(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 176 302**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **03.05.89**

(51) Int. Cl.[4]: **B 65 B 11/10**, B 65 C 3/02

(21) Application number: **85306576.1**

(22) Date of filing: **16.09.85**

(54) **Apparatus for enwrapping articles.**

(30) Priority: **14.09.84 GB 8423336**

(43) Date of publication of application:
02.04.86 Bulletin 86/14

(45) Publication of the grant of the patent:
03.05.89 Bulletin 89/18

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(56) References cited:
GB-A-2 092 984

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EP 0 176 302 B1

Courier Press, Leamington Spa, England.

Description

This invention relates to apparatus for wrapping articles.

It is known from GB Patent Application No. 2 092 984A to wrap rolls by means of apparatus comprising pusher bars for moving a roll against a length of wrapping material so that the roll becomes enwrapped with the material and means for bonding the ends and severing the wrapping material from the enwrapped roll.

The present invention provides an apparatus of the general form described but which is particularly adapted for applying a sleeve of material to an elongate object, such as a wire.

With an electrical wiring harness consisting of a large number of wires, identification of the wires can be difficult and thus it is useful if the wires carry a suitable form of coding. The coding may consist of, for example, a marked or coloured sleeve wrapped around the wire.

It is an object of the present invention therefore to provide apparatus which is able to apply such a sleeve around a wire.

According to the present invention there is provided an apparatus for applying a sleeve of material to an elongate object comprising supporting means for supporting a length of said material, locating means for positioning the elongate object adjacent to the material supported by the supporting means, the locating means and the supporting means being relatively movable to a position at which the material becomes wrapped substantially around the object, relatively movable urging members being provided in association with the supporting means for urging the material the remaining distance around the elongate object, there being provided securing members for securing the material in the form of a sleeve around the object, and cutting members for separating the formed sleeve from the material, characterised in that the locating means comprises two co-operating pairs of rotatable pulleys which guide and move the elongate object (e.g. wire) axially and at right angles to strip material to the appropriate position and in that two sets of strip urging, securing and cutting members are provided, one at either side of the strip material and actuated so that a complete sleeve is cut from the strip material and formed on the elongate object after each relative movement between the supporting means and the locating means.

The strip material is preferably a plastics strip and the movable urging members may include welding electrodes whereby after the plastics strip is urged the remaining distance around the wire the strip is welded to form a sleeve.

The cutting member may operate simultaneously with the welding operation.

Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings in which,

Figure 1 is a pictorial view of part of apparatus for automatically applying identification sleeves to wires and cables constructed in accordance with the invention,

Figures 2 to 7 illustrate the sequence of operation of one embodiment of the apparatus.

In Figure 1 is shown part of a supporting head 15 of an apparatus for automatically applying identification sleeves to a wire 10. Four fixed rotatable pulleys 14 guide the wire 10 which moves in increments to the position in which an identification sleeve is required. The head 15 includes a supply of plastics tape 11 which is also moved in increments by rollers 12. The head 15 is transversely movable relative to the wire 10, the head 15 being provided with a slot 16 so that the head can straddle the wire 10 and the pulleys 14.

Referring now to Figures 2 to 7 these show cross-sectional views across part of a supporting head 25 of the apparatus and illustrate the sequence of operation of one embodiment of the invention.

The head 25 which corresponds to the head 15 shown in Figure 1 is provided with two slots 26 and 27, two sets of spaced welding tools 28 and two cutting tools 30. The wire 10 is guided by pulleys 14 (Figure 1) as before, and the plastics tape 11 is moved by the rollers 12.

In operation, the head 25 moves across the wire 10 so that the wire is effectively moved from the slot 27 to the slot 26 (Figure 2) and the plastics tape 11 is dragged around the wire to wrap it by about 180°. Encirclement of the wire by the tape is then completed as the set of spaced welding tools 28 moves into abutment with the tape (Figure 3). The tape is welded and cut by the cutting tool 30 between the spaced welds (Figure 4). By welding on both sides of the cutting tool 30 the sleeve is completed and the continuity of the tape 11 is retained (Figure 5). The welding and cutting tools now retract, the wire 10 is fed along by the pulleys 14 and the tape 11 increments down (Figure 6).

The head 25 now returns to the position shown in Figure 2 in which the wire 10 is in the slot 27 and again the tape 11 is dragged around the wire and the other set of welding tools 28 moves into abutment with the tape to complete the encirclement of the wire 10 by the tape 11 (Figure 7). The sequence thus repeats, with a sleeve being wrapped around the wire every time the head 25 moves across the wire.

It is anticipated that a number of tape applying stations would be arranged side-by-side, for example ten, each applying a different coding tape such as different colours or a combination of different colours and printed codes. The codes could be pre-printed on the tapes or printed at the head immediately before application of the sleeve.

