May 26, 1936. D. MARINSKY 2,041,848

METHOD OF MANUFACTURING SEPARABLE FASTENER DEVICES

Filed March 16, 1933 2 Sheets-Sheet 1

Fig. 1.

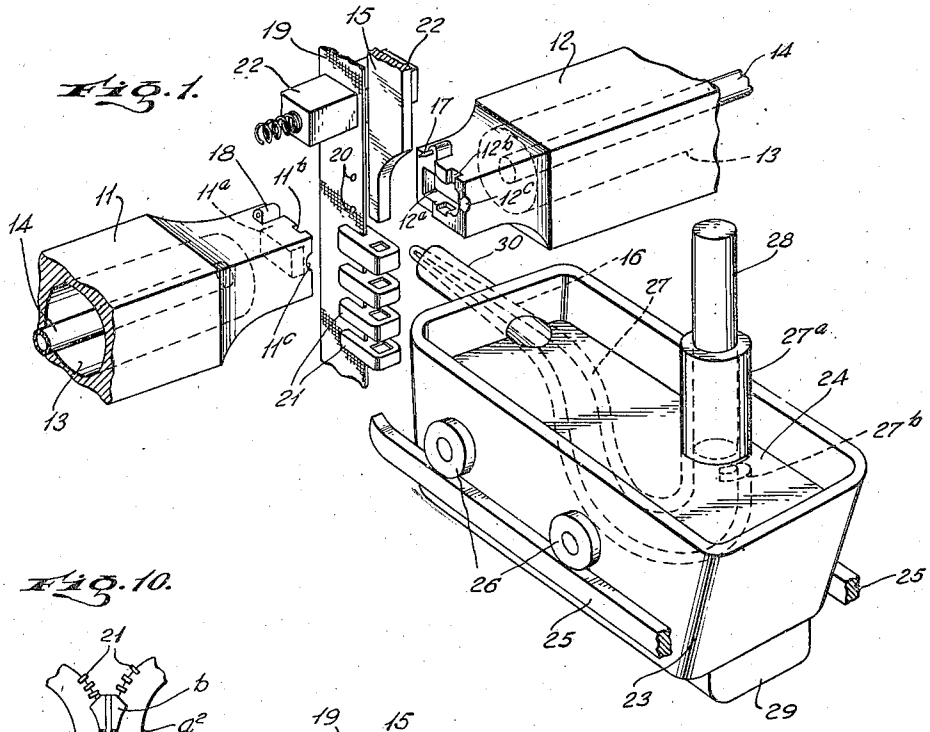
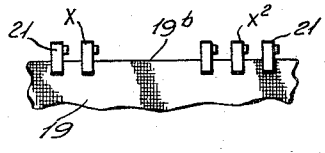


Fig. 10.

Fig. 2.

Fig. 8.

Fig. 9.



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Filed March 16, 1933 2 Sheets-Sheet 2

Fig. 3.

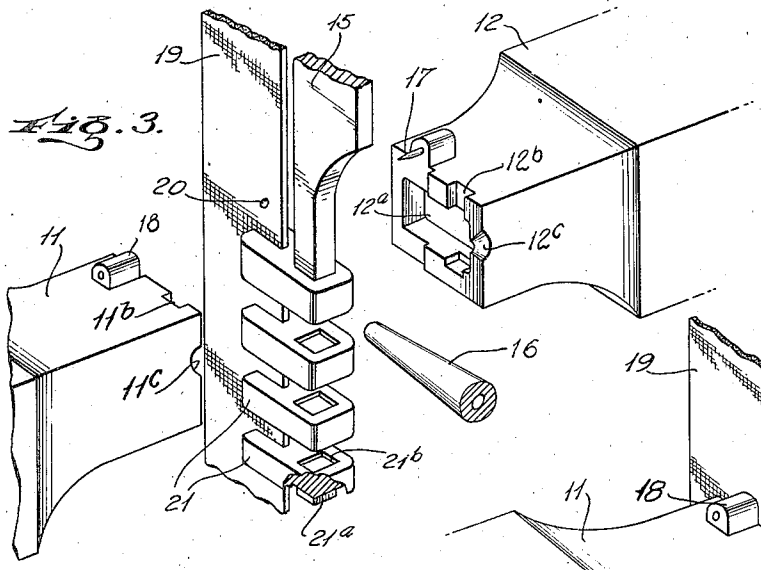


Fig. 4.

