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SLIDE ACTUATED CLOSURE

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Fig. 1.

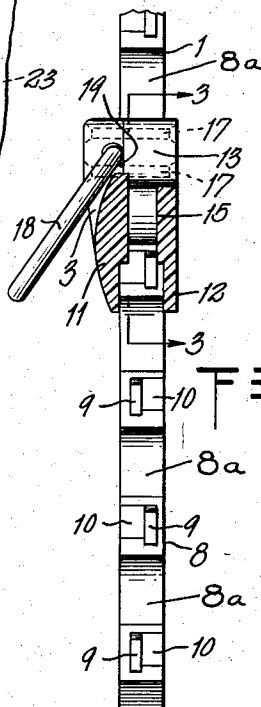
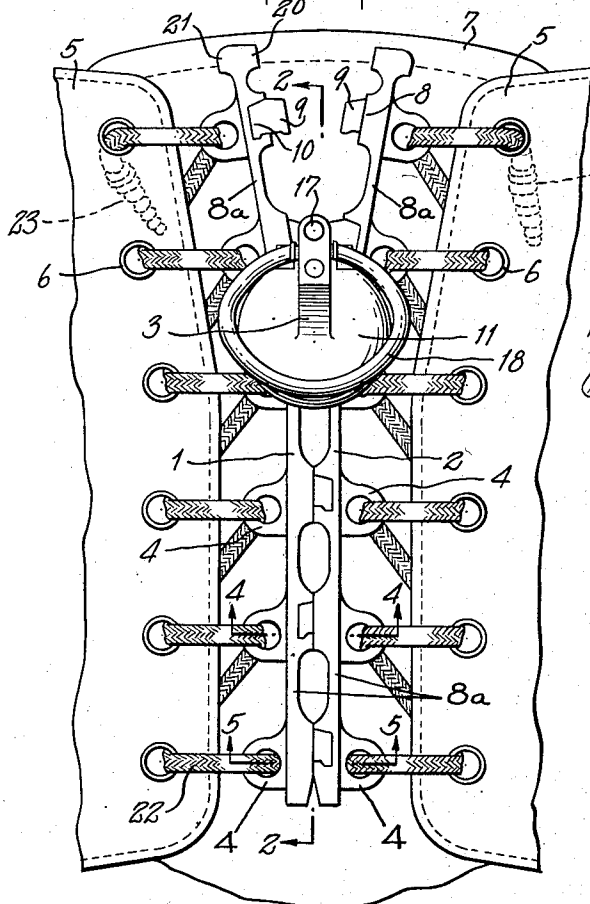


Fig. 2.

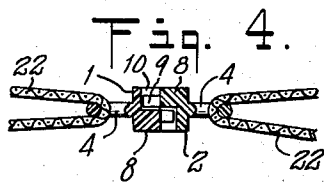


Fig. 4.

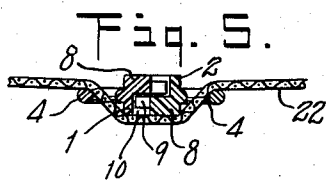


Fig. 5.

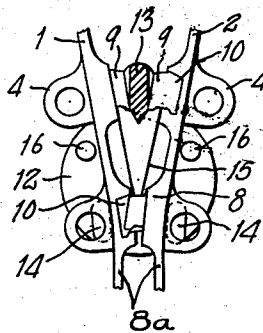


Fig. 3.

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2,867,878

SLIDE ACTUATED CLOSURE

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This invention relates to improvements in slide actuated closures, of the type consisting of a pair of stringers, each provided with a series of interlocking elements, adapted to be engaged or disengaged for closing or opening of the closure by movement of a slider therealong. Such a closure is similar to, but not the same as, the well-known slide fastener or zipper, and differs therefrom in one important respect, among others, that the stringers are provided with a series of lace holes or eyes whereby the closure may be laced into an article, such as a shoe, tarpaulin, or the like, to which a closure is to be applied, thus eliminating the fabric of the conventional slide fastener, and the necessity of sewing such fabric to apply the closure.

It is one of the objects of my invention to provide a slide actuated closure which may be laced into an application such as a shoe, tarpaulin or the like, so that the closure may be applied to an application in the field, since it does not require for its application a sewing machine or other specialized equipment or tools.

It is another object to provide a stringer for such a closure which is of simple geometry and can, therefore, be manufactured quickly and inexpensively.