The operation of the stations would preferably be controlled by computer.

Various types of welding of the tape could be used such as by heating or by radio frequency.

The system may also be applied to many other articles which require some form of identification, such as hydraulic pipes and other elongate or rod-like articles.

Claims

1. An apparatus for applying a sleeve of material to an elongate object comprising supporting means (12) for supporting a length of said material (11), locating means (14) for positioning the elongate object adjacent to the material supported by the supporting means, the locating means and the supporting means being relatively movable to a position at which the material becomes wrapped substantially around the object (10), relatively moveable urging members being provided in association with the supporting means for urging the material the remaining distance around the elongate object, there being provided securing members (28) for securing the material in the form of a sleeve around the object, and cutting members (30) for separating the formed sleeve from the material (11), characterised in that the locating means comprises two co-operating pairs of rotatable pulleys (14) which guide and move the elongate object (e.g. wire) (10) axially and at right angles to strip material (11) to the appropriate position and in that two sets of strip urging, securing and cutting members (28, 30) are provided, one at either side of the strip material (11) and actuated so that a complete sleeve is cut from the strip material and formed on the elongate object (10) after each relative movement between the supporting means (12) and the locating means (14).

2. An apparatus as claimed in Claim 1, characterised in that the strip material (11) is a plastics strip.

3. An apparatus as claimed in Claim 2, characterised in that the strip urging members (28) include welding electrodes whereby after the plastics strip (11) is urged the remaining distance around the wire (10) the strip is welded to form a sleeve.

Patentansprüche

1. Vorrichtung zum Anbringen einer Materialhülse an einem ausgedehnten Objekt umfassend Trägermittel (12) zum Tragen einer Länge des besagten Materials (11), Führungsmittel (14) für das Positionieren des ausgedehnten Objektes benachbart zum Material, das durch die Trägermittel getragen wird, wobei die Führungsmittel und die Trägermittel relativ zu einer Position bewegbar sind, bei welcher das Material weitgehendst um das Objekt (10) gehüllt wird, relativ bewegbare Treibbauteile, die im Zusammenhang mit den Trägermitteln vorgesehen sind, um das Material die noch verbleibende Distanz um das ausgedehnte Objekt zu treiben, wobei Sicherungsbauteile (28) vorgesehen sind, um das Material in der Form einer Hülse um das Objekt zu sichern, und Schneidebauteile (30), um die ausgebildete Hülse vom Material zu trennen, dadurch gekennzeichnet, dass die Führungsmittel zwei kooperierende Paare, von drehbaren Führungsrollen (24) umfassen, die das ausgedehnte Objekt (10) (z.B. Draht) axial und rechtwinklig zu Bandmaterial (11) an die entsprechende Stelle führen und bewegen, in welcher zwei Paare von Bandtreib-, Sicherungs- und Schneidebauteile (28, 30) vorgesehen sind, eines auf jeder Seite des Bandmaterials (11) und derart betätigbar, dass nach jeder relativen Bewegung zwischen den Trägermitteln (12) und den Führungsmitteln (14), eine komplete Hülse vom Bandmaterial abgeschnitten wird und um das ausgedehnte Objekt gebildet wird.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass das Bandmaterial (11) ein Kunststoffband ist.

3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass die das Band treibenden Bauteile (28) Schweisselektroden umfassen, wobei nachdem das Kunststoffband (11) um die verbleibende Distanz um das Kabel (10) getrieben worden ist, das Band geschweisst wird, um eine Hülse zu bilden.

Revendications

1. Appareil destiné à appliquer un manchon d'un matériau sur un objet allongé, comprenant un dispositif (12) de support d'un tronçon (11) du matériau, un dispositif (14) de positionnement de l'objet allongé près du matériau porté par le dispositif de support, le dispositif de positionnement et le dispositif de support étant mobiles l'un par rapport à l'autre vers un emplacement dans lequel le matériau entoure pratiquement l'objet (10), des dispositifs de rappel, mobiles les uns par rapport aux autres, étant associés au dispositif de support afin qu'ils repoussent le matériau de la distance restante autour de l'objet allongé, des organes de fixation (28) étant destinés à maintenir le matériau sous forme d'un manchon autour de l'objet, et des organes de coupe (30) destinés à séparer le manchon formé du matériau (11), caractérisé en ce que le dispositif de positionnement comporte deux paires coopérantes de poulies rotatives (14) qui guident et déplacent l'objet allongé (par exemple un fi1) (10) en direction axiale et perpendiculairement au matériau (11) en forme de bande à l'emplacement convenable, et en ce que deux jeux d'organes de rappel, de fixation et de découpe de bande (28, 30) sont disposés chacun d'un côté du matériau (11) en forme de bande et sont commandés de manière qu'un manchon complet soit découpé dans le matériau en forme de bande et soit disposé sur l'objet allongé (10) après chaque déplacement relatif du dispositif de support (12) et du dispositif de positionnement (14).

