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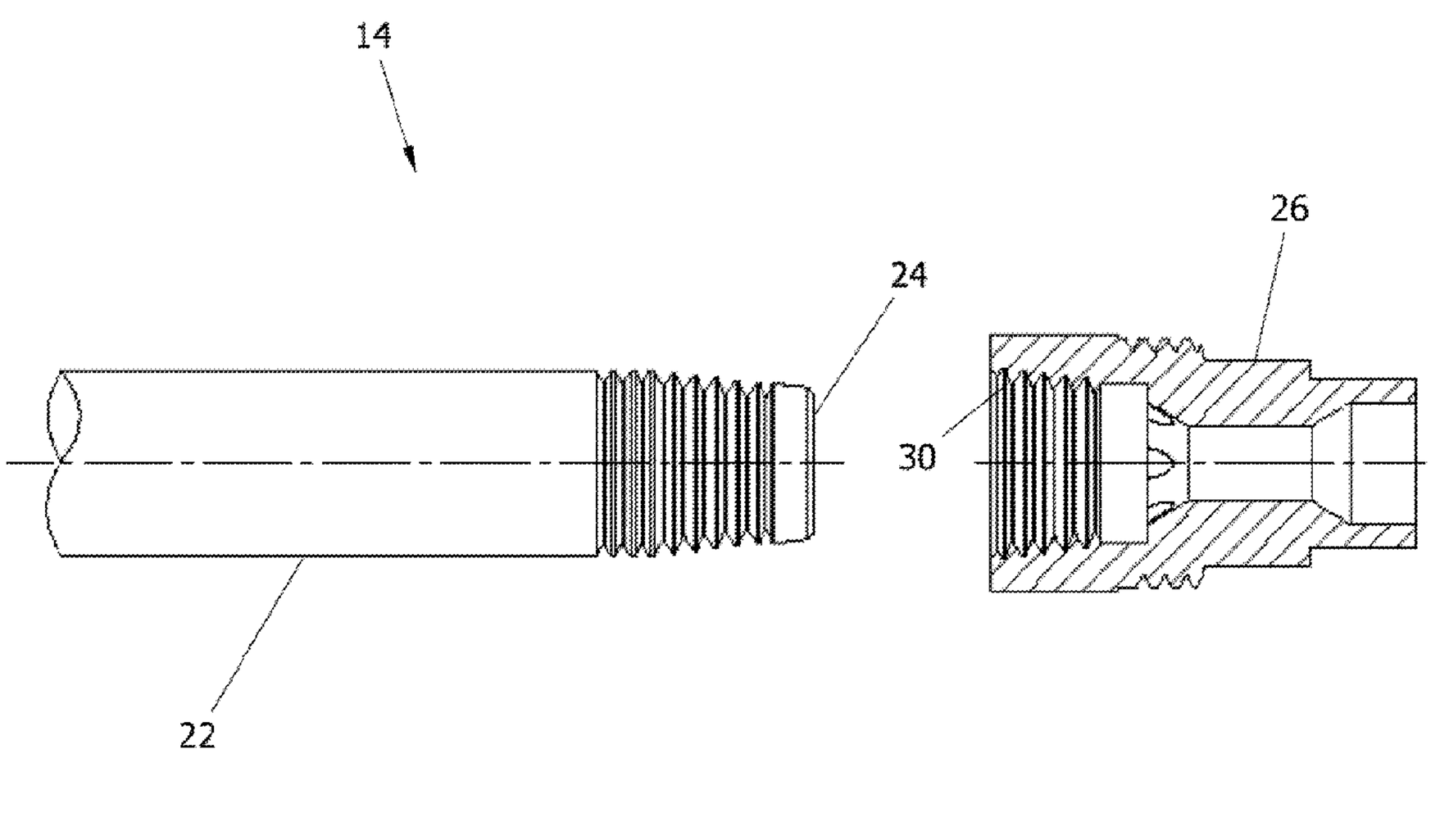

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A welding gun neck for a welding gun includes an elongated tubular body having an end connectable to a gas diffuser. The elongated tubular body includes a threaded external surface adjacent the end. The threaded external surface defines a male, threaded portion. The male, threaded portion is mateable with a female thread of the gas diffuser. The threaded external surface includes a straight portion and an adjoining tapered portion. The welding gun neck is connectable to both a gas diffuser having a straight female thread and a gas diffuser having a tapered female thread.