It is a further object to provide a stringer for such a closure which may be made by injection moulding of a plastic material, such as a linear polyamide resin, in a single cavity die which does not require retractable cores or re-entrant configurations in the die cavities.

It is still another object of this invention to devise such a closure in which only one stringer casting is required, i. e., whereby any two stringer castings from a single die or mould may be mutually engaged to form a closure.

Various other objects and advantages of this invention will be more apparent in the course of the following specification, and will be particularly pointed out in the appended claims.

In the accompanying drawings, there is shown for the purpose of illustration, an embodiment which my invention may assume in practice.

In these drawings:

Fig. 1 is a front elevational view of the slide actuated closure of my invention, shown laced to the lace flaps of a shoe, the shoe being shown in part only;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1; and

Fig. 5 is a sectional view similar to Fig. 4, taken along line 5—5 of Fig. 1.

Like characters of reference designate corresponding parts in the different views.

Referring to the drawing, my closure consists, broadly, of a pair of stringers, 1 and 2, adapted to be engaged or disengaged for closing or opening by a slider 3. The closure is particularly adapted to be applied to an opening such as the access opening of a shoe which is normally laced and which has to be unlaced to be opened. To

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this end the stringers 1 and 2 may be provided with lace eyes 4, 4, and I have illustrated by closure laced into a shoe, of which parts only are shown, such as lace flaps 5, 5 provided with the usual lace holes or eyelets 6, 6 and a tongue 7.

Each stringer 1 or 2 of the closure, which, it should be noted, are identical, is provided with a series of uniformly spaced, thickened or interlocking portions, designated 8 in the drawing, connected together by relatively thin flexible portions 8a. On the inner edge of each of these interlocking portions 8, there is arranged a substantially hook-shaped interlocking projection 9, an interlocking projection receptacle or recess 10 which is open to the side of the interlocking portion in which it is arranged. As best illustrated in Fig. 2, each interlocking projection 9 is disposed on one side of the longitudinal centre or medial line of the stringer and thickened portion, and the adjacent interlocking projection receptacle 10 is located on the opposite side of the centre or medial line, and the order of the projections 9 and receptacles 10 on successive thickened portion 8 reverses from one thickened portion to the next thickened portion, or, in other words, every other interlocking projection along a stringer is on one side of the longitudinal centre line of the stringer, and the others are on the other side of the centre line, for a purpose which will become apparent later herein.

The slider 3 of the closure may consist of a pair of plate-like members 11 and 12, connected by a neck 13, which is preferably of wedge-shape section, as best shown in Fig. 3. At least one of the members 11 and 12 is provided with a pair of bosses 14, 14, which are preferably of circular or oval section, and at least one of the members 11 and 12 may also be provided with a boss 15 of elongated V-shape. Each member 11 or 12 may also be provided with an additional pair of bosses 16, 16, preferably of circular section, which as best illustrated in Fig. 3, are spaced transversely of the closure a greater distance than are the bosses 14, 14. As illustrated, the slider 3 has been made by die-casting the unit in two halves consisting of a member 11 or 12, a pair of bosses 14, a boss 15, a pair of bosses 16, and part of the neck 13, and rigidly connecting the halves together by means such as rivets 17, 17 but such construction has been shown merely for purpose of illustration, and the slider may be constructed in a number of other ways. The slider may also be provided with a pull, or handle 18, which, as illustrated, may be in the form of a bail concentric with the plate-like element 11 of the slider, and may be provided with one or more closure locking projections 19.

On one end of each of the stringers 1 and 2, means for preventing removal of the slider from the stringers may be provided, and, as illustrated, such means may take the form of a projection 20 extending inwardly of the closure, and a second projection 21 extending outwardly of the closure.

In use, the closure may be laced into an opening to be closed, such as the space between the lace flaps 5, 5 of the shoe illustrated, by means of a lace 22 having the usual lacing tips 23, 23. One of the many ways of doing this, as shown in Fig. 1, is by anchoring one end of the lace 22 on the inside of the top lacing eye 6 of one lace flap 5, by a knot, then threading the lace through the top lace eye 4 of the stringer 1, thence back through the lace flap and through another lace eye on the stringer, and so on down the lace flap until the stringer 1 has been fully laced to the one lace flap of the shoe. At the bottom of the stringer 1 the lace is threaded through the lowermost lace eye 4, from the outside, is passed around behind the two stringers 1 and 2, and up through the lowermost lace eye on the stringer 2, whereafter the lace

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is passed back and forth between the other lace flap 5 and stringer 2 until that stringer is fully laced to the flap, whereafter the free end of the lace 22 may be anchored in the uppermost lace hole 6 of the flap by a knot, as was the first end of the lace.

