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METHOD OF CONTROLLING THE LENGTH
OF SEPARABLE FASTENERS
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Fig. 1.

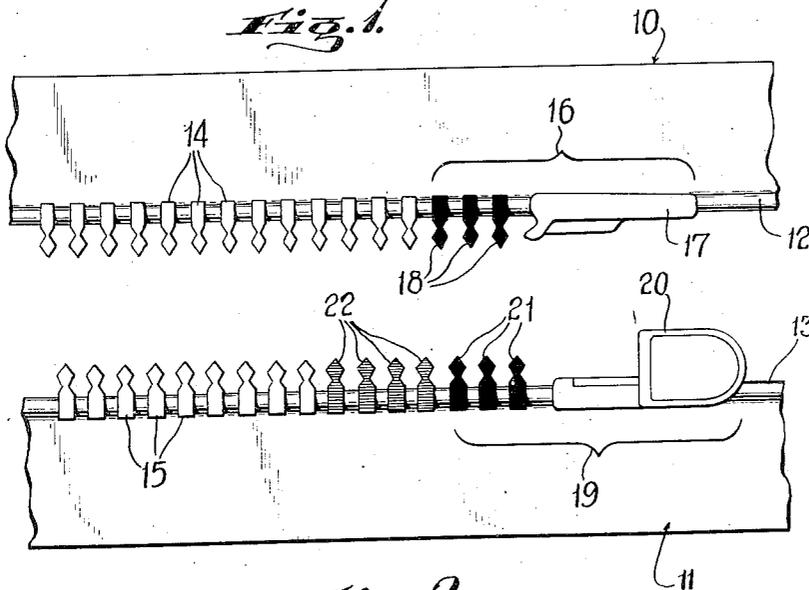


Fig. 2.

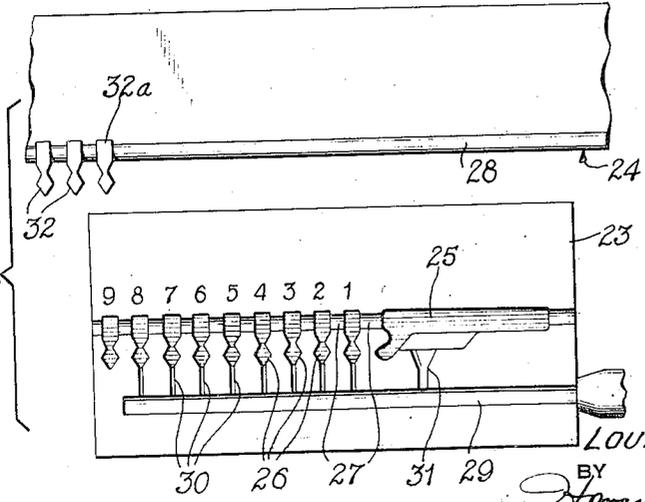


Fig. 3.

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METHOD OF CONTROLLING THE LENGTHS OF SEPARABLE FASTENERS

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This invention relates to the method of forming separable fastener stringers of the type and kind employing separators at one end of the stringers to provide complete separation thereof. More particularly, the invention deals with the formation of die cast separators, such as pin and box parts on the stringer ends and simultaneously forming a predetermined number of scoops in a single casting operation in determining fixed stringer lengths and, further, in obtaining, in each cast unit, fixed length increments, particularly in inches consistent with the casting of groups of scoops also of fixed inch lengths.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, 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 plan view of one end portion of one stringer of a separable fastener illustrating the formation of a pin part and a plurality of scoops simultaneously on said stringer.

Fig. 2 is a view similar to Fig. 1 of a companion stringer showing the box part and a plurality of links cast simultaneously with the box part on the stringer; and

Fig. 3 is a diagrammatic face view of one die, showing, in exploded relationship, one end portion of a stringer about to be inserted into the die, preparatory to forming a cast unit on said end portion of the stringer.

