

[54] TAG APPLYING TOOL

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[51] Int. Cl. **B25c 1/00**

[58] Field of Search 227/67, 68, 124, 141, 143,
227/144

[56] References Cited

UNITED STATES PATENTS

259,067	6/1882	Whittlesey et al.	227/68
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Primary Examiner—Granville Y. Custer, Jr.

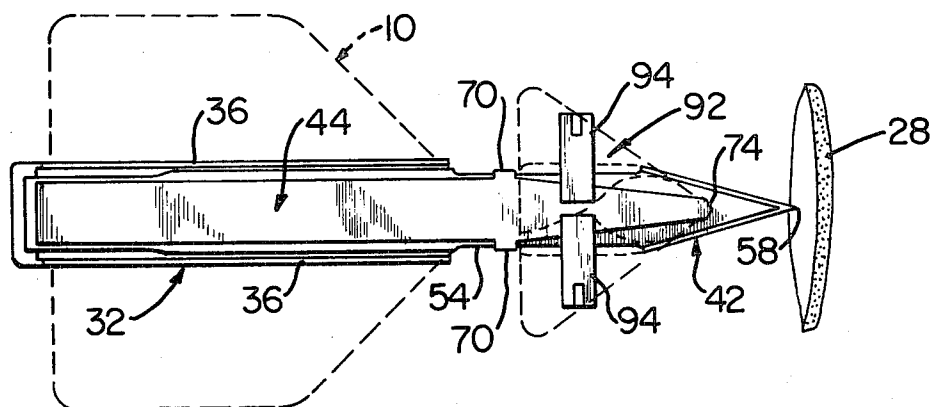
Attorney, Agent, or Firm—Sheridan, Ross & Fields

[57] ABSTRACT

The tool includes a main body in the form of an elongate block normally held generally horizontal by gripping a depending handle. Retainer means for the tag is a pair of elongate retainer members pivoted to the aft

end of the main body to swing up for loading and down to parallelism with the body for the tagging operation. A tag of resilient flat material having a wide base, a narrow neck, and an arrow-shaped anchoring head is sandwiched between the members with the leading end of the head forward. When the members are swung down, a pair of crimping jaws on a slidable bracket fold the wings of the head over each other and over the members to present a small compact cross section. One of the members is longer than the other and has a piercing point which is driven through the element to be tagged by manually forcing the tool forward. Contact of the jaws with the element drives them and the bracket relatively rearward to release the wings on the remote side of the element, and the tool is withdrawn rearwardly from the element. In a modification, a lever is pivoted at an intermediate point on an intermediate point on the handle. The lower portion of the handle and the lower rear portion of the lever form a plier-type grip, while the upper forward end of the lever carries a backup jaw to contact the remote side of the element to be tagged. When force is applied to the grip, the backup jaw and the retainer means move toward each other to force the piercing point through the element.

