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(54) SEPARABLE SLIDE FASTENER

(71) We, YOSHIDA KOGYO K.K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumicho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates generally to slide fasteners, and in particular to separable slide fasteners wherein the pair of stringers are made completely separable from each other, as for use with windbreakers and other garments. More particularly, the invention is directed to an aligning device in the slide fastener of the class under consideration whereby the fastener stringers can be coupled and uncoupled with extreme ease.

There are two well known types of separable slide fasteners, one which permits the fastener to be opened from one end only, and another known as the "two-way" or "double acting" type which permits the fastener to be opened from both ends. The former type of fasteners usually have a single slider in combination with what is generally referred to as the box and pin separable coupling, whereas the later type of fasteners incorporate a pair of sliders arranged reversely with respect to each other on the rows of inter-locking fastener elements. In either type of fasteners, it is necessary that the slider and the box member, or pair of sliders, be held in correct alignment with each other on one of the fastener stringers during insertion or removal of the pin member on the other stringer into or out of their guide channels.

A wide variety of aligning devices have heretofore been suggested and used to this end. United States Patent No. 2,069,655, for example, discloses a device wherein the slider is provided with an extension of U-shaped cross section so as to fit over parts of the box member. The slider of such configuration inevitably becomes bulky in size, uneconomical, and unfavourable in appearance. French Patent No. 739,942 and U.S. Patents Nos. 2,728,125 and

3,583,043 are more or less identical in that they suggest devices wherein inter-engaging notch or notches and projection or projections are formed respectively at the opposed ends of the slider and the box member or of the pair of sliders. All these devices are unsatisfactory because the interengaging notch and projection are too conspicuous, requiring undue modification in the external appearance of the sliders. Further, according to U.S. Patent No. 2,302,239 and Japanese Patent Publication No. 47-9388, the box member has a projecting pin portion adapted to enter a groove or grooves formed internally of the slider, but this arrangement is inapplicable to the two-way type of separable fasteners.

In view of the listed drawbacks of the prior art, the present invention seeks to provide an improved aligning device adaptable for use both with the separable slide fastener of the two-way type and with those of the usual box-and-pin-coupling type, although the device may be better suited for use with the former type of fasteners.

The invention further seeks to provide an aligning device of the character described, whereby the manipulation of the separable slide fasteners is materially simplified, particularly in connection with insertion or removal of a pin member on one of the fastener stringers into or out of a pair of sliders on the other stringer.

The invention still further seeks to provide an aligning device of the character described, which requires minimum modification in the shape or size of the sliders, such that the general appearance of the conventionally known sliders is substantially retained intact.

The invention furthermore seeks to provide an aligning device of the character described, which is compact, inexpensive and durable in construction and which permits the sliders to be correctly and securely aligned with each other over prolonged periods of use.

According to one aspect of the invention, there is provided a separable slide fastener including a pair of stringers having longi-

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5 longitudinal rows of interlocking fastener elements on their opposed edges respectively, a pair of sliders arranged reversely with respect to each other on said rows of fastener elements for longitudinal movement therealong to engage and disengage the same, each of said sliders having a body consisting of a pair of spaced-apart and interconnected wings adapted to define a generally Y-shaped guide channel therethrough, a stop member arranged on one end of one of said stringers for retaining said sliders on said one stringer when the other stringer is completely separated therefrom, and a pin member arranged on the corresponding end of said other stringer for insertion through the guide channels of both of said sliders, wherein a pair of recesses is formed at that end of one of said sliders disposed opposite to the other slider, said recesses being formed in the respective wings of said one slider so as to be substantially invisible at least from the outside surfaces of said wings, and a pair of tongues formed at the corresponding end of the other slider and adapted to be neatly received in said recesses respectively for aligning said sliders when said pin member is to be inserted into or removed out of the guide channels.

30 Another aspect of the invention provides a separable slide fastener including a pair of stringers having longitudinal rows of interlocking fastener elements on their opposed edges respectively, a slider arranged on said rows of fastener elements for longitudinal movement therealong to engage and disengage the same, said slider having a pair of spaced-apart and interconnected wings disposed to define a generally Y-shaped guide channel therethrough, a box member arranged on one end of said stringers for limiting the movement of said slider, said box member having a pair of spaced-apart and interconnected plate portions having a guide channel therein, and a pin member arranged on the corresponding end of the other stringer for insertion through the guide channels of said slider and said box member, wherein a pair of recesses is formed in the slider so as to be substantially invisible at least from the outside surfaces of the slider and a pair of tongues are provided on the box member, said tongues having a configuration complementary to the corresponding recesses in the slider and being disposed for insertion thereinto, each recess and corresponding tongue being disposed on respective confronting ends of said slider and box member, and the tongues and recesses being generally trapezoidal to aid in the alignment of said slider and box member when the tongues are received in the recesses, thereby aiding the insertion and removal

through said guide channels of the pin member.

