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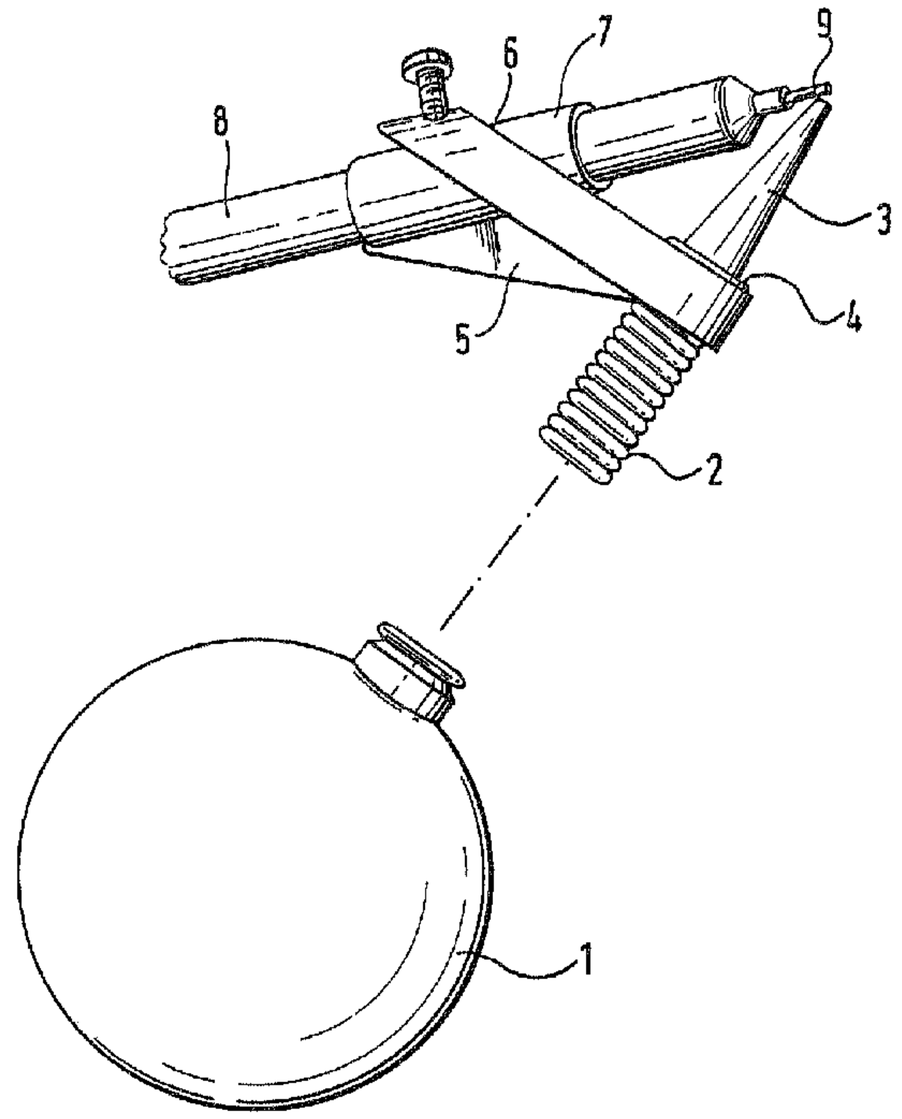
(54) **DISPOSITIF SIMPLIFIE DE BROSSE PNEUMATIQUE**

(54) **SIMPLIFIED AIR BRUSH APPARATUS**



(57) Apparatus for dispensing a fine spray of liquid particles comprises a manually operated pump connected to supply air under pressure directly to a nozzle so positioned that air leaving the nozzle is directed onto and over the nib of a pen releasably supported within a holder with the pen nib in close proximity with the nozzle outlet to cause liquid from the pen to be dispensed as a fine particulate spray in air.

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ABSTRACT

Apparatus for dispensing a fine spray of liquid particles comprises a manually operated pump connected to supply air under pressure directly to a nozzle so positioned that air leaving the nozzle is directed onto and over the nib of a pen releasably supported within a holder with the pen nib in close proximity with the nozzle outlet to cause liquid from the pen to be dispensed as a fine particulate spray in air.