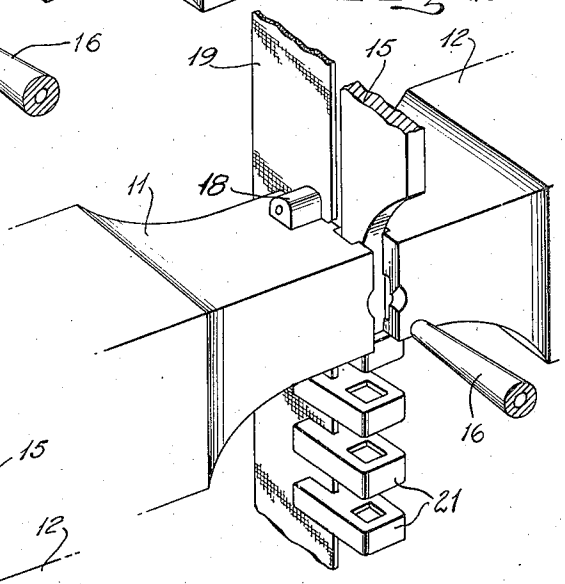


Fig. 5.

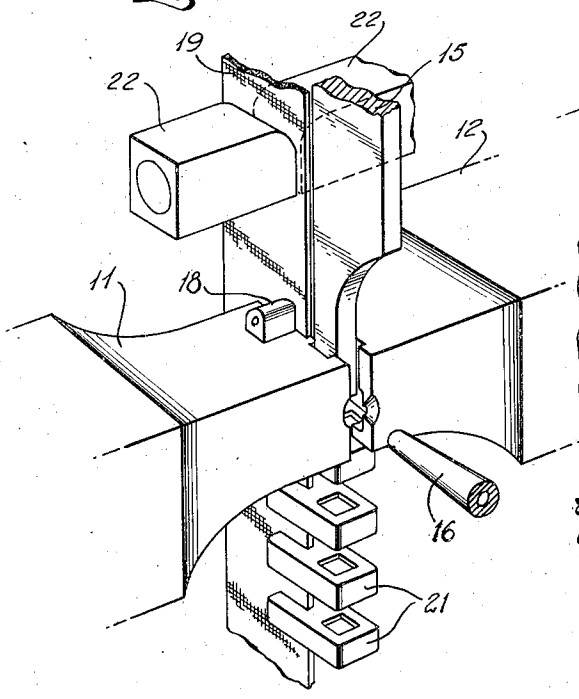


Fig. 7.

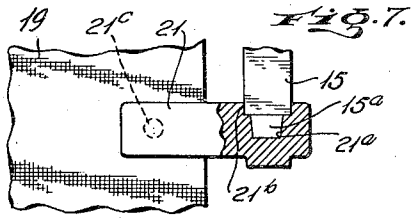
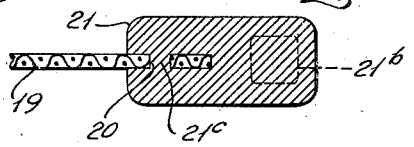


Fig. 6.



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Patented May 26, 1936 2,041,848

UNITED STATES PATENT OFFICE

2,041,848

METHOD OF MANUFACTURING SEPARABLE FASTENER DEVICES

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Application March 16, 1933, Serial No. 661,099

21 Claims. (Cl. 22—202)

This invention relates to what are known as separable fastener devices employing stringers having coupling links or elements disposed and spaced longitudinally of their edges and interlocking with each other in coupling and uncoupling the stringers; and the object of the invention is to provide a method of forming and mounting the coupling elements in spaced relation on a suitable supporting strand, strip or body in the production of said separable fasteners, and especially a method involving a successive series of forming operations consisting in molding or casting the coupling elements directly upon the supporting strand, strip or body by what may be termed die casting or molding, and to intermittently feed a cast coupling element and the supporting body upon which the same is mounted, out of position with the molding dies or members to permit the next successive cast or mold; a further object being to provide a core forming element which is utilized as a feeding and spacing means; a further object being to provide means for piercing or otherwise forming the supporting tape, strand or body of the stringer to provide means for anchoring the coupling elements cast or molded thereon; a further object being to provide means for frictionally or otherwise supporting the workpiece in the operation of forming the successive links or coupling elements thereon; a further object being to provide means for cooling the dies or molds to eliminate excessive heating or burning of a supporting strip or strand, especially when composed of fibrous material; a still further object being to provide a method of the class described involving a receptacle containing the molten material with means for moving the receptacle toward and from the dies or molds and for discharging the molten material into said dies or molds; and with these and other objects in view, the invention consists in the method of forming fastening devices of the class under consideration, which is more fully hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters, and in which:

Fig. 1 is a diagrammatic view showing one step in the process of forming a fastener stringer, just prior to the molding operation.

Fig. 2 is a similar view, showing the parts during a molding operation.

Fig. 3 is a view similar to Figs. 1 and 2, omitting part of the construction and showing the step immediately after the molding operation.

