Feb. 11, 1969 A. LAURO 3,426,400

PLASTIC HOOK AND EYE FASTENER APPARATUS

Filed Dec. 29, 1966

FIG. 1

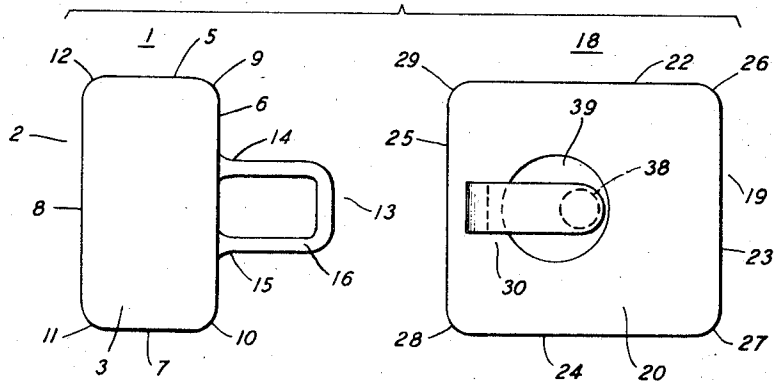


FIG. 2

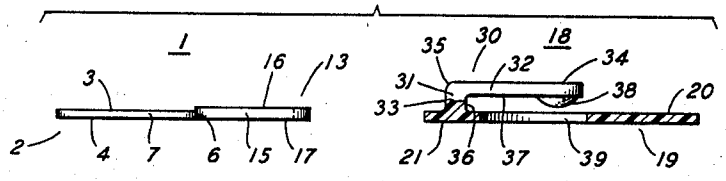


FIG. 3

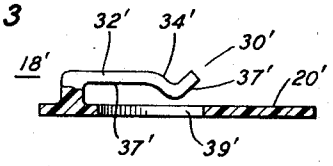


FIG. 4

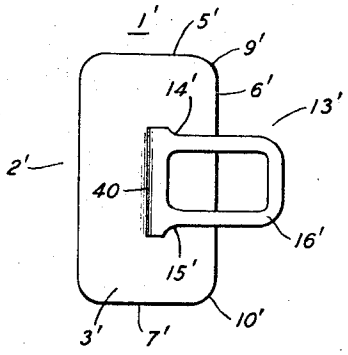
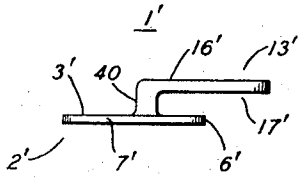


FIG. 5



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PLASTIC HOOK AND EYE FASTENER APPARATUS

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ABSTRACT OF THE DISCLOSURE

A plastic hook and eye fastener is disclosed having a wafer thin tab of sewing machine puncturable plastic material plastic molded to a plastic hook or eye catch member.

This invention relates to fastening elements and particularly to sewable plastic fasteners comprising so-called hook and eye catch elements. The invention further relates to a plastic fastener having complementary hook and eye elements with respective unitary tabs of sewing needle puncturable plastic material and which tabs are affixable to clothing and the like by sewing with minimal danger of breaking a sewing needle.

Widespread use is currently made of hook and eye fasteners for selectively linking materials together. One such use is for wearing apparel such as dresses, corsets, brassieres, pants and swim suits. The universal appeal of such fasteners to the wearer emanates in part from the small size and light weight of the hook and eye elements as well as the fact that they may be conveniently concealed while the apparel is being worn.

While the hook and eye fasteners of the prior art have been satisfactory for a variety of applications, they have proven inefficient, costly and complex to manufacture and secure to materials for the fastening operation. A customary procedure employed for garments, for illustration, involves the production of separate metallic hook and eye elements of extremely small dimensions. Each of the hook and eye elements is then manipulated onto a rectangular or square cloth tab and hand sewn thereon. Subsequently, the cloth tab is sewn manually or by machine onto the garment. The cloth tab has been required in order to facilitate the manipulating and machine sewing operations. All of the foregoing manual operations have been necessary because of the small structural dimensions of the fastener elements and because there are no known facilities for automatically affixing the delicate hook and eye elements to the tab. Consequently, such operations have proven to be time consuming and tedious tasks for personnel as well as inefficient and expensive procedures from a manufacturing standpoint. Importantly, the hand sewing operations frequently result in damage to sewing needles due to their contact with the metallic fastener elements.