With the closure laced in the shoe, as described, when the slider 3 is moved upwardly along the stringers 1 and 2, by grasping the pull 18, the closure is closed by virtue of the bosses 14 guiding the stringers 1 and 2 into close contact while the neck 13 of the slider keeps the stringers spread apart above the bosses 14, so that, as the slider travels along the stringers, each interlocking projection 9 of stringer 1 enters an interlocking projection receptacle 10 of the stringer 2 immediately opposite it, and at the same time the adjacent projection 9 of stringer 2 enters the receptacle 10 of stringer 1. Simultaneously the V-shaped bosses 15 of the slider guide the interlocking projections 9, so that those of one stringer pass over those of the other stringer. When the slider reaches the top of the closure it is prevented from coming off the stringers 1 and 2 by the projections 20, 20, which abut the neck 13 of the slider, and the projections 21, 21 which engage the bosses 16, 16 of the slider. In this position of the slider 3 the pull 18 may be folded flat against the closure, whereupon the locking projection or projections 19 protrude over the projections 20 on the ends of the stringers and engage such projections to prevent downward travel of the slider, i. e. to lock the slider on the closure.

On moving the slider 3 in the opposite direction along the stringers 1 and 2, the point of the wedge-shaped neck 13 enters successively between each pair of interlocking projections 9, 9, to spread the stringers 1 and 2 apart, and to cause the projections 9 therebelow to disengage from the receptacles 10 into which they were hooked by the closing action of the slider. At the lower end of the closure, the portion of the lace 22 bridging the two stringers (see Fig. 5) acts as a stop to engage the member 12 to keep the slider from coming off the closure. It will be understood that this method of stopping the slider at the bottom of the closure by the lace 22 is a matter of convenience, and other means, such as cementing the lowermost projections 9 into the corresponding receptacles 10, may be used.

It should be noted that the stringers 1 and 2, as illustrated, are identical, which permits the stringers to be moulded, or cast, in a single die, and that this result is possible because the interlocking projections 9 alternate from one side to the other of the stringer, along the length of the stringer, and the corresponding interlocking element receptacles 10 also alternate across the centre line of the fastener, so that when two stringers are engaged to form a closure each pair of interlocking projections 9 disposed opposite each other transversely of the closure keeps the two stringers from being displaced, in one sense, at right angles to the plane of the stringers, while the two adjacent pairs of interlocking projections prevent the stringers from being displaced, in the other sense, at right angles to the closure. With this alternating orientation of the interlocking elements and receptacles, stringers for my closure can be cast, or moulded, in a two-piece die which does not require retractable cores or re-entrant portions.

The closure stringers may be advantageously made of a linear polyamide resin, such as that commonly known as nylon, in which case the stringers may be fabricated rapidly and economically by injection moulding. The stringers may, of course, be made of other materials, the only requirements being that, as fabricated, the material be reasonably flexible, and substantially non-elastic to ensure that the interlocking projections will register with the corresponding receptacles as the slider is moved along the stringers to engage and disengage them.

It is quite possible to dispense with the bosses 16 of the slider, particularly if the closure is to be used in an

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application where the opening stress on the closure is not high. The bosses 14 may be required on only one of the plate-like elements 11 or 12 of the slider 3, if such simplification of the slider is desirable.

An advantage of my closure is that it provides a light, smooth working, and relatively inexpensive substitute for permanent lacing, buttons, or the like, in a wide variety of applications, and which may be applied to an application such as a shoe, tarpaulin, handbag, or the like, by lacing, whereby the closure can be added to an article by a user after it has been purchased, since it does not require special machinery or equipment for installation. By the same token, if the closure should become inoperative, through excessive or careless use, it can be replaced by the user without special equipment.

Another advantage of the stringer construction I have disclosed, is that it can be fabricated by moulding in a two-part die, free from retractable cores or undercuts, the presence of which would make a die for moulding such a closure prohibitively expensive, both as to first cost and to operation.

While I have shown and described an embodiment which my invention may assume in practice, it will be understood that this embodiment is merely for the purpose of illustration and description, and that other forms may be devised within the scope of my invention as defined in the appended claims.

