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3,145,388

PLIERS FOR ATTACHING SNAP FASTENERS

Filed April 20, 1962

Fig. 1

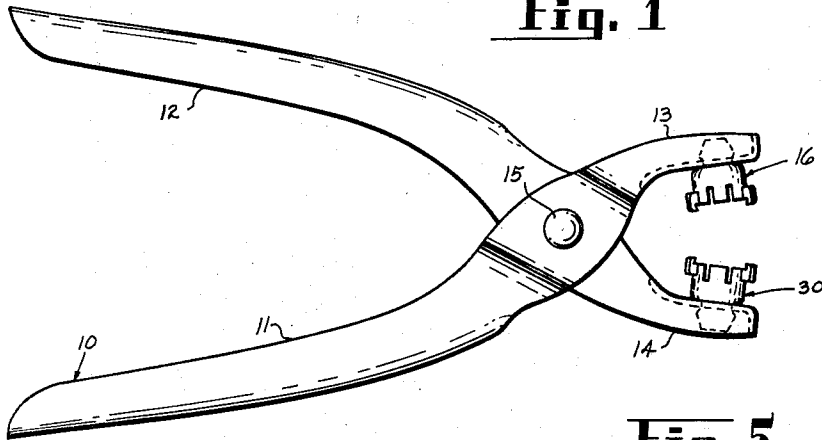


Fig. 2

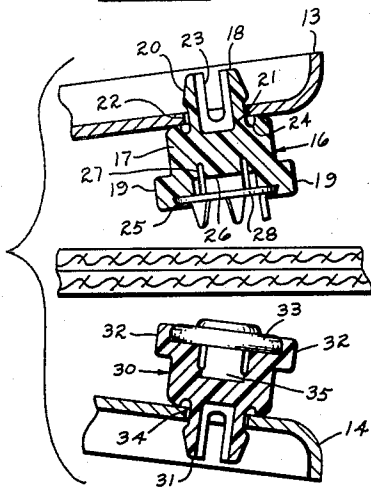


Fig. 3

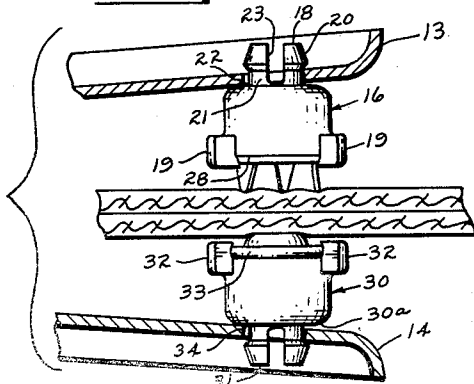


Fig. 5

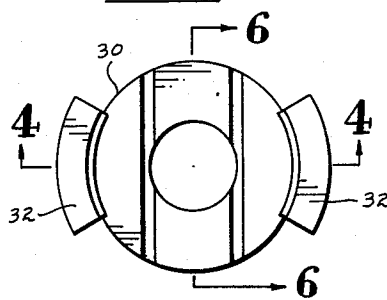


Fig. 4

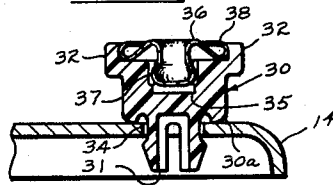
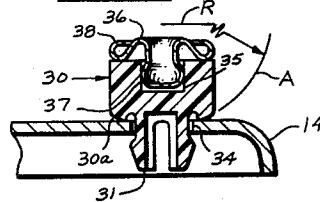


Fig. 6



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PLIERS FOR ATTACHING SNAP FASTENERS
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2 Claims. (Cl. 1—317)

This invention relates to tools for setting snap fasteners upon a supporting material such as a garment piece.

The type of tool now being used for this purpose is a simple pair of pliers wherein the jaws of the pliers swing in an arc of a circle with the fulcrum as a center, and carry suitable fastener setting dies on their jaw ends. One of the faults of this type of pliers is that the setting dies carried by the jaws cannot adjust themselves to the various thicknesses of material to which the fastener member may be attached. Consequently, under certain conditions, the interengaging elements of a fastener member will be biased to each other sufficiently to result in an insecure setting such that might tear out of a garment in normal use.