In the formation of separable fasteners and, particularly, where the scoops are cast on each stringer of the fastener in groups defining fixed inch lengths, stringer lengths are determined by the number of these groups which are formed, particularly in that separable fasteners of this kind are usually sold in lengths comprising a predetermined number of inches. In some fasteners of this kind, particularly where complete separation of the stringers is required, pin and box couplings are provided at one end of the stringers for the complete separation thereof. As these pin and box couplings vary in length in different size fasteners in order that the pin and box couplings be consistent in size with the size of the scoops employed, difficulty is experienced in producing the required over-all length of the resulting stringers.

It is one purpose and object of my invention to provide a method of forming the desired stringer lengths by simultaneously die casting with the pin and box parts such additional scoops

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as may be necessary to make up the desired inch increment in the resulting fastener.

In some instances, this will require the casting of a like number of additional scoops on each stringer, or a varied number of scoops on the stringers. However, in other instances, where it is desirable to provide one stringer of greater length than the other stringer, as for example as taught in my prior application Ser. No. 527,802, filed March 23, 1944, now Patent No. 2,438,614, these added scoops required on the one stringer may also be simultaneously cast in addition to the scoops added to make up the increment, thus eliminating the necessity of having to form stringers of different lengths in the initial production of the stringers. In other words, it will be understood that, in accordance with my method, the formation of end stops or couplings of any type or kind as die castings upon the stringer tapes may also include the addition of added scoops on one or both stringers of a pair in definitely controlling and obtaining predetermined over-all stringer lengths in the resulting fastener. In this respect, it will be apparent that the separable end stops, illustrated in the accompanying drawing and later described, are only illustrative of one type and form of end stop which can be employed.

For the purpose of illustrating one adaptation of the invention, I have shown at 10, in Fig. 1, one end portion of one stringer and at 11, in Fig. 2 of the drawing, the corresponding end portion of a companion stringer. The stringers 10 and 11 have beaded edges 12, 13 respectively and, on these beaded edges are secured a plurality of scoops 14 and 15 applied to the stringers in the usual manner and these may be applied by simultaneously casting groups of the scoops in defining inch lengths along the stringers. For example, if each group of castings would consist of eight scoops and it is desired to produce a ten inch stringer, then the ten inch stringer would comprise eighty scoops. The foregoing is only by way of illustration, as a greater and lesser number of scoops may be cast simultaneously on the beaded edges of the stringers in forming the inch lengths.

On the beaded edge 12 of the tape 10 beyond end scoops is formed a die cast unit outlined by the bracket 16. This unit comprises a pin portion 17 of a separable coupling and three scoops 18 which are shown in solid black in order to distinguish these scoops from the pre-cast scoops 14 and to associate them with the pin part 17 in forming the unit 16.

On the beaded edge 13 of the tape 11 is formed another die cast unit 19 comprising a box part 20 of a separator and three scoops 21, which are also shown in solid black. As the pin and box couplings 17 and 20 generally are known in the art, no specific description of these members will be given, as it is well known that the pin part 17 enters the box part 20 in securely retaining the stringers 10 and 11 together and in forming an end stop limiting movement of the conventional slider, not shown, at least on one of the stringers, namely the stringer 11.

The die cast units 16 and 19 will collectively comprise an inch increment of the resulting fastener. In other words, the pin part 17 plus the three scoops 18 and the box part 20 and the three scoops 21 will each comprise in the assembled relationship of these parts an inch increment on the resulting fastener, thus if a ten inch over-all length on the resulting fastener is required, the scoop length of each stringer will be nine inches and the units above mentioned will add the one inch making up the ten inch length.

It will be understood that, in forming certain units, particularly in the different size fasteners, that is to say, where the scoops are of different sizes and may comprise more or less scoops in the inch lengths, more or less of the added scoops in the units 16 and 19 will be provided and, in some instances, the added scoops in the units may vary, for example, the unit 19 may have two scoops, where the unit 16 has three scoops or vice versa.