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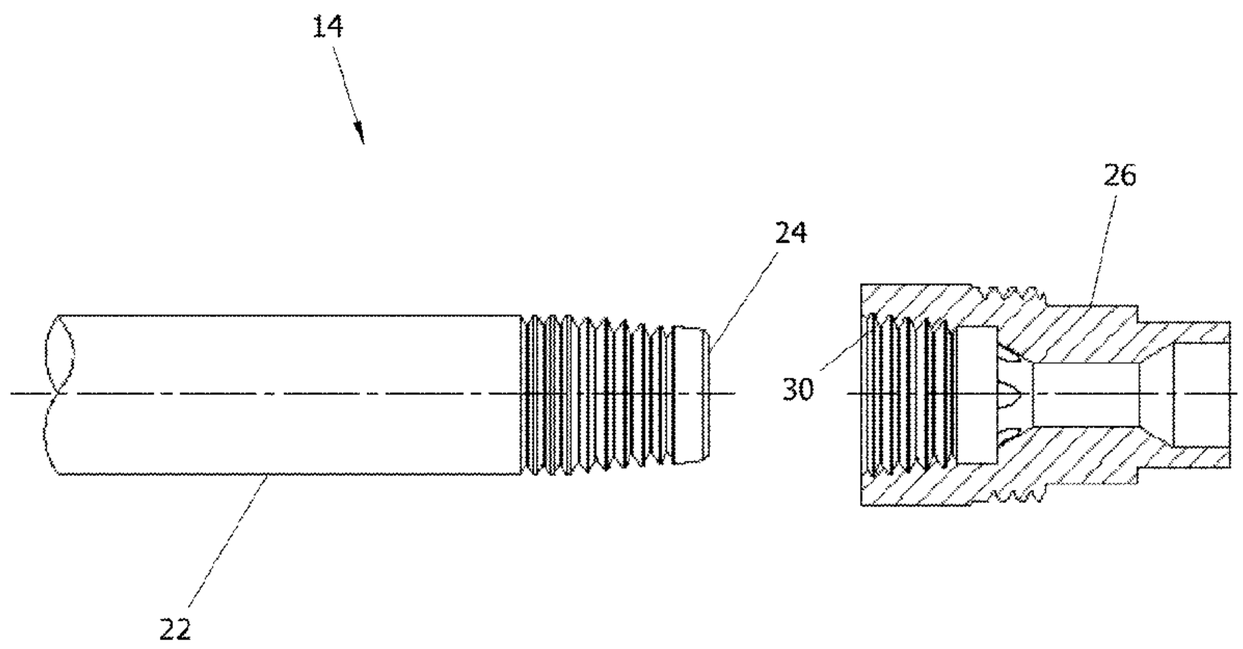

Fig. 3

(57) Abstract: A welding gun neck for a welding gun includes an elongated tubular body having an end connectable to a gas diffuser. The elongated tubular body includes a threaded external surface adjacent the end. The threaded external surface defines a male, threaded portion. The male, threaded portion is mateable with a female thread of the gas diffuser. The threaded external surface includes a straight portion and an adjoining tapered portion. The welding gun neck is connectable to both a gas diffuser having a straight female thread and a gas diffuser having a tapered female thread.

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HYBRID THREAD FOR WELDING GUN NECK

TECHNICAL FIELD

This disclosure relates to welding guns, and more particularly to a neck for a welding gun.

BACKGROUND OF THE INVENTION

Arc welding guns generally consist of two main sections: (i) a flexible cable section which delivers power, shielding gas, electrode wire, and sometimes cooling water to (ii) a rigid neck section which delivers the power, shielding gas, electrode wire, and sometimes cooling water to the contact tip and nozzle. The contact tip and nozzle are secured at a front end of the rigid neck section.

Typically, the neck of the welding gun has a threaded end for accepting welding consumables such as the welding gas diffuser. The gas diffuser is screwed onto the threads at the end of the welding gun neck, and allows for passage of shielding gas that is fed through the neck. The gas diffuser also provides for mounting of the contact tip at the front end of the welding gun.

Gas diffusers are available from a variety of manufacturers throughout the world. It is common for each manufacturer to have their own unique design(s) for the gas diffuser, and for each manufacturer to make welding gun necks that mate only

with their own gas diffusers. No industry standard exists for the connection of the welding gun neck to the gas diffuser.

