

Oct. 15, 1940.

D. MARINSKY ET AL

2,218,090

METHOD OF MANUFACTURING SEPARABLE FASTENERS

Original Filed July 16, 1937

Fig. 7.

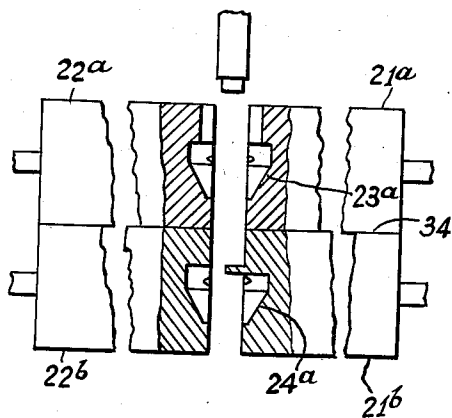


Fig. 1.

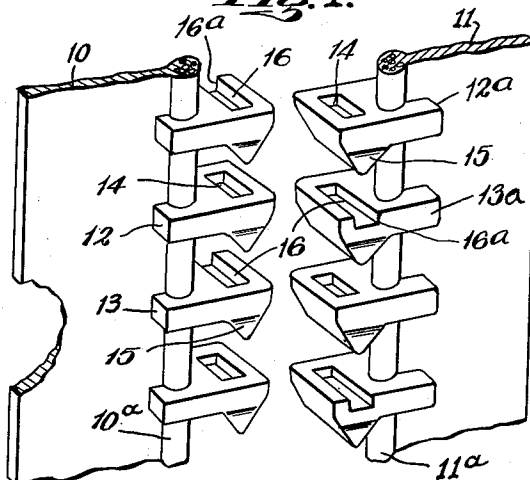


Fig. 2.

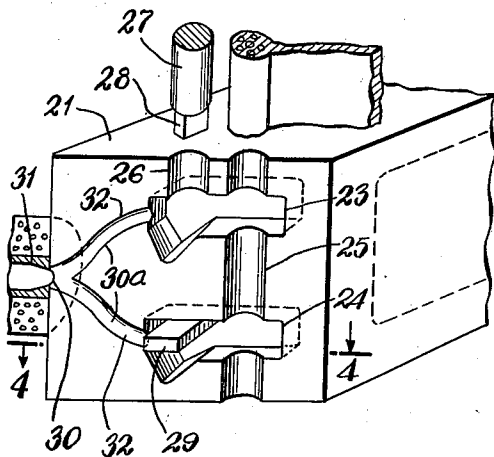


Fig. 3.

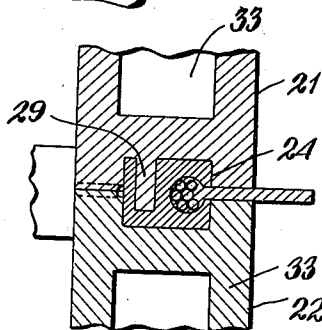


Fig. 4.

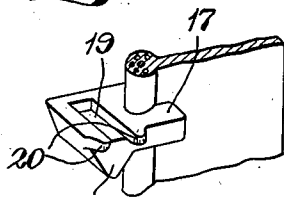


Fig. 5.

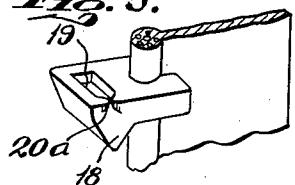
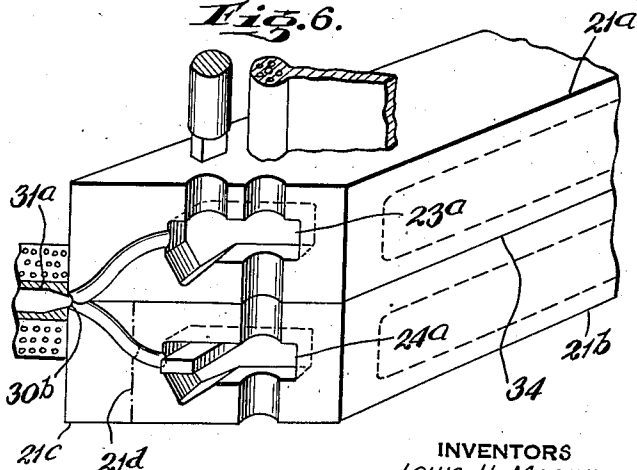


Fig. 6.