Figs. 4 and 5 are views similar to Fig. 3, showing the next successive steps in the operation of forming the stringers.

Fig. 6 is an enlarged, sectional view through one of the molded links arranged on the tape in the manner illustrated in Figs. 1 to 5 inclusive, and showing the means of anchoring the link to the tape.

Fig. 7 is a side and sectional view of a tape showing one link thereon and showing a modification.

Fig. 8 is a perspective view of a modified form of stringer that I may produce.

Fig. 9 is a detail view of a part of a stringer showing the spacing of groups of coupling elements; and,

Fig. 10 is a detail view of a pair of stringers diagrammatically illustrating the method of coupling and uncoupling the same.

Heretofore, in the construction of what are known as separable fasteners or devices of this class involving a pair of stringers having arranged longitudinally at one edge thereof interengaging coupling elements for coupling and uncoupling the stringers and the numerous devices or garment parts to which the stringers or coupling elements are attached, it has been customary to form the coupling elements of metal stampings having spaced jaws which were fed onto a mounting tape and then crimped or compressed onto the tape, or to form said elements from independent wire link members having end portions which would wrap around a mounting strand or tape or which pierce the tape in coupling the ends of the wire links thereto, and still further, in the formation of a continuous coil of wire which is fed through a mounting tape, in all of which cases, it was first essential to preform the wire or metal or partially preform the same, and then apply it to a tape or other strand.

It is the purpose of my present invention to obviate and eliminate these old methods of procedure, and to eliminate the added cost occasioned thereby, especially in first preforming the raw material to a desired contour or cross sectional form, such for example, as in first forming the wire from which the wire type fasteners were produced, or in first shaping or rolling the strips of metal from which the stampings are formed, and to take the crude or raw material which is in a molten state and to shape it directly upon the mounting strip, tape or other supporting

body. In the following specification and claims, where reference is made to molten material or molding and casting material, it will be understood that this is to include any kind or class of metal that may be found suitable for forming the moldings or die casting on the stringer tape or strand, or any type of other plastic or molding material or compositions of material of cellulose base, rubber base and including bakelite and similar compositions. At this time, it will also be apparent that the form, contour or design of the separate coupling elements as well as the size thereof may be varied to suit the fancies of the customer or consumer.

To illustrate one manner of carrying my improved method into effect, I have shown in Figs. 1 to 5 inclusive what may be regarded as the successive series of steps of forming the successive coupling elements in one cycle of operation of the machine parts or elements.

In these figures, I have shown oppositely disposed dies or molds 11 and 12, each having a bore 13 in which is disposed a pipe 14 for introduction of a cooling fluid into the die to cool the same. The adjacent faces of the dies are recessed as seen at 11*a*, 12*a*, to produce the desired molded element or link when said faces of the dies are brought together as indicated in Fig. 2, the dies having recesses 11*b* and 12*b* to receive a core piece and feed member 15, and other recesses 11*c* and 12*c* to receive the nozzle 16 through which molding material or casting material is inserted into the recesses 11*a* and 12*a*. The die 12 carries a needle-like pin 17 adapted to enter an apertured lug 18 in the die 11 and to pass through a mounting strip or tape 19 to form openings 20 therein as is indicated in Fig. 1. In Fig. 1, I have shown at 21, a number of coupling links or elements secured to the strip 19 and formed by the mold recesses 11*a*, 12*a* of the dies 11 and 12, with the last formed coupling element disposed below and out of the path of the dies 11 and 12, the strip 19 with the coupling elements thereon being supported in position by oppositely disposed friction blocks 22 as clearly seen in Fig. 1.

At 23, I have shown a melting pot containing suitable molten material as indicated at 24, and the pot 23 is slidably mounted on guide rails 25 by means of suitable rollers or wheels 26 to permit movement of the pot 23, including the nozzle 16, toward and from the dies 11 and 12. The nozzle 16 is coupled with and forms a continuation of a goose neck 27, the free end 27*a* of which extends upwardly and protrudes through the top of the pot 23 to form a pump cylinder in which a piston 28 is movably mounted above and below an admission port 27*b* formed in the cylinder 27*a* so that when the piston 28 is in raised position as shown in Fig. 1, the molten material 24 will enter the goose neck 27 through the port 27*b* and assume in the goose neck a level consistent with the level of the material 24 in the pot 23. At this time, it will be understood that the nozzle 16 and especially the discharge end thereof is at all times above the level of the molten material 24 in the pot. It will thus appear that when the piston 28 descends in the cylinder 27*a* below the port 27*b*, the molten material in the goose neck 27 will be forced out through the nozzle 16 and into the recesses 11*a*, 12*a* of the dies to mold or cast the elements 21, and this position of the parts is shown in Fig. 2 of the drawings. It will be understood that the pot 23 will be heated in any desired manner to maintain the material 24 in proper fluid state to permit the formation of the castings or moldings. At 29, I have indicated at the bottom of the pot 23, a suitable heating unit which may be electrical. In dotted lines, I have indicated at 30 in Fig. 1, a housing enclosing the nozzle 16 which may contain an electric or other heating unit for maintaining the nozzle in heated state at all times, the tip end only of the nozzle being exposed for insertion into the recesses 11*c*, 12*c* of the dies. The heating unit 30 is omitted from Figs. 2 to 5 inclusive for sake of simplicity, it being understood that these features of the apparatus in themselves form no direct part of my invention and will be consistent with the customary practice in molding or casting apparatus of the class under consideration. The heating units and the method of constructing the same as well as the method of constructing the melting pot 23 and its insulation will be made to suit the particular types and kinds of casting and molding material employed.

