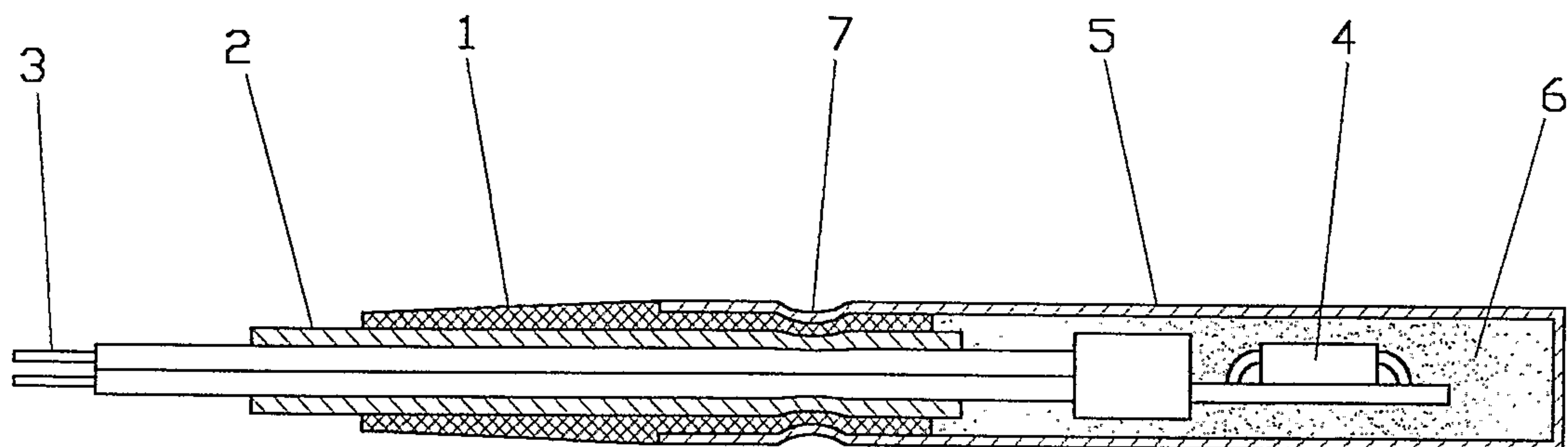




(86) Date de dépôt PCT/PCT Filing Date: 2005/07/14
(87) Date publication PCT/PCT Publication Date: 2006/02/09
(85) Entrée phase nationale/National Entry: 2007/01/26
(86) N° demande PCT/PCT Application No.: BR 2005/000131
(87) N° publication PCT/PCT Publication No.: 2006/012719
(30) Priorité/Priority: 2004/08/03 (BRMU 8401979-4)

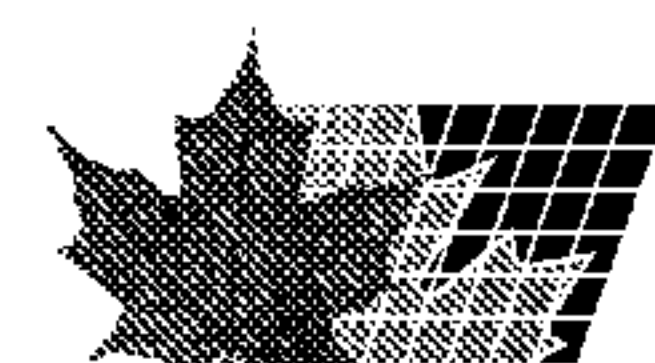
(51) Cl.Int./Int.Cl. *G01K 1/08* (2006.01)
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(54) Titre : AMELIORATION D'ISOLATION DE CABLES AVEC CAPTEURS
(54) Title: INSULATING IMPROVEMENT OF CABLES WITH SENSORS



(57) **Abrégé/Abstract:**

The present invention refers to an innovative construction introduced in an insulating system at the end of cables with electric-electronic sensors. The insulating system has a rubber plug (1) that covers the end of the insulating cap (2) of the sensor's (4) supply cable (3). A metal cap (5) is partially filled with epoxy resin (6) that covers the sensor (4) in such a way that it sticks to the end of the rubber plug (1). The end of the cap (5) is deformed to make a peripheral indentation (7) against the rubber plug (1). The shape of the rubber plug (1) has a proximal end (11) of a diameter that is compatible with the internal diameter of the metal cap (5) and a distal end (12) of a larger diameter to create a support lift for the cap (5) during the assembly. An optional construction for the rubber plug (1) is a continuously cylindrical shape.



