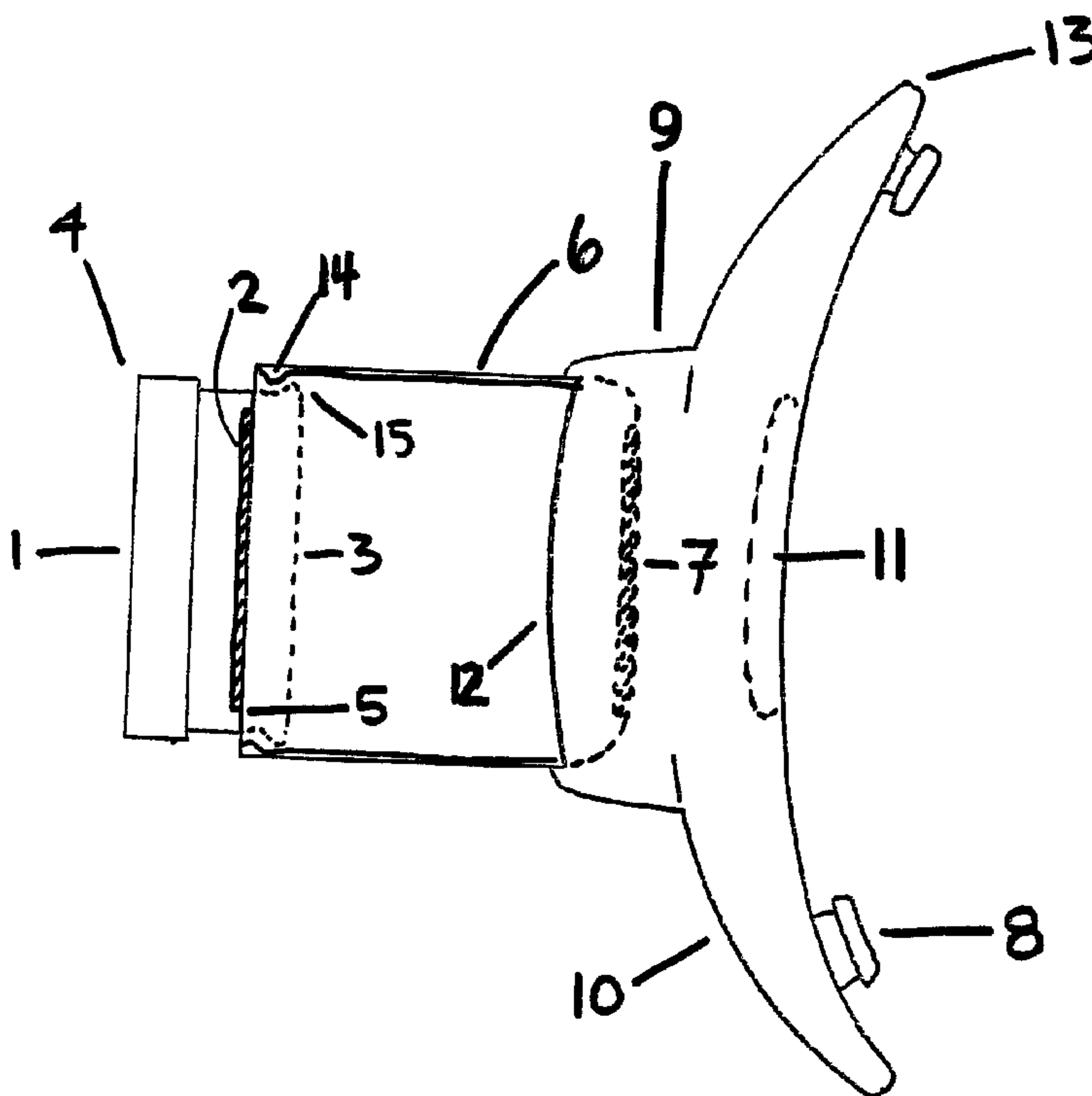




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(54) Titre : DISPOSITIF DE FILTRATION AVEC CARTOUCHE JETABLE
(54) Title: FILTRATION DEVICE WITH DISPOSABLE CARTRIDGE



(57) Abrégé/Abstract:

A filtration device is provided. Such filtration device is used to prevent the inhalation of unwanted particles while still allowing for the inhalation and exhalation of clean oxygen by the user. An interchangeable and disposable filtration insert, made of non-permeable polypropylene, permits airflow only through the end which contains a plurality of holes. Air may be transmitted only through the center of such insert, passing over filtration material to prevent passage of unwanted particles. A second chamber of polypropylene for receiving such interchangeable inserts also contains such filtration material. Clean air is then channelled into the breathing passage of the user from the receiving chamber and through a mouthpiece into which such chamber is placed, and the mouth is closed around the mouthpiece. Full inhalation and exhalation is possible by the user at all times.