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Simplified Air Brush Apparatus

This invention relates to apparatus for dispensing a fine spray of liquid particles and more especially, but not exclusively, to liquid dispensers known as air brushes.

An air brush for non-contact marking of objects is disclosed in GB 2035138 in the name of Inst. Forster F Pruf and published on June 18, 1980, in which a jet of compressed air released from a cylinder or other source of air under pressure is directed onto a fibrous wick carrying marking material, e.g. a felt-tipped pen. The compressed air jet is controlled by means of a valve connected to the air cylinder. Such an air brush is both cumbersome and expensive because of the presence of the compressed-air cylinder and the need for a relatively complicated and expensive valve system for controlling the flow of compressed air.

The present invention sets out to provide a simplified air brush which removes the need for a source of compressed air and associated valve system but, by use of which, the quality of artwork achieved is as good as that which can be achieved using conventional air brush equipment. Liquid dispensing apparatus in accordance with the invention can also be employed to dispense fine sprays of media other than colourants or inks.

According to the present invention in one aspect, there is provided an apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having a nozzle outlet formed with a step to define an abutment surface;

a manually operated pump arranged to supply air under pressure directly to the nozzle;

a felt-tipped pen having a wettable nib and a shoulder adjacent the nib; and

a holder supporting the pen and the nozzle so that the nib is in close proximity to the nozzle outlet with the shoulder of the pen abutting said abutment surface to locate the nib correctly with respect to the nozzle outlet, said holder having discrete channels within which the nozzle and the pen

are respectively retained, the channels being mutually inclined so that compressed air leaving the nozzle outlet flows directly over and around the nib of the pen to cause liquid from the pen to be dispensed as a fine particulate spray in air.

In another aspect there is provided an apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having an outlet formed with a step to define an abutment surface;

a flexible hose connected to the nozzle;

a foot operated pump arranged to supply air under pressure through the flexible hose directly to the nozzle;

a felt-tipped pen having a wettable nib and a shoulder adjacent the nib; and

a holder supporting the pen and the nozzle so that the nib is in close proximity to the outlet of the nozzle with the shoulder of the pen abutting said abutment surface to locate the nib correctly with respect to the nozzle outlet, said holder having discrete channels within which the nozzle and the pen are respectively retained, the channels being mutually inclined so that compressed air leaving the nozzle outlet flows directly over and around the nib of the pen so as to entrain particles therefrom and dispense such particles as a fine spray.

In a still further aspect there is provided an apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having a nozzle outlet formed with a step to define an abutment surface;

a felt-tipped pen having a wettable nib and a shoulder adjacent the nib;

a holder connected to the nozzle and having a pair of discrete channels respectively retaining said nozzle and said pen with the nib being in close proximity to the nozzle outlet;

a manually operated pump connected to supply air under pressure directly to the nozzle;

a plurality of sleeves each of differing internal cross-section;

said pen being supported in a said channel by one of said plurality of sleeves detachably mounted therein such that the shoulder of the pen abuts said abutment surface to locate the nib correctly with respect to the nozzle outlet, and said channels being mutually inclined so that compressed air leaving the nozzle outlet flows directly over and around the nib of the pen to cause liquid from the pen to be dispensed as a fine particulate spray in air.

In another aspect, the invention provides an apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having a nozzle outlet formed with a step to define an abutment surface;

a manually operated pump arranged to supply air under pressure directly to the nozzle;

a felt-tipped pen having a wettable nib and a shoulder adjacent the nib; and

a holder supporting the pen and the nozzle so that the nib is in close proximity to the outlet of the nozzle with the shoulder of the pen abutting said abutment surface to locate the nib correctly with respect to the nozzle outlet, said holder having discrete channels within which the nozzle and the pen are respectively retained, the channels being mutually inclined so that compressed air leaving the nozzle outlet flows directly over and around the nib of the pen so as to entrain particles therefrom and dispense such particles as a fine spray;

wherein the pump comprises a piston slidably mounted within a cylindrical chamber, movement of the piston forcing air under pressure through the nozzle, and wherein the piston is hollow to house the pen when the pen is not in use.

