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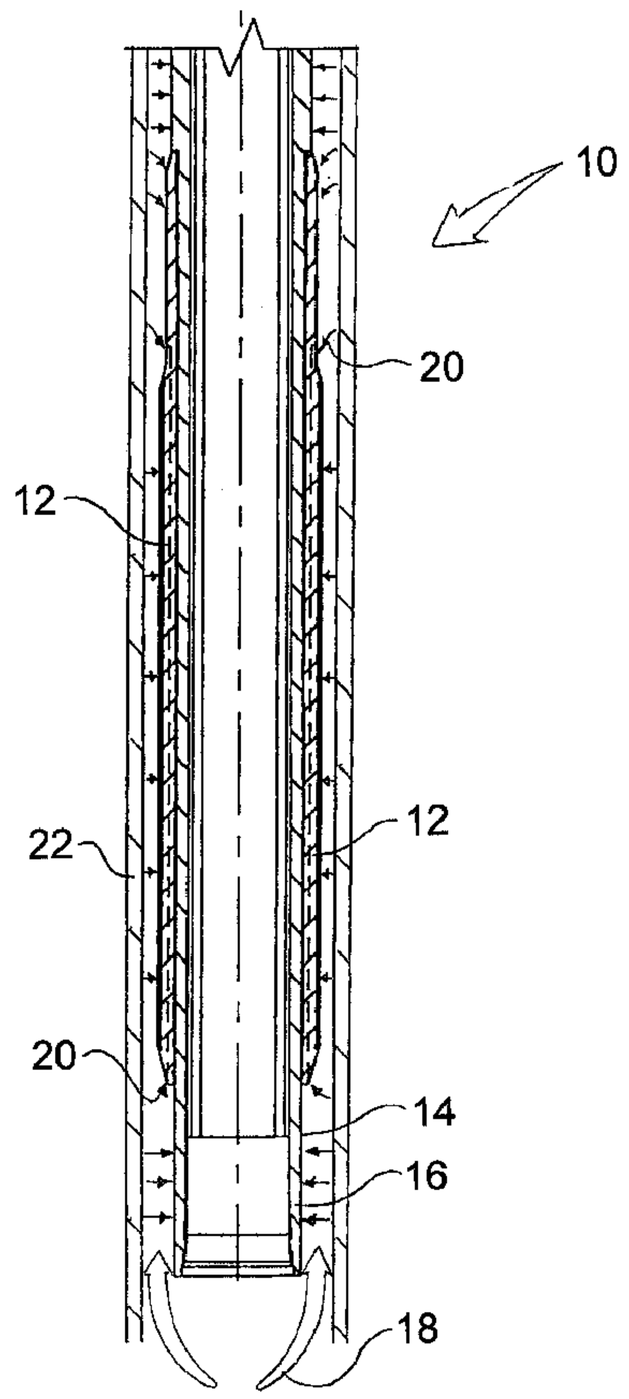
(54) Titre : METHODE DE STABILISATION DE MOTEUR DE FORAGE DE FOND ET MOTEUR DE FORAGE DE FOND
(54) Title: METHOD OF STABILIZING A DOWNHOLE DRILLING MOTOR AND A DOWNHOLE DRILLING MOTOR



(57) Abrégé/Abstract:
A method of stabilizing a downhole drilling motor. A first step involves securing a plurality of vanes to an exterior surface of a stator housing of the drilling motor. A second step involves passing a flow of drilling fluids past the exterior surface of the stator housing between the vanes to create an area of pressure differential and using such pressure differential to protect the stator housing from becoming differentially stuck while drilling.

ABSTRACT OF THE DISCLOSURE

A method of stabilizing a downhole drilling motor. A first step involves securing a plurality of vanes to an exterior surface of a stator housing of the drilling motor. A second step involves passing a flow of drilling fluids past the exterior surface of the stator housing between the vanes to create an area of pressure differential and using such pressure differential to protect the stator housing from becoming differentially stuck while drilling.

TITLE OF THE INVENTION:

Method of stabilizing a downhole drilling motor and a downhole drilling motor

FIELD OF THE INVENTION

The present invention relates to a method of stabilizing a downhole drilling motor and a downhole drilling motor, which has been modified in accordance with the teachings of the method.