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
9 February 2006 (09.02.2006)

PCT

(10) International Publication Number
WO 2006/012719 A1

(51) International Patent Classification⁷: **G01K 1/08**

(21) International Application Number:
PCT/BR2005/000131

(22) International Filing Date: 14 July 2005 (14.07.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
MU 8401979-4 3 August 2004 (03.08.2004) BR

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

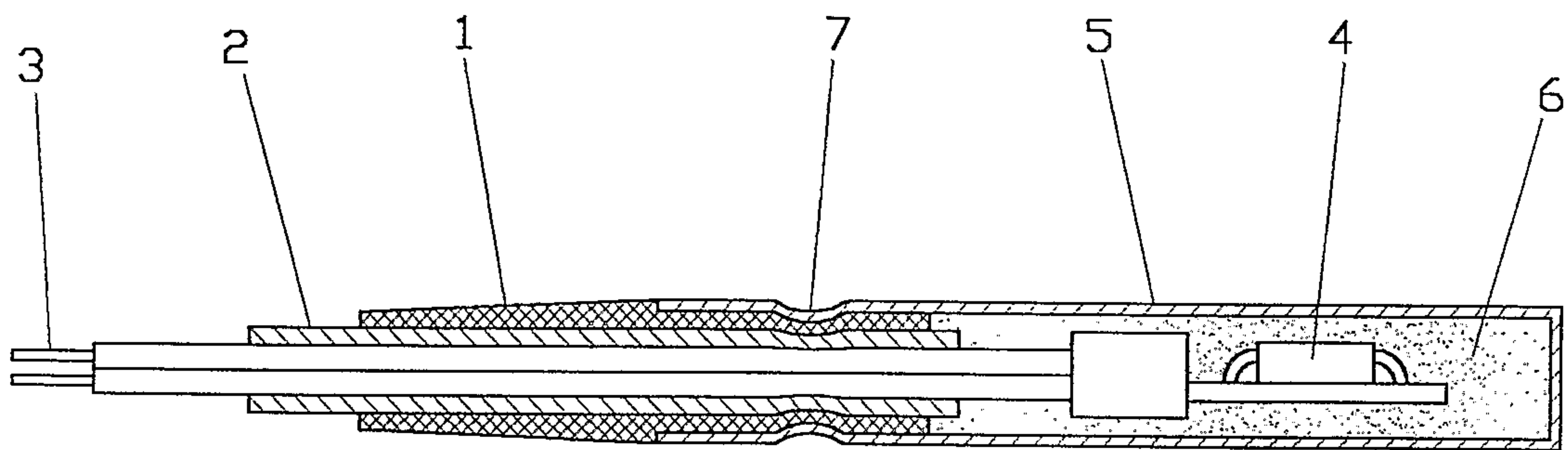
— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: INSULATING IMPROVEMENT OF CABLES WITH SENSORS



(57) Abstract: The present invention refers to an innovative construction introduced in an insulating system at the end of cables with electric-electronic sensors. The insulating system has a rubber plug (1) that covers the end of the insulating cap (2) of the sensor's (4) supply cable (3). A metal cap (5) is partially filled with epoxy resin (6) that covers the sensor (4) in such a way that it sticks to the end of the rubber plug (1). The end of the cap (5) is deformed to make a peripheral indentation (7) against the rubber plug (1). The shape of the rubber plug (1) has a proximal end (11) of a diameter that is compatible with the internal diameter of the metal cap (5) and a distal end (12) of a larger diameter to create a support lift for the cap (5) during the assembly. An optional construction for the rubber plug (1) is a continuously cylindrical shape.

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“INSULATING IMPROVEMENT OF CABLES WITH SENSORS”

The present invention refers to an innovative construction introduced in an insulating system at the end of cables with electric-electronic
5 sensors.