19 Claims, 9 Drawing Figures



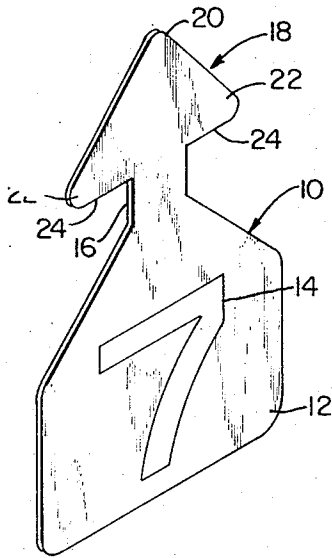


FIG. 1

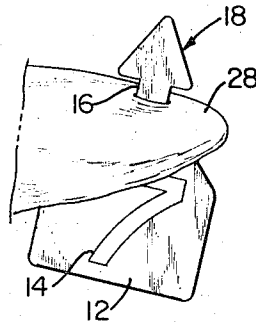


FIG. 3

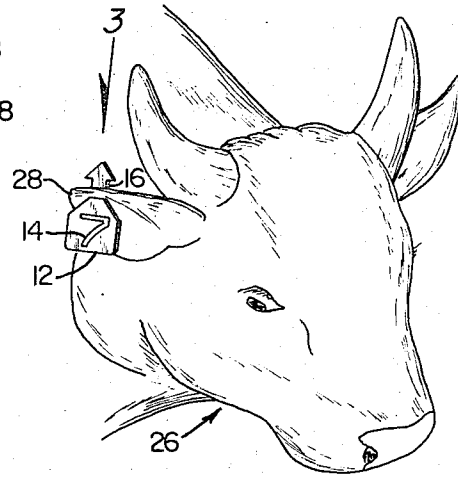


FIG. 2

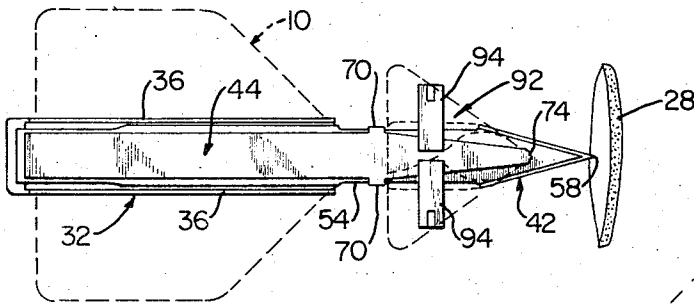