BACKGROUND OF THE INVENTION

A downhole drilling motor is in excess of 25 feet in length. When drilling with a downhole drilling motor, some flexing of the downhole drilling motor occurs whenever the drill string becomes differentially stuck down hole, due to uneven fluid pressure acting upon the stator housing. This flexing is undesirable, as it causes excessive wear of the stator. In order to reduce this flexing and protect the drilling motor, stabilizers are placed both above and below the drilling motor.

SUMMARY OF THE INVENTION

What is required is a method of stabilizing a downhole drilling motor.

According to one aspect of the present invention there is provided a method of stabilizing a downhole drilling motor. A first step involves securing a plurality of vanes to an exterior surface of a stator housing of the drilling motor. A second step involves passing a flow of drilling fluids past the exterior surface of the stator housing between the vanes to create an area of pressure differential and using such pressure differential to protect the stator housing from becoming differentially stuck while drilling.

With this method, the pressure around the stator housing of the drilling motor is deliberately increased to prevent the drilling motor from becoming stuck due to a pressure differential.

According to another aspect of the present invention there is provided a downhole drilling motor, which includes a stator housing having an exterior surface with vanes.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is made to the appended drawings, the drawings are for the purpose of illustration only and are not intended to in any way limit the scope of the invention to the particular embodiment or embodiments shown, wherein:

FIGURE 1 is a side elevation view, in section, of a drilling motor being used in accordance with the teachings of the present method.

FIGURE 2 is a side elevation view, in section, of a drilling motor constructed in accordance with the teachings of the present invention.

FIGURE 3 is a side elevation view, in section, of a stator housing from the drilling motor illustrated in **FIGURE 2**.

FIGURE 4 is a side elevation view, in section, of a mounting sleeve from the drilling motor illustrated in **FIGURE 2**.

FIGURE 5 is an end elevation view, in section, of the mounting sleeve illustrated in **FIGURE 4**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment, a method of stabilizing a downhole drilling motor and a downhole drilling motor generally identified by reference numeral 10, will now be described with reference to **FIGURES 1** through **5**.

Structure and Relationship of Parts:

Referring to **FIGURE 1**, a first step involves providing a drilling motor 10 and securing a plurality of vanes 12 to an exterior surface 14 of a stator housing 16. A second step involves passing a flow of drilling fluids 18 past exterior surface 14 of stator housing 16 between vanes 12. As a result of steps one and two, an area of pressure differential (indicated by arrows 20) is created within a well string 22 thereby protecting stator housing 16 from becoming differentially stuck while drilling. Referring to **FIGURE 3**, exterior surface 14 of stator housing 16 has an upper vane mounting region 24 on which are positioned threads, hereinafter referred to as stator threads 26, and a lower vane mounting region 24′ on which are positioned threads 26′. Upper vane mounting region 24 terminates in an upper contact shoulder 34 spaced inwardly from the upper end of housing 16, and lower vane mounting region 24′ terminates in a lower contact shoulder 34′ spaced inwardly from the lower end of housing 16. Referring to **FIGURE 4**, vanes 12 are secured to upper mounting sleeve 28 and lower mounting sleeve 28′, each mounting sleeve 28 having an internal surface 30 upon which are positioned threads, hereinafter referred to as sleeve threads 32, such that rotation of the stator housing brings upper mounting sleeve 28 into contact with upper contact shoulder 34 and lower mounting sleeve 28′ into contact with lower contact shoulder 34′. Referring to **FIGURE 2**, sleeve threads 32 are coupled with stator threads 26 of vane mounting region 24 so as to secure vanes 12 in position.

Operation:

The method of stabilizing a downhole drilling motor and the use and operation of a downhole drilling motor will now be described with reference to **FIGURES 1** through **5**. Referring to **FIGURE 3**, stator housing 16 is adapted with stator threads 26. Referring to **FIGURE 4**, mounting sleeve 28 is adapted with vanes 12. Referring to **FIGURE 2**, mounting sleeves 28, adapted with sleeve threads 32 are coupled to stator 16 at stator threads 26, securing vanes 12 in position. Referring to **FIGURE 1**, assembled downhole drilling motor 10 is then positioned in well string 22. Flow of drilling fluids 18 is passed into well string 22 and an area of pressure differential 20 is created. Referring to **FIGURE 5**, pressure differential 20 is distributed such that flexing of downhole drilling motor 10 which might otherwise lead to motor 10 becoming differentially stuck, is minimized.