The end of the sensor supply cables must be insulated, mainly against humidity to avoid measuring mistakes. For example, the cables commonly used to determine a physical characteristic have temperature sensors in refrigeration equipment. Those cables work as probes and are immersed in the
10 material mass to be measured. As electronic components are used at the end of the cable, such as a plate with a thermistor for example, the end must be waterproof enough to stop any damp penetration. If not, damp is likely to change the reading of the physical characteristic and result in an inaccurate value.

The usual protection technique of those sensors uses a metal
15 cap that is filled with thermoretractile resin, in which the cable end with sensors is immersed. It sensor is previously protected with resin, generally epoxy resin. Once the thermoretractile resin inside the metal cap is dry it sticks perfectly to the cable and thereby protects the sensor inside.

Nevertheless, even this insulating technique encounters the
20 following failures:

- the sensor is not entirely covered with thermoretractile resin when gaps are left inside the cap, thereby exposing the sensor to direct contact with the metal wall and damp, and resulting in inaccurate readings;
- the use of poor quality resin results in air bubbles and water build-up through
25 infiltration, and thereby also results in inaccurate readings.

Therefore, the object of this invention is to present an innovative construction in the insulating system at the end of cables equipped with electric-electronic sensors. The plug of the system proposed made of elastomer, preferably silicon rubber, covers the end of the insulating cap of the sensor supply
30 cable. A metal cap partially filled with epoxy resin covers the sensor and sticks to the end of the rubber plug. Finally, the end of the cap is deformed so as to obtain a peripheral indentation around the rubber plug. The cap necking effectively stops

the sensor from any contact with damp.

The improvement in the insulating system used for sensor cables in question in this invention has the following advantages on the more conventional techniques:

- 5 - more effective damp proofing
- better finish
- no thermoretractile resin required

For a better understanding of the insulating system for electric sensor cables of this invention, the following detailed description is provided,
10 based on the drawings supplied in appendix:

Figure 1 – side view of the cable end with an insulated sensor;

Figure 2 – sectional view of the insulated cable end;

Figure 3 – detail of the rubber plug shape;

Figure 4 – detail of one construction option for the rubber plug.

15 Figures 1 and 2 illustrate the insulating system proposed, including one rubber plug (1) to cover the insulating cap end (2) of the sensor's (4) supply cable (3). A metal cap (5) is partially filled with epoxy resin (6) and placed on top of the sensor (4) so as to cover the end of the rubber plug (1) too. The cap end (5) is deformed, thereby making a peripheral indentation (7) against the
20 rubber plug (1).

Figure 3 specifies the shape of the rubber plug (1) whose proximal end (11) has a diameter compatible with the internal diameter of the metal cap (5) and a distal end (12) of a larger diameter so as to create a support
lift (5) during the assembly.

25 Figure 4 specifies a construction option for the rubber plug (1), which then has a continuously cylindrical shape.

CLAIMS

1 – “INSULATING IMPROVEMENT OF CABLES WITH SENSORS” using a metal cap (5), which covers the end of the sensor's (4) supply cable (3), characterized by having a rubber plug (1) that covers the end of the
5 insulating cap (2) of the sensor's (4) supply cable (3), which comes on top of the end of the metal cap (5) which is partially filled with epoxy resin (6), thereby leaving the sensor (4) protected away inside the cap (5), whose end has been deformed to make a peripheral indentation (7) against the rubber plug (1), whereby the rubber plug (1) has a proximal end (11) of a diameter that is
10 compatible with the internal diameter of the metal cap (5) and a distal end (12) of a larger diameter, working as a support lift for the cap (5).

2 – “INSULATING IMPROVEMENT OF CABLES WITH SENSORS” according to claim 1, characterized by having a rubber plug (1) optionally of a continuously cylindrical shape.