FIG. 6

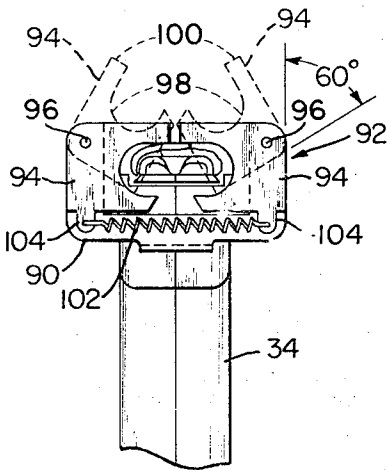


FIG. 5

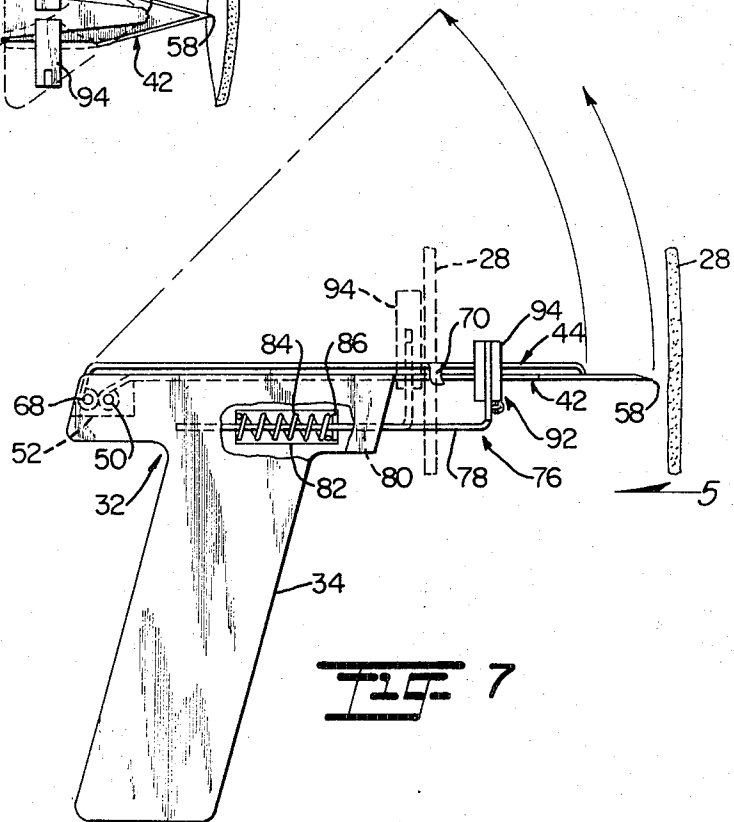
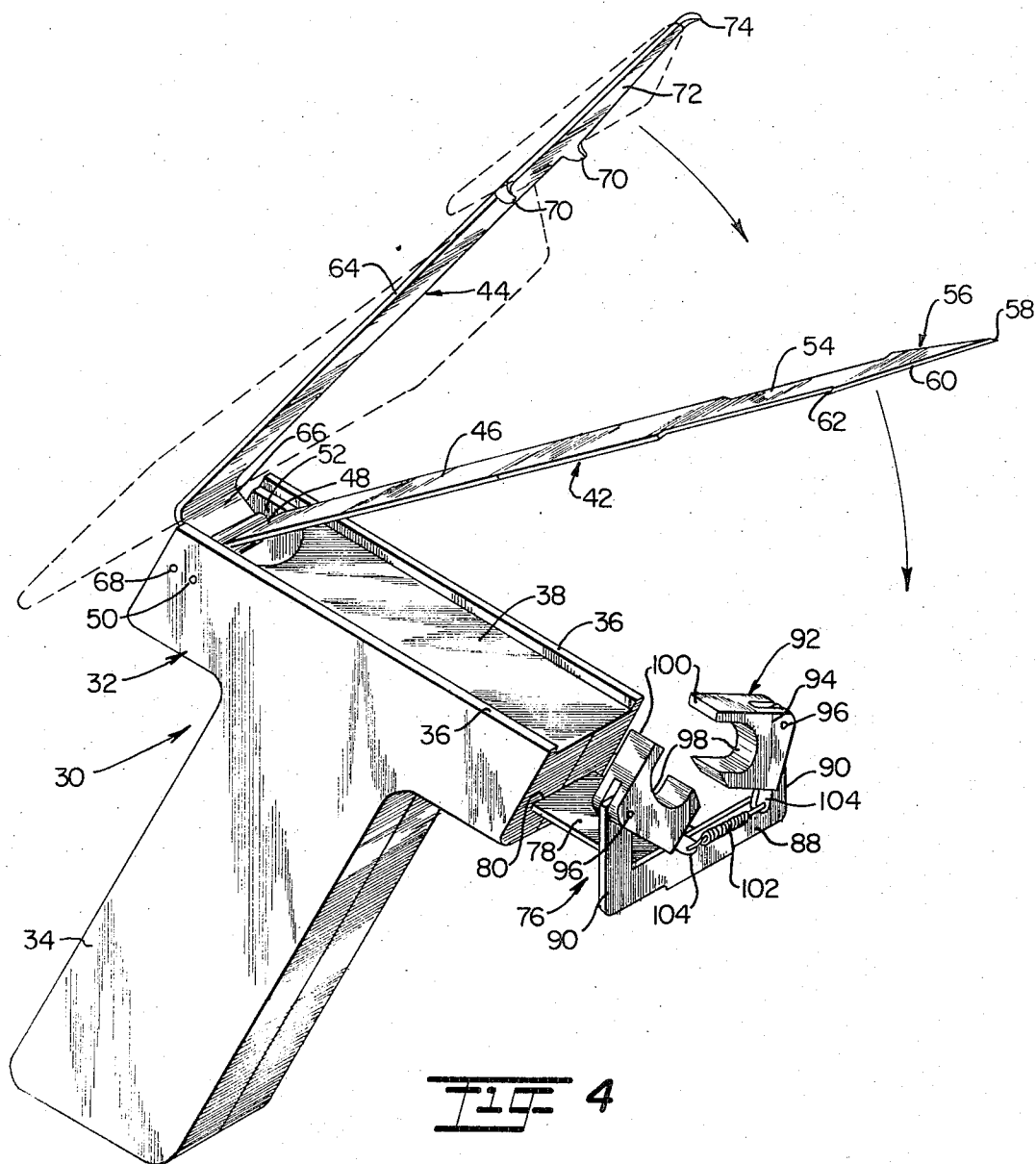
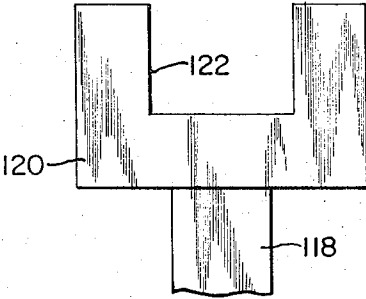
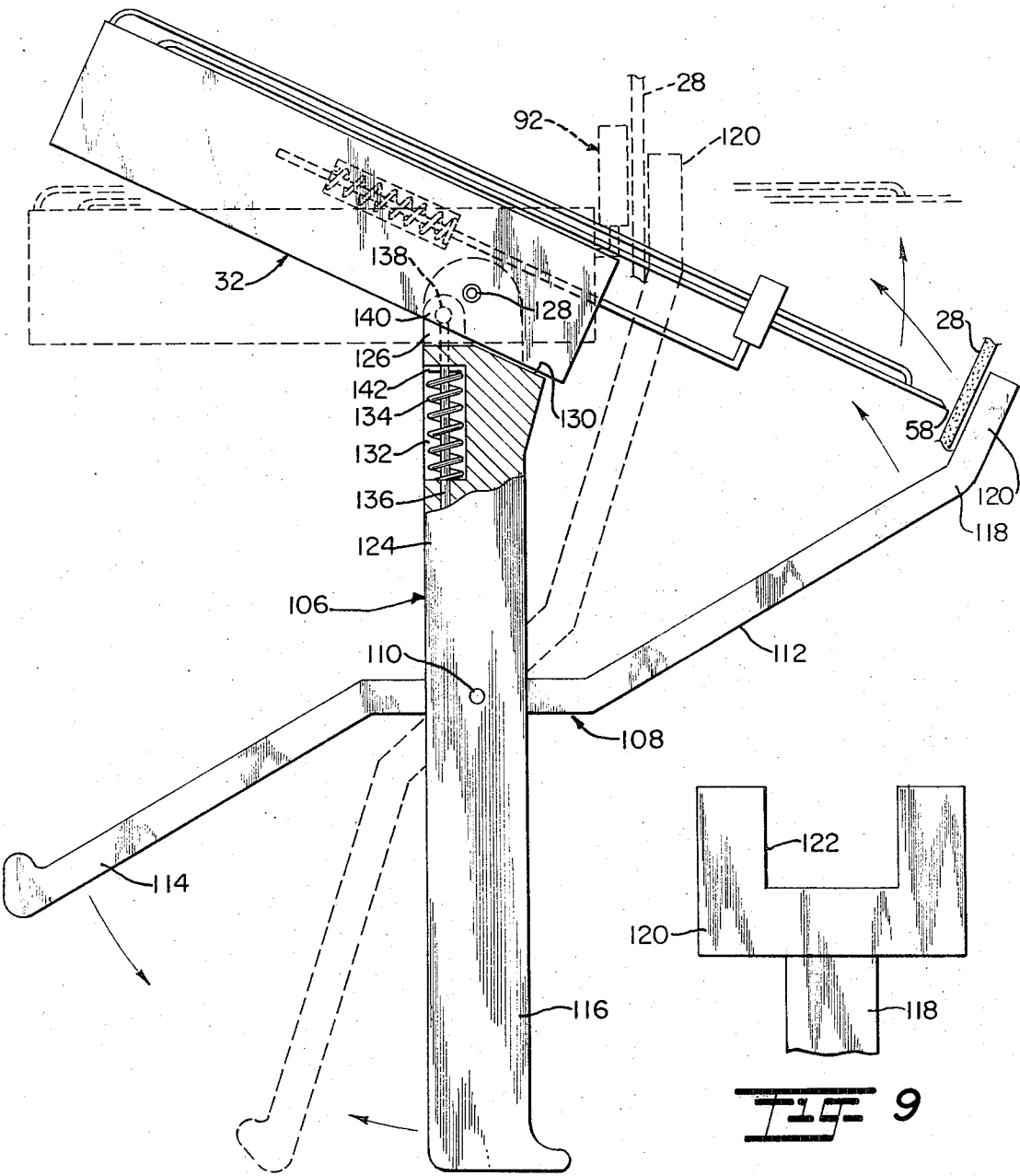


