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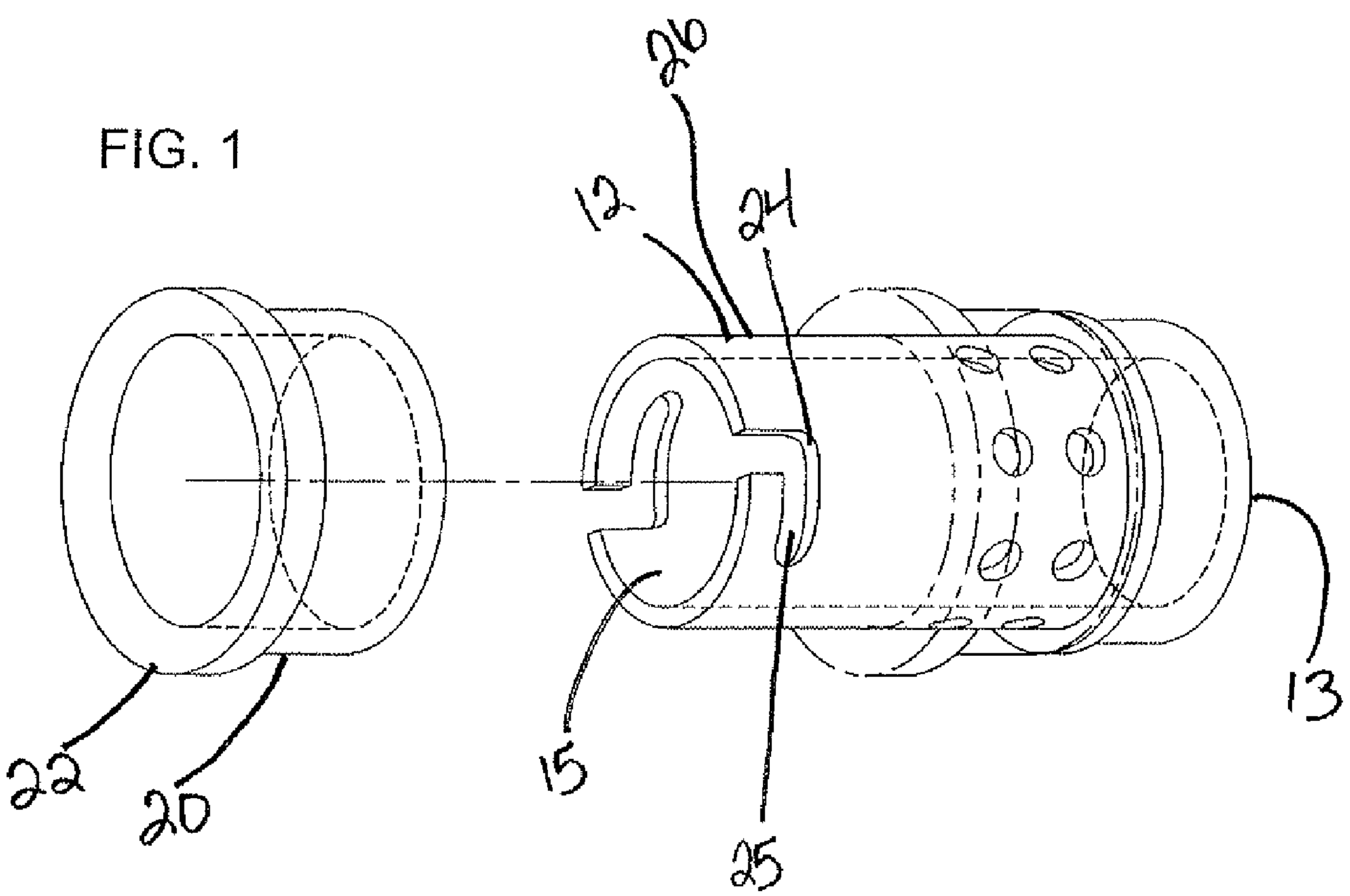
(54) **Titre : ACCELERATEUR DE GONFLAGE**
(54) **Title: AIR INFLATION ACCELERATOR**

FIG. 1




(57) **Abrégé/Abstract:**
An air inflation accelerator for increasing the rate of inflation of an air pump inflating a product, the accelerator comprising an elongated tubular member connectable to an inflator appliance at a first end and connectable to a valve of the bladder of the

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(57) **Abrégé(suite)/Abstract(continued):**
product to be inflated at a second end, the tubular member having a plurality of air inlets to allow for use of the venturi principle and a closure mechanism for disengaging the air inlets once atmospheric pressure is reached within the bladder being inflated.

