Oct. 31, 1944. R. LOW 2,361,782

MOLDED SLIDE FASTENER

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Fig. 1.

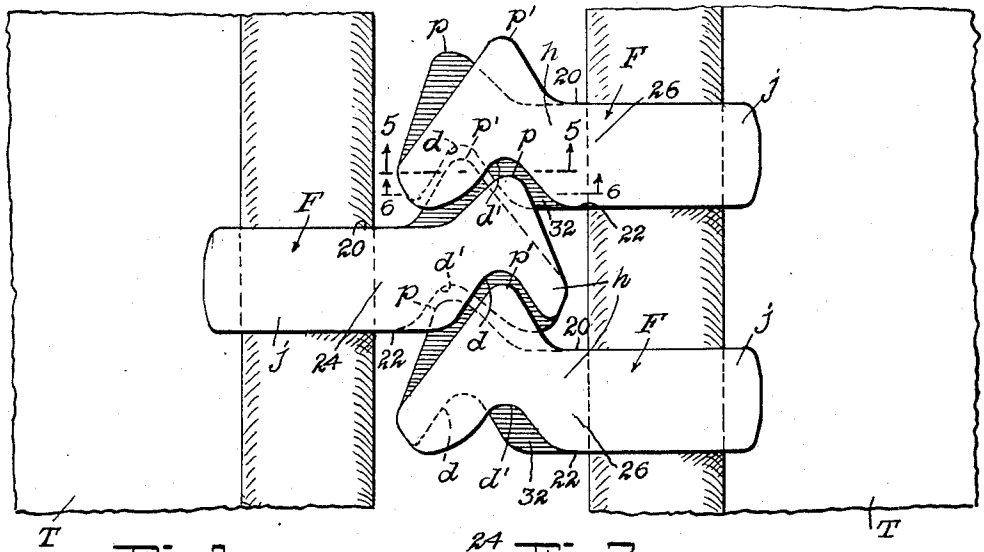


Fig. 3.

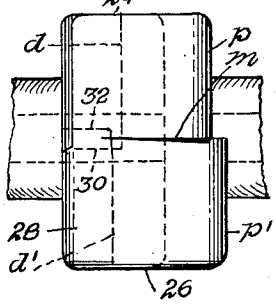


Fig. 2.

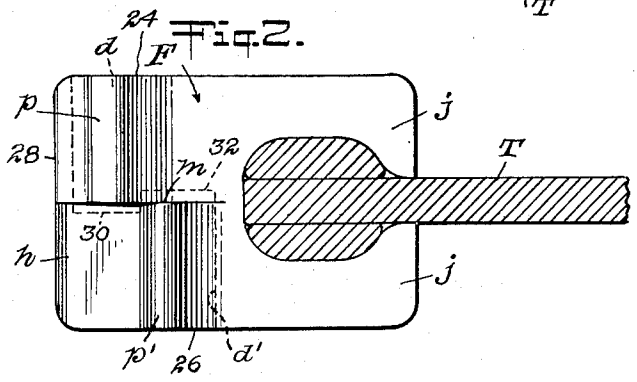


Fig. 5.

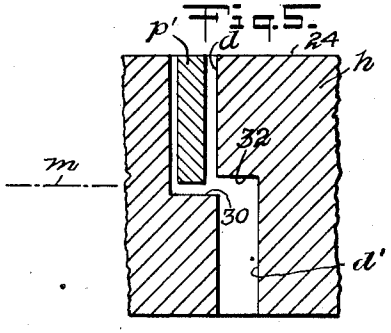


Fig. 4.