In other instances, where the stringers are made of totally different lengths, as for example in the application heretofore identified, instead of having to produce stringers of different lengths, the added scoops may be simultaneously formed in the casting one of the units, for example, the unit 19 in the structure shown in Fig. 2. To illustrate one such addition, I have shown at 22 four shaded scoops which would be formed in addition to the three scoops 21 in casting the unit 19, the added four scoops providing the additional length required in the stringer 11.

It will be apparent that, with my improved method, fasteners of odd lengths may also be produced without interfering with standard production of the stringers by casting onto each stringer a less or greater number of scoops in casting each unit to provide the odd over-all dimensions. In other words, this might be done by minimizing the number of scoops cast in the unit or by increasing the number of scoops cast. For example, in the present illustration of the unit 16 and 19, if 10½ inches were required on the resulting fastener, then four additional scoops would be cast on each stringer in forming each of the units 16 and 19, keeping in mind that the inch increment in this instance would comprise eight scoops. It will thus be seen that my improved method provides a very flexible and practical method of producing separable fastener stringers, particularly in the operation of die casting end stops of any type or kind thereon.

From this standpoint, it will be understood that the same principle may be utilized in casting end scoops at either end of the stringers, particularly separable fasteners which do not employ the separators, as at 17 and 20.

In order to illustrate more clearly my method of forming the cast units including the end stop and a predetermined number of scoops and, further, in illustrating another adaptation of the invention, I have shown diagrammatically in

Fig. 3 the face view of one part 23 of a die casting die and at 24, in exploded relationship, one end portion of a stringer for insertion into the impressions or cavities of the die preparatory to forming a cast unit on said end portion of the stringer. For illustrative purposes, the die 23 has, on its face, an impression 25 for forming part of the pin member of an end coupling, similar to the member 17 shown in Fig. 1 and, at 26, are shown a plurality of spaced cavities or impressions which have been numbered, for illustrative purposes, 1-9 inclusive. Extending along the cavities or impressions 26 and also registering with the cavity or impression 25 are other longitudinally aligned cavities 27 adapted to receive the beaded edge 28 of the tape of the stringer. At 29 is shown the preliminary gate passage for admission of the cast material. At 30 are shown a plurality of small supplemental gate passages placing the passage 29 in communication with the cavities 26 and at 31 is another supplemental gate passage placing the passage 29 in communication with the cavity 25. It will be seen, from a consideration of Fig. 3 of the drawing, that casting material injected into the die through the gate 29 will enter all of the cavities 25, 26 and, particularly, such cavities as 26 which are exposed and not blocked off by links or scoops 32 arranged on the beaded edge 28 of the stringer 24.

With the construction shown in Fig. 3, the normal procedure in forming a cast unit would be to arrange the stringer 24 with the end scoop 32^a thereon in the cavity or impression 26 designated as number 9. This last cavity is employed simply to receive the scoops and no casting material extends to this cavity or impression. It will thus be seen that, in forming a normal cast unit, this unit will comprise the part similar to 17 formed in the cavity 25 and eight scoops numbered 1-8 inclusive for illustrative purposes.

In some instances, however, it will be desirable to form stringers of shorter lengths, in which event the end scoop 32^a on the stringer may be placed in either one of the cavities numbered 8-2 inclusive, so that, in forming the cast unit, this unit will comprise the pin part and 1 to 7 scoops added to the scoops 32-32^a previously formed on the stringer. To clearly illustrate this procedure, let us say that, for example, the cast unit will comprise the pin part and scoops numbered 1-4 inclusive. In this event, the scoop 32^a on the stringer will be arranged in the cavity designated as number 5 and the next adjacent scoops will occupy cavities 6, 7, 8 and 9 blocking off all of these cavities and, when the casting is formed, four scoops, including the pin part, will be added to the stringer.