2. Appareil selon la revendication 1, caractérisé en ce que le matériau sous forme d'une bande (11) est une bande de matière plastique.

3. Appareil selon la revendication 2, caractérisé en ce que les organes (28) destinés à repousser la bande comportent des électrodes de soudage si bien que, après que la bande (11) de matière plastique a été repoussée sur la distance restante autour du fil (10), la bande est soudée afin qu'elle forme un manchon.

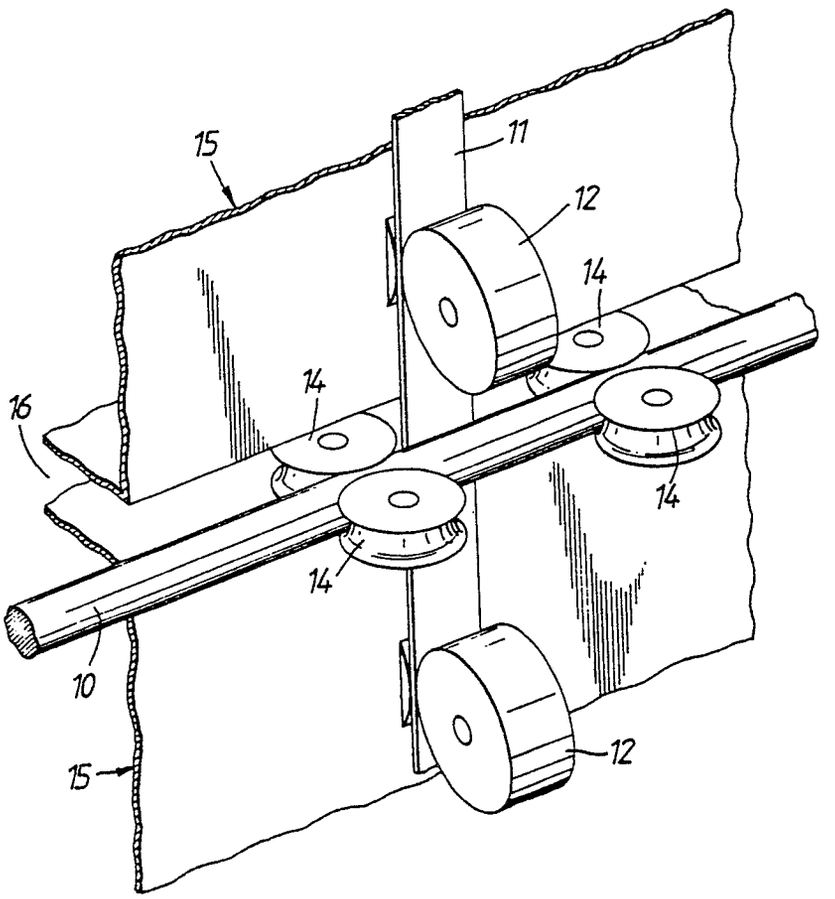

FIG. 1.

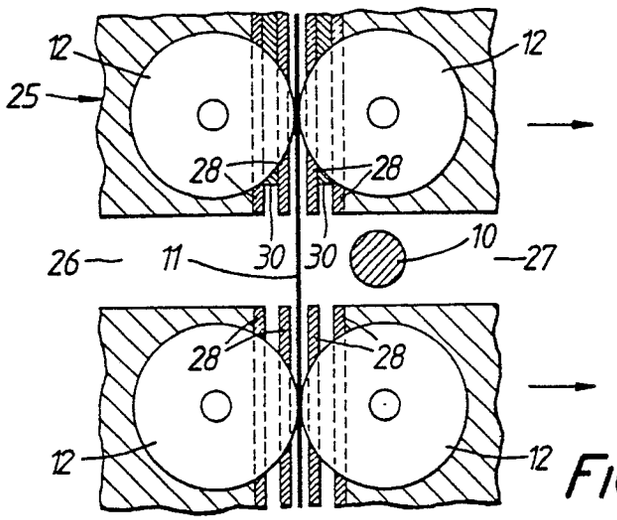

FIG. 2.