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The nozzle and the pen may, in use of the apparatus, be retained within discrete channels of a separable holder, the channels being mutually inclined so that compressed air leaving the nozzle flows directly onto and over the nib of the pen.

The channel for retaining the pen may be defined by a sleeve releasably secured to the holder. More than one such sleeve may be provided to enable pens having a variety of diameters and cross-sections to be retained by the holder.

The pump may be foot or hand operated and may comprise a bulb of a flexible material such as rubber which can be squeezed or otherwise deformed to expel air under pressure therefrom. Alternatively, the pump may take the form of a hand operated pump including a cylinder through which a sliding piston can be moved to expel air under pressure from the cylinder.

The flexible hose may be formed as a continuous spiral to assist connection to the pump and to the nozzle.

The liquid may be a colourant such as ink or an edible food colourant and the liquid source may comprise a conventional ink pen or a felt tipped marker.

Alternatively, the liquid may comprise a scented medium, a disinfectant, a deodorant or an insecticide or pesticide contained in a pen-like container.

In a further aspect, there is provided apparatus for dispensing a fine spray of liquid particles, the apparatus comprising a manually operated pump including an outlet nozzle through which air under pressure is directed over the tip of a source of liquid releasably supported within retaining means carried by the pump housing.

The pump may comprise a piston slidably mounted within a cylindrical chamber, movement of the piston forcing air under pressure through the nozzle. The piston may be of hollow construction to house a liquid source, e.g. a pen or marker, when not in use.

The retaining means may comprise a suitably shaped bracket secured to or formed integral with the pump housing, the bracket being suitably inclined so that when a liquid source is retained therein, its tip lies adjacent to the pump nozzle.

The invention will now be described by way of example only with reference to the accompanying diagrammatic drawings in which:-

Figure 1 is a perspective view of air brush apparatus in accordance with the invention;

Figure 2 is a front view of a part of the apparatus illustrated in Figure 1;

Figure 3 is a side view to an enlarged scale of a nozzle used in the apparatus illustrated in Figure 1; and

Figure 4 is a side view partly in section of alternative apparatus in accordance with the invention.

The air brush illustrated in Figures 1 to 3 comprises a foot pump 1 connected by a flexible hose 2 to a nozzle 3 retained within a first channel 4 of a plastics holder 5. The holder 5 includes a second channel 6 within which is removably mounted a sleeve 7. The sleeve is retained in place by a suitable screw fixing. Positioned within the sleeve 7 is a pen 8. The sleeve 7 may be removed and replaced by a sleeve having a different internal diameter or cross-section selected from a plurality of such sleeves.

As will be seen from Figures 1 to 3, the channels 4, 6 are mutually inclined so that the tip 9 of the pen is positioned in close proximity to the nozzle outlet. When using a nozzle as illustrated in Figure 1, the tip 9 is positioned immediately downstream of the nozzle 3. In Figure 3, however, the nozzle end includes a step 10 against which abuts the shoulder 11 of the pen for location purposes.

The holder 5 is designed to be held a specified distance away from the article on which a fine spray of particles is to be applied. Operation of the foot pump causes air under pressure to flow directly through the hose 2 and to exit from the nozzle 3. As this compressed air passes over the tip 9 of the pen, a fine dispersion of particles is produced.

The pen 8 comprises a felt-tipped pen having a wettable nib. A selection of sleeves 7 may be provided to enable a variety of different liquid sources to be employed.

The shape and configuration of the nozzle 3 may take several forms, these including cylindrical, conical and undulating. The nozzle may include a discrete opening through which the tip of the liquid container may protrude.

The dispenser illustrated in Figure 4 includes a hand-operated pump which comprises a cylindrical housing 12 which defines a nozzle 13, compression chamber 14 swept by a piston 15 carried by a plunger 16. The piston 15 typically comprises a washer of rubber or plastics. The plunger 16 includes a handle 17 by which the piston 15 can be moved through the chamber 14. The plunger is hollow to

enable a liquid source such as a marker 18 to be stored when not in use. The end of the handle is flared to define a flange-stand 19.

Secured to one inclined face of the nozzle 13 is a bracket 22 for retaining a suitable liquid source.