What I claim as my invention is:

1. In a slide fastener closure of the class described, a pair of stringers made of a plastic material, each stringer consisting of a longitudinally extending continuous length member having a series of opposed spaced-apart interlocking portions arranged therealong integrally connected together by relatively thin flexible portions, each of said interlocking portions having a substantially hook-shaped projection arranged on one side of the longitudinal medial plane thereof and extending outwardly from the inner edge thereof, a recess corresponding in shape to said projection arranged in each of said interlocking portions to one side of said projection and directly next thereto on the other side of the longitudinal medial plane of said interlocking portion, each of said recesses being open to that side of the interlocking portion in which it is arranged.

2. In a slide fastener closure of the class described, as defined in claim 1, wherein the hook-shaped projection and recess of one interlocking portion are arranged opposite to those of the next succeeding interlocking portion of the series.

3. In a slide fastener closure of the class described, as defined in claim 1, including means arranged on the outer edges of each of said stringers directly opposite each of said interlocking portions for attaching the fastener stringers to the edges of an opening which the fastener is adapted to close.

4. In a slide fastener of the class described, a pair of stringers made of a plastic material, each of said stringers consisting of an elongated continuous length member having a series of directly opposed spaced-apart, relatively thick interlocking portions arranged therealong having relatively thin flexible portions arranged therebetween so that the interlocking portions and thin flexible portions are integrally connected together, each of said interlocking portions having a substantially hook-shaped portion and a corresponding recess arranged therein adjacent one another, said projections extending outwardly from the inner side of said interlocking portions and adapted to be positioned in the recess of the opposed interlocking portion when the fastener is closed, and an eyelet portion arranged on the outer side of each of said interlocking portions for attaching the stringers to the article with which the fastener is to be used.

5. In a slide fastener of the class described, a pair of stringers made of a plastic material, each of said stringers consisting of an elongated continuous length member

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having a series of directly opposed spaced-apart relatively thick interlocking portions arranged therealong having relatively thin flexible portions arranged therebetween so that the interlocking portions and thin flexible portions are integrally connected together, each of said interlocking portions having a substantially hook-shaped projection arranged on one side of the longitudinal medial plane thereof and extending outwardly from the inner side thereof and a recess corresponding in shape to said projection arranged to one side of said projections and directly next thereto on the other side of the longitudinal medial plane of each of said interlocking portions, the hook-shaped projection and recess of one interlocking portion being arranged on the side opposite the longitudinal medial plane to that of the next succeeding interlocking portion of the series, and an eyelet portion arranged on the outer side of each of said interlocking portions for attaching the stringers to the article with which the fastener is to be used.

6. In a slide fastener of the class described, the combination as defined in claim 5, including an end stop portion arranged integral with the endmost interlocking portion of said series of each of said stringers.

7. In a slide fastener of the class described, a pair of stringers made of a plastic material, each of said stringers consisting of an elongated continuous length member having a series of directly opposed, spaced-apart, relatively thick, interlocking portions arranged therealong connected by relatively thin portions, each of said interlocking portions having a substantially hook-shaped pro-

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jection arranged on the inner side thereof to one side of the longitudinal medial plane thereof and a recess corresponding in shape to said projection arranged therein directly next to said projection on the other side of the longitudinal medial plane of each of said interlocking portions, the projections and recesses being in staggered relation so that the projections and recesses of succeeding interlocking members are arranged on opposite sides of the longitudinal medial plane of the interlocking portions.

References Cited in the file of this patent

UNITED STATES PATENTS

557,207	Judson	Mar. 31, 1896
557,208	Judson	Mar. 31, 1896
1,813,385	Dalton	July 7, 1931
1,817,838	Poux	Aug. 4, 1931
1,836,958	Dalton	Dec. 15, 1931
1,837,838	Whitney	Aug. 4, 1931
1,850,160	Sundback	Mar. 22, 1932
2,066,060	Sipe	Dec. 29, 1936
2,110,740	Seaver	Mar. 8, 1938
2,252,305	Puschner	Aug. 12, 1941
2,496,925	Winterhalter	Feb. 7, 1950
2,736,940	Morin	Mar. 6, 1956

FOREIGN PATENTS

120,653	Sweden	Feb. 7, 1950
618,340	France	Mar. 7, 1927
956,320	France	Jan. 30, 1950