In the construction shown, the contour of the recesses 11*a*, 12*a* in the dies 11 and 12 is such as to form elongated coupling elements 21, the ends of which protrude beyond the strip 19, having on their lower faces projecting rectangular knobs or beads 21*a*, note Fig. 3, and the upper faces of said protruding ends of the coupling elements have in vertical alinement with the knobs or beads 21*a* corresponding and slightly larger recesses 21*b* which are formed by the core and feed member 15 and are adapted to receive the knobs 21*a* on the coupling elements 21 of a companion stringer in coupling and uncoupling the stringers in the manner indicated in Fig. 10 of the drawings. At this time, it will be apparent that the contour of the coupling elements 21 as well as that of the knobs or beads 21*a* and recesses 21*b* may be modified to suit the fancies of a manufacturer and/or consumer, and by virtue of the molding and casting process herein disclosed, it will be apparent that various designs, imprints and other characteristics of ornamentation or advertising may be incorporated in the coupling elements by simply constructing the dies accordingly, and for the sake of simplicity, a simple form of coupling element is disclosed.

In Fig. 6 of the drawings, it will appear that the openings 20 are formed by piercing the strip 19 with the pin 17 which operates to spread the fibres or threads of the strip 19 if the same is of such structure. In casting or molding the elements 21, the molding material will cast or mold a binding portion 21*c* through the apertures or openings 20 as seen in Fig. 6 to securely retain the elements 21 against displacement from the strip, it being also understood, however, that the cast or molded material will impregnate the fibre of the strip and be securely bound thereto.

In this connection, attention is directed to the fact that in molding hot, molten metal upon the strip, there will be no danger of scorching a fibre strip by reason of the well known fact that the heat of the cast or molded metal will immediately flow to the cool metals of the dies 11 and 12 and be absorbed thereby, and this operation is assured through the relatively fast series of molding operations which would necessarily be provided in the production of my improved product by the introduction of the cooling medium or fluid to the dies through the pipes 14 and the bores 13 in the dies. It will also be understood that the elements 21 may be molded or cast on supporting strips, strands or bodies of any kind or class, and in some instances, may include metallic strips,

strands or bodies. For example, in Fig. 8 of the drawings, I have shown coupling elements 21 similar to those shown in Figs. 1 to 5 inclusive molded or cast upon a cord, wire, cable or the like 19a which forms the stringer, or at least part of the stringer of a coupling element of the class under consideration.

In forming coupling stringers of the class under consideration, it is a common practice to form a plurality of groups of coupling elements on the supporting strip or strand and to space one group of elements from another to form the independent stringers by severing the strip or strand intermediate said groups. In Fig. 9 of the drawings, I have indicated at 19b, the space on the strip 19 between two groups x and $x2$ of the coupling elements 21, it being understood that the stringers are produced for commercial use in different lengths to suit various types and kinds of merchandise, and in production, the desired and predetermined inch length requirement of the coupling elements will be formed in the respective groups x, $x2$ and then spaced apart as indicated at 19b for the purposes stated.

In Fig. 10 of the drawings, I have diagrammatically illustrated at a one stringer and at $a2$ a companion stringer coupled and uncoupled with the stringer a through a slider b of conventional or any desired form and construction which slidably engages the coupling elements 21 of the stringers to couple and uncouple the same, and at c I have indicated a finger piece or pull, by means of which the slider b may be moved longitudinally of the stringers.

In Fig. 7 of the drawings, I have shown a slight modification wherein the core and feed member 15 includes a protruding tapered tongue 15a on the lower face thereof, which forms in the coupling element 21 a supplemental recess 21d below the recess 21b and as a continuation thereof. The purpose of this modification would be primarily to reduce the amount of material employed in molding each link or coupling element 21, without in any way affecting the strength of the coupling element. This feature may, however, also be included to modify the form and contour of the interengaging portions of the links of separate stringers.