Alternatively, the recesses may be formed in the box member and the tongues provided on the slider.

The invention will now be further described, by way of example, with reference to the accompanying drawings which illustrate some preferred embodiments of the invention and in which like reference characters denote corresponding parts of the several views, and in which:

Figure 1 is a fragmentary perspective view of a separable slide fastener of the two-way type configured in accordance with the invention;

Figure 2 is a fragmentary top plan view of the separable slide fastener of Figure 1, in which the pull tabs are omitted and in which the pair of sliders are shown in their properly aligned position;

Figure 3 is a side elevational view, partly in section, of the pair of sliders aligned as in Figure 2;

Figure 4 is a view similar to Figure 2 which is explanatory of the positions which the respective sliders will assume when a pin member is about to be inserted into their guide channels;

Figure 5 is a sectional view taken along the line V—V in Figure 4;

Figure 6 is also a sectional view taken along the line VI—VI in Figure 2;

Figure 7 is a fragmentary sectional view similar to Figure 3 showing another preferred embodiment of the invention;

Figure 8 is a fragmentary top plan view showing still another preferred embodiment of the invention; and

Figure 9 is a perspective view of the box member of a box and pin separable coupling constructed according to the invention.

As best illustrated in Figure 1, the two-way separable fastener comprises a pair of stringer tapes 10 and 11 carrying longitudinal rows of spaced-apart interlocking fastener elements 12 of any known or suitable type on their opposed beaded edges respectively. In order to permit the fastener to be opened from either end, there are arranged on the rows of fastener elements 12 a pair of sliders 13 and 14 which are disposed reversely from each other and are adapted for longitudinal movement along the fastener elements for engaging and disengaging the same in the usual manner.

As seen in Figures 2 and 3, each of the sliders 13 and 14 has a body portion comprising a pair of spaced-apart wings or plate members 15 and 16 having flanges 17 along their marginal edges and interconnected through an integral neck or web 18 at their flared end 19 so as to define a generally Y-shaped guide channel through the slider. Such guide channels of the respec-

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tive sliders are adapted to permit the wings of fastener elements 12 to be threaded there-through for their engagement or disengagement. Each of the sliders 13 and 14 is further provided with a longitudinally extending lug 20 on its top wing 15 to which there is pivotally and slidably attached a finger piece or pull tab 21 for use in manipulating the slider.

10 A pair of pin members 22 and 23 are attached to the opposed edges of the respective stringer tapes 10 and 11 at one end of the fastener. As indicated in Figure 2, the pin member 23 includes an integral stop portion 24 for limiting the movement of the slider 14 at the said one end of the fastener and for retaining the sliders 13 and 14 on the stringer tape 11 after it has been completely separated from the other stringer tape 10. It may be noted from Figures 2 and 3 that during insertion or removal of the pin member 22 on the stringer tape 10 into or out of the sliders 13 and 14, the contracted end 25 of the slider 13 is to be held in neat contact with a similar contracted end 26 of the other slider 14, so that the two sliders will be completely aligned with respect to each other.

30 In order to cause such complete alignment of the sliders 13 and 14, the top and bottom wings 15 and 16 of the slider 13 are both recessed internally at its contracted end 25, as indicated by the numerals 27 and 28 respectively. Each of these recesses 27 and 28 is of generally trapezoidal shape when seen in a plan view as in Figure 2, tapering inwardly both in width and thickness (refer also to Figure 3). It will also be noted from Figure 3 that the recesses 27 and 28 are both open through the inside surfaces of the respective wings 15 and 16 of the slider 13 but not through their outside surfaces.

