Oct. 6, 1936. R. E. DE VORE 2,056,172

SLIDE FASTENER

Filed April 24, 1935

Fig. 1.

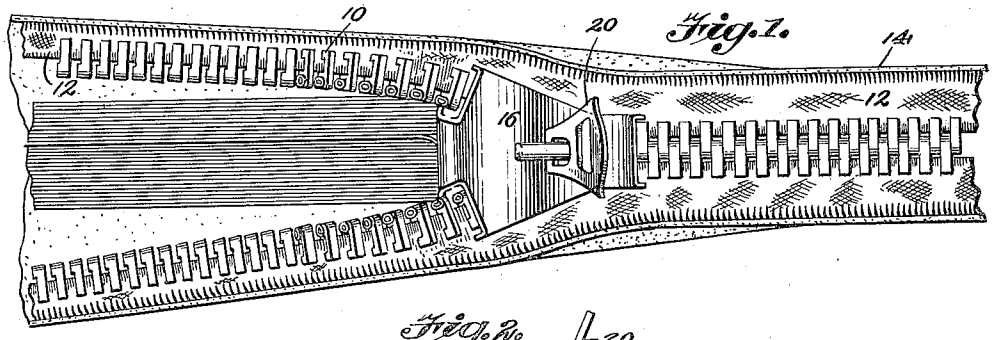


Fig. 2.

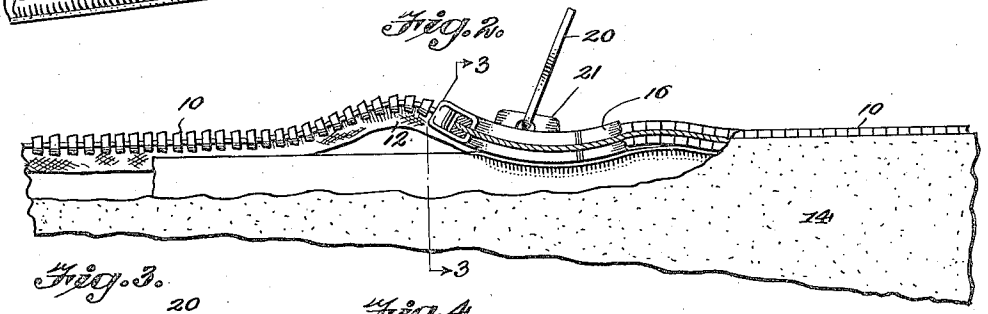


Fig. 3.

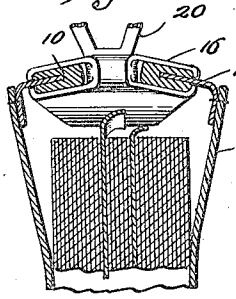


Fig. 4.

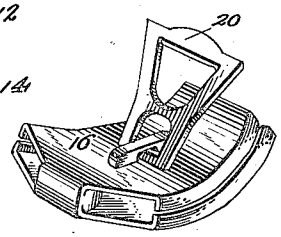


Fig. 5.

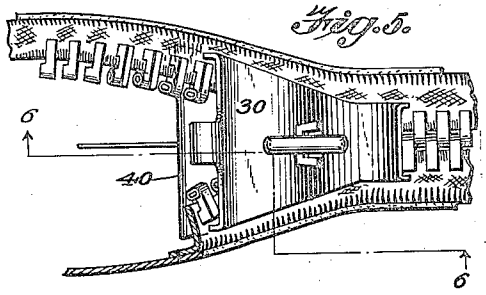


Fig. 6.

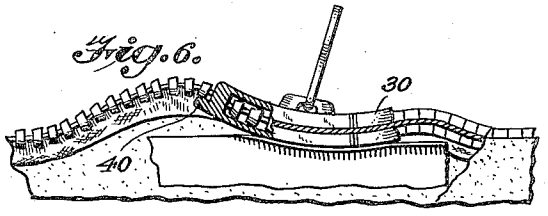


Fig. 7.

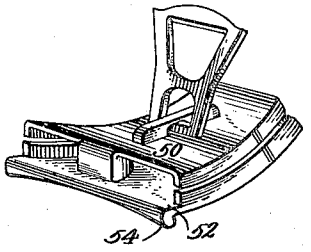


Fig. 9.

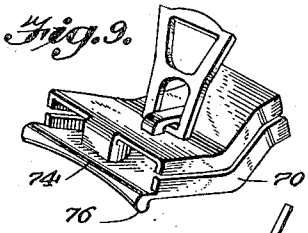


Fig. 8.

