Oct. 6, 1959 L. H. MORIN 2,907,087

SEPARABLE FASTENER STRINGERS EMPLOYING SEPARATED COUPLED SCOOPS

Original Filed Oct. 31, 1951 2 Sheets-Sheet 1

Fig. 1.

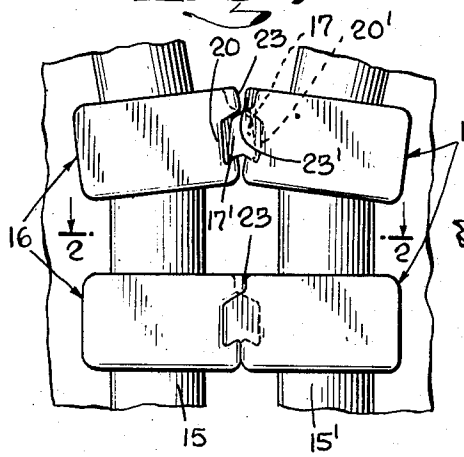


Fig. 2.

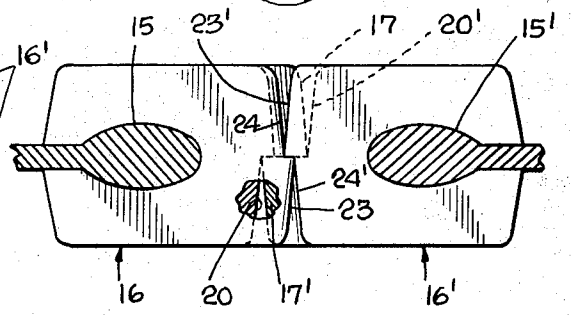


Fig. 3.

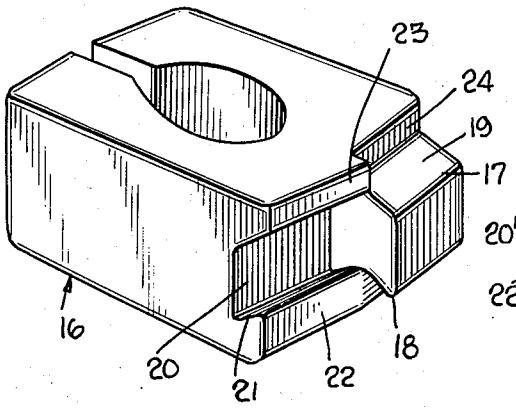


Fig. 4.

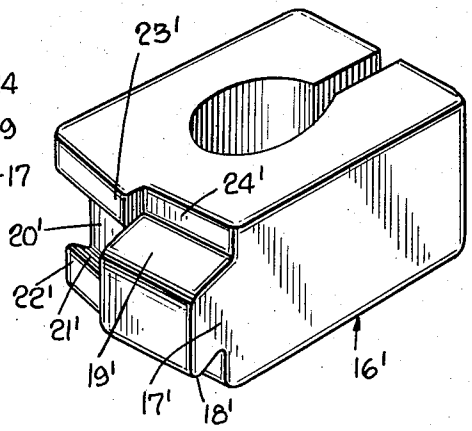


Fig. 5.

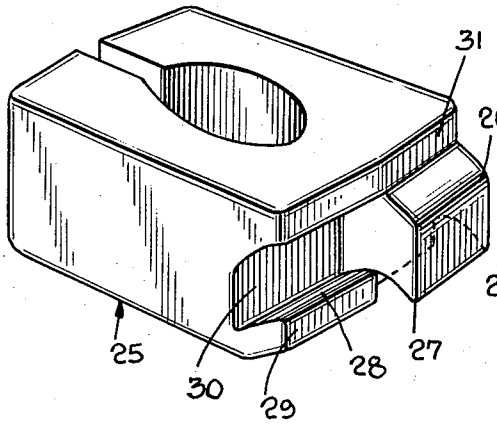
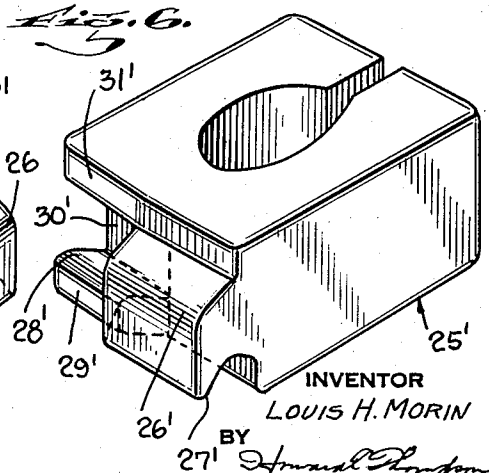


Fig. 6.