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**Declarations under Rule 4.17**:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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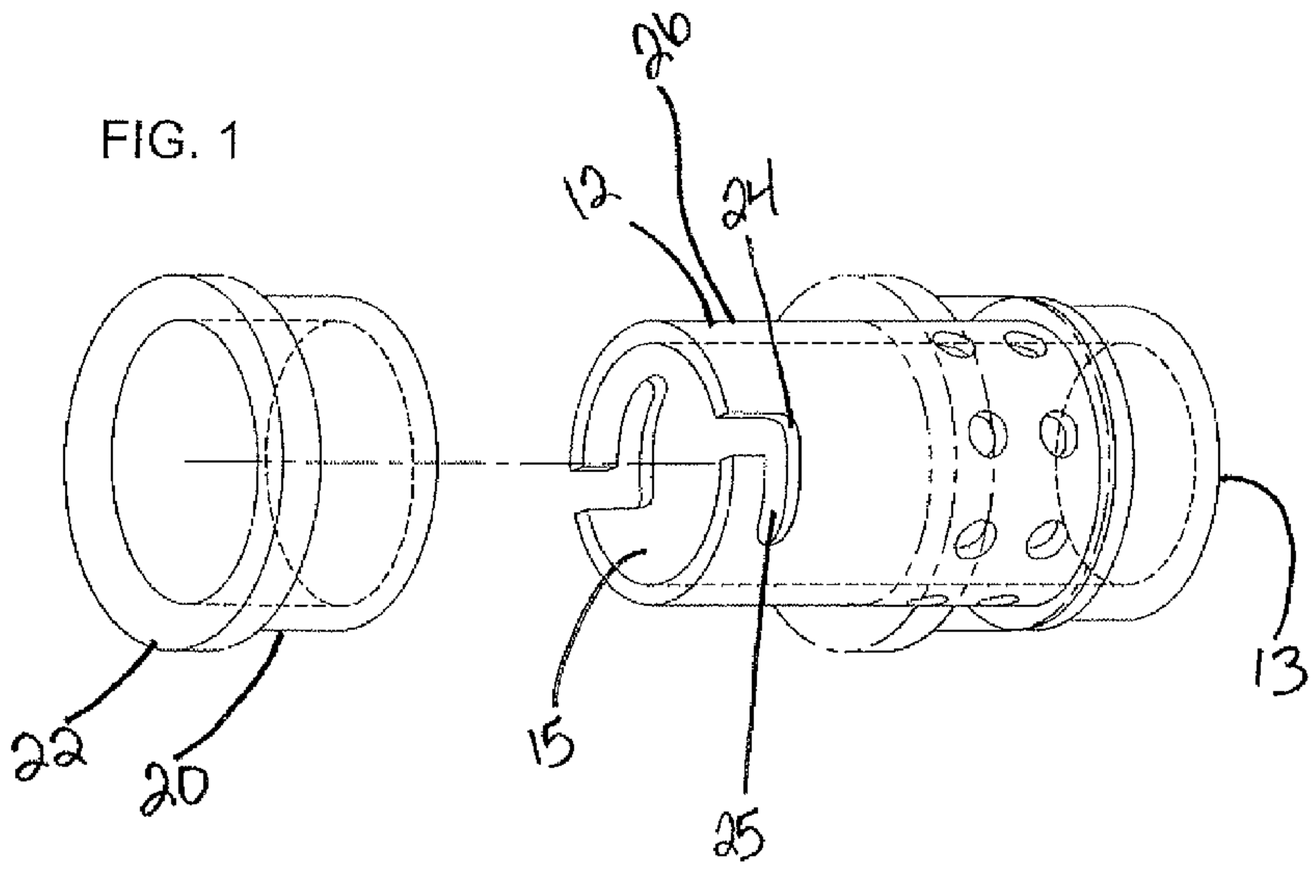
FIG. 1




**(57) Abstract**: An air inflation accelerator for increasing the rate of inflation of an air pump inflating a product, the accelerator comprising an elongated tubular member connectable to an inflator appliance at a first end and connectable to a valve of the bladder of the product to be inflated at a second end, the tubular member having a plurality of air inlets to allow for use of the venturi principle and a closure mechanism for disengaging the air inlets once atmospheric pressure is reached within the bladder being inflated.