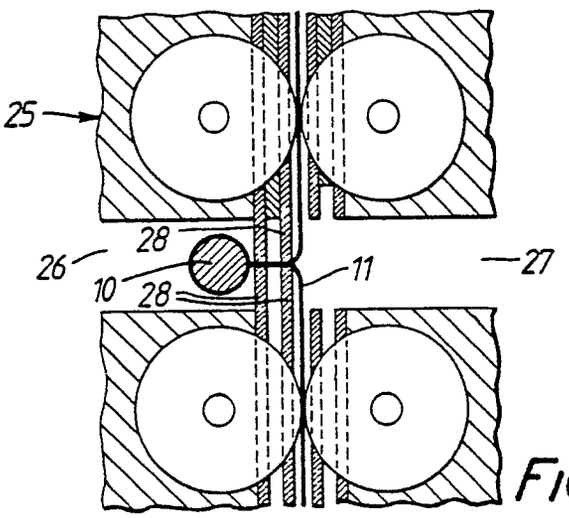

FIG. 3.

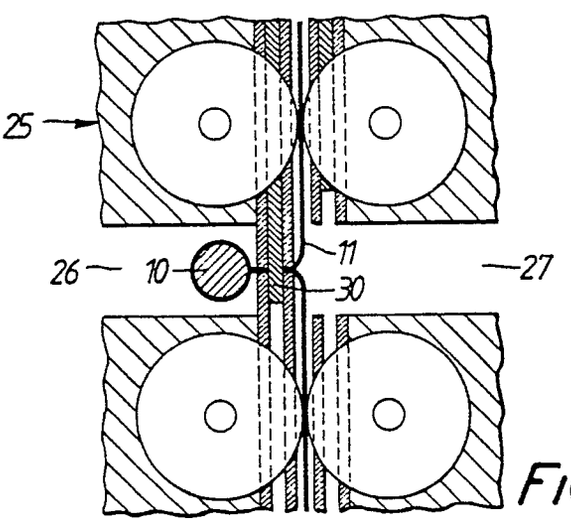

FIG. 4.

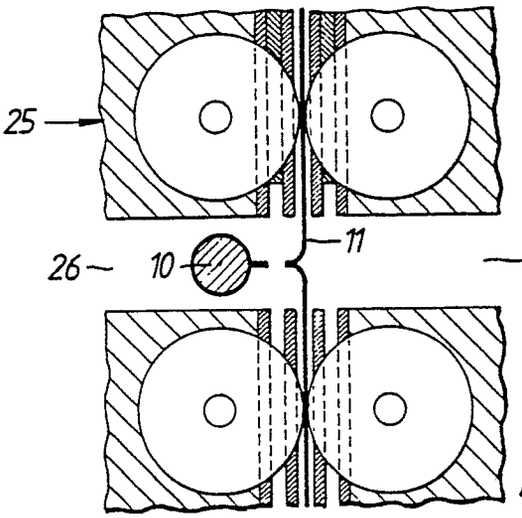

FIG. 5.

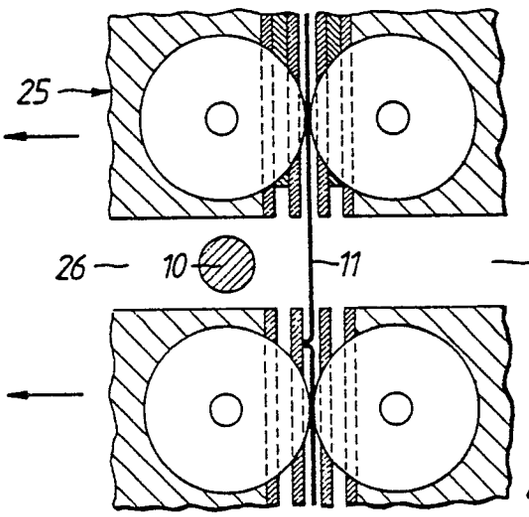

FIG. 6.

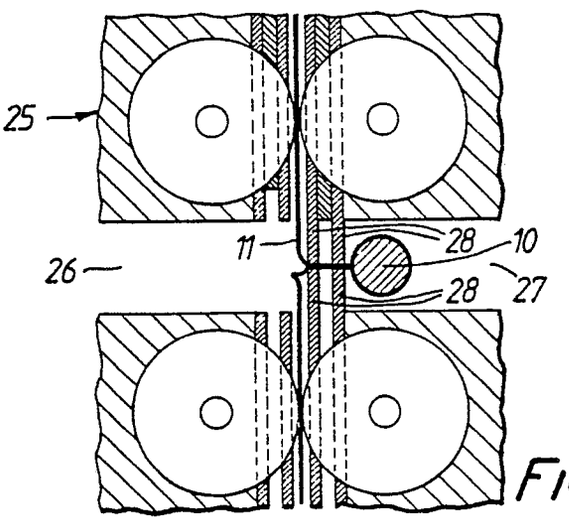

FIG. 7.