It will be apparent that the particular number of scoop cavities initially employed in the die may vary depending entirely upon the size of the scoop castings being formed. In other words, the die may simply have four or five scoop cavities or may employ a materially greater number than that shown; for example, may comprise seven-teen.

It will be apparent that, while Fig. 3 illustrates the formation of a cast unit comprising a predetermined number of scoops and an end stop or coupling member in the form of the pin member of a separable coupling such as shown in Fig. 1, a similar die will be employed to form the coupling 20 comprising the box part, as is shown in Fig. 2. In fact, the method herein disclosed is applicable to the formation of any type and kind of cast body at one end portion of an elongated

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mounting member in the operation of forming upon the mounting member a plurality of cast elements.

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

1. The method of controlling the length of castings on an elongated mounting member on which part of the castings have been pre-formed, which comprises arranging said member in a die having a plurality of cavities conforming to the contour of said pre-formed castings and with one or more of the pre-formed castings in one or more of the cavities of said die, then forming on said member a single cast unit comprising a number of castings defined by the unfilled cavities of the die and an added casting, said added casting being spaced from the end casting of the unit and being of a contour contrasting to that of the pre-formed castings on said member.

2. A die for forming die cast units at ends of separable fastener stringers, said die having a plurality of spaced scoop cavities arranged at one end portion thereof, a larger cavity at the other end portion of the die and adjacent said scoop cavity, a longitudinal impression in the die registering with all of said cavities for the reception of the beaded edge of a stringer tape, a single gate passage opening through one outer surface of the die, a plurality of supplemental gate passages leading from the first passage to each of the cavities of said die, said large cavity being of a contour adapted to define an end stop on a stringer adjacent an end scoop thereon, and another scoop cavity of the die arranged beyond the limits of and out of communication with said gate passage, said last named scoop cavity being spaced with respect to the other scoop cavities and an edge of the die to permit a pre-cast scoop of a stringer series to be laid in the said last named scoop cavity.

3. The method of making a separable fastener stringer consisting of a tape carrying a series of spaced scoops thereon and also an end stop member, the said scoops, spaces and end stop member together comprising a stringer of predetermined scoop length, which method comprises: casting on a tape, of a length substantially in excess of the said predetermined length, a scoop series of a length less than the said predetermined length by an amount equal to the length of the end stop member plus at least one scoop, and thereafter simultaneously casting on the tape the said end stop member and also as many scoops as are required to complete the said predetermined length.

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4. The method of forming stringers of separable fasteners, which comprises completing a stringer length by die casting a unit including an end stop part at one end of the stringer, said part being of a shape different from the stringer scoops, and forming as a portion of said unit, scoops common to the stringer scoops and materially less in number than the scoops defining the remainder of the stringer and arranged adjacent end scoops of said stringer.

5. The method of completing the desired overall scoop length of a stringer of a separable fastener and finishing one end thereof, which comprises die casting a unit at said end of the stringer adjacent an end scoop thereon, forming in said unit a minimum number of scoops adjacent said end scoop of the stringer, and an end stop body larger than the scoops and finishing said end of the stringer.

6. The method of finishing one end of the stringer of a separable fastener on which scoops have been pre-cast, which comprises forming a die cast unit on one end of the stringer of a separable fastener, said unit comprising an end stop and a sufficient number of scoops arranged between the end stop and an end scoop pre-formed on the stringer to complete the scoop stringer length.

7. The method of finishing one end of the stringer of a separable fastener on which scoops have been pre-cast, which comprises arranging an end scoop or scoops of a stringer in a corresponding number of scoop cavities of a die, said die having a minimum number of scoop cavities and a cavity larger than any scoop cavity and closely adjacent the last scoop cavity of the die, and then forming a die cast unit on the stringer arranged in the die and adjacent the end pre-cast scoop of the stringer and comprising one or more scoops and a large cast body.

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