Abstract of the Specification

A filtration device is provided. Such filtration device is used to prevent the inhalation of unwanted particles while still allowing for the inhalation and exhalation of clean oxygen by the user. An interchangeable and disposable filtration insert, made of non-permeable polypropylene, permits airflow only through the end which contains a plurality of holes. Air may be transmitted only through the center of such insert, passing over filtration material to prevent passage of unwanted particles. A second chamber of polypropylene for receiving such interchangeable inserts also contains such filtration material. Clean air is then channelled into the breathing passage of the user from the receiving chamber and through a mouthpiece into which such chamber is placed, and the mouth is closed around the mouthpiece. Full inhalation and exhalation is possible by the user at all times.

Filtration Device With Disposable Cartridge

Description

Technical Field

The instant invention is a small filter designed to utilize disposable or interchangeable cartridges containing a filtering cloth material for use in environments where particular elements in the air, such as paint particles or tanning spray, are required to be prevented from entering the mouth or throat of the user while still allowing for breathing through the mouth of the user. The filtration device is light and fits comfortably directly into the mouth of the user and the filtration process occurs outside the mouth. The density of the material in the filtration insert cartridges may be altered to increase or decrease the level of necessary filtration.

Background of the Invention

Filtration masks are well known in the art.

The usual way in which such masks operate is by attaching a filter element over the nose and mouth of the wearer. In some instances, the mask also provides protection for the user's eyes. It is also the usual way of operation of such masks that they be fitted around the circumference of the user's head, affixed either by straps or elastic.

These filter masks are large and generally operate on the basis of sealing the area around the lower portion of the face, and providing for a fabric or screen to prevent certain particles or gases from entering the nose and/or throat of the user while still allowing for the user to breathe freely. Some filters have included an element imbued with or covered by a coating to further reduce the transmission of toxic gases.

The present invention allows users to adjust the level of filtration desired for the density of the particles being filtered away from the throat, while being easily transported and convenient to use for short-term use.

It is therefore an object of the present invention to provide a novel filtration device for use in light industrial or commercial situations.

Summary of the Invention

It is one object of the present invention to provide a small and lightweight filtration device, in this embodiment generally constructed out of polypropylene, that is designed to permit the user to prevent foreign particles from being inhaled while still allowing for easy breathing through the mouth. There is no need for straps or other means of affixing the filter to the head, and thus is not a mask as is the case with the prior art, but the present invention is instead placed directly into the mouth.

An additional object of the invention is to provide for an interchangeable and disposable filter, that may be disposed of after one use in order to maintain the integrity of the filtering material therein. This also affords the user the ability to increase or decrease the level of filtration required.

Furthermore, it is an additional object of the invention that the removable filter increases the hygienic properties of the said invention relative to other instances found in the prior art.

According to the second aspect of the invention, therefore, there is provided a removable insert that houses the filtration material in a solid housing, through which the user may breathe without allowing for the passage of unwanted particles.

In the drawings, which form a part of this specification, Figure 1 is a profile view of the filter insert as discussed herein, containing the filtering material, and housed in its compartment and that is inserted into the mouthpiece, shown in Figure 3;

Figure 2 is a view of the end of the filter insert pictured in Figure 1 indicating the design of the opening to permit free air flow into the filter insert;

Figure 3 is a profile view of the filter insert pictured in Figure 1 with the filter insert separated from the compartment;

Figure 4 is an isometric view of the mouthpiece, into which the integrated filter insert in Figure 1 is inserted, and which is placed directly into the user's mouth; and

Figure 5 is a profile view of the subject invention when fully assembled and ready for use.

