June 29, 1971 L. V. DUDLEY ET AL 3,588,964

CABLE TIE

Filed June 9, 1970

Fig. 1.

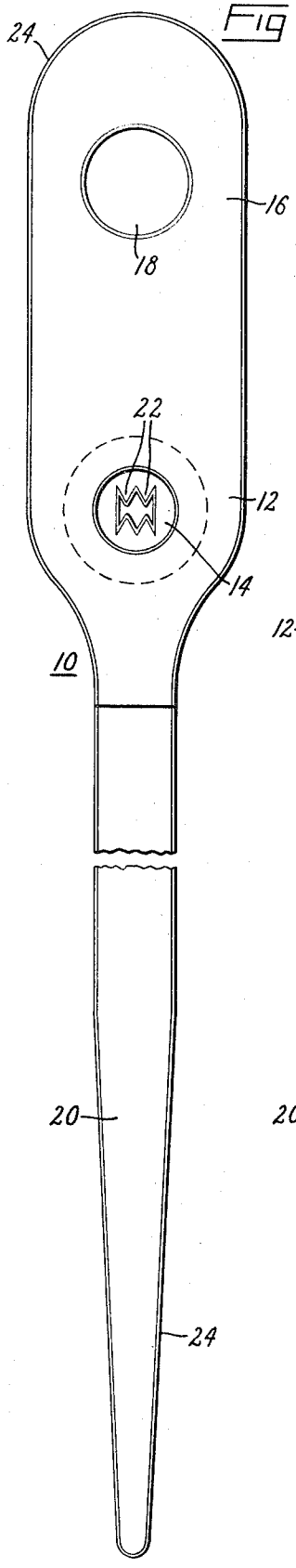


Fig. 2.

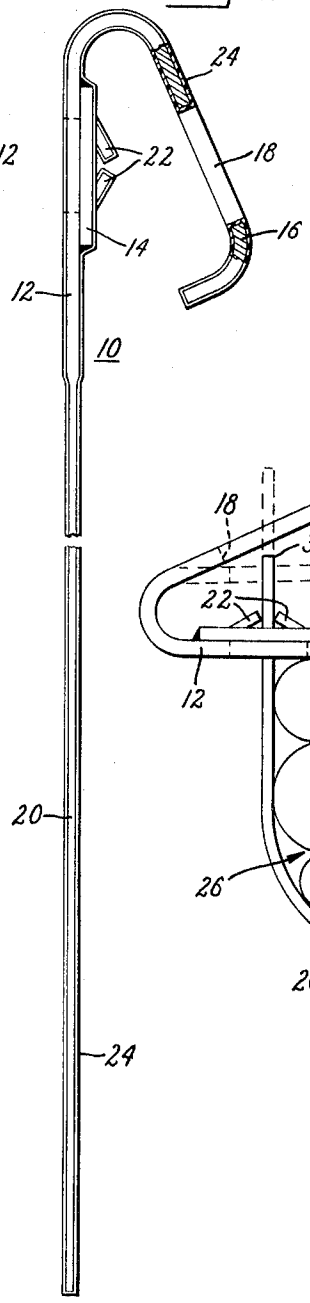
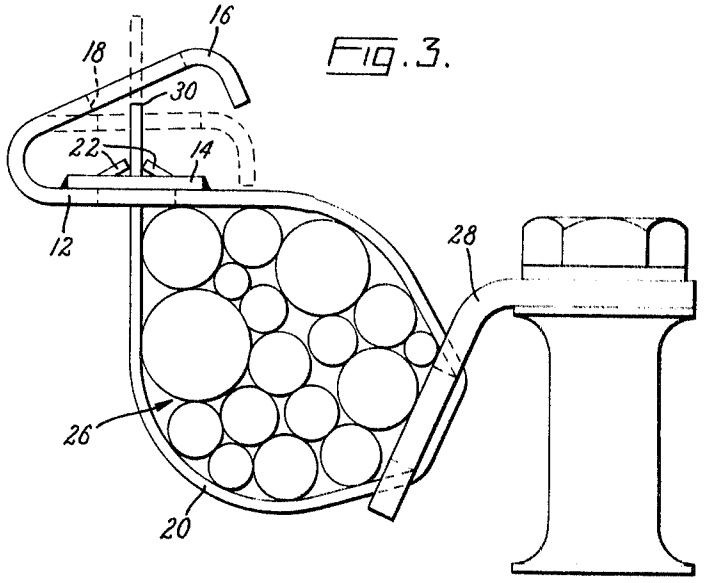


Fig. 3.



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CABLE TIE

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ABSTRACT OF THE DISCLOSURE

Prior art cable tie having free end adapted to be inserted in slotted end and retained by pawls is modified by providing slotted end with springy perforated U-shaped extension, which collapses during clipping of excess length of free end, and then springs out to form guard over sharp clipped end. Particularly suitable for use with plastic-clad metal ties.