FIG. 7





TAG APPLYING TOOL

BACKGROUND OF THE INVENTION

This invention lies in the field of tools for applying tags to various elements and is more particularly directed to such tools for applying tags to the ears of animals such as cattle and sheep. Such tags may be marked in various ways to indicate identity, or ownership, or classification of any type.

Tags of various kinds have been used for many years to accomplish the purposes mentioned above and widely different tools have been used for applying them. Some tags have been made of metal and formed in one or more pieces which were fastened together by clinching after piercing an aperture through the ear. Most of them were formed into loops which had a tendency to catch on bushes, fence wires, etc., causing them to be torn off or to seriously injure the animals.

A superior tag for the purpose is disclosed in U.S. Pat. No. 3,552,051 to Eugene B. Ritchey. This tag is molded or stamped from a flat sheet of resilient elastomeric material such as polyurethane and includes a laterally extensive base for marking purposes, a narrow neck, and an anchoring head having the general planform of an arrow head with a narrow leading end and rearwardly diverging wings. To apply this tag, the wings are folded or rolled together and the head is inserted into the aft end of a tubular applying tool having a piercing point at its forward end. The tool is then pushed through the ear and then gripped on the remote side and pulled through the ear and away from the head. The wings expand on the remote side and anchor the tag, leaving the base exposed on the first side. There are no loops of any kind to catch on bushes or fence wires and yet the tag is securely anchored.

While the tag is very satisfactory, the combination of the tag and tool has some disadvantages. It is difficult to roll up the wings to insert them into the tool and this difficulty is accentuated by cold weather which makes the plastic material rather stiff. Also, between the time when the tool is initially forced through the ear and the time at which it can be grasped on the remote side to complete the insertion, the animal has reacted to the pain caused by the incision and shakes its head so that it is sometimes difficult to complete the installation.

SUMMARY OF THE INVENTION

The tool of the present invention overcomes the difficulties and disadvantages mentioned above and provides a simple and reliable tag applying means which is easy to load and use and which may be inserted and removed in less than the animal reaction time which is about 0.3 seconds.

