermetic closure is desired for an opening in merchandise or articles of different kinds and descriptions.

In Figs. 1 to 4 inclusive is illustrated one adaptation of the invention. In these figures, 10 and 11 represent the two stringers of one pair, and 12 and 13 represent corresponding stringers of the companion pair. On the beaded edges of the stringers 10, 11, are links 14, 15, and on corresponding edges of the stringers 12, 13, are links 16 and 17.

Arranged between each pair of stringer tapes are sealing strips 18 and 19, comprising folded strips or rubber, rubber impregnated cloth, rubber treated fabric, including synthetic rubber or compounds, such as Neoprene or Kero seal. In certain forms of construction, these sealing strips are folded intermediate side edges thereof to form an inner loop 20, note Fig. 8, which illustrates the folded portion of the strip 19, and the folded or looped portion 20 of each strip extends beyond the beaded edge of the stringer tapes, but terminates short of the outer extremities of the links attached thereto, so that when the stringer links 14—16, 15—17, are coupled together, the edges 20 will be brought into abutting relationship to each other under slight compression, effecting a seal between the strips 18, 19, where they abut between opposed coupled links.

It will also be apparent that the coupled links have a pressure engagement upon upper and lower surfaces of the sealing strips to support these strips in abutting and sealed relationship as is more specifically pointed out in the prior application referred to.

This firm engagement of the coupled links is made possible by securing the stringer tapes 10 and 11, and 12 and 13, to the strips 18, adjacent the attached ends of the links as is clearly illustrated in Fig. 3, as well as in Figs. 6 and 7. The tapes may be cemented to the sealing strips and in addition, if desired, a line of stitching 21, 22, can be employed as noted in Fig. 3 to join the pairs of tapes firmly together and to the sealing strips employed.

To couple and uncouple stringers of the type and kind defined we employ a novel slider structure 23 comprising a top wall 24 and bottom wall

25 joined at the wide end portion thereof by a connecting web 26 which instead of being substantially triangular in cross sectional form is substantially of diamond shape cross sectional form as appearing in Fig. 2 of the drawing. In addition to the difference in cross sectional contour, the web has centrally thereof an outwardly projecting ridge or rib 27 which extends in the direction of the small or contracted end of the slider and is arranged on two sides only of the web 26. This rib serves to engage the inner folded edges 20 of the sealing strips 18 and 19 as clearly noted in Fig. 3, and also indicated in Fig. 2 to effect a seal between these strips within the slider structure when the latter is in the closed position. This rib will extend sufficiently to form a pressure engagement of the sealing strips therewith, and at the same time gives the necessary clearance for the stringer links within the slider body 23 as will be apparent from a consideration of Fig. 2. The walls 24 and 25 of the slider have at their side edges inturned flanges 28, two of which are shown in section in Fig. 2 of the drawing in order to clearly illustrate the invention; and these flanges extend from the narrow contracted end of the slider to points short of the pointed end 29 of the web 26. The upper and lower walls 24, 25 of the slider also include at their wide ends projecting flanges 30 which extend beyond the end 29 of the web and are adapted to form shields or guards over the ends of the tapes and sealing strips where they are brought together and united by a stitching or other suitable means as at 31.

At this securing point and adjacent the same, the sealing strips 18 and 19, or their folded edges 20, will be brought together under considerable pressure to effect a positive seal therebetween as is diagrammatically illustrated in Fig. 4. While the beaded edges of the stringer tapes 10, 11, and 12, 13, are disposed in close proximity to each other, it is not absolutely essential that these beaded edges be brought together. Before securing the stringer tapes together as at 31, an end sealing strip or sheet 32 is first arranged upon the outer surfaces of the stringer tapes preferably by folding a single sheet of resilient material around the ends of the tapes and extending this sheet inwardly onto the tapes to form inner edges 33 which are adapted to be engaged by the pointed end 29 of the web 26 and by the ends of the inturned flanges 28 as indicated in Fig. 2 of the drawing, the edges 33 being flexed in this operation.