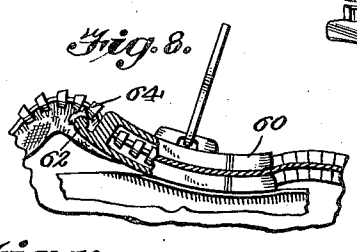
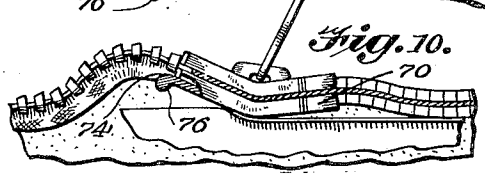


Fig. 10.



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SLIDE FASTENER

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Application April 24, 1935, Serial No. 18,048

17 Claims. (Cl. 24—205)

This invention relates to slide fasteners of the interdigitating type.

The invention looks to a slide fastener in which the slider thereof has simple and reliable means for moving out of the way protruding objects which happen to be in the path of travel of the slider and which would otherwise tend to or actually obstruct movement of the slider along the associated rows of fastener elements.

More particularly, a slider embodying the invention is especially adaptable to closures between the sides of which papers and other objects are prone to project and the slider will be found to have means to move such objects inward away from the fastener elements and at the same time to move outward the adjacent fastener elements and thus prevent protruding objects from interfering with the free advance of the slider.

Also, it will be found that the configuration of the slider provides a simple means by which objects in the path of travel of the slider during retraction thereof and which might lodge between the slider and the associated rows of fastener elements are moved inward out of the way so as to allow of the free and unobstructed retraction of the slider.

Another attribute of the slider resides in the fact that the same may be applied to and used in connection with cooperating rows of fastener elements of what might be said to be standard design without special preparation of such fastener elements for use in association with the improved slider.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawing, forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a fragmentary plan view of a slide fastener embodying the invention and applied to a receptacle for papers, the slide fastener being partly open,

Figure 2 is a fragmentary side elevation of the structure shown in Figure 1,

Figure 3 is a vertical transverse sectional view taken on line 3—3 of Figure 2.

Figure 4 is a perspective of a slider embodying the invention,

Figure 5 is a fragmentary plan view of a modified form of invention,

Figure 6 is a detail longitudinal sectional view taken on line 6—6 of Figure 5,

Figure 7 is a perspective disclosing another expression of the invention,

Figure 8 is a longitudinal sectional view partly in elevation of a slider of another form in operation,

Figure 9 is a perspective of an angled slider,

Figure 10 is an edge elevation of the slider shown in Figure 9, the slider being applied.

In the drawing, wherein for the purpose of illustration are shown several preferred embodiments of the invention, the numeral 10 designates rows of cooperating fastener elements mounted on tapes 12 by which the fastener elements are attached to the edges of the member 14 to be joined, the various applications of a fastener of the type herein shown being too numerous to mention.

It is clearly shown in Figures 1 and 2 that the rows of cooperating fastener elements 10 are mounted in spaced relation along the associated tapes and are adapted to be brought into interlocking relation through the advance of a slider 16 and to be separated by the retraction of such slider, all as well known in the art. However, it might be explained that the slider 16 is formed with a central passage having diverging branches or channels having means associated therewith by which the fastener elements are brought into the required interdigitating relation and by which the fastener elements are separated.

It is disclosed in Figure 2 that the body of the slider 16 is given a definite longitudinal curvature from end to end about an axis at right angles to the line of travel of the slider. This longitudinal curvature of the slider or more particularly, the passage therethrough has the effect of lifting or raising the fastener elements immediately in advance thereof and in the line of travel of the slider so that objects which happen to be in the path of travel of the slider are prevented from interfering with its free operation. That is to say, the lifting or raising of the fastener elements immediately in advance of the slider is in the direction away from the container to which the fastener as a whole is connected and of course, in a direction diametrically opposite the contents of the container, of whatever nature the latter happens to be.

It is not at all unusual to find papers and other objects protruding into the space between the rows of fastener elements and thus in position to interfere with the advance of the slider. It will be seen that the longitudinal curvature of the slider raises or moves outwardly the fastener ele-

ments immediately in advance thereof away from the objects within the associated receptacle. At the same time, the lower or inner surface of the slider is shown to be curved to present a rounded cam-like surface to protruding objects so as to depress such objects.

Thus, the curved formation of the slider provides, first, for the raising or outward movement of the fastener elements immediately in advance thereof and, second, to depress or move inward protruding objects or those which might interfere with the easy operation of the slider, the fastener elements and the protruding objects being moved in diametrically opposite directions to establish definite clearance.