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# AIR INFLATION ACCELERATOR

## CROSS-REFERENCES TO RELATED APPLICATIONS

**[0001]** The present application claims the benefit of U.S. Provisional Application No. 61/882,155, filed on September 25, 2013, the full disclosure of which is incorporated herein by reference.

## BACKGROUND

**[0002]** Inflatable mattresses or "airbeds" as they are often called, are commonly used to provide a temporary resting surface while camping or to provide additional sleeping accommodations for guests. One drawback to inflatable mattresses is the amount of time it takes to inflate the mattress. Similarly, inflatable pool toys, floats and the like also take time to inflate – the goal for the user again being a short inflation time. Most such inflatable mattresses and inflatable water recreation items are inflated using battery-operated or electric hand-held air pumps, although some use manual air pumps. The inflation nozzle of the air pump is inserted into the open valve on the product to be inflated and the pump is activated, resulting in inflation to the inflatable bladder of the product being inflated. It would be beneficial to have a device that is attachable to an existing air pump that would increase the rate of inflation of the air pump being utilized that is easy to use, easy to store and light-weight to carry.

## BRIEF SUMMARY

**[0003]** The following presents a simplified summary of some embodiments of the invention in order to provide a basic understanding of the invention. This summary is not an extensive overview of the invention. It is not intended to identify key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some embodiments of the invention in a simplified form as a prelude to the more detailed description that is presented later.

**[0004]** An embodiment for a device for accelerating the inflation rate of an air pump includes an elongated tube having a sidewall, opposed open first and second ends, and a plurality of air

inlets spaced around the exterior of the tube between the open ends, the first open end having a nozzle connectable to the valve of a product to be inflated and the second open end having an adaptor connectable to an inflator outlet, the acceleration device using the venture principle to increase air flow into the product to be inflated.

**[0005]** In embodiments described herein, the acceleration device has a closure mechanism that operates to disrupt the air flow into the air inlets when a certain pressure within the product to be inflated is attained.

**[0006]** For a fuller understanding of the nature and advantages of the present invention, reference should be made to the ensuing detailed description and accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0007]** **FIG. 1** shows an exploded perspective view of an air inflation accelerator, in accordance with an embodiment.

**[0008]** **FIG. 2** shows a side view of the air inflation accelerator of **FIG. 1**, shown in the open configuration.

**[0009]** **FIG. 3** shows a perspective view of the air inflation accelerator of **FIG. 1**, shown connected to an inflatable bladder in the open configuration.

**[0010]** **FIG. 4** shows a perspective view of the air inflation accelerator of **FIG. 1**, shown connected to an inflatable bladder in the closed configuration.

## DETAILED DESCRIPTION

**[0011]** In the following description, various embodiments of the present invention will be described. For purposes of explanation, specific configurations and details are set forth in order to provide a thorough understanding of the embodiments. It will also be apparent to one skilled in the art, however, that the present invention may be practiced without the specific details. Furthermore, well-known features may be omitted or simplified in order not to obscure the embodiment being described.

**[0012]** Referring now to the drawings, in which like reference numerals represent like parts throughout the several views, **FIG. 1** shows an air inflation accelerator device **10** of an embodiment of the present invention. The air inflation accelerator device **10** comprises base **12**, nozzle **14**, air intake inlets **18**, and adaptor **26**.

**[0013]** Base **12** is a cylindrical tube having opposed open ends **13, 15**. Nozzle **14** and nozzle stop **16** are located at a first open end **13**. Nozzle **14** is shaped and sized to fit into the valve **32** of the product **34** to be inflated, as shown in **FIGS. 3** and **4**. Nozzle **14** comprises nozzle stop **16** which forms a collar around the perimeter of nozzle **14** located most opposite to open end **13** to provide a physical barrier to prevent over-insertion of the nozzle **14** into the valve **32** and also to provide a stop for the inlet closure **20**. Although it is preferred for use with a double-lock type valve, nozzle 14 can be shaped and sized to fit any valve in the industry. It is also within the scope of the present invention to provide a separate nozzle adaptor (not shown) to accommodate different types and shapes of valves as such nozzle adaptor are known in the industry.