SUMMARY OF THE INVENTION

Disclosed is a welding gun neck that provides cross-brand compatibility with a plurality of welding gun consumables from different manufacturers. The welding gun neck includes a custom threaded connector that allows more than one type of gas diffuser to be threaded on the neck, adding versatility to a welding gun incorporating the neck.

More particularly, a welding gun neck for a welding gun includes an elongated tubular body having an end connectable to a gas diffuser. The elongated tubular body includes a threaded external surface adjacent the end. The threaded external surface defines a male, threaded portion. The male, threaded portion is mateable with a female thread of the gas diffuser. The threaded external surface includes a straight portion and an adjoining tapered portion. The welding gun neck is connectable to both a gas diffuser having a straight female thread and a gas diffuser having a tapered female thread.

In one embodiment, the tapered portion is disposed closer to the end of the elongated tubular body than the straight portion. The tapered portion of the threaded external surface has NPT threads, and the straight portion of the threaded external surface

has screw threads. The thread of the tapered portion is continuous with the thread of the straight portion. That is, the threaded external surface consists of both NPT and screw types of threads adjacently disposed to one another proximate the end of the tubular body for connecting a gas diffuser.

Optionally, the elongated tubular body may include a tapered nose portion having a smooth external surface. The tapered nose portion may be disposed between the end of the tubular body and the tapered portion of the threaded external surface.

These and other features and advantages of the device will be more fully understood from the following detailed description of the invention taken together with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a side view of a welding gun including a welding gun neck;

FIG. 2 is a side view of the welding gun neck including a threaded connector;

FIG. 3 is an exploded view of the welding gun neck and a gas diffuser; and

FIG. 4 is an exploded view of the welding gun neck and another gas diffuser.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1 of the drawings in detail, numeral 10 generally indicates a welding gun for arc welding such as a MIG welding gun or similar. In MIG welding, a metal wire is used as the electrode to produce the arc. The weld area is shielded by an inert gas and the metal wire acts as a filler to add mass to the weld. The inert gas is used to shield the molten metal from outside contaminants and gases that may react with the molten material of the weld.

The welding gun 10 includes a handle 12, a gooseneck 14 extending from a front end of the handle, and a contact tip assembly 16 connected to a front end of the gooseneck opposite the handle. A power cable 18 is connected to a rearward end of the handle 12 to supply one or more of gas, electrical current, and a consumable electrode (e.g., metal welding wire) to the welding gun 10. An opposite end of the power cable 18 is connected to a wire feeder (not shown). The gooseneck 14 connected to the forward end of the handle 12 allows for the communication of the consumable electrode, the shielding gas, and the welding current to the contact tip assembly 16 mounted on the gooseneck. The contact tip assembly 16 includes a gas diffuser allowing for passage of shielding gas fed from the gooseneck, a contact tip mounted in the gas diffuser for transmitting electrical energy to the welding wire while directing the welding wire to the weld area, and a nozzle covering the gas diffuser and contact tip and

directing the shielding gas evenly into the welding zone. The welding gun 10 may be a handheld gun including a control switch such as a trigger 20 for use by a human operator, or alternatively the welding gun may be mounted to a robotic arm for automatic operation. The trigger 20, when pressed by the operator, initiates the wire feed, electric power, and shielding gas flow, causing an electric arc to be formed.

Turning to FIGS. 2 and 3, the neck 14 of the welding gun 10 includes an elongated, rigid tubular body 22 having an end 24 that is connectable to the gas diffuser 26. The tubular body 22 typically has an angular bend, but alternatively may be straight. The tubular body 22 includes a threaded external surface 28 adjacent the end 24. While the threaded external surface 28 is shown slightly spaced from the end 24 due to the presence of a nose portion (see below), the threaded external surface alternatively may be disposed directly at the end of the tubular body. The threaded external surface 28 defines a male, threaded portion. The male, threaded portion is mateable with an internal female thread 30 of the gas diffuser 26 for connecting the gas diffuser to the welding gun neck.

The threaded external surface 28 includes both a straight portion 32 and an adjoining tapered portion 34. The tapered portion 34 is disposed closer to the end 24 of the tubular body 22 than the straight portion 32, and the thread of the tapered portion is continuous with the thread of the straight

portion. In one embodiment, the straight portion 32 has a 9/16"-18 screw thread, and the tapered portion 34 has a 1/4"-18 NPT (National Pipe Thread) thread. However, the tapered portion and straight portion may have other dimensions, as long as the tapered portion blends into the straight portion.