It has been found that the movement of protruding objects, on one hand, and the fastener elements, on the other, in diametrically opposite directions as a mere incident to the advance of the slider is highly advantageous and avoids the possibility of entanglement of such protruding objects with the slider and the associated rows of fastener elements.

Since the longitudinal curvature of the slider 16 is continued for the full length of the slider, it is effective during the retraction of the slider in moving out of the way objects which might become entangled between the rows of interdigitating fastener elements and the slider and thus interfere with the easy retraction of the slider.

The longitudinal curvature of the slider 16 is shown to be moderate as distinguished from sharp, so that the rows of fastener elements are not required to make abrupt bends as an incident to the operation of the slider.

It might be stated that the longitudinal curvature of the slider defines cam-like surfaces on the underside of the slider and such cam-like surfaces are presented to the contents of the receptacle at a tangent thereto. The tangential presentation of the cam-like lower surfaces of the slider to the contents of the receptacle looks to the easy bending or direct depression of the objects encountered thereby so that in case the contents of the receptacle happen to be in the nature of papers, no damage will be done thereto.

It will be seen that the handle or finger piece 20 for the slider is located at the center of the slider or at the bottom of the curve thereof, having a longitudinally slotted connection therewith allowing the handle to be drawn slightly off center in the direction of travel of the slider. This and the curvature of the slider has the effect of lifting the leading portion of the slider and thus aid in the travel of the slider.

With reference to the foregoing description taken in connection with the accompanying drawing it will be seen that the formation or curvature of the slider 16 causes the slider to function as a sort of deflecting plow effective in both directions of movement of the slider in moving out of the way objects which might tend to interfere with the free operation of the slider and which might be torn were the same allowed to be caught between the slider and the adjacent fastener elements.

In the form of invention shown in Figures 5 and 6, the lower wall of the longitudinally curved slider 30 is formed with a protruding portion 40 functioning as a plow moving out of the way objects which might otherwise tend to interfere with the advance of the slider.

The plow 40 has the same curvature as the slider and in fact is in the nature of an extension of the bottom wall of the slider. The plow 40 has the forward terminal thereof approximately at right angles to the line of travel of the slider and at obtuse angles to the adjacent portions of the rows of fastener elements.

By extending the forward terminal of the plow straight across or at right angles to the line of travel of the slider, there is avoided the creation of acute angles or crotches in which protruding objects might lodge. If the leading portion of the deflecting plow were in the nature of a spoon-like projection, such as shown in the patent to Rust, No. 1,886,123, such spoon-like projection would have the edges thereof at acute angles to the adjacent fastener elements, producing pockets or deep crotches into which protruding objects would be directed. This, of course, is the very thing that should be avoided. A deflecting plow or guard which actually forms acute angles or deep crotches with the adjacent portions of the rows of fastener elements defeats the purpose for which it was intended. That is to say, the presence of notches or deep crotches immediately in advance of the slider actually encourages interference on the part of protruding book leaves, clothing, and other objects with the free operation of the slider.

The form of invention disclosed in Figure 7 contemplates a longitudinally curved slider 50 having a plow 52 projecting from the lower portion thereof and formed at its forward terminal with a bead 54 to extend downward toward the enclosed papers or the like to move the same out of the way and thus provide for the smooth advance of the slider.

Also, in Figure 7, the plow 52 is shown to be recessed toward the central portion thereof on a curved line so as to move papers and the like encountered by the plow toward the longitudinal center of the plow and inward away from the adjacent fastener elements. Clearly, this prevents protruding papers and other objects from lodging between the rows of fastener elements and the adjacent portions of the slider and either tearing the protruding objects or binding the slider against further endwise movement without first removing the obstruction.

The upper wall of the slider 50, as well as the upper wall of the slider 30 has the forward terminal thereof extended substantially at right angles to the line of travel of the slider.

In the form of invention disclosed in Figure 8, the slider 60 is shown to be curved longitudinally about an axis at right angles to the line of travel of the slider and the forward portion of the slider is formed with an extension constituting a deflecting plow 62, moving out of the way objects encountered thereby. At the same time, the plow 62 is formed at the forward terminal thereof with a raised rib 64 engaging and lifting the fastener elements immediately in advance of the slider. Thus, the plow 62 serves first, to move inward objects encountered thereby and second, to move outward or raise the fastener elements immediately in advance of the slider. Of course, the rib 64 is rounded for smooth sliding contact with the rows of fastener elements.