The successive steps in each cycle of operation of the machine elements diagrammatically disclosed for producing the molded or cast coupling elements 21, will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following statement.

Considering Fig. 1, the several parts are now in position preparatory to moving the dies 11 and 12 together and to position the nozzle 16 within and between said parts to form another link, the core 15 being disposed between the recesses 11b and 12b of the dies, and the strip 19 supported by the friction blocks 22. From this position, the parts move into the position shown in Fig. 2 wherein the pot 23 including the nozzles 16 has advanced, and the dies 11 and 12 have been brought together under pressure with the perforated strip 19 between the dies with the core 15 disposed in the recesses 11b, 12b and with the nozzle 16 in the recesses 11c, 12c. The instant that the parts are brought together in the position shown in Fig. 2, the plunger or piston 28 is moved downwardly into the position shown in Fig. 2, to force the molten material 24 into the recesses 11a, 12a of the dies to cast or mold one of the coupling elements 21. Immediately after the casting has been formed, the dies 11 and 12 are moved in opposite directions away from the resulting casting and the nozzle 16 including the pot 23 is moved outwardly, the result of which will leave the parts in the position shown in Fig. 3 with the last formed coupling element 21 disposed on the lower end of the core and feed member 15.

The next step in the operation consists in moving the member 15 downwardly after releasing the friction blocks 22 from the strip 19 and to again move the dies 11 and 12 inwardly to such position as to dispose the inner ends of the dies over the side edge portions of the last formed coupling link, which has been moved by the member 15 into a position below the lower surfaces of the dies as clearly seen in Fig. 4 of the drawings, after which the member 15 is moved upwardly as shown in Fig. 5, in which operation, the last formed coupling element is brought into firm engagement with the lower surfaces of the die, and the friction blocks 22 are again moved into position to engage and support the strip 19 to retain said strip with the coupling elements thereon against movement, and as will be apparent, the core 15 is released from the recess 21b of the last formed coupling element. In raising said member it is returned into the position shown in Fig. 1, after which the dies 11 and 12 are also returned into the position shown in Fig. 1.

During the foregoing steps in the operation, as illustrated in Figs. 3, 4 and 5 and back to Fig. 1, the pot 23 and nozzle 16 thereof remain stationary, it being understood that after the piston 28 has forced the molding material into the die as shown in Fig. 2, it will immediately return to the position shown in Fig. 1, in which operation the piston will suck the molding material contained in the nozzle inwardly to expose the same to the material within the pot through the passage 27b, which is then open, thus preventing any clogging of material in the discharge end of the nozzle 16. It will also be apparent that in the inward movement of the dies as shown in Figs. 4 and 5 of the drawings, a second hole 20 will be partially formed in the strip 19 above the first hole formed therein by the inward movement of the dies as shown in Fig. 2 of the drawings. It will be further apparent that the movement of the last formed coupling element into engagement with the lower surface of the dies 11 and 12 serves to definitely space the links one from the other, which spacing is in part controlled by the member 15 and the movements imparted thereto. The blocks 22 merely serve to support the strip 19 with the elements 21 thereon intermittently in fixed position, the spacing as at 19b being accomplished by an independent feed as is common in other apparatus of the class under consideration, or in fact, this strip may be fed to provide the space 19b by hand.

In the use of some metals in forming the castings it may be found necessary and desirable to treat fibrous supporting strips, strands or bodies with a material which will render the same substantially fire or flame proof to prevent burning, scorching or other breaking down of the fibre of the strip or supporting body where the coupling element is attached thereto. However, I have found in practice that in using a molding material composed of zinc or a composition containing a fairly large percentage of zinc, no scorching or burning of a fibrous body will be experienced, bearing in mind the fact that the

heat of the molded element will flow through and be absorbed by the dies which are water cooled.

From the foregoing, it will be apparent that each coupling element 21 is formed through a series of operations similar to those above described with respect to the illustrations in Figs. 1 to 5 inclusive. It will be understood that while I have diagrammatically illustrated certain forms of dies and other elements in carrying my improved method into effect and have illustrated the specific forms of coupling elements, my invention is not limited in these respects, nor am I limited to the specific steps of the method herein disclosed nor to the use of any particular type or kind of molding or casting material, and various other changes in and modifications of the construction herein shown and described may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

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

1. The herein described method of forming stringers of separable fasteners of the class described, which consists in arranging one edge only of a mounting strip or body between adjacent surfaces of opposed die parts, moving said die parts together into abutting relation and into engagement with said edge of the strip, introducing a molding material into the mold recesses of the dies and upon a portion of the strip disposed between the dies to form at a predetermined point on the strip, a coupling element having an interlocking portion protruding beyond one side edge of the strip.