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Fig. 7.

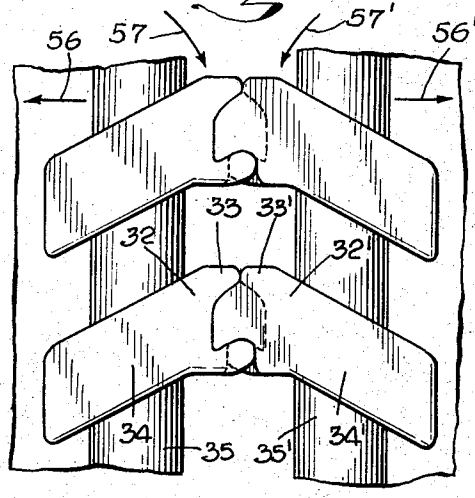


Fig. 8.

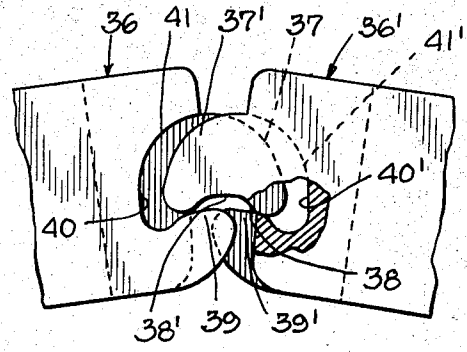


Fig. 10.

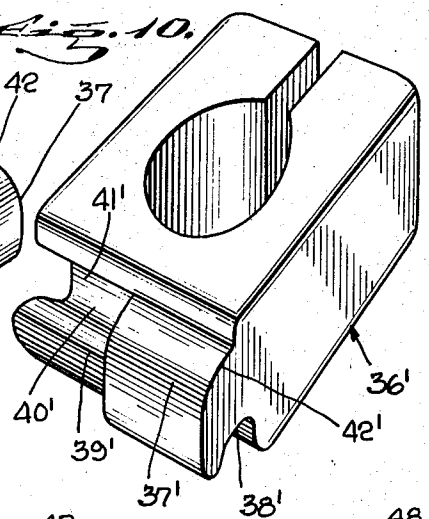


Fig. 9.

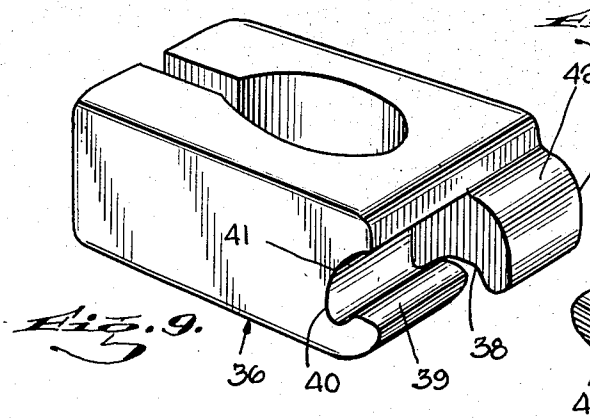
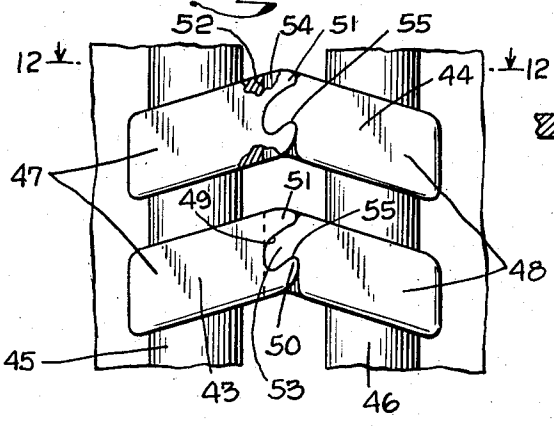


Fig. 11



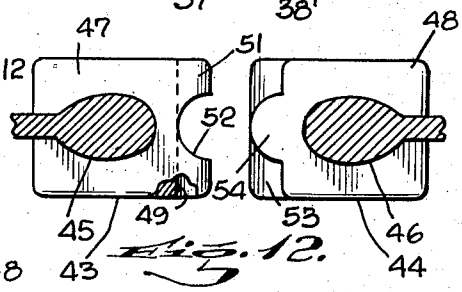


Fig. 12.