45 Correspondingly, the contracted end 26 of the other slider 14 has integral tongues 29 and 30 protruding from its top and bottom wings 15 and 16 respectively. These tongues 29 and 30 correspond both in shape and size to the recesses 27 and 28, and as will be seen from Figure 3, the inside surfaces of the tongues 29 and 30 are on the same planes as the inside surfaces of the respective top and bottom wings of the slider 14. Hence, as illustrated in Figures 2 and 3, the tongues 29 and 30 of the slider 14 are to be neatly received in the respective recesses 27 and 28 of the slider 13 when the contracted ends 25 and 26 of the two sliders are brought into contact with each other, so that the sliders can be held in completely aligned relationship to each other.

60 Described hereinbelow, with reference to Figures 4 to 6 in particular, is the functioning of the improved two-way separable slide fastener according to the invention. Let it

be assumed that the stringers of the fastener have been completely separated from each other and that the pin member 22 on the stringer tape 10 is now about to be inserted into the guide channels of the respective sliders 13 and 14 for joining the corresponding ends of the stringers together, as illustrated in Figure 4. The sliders 13 and 14 may not at first be aligned with respect to each other and may further be partly displaced from the plane of the stringer tape 11, as illustrated in Figures 4 and 5, even though the tongues 29 and 30 of the slider 14 may be partly received in the respective recesses 27 and 28 of the slider 13.

However, as the pin member 22 is threaded through the guide channels of the sliders 13 and 14, the slider 13 can be forced into correct alignment with the slider 14 since then the recesses 27 and 28 of the former completely engage the respective tongues 29 and 30 of the latter. Thus, as illustrated in Figures 2 and 6, the pin member 22 can now be smoothly inserted into and through the guide channel of the slider 13 and further into the guide channel of the slider 14 until the pin member is properly positioned therein to permit the correct engagement of the fastener elements 12 upon movement of the slider 13 away from the slider 14.

It is particularly noteworthy that in this embodiment of the invention, both wings 15 and 16 of each of the sliders 13 and 14 are provided with their own recesses 27 and 28 or tongues 29 and 30. This arrangement permits dual interengagement, so to say, of the sliders 13 and 14, so that these sliders can be securely prevented from any misalignment relative to each other as the pin member 22 is inserted into or removed from their guide channels.

In Figure 7 there is illustrated a modification of the preceding embodiment of Figures 1 to 6, in which the tongues 29 and 30 protruding from the respective wings 15 and 16 of the slider 14 are replaced by those which have unvarying thickness and width, that is, are not tapered like the tongues 29 and 30. Only one, 29a, of such modified tongues is illustrated in Figure 7 for the sake of simplicity, together with a correspondingly modified recess 27a to be formed in the other slider. In order to permit the tongue 29a to be easily received in the recess 27a, its leading edges are suitably rounded as indicated at 31 in the drawing. It is, of course, assumed that the other tongue is of identical shape.

Figure 8 illustrates another preferred embodiment of the invention, in which the tongue 29b protruding from each of the wings 15 and 16 of the slider 14 has a notch 32 formed centrally in its leading end. There is correspondingly formed an integral pro-

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4 tubulance 33 in the recess 27b in each of
the wings 15 and 16 of the other slider 13,
the protuberance 33 being shaped and sized
to be neatly received in the notch 32 in
5 the tongue 29b upon contact of the con-
tracted ends 25 and 26 of the sliders 13 and
14. The mating notch 32 and protuberance
33 are calculated to ensure still more cor-
rect alignment of the sliders 13 and 14
10 which would otherwise be insufficient due
to the presence of recesses 27, 28 during
insertion or removal of the pin member 22
into or out of their guide channels.

15 As illustrated in Figure 9, the concepts
of this invention are applicable to a separ-
able slide fastener of the usual box-and-pin-
coupling type whereby the fastener can be
opened from one end only. Only the box
20 member 34 of the box and pin separable
coupling is illustrated in Figure 9, but it
will be apparent that this box member is
to be used to render the slider 14 station-
ary in the first described embodiment of
25 Figures 1 to 6. Like the slider 14, the box
member 34 has a pair of tongues 29c and 30c
formed integral with its top and bottom
plate portions 35 and 36, respectively, at
their ends to be disposed opposite to the
30 contracted end 25 of the slider 14. This
box member is to be employed in combina-
tion with the slider 13 in the well known
manner. Although the tongues 29c and
30c as illustrated in Figure 9 are shaped
35 exactly like the tongues 29 and 30 shown
previously in Figures 2 and 3 in particu-
lar, it will be understood that they can be
modified in shape like the examples of Fig-
ures 7 and 8, with corresponding modifica-
40 tions in the shape of the recesses to be
formed in the cooperating slider 13.

