Jan. 12, 1971 R. A. LONG ET AL 3,553,793

BUNDLE TIE

Filed Nov. 12, 1968

Fig. 1

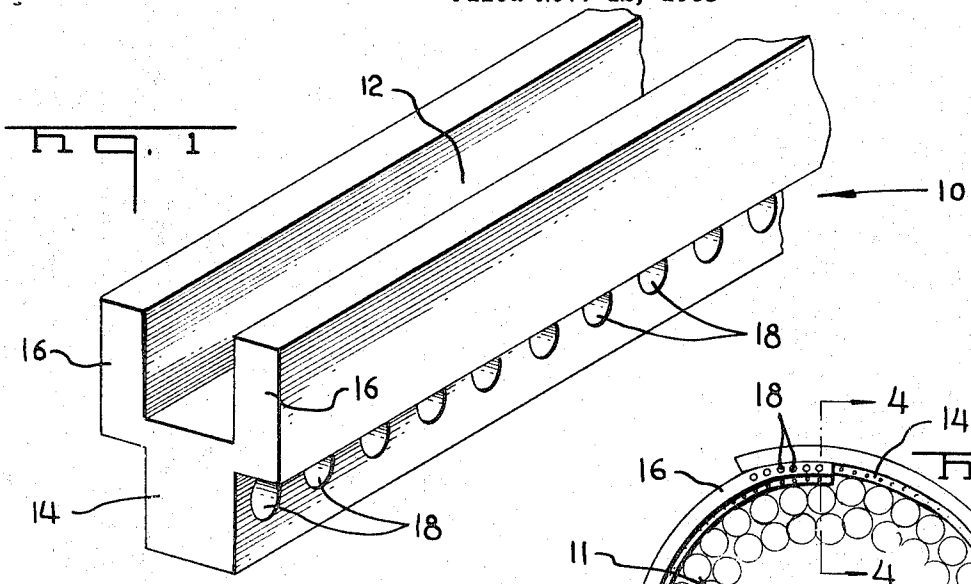
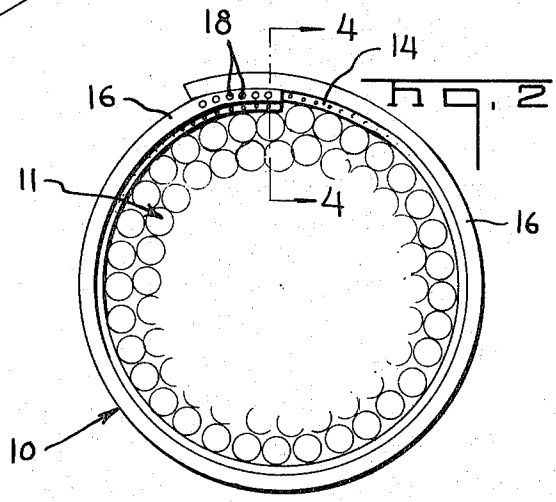