**[0014]** Adaptor **26** is located at a second open end **15**. Adaptor **26** comprises locking notch **24** which is a slot located in the sidewall of the base **12** near the edge of open end **15**. Locking notch **24** is shaped and sized with a channel **25** for receipt of a locking pin **28** that is located on the inflator outlet **30**. As shown in **FIGS. 3** and **4**, locking pin **28** is inserted into channel **25** and base **12** is rotated so that locking pin **28** locks into place in locking notch **24**. As shown in the figures, there are two locking notches **24** preferably located on opposite sides of base **12**. It is certainly within the scope of the present invention, however, for only one locking notch **24** to be present or for the shape of locking notch **24** to be other than a slot having an open channel. Other attachment and retaining means known in the industry can be used to ensure that the inflator outlet **30** is securely connected to adaptor **26**. Adaptor **26** is comprised of natural or man-made materials and is shaped and sized to interface with the existing inflator outlet **30**.

**[0015]** The base portion located between open ends **13** and **15** comprises a plurality of air intake inlets **18** spaced around base **12** which each extend entirely through the side wall of the base **12**. Air intake inlets **18** are preferably round for ease of manufacture, but other shapes could also be utilized. Device **10** further includes inlet closure **20** which is shaped and sized to fit over base **12** from open end **15** in a sliding engagement. Collar **22** of inlet closure **20** provides

an easy grip for a user to grasp inlet closure **20** and move it to the desired position and also assists in preventing inlet closure **20** from being moved too far onto inflator outlet **30**.

**[0016]** Inlet closure **20** is movable from a first position (shown in **FIG. 3**) allowing air intake inlets **18** to function by permitting air to flow from the atmosphere through intake inlets **18** and into base **12**, flowing into product **34** through valve **32** to a second position (shown in **FIG. 4**) blocking exposure of intake inlets **18** from the atmosphere. Intake inlets **18** increase the air intake volume to accelerate the rate of inflation of the inflator (not shown), using the venturi principle. Intake inlets **18** will increase the rate of inflation to a point where the internal pressure of the product **34** being inflated reaches atmospheric pressure. Once atmospheric pressure has been reached, inlet closure **20** is moved from the open first position to the closed second position so that the inflator can complete inflation of the product to the desired pressure above room pressure. Although the figures depict a manual inlet closure **20**, it is also within the scope of the present invention for inlet closure **20** to be connected to a sensor and an actuator which moves inlet closure **20** into the closed second position once atmospheric pressure within the product **34** has been reached.

**[0017]** It is also within the scope of the present invention to include audible and/or visual alerts to signal when the inflatable bladder pressure reaches atmospheric pressure. An audible alert such as a whistle or other easily identifiable sound will activate when atmospheric pressure within the inflatable bladder is reached such that air begins to exit through the intake inlets. This alert will signal the user to move the inlet closure **20** over the intake inlets **18** or to activate an automatic inlet closure. Similarly, a visual alert such as a flashing light or a specific color of light will activate when atmospheric pressure within the inflatable bladder is reached such that aire begins to exit through the intake inlets. This alert will signal the user to move the inlet closure **20** over the intake inlets **18** or to activate an automatic inlet closure.

**[0018]** While the figures depict intake inlets **18** arranged in 2 rows around the circumference of base **12**, it is within the scope of the present invention to have more or fewer rows and to have any number and size of holes within each row. The accelerated inflation enhancement feature of the present invention can be used with any existing or newly designed electric, battery, manual, built-in, handheld or foot inflator pump used to inflate inflatable products including air mattresses, pool floats and other recreational items.

**[0019]** While the present invention is shown and described as being connected to an inflator outlet **30**, which could be a pump interface or a pump hose, it is also within the scope of the present invention for the device **10** to form an integrated and manufactured part of the inflator itself. It is further contemplated that the device **10** can form an integrated and manufactured part of the inflator even for built-in pumps which are integrated into the product being inflated.

**[0013]** Other variations are within the spirit of the present invention. Thus, while the invention is susceptible to various modifications and alternative constructions, certain illustrated embodiments thereof are shown in the drawings and have been described above in detail. It should be understood, however, that there is no intention to limit the invention to the specific form or forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention, as defined in the appended claims.

**[0014]** The use of the terms "a" and "an" and "the" and similar referents in the context of describing the invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. The term "connected" is to be construed as partly or wholly contained within, attached to, or joined together, even if there is something intervening. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (*e.g.*, "such as") provided herein, is intended merely to better illuminate embodiments of the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

**[0015]** Preferred embodiments of this invention are described herein, including the best mode known to the inventors for carrying out the invention. Variations of those preferred

embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

**[0016]** All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

WHAT IS CLAIMED IS:

1. An inflation acceleration device comprising:

An elongated tubular member having a sidewall and having opposed open first and second ends;

A plurality of air inlets spaced around the exterior of said tubular member, said plurality of air inlets located between said opposed open first and second ends, said air inlets extending through said tubular member sidewall, said air inlets being in fluid communication with both the tubular member external and internal atmospheres;

A nozzle adjacent said first open end, said nozzle connectable to a valve in fluid communication with the interior of an inflatable bladder that is to be inflated;

Said tubular member connected to an outlet of an inflator appliance at said second open end;

An engageable closure mechanism operable to substantially block the fluid communication between said tubular member external and internal atmospheres;

Wherein said plurality of air inlets provide increased air flow into said inflatable bladder when said closure mechanism is disengaged.