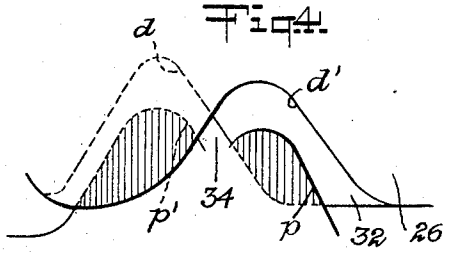
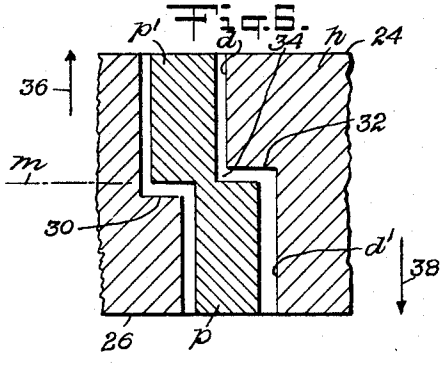


Fig. 6.



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Fig. 6.

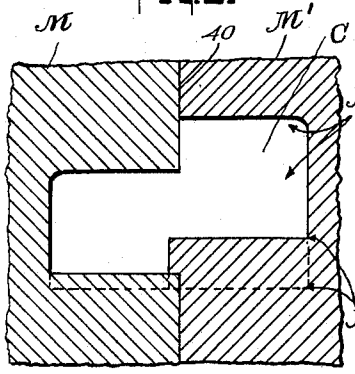


Fig. 7.

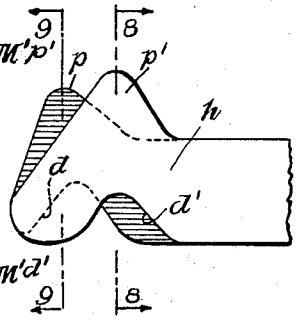


Fig. 8.

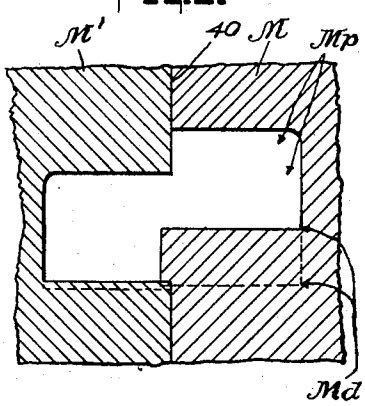


Fig. 10.

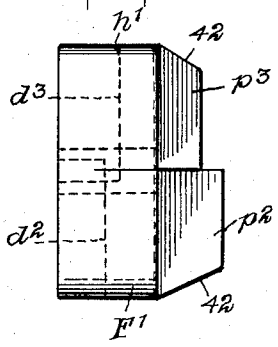


Fig. 11.

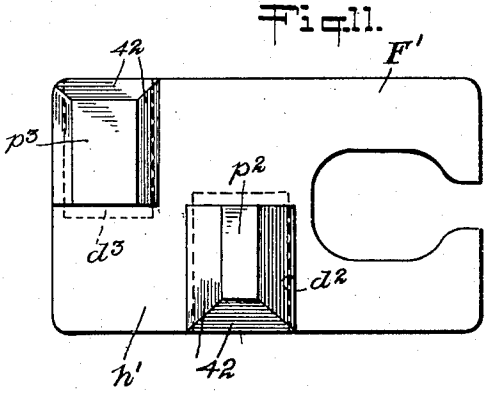


Fig. 12.

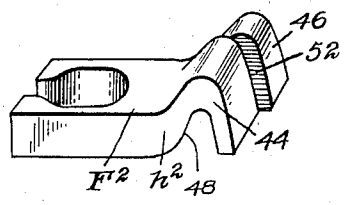
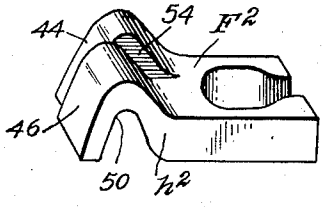


Fig. 13.



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UNITED STATES PATENT OFFICE

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MOLDED SLIDE FASTENER

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Application April 8, 1943, Serial No. 482,345

7 Claims. (Cl. 24—205)

This invention relates to slide fasteners of the type in which the slide fastener elements are molded onto the fastener tape.

In molding slide fastener elements onto a tape to make the so-called stringer, the mold has to be commonly provided with a core to form the female interlocking element or depression in one face of each slide fastener element. This is because the depression is a pocket recessed in a surface of the element that lies normal to the plane of the tape and hence perpendicular to the parting plane of the mold sections.