Figure 6 is an isometric view of the mouthpiece, from the opposite angle as that indicated in figure 4, to more fully illustrate the hollow nature of the mouthpiece element.

Description of the Preferred Embodiment

Referring to the drawings, in which corresponding elements are identified throughout with the same reference numeral, and more particularly to Figure 3, wherein the filtering component of the present invention is identified generally in two parts, the filter insert 4 and the receiving compartment, 6, both of which are, in this embodiment, constructed out of polypropylene.

The filter insert 4 is hollow with the exception of the filtering material 2. The filtering material 2 completely spans the diameter of the opening approximately .25 inches behind the opening of the filter insert and allows only certain particles to pass successfully into the

opening at the top 5 of the receiving compartment 6, and then the airway of the user. The opening of the filter insert 4 is indicated at 1 and illustrated in greater detail in Figure 2.

The end 3 of the filtration insert 4 is hollow to allow for the passage of air into the receiving compartment.

There is present at the bottom of the filtration insert 4 an outward-facing protrusion 15 running along the perimeter of the insert, which is locked under the similar inward-facing protrusion 14 of the receiving compartment 6 to secure the insert 4 in fluidic connection to the rest of the invention.

The top of the receiving compartment 6 has an inner circumference with a lip 14 that is contains an inward-facing protrusion along the perimeter to allow the filter insert 4 to be held securely in place when inserted by having the outer-protruding lip 15 of the filter insert 4 lock into place under the lip 14 of the receiving compartment 6.

Additional filtering material as in 2 may also be secured at the bottom of the receiving compartment 7 in the event additional filtration is required.

Figure 2 displays the top of the filter insert 4 and contains a plurality of holes 16 that may be arranged in any design by those skilled in the art, through which air may pass while larger particles are prevented from passing into the filter insert 4.

Turning now to figures 4 and 6, wherein the portion of the instant invention that is placed in the user's mouth is illustrated, the aperture into which the filter insert is inserted is indicated at 12.

The mouthpiece illustrated in figure 4 is, in the present embodiment, made of rubber in order to form a closed seal around the perimeter of the filter insert compartment 6 when placed in the mouthpiece opening 12.

Airflow is facilitated into the breathing passage of the user by having air pass through the end of the filtration insert as illustrated in figure 2, through the filtration material 2, through the hollow receiving compartment 6, passing through the outward-extended portion of the mouthpiece 9 for receiving the compartment 6, and into the breathing passage of the user through the hollow opening in the mouthpiece, 11.

The mouthpiece extends outward in a curved shape 10 to allow the mouthpiece to be placed beneath the user's lips and the mouth being closed around the curved portion 10.

The mouthpiece is held in place by each of the two protrusions 8 extending outward from the curved portion of the mouthpiece 10 being held between the user's teeth.

The final construction of the instant invention would have the filter insert 4 locked into the receiving compartment 6, with the receiving compartment 6 then securely fastened into the opening of the mouthpiece 11 and the curved portion of the mouthpiece 10 then placed into the user's mouth and secured by biting upon the two protrusions 8. Inhalation of filtered oxygen and exhalation are both possible in this embodiment.

The above-described embodiments of the invention are intended to be examples of the present invention and alterations and modifications may be effected thereto, by those of skill in the art, without departing from the scope of the invention which is defined solely by the claims appended hereto.

Claims

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A filtration device consisting of a disposable and replaceable filtering insert, across the interior diameter of such insert being placed a type of filtering material suitable for use by the user, with the said filtering insert being inserted into a hollow receiving compartment, with the said receiving compartment placed inside a mouthpiece, the said mouthpiece for placement into the mouth of the user, secured in place by closing the user's mouth around the mouthpiece and closing the user's teeth upon two protrusions emanating from the mouthpiece.
2. A filtration device as set forth in claim 1, consisting of a disposable and replaceable filtering insert referenced therein that has at its end a plurality of openings for the prevention of larger unwanted particles from entering the filtration device.
3. A filtration device insert as set forth in claim 2, containing a screen of fibrous filtering material of the type and density appropriate for the usage requirement that is secured across the interior diameter of the of the hollow filtering insert.
4. A filtration device insert as set forth in claim 2, including a protrusion around the perimeter of the base of the insert sufficient to secure the insert in place below the oppositely-extruded protrusions around the interior circumference at the top of the receiving compartment.