Generally stated, the tool includes an elongate block-like main body with a longitudinal axis which is generally horizontal in its position of use, and a depending handle to be gripped by the operator. Retainer means in the form of a pair of narrow elongate and generally planar retainer members is pivotally mounted to the aft end of the main body to swing up to a loading position and down to an insertion position substantially parallel to the upper surface of the body. The members are substantially longer than the body and extend well forward of it in insertion position. One member is longer than the other and provided with a piercing point at its lead-

ing end. The forward portion of the shorter member is tapered to a narrow tip which is bent inward toward the longer member to shield the tip of the tag which is to be inserted between them.

The two members are pivoted with respect to each other so that they can be swung apart in their upper loading position. The shorter member has a shank which is of the same width as the neck of the tag and is provided just aft of the tapered tip portion with a pair of flanges, one at each side edge, extending toward the other member to embrace the tag neck and the shank of the other member.

The tag is first applied to the shorter member with its base reaching back to the pivotal connection and the leading end of its anchoring head just aft of the bent tip of the member and with the neck fitting snugly between the flanges. The flanges are so located longitudinally that they are in contact with the aft edges of the wings to apply driving force to them during the insertion operation. The longer member is now swung into contact with the tag so that the latter is sandwiched in facewise contact between the two members and reinforced against any longitudinal buckling, and the flanges prevent lateral displacement of the tag.

A bracket is longitudinally slidably mounted on the main body and is spring-loaded forward, with stop means to limit it to a predetermined forward position. Crimping means are mounted on the forward end of the bracket and comprise a pair of jaws spaced apart laterally to each side of the longitudinal center line on axes parallel to the longitudinal axis. The jaws in lowered, retracted position face each other and each jaw has a recess facing the recess in the other jaw. These recesses are large enough to embrace the two retainer members and the folded wings of the anchoring head. When the jaws swing upward and outward through an arc of about 60°, the recesses open upwardly to form a substantial gap.

When the bracket is extended to its forward limit the jaws are located to engage the wider part of the wings as the retainer means is lowered. As the retainer means approaches its final position, the wings contact the jaws and they swing downward and inward, folding the wings one over the other and over the retainer means and lock them in position, ready for the applying operation.

To carry out the operation, the tool is held in one hand and the animal's ear is grasped by the other hand. The tool is then driven forward with sufficient force to cause the forward portion of the retainer means to pass through the ear, carrying with it the anchoring head of the tag. Contact with the adjacent surface of the ear drives the jaws back against the force of the bracket spring, and the tag wings are released on the remote side of the ear to lock the tag in place. The main body is swung down to open the jaws and the retainer means is pulled back out of the incision.

The modification with the plier type attachment works basically in the same way. A lever is pivotally mounted at an intermediate point on an intermediate point on the handle, which is made somewhat longer in this version. The lower end of the handle and the lower rearwardly directed portion of the lever form a plier-type grip. The upper forwardly directed portion of the lever carries a backup jaw at its free end. The jaw is adapted to be spaced forward of the piercing point a sufficient distance to define a gap for reception of the

ear and is provided with a suitable passageway to permit relative forward movement of the retainer means.

For operation, the tool is moved to a position with the ear between the retainer means and the backup jaw. When force is applied to the plier-type grip, the retainer means and backup jaw are caused to be moved toward each other and the retainer means is driven through the ear in the same manner as in the first version. The advantage of the modification is that the installation is faster and more accurate since the animal is not disturbed in advance by contact with the operator's hand. Also, the operator is safer because he does not have to place his hand where the piercing point may strike it.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other advantages and features of novelty will become apparent as the description proceeds in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of the tag to be installed by the tool of the invention;

FIG. 2 is a perspective view of the head of an animal having the tag inserted in its ear;

FIG. 3 is a rear view of a portion of the animal's ear with the anchoring head of the tag expanded in locking position;

FIG. 4 is a perspective view of the tool;

FIG. 5 is a front elevational view of the tool with the tag and retainer means embraced by the crimping jaws;

FIG. 6 is a top plan view of the tool ready for the installation operation;

FIG. 7 is a side elevational view of the tool;

FIG. 8 is a side elevational view of the modified form of the tool; and

FIG. 9 is a front elevational view of the backup jaw.

DESCRIPTION OF PREFERRED EMBODIMENTS

The novel installation tool is particularly adapted for use with a tag 10 of the type shown in FIG. 1, in which the tag comprises a generally flat sheet of rubber-like elastomeric material such as polyurethane. It may be stamped or molded to form a laterally extensive base 12 adapted to bear indicia 14, a narrow neck 16, and an anchoring head 18 with the general planform of an arrow head having a narrow leading end 20 which may be rounded, and rearwardly diverging wings 22 which define detent shoulders 24 at the forward end of the neck. In FIGS. 2 and 3 an animal 26 is shown with the tab inserted in its ear 28 with base 12 hanging generally vertically in front to display the indicia 14, the narrow neck 16 passing through the ear, and the anchoring head 18 in back with the wings 22 deployed to prevent removal. It will be apparent that the base and anchoring head do not present any closed loop or the like which might become entangled with bushes or fence wires.