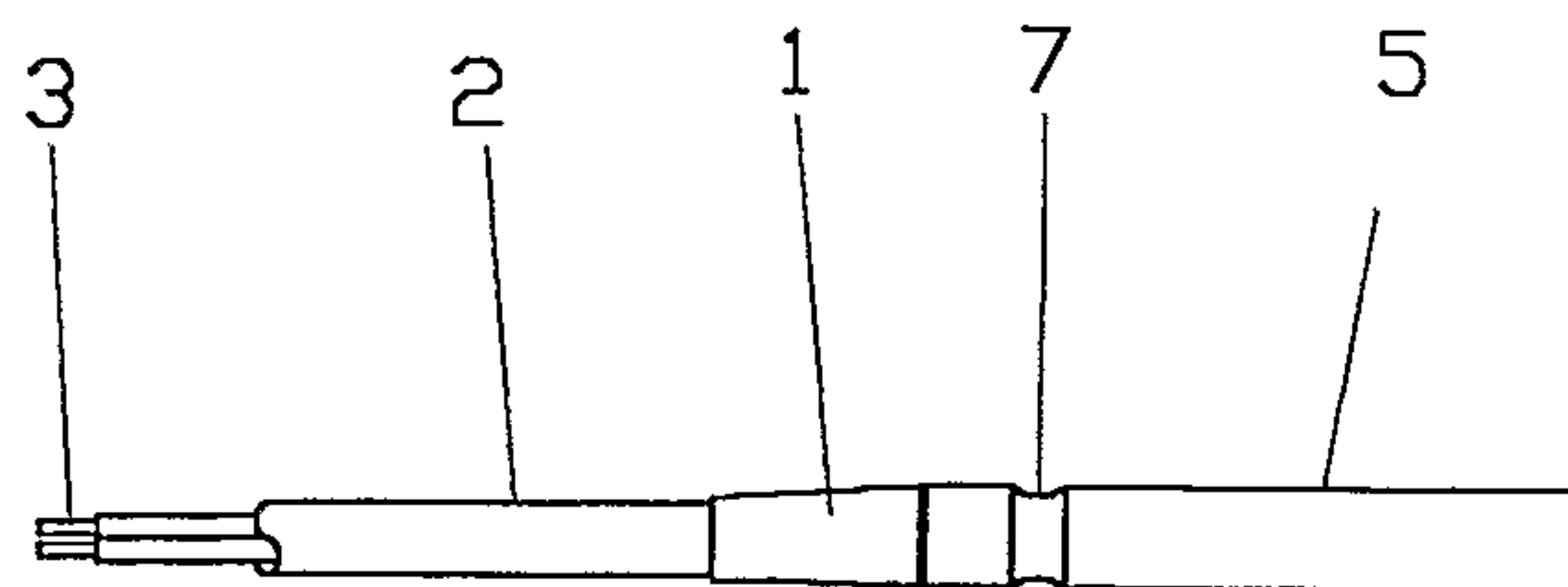


FIG. 1