INVENTORS
LOUIS H. MORIN
BY DAVID MARINSKY
Donald C. Thompson
ATTORNEY

UNITED STATES PATENT OFFICE

2,218,090

METHOD OF MANUFACTURING SEPARABLE FASTENERS

Davis Marinsky and Louis H. Morin, Bronx, N. Y.,
assignors to Whitehall Patents Corporation,
New York, N. Y., a corporation of New York

Original application July 16, 1937, Serial No.
153,962. Divided and this application Novem-
ber 17, 1937, Serial No. 175,038

3 Claims. (Cl. 18—59)

This invention relates to separable fasteners employing stringers with coupling links or scoops arranged on adjacent, preferably beaded, edges of stringer tapes, each link or scoop having male and female coupling portions whereby the links of opposed stringers may be interlocked in coupling the stringers together; and the object of the invention is to provide a stringer for fasteners of the class described wherein the links or scoops applied to each stringer are made of two different forms of construction arranged alternately on the stringer, one of the groups of links having the female socket portion formed initially in closed boundary walls and the others with an open boundary wall; a further object being to provide a new method of forming the two different series of links on each stringer which consists in die casting, in one die casting operation, one link of each group so that a pair of links are cast simultaneously on the stringer tape in spaced relation to each other in a single casting operation; a further object being to provide a method as set forth wherein the core forming the female socket of one link is pulled vertically or transversely with respect to the longitudinal plane of the die parts and the core of the other companion link is pulled horizontally or longitudinally with respect to the die parts, the latter forming the socket normally opening outwardly through one side edge of the resulting link or scoop; a further object being to provide means in the form of dies and cores for producing simultaneously, or in one die casting operation, two castings in spaced impressions or mold cavities between adjacent surfaces of die parts or in pairs of die parts, in which latter event independent pressures may be applied to the respective pairs of die parts to simplify the production of substantially flare-proof castings; a still further object being to provide a cast link having a normally open socket which link is so formed as to close the opening of the socket through one side wall of the link; and with these and other objects in view, the invention consists in a device of the class and for the purpose specified, constructed in accordance with the method and by the dies employed as more fully hereinafter described and claimed.

This invention constitutes a division of our prior application Serial No. 153,962, filed July 16, 1937 (Patent 2,170,421), and is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of our improvement are designated

by suitable reference characters in each of the views, and in which:

Fig. 1 is a plan view of a part of a separable fastener, diagrammatically illustrating the arrangement of stringers, and the manner of coupling the same.

Fig. 2 is a perspective view of the separate stringers of a fastener, showing said stringers detached.

Fig. 3 is a perspective view of one part of a die employed in forming a device as shown in Figs. 1 and 2.

Fig. 4 is a partial section on the line 4—4 of Fig. 3, taken through the adjacent surfaces of both die parts which are employed.

Fig. 5 is a perspective view of a modified form of one of the links shown in Fig. 2.

Fig. 6 is a view similar to Fig. 5, showing the step in completing the formation of the link shown in Fig. 5; and,

Fig. 7 is a view similar to Fig. 3, showing a modification wherein the die parts are formed of two pairs of parts rather than the single parts as in Figs. 3 and 4.

In the manufacture of die cast separable fasteners made from suitable die cast metals and/or thermoplastic materials, it has been the practice to die cast individual links in a successive series of casting operations on spaced intervals of a separable fastener stringer. This is taught, for example, in Patents 1,975,966 and 2,041,848. It is the purpose of our present invention to increase the speed of production of die cast separable fasteners by providing dies of novel construction wherein two different types of castings are formed in a single casting operation, upon spaced sections or parts of a tape disposed between adjacent surfaces of the dies; or in other words, on the parting line thereof. This is accomplished by forming one cast link with a socket or female coupling portion, the side walls of which are completely closed; and by the use of a core which is pulled perpendicularly with respect to said socket, whereas the other adjacent link is formed with a socket or female coupling portion which opens through one side surface of a link; and the core forming said socket is pulled horizontally or laterally through said side wall of the link. With this construction, it will be seen that when the links of opposed stringers are coupled together, the stringers will be held against separation in all directions as in the conventional type of fasteners in which all the links have, what may be termed, the closed socket or female coupling portion, which result is assured by arranging

the links of opposed stringers with the openings through the sides of the links arranged in opposite directions as clearly illustrated in Fig. 2 of the drawing. It is also possible to close the openings in the side walls of the links in the manner taught

5 in Figs. 5 and 6 of the drawing so that the resulting fastener would be equivalent in all respects to fasteners of the conventional construction.