2. The inflation acceleration device of claim 1, wherein said closure mechanism comprises a collar member slidingly engaged around the exterior of said tubular member, said collar member movable between at least a first open position where said air inlets are exposed to the external atmosphere and a second closed position where said air inlets are substantially blocked from the external atmosphere.

3. The inflation acceleration device of claim 1, further comprising an adaptor member connecting said tubular member to an independent inflator appliance.

4. The inflation acceleration device of claim 1, further comprising an interface member connecting said nozzle to said valve.

5. The inflation acceleration device of claim 1, further comprising a sensor member and an actuator member electrically connected to said closure member, said actuator

member engaging said closure mechanism when a pressure inside said inflatable bladder to be inflated reaches atmospheric pressure.

6. The inflation acceleration device of claim 1, further comprising an alert mechanism indicating that atmospheric pressure within said inflatable bladder has been achieved.

7. An inflation acceleration device connectable to an inflator appliance, comprising:

An elongated tubular member having a sidewall and having opposed open first and second ends;

A plurality of air inlets spaced around the exterior of said tubular member, said plurality of air inlets located between said opposed open first and second ends, said air inlets extending through said tubular member sidewall, said air inlets being in fluid communication with both the tubular member external and internal atmospheres;

A nozzle adjacent said first open end, said nozzle connectable to a valve in fluid communication with the interior of an inflatable bladder that is to be inflated;

Said tubular member connected to an outlet of an inflator appliance at said second open end;

Wherein said plurality of air inlets operate using the venturi principle to provide increased air flow into said inflatable bladder.