In addition to uniting the stringers as at 31, another coupling is provided in the form of two transversely arranged top and bottom plates 34 and 35 riveted together as seen at 36. The top plate 34 also includes an upwardly projected headed pin 37 centrally thereof which forms part of a coupling or slider retaining means. The other part of this retaining means comprises a pull 38 movably supported upon the slider 33 and having a keyhole aperture 39 through which the pin 37 is passed in the operation of securing the pull 38 to said pin. It will, of course, be understood that the slider 23 is retained in position under tension in effecting a seal between the parts within the slider body while at the same time firmly supporting the pull 38 against accidental displacement.

It is also preferred that a filler body 40 be employed between the folds of the sealing strips 18, 19, where secured together at 31, and also by the retaining means 34, 35, 36, to compensate

for the omission of the links on the stringer tapes, and the sealing strip 32 is made sufficiently thick, particularly at the edge portion 33 thereof to establish firm engagement of the strip with the inner surfaces of the flanges 30, which further aids in effecting the seal of the fastener as will be apparent.

The pivot end 41 of the pull is movable along a channeled rib 42 on the top wall of the slider in operating the pull to open and close the fastener. However, any desired type and kind of pull mounting may be employed. At 43 is shown a finger piece strap coupled with the pull to facilitate operation thereof.

In Fig. 5 of the drawing is shown a slight modification of the structure shown in Figs. 1 to 4 inclusive. In this figure a pull 44 has projecting from one surface thereof a headed pin 45, forming the button part of a snap button fastener, the female or spring socket part being illustrated at 46. This part is substituted for the plate 34 and is secured in position by rivets 47, similar to the rivets 36, which also pass through a bottom plate 48. Otherwise, the structure of Fig. 5 is identical with that shown in the other figures; and no further brief description is required, and like parts are identified by like references.

In Fig. 6 is shown a slight modification of the structure shown in the other figures, primarily from the standpoint of the form and arrangement of the sealing strips in connection with the stringer tapes. In this figure 49 and 50 represent the stringer tapes of one pair; 51 and 52 the stringer tapes of the other pair. At 53 and 54 are shown sealing strips which are substituted for the strips 18 and 19. The only difference between these two strip constructions is that wider sealing strips are employed, and instead of folding the strips centrally, they are folded off-center to form the inner abutting rounded edges 55, thus providing an extending side 56 on each strip which extends the full width of the tapes of the stringers 49, 52. With this type of construction, it will appear that the product or article portions 57 to which the stringers are to be cemented or otherwise attached can be arranged between the extensions 56 and the tapes of the stringers 49, 51, outwardly of the short ends 58 of the sealing strips. This will provide another adaptation of the structure to various uses; and it will appear that with this structure, the sealing strips extend in an overlapped relation onto the supports 57.

In Fig. 7 of the drawing a further slight modification of the sealing strip construction is shown, wherein the sealing strips 59 and 60 have both side portions extending the full width of the tapes of the pairs of stringers indicated generally by the reference characters 61 and 62, and the supports 63 to which the stringers are attached are arranged between both sides; or in other words, within the fold of the sealing strips 59 and 60.

It will, of course, be apparent that the extension of the sealing strips throughout the full width of the stringer tapes is essential only when the stringer tapes are composed of fabric material, but where these strips are composed of rubber or rubberized materials or processed materials to render the same waterproof, the extension of the sealing strips is not necessary and shorter strips of the type and kind illustrated, for example in Fig. 3 of the drawing, can be employed. Moreover, in some installations, the seal can be readily accomplished with a structure

of the type illustrated in Fig. 3 whether or not the stringer strips are of waterproof or other characteristics necessary to produce the hermetic type of fastener.

While we have illustrated in Figs. 1 to 8 inclusive sealing strips of a specific structure, it will be understood that various types and kinds of strips may be employed. For example, in Fig. 9 of the drawing, a strip of the general type shown in Figs. 1 to 8 is illustrated wherein a filler 64 is disposed in the folded portion 65 of the strip. The filler will preferably be of a soft and yieldable structure so as to compensate for the firm engagement of adjacent ends of the sealing strips in effecting the seal longitudinally of the stringers throughout the full length thereof.