In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements.

It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A down hole drilling motor, comprising:

a stator housing having an exterior surface, the exterior surface having an upper vane mounting region toward an upper end on which are threads, the upper vane mounting region terminating in an upper contact shoulder spaced inwardly from the upper end and a lower vane mounting region toward a lower end on which are positioned threads, the lower vane mounting region terminating in a lower contact shoulder spaced inwardly from the lower end;

an upper mounting sleeve having an internal surface on which are positioned threads adapted to mate with the threads of the upper vane mounting region, such that rotation of the stator housing brings the upper mounting sleeve into contact with the upper contact shoulder;

a lower mounting sleeve having an internal surface on which are positioned threads adapted to mate with the threads of the lower vane mounting region, such that rotation of the stator housing brings the lower mounting sleeve in contact with the lower contact shoulder; and

a plurality of stabilizer vanes being secured at spaced intervals around a circumference of and extending radially from each of the upper mounting sleeve and the lower mounting sleeve, each stabilizer vane extending radially from the upper mounting sleeve and the lower mounting sleeve substantially the same distance as the other stabilizer vanes.

2. The down hole drilling motor as defined in claim 1, wherein there are an odd number of stabilizer vanes spaced circumferentially around each of the upper mounting sleeve and the lower mounting sleeve.