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2,907,087

SEPARABLE FASTENER STRINGERS EMPLOYING SEPARATED COUPLED SCOOPS

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Original application October 31, 1951, Serial No. 254,040, now Patent No. 2,736,940, dated March 6, 1956. Divided and this application December 16, 1955, Serial No. 553,581

6 Claims. (Cl. 24—205.13)

This invention relates to separable fasteners, wherein the stringers have scoops spaced longitudinally thereof and, wherein, the scoops of opposed stringers are directly opposed and coupled with each other and, wherein, no coupling engagement is provided between adjacent scoops so that, in the resulting fastener, a definite spacing is maintained between the pairs of coupled scoops longitudinally of the stringer. More particularly, the invention deals with a scoop construction, which lends itself to being cast by the use of dies produced by powder metallurgy, whereby die costs in production of fasteners of the kind under consideration are materially reduced.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawings, 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 side view of a portion of two stringers showing two pairs of coupled scoops on the stringers.

Fig. 2 is a section substantially on the line 2—2 of Fig. 1, with part of the construction broken away and in section.

Fig. 3 is a diagrammatic perspective view of one of the scoops of the stringer shown at the left of Fig. 1.

Fig. 4 is a diagrammatic perspective view of one of the scoops shown on the stringer at the right of Fig. 1.

Fig. 5 is a view similar to Fig. 3, showing a modification.

Fig. 6 is a view, similar to Fig. 4, showing the same modification as illustrated in Fig. 5.

Fig. 7 is a view similar to Fig. 1, showing an angular arrangement of the mounting end portion of the scoops on a pair of stringers.

Fig. 8 is a side view of segmental portions of a pair of scoops in angular relationship to each other and illustrating another form of scoop structure.

Fig. 9 is a diagrammatic perspective view of the lefthand scoop of Fig. 8.

Fig. 10 is a diagrammatic perspective view of the righthand scoop of Fig. 8.

Fig. 11 is a view, similar to Fig. 7, showing another form of scoop structure; and

Fig. 12 is a sectional view, substantially on the line 12—12 of Fig. 11, showing the scoops detached, with part of the construction in section.

This application is a division of my prior application Serial Number 254,040, filed October 31, 1951, now Patent No. 2,736,940, issued March 6, 1956.

In Figs. 1 to 4, inclusive, I have shown one form of construction, in which two beaded stringer tapes 15, 15' are employed and spaced longitudinally of the edge of the tape 15 are disposed a series of similar scoops 16, the scoops 16' of the companion stringer 15' being identical to the scoops 16 and simply arranged in a reversed relationship thereto in establishing the coupling engagement.

Each scoop 16, 16' has, at one side thereof, an outwardly projecting hook-shaped male coupling head or member 17, 17' having a recessed lower surface 18, 18' and a rounded upper surfaces 19, 19'. At the opposite side of the scoop is provided a female coupling portion 20, 20' which has an undercut or V-shaped recess 21, 21', partially formed by a raised rib 22, 22', the rib 22 being adapted to enter the recess 18' of the head 17'; whereas, the rib 22' is adapted to enter the recess 18 of the head 17.

The recess, or female coupling portion 20, 20', is also partially formed by an outwardly projecting flange or shoulder 23, 23' which forms a male coupling element of the scoop and the opposite side of the scoop is recessed, as seen at 24, 24', at the upper portion of the head 17, 17', so as to receive the coupling member of the opposed scoop. In other words, the coupling member 23 enters the recess 24' of the scoop 16'; whereas, the member 23' enters the recess 24 of the scoop 16. This establishes a direct coupling engagement of the members 23, 23' with each other centrally of the scoop to retain the scoop against transverse separation. This same result is, of course, accomplished by engagement of the adjacent surfaces of the heads 17, 17' with each other. However, the heads 17, 17' establish the engagement in one direction; whereas, the members 23, 23' establish the engagement in the opposite direction.