In Fig. 10 is illustrated another adaptation of the invention in which figure a sealing strip 66 of rubber, synthetic rubber, or the like, is employed, and the inner end of this strip will preferably be slightly enlarged or beaded as indicated at 67 in order to insure the compression of this edge in firmly abutting the sealing strips of opposed stringers.

With a fastener of the type and kind under consideration the sealing strips are firmly supported and held in abutting engagement with each other by the pressure engagement of the coupled links upon upper and lower surfaces of the abutted strips. For purposes of description each stringer of the fastener may be said to comprise a pair of link chains, each chain being formed from a mounting strip to one edge of which are attached the coupling links. Between each pair of link chains are disposed the sealing strips. These sealing strips are preferably so mounted between the link chains that when the link chains of both stringers are coupled together, the links will bear upon or have a slight pressure engagement upon the intervening and abutting sealing strips.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A hermetic closure of the class described comprising a pair of sealing strips, each strip having a fold therein and being composed of waterproof material, means attached to each side of each strip for joining said strips with the folded edges in abutting relationship to each other, means movable longitudinally of said strips to couple and uncouple said last named means, and means cooperating with said last named means joining and forming a seal at one end of said strips.

2. A separable fastener comprising stringers adapted to be coupled and uncoupled, each stringer comprising a pair of link chains with a sealing strip disposed between said link chains, means for coupling link chains of one stringer with those of the companion stringer to maintain the link chains of both stringers in engagement with the sealing strip of both stringers while maintaining adjacent edges of said strips in abutting relationship to each other, said abutting edges of the strips comprising yieldable portions adapted to flex in coupling said link chains, means coupling said strips in abutting relationship to each other adjacent end links of said link chains, and said last named means including means cooperating with the first named means to form a seal at said end of the stringers.

3. A separable fastener comprising two stringers, each stringer having a pair of link chains, 75

a folded sealing strip disposed between each pair of link chains and secured thereto adjacent the links of said chains with the folds in said strips disposed intermediate the links, a slider movable longitudinally of said stringers to couple the pair of chains of said stringers and in supporting the links thereof in firm engagement with said sealing strips, and said sealing strips extending the full width of the link chains.

4. A separable fastener comprising two stringers, each stringer having a pair of link chains, a folded sealing strip disposed between each pair of link chains and secured thereto adjacent the links of said chains with the folds in said strips disposed intermediate the links, a slider movable longitudinally of said stringers to couple the pair of chains of said stringers and in supporting the links thereof in firm engagement with said sealing strips, said sealing strips extending the full width of the link chains, and means coupling the stringers adjacent end links thereon, with the sealing strips in abutting relationship, and said last named means including a supplementary sealing strip cooperating with said slider to form a seal at said end of the stringers.

5. A separable fastener comprising two stringers, each stringer having a pair of link chains, a folded sealing strip disposed between each pair of link chains and secured thereto adjacent the links of said chains with the folds in said strips disposed intermediate the links, a slider movable longitudinally of said stringers to couple the pair of chains of said stringers and in supporting the links thereof in firm engagement with said sealing strips, said sealing strips extending the full width of the link chains, means at one end of the stringers adjacent end links thereon for coupling said stringers with the sealing strips in abutting relationship, and means on the slider cooperating with said last named means to retain the slider in firm engagement with said end, to form a seal at said end of the stringers.

6. A separable fastener comprising two stringers, each stringer having a pair of link chains, a folded sealing strip disposed between each pair of link chains and secured thereto adjacent the links of said chains with the folds in said strips disposed intermediate the links, a slider movable longitudinally of said stringers to couple the pair of chains of said stringers and in supporting the links thereof in firm engagement with said sealing strips, said sealing strips extending the full width of the link chains, means at one end of the stringers adjacent end links thereon for coupling said stringers with the sealing strips in abutting relationship and means on the slider cooperating with said last named means to retain the slider in firm engagement with said end to form a seal at said end of the stringers, and other means on the slider cooperating with said sealing strips to effect a seal between the strips and slider when the slider is in closed position.