5. A filtration device as set forth in claim 1, including a receiving compartment which is hollow with walls of approximately .035 inches in thickness, into which the a filtration device insert as described in claim 2 is inserted.

6. A filtration device as set forth in claim 5, including a receiving compartment consisting of an inward-facing protrusion around the interior perimeter of the end of the compartment to receive the filtration device insert that is the subject of claim 2 and which secures and prevents easy removal of the said insert by locking it in place using the said compartment's inward-facing protrusions against the outward facing protrusions at the base of the said insert.

7. A filtration device as set forth in claim 6, including a receiving compartment with an additional screen of fibrous filtering material of the type and density appropriate for the usage requirement secured across the perimeter of the base of the said compartment.

8. A filtration device as set forth in claim 1, including a mouthpiece for insertion into the user's mouth to permit both inhalation and exhalation.

9. A filtration device as set forth in claim 8, with said mouthpiece consisting of a curved rubber outer element to be placed under the lips and over the teeth of the end user.

10. A filtration device as set forth in claim 8, wherein said mouthpiece contains two protruding elements for placement between the user's teeth to secure the said mouthpiece in place.

11. A filtration device as set forth in claim 1, consisting essentially of elements that are impermeable to air excepting the channel for inhalation and exhalation throughout the center of the present invention, across the width of such channel, being placed in a duplicity of locations, fibrous material of a consistency to be determined by the end user subject to the level of filtration required.