Fig. 2



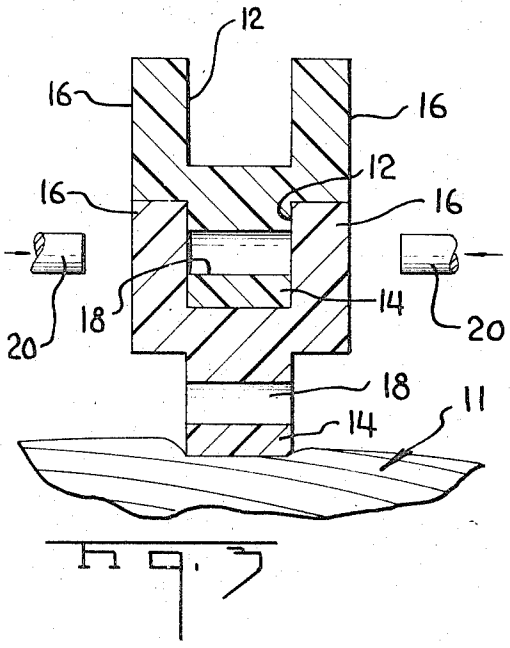


Fig. 3

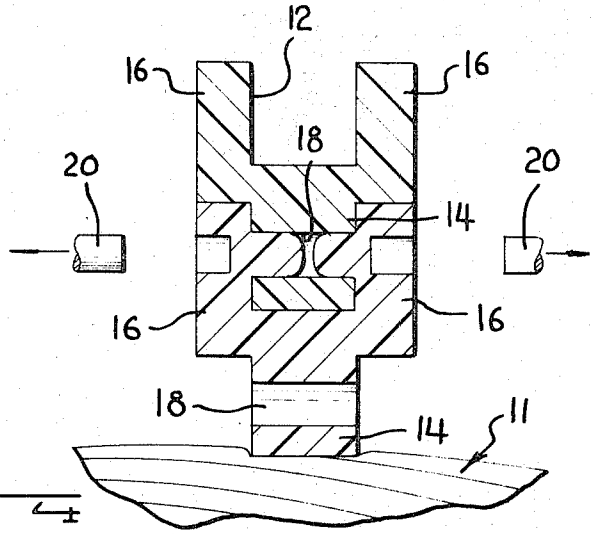


Fig. 4

INVENTOR.
ROBERT ALVIN LONG
BY WILLIAM RODERICK OVER

United States Patent Office 3,553,793 Patented Jan. 12, 1971

3,553,793

BUNDLE TIE

Robert Alvin Long and William Roderick Over, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 12, 1968, Ser. No. 774,745
Int. Cl. B65d 63/00
U.S. Cl. 24—16 5 Claims

ABSTRACT OF THE DISCLOSURE

A bundle tie is disclosed and comprises an elongated flexible strap for tying a bundle of cables or the like, the strap being of generally constant external configuration and adapted to have its ends placed in overlapped position to permit material from one end of the strap to be extruded into apertures in the opposite end of the strap.

In the electronic industry there are various applications involving the use of a great number of electrical conductors disposed in close proximity to each other. It is normally desirable to separate the conductors into discrete bundles and to secure the bundles together with some form of a tie.

Various bundle ties are known in the prior art for securing a bundle of conductors, cables or the like. The most frequent form of tie involves a belt-like strap having a slotted portion at one end and a series of teeth extending along the strap. The strap is passed around the bundle and the teeth are ratcheted through the slot until the strap is securely in position. There are several drawbacks of this type of strap. First, it involves a considerable waste of material in that there is always excess strap which serves no purpose and must be discarded. Additionally, many various lengths of straps must be stocked in order to cover a range of bundle sizes. Another drawback is that the tie appreciably increases the overall bundle size since the locking arrangement on a strap produces a build-up of material around the bundle. These and other drawbacks of the prior art provide the background for the instant invention in which a continuous length of strap is employed, which strap may be selectively severed either before or after being applied to a bundle. A portion of the strap is overlapped adjacent its ends and the configuration of the strap permits it to fit snugly around the bundle thus avoiding any appreciable size build-up.

It is, therefore, an object of this invention to provide a bundle tie which avoids the various drawbacks of the prior art devices.

Another object is to provide a bundle tie which is supplied in indeterminate length to avoid the necessity of storing multiple size ties.

Another object is to provide a bundle tie of continuous hermaphroditic design.

A further object is to provide a tie which may be applied to a bundle through the use of a simple and inexpensive tool.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings in which like reference numerals refer to like parts:

FIG. 1 is a perspective view of a bundle tie made in accordance with the teachings of the present invention;

FIG. 2 is an end view showing the bundle tie of FIG. 1 in position around a bundle of cables;

FIG. 3 is a cross-sectional view showing the bundle tie in overlapped position prior to securing the ends of the tie together; and

FIG. 4 is a cross-sectional view similar to FIG. 3 and taken along the line 4—4 of FIG. 2 showing the bundle tie after an extruding operation locking the two parts of the bundle tie together.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there is shown and described an illustrative embodiment of the invention; it is to be understood, however, that this embodiment is not intended to be exhaustive nor limiting of the invention but is given for purpose of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

Turning now to the drawings there is shown a strap indicated generally at **10** for securing a bundle of cables or the like **11**. The term "cable" as used throughout the specification and claims is intened to cover any generally elongated member and is not restricted to electric cables. The strap **10** is sufficiently flexible to permit its being wrapped around the bundle and is conveniently formed of a thermoplastic material such as nylon. The configuration of the strap permits it to be manufactured by an extruding process thus materially reducing the overall manufacturing cost.