10 In Fig. 1 of the drawing we have indicated at 10 and 11, portions of the stringers of a separable fastener which stringers are preferably provided with enlarged or beaded edges 10a, 11a, to which are attached the die cast links 12, 12a, 13, 13a.

15 In the construction shown in Figs. 1 and 2, the links 12, 12a are of the conventional closed type; that is to say, are provided with female coupling portions or sockets 14 which open only through one surface of the links, said links having projections 15 on the opposite surfaces for entering the sockets of the links of opposed stringers. The links 13, 13a have sockets 16 which open not only through one surface of the link, but also through one side wall thereof as clearly seen at 16a, in Fig. 2 of the drawing.

20 At this time, it will be apparent that the links 12, 12a, 13, 13a, may be of any desired size, style, or contour, and may be made of any suitable die cast material. The shape and contour of the coupling elements may be modified within such degrees as will permit of the formation thereof in accordance with the teachings herein defined.

25 In Figs. 5 and 6 of the drawing, we have shown at 17, a modified form of link, 13, 13a, wherein one side wall 18 of the link, the side wall through which the socket 19 opens, is fashioned to provide a pair of projecting members 20, adjacent surfaces of which are continuous with opposed side walls of the socket 19. The members 20 may be turned inwardly to close the opening of the socket 19, through the wall 18, as indicated at 20a, in Fig. 6 of the drawing. At this time, it will be well to note that if the link is made of thermoplastic material, the members 20 may be cemented together where they abut as at 20a in Fig. 6 of the drawing.

30 In forming fasteners of the kind under consideration, one of the links 12—12a, and one of the links 13—13a, are formed simultaneously upon the stringer tape or the beaded edge thereof, by the use of a novel type of die construction, one end portion of one part 21 of which is shown in perspective in Fig. 3 of the drawing; whereas the end portion of the other part 22 is indicated in section in Fig. 4 of the drawing. Adjacent surfaces of the die parts are provided with mold cavities 23 and 24 of a contour defining the contour of the links, 12, 13, respectively, to be formed when the dies are brought into abutting relation with each other with the tape therebetween, the beaded edge being disposed in recesses 25, formed in adjacent surfaces of the die parts. A recess 26 is also formed between the die parts and opens into the cavity 23 through the upper surface of the die parts to receive a transverse core pin 27, the lower end 28 of which forms the recess or socket 14, in the links 12—12a. The cavity 24 differs from the cavity 23 in that the recess 26 is omitted but substituted therefor the die part 21, in the construction shown, is provided with an inwardly projecting longitudinal core pin portion 29 which forms the recess 16 in the links 13—13a.

Opening through one side surface of the dies on the parting line thereof is an admission passage or gate 30 into which suitable die casting mate-

31, partially shown in Fig. 3 of the drawing, may be injected under pressure into the cavities 23, 24 through diverging branches 30a of the opening or gate 30. The branches 30a are also arranged on the parting line of the die parts so that after the castings have been formed in the cavities or impressions 23, 24, the dies may be separated and the two resulting castings, including the gate portions formed in the gate passages 32, may be collectively moved downwardly and the uppermost casting stripped from the transverse core 27 after which this core is returned to its raised position and then moved between the dies in again closing the same in the next successive casting operation in which another pair of castings, 12—13, 12a—13a, are formed. At this time, it will be understood that the gates may be trimmed from the castings in the usual or known manners. The dies are provided with water circulating passages, which extend to points adjacent the impressions in the die parts, to cool the castings in order to insure a high rate of production of the fastener stringers in question.

35 In Fig. 7 of the drawing, we have shown a slight modification of the structure shown in Fig. 5, to illustrate that the die parts may be severed longitudinally to divide the same into independent sections or pairs of die parts as is indicated by the line 34 in Fig. 7 of the drawing, which will divide the die part, for example the part 21, into independent sections or members 21a, 21b; the section 21a containing the cavity or impression 23a, equivalent to the impression 23, whereas the section 21b has the cavity or impression 24a, similar to the impression 24. While only one die part is shown, it will be understood that both die parts will be similarly formed.