FIGURE 1

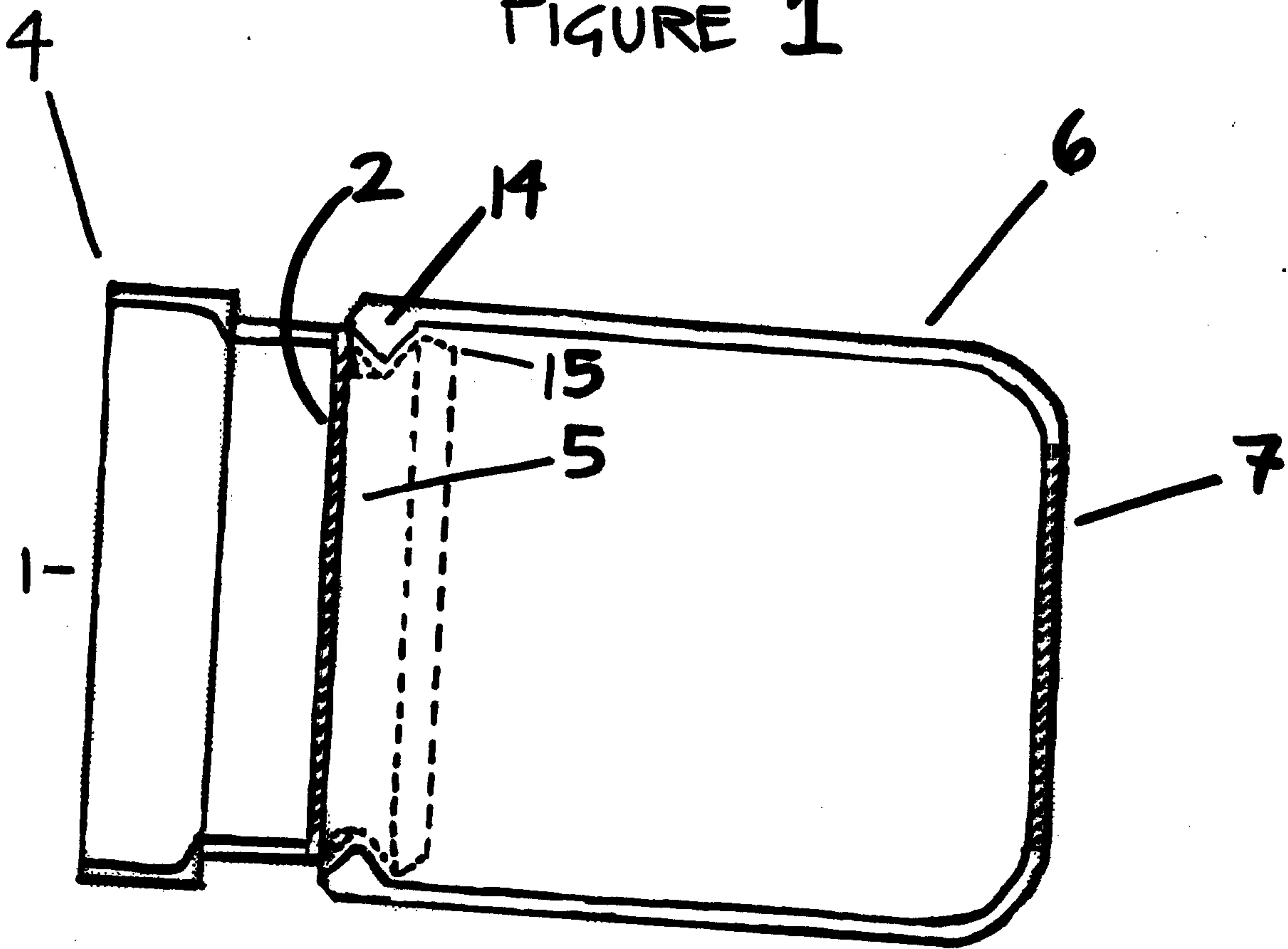


FIGURE 2