As will be seen, the plow 62 acts in concert with the longitudinal curvature of the slider 60 in raising or lifting the fastener elements immediately in advance of the slider outward or in a direction diametrically opposite to the contents of the receptacle with which the slider is associated.

Figures 9 and 10 disclose a slider 70 angled

between the ends thereof so that the terminal portions thereof or the two meeting and communicating sections thus formed are extended outward on straight lines in directions diametrically opposite the contents of the receptacle with which the slider is associated. In other words, the angling of the slider 70 provides two meeting sections or portions which are disposed at obtuse angles to each other and at acute angles to the line of travel of the slider.

It will be seen that by angling the slider between the ends thereof, the same is effective when moving in either direction to raise or lift the fastener elements in advance thereof in a direction diametrically opposite the contents of the receptacle with which the slider is associated and at the same time acts to depress the objects encountered thereby and thus move the same out of the way of the advance of the slider.

The forward portion of the slider 70 is shown to be formed with a plow 74 extending at right angles to the line of travel of the slider and serving to cooperate with the angled formation of the slider in raising or lifting the fastener elements immediately in advance thereof.

The plow 74 is formed with a downwardly directed bead 76 recessed toward the longitudinal center of the slider on a curved line so as to assist in urging protruding objects in the direction of the longitudinal center of the slider and thus, inward away from the spaced rows of fastener elements. This assists in avoiding entanglement of the contents of the receptacle with the rows of the fastener elements and thus facilitates the advance of the slider.

By way of review, it will be seen that the upper and lower wings of the slider are directed outward toward the ends thereof and away from the articles contained within the receptacle to which the rows of fastener elements are attached so that the fastener elements within the slider or straddled by the upper and lower wings thereof will be raised to similarly raise the fastener elements immediately beyond the slider and in this way, entanglement of the slider with protruding objects is combatted. At the same time, it will be seen that the under or lower surface of the lower wing of the slider is directed outward toward the ends thereof so as to form deflectors for engagement with articles in the path of travel of the slider. Thus, the curvature of the under side of the slider coacts with the curvature or angling of the wings in providing for the smooth and easy operation of the slider against such contrary influences as protruding papers. Of course, there are other aspects to the invention, such as the recessing of the leading portion of the plow toward the longitudinal center of the slider so that protruding objects will be directed toward the longitudinal center of the slider and hence away from the adjacent fastener elements.

Having thus described the invention, what is claimed is:

1. In a slider for use in connection with rows of cooperating fastener elements for attachment to an article, a slider body having spaced upper and lower wings defining an intervening passage for fastener elements, said upper and lower wings having terminal portions directed longitudinally outward in the same general direction and away from the article to which the fastener elements are attached to raise the fastener elements encountered thereby and the fastener elements immediately beyond one end of the body.

2. In a slider for use in connection with rows of cooperating fastener elements, a longitudinally movable slider body having inner and outer wings to straddle cooperating fastener elements, said inner and outer wings being curved longitudinally outward as the same approach one end of the body to raise the fastener elements straddled thereby and the fastener elements immediately beyond that end of the body, said body being provided with an inner surface also curved outward to deflect the objects encountered thereby and thus allow of the smooth operation of the body along the rows of cooperating fastener elements.

3. In a slider for use in connection with rows of cooperating fastener elements having means whereby the same may be secured to a receptacle for articles, a body having a passage formed with diverging branches for cooperating fastener elements, said diverging branches having bottom walls curved outward in a direction diametrically opposite the articles contained within the receptacle to raise the fastener elements within said branches and immediately beyond the body, said body being formed with a lower article engaging surface curved longitudinally outward toward the ends of the body for deflecting engagement with protruding objects within the receptacle.

4. In a slider for use in connection with rows of cooperating fastener elements having means whereby the same may be secured to a receptacle for articles, a body having a passage formed with diverging branches for cooperating fastener elements, said diverging branches being curved outward in a direction diametrically opposite the articles contained within the receptacle to raise the fastener elements within said branches and immediately beyond the same away from protruding articles within the receptacle, said body being provided with an inner surface also curved outward to deflect the articles encountered thereby, and thus allow of the smooth operation of the body along the rows of cooperating fastener elements, and a plow carried by said body and projecting beyond one end of the body.

5. In a slider for use in connection with rows of cooperating fastener elements, a body having upper and lower wings to straddle rows of cooperating fastener elements, said upper and lower wings being curved longitudinally from end to end in the same direction to impart an approximately similar curvature to the portions of rows of fastener elements being encountered thereby.