It is one of the objects of this invention to overcome the above fault by providing dies that can be detachably secured to the jaws of a pair of pliers and also, loosely fitted to said jaws and provided with a base that can rock upon the jaw support surface so that the working faces of the dies can always assume a parallel position to each other and assure uniform pressure on all parts of the fastener elements during the setting operation.

It is another object of this invention to overcome the above fault by providing dies that can be detachably and loosely fitted to said jaws, and wherein the element gripping means on the jaws are such that they will not interfere with each other regardless of the indiscriminate rotation of the dies relative to their respective jaws or to each other. In other words, the dies do not have to be registered relative to each other.

A still further object of the invention is to avoid the danger of breakage by making the dies of a hard plastic material with some degree of resiliency and wherein the gripping means are made as a firm and integral part of the die body. The die body is transversely grooved to provide the necessary resilient action to that portion of the body carrying the gripping means so that a fastener element can be forced into snap-locking with said gripping means.

Other objects and advantages will appear from a reading of the following description taken in conjunction with the accompanying drawing, in which:

FIG. 1 is a side view of a pair of common pliers supporting the dies embodying my invention;

FIG. 2 is a sectional view through the jaws and die ends of the pliers in open position and showing the socket elements assembled in their respective dies;

FIG. 3 is a similar view showing the dies positioning the elements against the support, preliminary to the final setting operation;

FIG. 4 is a sectional view of one of the jaw ends and a die that receives the stud element, taken along the line 4—4 of FIG. 5;

FIG. 5 is a plan view of the same; and,

FIG. 6 is a similar view of FIG. 4 taken along the line 6—6 of FIG. 5.

The tool as disclosed in the drawing now to be further described, is adapted to set that type of snap fastener such as shown in the Fenton Patent 2,131,347 known in the trade as a duo-type fastener. In this fastener, the socket and the stud can be attached by the same kind of prong ring.

Referring now to the drawing, the numeral 10 design-

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ates a common pair of pliers having handles 11 and 12 and jaws 13 and 14 pivoted at a fulcrum point 15. The upper jaw 13, as seen in FIG. 1, carries a prong ring die 16 preferably made of a hard plastic material having some degree of resiliency. The die 16 consists of a body 17 having a tubular anchor pin at one end and a pair of opposed element gripping lugs 19 at its opposite end. The anchor pin 18 is formed with a conical head 20 and a neck portion 21 that is adapted to fit into an opening 22 in the upper jaw 13. The opening 22 is of a diameter somewhat larger than the pin neck 21 so as to provide a floating die. This looseness also permits the die to rotate about its own axis to change its angular position indiscriminately relative to the jaw. The anchor pin 18 is slotted at 23 and a counter recess 24 is provided at the point where said pin joins the die body, all for the purpose of enhancing the resiliency of the pin 18. It will be noted that the crest diameter of the pin conical head 20 is slightly larger than the jaw opening 22. This allows for a snap-locking action between the die 16 and the jaw 13 in assembling or removing said die.

The lugs 19 are formed as a firm integral part of the die body 17 and extend radially outwardly thereof. They also project axially beyond the outer face of said body and are provided with undercut lips 25. A central recess 26 is formed in the outer face of the body 17, and also a pair of transverse slots or grooves 27 are provided that extend across the entire width of the die body intermediate the lugs 19. The recess 26 and the slots 27 afford some amount of resiliency to that portion of the body 17 supporting the lugs 19 so that said lugs can spring outwardly when a prong ring 28 is snap-locked into position when being forced past the undercut lips 25.

A socket die 30 is carried by the opposite or lower plier jaw 14. The die 30, similar to the prong ring die 16 is also provided with an anchor pin 31 and opposed socket gripping lugs 32 for holding a socket member 33. The anchor pin 31 similar to the anchor pin 18 of die 16 is also adapted to have detachable engagement in an enlarged opening 34 in the lower jaw 14 and thus provide a relative loose fit for said die to said jaw. The socket die 30 in details of construction is the same as the prong ring die 16 except that the central recess 35 is smaller in diameter than the die recess 26 and extends further into the body of the die for reasons as will appear later.