2. The herein described method of forming stringers of separable fasteners of the class described, which consists in arranging one edge only of a mounting strip or body between adjacent surfaces of opposed die parts, moving said die parts together into abutting relation and into engagement with said edge of the strip, introducing a molding material into the mold recesses of the dies and upon a portion of the strip disposed between the dies to form at a predetermined point on the strip, a coupling element having an interlocking portion protruding beyond one side edge of the strip, and forming on opposed surfaces of the interlocking portions of said coupling elements, protruding members and recesses to provide interlocking engagement of one stringer with a companion stringer.

3. The herein described method of forming stringers of separable fasteners of the class described, which consists in arranging a mounting strip or body between adjacent surfaces of opposed die parts, moving said die parts together into abutting relation and into engagement with said strip, introducing a molding material into the mold recesses of the dies and upon a portion of the strip disposed between the dies to form at a predetermined point on the strip a coupling element having an interlocking portion protruding beyond one side edge of the strip, forming on opposed surfaces of the interlocking portions of said coupling element, protruding members and recesses to provide interlocking engagement of one stringer with a companion stringer, the recesses in said coupling elements being formed by a core member independent of the die parts and by means of which a formed coupling element is moved out of engagement with the die parts when separated, and the strip positioned to receive another molded coupling element spaced a predetermined distance from the first element.

4. The herein described method of forming stringers of separable fasteners of the class described, which consists in arranging a mounting strip or body between adjacent surfaces of opposed die parts, moving said die parts together into abutting relation and into engagement with said strip, introducing a molding material into the mold recesses of the dies and upon a portion of the strip disposed between the dies to form at a predetermined point on the strip a coupling element having an interlocking portion protruding beyond one side edge of the strip, forming on opposed surfaces of the interlocking portions of said coupling element protruding members and recesses to provide interlocking engagement of one stringer with a companion stringer, the recesses in said coupling elements being formed by a core member independent of the die parts and by means of which a formed coupling element is moved out of engagement with the die parts when separated and the strip positioned to receive another molded coupling element spaced a predetermined distance from the first element, and detaching the core member from a formed coupling element with said coupling element retained in predetermined position.

5. The herein described method of forming stringers of separable fasteners of the class described, which consists in arranging a mounting strip or body between adjacent surfaces of opposed die parts, moving said die parts together into abutting relation and into engagement with said strip, introducing a molding material into the mold recesses of the dies and upon a portion of the strip disposed between the dies to form at a predetermined point on the strip a coupling element having an interlocking portion protruding beyond one side edge of the strip, forming on opposed surfaces of the interlocking portion of said coupling element protruding members and recesses to provide interlocking engagement of one stringer with a companion stringer, the recesses in said coupling elements being formed by a core member independent of the die parts and by means of which a formed coupling element is moved out of engagement with the die parts when separated and the strip positioned to receive another molded coupling element spaced a predetermined distance from the first element, detaching the core member from a formed coupling element with said element retained in predetermined position, and supporting said strip and coupling elements against movement after disengaging the core member from a formed element and prior to molding an adjacent element on the strip.

6. The herein described method of forming stringers of separable fasteners of the class described, which consists in arranging a mounting strip or body between adjacent surfaces of opposed die parts, moving said die parts together into abutting relation and into engagement with said strip, introducing a molding material into the mold recesses of the dies and upon a portion of the strip disposed between the dies to form at a predetermined point on the strip a coupling element having an interlocking portion protruding beyond one side edge of the strip, forming on opposed surfaces of the interlocking portion of said coupling element protruding members and recesses to provide interlocking engagement of one stringer with a companion stringer,

the recesses in said coupling elements being formed by a core member independent of the die parts and by means of which a formed coupling element is moved out of engagement with the die parts when separated and the strip positioned to receive another molded coupling element spaced a predetermined distance from the first element, detaching the core member from a formed coupling element with said coupling element retained in predetermined position, supporting said strip and coupling elements against movement after disengaging the core member from a formed element and prior to molding an adjacent element on the strip, and forming apertures in the strip at spaced intervals and in alinement with that part of the coupling elements to be mounted on the strip to provide a binding between the parts of the molded coupling elements on the strip.