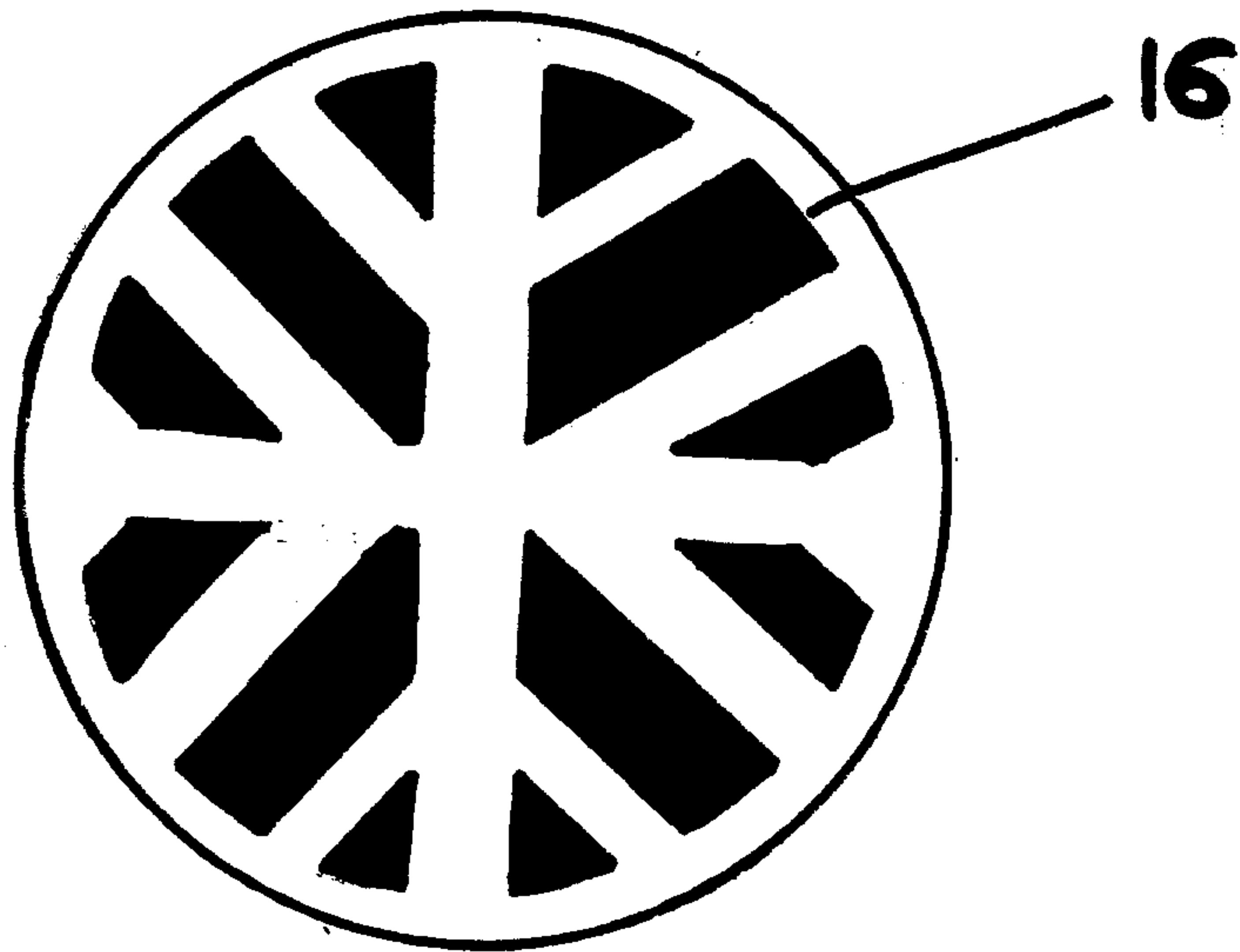


FIGURE 3