In operation, a liquid source - for example a felt-tipped marker 20, is positioned within the bracket 22 with its tip 21 in the position shown in broken line. The plunger 16 is then moved by its handle 17 to cause the piston 15 to sweeep the chamber 14 to cause air under pressure to emerge from the nozzle 13 and pass over the tip 21. As for the arrangement described above with reference to Figures 1 to 3, as the compressed air flows over the tip of the marker 20, liquid particles are entrained and are dispensed as a fine spray.

It will be appreciated that the foregoing is merely exemplary of one embodiment of dispensing apparatus in accordance with the invention and that modifications can readily be made thereto without departing from the true scope of the invention as defined by the appended Claims.

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

1. Apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having a nozzle outlet formed with a step to define an abutment surface;

a manually operated pump arranged to supply air under pressure directly to the nozzle;

a felt-tipped pen having a wettable nib and a shoulder adjacent the nib;

a holder supporting the pen and the nozzle so that the nib is in close proximity to the nozzle outlet with the shoulder of the pen abutting said abutment surface to locate the nib correctly with respect to the nozzle outlet, said holder having discrete channels within which the nozzle and the pen are respectively retained, the channels being mutually inclined so that compressed air leaving the nozzle outlet flows directly over and around the nib of the pen to cause liquid from the pen to be dispensed as a fine particulate spray in air.

2. Apparatus as claimed in claim 1 wherein the pump comprises a bulb of a flexible material which can be deformed to expel air under pressure therefrom.

3. Apparatus as claimed in claim 1 wherein the pump is a hand operated pump.

4. Apparatus as claimed in claim 1, 2 or 3, wherein the channel for retaining the pen is defined by one or more sleeves detachably secured to the holder.

5. Apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having an outlet formed with a step to define an abutment surface;

a flexible hose connected to the nozzle;

a foot operated pump arranged to supply air under pressure through the flexible hose directly to the nozzle;

a felt-tipped pen having a wettable nib and a shoulder adjacent the nib; and

a holder supporting the pen and the nozzle so that the nib is in close proximity to the outlet of the nozzle with the shoulder of the pen abutting said

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abutment surface to locate the nib correctly with respect to the nozzle outlet, said holder having discrete channels within which the nozzle and the pen are respectively retained, the channels being mutually inclined so that compressed air leaving the nozzle outlet flows directly over and around the nib of the pen so as to entrain particles therefrom and dispense such particles as a fine spray.

6. Apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having a nozzle outlet formed with a step to define an abutment surface;

a felt-tipped pen having a wettable nib and a shoulder adjacent the nib;

a holder connected to the nozzle and having a pair of discrete channels respectively retaining said nozzle and said pen with the nib being in close proximity to the nozzle outlet;

a manually operated pump connected to supply air under pressure directly to the nozzle; and

a plurality of sleeves each of differing internal cross-section;

said pen being supported in a said channel by one of said plurality of sleeves detachably mounted therein such that the shoulder of the pen abuts said abutment surface to locate the nib correctly with respect to the nozzle outlet, and said channels being mutually inclined so that compressed air leaving the nozzle outlet flows directly over and around the nib of the pen to cause liquid from the pen to be dispensed as a fine particulate spray in air.

7. Apparatus for dispensing a fine spray of liquid particles, the apparatus comprising:

a nozzle having a nozzle outlet formed with a step to define an abutment surface;

a manually operated pump arranged to supply air under pressure directly to the nozzle;

a felt-tipped pen having a wettable nib and a shoulder adjacent the nib; and

a holder supporting the pen and the nozzle so that the nib is in close proximity to the outlet of the nozzle with the shoulder of the pen abutting said abutment surface to locate the nib correctly with respect to the nozzle outlet, said holder having discrete channels within which the nozzle and the pen are

respectively retained, the channels being mutually inclined so that compressed air leaving the nozzle outlet flows directly over and around the nib of the pen so as to entrain particles therefrom and dispense such particles as a fine spray; and

wherein the pump comprises a piston slidably mounted within a cylindrical chamber, movement of the piston forcing air under pressure through the nozzle, and wherein the piston is hollow to house the pen when the pen is not in use.