The tubular body 22 also includes a tapered nose portion 36 having a smooth external surface. The tapered nose portion 36 is disposed at the front of the tubular body 22 between the tubular body end 24 and the tapered portion 34 of the threaded external surface 28.

The threaded external surface 28 including the tapered portion 34 and the adjoining straight portion 32 allows the welding gun neck 14 to be connected to either a gas diffuser having a straight female thread or a gas diffuser having a tapered female thread. Thus, the neck 14 (and the welding gun 10 including the neck) is cross-compatible with more than one brand or style of consumable gas diffuser. As shown by example in FIG. 3, the neck 14 is compatible with a gas diffuser 26 having a tapered female thread 30, and as shown in FIG. 4, the neck 14 is also compatible with a different gas diffuser 38 having a straight female thread 40.

Although the device has been described by reference to a specific embodiment, it should be understood that numerous changes may be made within the spirit and scope of the inventive concepts described. Accordingly, it is intended that the

device not be limited to the described embodiment, but that it have the full scope defined by the language of the following claims.

WHAT IS CLAIMED IS:

1. A welding gun neck for a welding gun, the welding gun neck comprising:

an elongated tubular body having an end connectable to a gas diffuser;

the elongated tubular body including a threaded external surface adjacent the end, the threaded external surface defining a male, threaded portion;

the welding gun wherein the elongated tubular body includes a tapered nose portion having a smooth external surface, the tapered nose portion being disposed between the end of the tubular body and the tapered portion of the threaded external surface;

the male, threaded portion being mateable with a female thread of the gas diffuser;

the threaded external surface including a straight portion and an adjoining tapered portion;

wherein said welding gun neck is connectable to both a gas diffuser having a straight female thread and a gas diffuser having a tapered female thread.

2. The welding gun neck of claim 1, wherein the tapered portion is disposed closer to the end of the elongated tubular body than the straight portion.

3. The welding gun neck of claim 1, wherein the tapered portion of the threaded external surface has NPT threads.

4. The welding gun neck of claim 1, wherein the tapered portion of the threaded external surface has a 1/4"-18 NPT thread.

5. The welding gun neck of claim 1, wherein the straight portion of the threaded external surface has screw threads.

6. The welding gun neck of claim 1, wherein the straight portion of the threaded external surface has a 9/16"-18 screw thread.

7. The welding gun neck of claim 1, wherein the thread of the tapered portion is continuous with the thread of the straight portion.