The adjacent surfaces of the heads 17, 17', as well as the members 23, 23', will be flared outwardly, so as to insure and simplify coupling engagement of opposed scoops. In this connection, it will be noted, from a consideration of Fig. 2 of the drawing, that the surfaces of the heads 17, 17' and the recesses 20, 20' flare outwardly to the sides of the scoops to facilitate bending of the stringers, keeping in mind that, by reason of the wide spacing of the coupled scoops on the stringer tapes, an extremely more flexible stringer is provided, than is possible with the conventional type of fasteners, where adjacent scoops fit one within the other in providing a coupling engagement and form more or less of a continuously engaged scoop column. As will appear, from a consideration of Fig. 1 of the drawing, one pair of scoops 16, 16' are spaced from and totally independent of the adjacent pair of similar scoops.

In Figs. 5 and 6 of the drawing, I have shown perspective views, similar to Figs. 3 and 4, of a modification in the scoop structure and, in these figures, 25, 25' represent scoops generally the same as the scoops 16, 16', with the exception that the coupling heads 26, 26' are modified in contour as are also the contour of the recesses 27, 27' and the coupling rib 28, 28' is also modified in its contour, particularly in the contraction of the outer edge portion of said rib 28, 28' to a slight extent, as indicated at 29, 29' to facilitate coupling engagement of the scoops. The coupling rib 28, 28' is also longer, i. e., projects forwardly more than the rib 22, 22', so that 28 overlaps 28' to retain the coupled scoops against transverse separation. These scoops have the female coupling portions, or sockets, 30, 30' generally similar to the sockets 20, 20'.

By overlapping 28, 28', I have also dispensed with the coupling members 23, 23' in Figs. 5 and 6. In other words, the upper edge portion 31, 31' of the scoop is substantially transversely straight, aside from the slight taper, and these edge portions will be in close proximity when the scoops are coupled together.

In Fig. 7 of the drawing, I have shown a modification of the construction shown in Figs. 1 to 4, wherein scoops 32, 32' are employed which, as far as the coupling end portions 33, 33' are concerned, are the same as the coupling end portions of the scoops shown in Figs. 5 and 6 and are modified solely to the extent that the mounting end portions 34, 34' are disposed on the beaded tapes 35, 35' in an angular direction forming a chevron,

or herring-bone type of scoop structure. As the scoops 32, 32' are otherwise of the same form, no further detailed description will be given.

In Figs. 8, 9 and 10 of the drawing, I have shown a still further modification of the structure shown in Figs. 1 to 7, wherein scoops 36, 36' have rounded coupling members 37, 37' with deeply rounded recesses 38, 38' on the under-surfaces thereof, which are adapted to receive upwardly extended rounded coupling members 39, 39' of the opposed stringers.

The members 39, 39' partially form the sockets, or female coupling portions 40, 40' for reception of the male couplings 37, 37' and these recesses extend deeply into the body of the scoop and have upwardly and outwardly extended rounded surfaces 41, 41' which substantially conform to the upper rounded surfaces 42, 42' of the members 37, 37'. It will be apparent, however, from a consideration of Fig. 8 of the drawing, in which the scoops are indicated as angularly disposed, that the coupling members 37, 37', in entering the female coupling portions or sockets 40, are free to swing thereinto, while the upwardly curved projections 39, 39' are free to pass into the recesses 38, 38'.

It will be understood that, in the respective coupling engagements, 37' enters 40 and 37 enters 40'; whereas, 39 enters 38' and 39' enters 38. The scoop structure of the type and kind illustrated in Figs. 8 to 10, inclusive, will insure easy coupling engagement between opposed scoops of the stringers.

In Figs. 11 and 12 of the drawing, I have shown a modification of the construction shown in Figs. 8, 9 and 10, wherein scoops 43, 44 are employed and disposed upon tapes 45, 46 the mounting end portions 47, 48 of the scoops being angularly disposed and, with this construction, it will be understood that two different stringers are employed, that is to say, a left stringer and a right stringer in establishing the coupling engagement.