To avoid the use of cores, it has been suggested to so form the depression or pocket that it is open at the side wall of the fastener element. Since the element side wall parallels the parting plane of the mold, the open sided pocket therein may be formed by a part of one of the mold sections. Slide fastener elements so formed, however, have the disadvantage that unless they are made in two different forms, the mating slide fastener stringers may be undesirably separated by a sidewise or transverse movement (a direction perpendicular to the plane of the tape). The two stringers must thus be made, one stringer with one form of element, which may be denoted left elements, and the other stringer with the opposite form of element, which may be denoted right elements, the elements on one stringer being a mirror image of the elements on the other or mating stringer. The necessity of making and handling the stringers as left stringers and right stringers unduly complicates and thereby increases the cost of production.

The prime object of the present invention pertains to the provision of a molded slide fastener in which the elements, moldable without the use of cores, are all of one form, and in which the two mating stringers, each thus having the same form of elements, are not subject to the disadvantage of being undesirably separable.

To the accomplishment of this object and such other objects as may hereinafter appear, my invention is directed to the molded slide fastener and to the form or shape of the elements thereof as sought to be defined in the appended claims and described in the following specification taken together with the annexed drawings, in which:

Fig. 1 is an elevational view of the molded slide fastener of the present invention, showing illustratively three slide fastener elements in engaged or interlocking relation;

Fig. 2 is a top plan view of a slide fastener;

Fig. 3 is an end elevational view of an element;

Fig. 4 is an explanatory view thereof;

Fig. 5 is a fragmentary view of one of the slide fastener elements taken in cross-section in the plane of the line 5—5 of Fig. 1;

Fig. 6 is a similar view taken in cross-section in the plane of the line 6—6 of Fig. 1;

Fig. 7 is an explanatory view of the element in the mold;

Fig. 8 is a view of the mold sections taken in the plane of the line 8—8 of Fig. 7;

Fig. 9 is a similar view taken in the plane of the line 9—9 of Fig. 7;

Fig. 10 is an end elevational view of a modified form of element embodying the invention;

Fig. 11 is a plan view of the element of Fig. 10;

Fig. 12 is a perspective view of another modification of the element embodying the present invention; and

Fig. 13 is a perspective view of the same taken from a different point and illustrating in connection with Fig. 12, how two elements of the same form or type are related for interlocking relation.

Referring now more in detail to the drawings and having reference first to Figs. 1 to 6, the molded slide fastener comprises a tape T of any conventional form having molded on to the beaded edge thereof the slide fastener elements F, F in the usual spaced relation to form a so-called stringer, two such stringers, both of the same construction, being shown in Fig. 1 of the drawings with the elements F, F thereof in interlocking relation. Each element F comprises the customary tape engaging jaws *j*, *j* and the interlocking head *h*.

To carry out the constructional principles of the present invention, the head *h* of each slide fastener element F defined by the top face 20, the bottom face 22, the opposite side walls 24 and 26 and the end wall 28, is provided with interlocking means comprising two projections *p* and *p'* on one face (the top face) of the head *h* spaced in offset relation, that is, spaced both longitudinally and transversely of the element, and two depressions *d* and *d'* on the opposite face (that is, on the bottom face) of the head correspondingly spaced, the depressions *d* and *d'* being substantially vertically aligned with the projections *p* and *p'*. Each projection *p* and *p'* extends on its side of the head to the longitudinal median plane of the element designated as *m*, the projection *p* thus extending inwardly from its head side wall 24 to the median plane *m* and the projection *p'* extending inwardly from its head side wall 26 to the median plane *m*. Each depression

d and d' is open at its side wall of the head extending inwardly therefrom, the depression d thus extending from its head side wall **24** to and preferably slightly beyond the median plane m, while the depression d', open at its head side wall **26**, extends inwardly and preferably slightly beyond the median plane m. As particularly shown in Figs. 1 and 2, the depression d extends to the wall **30** while the depression d' extends to the wall **32**, the purpose of the slight extension beyond the median plane m being to provide full clearance for the mating projections of the element head interlocking therewith.