8. A welding gun including the welding gun neck of claim 1.

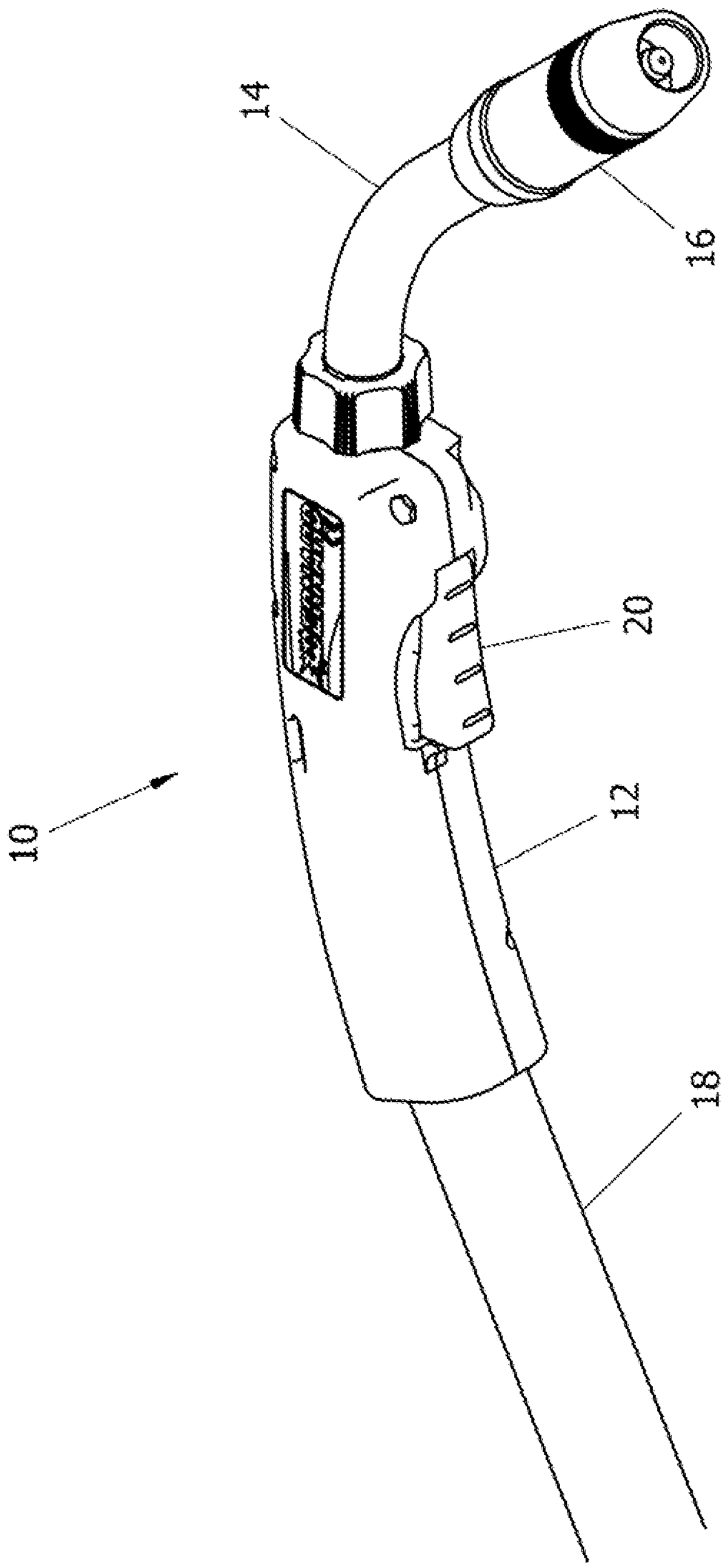