The tool 30 is shown in its entirety in FIG. 4 with the various components in loading position. The block-like main body 32 is generally rectangular in cross-section and elongate, with its longitudinal axis generally horizontal when held in operating attitude by gripping the depending handle 34. Upstanding edge portions 36 define a shallow recess 38 in the upper surface of the body for a purpose to be explained later. The retainer

means in preferred form consists of two discrete retainer members 42 and 44 pivotally connected at their aft ends to the aft end of body 32. Both of the retainer members are preferably formed of flat stiff elongate strips of metal.

The first retainer member 42 is longer than the second member and includes an elongate shank 46 with a curled aft end 48 mounted on pivot pin 50 extending through the side walls of a recess 52 formed in the aft end of the body. The forward portion 54 of the shank is narrowed down as shown to be substantially the same width as the neck of the tag to be applied, and the tip 56 has the general planform of an arrow head with a sharp piercing point 58 and sharp side edges 60 to readily penetrate the element to be tagged. The aft end 62 of the tip is wider than shank portion 54 to pierce an opening large enough for passage of the retainer means and the anchoring head of the tag. The aft portion of shank 46 is just wide enough to fit into recess 38 so that edge portions 36 will prevent any lateral displacement of the shank during the tagging operation.

The second retainer member 44 has an elongate shank 64 with a curled aft end 66 mounted on pivot pin 68 which also extends through the side walls of recess 52. Shank 64 is substantially the same width as the neck of the tag to be applied, and near its forward end is provided with two prongs or flanges 70, one at each side edge, extending toward member 42 to embrace the tag neck and shank portion 54. The forward section 72 beyond flanges 70 is tapered to a narrow tip 74 which is bent inward toward member 42 to shield the tip of the anchoring head of the tag. As indicated in phantom lines, the tag is first mounted facewise against the inner face of member 44 with its neck embraced by flanges 70, the anchoring head being just long enough to locate its tip behind tip 74 and its detent shoulders in contact with flanges 70, while the aft edge of the base reaches aft end 66 of member 44. When the tag is so mounted, the retainer members are swung together to sandwich the tag between them in facewise engagement and reinforce the entire length of the tag against longitudinal buckling.

It is necessary to crimp or fold the wings 22 over each other and over the retainer means to form a compact cross section which will pass through the incision made by tip 56. For this purpose, bracket 76 is provided and comprises an elongate flat shank 78 slidably mounted for longitudinal movement in the correspondingly shaped passageway 80 in body 32, preferably on the longitudinal axis. The passageway has an enlarged section 82, FIG. 7, containing a compression spring 84 which backs up against the aft wall of section 82 and contacts pin 86 in shank 78 to yieldingly urge the shank forward, the pin contacting the forward wall of section 82 to limit forward movement of the shank to the desired extent.

The forward end of shank 78 is bent up and provided with a cross bar 88 having laterally spaced upstanding legs 90. The crimping means 92 comprises a pair of gripping jaws 94 of generally rectangular shape laterally spaced at opposite sides of the axis of longitudinal movement of the bracket, each jaw being pivotally mounted at its upper outer edge on pivot 96 to the upper end of its respective bracket leg. When the jaws are in their lowered retracted position as seen in FIG. 5 they are closely spaced and provided with opposing recesses 98 in their inner edges 100 which are large

enough to surround the retainer means and the folded tag wings. The jaws are swingable upward and outward through an arc of about 60° to an open extended position to define an upwardly open gap large enough to receive the retainer means and the wings as they are lowered to operative position.

Considering FIG. 6, it will be seen that the lengths of the retainer members and the location of flanges 70 are so selected with respect to the extended position of the bracket and gripping jaws that when the retainer means is lowered to operative position on top of the main body a rather wide portion of the wings will contact the gripping jaws and they will swing inwardly and downwardly to retracted position, folding the wings one over another and over the retainer means in the process. The final relation of the parts, ready for the installing operation, is also shown in FIG. 5. This figure also shows the eccentric pivotal mounting arrangement of the jaws which serves to increase their restraining action. While the jaws will normally remain in their open extended position to receive the other components by virtue of friction in their pivotal mountings, spring biasing means may be provided if desired. One such arrangement is indicated in FIGS. 4 and 5, in which a light coil spring 102 is stretched between ears 104 depending from jaws 94.