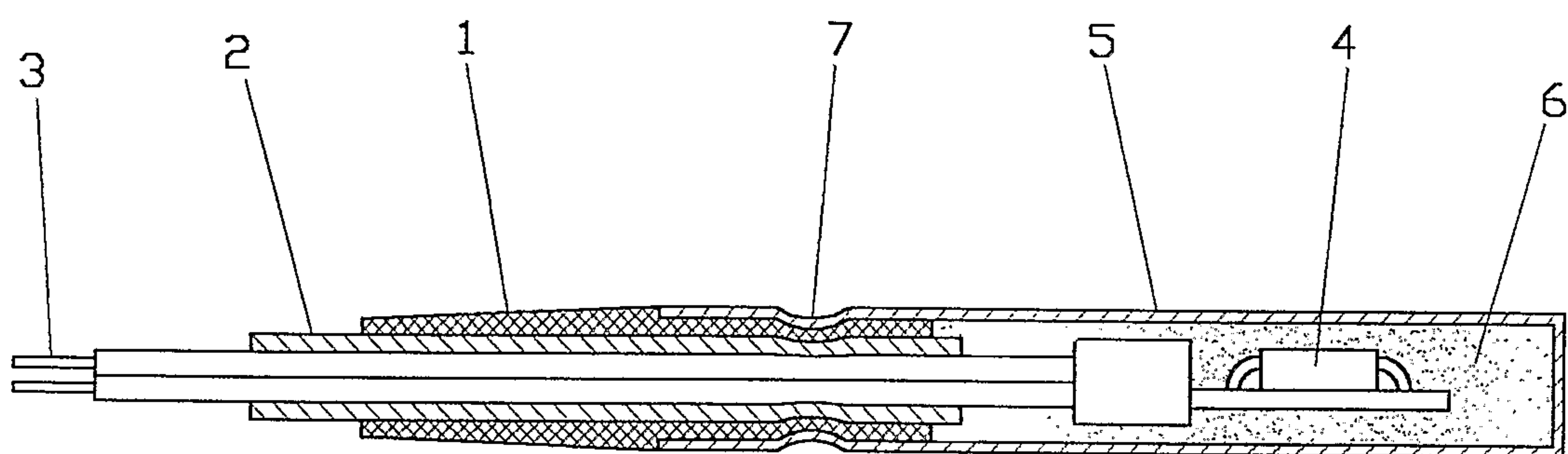


FIG. 2

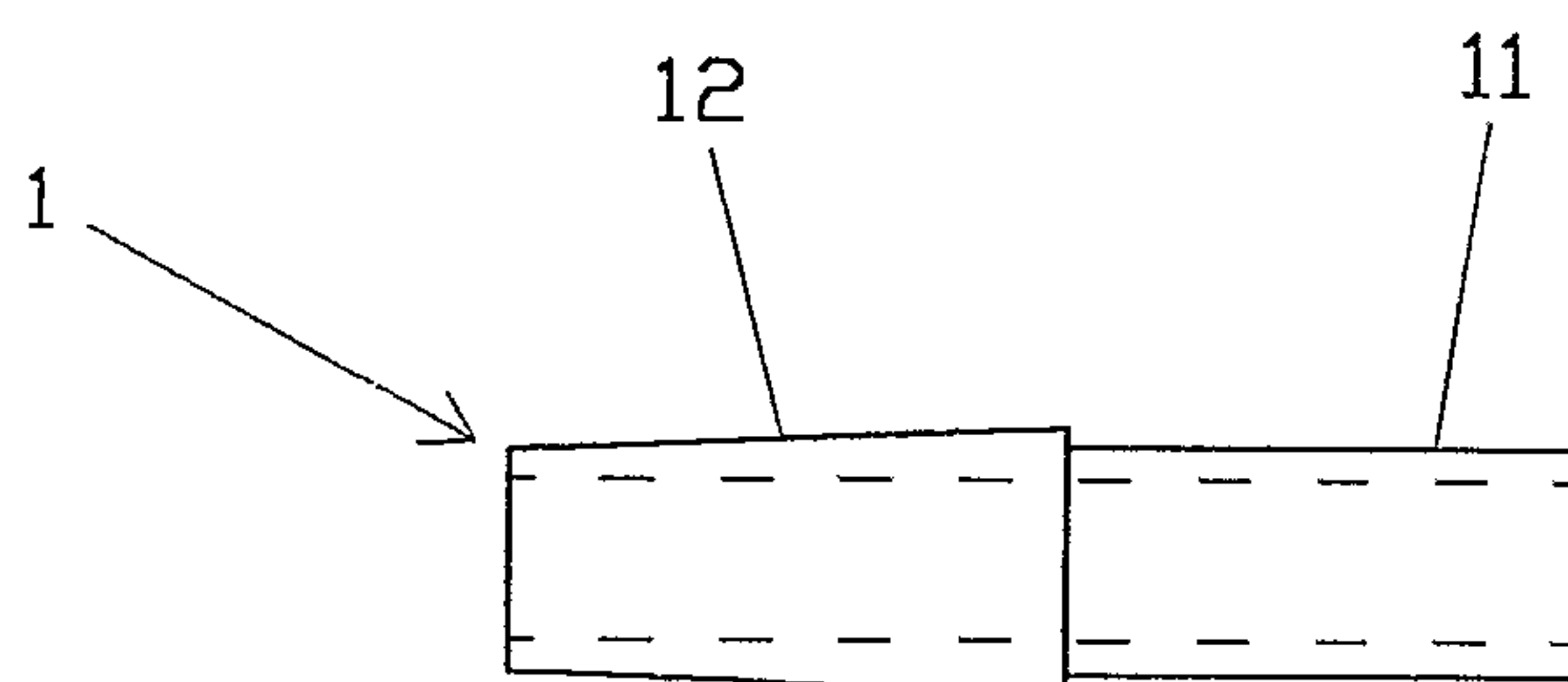