Fig. 1

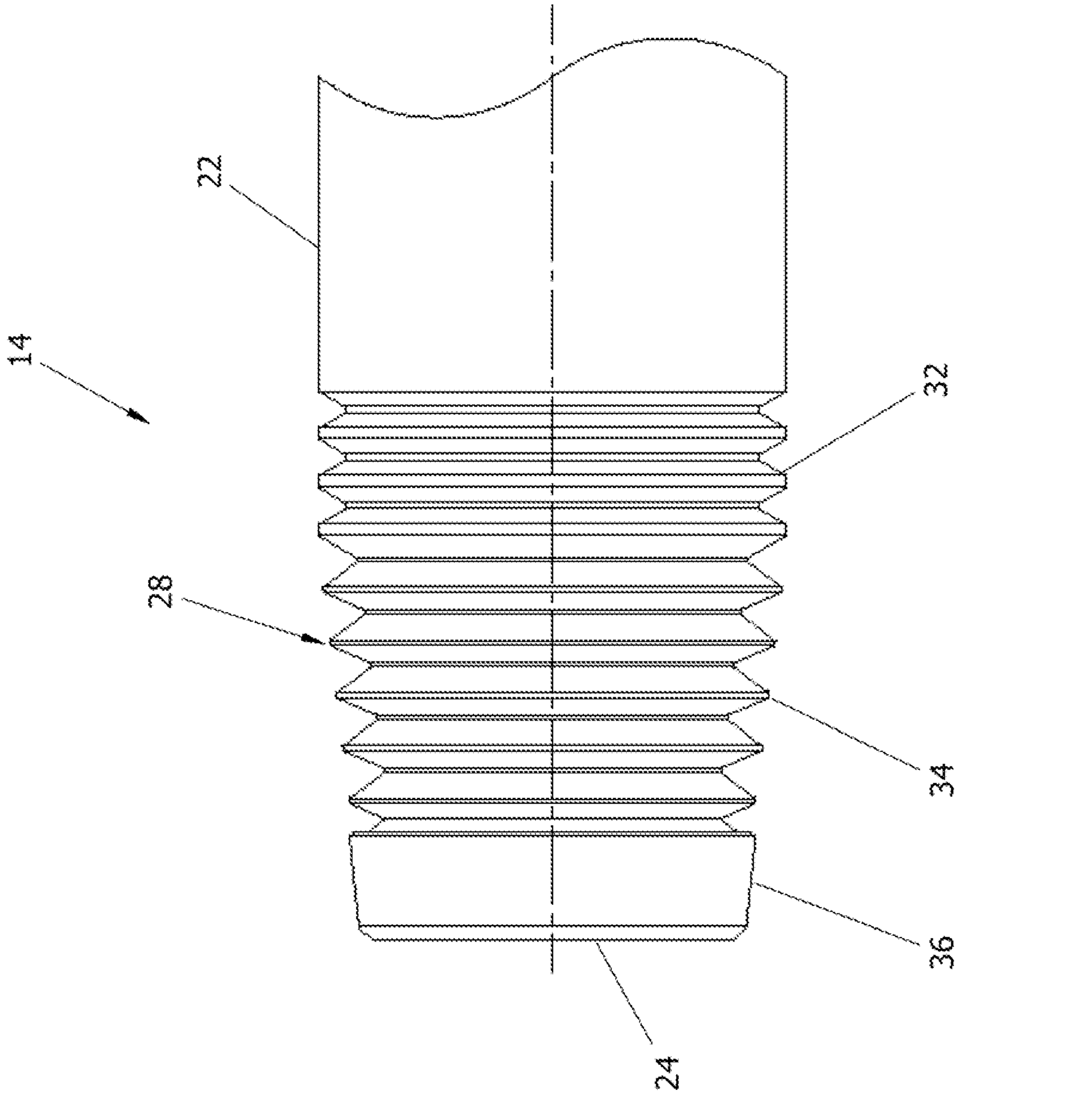


Fig. 2