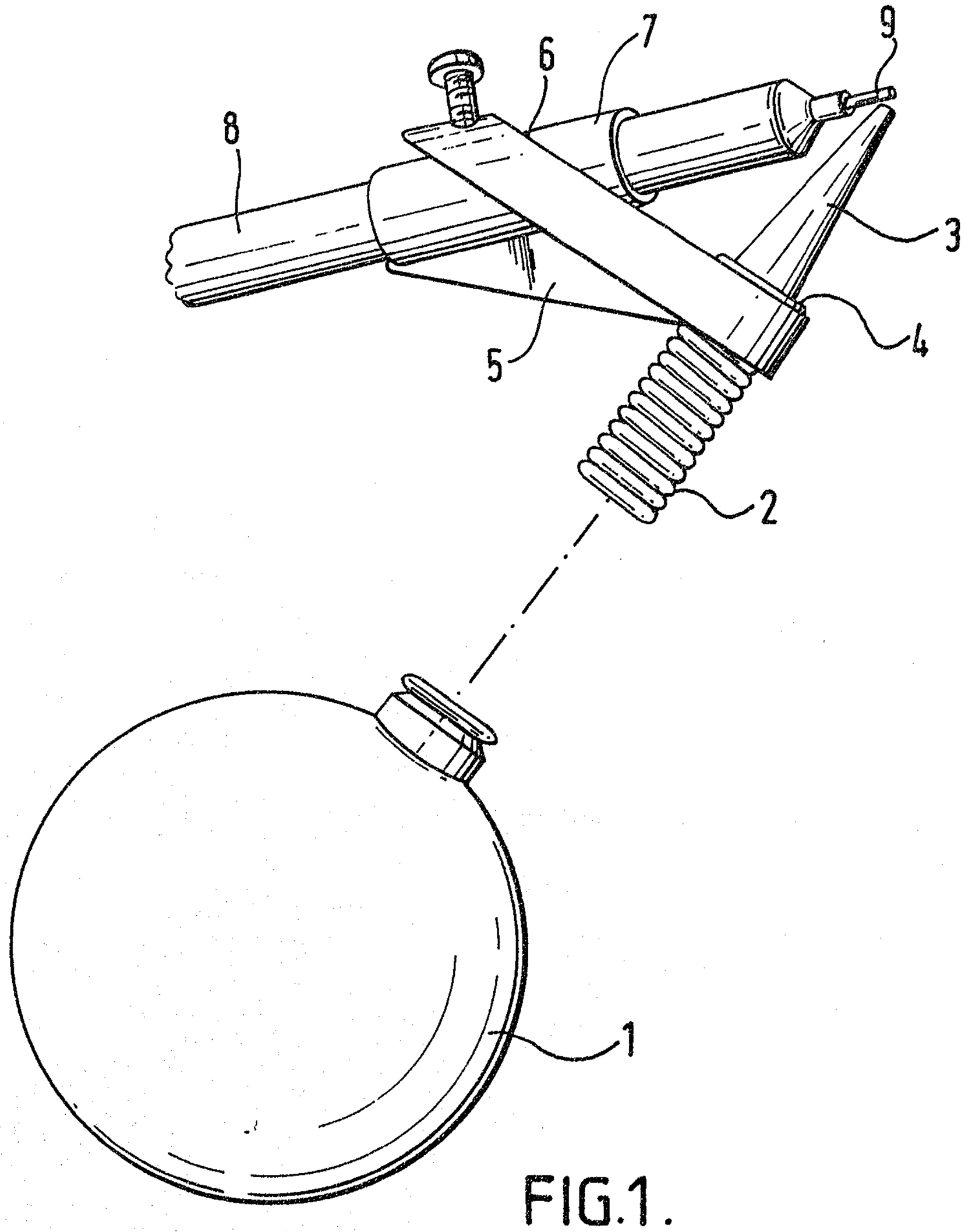


FIG.1.