In view of the foregoing, an object of my invention is to provide simple, efficient and economical fastener facilities with so-called hook and eye elements.

Another object is to improve the procedures for securing hook and eye fastener elements to materials to be linked together.

It is another object of my invention to eliminate the need for sewing hook and eye fastener elements to tabs prior to the affixing of the tabs to materials such as garments to be fastenable together and particularly to reduce damage to needles during sewing operations.

The foregoing and other objects are attained in accordance with specific exemplary embodiments of my invention in which an efficient, simple and economical fastener with individual hook and eye catch elements is provided in unitary plastic structures as a result of an

automatic injection molding process. Accordingly, each of the hook and eye elements is durable and reliable for fastening operations and the need for metal compositions therefor is eliminated. Moreover, a unitary plastic structure of the hook and eye elements with respective tabs is automatically process molded according to my invention and therefore the complicated and expensive manual hand sewing operations of the prior art manufacturing are rendered unnecessary.

In accordance with a specific illustrative embodiment, the fastener comprises a plastic hook body having a platform member forming a wafer thin tab of a sewing needle puncturable material which virtually eliminates needle damage due to its sewing onto clothing and the like. The tab includes substantially flat upper and lower surfaces as well as side surfaces defining a substantially square platform member with rounded corners. The hook body of one embodiment also has an L-shaped hooking extension element molded to the upper platform surface near a first side surface of the tab platform. A first segment of the hooking element extends upwardly perpendicular to the upper tab surface. Another segment of the L-shaped element extends inwardly toward the center of the tab and substatnially perpendicular to the contiguous first segment of the hooking element.

A dome projecing device of plastic is advantageously molded about a free end of the hooking element and on an inner surface thereof facing the upper surface of the platform tab. This dome device is utilized, as hereinafter explained, for retaining the eye element within the hook body during a fastening operation. A circular orifice extends through the tab platform member from its upper to lower surfaces and in alignment with the hook dome device. This orifice is of a larger inner diameter than the dome device and is advantageously used for simplifying the injection molding process of the hooking element.

The other portion of the fastener according to a specific embodiment of my invention comprises an eye body having a wafer thin platform member forming a tab of substantially rectangular shape and flat upper and lower surfaces. It also is fabricated of a sewing needle puncturable plastic material. A U-shaped member is molded with its open ends contiguous to one side member of the latter tab and thereby forms an eye element which cooperates with the aforementioned hook body for the fastening operation. The latter operation is accomplished by inserting the eye element beyond the hook dome device so that it is confined between the upper hook platform surface and the hooking element. The U-shaped eye element is moved into the confined position by urging the L-shaped hooking element upwardly from the upper hook platform surface and admitting the eye element beyond the hook dome device. Thereafter, the hooking element is released to urge the dome device back toward the upper surface of the hook platform to confine the eye element beyond the dome device.

Advantageously, my invention provides individual plastic hook and eye elements each of which is molded unitary with a plastic tab which is structurally strong for sewing directly to wearing apparel or other materials to be fastened. My invention further eliminates the need for handling of delicate metallic prior art hook and eye elements as well as the manual sewing of such elements to cloth tabs. In addition, the frequent damage to needles during sewing procedures is eliminated. As a result, personnel are relieved of routine tiring and time consuming tasks and manufacturing efficiency and economies are achieved in hook and eye fastener production.

The foregoing and other objects, features and advantages of my invention will be more fully understood from a reading of the following description of the illustrative

embodiments thereof with reference to the drawing, in which:

FIG. 1 shows top views of exemplary hook and eye fastener bodies;

FIG. 2 is a side view of the hook and eye fastener bodies of FIG. 1;

FIG. 3 depicts another hook fastener body according to the teaching of my invention;

FIG. 4 is a top view of another exemplary eye fastener body; and

FIG. 5 is a side view of the eye fastener body of FIG. 4.

Referring to FIG. 1, a unitary eye body 1 fabricated entirely of plastic is structurally illustrated as comprising a wafer thin platform member 2 forming a tab. The latter has substantially flat upper and lower surfaces 3 and 4 as shown in FIGS. 1 and 2. In the illustrative embodiment, the platform tab 2 is substantially rectangular in shape as defined by its side members 5, 6, 7 and 8 with the rounded corner segments 9, 10, 11 and 12. A U-shaped member 13 is molded with its tapered extensions 14 and 15 contiguous to the side member 6 of platform tab 2 and thereby forms the eye element which cooperates with a hook element for a fastening operation as hereinafter described.