FIG. 1

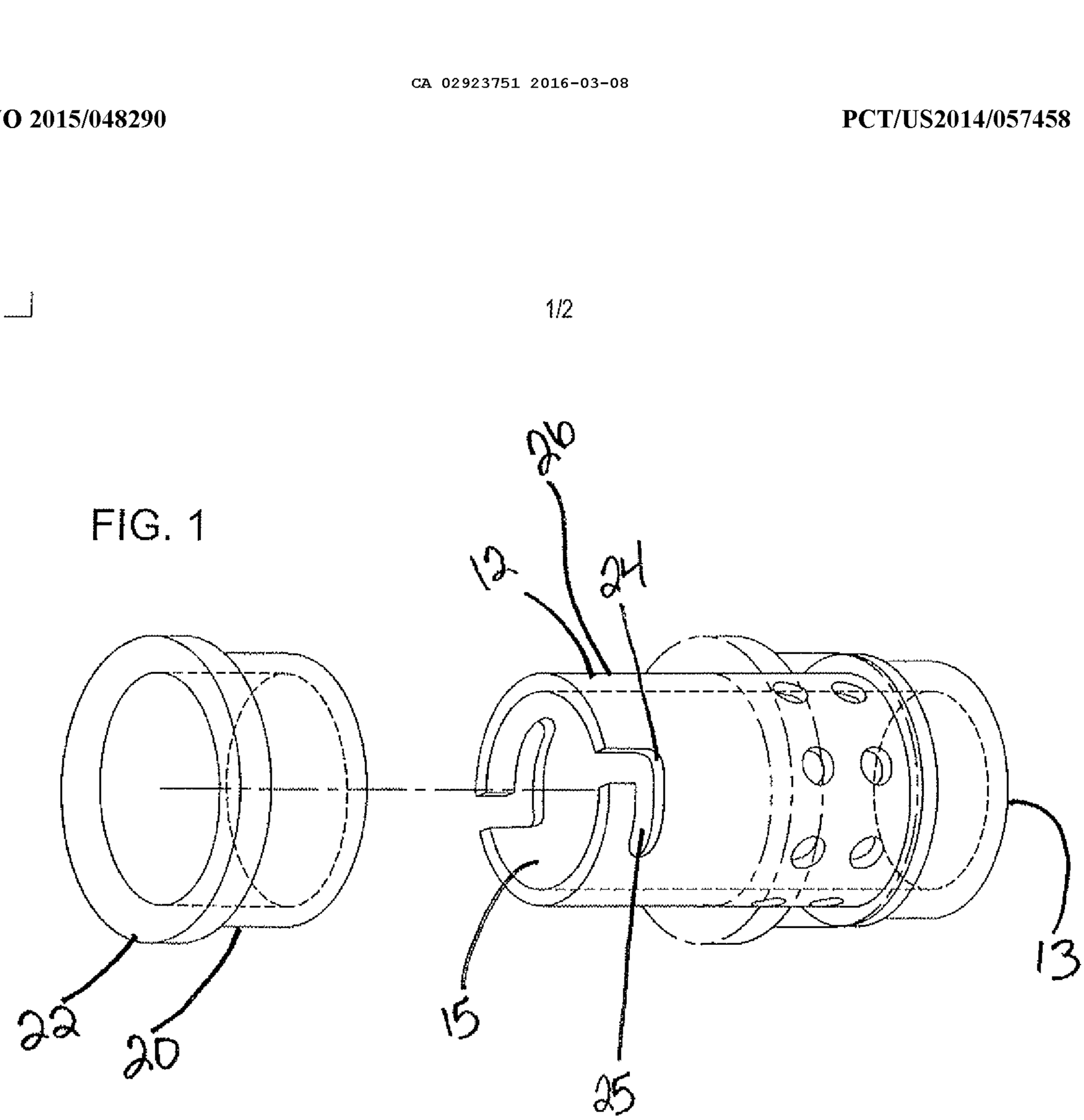


FIG. 2