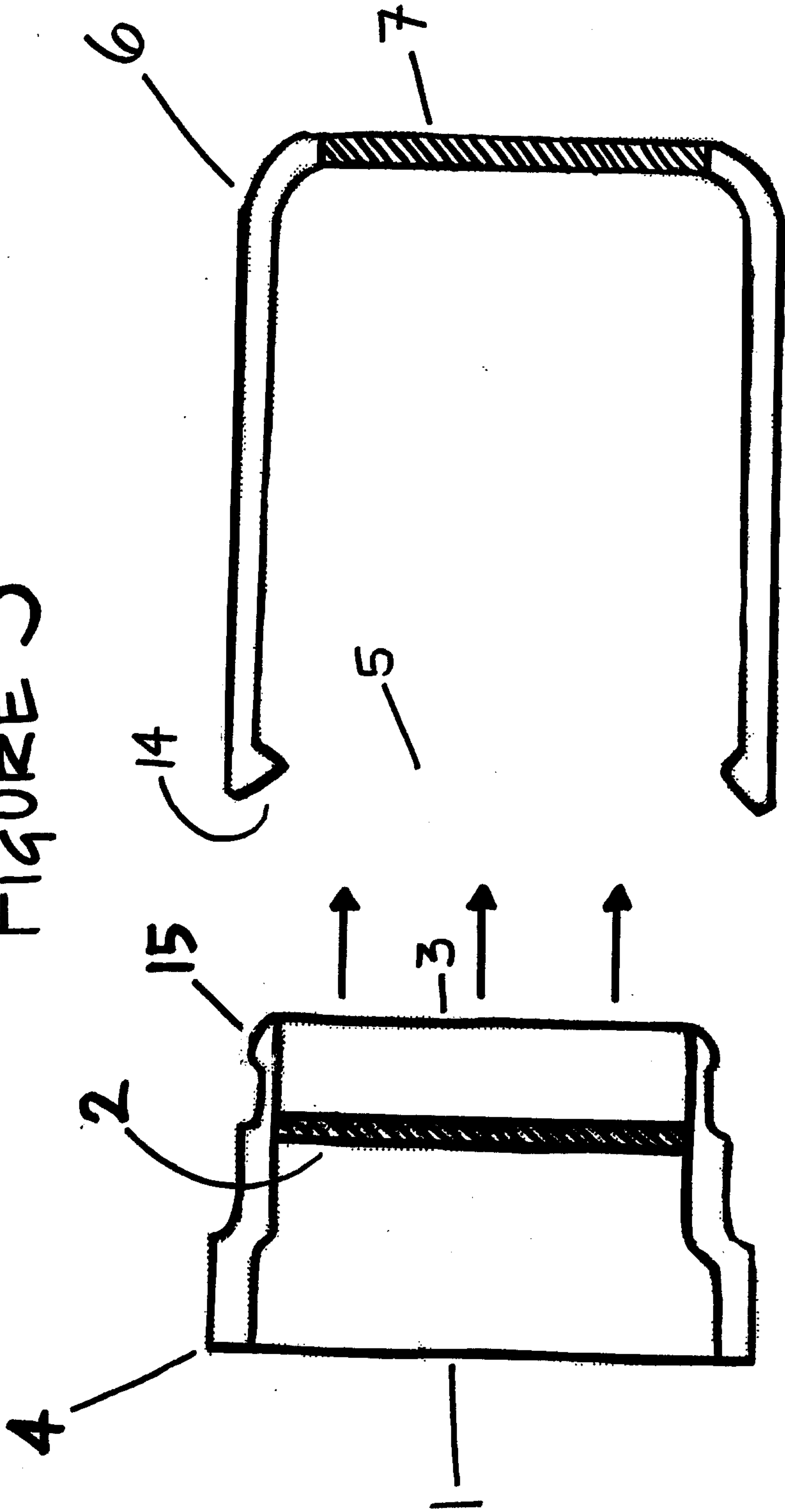
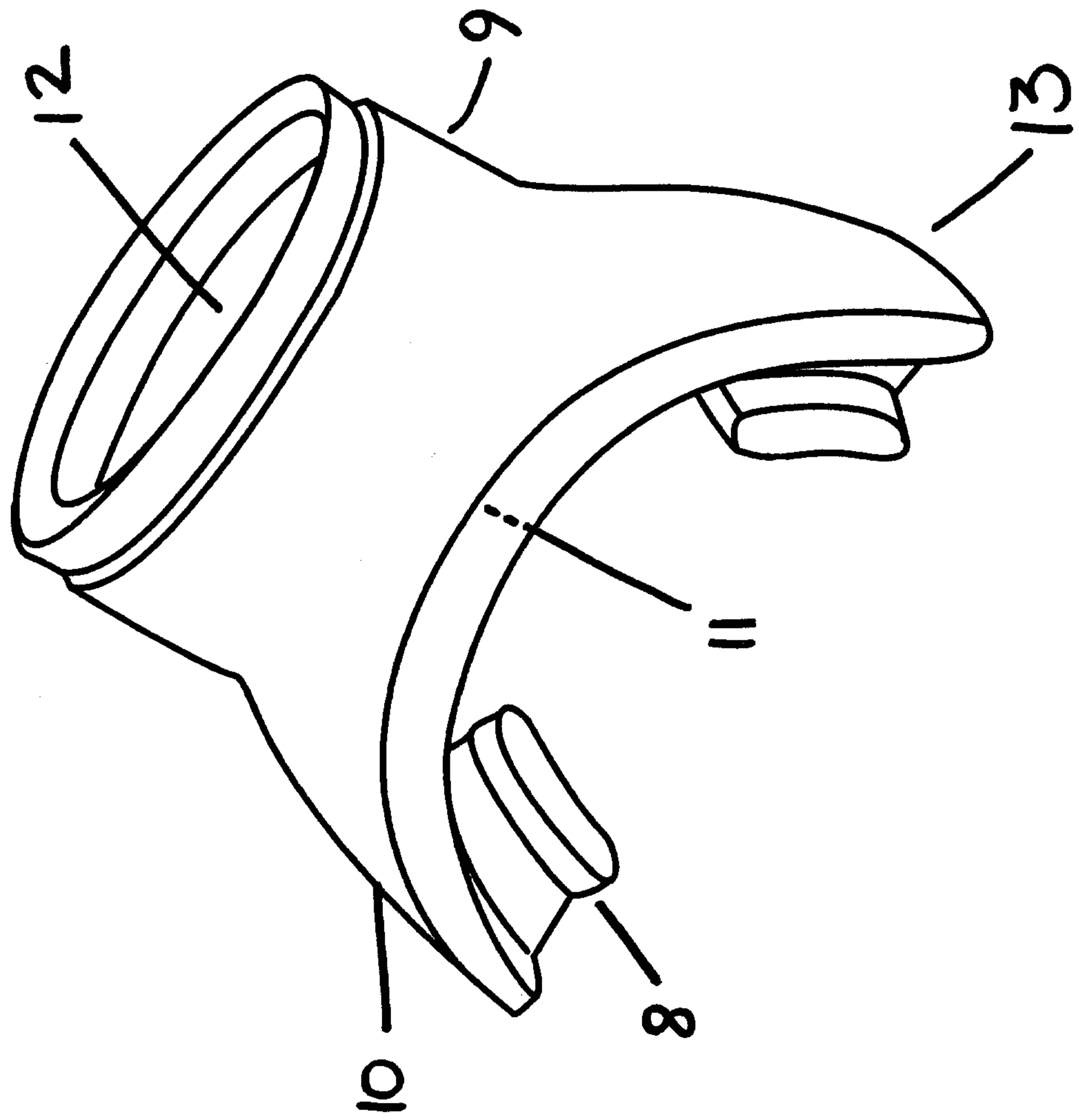