3. The down hole drilling motor as defined in claim 2, wherein there are five stabilizer vanes.

FIG. 1

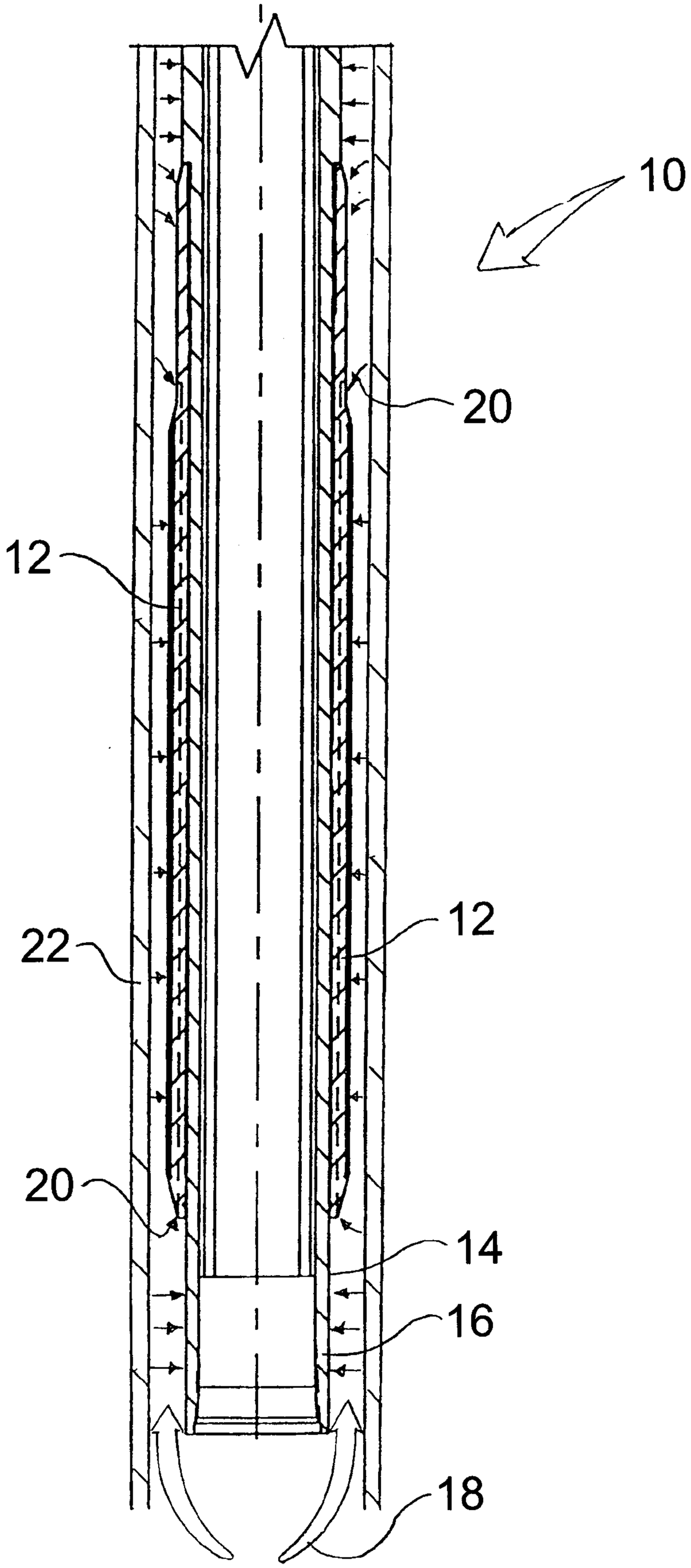


FIG. 2

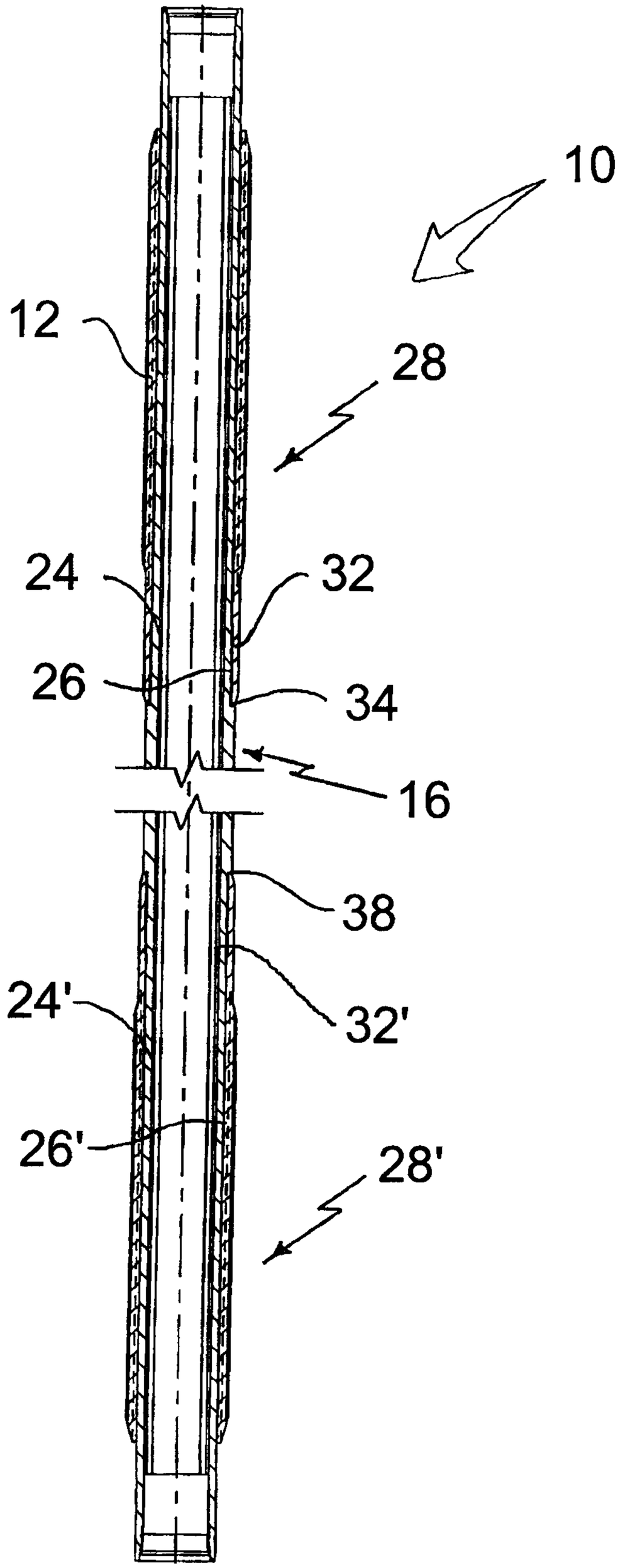


FIG. 3

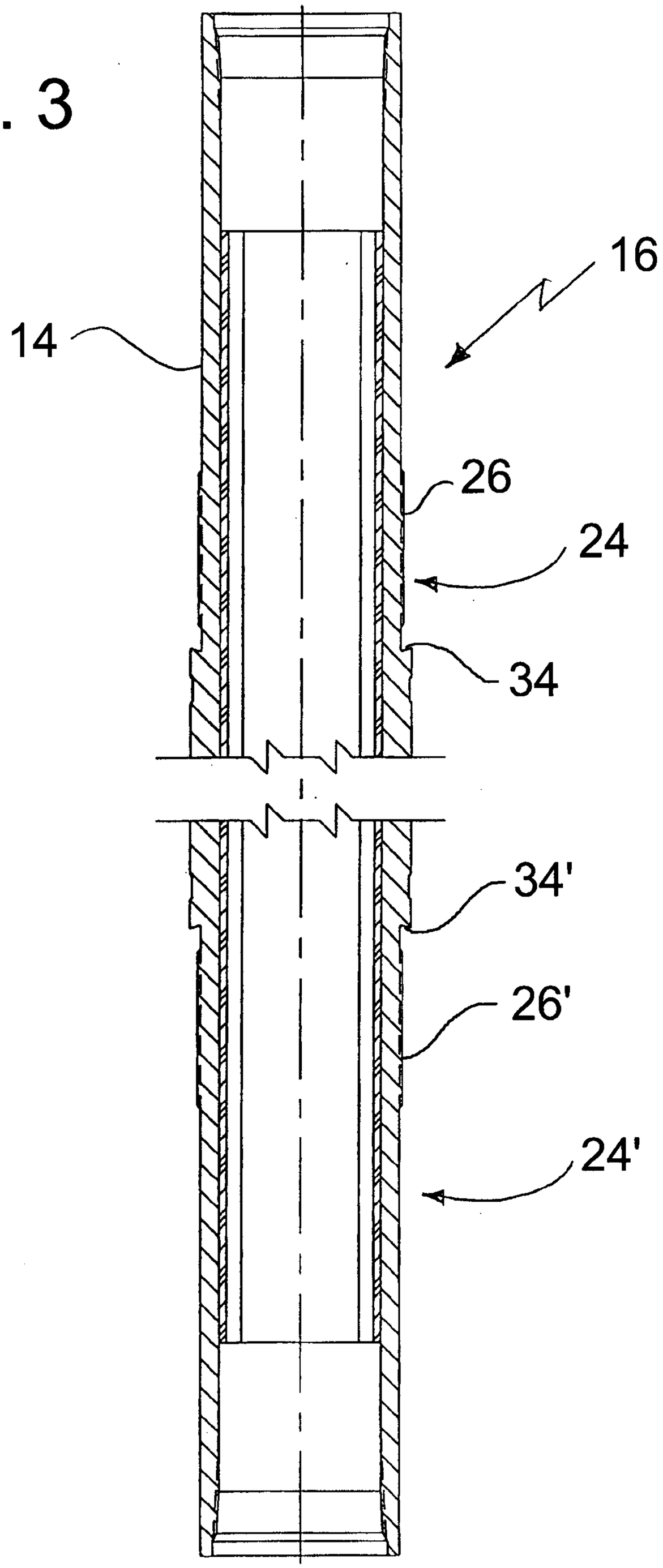


FIG. 4

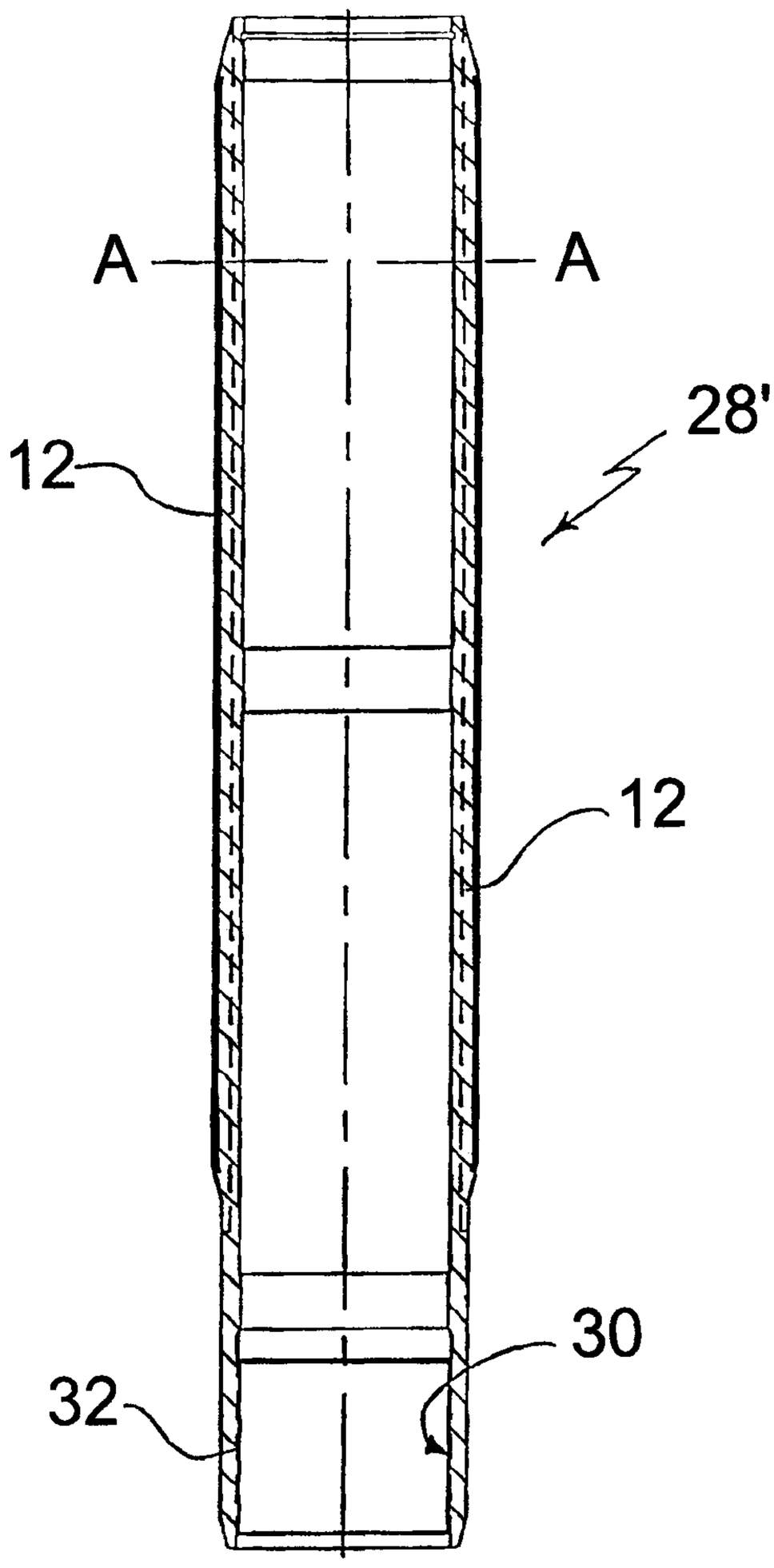
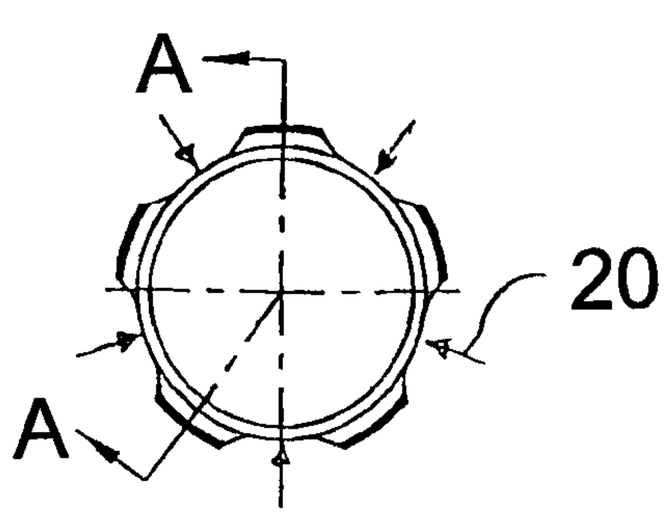
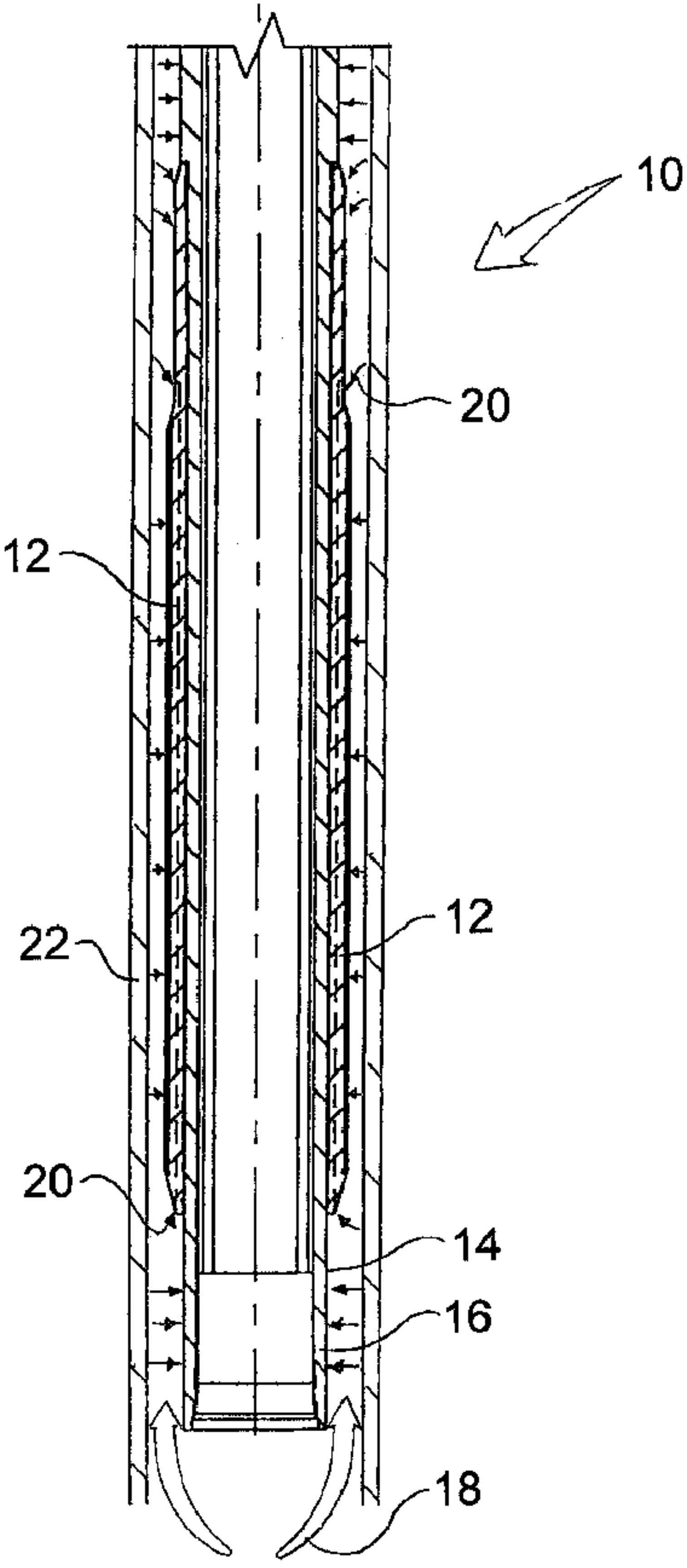


FIG. 5

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