45 While the separable slide fastener accord-
ing to this invention has been shown and
described hereinbefore in terms of some
preferred embodiments thereof, it is under-
stood that the invention itself is not to be
restricted by the exact showing of the draw-
ings or the description thereof. In the first
described embodiment of the invention, for
50 example, the recesses 27 and 28 may be
formed in the slider 14 and the tongues 29
and 30 on the slider 13, without departing
from the scope of this invention. It is there-
fore appropriate that the invention be con-
55 strued broadly and in a manner consistent
with the scope of the following claims.

WHAT WE CLAIM IS—

60 1. A separable slide fastener including a
pair of stringers having longitudinal rows
of interlocking fastener elements on their
opposed edges respectively, a pair of sliders
arranged reversely with respect to each other
65 on said rows of fastener elements for longi-
tudinal movement therealong to engage and
disengage the same, each of said sliders

having a body consisting of a pair of spaced-
apart and interconnected wings adapted to
define a generally Y-shaped guide channel
therethrough, a stop member arranged on
one end of one of said stringers for retain-
70 ing said sliders on said one stringer
when the other stringer is completely separ-
ated therefrom, and a pin member arranged
on the corresponding end of said other
stringer for insertion through the guide chan-
75 nels of both of said sliders, wherein a pair
of recesses is formed at that end of one of
said sliders disposed opposite to the other
slider, said recesses being formed in the re-
80 spective wings of said one slider so as to be
substantially invisible at least from the out-
side surfaces of said wings, and a pair of
tongues formed at the corresponding end
of the other slider and adapted to be neatly
85 received in said recesses respectively for
aligning said sliders when said pin member
is to be inserted into or removed out of
their guide channels.

2. A separable slide fastener according
to claim 1, wherein each of said recesses is
90 of generally trapezoidal shape, as seen in a
plan view, tapering inwardly both in width
and thickness, and wherein each of said
tongues is of corresponding shape.

3. A separable slide fastener according
to claim 1 or claim 2, including a notch
95 formed centrally at the leading end of each
of said tongues, and a protuberance formed
correspondingly within each of said recesses
to be neatly received in said notch.

4. A separable slide fastener including a
pair of stringers having longitudinal rows
of interlocking fastener elements on their
opposed edges respectively, a slider arranged
on said rows of fastener elements for longi-
105 tudinal movement therealong to engage and
disengage the same, said slider having a pair
of spaced-apart and interconnected wings
disposed to define a generally Y-shaped
guide channel therethrough, a box member
110 arranged on one end of one of said stringers
for limiting the movement of said slider,
said box member having a pair of spaced-
apart and interconnected plate portions hav-
ing a guide channel therein, and a pin member
115 arranged on the corresponding end of
the other stringer for insertion through the
guide channels of said slider and said box
member, wherein a pair of recesses is formed
in the slider so as to be substantially invis-
120 ible at least from the outside surfaces of
the slide and a pair of tongues are provided
on the box member, said tongues having a
configuration complementary to the corres-
ponding recesses in the slider and being dis-
125 posed for insertion therein, each recess and
corresponding tongue being disposed on res-
pective confronting ends of said slider and
box member, and the tongues and recesses
being generally trapezoidal to aid in the 130

tubulance 33 in the recess 27b in each of the wings 15 and 16 of the other slider 13, the protuberance 33 being shaped and sized to be neatly received in the notch 32 in the tongue 29b upon contact of the contracted ends 25 and 26 of the sliders 13 and 14. The mating notch 32 and protuberance 33 are calculated to ensure still more correct alignment of the sliders 13 and 14 which would otherwise be insufficient due to the presence of recesses 27, 28 during insertion or removal of the pin member 22 into or out of their guide channels.

As illustrated in Figure 9, the concepts of this invention are applicable to a separable slide fastener of the usual box-and-pin-coupling type whereby the fastener can be opened from one end only. Only the box member 34 of the box and pin separable coupling is illustrated in Figure 9, but it will be apparent that this box member is to be used to render the slider 14 stationary in the first described embodiment of Figures 1 to 6. Like the slider 14, the box member 34 has a pair of tongues 29c and 30c formed integral with its top and bottom plate portions 35 and 36, respectively, at their ends to be disposed opposite to the contracted end 25 of the slider 14. This box member is to be employed in combination with the slider 13 in the well known manner. Although the tongues 29c and 30c as illustrated in Figure 9 are shaped exactly like the tongues 29 and 30 shown previously in Figures 2 and 3 in particular, it will be understood that they can be modified in shape like the examples of Figures 7 and 8, with corresponding modifications in the shape of the recesses to be formed in the cooperating slider 13.