The essence of this construction resides in providing two offset projections and two correspondingly offset depressions in the element head, both projections extending to the longitudinal median plane of the element and both depressions being open at the side walls of the element. It is a corollary essence of the invention, since the projections of one element mate with the depressions of another element, that the projections each extend inwardly from its head side wall to the median plane and the depressions each opened at its side wall correspondingly extend inwardly to and preferably slightly beyond the said median plane. By offsetting the interlocking elements (projections and depressions), walls are provided in each element for preventing lateral separation of the element in both lateral directions; by having the projections extend to the median plane of the element, they correspondingly extend to the parting plane of the mold sections (any depression or pocket between the projections would prohibit the use of a coreless mold); and by having depressions open-ended at the element side walls, the depressions or pockets are open to mold forming parts so that these depressions may be made by such mold parts and, therefore, without the use of a core.

These relations are depicted in Figs. 4 to 9 of the drawings. Referring first to Figs. 4 to 6, it will be seen that the pocket d' is open at the side wall **26** and is closed at its own end wall **32**, while the pocket d is open at the element side wall **24** and is closed at its own end wall **30**. These pockets meet and have the common passage **34**, which latter runs through the entire width of the scoop. The projection p of one element is received by the depression or pocket d' of the next element, and the projection p' of the first element is received by the depression d of the said next element. Figs. 4 and 6 of the drawings show that any movement of an element in the transverse direction indicated by the arrow **36** is inhibited by the engagement of the projection p of that element with the end wall **32** of the next element, as indicated by the hatched lines to the right in Fig. 4, and any movement of the said element in the opposite transverse direction indicated by the arrow **38** is inhibited by the engagement of the projection p' of that element with the end wall **30** of the said next element, as indicated in the hatched lines to the left in Fig. 4. Thereby, due to the offset (longitudinal and transverse) arrangement, undesirable transverse separation of the stringers in either transverse direction is prevented. Figs. 7 to 9 of the drawings explain the relation between the element being molded and the sections of the mold. The mold sections M and M' have the parting line or plane **40**, which parting plane is coincident with the median plane of the tape T. The two mold sections when moved in mating relation, define the mold cavity C. In Fig. 8 it will be seen that the part of the mold cavity designated as M'p' produces the projection p', while the part of the mold designated as M'd' produces the depression or pocket d'. From Fig. 9 it will be seen that the part of the mold cavity designated as Mp produces the projection p, while the mold part Md produces the depression or pocket d. Because the projections extend to the parting plane of the mold sections and because the depressions or pockets are open at the element sides, both the projections and the pockets may thus be made with coreless molds.

In Figs. 10 and 11 of the drawings, I show a modification of the structure of the slide fastener element, in which the projections and depressions are offset longitudinally a greater distance than in the form of the invention of Figs. 1 to 3, a distance greater than half the length of either of the projections. Also in this form of the invention, the projections have inclined transverse and outer faces. Thus here the element F' having the head h' is provided with the projections p^2 and p^3 on one face of the head, and the depressions d^2 and d^3 on the other face of the head, following the principles of construction already described, except that as here shown the projections and the depressions are offset a larger distance longitudinally of the element and the projections are provided with the inclined faces **42**, **42**.

In Figs. 12 and 13 of the drawings, I show a slide fastener element F^2 embodying the structural principles of the invention in which the head h^2 of the element is provided with two hook-like projections **44** and **46** formed to provide the depressions **48** and **50**, these depressions and projections acting as the interlocking means. The projections **44** and **46** of one element interlock respectively with the depressions **50** and **48** of the next element. The projection **44** extends to the wall **52** and the projection **46** extends to the wall **54**. The walls **52** and **54** are in the median plane of the element F^2 and serve as the abutting walls to prevent transverse movement of one element with respect to the next element in both transverse directions.