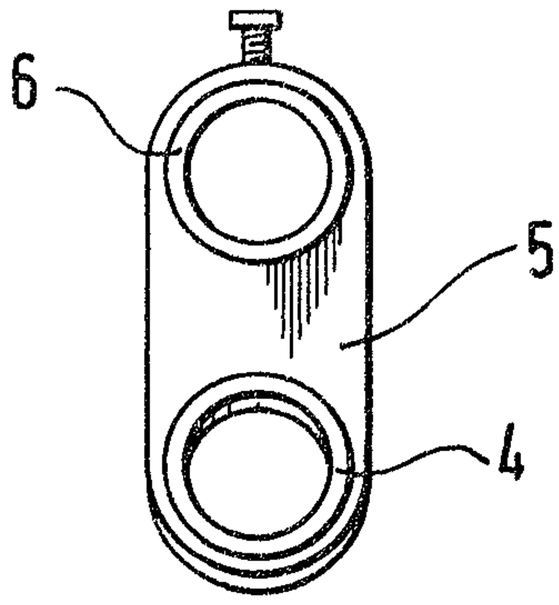


FIG. 2.

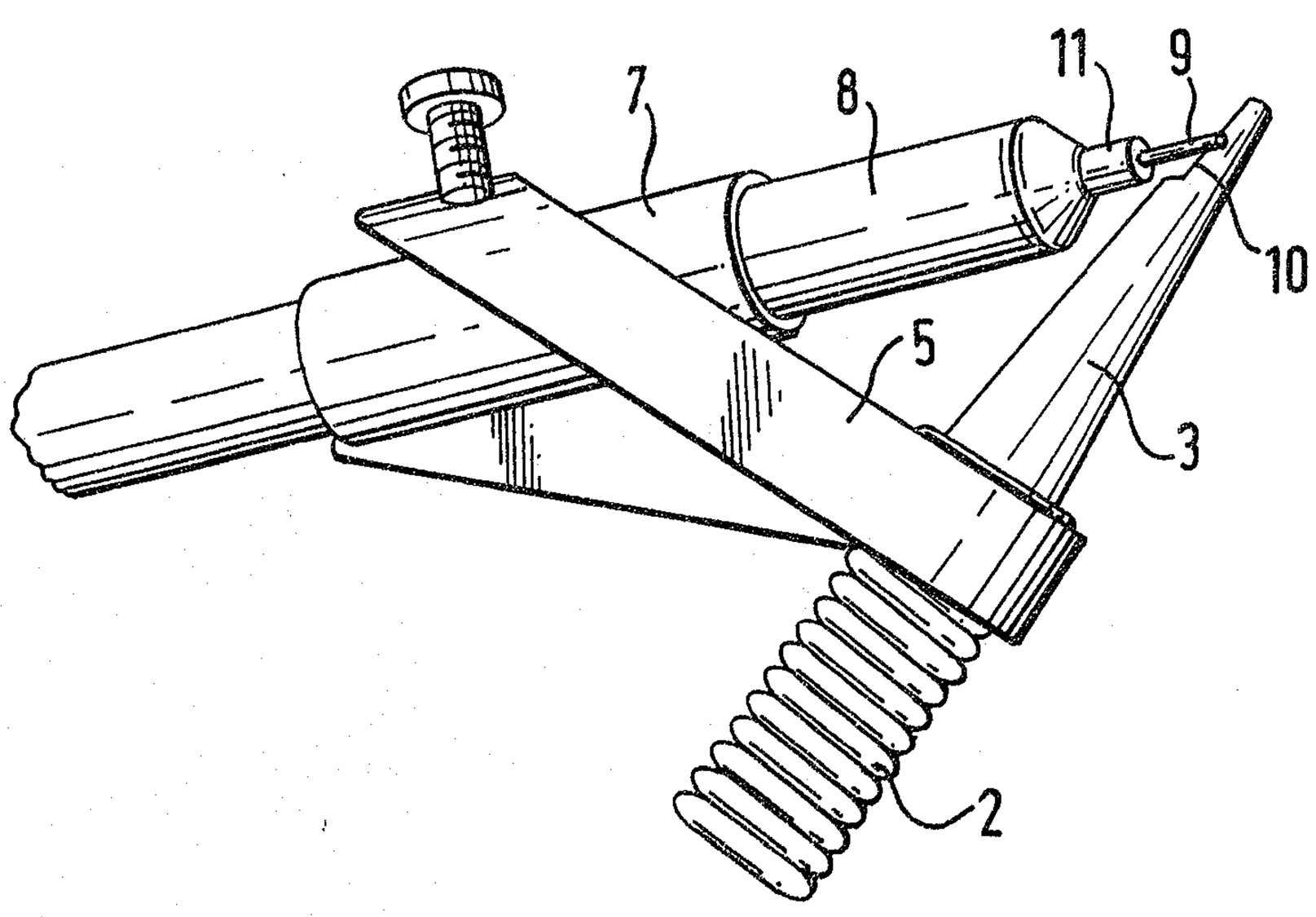


FIG. 3.