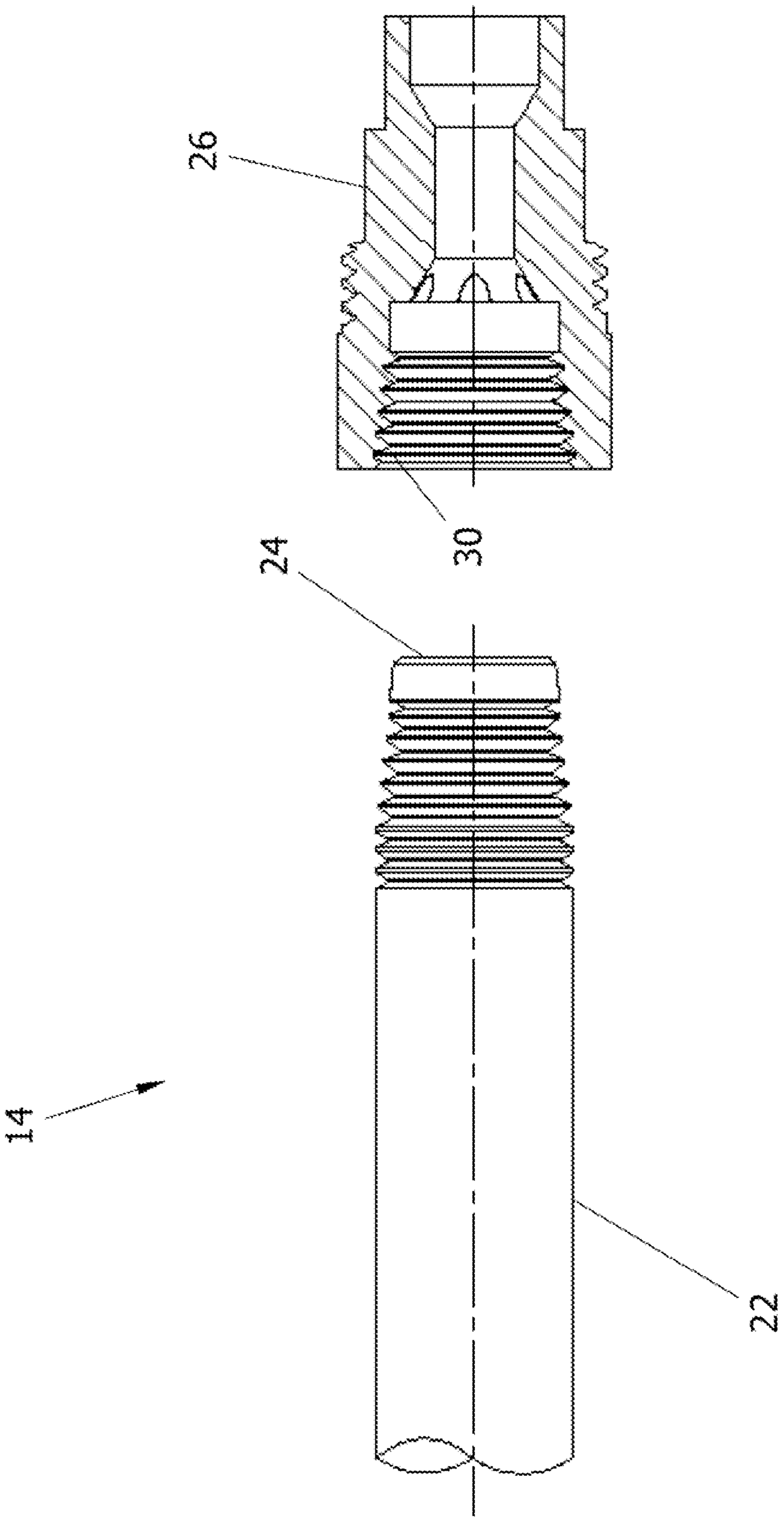


Fig. 3

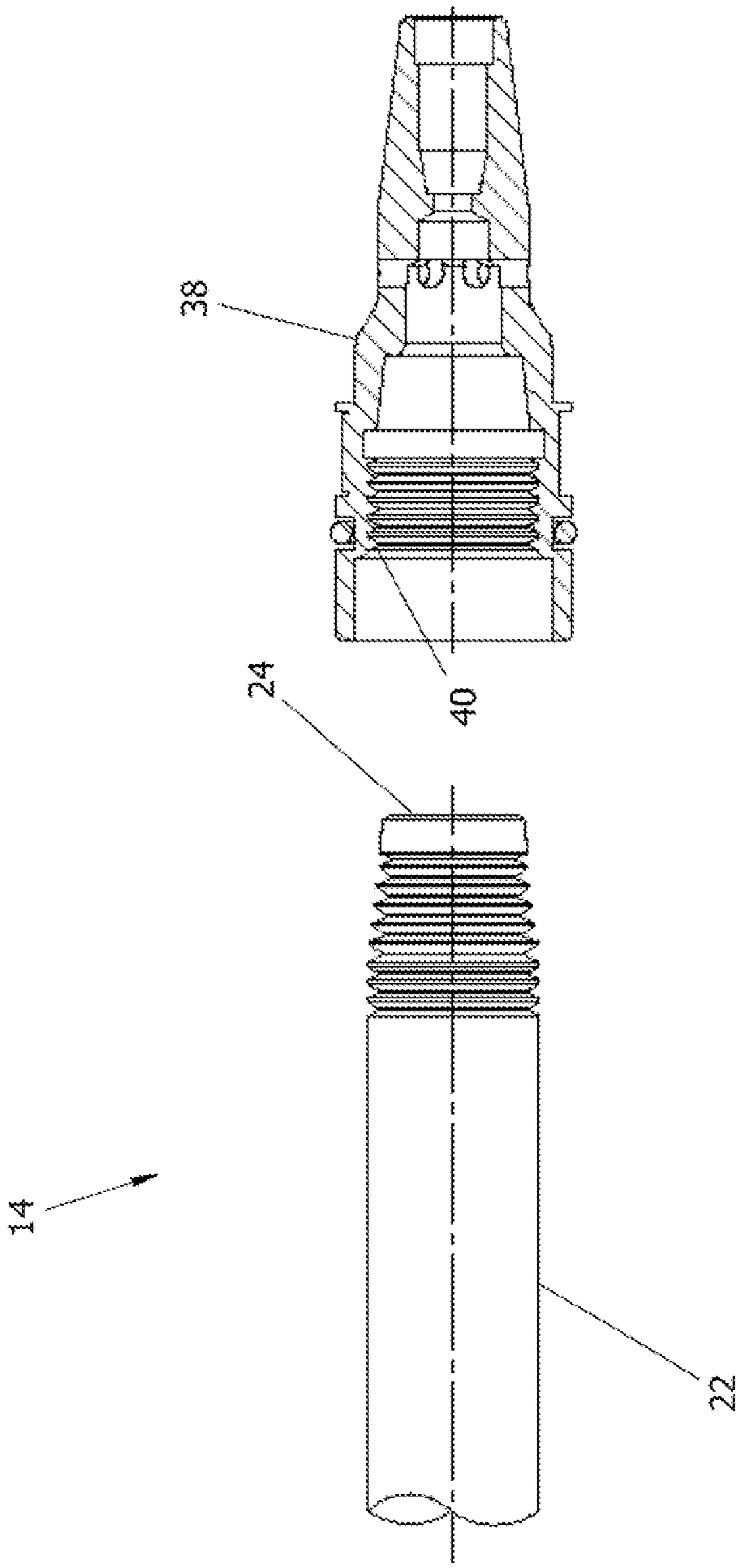