The stringer 45 with the scoops 43 thereon have transverse female coupling portions 49 extending the full width of the scoop, as seen in Fig. 12, the female coupling portion being partially formed by an upwardly extending rounded coupling member 50 at the lower portion thereof and an outwardly projecting shoulder or flange 51 at the upper portion thereof. The member 50 and flange 51 have a vertical recess 52 opening outwardly through the edge of the scoop; the scoops 44 of the stringer 46 have an outwardly projecting and downwardly curved male coupling member 53 extending the full width of the scoop, as seen in Fig. 12 and, at the upper portion of the coupling member, is a projecting lug or coupling element 54, which is substantially half-round in cross-sectional form, note Fig. 12, to fit snugly in the half-round recess 52 in the scoop 43. With this construction, all scoops of the stringer 45 will be of the same construction, as well as all scoops 44 of the stringer 46.

The male coupling member 53 has a recess 55 on the undersurface thereof for reception of the member 50 in coupling the scoops against pull-apart separation; whereas, the coupling member, or element 54, engaging the recess 52, retains the coupled scoops against transverse separation.

It will be apparent from a consideration of Fig. 2 of the drawing that tapers are provided on the surfaces of the several scoops, which tapers are exaggerated in Fig. 2 of the drawing, and are also exaggerated in the large perspective showings in Figs. 2 to 6, inclusive; whereas, they are not shown in Figs. 9 and 10, the latter figures showing what might be considered the normal coupling engagement which brings adjacent surfaces of the small normal sized scoops into what appears to be a direct abutting engagement with each other. The actual taper providing clearance for removing the scoops from the dies would be extremely slight. These showings have been exaggerated in some figures, as noted above, simply to illustrate this feature. In other words, the showing in the drawing must be regarded as diagrammatic, both as to the lack of showing in taper of Figs. 9 and 10 and the exaggerated showing of taper in Figs. 2 to 6, inclusive.

Considering the chevron-type of scoops, such for example, as shown in Figs. 7 and 11, and noting particularly Fig. 7 of the drawing, it will appear that, when a separating strain is applied to the stringers, for example, in the direction of the arrows 56, 56', the tendency would be to further swing the scoops downwardly in the direction of the arrows 57, 57', resulting in further tightening the grip between the scoops, thus the greater the tension to separate the fastener, the tighter the scoops will hold together.

By reason of the manner of constructing the scoops, dies for producing the scoops may be practically and economically made by powder metallurgy, thus materially reducing production costs, particularly when a large number of dies are required in production of fasteners of the kind under consideration. The form of the scoops considered with respect to the parting line is such as to provide die cavities which can withstand the pressure required in forming powdered metal dies. It will also be apparent that the scoops may be formed of any suitable material and, by reason of the structure of the male and female couplings provided, a strong and substantial coupling engagement is provided between the scoops. The scoops may be formed individually or in multiples in a single casting operation, depending entirely upon the process employed.

The scoops in the various showings may be said to have hook-shaped male coupling portions, the hooks being directed downwardly and undercut female coupling portions or sockets, the bottom walls of the stockets having upwardly extending ridges or hook portions interfitting with the hook-shaped male coupling portions of the scoop. With the exception of the showing in Figs. 11 and 12, each scoop has male and female coupling portions both of which are disposed at side portions of the scoop and the scoops include other interengaging means for retaining the scoops against transverse separation by overlapping parts of the scoops or providing other male and female coupling portions.

In Figs. 11 and 12 of the drawing, a female scoop is provided on one stringer and a male scoop on the opposed stringer; whereas, in the other figures, the scoops are of the same construction on each stringer.

Considering the scoops of Figs. 1 to 10 in a little more detail, it is apparent that each scoop is characterized by being integrally formed in one piece. Each scoop of one stringer engages a single scoop on the opposite stringer. The coupling end portion of each scoop has flat uppermost and lowermost surfaces that are parallel. The length of each scoop is greater than its width and the width is greater than its height. Each scoop has, at one side of the forward end of the coupling end portion, a downwardly turned central projection, an upper recess above said projection, and a lower recess disposed below the projection (in Fig. 3, for example, note projection 17, upper recess 24, and lower recess 18); and each scoop has at the other side of said forward end of the coupling end portion a central recess extending angularly upwardly relatively to said parallel upper and lower scoop surfaces, an upper projection vertically spaced above the central recess, and an upwardly turned lower projection vertically spaced below the central recess (in Fig. 3, note central recess 20, upper projection 23, and lower projection 22). One of the said upper and lower projections has a forward edge which extends continuously across the width of the scoop (note projection 22 in Fig. 3 or projection 31 in Fig. 3, for example). Each of the said recesses opens through the forward end of the coupling end portion. The central projection and the lower and upper recesses of said one side of the scoop are trans-