6. In a slider for use in connection with rows of cooperating fastener elements, a slider body for movement along the fastener elements and having a lower article engaging surface longitudinally depressed between the ends thereof to form deflectors for engagement with objects in the path of travel of the slider body.

7. In a slider for use in connection with rows of cooperating fastener elements, a body movable along the fastener elements and having a lower article engaging surface longitudinally bowed downward between the ends thereof to deflect articles engaged thereby, and an actuating handle secured to said body.

8. In a slider for use in connection with rows of cooperating fastener elements, a body having upper and lower wings to straddle the fastener elements and being curved longitudinally outward in the same general direction from end to end to raise the fastener elements encountered thereby, an actuating handle secured to the center of said

body, and a deflector plow carried by and projecting beyond the lower wing and having the same curvature as the curvature of the lower wing.

9. In a slider for use in connection with rows of cooperating fastener elements of the type applied to a receptacle for articles, a body having a passage formed with diverging branches for fastener elements and being extended outward in a direction diametrically opposite the articles contained within the receptacle so as to move the adjacent fastener elements outward in a direction diametrically opposite the articles contained within the receptacle, said body having an under article engaging surface also directed longitudinally outward to form a cam for engaging articles contained within the receptacle to move the same out of the way of the body.

10. In a slider for use in connection with rows of cooperating fastener elements of the type applied to a receptacle for articles, a body having a passage formed with diverging branches directed outward in a direction diametrically opposite the articles contained within the receptacle to turn the fastener elements within the branches and in the region thereof outward in a direction diametrically opposite the articles contained within the receptacle, said body being provided with an inner surface also directed outward to form a cam surface for engagement with articles contained within the receptacle, and a plow carried by said body and projecting beyond one end of the body for engagement with the fastener elements immediately in advance of the body to assist in raising the fastener elements immediately in advance of the body.

11. In a slider for use in connection with rows of cooperating fastener elements of the type applied to a receptacle for articles, a body having a passage formed with diverging branches directed outward in a direction diametrically opposite the articles contained within the receptacle to turn the fastener elements within the branches and in the region thereof outward in a direction diametrically opposite the articles contained within the receptacle, said body being provided with an inner surface also directed outward to form a cam surface for engagement with articles contained within the receptacle, and a plow carried by said body and projecting beyond one end of the body and being recessed in the direction of the longitudinal center of the body.

12. In a slider for use in connection with rows of cooperating fastener elements of the type applied to a receptacle for articles, a body having a passage formed with diverging branches directed outward in a direction diametrically opposite the articles contained within the receptacle to turn the fastener elements within the branches and in the region thereof outward in a direction diametrically opposite the articles contained within the receptacle, said body being provided with an inner surface also directed outward to form a cam surface for engagement with articles contained within the receptacle, and a plow carried by said body and projecting beyond one end of the body, said plow being formed with a rib having a rounded surface for constant engagement with the adjacent fastener elements to assist in raising the same.

13. In a slider for use in connection with rows of approximately parallel cooperating fastener elements, a body having spaced upper and lower wings to straddle the fastener elements, the upper and lower wings being substantially V-shaped in edge elevation so as to raise the fastener elements immediately beyond the body.

14. In a slider for use in connection with rows of cooperating fastener elements, a longitudinally movable slider body having a passage for fastener elements, said body being formed with a lower wing having a leading end portion angled outward with respect to the line of travel of the slider body to raise the fastener elements encountered thereby.

15. In a slider for use in connection with rows of cooperating fastener elements, a slider body having a passage for fastener elements, and a plow carried by the body and having a leading end recessed toward the longitudinally central portion of the slider body.

16. In a slider for use in connection with rows of cooperating fastener elements, a body having a passage formed with diverging branches curved outward to turn the fastener elements therein and in the region thereof outward away from protruding objects, said body being provided with an inner surface also curved outward to deflect the objects encountered thereby and thus allow of the smooth operation of the body along the rows of cooperating fastener elements, and a plow carried by said body and projecting beyond one end of the body, the forward terminal of said plow being recessed on a curved line toward the center thereof.

17. In a slider for use in connection with rows of cooperating fastener elements, a longitudinally movable slider body having substantially uniformly spaced upper and lower wings defining a passage for the rows of cooperating fastener elements, said upper and lower wings being formed with leading end portions directed longitudinally outward in the same direction to raise the fastener elements immediately beyond preparatory to the reception of the same in said passage.

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