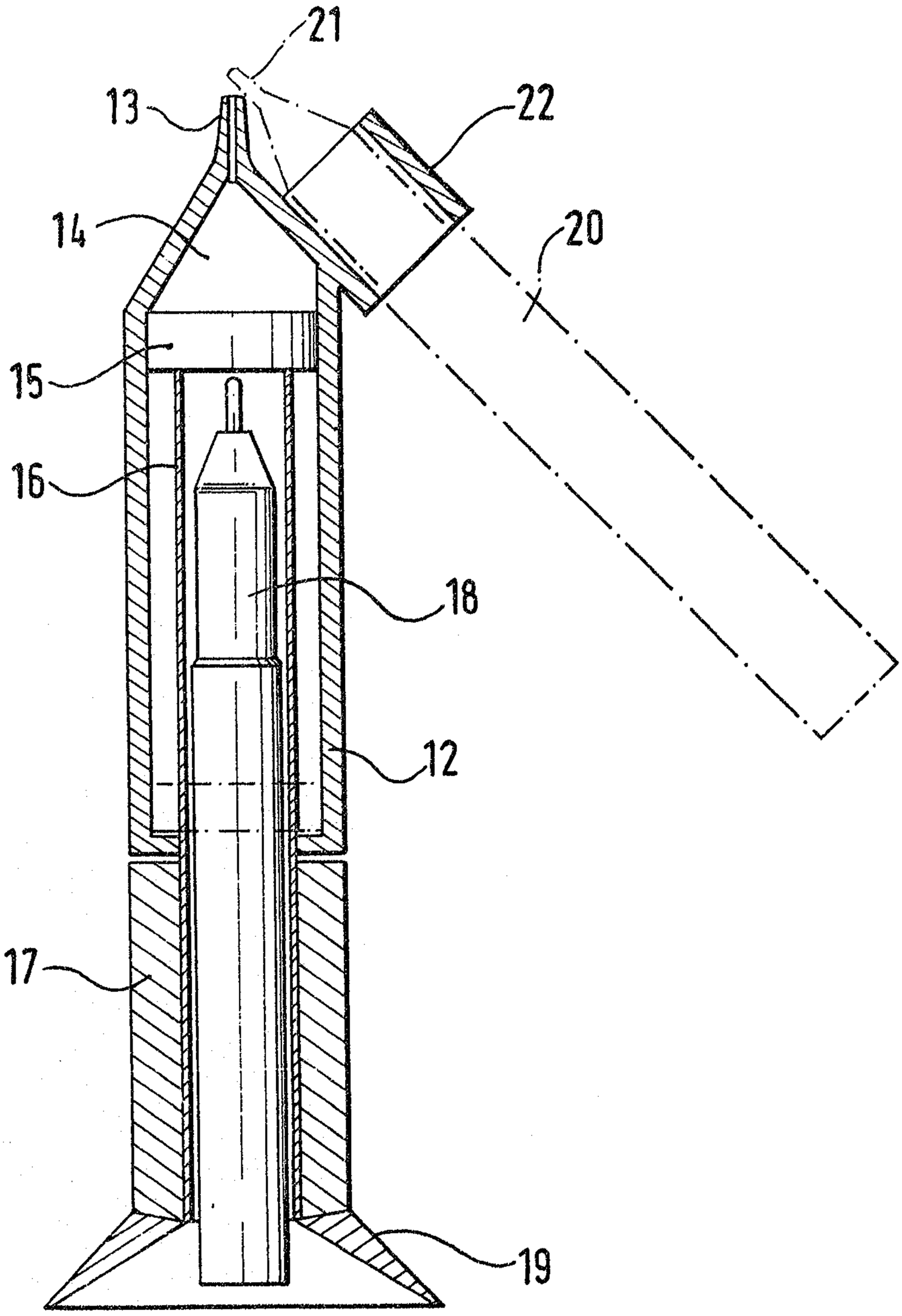
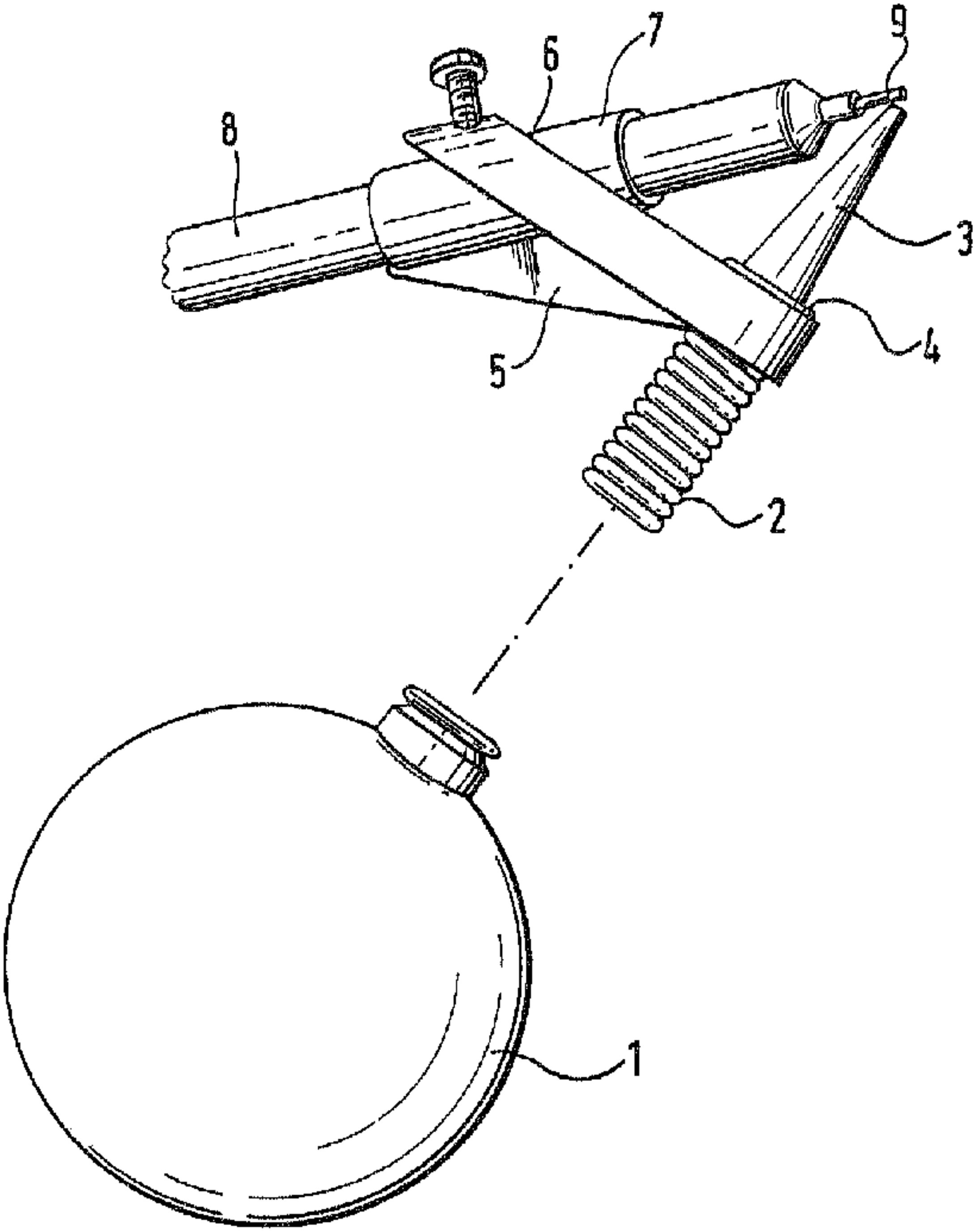


FIG. 4.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