While the separable slide fastener according to this invention has been shown and described hereinbefore in terms of some preferred embodiments thereof, it is understood that the invention itself is not to be restricted by the exact showing of the drawings or the description thereof. In the first described embodiment of the invention, for example, the recesses 27 and 28 may be formed in the slider 14 and the tongues 29 and 30 on the slider 13, without departing from the scope of this invention. It is therefore appropriate that the invention be construed broadly and in a manner consistent with the scope of the following claims.

WHAT WE CLAIM IS—

1. A separable slide fastener including a pair of stringers having longitudinal rows of interlocking fastener elements on their opposed edges respectively, a pair of sliders arranged reversely with respect to each other on said rows of fastener elements for longitudinal movement therealong to engage and disengage the same, each of said sliders

having a body consisting of a pair of spaced-apart and interconnected wings adapted to define a generally Y-shaped guide channel therethrough, a stop member arranged on one end of one of said stringers for retaining said sliders on said one stringer when the other stringer is completely separated therefrom, and a pin member arranged on the corresponding end of said other stringer for insertion through the guide channels of both of said sliders, wherein a pair of recesses is formed at that end of one of said sliders disposed opposite to the other slider, said recesses being formed in the respective wings of said one slider so as to be substantially invisible at least from the outside surfaces of said wings, and a pair of tongues formed at the corresponding end of the other slider and adapted to be neatly received in said recesses respectively for aligning said sliders when said pin member is to be inserted into or removed out of their guide channels.

2. A separable slide fastener according to claim 1, wherein each of said recesses is of generally trapezoidal shape, as seen in a plan view, tapering inwardly both in width and thickness, and wherein each of said tongues is of corresponding shape.

3. A separable slide fastener according to claim 1 or claim 2, including a notch formed centrally at the leading end of each of said tongues, and a protuberance formed correspondingly within each of said recesses to be neatly received in said notch.

4. A separable slide fastener including a pair of stringers having longitudinal rows of interlocking fastener elements on their opposed edges respectively, a slider arranged on said rows of fastener elements for longitudinal movement therealong to engage and disengage the same, said slider having a pair of spaced-apart and interconnected wings disposed to define a generally Y-shaped guide channel therethrough, a box member arranged on one end of one of said stringers for limiting the movement of said slider, said box member having a pair of spaced-apart and interconnected plate portions having a guide channel therein, and a pin member arranged on the corresponding end of the other stringer for insertion through the guide channels of said slider and said box member, wherein a pair of recesses is formed in the slider so as to be substantially invisible at least from the outside surfaces of the slide and a pair of tongues are provided on the box member, said tongues having a configuration complementary to the corresponding recesses in the slider and being disposed for insertion thereinto, each recess and corresponding tongue being disposed on respective confronting ends of said slider and box member, and the tongues and recesses being generally trapezoidal to aid in the



alignment of said slider and box member when the tongues are received in the recesses, thereby aiding the insertion and removal through said guide channels of the pin member.

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5. A separable slide fastener including a pair of stringers having longitudinal rows of interlocking fastener elements on their opposed edges respectively, a slider arranged on said rows of fastener elements for longitudinal movement therealong to engage and disengage the same, said slider having a body consisting of a pair of spaced-apart and interconnected wings adapted to define a generally Y-shaped guide channel there-through, a box member arranged on one end of one of said stringers for limiting the movement of said slider, said box member having a pair of spaced-apart and interconnected plate portions having a guide channel therein, and a pin member arranged on the corresponding end of the other stringer for insertion through the guide channels of said slider and said box member, wherein a pair of recesses is formed in the

box member so as to be substantially invisible at least from the outside surfaces of the box member and a pair of tongues are provided on the slider, said tongues having a configuration complementary to the corresponding recess in the box member and being disposed for insertion thereinto, each recess and corresponding tongue being disposed on respective confronting ends of said box member and slider, and the tongues and recesses being generally trapezoidal to aid in the alignment of said slider and box member when the tongues are received in the recesses, thereby aiding the insertion and removal through said guide channels of the pin member.

6. A separable slide fastener substantially as herein described with reference to the accompanying drawings.

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