FIG. 6 shows the tool with the tab loaded in place and with the piercing point 58 adjacent to the element 28 to be tagged. FIG. 7 shows the tool before and after the insertion operation. The operator grasps element 28 with one hand and handle 34 with the other and moves the tool to the position of FIGS. 6 and 7. He then forcefully thrusts the tool forward, driving point 58 through element 28 and continuing the movement until the entire length of the tag anchoring head has passed through the element. In the middle of this movement jaws 94 contact the near side of the element and are driven back together with their bracket against the yielding force of spring 84 to the position shown in broken lines in FIG. 7. This releases the tag wings which deploy on the remote side of element 28 and lock the tag in place. In aft position, jaws 94 spring open or are caused to open by lowering movement of the main body, and members 42 and 44 are withdrawn from the element 28 and swing open to release the base of the tag.

In the modification shown in FIG. 8, the main body, retainer means, and crimping means are substantially identical to their counterparts in the form previously described. However, in this case main body 32 is pivotally mounted on a longer handle 106. A force-applying member in the form of a lever 108 is pivotally mounted at an intermediate point by pivot pin 110 to an intermediate point on handle 106 and has a first section 112 extending forward and upward and a second section 114 extending downward and rearward. Section 114 cooperates with section 116 of the handle to define a plier type grip. The forward free end 118 of section 112 is provided with a backup jaw 120 adapted to engage the remote side of element 28 to be tagged. The backup jaw, as seen in FIG. 9, is laterally extensive and is provided with a passageway 122 to be aligned with the retainer means and provide for movement of the retainer means through the jaw. Although the passageway may be an aperture, it is preferably open upwardly to allow upward releasing movement of the retainer means if desired. As shown in solid lines in FIG. 8, jaw 120 is

spaced far enough forward of piercing point 58 in initial position to provide a gap for reception of element 28. When sections 114 and 116 are gripped and squeezed by the operator, jaw 120 and the retainer means will be driven toward each other to force the retainer means through element 28 and complete the tagging.

Since the backup jaw swings upward and rearward about pivot 110, the main body and retainer means cannot maintain the attitude shown in solid lines. Therefore, the upper end of section 124 of the handle is formed as a clevis 126 to receive the main body on pivot pin 128. The base of the clevis is cut away at an angle to form a pad or stop 130 which engages the forward portion of the main body to limit its forward tilting to the desired extent to produce initial alignment with the backup jaw, and it is yieldingly held in this attitude by spring biasing means. A longitudinal recess 132 is formed in section 124 to contain spring 134 and a push rod 136 is mounted to slide through the recess, the upper end 138 engaging recess 140 in the bottom of the main body. The lower end of the spring backs up on the lower end of recess 132 and its upper end engages cross pin 142 in the push rod to yieldingly urge it upward and tilt the main body forward. As the backup jaw continues its approach to the main body, the latter is gradually tilted backward, and at the completion of the insertion operation the various components are in the positions shown in broken lines. The lever is then released and the components are withdrawn and separate in the same manner as described in connection with the first form of the tool.

What is claimed is:

1. A tag applying tool for use in combination with a tag of generally flat resilient material formed with a laterally extensive base, a narrow neck connected at its aft end to the forward end of the base, and an anchoring head connected at its aft end to the forward end of the neck and provided with a narrow leading end and rearwardly diverging wings defining detent shoulders at the forward end of the neck, the tool comprising:

a main body having a fore and aft longitudinal axis and a handle to be gripped by an operator;

narrow elongate retainer means for holding the tag having means at the aft end to pivotally mount said retainer means on the aft end of the main body for application of driving force to the retainer means and having a piercing point at the forward end to pierce the element to be tagged;

the retainer means being adapted in operative position to lie adjacent to the upper edge of the main body and substantially parallel thereto, and being substantially longer than the main body to extend beyond the forward end thereof in operative position;

a bracket longitudinally movably mounted on the main body and extending forwardly beyond the forward end of the main body;

crimping means mounted on the forward end of the bracket and extending upwardly therefrom;

the retainer means being adapted to receive the tag with its anchoring head in flatwise engagement with the forward portion of the retainer means and spaced rearward of the piercing point and movable down into juxtaposition with the crimping means to cause the latter to engage the wings and fold them

one over another and over the retainer means to reduce the lateral extent of the wings;
the retainer means being adapted to be forced by forward movement of the main body through the element to be tagged to an extent sufficient to carry the wings beyond the remote side of the element;

and the bracket and crimping means being movable rearward with respect to the main body by contact with the adjacent side of the element to release the wings and allow them to spread to anchoring position.