BACKGROUND OF THE INVENTION

(1) Field of the invention

This invention pertains to the art of tying bundles of cables.

(2) Description of the prior art

To hold cables in a bundle and fasten them to a support point, the prior art teaches a variety of straps with fastening means which are, broadly, slots through which the distal end of the strap is passed, and is retained by pawls which may be separate pieces of springy material, or may (in the case of molded plastic straps) be simply suitably dimensioned protrustions from the edges of the slot. Since these devices are ordinarily used in large numbers, they are usually highly standardized, and the number of sizes required is reduced by clipping off the excess length of strap remaining after the strap has been tightened to encompass the particular sized bundle of cables involved. Thus a given standard length of strap can accommodate a variety of sizes of cable bundles. But the severed end of the strap protrudes unguarded from the pawls. This is not ordinarily objectionable if the strap material is of plastic. However, plastic in general is objectionable for certain applications where readily combustible material must be avoided. Substantially non-combustible, or very difficultly ignitible, plastics, such as fluorinated organic materials, are known, but their mechanical properties require that they be objectionably heavier in a given application than the combustible plastics. Metal straps do not have this disadvantage (although many metals—notoriously, aluminum and magnesium alloys—are combustible in high oxygen concentrations); but when severed they tend to present objectionably sharp edges which are a hazard to workers in their vicinity.

SUMMARY OF THE INVENTION

We have modified the conventional prior art design by adding at the end of the strap which bears the pawl an elastic extension as a guard through which the end of the strap passes after its engagement with the pawl. A tool used for drawing the strap to tightness in the pawl and then severing it, an item commercially available, presses against the guard and forces it down during the tightening and cutting operation. The same operation may be performed by hand use of diagonal cutters. After severance of the strap, the tool moves away, and the guard springs up, surrounding the stump sufficiently so that casual accidental contact with it is prevented.

The protection thus provided against contact with the sharp stump renders feasible the use of metal strap of lightweight oxidizable material covered with a coating of difficultly ignitible or incombustible plastic which protects the metal against reaction with an external atmosphere and yet need itself be only sufficiently thick to cover the metal part, so that it adds very little to the total weight of the part. Plastics, such as the fluorocarbons, are commercially available which are nonflammable even in pure oxygen at atmospheric pressure, an environment in which even metals less reactive than aluminum and magnesium are combustible.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 represents a developed plan view of the embodiment;

FIG. 2 represents an elevation of the embodiment bent into its normal shape in use; and

FIG. 3 represents the use of the embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 there is represented a body **10**, which in an actual embodiment was of the aluminum alloy known as 6061–T6, 0.025 inch thick. The end portion **12** carrying the pawl **14** was 0.40 inch wide, as was the extension **16**, which was provided with the aperture **18**. The strap proper **20** was chemically milled to 0.023 inch thick and was 0.150 inch wide, but for the last inch of its length extending to the distal end tapered to a radius of 0.03 inch to facilitate insertion in pawl **14**. Pawl **14** was a small disk of spring steel, pierced to form a unidirectional retention means by the action of the small sharp pawl tongues **22**. Pawl **14** was cemented to portion **12** by an organic resin cement sufficient to hold it in place, since the load in use is one of compression on the cement and does no tend to rupture the cemented joint. A coating **24** of non-flammable plastic polyimide was applied to the entire assembly; it is represented as transparent.

FIG. 2 is an elevation of FIG. 1, but with extension **16** bent into its normal position.

FIG. 3 represents the embodiment of FIGS. 1 and 2 surrounding a bundle **26** of cables, which it ties to a support **28**. Amputated distal end of strap proper **20** is shown dashed; and extension **16** is represented solid-lined in its normal position, in which it guards the stump **30** of strap **20**, and dashed in the depressed position which it occupies during the amputation.

We claim:

1. In a binding strap having at one end a first aperture for passage of the distal end thereof through the aperture; and unidirectional retention means for retaining the strap in position in the first aperture against forces directed to draw the ditsal end back through the first aperture, the improvement comprising

an elastic extension of the strap beyond the first aperture, in a direction away from the distal end, folded back in the direction of the first aperture,

itself provided with a second aperture in substantial alignment with the first to permit ready

passage of the distal end of the strap through the two apertures,

the said extension in the absence of stress residing out of contact with the portion of the strap including the first aperture,

its elasticity permitting it to be drawn down to the said portion without permanent deformation.

2. The improvement claimed in claim 1 in which the said strap, including the said elastic extension, is of an oxidizable metal coated with a non-flammable plastic.

References Cited

UNITED STATES PATENTS

2,709,558	5/1955	Young	248—74
3,022,557	2/1962	Logan	24—17A
3,159,708	12/1964	Deal	248—74X

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