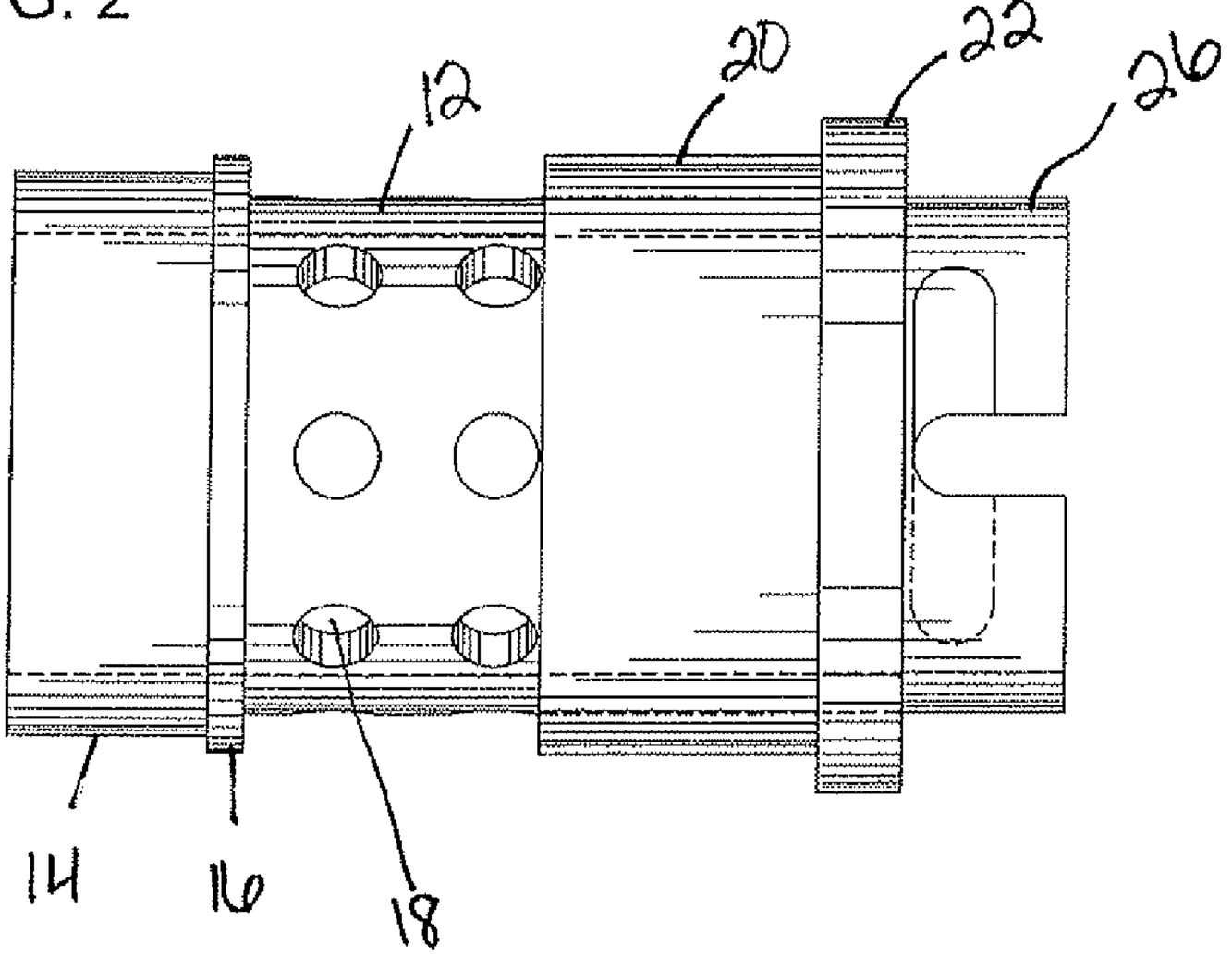

FIG. 3

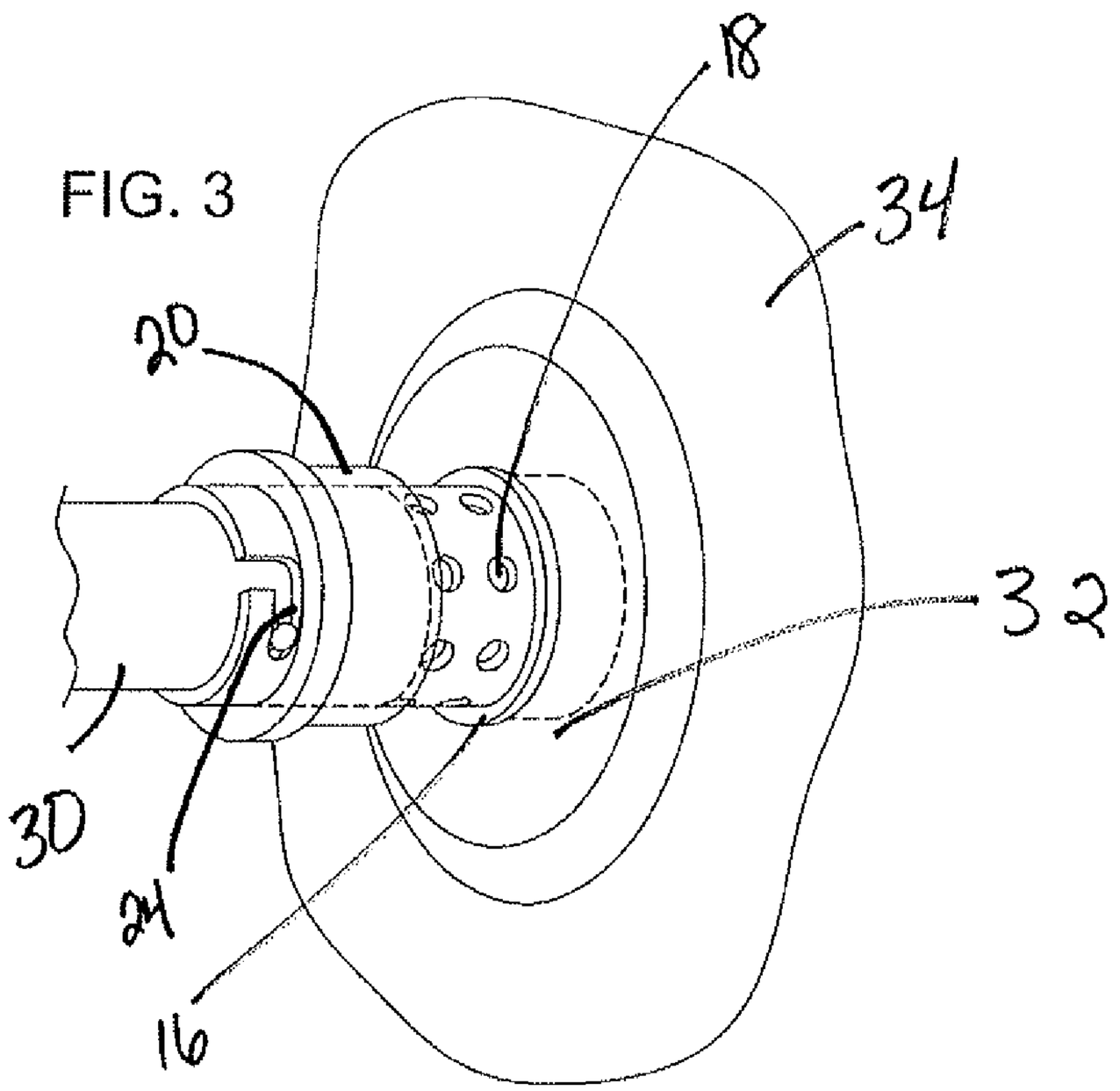