FIG. 3

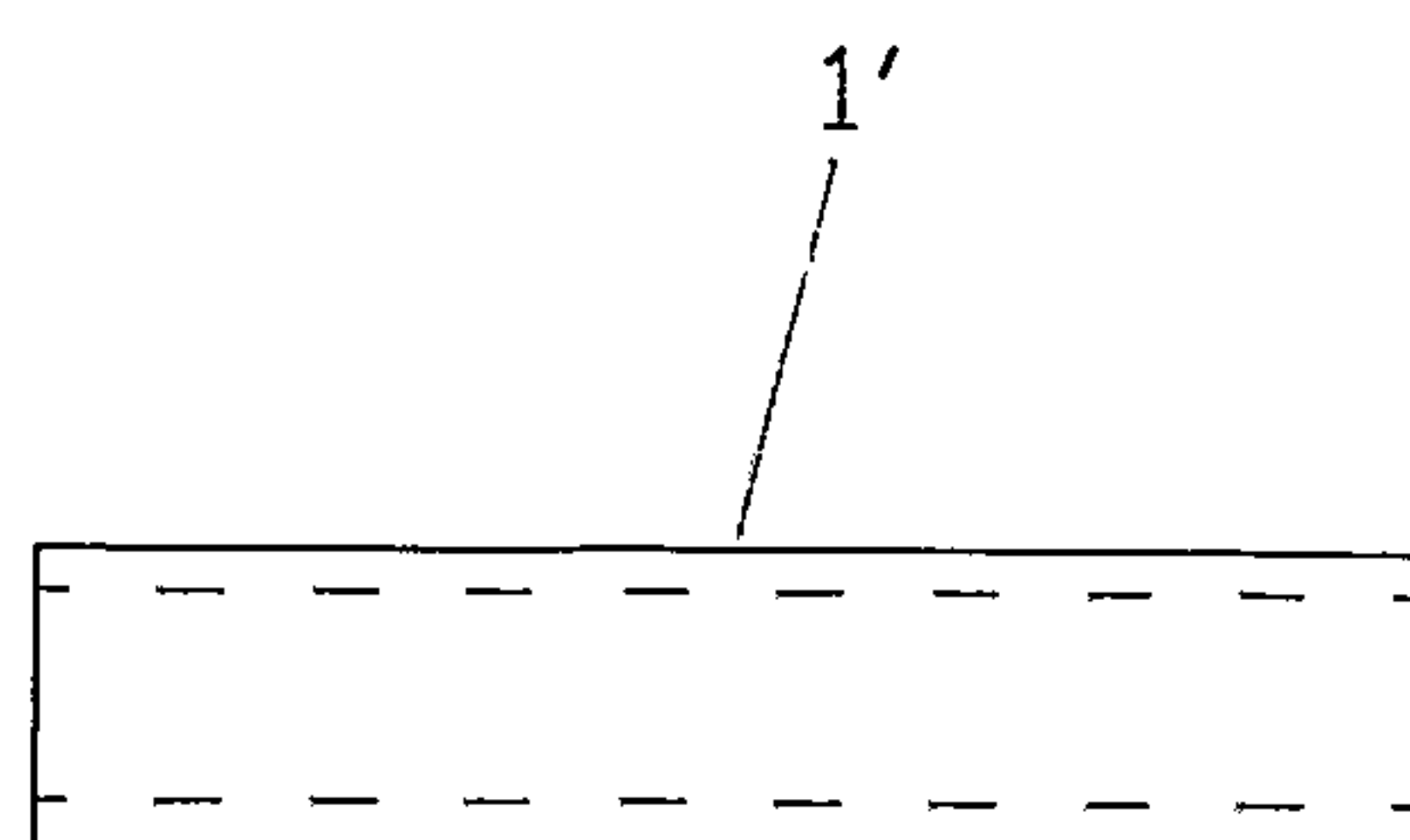


FIG. 4