7. The herein described method of forming stringers of separable fasteners of the class described, which consists in arranging a mounting strip or body between adjacent surfaces of opposed die parts, moving said die parts together into abutting relation and into engagement with said strip, introducing a molding material into the mold recesses of the dies and upon a portion of the strip disposed between the dies to form at a predetermined point on the strip a coupling element having an interlocking portion protruding beyond one side edge of the strip, forming on opposed surfaces of the interlocking portion of said coupling element protruding members and recesses to provide interlocking engagement of one stringer with a companion stringer, the recesses in said coupling elements being formed by a core member independent of the die parts and by means of which a formed coupling element is moved out of engagement with the die parts when separated and the strip positioned to receive another molded coupling element spaced a predetermined distance from the first element, detaching the core member from a formed coupling element with said coupling element retained in predetermined position, supporting said strip and coupling elements against movement after disengaging the core member from a formed element and prior to molding an adjacent element on the strip, forming apertures in the strip at spaced intervals and in alinement with that part of the coupling elements to be mounted on the strip to provide a binding between the parts of the molded coupling elements on the strip, and moving the means for injecting the molding material into the dies toward and from the dies during the successive molding operations.

8. The herein described method of manufacturing a stringer of separable fasteners of the class described, which consists in intermittently moving die parts toward and from each other to form a series of moldings or castings of predetermined contour, said moldings or castings forming the coupling elements of a stringer, molding said successive series of coupling elements at equally spaced intervals onto a supporting body of the stringer with the coupling portions of said elements protruding from said body, successively forming the coupling elements on a core member disposed between the dies, and utilizing said member as a feed to feed the formed element out of engagement with the dies and to space said element a predetermined distance from the next element to be molded on said body.

9. The herein described method of manufacturing a stringer of separable fasteners of the class described, which consists in intermittently moving die parts toward and from each other to form a series of moldings or castings of predetermined contour, said moldings or castings forming the coupling elements of a stringer, molding said successive series of coupling elements at equally spaced intervals onto a supporting body of the stringer with the coupling portions of said elements protruding from said body, successively forming the coupling elements on a core member disposed between the dies and utilizing said member as a feed to feed the formed element out of engagement with the dies and to space said element a predetermined distance from the next element to be molded on said body, and moving a nozzle through which the molding material is injected into the dies toward and from said dies in the successive series of molding operations.

10. The herein described method of manufacturing a stringer of separable fasteners of the class described, which consists in intermittently moving die parts toward and from each other to form a series of moldings or castings of predetermined contour, said moldings or castings forming the coupling elements of a stringer, molding said successive series of coupling elements at equally spaced intervals onto a supporting body of the stringer with the coupling portions of said elements protruding from said body, successively forming the coupling elements on a core member disposed between the dies and utilizing said member as a feed to feed the formed element out of engagement with the dies and to space said element a predetermined distance from the next element to be molded on said body, moving a nozzle through which the molding material is injected into the dies toward and from said dies in the successive series of molding operations, and forcing the molded material through the said nozzle into the dies under pressure.

11. The method of manufacturing a fastener device, comprising an elongated supporting body having a plurality of coupling elements arranged and spaced longitudinally of one edge of said body with the coupling parts of said elements protruding beyond said edge, which consists in moving dies for molding said coupling elements toward and from opposed sides of said supporting body and introducing molding material into the dies under pressure to form said elements when said dies are held in firm engagement with each other and with said supporting body, and moving the formed coupling elements by a forming member out of engagement with the dies when separated to position an adjacent part of the supporting body between the dies to permit the next successive molding operation.

12. The method of manufacturing a fastener device, comprising an elongated supporting body having a plurality of coupling elements arranged and spaced longitudinally of one edge of said body with the coupling parts of said elements protruding beyond said edge, which consists in moving dies for molding said coupling elements toward and from opposed sides of said supporting body and introducing molding material into the dies under pressure to form said elements when said dies are held in firm engagement with each other and with said supporting body, moving the formed coupling elements by a forming member out of engagement with the dies when separated to position an adjacent part of the supporting body between the dies to permit the

next successive molding operation, and shaping the supporting body to provide for the formation of anchoring or keying means on said molded element for binding the elements on and retaining the same against displacement from said supporting body.

13. The method of manufacturing a fastener device comprising an elongated supporting body having a plurality of coupling elements arranged and spaced longitudinally of one edge of said body with the coupling parts of said elements protruding beyond said edge, which consists in intermittently moving coupling element forming dies toward and from opposite side faces of the supporting body and a core forming member disposed in alinement with said body and in the path of said dies, supporting said dies in firm engagement with each other and with said supporting body and core member to form between the dies and around said body and member a mold chamber, introducing molding material into said mold chamber under pressure to form a coupling element supported on said core member, then separating the dies and operating the core member to move the formed coupling element out of alinement with the mold recesses of the dies and to position another part of the supporting body between the dies to receive the next adjacent coupling element, and then disengaging the core member from the formed element, and retaining said formed element and the supporting body in predetermined spaced position in the disengagement of said core member.