FIG. 4

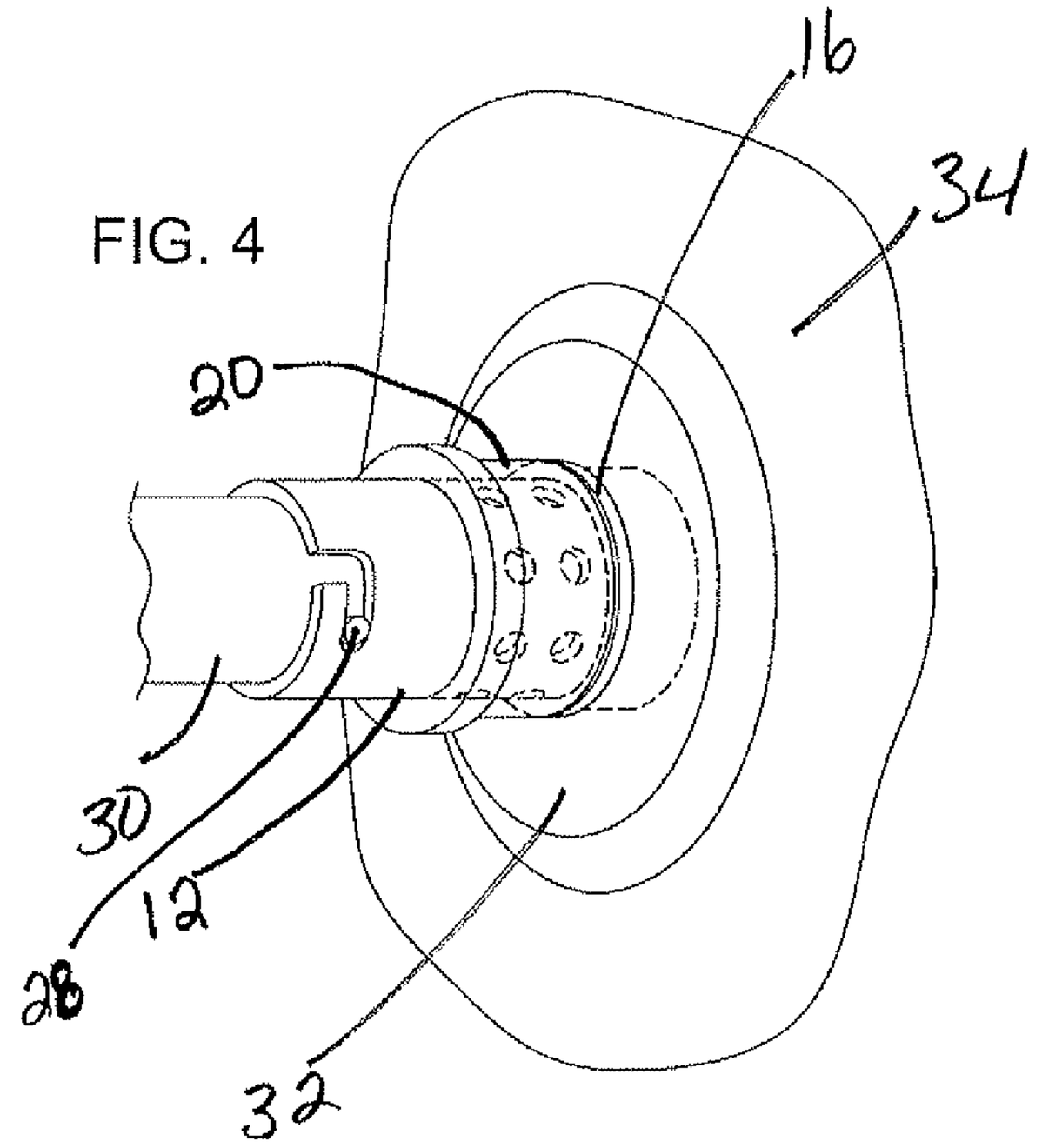

FIG. 1