versely alined with and of substantially the same height as the central recess and the lower and upper projections, respectively, of said other side. The projections and recesses of each scoop of one stringer engage the corresponding recesses and projections of a scoop of the opposite stringer to couple said stringers and to provide interlocks against pull-apart, longitudinal, and transverse separation of the coupled scoops. Also, each said projection and recess of a scoop lies within contour lines defined by the said uppermost and lowermost surfaces of the scoop when the latter is viewed in side elevation, and the upper surfaces of the coupling end portions of each pair of coupled scoops are parallel to the lower surfaces thereof.

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

1. In a separable fastener comprising a pair of stringers, each stringer comprising a tape having spaced, intergrally formed, one piece scoops die cast thereon, each scoop having a coupling end portion extending from the tape edge and a mounting end portion on the tape, the improvement wherein each scoop of one stringer engages a single scoop on the opposite stringer; each scoop throughout its length having flat uppermost and lowermost surfaces that are parallel, the length of each scoop being greater than its width and the width greater than its height, each scoop having a generally flat, rectangular form; each scoop of one stringer having at the forward end of the coupling end portion a downwardly turned transverse projection extending across the width of said scoop, a lower recess vertically spaced below the projection and also extending transversely across the width of the scoop, a vertical projection extending upwardly from the transverse projection and disposed centrally thereof; each scoop of the other stringer having at the forward end of the coupling end portion a vertical centrally disposed recess extending vertically throughout the height of said scoop, a transverse centrally disposed recess on each side of said vertical recess and extending angularly upwardly relatively to said vertical recess, an upper projection vertically spaced above each said transverse recess, and an upwardly turned lower projection vertically spaced below each said transverse recess; each of said recesses of the scoops of both stringers opening through said forward end of the coupling end portion of the scoops; the transverse projection of each scoop of said one stringer engaging the transverse recesses and overlapping both the upper and lower projections of an opposite scoop to provide an interlock against pull-apart separation of said stringers, the vertical projection of each scoop of said one stringer extending into the vertical recess of said opposite scoop to provide an interlock against transverse separation of the stringers; each said projection and recess of a scoop lying within contour lines defined by said uppermost and lowermost surfaces of the scoop when the latter is viewed in side elevation; and each scoop being disposed on the tape, and extending therefrom, at an acute angle relatively to said tape.

2. In a separable fastener comprising a pair of stringers, each stringer comprising a tape having spaced, integrally formed, one piece scoops thereon, each scoop having a coupling end portion extending from the tape edge and a mounting end portion on the tape, the improvement wherein each scoop of one stringer engages a single scoop on the opposite stringer; each scoop of one stringer having at the forward end of the coupling end portion a downwardly turned transverse projection extending across the width of said scoop, a vertical projection extending upwardly from the transverse projection and disposed centrally thereof; each scoop of the other stringer having at the forward end of the coupling end portion a vertical centrally disposed recess extending vertically throughout the height of said scoop, a transverse centrally disposed recess on each side of said vertical recess and extending angularly upwardly relatively to said vertical recess, with said transverse recesses opening into said vertical centrally disposed recess, an upper projection vertically spaced above each said transverse recess, and an upwardly turned lower projection vertically spaced below each said transverse recess; the transverse projection of each scoop of said one stringer engaging the transverse recesses and overlapping both the upper and lower projections of an opposite scoop to provide an interlock against pull-apart separation of said stringers, and the vertical projection of each scoop of said one stringer extending into the vertical recess of said opposite scoop to provide an interlock against transverse separation of the stringers.