FIGURE 4



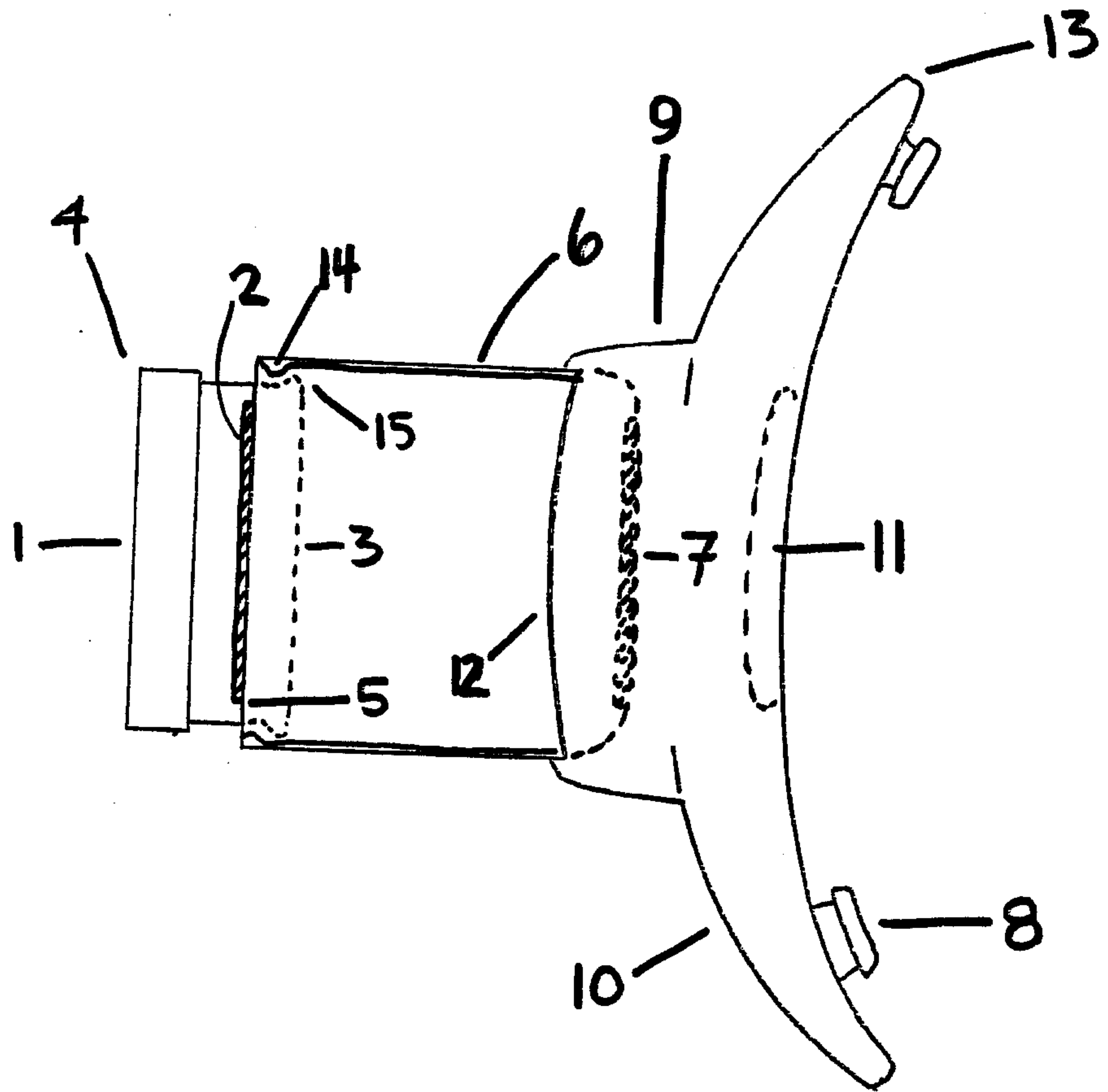


FIGURE 5

FIGURE 6