40 The purpose of this construction is to permit the application of independent pressures on the separate sections 21, 21a, so that if any slight variation should prevail in the structure of the stringer tape or the beaded edge thereof, this slight or minute variation will be compensated for by the independent pressures applied to the sections 21a, 21b, in the operation of moving the dies into closed position. This will insure a more perfect seal of the dies around the tape and avoid the possibility of flare of the casting material, not only around the tape but at the other parting line edges of the resulting casting.

45 It will, of course, be understood that at no time would there be any appreciable differential between the two die sections 21a, 22b, which would cause any difficulty with respect to the admission of the casting material through the nozzle 31a. However, it is also possible to construct the upper section 21a to include, as an integral part thereof, the portion designated at 21c which would abut the part 21b on the dot-dash line 21d; in which event the admission opening or gate passage 30b would be formed only in the part 21a and its associated or opposed part, and not in the part 21b or its associated and opposed part.

50 Aside from the structural differences above outlined, the method of forming dual castings with the structure shown in Fig. 7 will be the same as in the steps of the method as disclosed in conjunction with the dies shown in Figs. 3 and 4 of the drawing. With respect to the structure shown in Figs. 5 and 6, it will be understood that the step of turning the member 20 inwardly from the position shown in Fig. 5 to that shown in Fig. 6, will be performed either in a suitable press when metallic castings are formed or by

softening the material and then reshaping the same in the event that the links are formed from thermoplastic or similar material.

In forming thermoplastic die castings, it will be understood that the stringer tapes, or at least the beaded edge portions thereof, may be first treated with a suitable material, such for example as acetone, to more securely attach the thermoplastic links to the stringers or beaded edge portions thereof; especially when the links are constructed of cellulose acetate.

In the description and claims we have for the sake of convenience used the expressions "vertical" and "horizontal" to define the relative positions of the various elements and their movements with respect to each other. It is to be understood, however, that these terms are only relative and are not to be taken in a limiting sense.

We are also aware that various changes may be made in details of the invention described above and therefore we do not intend to limit ourselves except by the appended claims.

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

1. The method of forming a pair of vertically spaced links of a slide fastener on the vertical edge portion of a tape, which comprises placing the edge portion of said tape in position for said links to be cast thereon, moving a vertical core downwardly into position to form a recess in the top of the upper link of the pair, horizontally moving a horizontal core and separable die members, each die member having two vertically spaced recesses, into position wherein said horizontal core will define a recess in the top of the lower link of the pair and wherein the recesses in said die members will form two separate vertically spaced mold cavities, one about each core, simultaneously injecting molding material into both of said cavities, separating said die members and removing said horizontal core horizontally from the lower link, and stripping the upper link from said vertical core.

2. The method of forming a pair of vertically spaced links of a slide fastener on the vertical edge portion of a tape, which comprises placing the edge portion of said tape in position for said links to be cast thereon, moving a vertical core downwardly into position to form a recess in the top of the upper link of the pair, horizontally moving a horizontal core and separable die members, each die member having two vertically spaced recesses, into position wherein said horizontal core will define a recess in the top of the lower link of the pair and wherein the recesses in said die members will form two separate vertically spaced mold cavities, one about each core, simultaneously injecting molding material into both of said cavities, separating said die members and removing said horizontal core horizontally from the lower link, then feeding the tape downwardly, and then moving said vertical core upwardly and stripping the upper link therefrom.

3. The method of forming a pair of vertically spaced links of a slide fastener on the vertical edge portion of a tape, which comprises placing the edge portion of said tape in position for said links to be cast thereon, moving a vertical core downwardly into position to form a recess in the top of the upper link of the pair, horizontally moving a horizontal core and separable die members, each die member having two vertically spaced recesses, into position wherein said horizontal core will define a recess in the top of the lower link of the pair opening laterally through one of the sides of the link, and wherein the recesses in said die members will form two separate vertically spaced mold cavities, one about each core, simultaneously injecting molding material into both of said cavities, separating said die members and removing said horizontal core horizontally from the lower link, stripping the upper link from said vertical core, and shaping the material of the lower link adjacent said side thereof to close the opening of said recess at that side.

DAVIS MARINSKY.
LOUIS H. MORIN.