3. In a separable fastener comprising a pair of stringers each comprising a tape having spaced, integrally formed, one piece scoops die cast thereon, each scoop having a coupling end portion extending from the tape edge and a mounting end portion on the tape, the improvement wherein each scoop of one stringer engages a single scoop on the opposite stringer; each scoop throughout its length having flat uppermost and lowermost surfaces that are parallel, the length of each scoop being greater than its width and the width greater than its height, each scoop having a generally flat, rectangular form; each scoop having at the forward end of the coupling end portion a vertically spaced projection and recess, the projection and recess of each scoop of one stringer respectively engaging the recess and projection of a scoop of the opposite stringer to couple said scoops and to provide an interlock against pull-apart separation of the stringers; each pair of couplable scoops having a centrally disposed projection at the forward end of the coupling end portion of one scoop engageable on opposite sides thereof by a centrally disposed recess in the coupling end portion of the other scoop to provide an interlock against transverse separation of the stringers; each said projection and recess of a scoop lying within contour lines defined by said uppermost and lowermost surfaces of the scoop when the latter is viewed in side elevation; and each scoop being disposed on the tape, and extending therefrom, at an acute angle relatively to said tape, thereby imparting a chevron pattern to each pair of coupled scoops.

4. In a separable fastener comprising a pair of stringers, each stringer comprising a tape having spaced, integrally formed scoops thereon, each scoop having a coupling end portion extending from the tape edge and a mounting end portion on the tape, the improvement wherein each scoop of one stringer engages a single scoop on the opposite stringer; each scoop of one stringer having at the forward end of the coupling end portion a downwardly turned, central transverse projection extending continuously across the width of said scoop, said transverse projection having upper and lower surfaces, a lower recess vertically spaced below the projection and also extending transversely and continuously across the width of the scoop, said recess being partially defined by the lower surface of said projection, a vertical projection extending upwardly from the upper surface of the transverse projection and disposed centrally thereof; each scoop of the other stringer having at the forward end of the coupling end portion a vertical centrally disposed recess extending vertically throughout the height of said scoop, a transverse centrally disposed recess on each side of said vertical recess and extending angularly upwardly, an upwardly turned, transversely extending upper projection vertically spaced above each said transverse recess, and an upwardly turned, transversely extending lower projection vertically spaced below each said transverse recess; the continuous transverse projection of each scoop of said one stringer engaging the transverse recesses and overlapping the lower projections of an opposite scoop to provide an interlock against pull-apart separation of said stringers, and the vertical projection of each scoop of said one stringer extending into the vertical recess of said

opposite scoop to provide an interlock against transverse separation of the stringers.

5. The fastener of claim 4 wherein said transverse projection of each scoop of said one stringer has a convexly curved upper surface from which said vertical projection extends, said vertical projection having a convexly curved lateral surface, said vertical recess of each scoop of said other stringer having a concavely curved lateral surface, and said convex lateral surface of the vertical projection engaging the concave lateral surface of the vertical recess.

6. In a separable fastener comprising a pair of stringers, each stringer comprising a tape having spaced, integrally formed scoops thereon, each scoop having a coupling end portion extending from the tape edge and a mounting end portion on the tape, the improvement wherein each scoop of one stringer engages a single scoop on the opposite stringer; each scoop of one stringer having at the forward end of the coupling end portion a downwardly turned, central transverse projection extending continuously across the width of said scoop, said transverse projection having upper and lower surfaces, a vertical projection extending upwardly from the upper surface of the transverse projection and disposed centrally thereof; each scoop of the other stringer having at the forward end of the coupling end portion a vertical

centrally disposed recess extending vertically throughout the height of said scoop, a transverse centrally disposed recess on each side of said vertical recess and extending angularly upwardly, and an upwardly turned, transversely extending projection vertically spaced below each said transverse recess; the transverse projection of each scoop of said one stringer engaging the transverse recesses and overlapping the lower projections of an opposite scoop to provide an interlock against pull-apart separation of said stringers, and the vertical projection of each scoop of said one stringer extending into the vertical recess of said opposite scoop to provide an interlock against transverse separation of the stringers.

References Cited in the file of this patent

UNITED STATES PATENTS

1,803,106	Freysinger	Apr. 28, 1931
2,157,828	Kuna	May 9, 1939
2,219,657	Morin	Oct. 29, 1940
2,554,929	Sundback	May 29, 1951
2,637,886	Hora	May 12, 1953

FOREIGN PATENTS

265,064	Great Britain	1927
548,898	Germany	1932