7. In hermetic fasteners of the class described employing stringers having sealing strips united to form a seal longitudinally of the stringers, an end coupling for said stringers comprising means joining the stringers with said sealing strips in abutting relationship, a slider movable along the stringers to couple and uncouple same, and means on the slider and said end coupling forming a seal between the slider and stringers when the slider is in closed position.

8. In hermetic fasteners of the class described

employing stringers having sealing strips united to form a seal longitudinally of the stringers, an end coupling for said stringers comprising means joining the stringers with said sealing strips in abutting relationship, a slider movable along the stringers to couple and uncouple same, means on the slider and said end coupling forming a seal between the slider and stringers when the slider is in closed position, and means retaining the slider in tensional engagement with the end coupling of said stringers.

9. In separable fasteners employing stringers and a slider movable longitudinally of the stringers to couple and uncouple the same, a yieldable end stop uniting the stringers adjacent end links thereon, and said slider and end stop having inter-engaging parts adapted to be coupled together when the slider is in closed position to support the slider in pressure engagement with said yieldable end stop and against accidental displacement therefrom.

10. In separable fasteners employing stringers and a slider movable longitudinally of the stringers to couple and uncouple the same, a yieldable end stop uniting the stringers adjacent end links thereon, said slider and end stop having inter-engaging parts adapted to be coupled together when the slider is in closed position to support the slider in pressure engagement with said yieldable end stop and against accidental displacement therefrom, said end stop including a sealing strip arranged upon upper and lower surfaces of the stringers, and said slider having protruding flanges adapted to engage said sealing strip to effect a seal at said end of the stringers.

11. In separable fasteners of the class described, a slider, said slider comprising a channeled body having spaced walls joined centrally of one end portion by a connecting web, opposed walls of the slider having inwardly extending side flanges, said web having a projecting rib centrally of opposed sides thereof and with respect to said top and bottom walls, and said rib dividing the slider body into upper and lower link receiving channel portions.

12. In separable fasteners of the class described, a slider, said slider comprising a channeled body having spaced top and bottom walls contracted at one end, the other wide end of said body having a central web uniting said walls, said web being contracted in the direction of

the narrow end of said body, said contracted end of the web having an outwardly projecting rib centrally with respect to said top and bottom walls, and said rib being contracted in the direction of the narrow end of said body and projecting beyond the corresponding end of said web.

13. In separable fasteners of the class described, a slider, said slider comprising a channeled body having spaced top and bottom walls contracted at one end, the other wide end of said body having a central web uniting said walls, said web being contracted in the direction of the narrow end of said body, said contracted end of the web having an outwardly projecting rib centrally with respect to said top and bottom walls, said rib being contracted in the direction of the narrow end of said body and projecting beyond the corresponding end of said web, said web being contracted in the direction of the wide end portion of said walls, and said top and bottom walls having flanges projecting beyond the last named contracted end of said web.

14. In hermetic separable fasteners forming closures for openings, said fastener comprising stringers adapted to be coupled and uncoupled by a slider movable along the stringers, each stringer comprising two stringer tapes with coupling links arranged longitudinally of one edge portion of said tapes, means extending longitudinally of the stringers providing a seal throughout the full length of an opening controlled by said fastener when the stringers are coupled by said slider, and said means including means forming a seal around the slider when in closed position.

15. In hermetic fasteners employing stringers comprising a pair of link chains, sealing means disposed longitudinally of the stringers intermediate the chains and beyond end of links thereon, a slider for coupling and uncoupling said stringers, said slider having projecting members engaging the link chains and said sealing means to provide a seal around the slider when the slider is in the position coupling the stringers, and the end of the stringers engaged by the slider when in closed position having other sealing means cooperating with predetermined projecting members of said slider in effecting said seal.

DAVIS MARINSKY.
LOUIS H. MORIN.

CERTIFICATE OF CORRECTION.

Patent No. 2,321,926.

June 15, 1943.

DAVIS MARINSKY, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 7, for "through" read --throughout--; line 46, for "of" before "various" read --to--; and second column, line 21, for "or" before "rubber" read --of--; page 2, first column, line 63, for "slider 33" read --slider 23--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of July, A. D. 1943.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.