

[54] **EXTRUSION GUIDER**
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[73] Assignee: **Anaconda Wire and Cable Company**
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[51] Int. Cl.....**B29c 27/14**
[58] Field of Search.....18/13 A, 13 H, 13 S, 13 T,
18/12 DM; 264/173, 174; 425/114, 113

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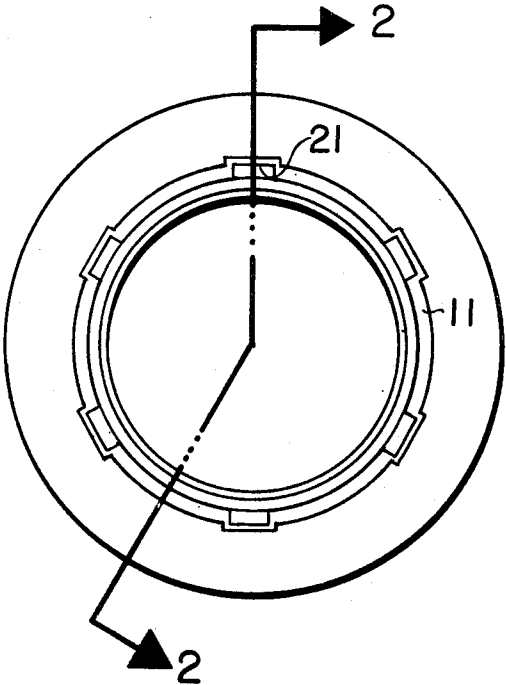
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[57] **ABSTRACT**

For extruding cable jackets with embedded strands the core guider comprises replaceable inserts. To select a desired depth of strand in the jacket, each insert has a tapered tubular extension with a different edge thickness.