In order to allow the dies 16 and 30 to self-align so that their element supporting faces will parallel each other during the fastener setting operation, regardless of the thickness of material to which the fasteners are applied, at least one of the dies should have its support base that rests against the plier jaw formed with a convex surface so that said die can easily rock and not interfere with the self-alignment of the jaws. For this purpose, the base 30a of the socket die 30 is formed on a relatively large arc A (see FIG. 6) with a radius R of approximately four times the diameter of the die body. The arcuate base 30a is, in fact, an annular portion of a spherical surface that furnishes a suitable fulcrum point for the die for any tilted position the die may assume.

From FIG. 5, it will be observed that each gripping lug 32 for holding the socket 33 extends substantially in an arc of 60° about the upper end of the die body 30 and the lugs 19 of die 16 are of like construction.

From FIG. 2, it will be noted that the lugs 32 do not extend beyond the clincher rim of the socket 33 and preferably, the height of these lugs is slightly less than the thickness of said rim. In the prong ring die 16, the lugs 19 are substantially on a common plane with the outer face of the prong ring 23. The fact that the dies 16 and 30 are loosely carried by their respective jaws 13 and 14 allows them to rotate indiscriminately about their

axes, but due to the height of the gripper lugs, there will be no interference of the dies during the fastener setting operation regardless of their relative rotated positions.

In the operation of my pliers, the prong ring 28 and the socket element 33 are first snapped into place in their respective dies 16 and 30. A support piece or garment material to which the fasteners are to be applied will next be positioned between the jaws and properly registered and then both the plier handles 11 and 12 will be pressed together and clinch and interlock the socket elements together from opposite sides to the piece S.

From FIG. 3, it is to be noted that as soon as the prong of the prong ring 28 and the socket element 33 contact opposite sides of the support S and due to the relatively loose connection of the dies 16 and 30 to their respective jaws 13 and 14, they will self-align with respect to each other so that their axes substantially coincide with each other. This is to assure that when the dies 16 and 30 are brought together, their working faces will impart a uniform pressure against the full circumference of the fastener parts and obtain a properly clinched engagement of said parts upon the garment.

FIGS. 4 and 6 show how the stud 36 of the duo-type to be used with this tool is fitted into the die 30. The stud 36 is provided with the usual enlarged head 37 and clincher rim 38. The diameter of the die recess 35 is such that it will have a snug fit upon the stud head 37. This is for the purpose of assuring that the stud element will be held in the die 30 in case the dimension of the clincher rim 38 is not sufficient to be retained in the die lugs 32.

It will be apparent that changes in details and construction and arrangement of the parts may be made without departing from the scope of the present invention as set forth in the appended claims.

What I claim is:

1. In a hand-operated tool for setting snap fasteners upon sheet material consisting of a pair of pliers having jaws movable toward and away from each other, the improvement consisting of a pair of plastic dies carried by the ends of said jaws and adapted to detachably receive parts of a snap fastener member, each of said dies con-

sisting of a body having a recess extending axially into one of its ends, a pair of opposed lugs formed as a firm integral part with and radially outwardly from the opposite sides of said body and extending upwardly from the recessed end, said lugs having gripping means for detachably receiving a fastener part, and one or more slots extending entirely across said body intermediate said lugs and of sufficient depth to afford some degree of resiliency to those portions of the body supporting the lugs.

2. In a hand-operated tool for setting snap fasteners upon sheet material consisting of a pair of pliers having jaws movable toward and away from each other, the improvement consisting of a pair of plastic dies loosely mounted on the ends of said jaws to permit relative rotation and adapted to detachably receive parts of a snap fastener member, each of said dies consisting of a cylindrical body having a recess extending axially into one of its ends, a pair of opposed arcuate lugs formed as a firm integral part with and extending radially outwardly from the opposite sides of said body and projecting axially upwardly from the recessed end, said lugs having gripping means for detachably receiving a fastener part and being of such a height above the recessed end of said body that they will not interfere with each other regardless of their rotated position relative to each other, and a pair of slots extending through the width of said body, one of said slots being located adjacent each of said lugs and of sufficient depth to afford some degree of resiliency to those portions of the body supporting the lugs.

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