The strap has a generally constant cross-sectional configuration and comprises an upper portion **12** and a lower portion **14**. The upper portion is generally channel shaped. Portion **12** has a pair of upstanding legs **16** disposed on either side of a rectangular recess to thus form the channel configuration. Lower portion **14** is generally rectangular and is of an overall size to permit the portion **14** to be insertable within the recess of the upper portion **12**. Portion **14** has a plurality of apertures **18** extending therethrough, the apertures being regularly spaced along the longitudinal extent of portion **14**.

When it is desired to secure a bundle **11** of cables or the like the strap **10** is placed loosely around the bundle and drawn into a position such as shown generally in FIG. 2. The strap would normally be supplied in a continuous extruded form and would be severed to appropriate length by the operator who is effecting the tie. Suitable tooling may be provided for drawing the strap sufficiently taut to insure that all the cables in the bundle are securely held. By way of an example a tool may be provided which engages the apertures **18** along both ends of the strap and pulls the strap ends together by force exerted on these apertures.

The amount by which one end of the strap should overlie the other end will depend upon the particular size of the bundle being tied and the desired amount of holding force. The amount of overlap shown in the drawings is approximately equal to the distance occupied by six of the apertures **18** but this is given by way of illustration only and is not intended to be limiting.

In FIGS. 3 and 4 there is shown the method of securing one end of the strap **10** to its opposite end after the strap is placed around the bundle **11**. A pair of blunt punches **20** are shown and are arranged along opposite sides of portion **12** of the innermost end of the strap. The punches are contained in suitable tooling and are movable inwardly toward the strap as indicated by the arrows shown in FIG. 3 and are subsequently movable outwardly as indicated by the arrows shown in FIG. 4. The punches **20** are positioned so as to be in alignment with the apertures **18** disposed along the outer strap layer. Movement of the punches inwardly will cause the side

walls **16** of the inner strap layer to be extruded inwardly causing a portion of the material to flow into the aperture **18** of the outer strap layer. When the punches are removed the material will remain within aperture **18** as shown in FIG. 4 thus preventing the strap ends from separating due to either tangential or radial forces. The amount of locking force between the strap ends will vary in accordance with the amount of overlap between the strap ends and the number of apertures filled with extruded material.

Thus it can be seen that the bundle tie of this invention provides a strap of simple construction which is conveniently supplied in extruded form and is subsequently punched to provide a series of apertures along its length. The strap takes up a minimum amount of space around the bundle and may be tightened and locked by relatively simple tooling.

Changes in construction will occur to those skilled in the art and various apparently different modifications and embodiments may be made without departing from the scope of the invention. The matter set forth in the foregoing description and accompanying drawings is offered by way of illustration only. The actual scope of the invention is intended to be defined in the following claims when viewed in their proper perspective against the prior art.

We claim:

1. An elongated flexible strap for tying a bundle of cables or the like and comprising an upper portion and a lower portion, said upper portion being substantially channel shaped and being of substantially constant cross-section throughout the length of said strap, said lower portion having an external configuration receivable within said channel shaped upper portion, and a series of apertures along said lower portion for securing said strap to itself upon overlapping of said strap around a bundle.

2. A strap as set forth in claim **1** wherein said lower portion is of generally rectangular configuration.

3. A strap as set forth in claim **1** wherein said apertures are regularly spaced along the entire length of said lower portion.

4. Assembling apparatus comprising a plurality of articles arranged in a bundle, an elongated flexible strap extending circumferentially around said bundle and comprising an upper portion being substantially channel shaped and a lower portion being shaped to be receivable within said upper portion, said strap having end portions overlapping each other whereby the lower portion of one end is received within the upper portion of the other end, a series of apertures along said lower portion, and means extruded from said upper portion other end and extending into the apertures of said lower portion one end to thereby retain said strap around said bundle.

5. Apparatus as set forth in claim **4** wherein said articles comprise elongated electrical conductors and wherein said strap is formed of a non-conductive material.

References Cited

UNITED STATES PATENTS

1,649,363	11/1927	Parsons	24—20X
1,812,151	6/1931	Jacocks	29—521X
2,023,059	12/1935	Vaughan	24—20
2,163,016	6/1939	Barker.	
3,197,831	8/1965	Martin et al.	24—16

THERON E. CONDON, Primary Examiner

N. ABRAMS, Assistant Examiner

U.S. Cl. X.R.

248—74