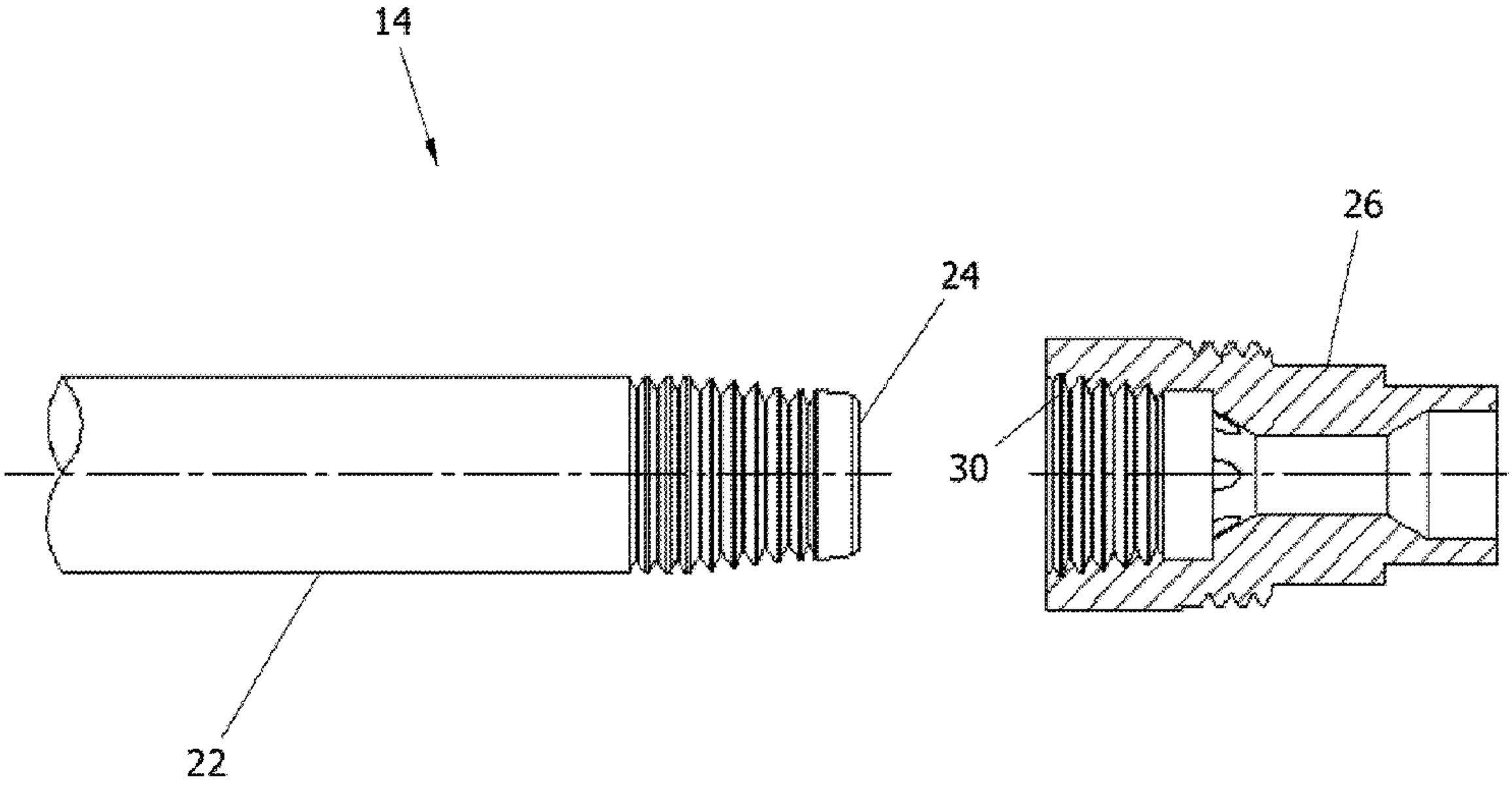


Fig. 4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