14. The method of manufacturing a fastener device comprising an elongated supporting body having a plurality of coupling elements arranged and spaced longitudinally of one edge of said body with the coupling parts of said elements protruding beyond said edge, which consists in intermittently moving coupling element forming dies toward and from opposite side faces of the supporting body and a core forming member disposed in alinement with said body and in the path of said dies, supporting said dies in firm engagement with each other and with said supporting body and core member to form between the dies and around said body and member a mold chamber, introducing molding material into said mold chamber under pressure to form a coupling element supported on said core member, then separating the dies and operating the core member to move the formed coupling element out of alinement with the mold recesses of the dies and to position another part of the supporting body between the dies to receive the next adjacent coupling element, then disengaging the core member from the formed element and retaining said formed element and the supporting body in predetermined spaced position in the disengagement of said core member, and forming apertures in that part of the supporting body in connection with which the coupling elements are molded to provide a binder of the molded element through said body.

15. The method of manufacturing a fastener device comprising an elongated supporting body having a plurality of coupling elements arranged and spaced longitudinally of one edge of said body with the coupling parts of said elements protruding beyond said edge, which consists in intermittently moving coupling element forming dies toward and from opposite side faces of the supporting body and a core forming member disposed in alinement with said body and in the path of said dies, supporting said dies in firm engagement with each other and with said supporting body and core member to form between the dies and around said body and member a mold chamber, introducing molding material into said mold chamber under pressure to form a coupling element supported on said core member, then separating the dies and operating the core member to move the formed coupling element out of alinement with the mold recesses of the dies and to position another part of the supporting body between the dies to receive the next adjacent coupling element, then disengaging the core member from the formed element and retaining said formed element and the supporting body in predetermined spaced position in the disengagement of said core member, and cooling the dies to provide quick chilling of the molded coupling elements on said body.

16. The herein described method of forming stringers of separable fasteners of the class described which consists in arranging a mounting strip or body between adjacent surfaces of opposed die parts having mold chambers between said surfaces in which one edge portion of the mounting strip is arranged, another die part arranged in the plane of said strip and between adjacent surfaces of the first die parts and movable relatively thereto, moving said first named die parts together into abutting relation and into engagement with said strip and the last named die part, and introducing molding material into the mold chambers of the dies to form on that part of the strip within the chambers of said dies a coupling element having an interlocking portion protruding beyond one edge of the strip.

17. The herein described method of forming stringers of separable fasteners of the class described which consists in arranging a mounting strip or body between adjacent surfaces of opposed die parts having mold chambers between said surfaces in which one edge portion of the mounting strip is arranged, another die part arranged in the plane of said strip and between adjacent surfaces of the first die parts and movable relatively thereto, moving said first named die parts together into abutting relation and into engagement with said strip and the last named die part, introducing molding material into the mold chambers of the dies to form on that part of the strip within the chambers of said dies a coupling element having an interlocking portion protruding beyond one edge of the strip and separating said first named die parts and feeding the formed element and said strip by the second named die part to position and space the strip to receive the next successive molded link, and then removing the second named die part from the formed element.

18. The herein described method of forming a series of coupling links on a mounting strand to produce a separable fastener of the class described which consists in utilizing three forming members, two of which are movable toward and from each other and said mounting strand in one plane, and the other member being movable angularly with respect to the first named members, said members when brought together forming around and beyond one edge portion of the mounting strand a mold chamber, and introducing molding material into said chamber to form therein a coupling link on said strand, the protruding portion of which includes on one side face a projecting member and on the opposite side

face a recess, the latter being formed by one of said forming members.

19. The method of forming die cast coupling links of fastener stringers of the class described which consists in moving dies toward and from each other and the mounting strip of a stringer disposed therebetween with one edge extending into the mold chamber of the dies, arranging a nozzle intermediate said dies with the discharge end thereof opening directly into the mold chamber of the dies and discharging casting material from the nozzle into the mold chamber of the dies under pressure so as to form on the edge of the mounting strip within said chamber and at the end of the nozzle a link of said stringer.

20. The method as defined in claim 19 including the step of first treating the mounting strip of the stringer to render the same substantially flame-proof before casting the links thereon.

21. The method of forming die cast coupling links of fastener stringers of the class described which consists in moving dies toward and from each other and the mounting strip of a stringer disposed therebetween with one edge extending into the mold chamber of the dies, arranging a nozzle intermediate said dies with the discharge end thereof opening directly into the mold chamber of the dies and discharging casting material from the nozzle into the mold chamber of the dies under pressure so as to form on the edge of the mounting strip within said chamber and at the end of the nozzle a link of said stringer, disposing a forming element between adjacent surfaces of the dies and extending into the mold chamber thereof to form on one surface of the link outwardly of said strip a recess.

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