As shown in FIG. 2, the eye element 13 has substantially flat upper and lower surfaces 16 and 17. The illustrative embodiment advantageously utilizes an eye element 13 of thicker dimension than the platform tab 2 as depicted in FIG. 2. This arrangement enables the tab 2 to be secured to a garment, for example, with minimal bulge caused by the tab while the thicker eye element 13 extends sufficiently to enable a person facilely to engage it with a hook element for the fastening operation.

A hook body 18 of the fastener as shown in FIGS. 1 and 2 is a unitary structure fabricated entirely of plastic and comprises a wafer thin platform tab member 19. Upper and lower surfaces 20 and 21 of the platform tab 19 are substantially flat. Tab 19 is also substantially square with rounded corners as defined by its side members 22, 23, 24 and 25 as well as its corner segments 26, 27, 28 and 29. Body 18 also comprises an L-shaped hooking extension element 30 molded to the upper platform surface 20 at a prescribed distance from the side member 25. The molded plastic segment of tab 19 between element 30 and side member 25 provides for resiliency to the hooking element 30, which resiliency is advantageously utilized for retaining the eye element during a fastening operation.

A first extension member 31 of hooking element 30 extends upwardly perpendicular from the tab surface 20 and a second extension member 32 of element 30 extends contiguously and at a right angle from member 31 inwardly toward the center of surface 20 and substantially parallel thereto. Member 31 is of a thicker dimension than member 32 in the illustrative embodiment. Members 31 and 32 have substantially flat outer surfaces 33 and 34 with a rounded corner segment 35 therebetween. An inner surface 36 of member 31 is substantially flat. Similarly, an inner surface 37 of member 32 is substantially flat, but advantageously it comprises a dome projecting device 38 molded about the free end of hooking element 30. Dome device 38 is utilized for retaining an eye element 13 within the hooking element 30 during a fastening operation. A circular orifice 39 extends through the platform tab 19 between the upper and lower surfaces 20 and 21 thereof and in alignment with the dome device 38. Orifice 39 is of larger inner diameter than that of dome 38 in the exemplary embodiment and facilitates injection molding of the hook body 18.

FIG. 3 discloses a hook body 18' which is similar to the hook body 18 of FIGS. 1 and 2, except that, in accordance with another aspect of my invention, it advantageously comprises a second extension member 32' having a curved V-loop extension in the surfaces 34' and 37' rather than flat upper and lower surfaces 34 and 37 with the domed device 38 as in FIG. 2 for retaining an eye element during a fastening operation.

FIG. 4 illustrates another exemplary embodiment of a unitary plastic eye body 1' which is similar to that of FIGS. 1 and 2 except that, in accordance with another feature of my invention, the body 1' comprises a U-shaped eye element 13' which is molded at the upper extremity of a post member 40. The latter is molded contiguous to the upper surface 3' of the platform tab 2' at a location thereon equidistant from the side members 5' and 7'. FIG. 5 depicts the eye body 1' as viewed inwardly at side member 7' thereof.

According to the exemplary embodiments, a fastening operation is accomplished by inserting an eye element 13 or 13' beyond the dome device 38 or the curved V loop extension of the respective hooking elements 30 or 30' so that the eye element is confined between the respective upper platform surface 20 or 20' and the lower surface 37 or 37' of the respective hooking element 30 or 30'.

The unitary hook and eye bodies of my invention may advantageously be of a nylon or polypropylene composition. It is further an advantage of my invention over the prior art that the color of the plastic composition is selectable for each use of the hook and eye fasteners by available plastic coloring processes. In the prior art, the fasteners have heretofore been of metallic compositions customarily with black coloring.

The foregoing embodiments of my invention provide for a hook body entirely of a plastic fabrication and forming a unitary platform tab and hook element with the latter including an extension member for retaining an eye loop in a fastening relationship therewith. The platform tab advantageously is square in shape to facilitate sewing through its upper and lower surfaces along any side thereof to a garment or other device to be fastened together. Importantly, the hook structure of my invention is fastenable to an eye loop including either loops of thread sewn on a garment, for example, or comprising the novel structural eye bodies which, in accordance with my teaching, are formed of unitary plastic tabs and eye elements.