2 Claims, 3 Drawing Figures



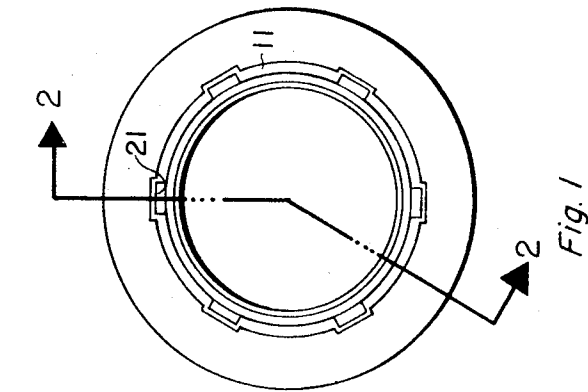


Fig. 1

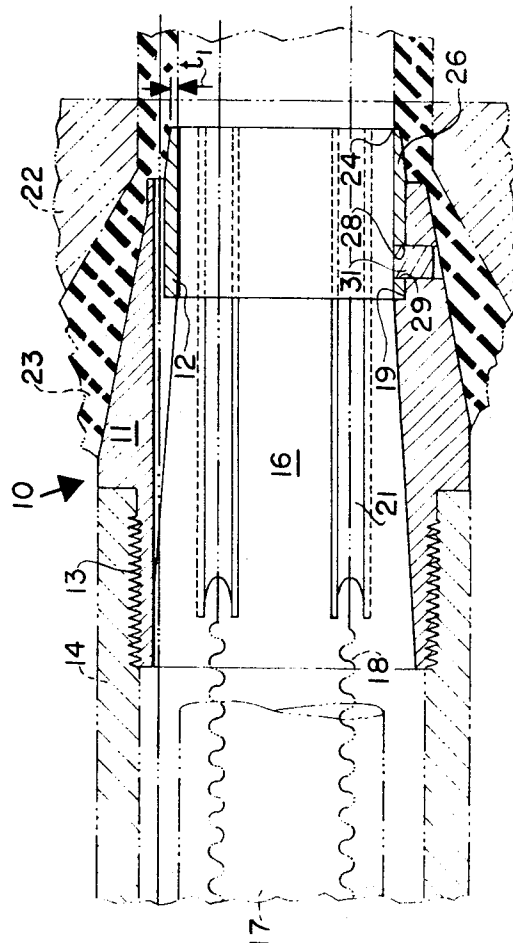


Fig. 2

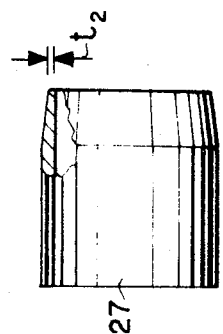


Fig. 3

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EXTRUSION GUIDER

BACKGROUND OF THE INVENTION

It has recently been found advantageous to manufacture electrical cables wherein the drain wires are embedded in the cable jacket rather than being wrapped around it. Such cables are described in U.S. Pat. No. 3,474,189 and application Ser. No. 39,674, now U.S. Pat. No. 3,571,613, but there has been a problem in their manufacture in controlling the depth to which the drain wires are embedded in the extruded jacket within close tolerances. Certain types of apparatus have become standard for cable extrusion processes. These are a core tube through which the core passes that is required to be covered with extrudate, a guider that is threaded into the core tube and supported by it, and a die which determines the shape and thickness of the extruded covering. The core passes loosely through the core tube but fits closely through the guider, which latter must be accurately aligned with the die to achieve concentricity of the core and jacket. A single guider may be used with different dies on occasions where different jacket thicknesses are required but it will generally be applied over a single diameter of core. This is important, commercially, because each of the above-described pieces of apparatus requires fine machining and is expensive to duplicate. Where drain wires are being guided by the guider, as well as a cable core, it has proven inordinately expensive to provide a different guider for each different wire gage and for each different required depth of penetration. This problem is aggravated by the fact that the depth of penetration is influenced to some extent by the physical characteristics, such as stiffness, of the extrudate itself, and this might require changes in the guider when the composition of the extrudate is changed, even though the other factors are unaltered.

SUMMARY

We have proposed by our invention to minimize the tooling cost for different jacket thicknesses, jacket compounds, and desired depths of drain wires in the cable jackets. To this purpose we have invented a novel extrusion guider for applying a jacket over an insulated cable core, where the jacket comprises a plurality of lengthwise metallic members. Our novel guider comprises a support member comprising a tapered zone that defines an entrance section and a reduced exit section, a uniform bore comprising a smooth inside surface extending from the reduced section, and a plurality of straight, evenly-spaced flat grooves in the inside surface for guiding the metallic members into the extrusion die. Our guider also comprises a plurality of replaceable tubular inserts for the support member. Each of these inserts comprises an outside cylindrical surface that fits closely into the bore in the support member, an inside surface that fits closely around the core, a tapered tubular extension that projects from the support member when the insert is fitted into it, and an annular face terminating the extension. The annular faces of the different inserts have preselected edge thicknesses, different for each insert, for determining the depths of the wires in the jacket. Means such as matching apertures through the support member and the insert, and a closely fitting pin, are provided for removably locking the insert in the support member.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows a front view of the guider of our invention.

FIG. 2 shows a lengthwise section through the line 2—2 of FIG. 1 and a partial section of a die.

FIG. 3 shows a side view of an element of our invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

The guider, indicated generally by the numeral 10, comprises a support member 11 and an insert 12. The support member 11 is threaded at one end 13 to fit into a conventional core tube 14 and has a tapered entrance zone 16 through which a cable core 17 and drain wires 18 will be paid. The entrance 14 terminates in a cylindrical straight walled portion 19 recessed to receive the insert 12. The portion 19 has 6 flat straight channels 21 which are covered interiorly by the insert 12 to form guide ports for drain wires. The core 17 and wires 21 pay into an extrusion die 22 where jacket stock 23 of polymeric compound is applied under high pressure with the wires 18 becoming embedded in the jacket stock. The depth to which the wires 18 are buried depends on complicated factors which are not amenable to precise analysis such as the flow patterns of the stock 23, the temperature and hence the stiffness or viscosity of the stock, the rigidity and gage of the wires and the shape of their undulations, the speed of the extrusion, and other factors that are not understood in detail in the present state of the art. In application Ser. No. 746,557, assigned to the present assignees, apparatus is described wherein the depth of the wires 18 is adjusted by means of shoes disposed radially in the wall of the die. We have now discovered that the depths of the drain wires in the jacket can be regulated by the proper selection of an edge thickness t_1 of an annular face 24 of a tapered extension 26 of the insert 12, and adjustments can be simply and reliably made by changing inserts. For this purpose we have made the insert 12 replaceable such as by an insert 27 (FIG. 3) having an annular face with a different edge thickness t_2 and each of our guiders 10 comprises a support member 11 and a plurality of inserts such as the inserts 12, 27. To retain the inserts 12, 27 they are bored to provide apertures 28 matching or registering with an aperture 29 in the member 11 for receiving a locking pin 31. Other means of locking the inserts into the support member of the guider can, however, be used without exceeding the scope of the present invention.

We have invented a new and useful guider of which the foregoing description has been exemplary rather than definitive and for which we desire an award of Letters Patent as defined in the following claims.

We claim:

1. An extrusion guider for applying a jacket over an insulated cable core, said jacket comprising a plurality of lengthwise embedded metallic members, comprising,

A. a support member comprising

a. a tapered zone defining an entrance section, and a reduced exit section,

b. a uniform bore extending from said reduced section, said bore comprising a smooth inside surface, and

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- c. a plurality of straight evenly spaced flat lengthwise grooves for guiding said metallic members, in said inside surface, and,
- B. a plurality of tubular inserts for said support member each comprising
 - a. an outside cylindrical surface closely fitting said bore, and cooperating with said grooves to form guide ports for said members,
 - b. an inside surface closely fitting said core,
 - c. a tapered tubular extension projecting from said support member, said insert being fitted therein, and

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- d. an annular face terminating said extension, said face having a preselected edge thickness for determining the depth of said wires in said jacket, said thickness being different for different of said inserts, and
 - e. means for removably locking said inserts in said support member.
2. The guider of claim 1 wherein said locking means comprises matching apertures through said support member and said inserts, and a pin closely fitting said apertures.

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