2. A tool as claimed in claim 1; in which the crimping means comprises two gripping jaws located in laterally spaced relation at opposite sides of the longitudinal axis of movement of the bracket and pivotally mounted thereon;

each jaw is pivoted near its outer edge on an axis parallel to the longitudinal axis of movement of the bracket for swinging between lower retracted position and upper extended position;

the inner edges of the jaws in retracted position are formed with opposing recesses sized to surround the retainer means and tag wings and restrain them in operative position;

and the jaws are swingable upward and outward away from each other to extended position to define an open gap large enough to receive the retainer means and the wings as they are lowered to operative position.

3. A tool as claimed in claim 2; in which the pivot axes of the jaws are above the centers of the recesses when the jaws are in retracted gripping position, defining eccentric pivotal mountings to increase the restraining action of the jaws.

4. A tool as claimed in claim 2; in which the jaws swing upward from retracted gripping position about 60° to extended open position.

5. A tool as claimed in claim 2; in which spring biasing means are connected to each of the jaws to yieldingly urge them to extended position.

6. A tool as claimed in claim 1; in which spring means are provided to yieldingly urge the bracket forward and stop means are provided to limit the forward movement of the bracket to locate the jaws in the predetermined appropriate position to initially receive the tag wings.

7. A tool as claimed in claim 1; in which the retainer means comprises two narrow elongate retainer members arranged to retain the tag between them in predetermined position;

one member being longer than the other and extending forward beyond it and being provided with the piercing point.

8. A tool as claimed in claim 7; in which the leading end of the shorter retainer member is bent inward toward the longer member to enclose the leading end of the anchoring head and prevent its displacement during the piercing operation.

9. A tool as claimed in claim 7; in which one of the retainer members is provided with a pair of flanges, one at each side edge, extending toward the other member to embrace the tag neck and abut the aft edges of the tag wings to longitudinally locate the wings in predetermined position for folding engagement with the crimping means.

10. A tool as claimed in claim 7; in which the retainer members are pivotally connected to the aft end of the main body at their point of engagement therewith;

and their forward portions are swingable up and down with respect to the crimping means.

11. A tool as claimed in claim 10; in which the retainer members are discrete and are pivoted with respect to each other to swing apart for reception of the tag and to swing together in facewise contact with the opposite faces of the tag and retain it in position for wing-folding engagement with the crimping means.

12. A tool as claimed in claim 11; in which the tip of the longer retainer member with the piercing point has a planform in the general shape of an arrow head, and the shank aft of the tip is of substantially the same width as the neck of the tag;

the shorter retainer member is of substantially the same width as the neck of the tag and is provided at each side edge with a flange directed toward the longer member to embrace the tag neck and the shank of the longer member and restrain the tag against lateral displacement;

the forward section of the shorter member is tapered to a narrow tip bent inward toward the longer member to shield the tip of the anchoring head of the tag;

the flanges are located aft of the tip of the shorter member a sufficient distance to abut the aft edges of the tag wings and urge the tag forward with the retainer members;

and the aft end of the tip of the longer member is wider than its shank to pierce an opening in the element to be tagged large enough for passage of the folded anchoring head of the tag.

13. A tool as claimed in claim 1; in which a force-applying member is movably connected to the tag applying tool and is provided at its forward free end with a backup jaw adapted to engage the remote side of the element to be tagged and formed with a passageway for the retainer means;

the backup jaw in initial position is substantially in alignment with and spaced forward of the piercing point of the retainer means to define a gap for reception of the element to be tagged;

and the retainer means and the backup jaw are relatively movable toward each other to force the retainer means through the element and the passageway.

14. A tool as claimed in claim 13; in which the passageway in the backup jaw is open upwardly to provide a path for relatively upward releasing movement of the retainer means from the backup jaw after completion of the piercing and tagging operation.

15. A tool as claimed in claim 13; in which the force-applying member is pivotally connected to the handle of the main body.

16. A tool as claimed in claim 13; in which the force-applying member is an elongate lever pivotally connected at an intermediate point to an intermediate point on the handle of the main body; the ends of the lever and the handle extending beyond the pivotal connection define plier-type gripping members;

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and the gripping members are movable toward each other under manual pressure to produce relative movement of the retainer means and the backup jaw.

17. A tool as claimed in claim 16; in which the main body is pivotally mounted on the handle to tilt forwardly and initially align the retainer member with the passageway in the backup jaw.

18. A tool as claimed in claim 17; in which

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spring means is interposed between the main body and the handle and is arranged to yieldingly tilt the main body toward its initial position.

19. A tool as claimed in claim 18; in which portions of the main body and the handle are arranged to interengage and serve as stops to limit the tilting movement to the predetermined initial position.

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