What is claimed is:

1. A sewable fastener adapted to be affixed to clothing and the like by sewing with the minimal danger of breaking a sewing needle comprising

a flat platform tab portion of sewing needle puncturable plastic material and having a supporting surface,

and a catch member comprising a hook element of plastic material having an end thereof molded contiguous to said tab portion and another end free for a fastening engagement with a fastener eye element,

wherein said hook element comprises a member extending parallel to said flat platform tab portion to form said free end, said hook element having an extension device of plastic molded about the free end of said hook element, said hook element being flexibly movable on said tab portion from a closed to an open position for admitting a fastener eye element past said extension device for a fastening engagement of said hook and eye elements, said extension device being operative for retaining said hook and eye elements in the fastening engagement in response to the return movement of said hook element to said closed position.

2. The invention defined in claim 1, wherein said extension device comprises a V-shaped member of plastic molded on the free end of said hook element, the apex of said member being directed toward said flat platform tab portion.

3. The invention defined in claim 1 wherein said hook element includes an L shaped hooking member having one end thereof molded contiguous to said tab surface and a free end thereof for fastening engagement with a fastener eye element, and wherein said extension device comprises a plastic dome member molded contiguous to a surface of said hooking member facing said tab supporting surface.

4. The invention defined in claim 3 wherein said platform tab comprises side members defining a square tab with flat upper and lower surfaces, and means defining an orifice extending from said upper to said lower surface and in alignment with said hooking member and dome member,

and said one end of said hooking member is molded on said upper tab surface between one of said side members and said orifice.

5. A sewable fastener adapted to be affixed to clothing and the like by sewing with minimal danger of breaking a sewing needle comprising

a flat platform tab portion of sewing needle puncturable plastic material and having a supporting surface,

and a catch member comprising an eye element of plastic molded contiguous to said supporting surface of said platform tab for a fastening engagement with a fastener hook element.

6. The invention defined in claim 5 wherein said eye elements comprises a U shaped eye member with the free ends thereof being flanged and molded contiguous to said tab supporting surface.

7. The invention defined in claim 5 wherein said eye element comprises a U shaped eye member with free ends thereof being flanged and a post device having one end thereof molded contiguous to said tab supporting surface and another end thereof molded to said flanged ends of said eye member for thereby providing a closed eye loop.

8. In combination,

a hook fastener body fabricated entirely of plastic and comprising

a flat platform tab of sewing needle puncturable plastic material and having side members defining a square with rounded corner segments and with flat upper and lower surfaces,

an L shaped hooking element having a first segment thereof molded to said upper tab surface and extending upwardly perpendicular therefrom, a second segment molded to said first segment and extending at a right angle therefrom inwardly toward the center of said tab surface in a plane parallel to said upper tab surface, and a dome extension device molded to a surface of said second segment facing said upper tab surface,

said tab having an orifice from said upper to said lower surface thereof and in alignment with said dome device,

said first segment of said hooking member being molded to said upper tab surface between one of said side members and said orifice, and

an eye fastener body fabricated entirely of plastic and comprising

a flat platform tab of sewing needle puncturable plastic material and having side members defining a rectangular tab with rounded corner segments and with flat upper and lower surfaces,

a U shaped eye element having flanged free ends molded to one of said side members of said eye body for a fastening engagement with said hooking element,

said second segment of said hooking element being flexibly movable from a closed to an open position for urging said dome device upward away from said upper surface of said hook platform tab for admitting said eye element past said dome device for a fastening engagement of said hooking and eye elements, said dome device being subsequently operative for retaining said hook and eye elements in the fastening engagement in response to the return movement of said second segment to said closed position.

9. A sewable fastener adapted to be affixed to clothing and the like by sewing with minimal danger of breaking a securing needle comprising

a flat platform tab portion of sewing needle puncturable plastic material and having a supporting surface, and a catch member for a hook and eye fastener comprising a portion of plastic and being plastic molded contiguously to said tab surface, said catch member comprising a hook element of plastic having an end thereof plastic molded contiguous to said tab surface and another end thereof free for a fastening engagement with a fastener eye element.

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