The molded slide fastener and the slide fastener elements thereof made in accordance with any of these modifications may be molded by any suitable method such as die casting, injection molding, etc., and any moldable material, metallic or non-metallic, may be used for the slide fastener elements.

The manner of making the molded slide fastener of the present invention, the structural features of the resulting molded slide fastener and the advantages thereof will, in the main, be fully apparent from the above detailed description. It will be further apparent that many changes may be made in the structure and in the method of making the same, without departing from the spirit of the invention defined in the following claims.

I claim:

1. A slide fastener comprising a tape and slide fastener elements molded onto the tape, the elements having tape encompassing jaws and interlockable heads, each element head being defined by top and bottom faces and opposite side walls, and interlocking means for each element comprising two projections on one face of the head spaced both longitudinally and transversely of the element and two depressions on the other face of the head correspondingly spaced, each

projection extending on its side of the head to the longitudinal medial plane of the element, and each depression being open at its side wall of the head.

2. A slide fastener comprising a tape and slide fastener elements molded onto the tape, the elements having tape encompassing jaws and interlockable heads, each element head being defined by top and bottom faces and opposite side walls, and interlocking means for each element comprising two projections on one face of the head spaced both longitudinally and transversely of the element and two depressions on the other face of the head in substantially vertical alignment with the projections, each projection extending inwardly from its head side wall to the longitudinal medial plane of the element, and each depression being open at its head side wall and extending inwardly to the said longitudinal medial plane of the element.

3. A slide fastener comprising a pair of mating stringers, each stringer consisting of a tape and slide fastener elements molded onto the tape, the said elements having tape encompassing jaws and interlockable heads, all of the elements of both stringers having the same construction, each defined by top and bottom faces and opposite side walls and each having interlocking means comprising two projections on one face of the head spaced both longitudinally and transversely of the element and two depressions on the other face of the head also spaced both longitudinally and transversely of the element, each projection extending on its side of the head to the longitudinal medial plane of the element and each depression being open at its side wall of the head, the projections of the elements on either one of the stringers interlocking with the depressions of the elements of the other of the stringers.

4. A slide fastener comprising a pair of mating stringers, each stringer consisting of a tape and slide fastener elements molded onto the tape, the said elements having tape encompassing jaws and interlockable heads, all of the elements of both stringers having the same construction, each defined by top and bottom faces and opposite side walls and each having interlocking means comprising two projections on one face of the head spaced both longitudinally and transversely of the element and two depressions on the other face of the head in substantial vertical alignment with the projections, each projection extending inwardly from its head side wall to the longitudinal medial plane of the element, and each depression being open at its head side wall and extending inwardly to said longitudinal medial plane of the element, the projections of the elements on either one of the stringers interlocking with the depressions of the elements of the other of the stringers.

5. A slide fastener element having tape encompassing jaws and an interlockable head, the head being defined by top and bottom faces and opposite side walls, and interlocking means on the element head comprising two projections on one of its faces spaced both longitudinally and transversely of the element and two depressions on the other of its faces correspondingly spaced, each projection extending on its side of the head to the longitudinal medial plane of the element, and each depression being open at its side wall of the head.

6. A slide fastener element having tape encompassing jaws and an interlockable head, the head being defined by top and bottom faces and opposite side walls, and interlocking means on the element head comprising two projections on one of the faces spaced both longitudinally and transversely of the element and two depressions on the other of its faces in substantially vertical alignment with the projections, each projection extending inwardly from its head side wall to the longitudinal medial plane of the element, and each depression being open at its head side wall and extending inwardly to the said longitudinal medial plane of the element.

7. A slide fastener comprising a tape and slide fastener elements molded onto the tape, the elements having tape encompassing jaws and interlockable heads, each element head being defined by top and bottom faces and opposite side walls, and interlocking means for each element comprising two projections on one face of the head spaced both longitudinally and transversely of the element and two depressions on the other face of the head in substantially vertical alignment with the projections, each projection extending inwardly from its head side wall to the longitudinal medial plane of the element, and each depression being open at its head side wall and extending inwardly to and somewhat beyond the said longitudinal medial plane of the element.

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