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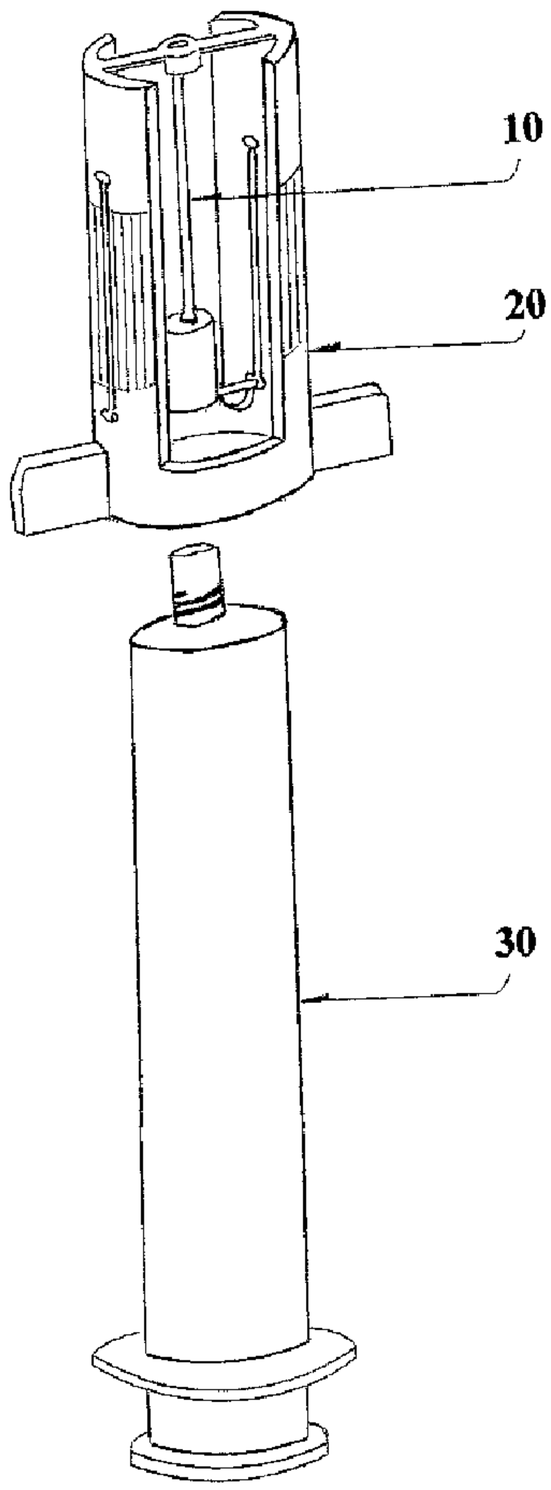
(54) Titre : SUPPORT D'AIGUILLE DE SURETE JETABLE POUR SERINGUE
(54) Title: DISPOSABLE SAFETY NEEDLE RACK SYSTEM FOR SYRINGE



(57) Abrégé/Abstract:
Disposable safety needle rack system comprises a needle assembly, a needle rack, and a cylinder with lock or screw thread, wherein the needle assembly has two sticks for rotating and guide the needle rack, an interiorly threaded or locking base to attach

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(57) Abrégé(suite)/Abstract(continued):
to the cylinder, and two elastic structures that push needle assembly and rack away from the cylinder ; and the needle rack has two slotted guides with locks, two ears as handles, a protective end; and the cylinder fits into the needle rack, and is locked to the needle assembly by means of lock or screw thread. After using the syringe, hold the cylinder in one hand; push the rack and turn the rack and needle assembly with the other hand. Then the rack and needle assembly ejects and releases from the cylinder. Thereby 4 steps (push, turn, eject and release) to dispose of the needle is ensured.

ABSTRACT

Disposable safety needle rack system comprises a needle assembly, a needle rack, and a cylinder with lock or screw thread, wherein the needle assembly has two sticks for rotating and guide the needle rack, an interiorly threaded or locking base to attach to the cylinder, and two elastic structures that push needle assembly and rack away from the cylinder ; and the needle rack has two slotted guides with locks, two ears as handles, a protective end; and the cylinder fits into the needle rack, and is locked to the needle assembly by means of lock or screw thread.

After using the syringe, hold the cylinder in one hand; push the rack and turn the rack and needle assembly with the other hand. Then the rack and needle assembly ejects and releases from the cylinder. Thereby 4 steps (push, turn, eject and release) to dispose of the needle is ensured.

DISPOSABLE SAFETY NEEDLE RACK SYSTEM AND METHOD OF USE

BACKGROUND OF INVENTION

There are many safety syringe designs such as those that have retractable sheath or retractable needles. Those designs cannot safely and easily separate the hazardous needle from the less-hazardous cylinder and store the hazardous needle properly. Thus it will be difficult for safe disposal and processing of the individual component.

A hypodermic needle entering into a patient's body is inevitably contaminated by the patient's body fluids and blood. After the needle is used, the needle brings a risk to physicians, nurses, and other health care personnel because the needle might transmit an infection or disease to such personnel if it were to accidentally puncture them.

SUMMARY OF INVENTION

One aspect of this invention is a disposable safety needle rack system for syringes comprising: an innovative needle assembly, a needle rack, and a cylinder with lock or screw thread, wherein the innovative needle assembly is removable and ejects mildly; and the needle rack is moveable and stores the innovative needle assembly and is disposable after use; and the cylinder, with lock or screw thread, that the innovative needle assembly attaches to.

Another aspect of this invention is the innovative needle assembly, which has two small sticks on each side; two pieces of elastic structure symmetrically on the bottom and lock (or screw thread inside).

Another aspect of this invention is the innovative needle assembly, which can be rotated, guided, locked and removed from the syringe by two small sticks on each side at the base of the needle assembly. The sticks will allow the guide to be locked in both the covered and exposed positions.

Another aspect of this invention is that the innovative needle assembly ejects mildly by the force created by two pieces of elastic structure, that are placed symmetrically on the sticks or on the base of the needle assembly, while the needle assembly is being removed.

Another aspect of this invention is that the needle assembly will be firmer and safer during the use of the syringe by means of a lock or screw thread as part of the innovative needle assembly. Rotation of the needle rack will provide the means by which the needle assembly is safely removed via its attachment by the symmetrical sticks at the base of the needle assembly.

Another aspect of this invention is that the needle rack is partially open, tubular and disposable, and is comprised of a protective end, two ears, two slots, two finger grips, and

two locks.

Another aspect of this invention is that the needle rack holds the top of the needle in the protective end, thus protecting the user from needle stick.

Another aspect of this invention is that the needle rack slides forward, guided by two slots and locks by means of two indentations at both the bottom and the top of the slots. Along both exterior sides of the plastic guide are two impressions for gripping the slide more easily when moving the needle rack into the safe position.

Another aspect of this invention is that the needle rack is easier to rotate by pushing on two ears located symmetrically on the bottom of the needle rack.

Another aspect of this invention is that the needle rack slides and locks the innovative needle assembly and is rotated to remove it together with the assembly from the cylinder.

Another aspect of this invention is the ability to store the needle safely, comprising: sliding a needle rack forward and locking the innovative needle assembly, then rotating the needle rack and unlocking the innovative needle assembly from the cylinder, and finally removing the needle safely and storing it and the cylinder for disposal or processing.

BRIEF DESCRIPTION OF DRAWINGS

For understanding this invention better, reference may be made to the accompanying drawings in which:

FIG 1 is a enlarged elevational view of a disposable safety needle rack system for syringes comprising: an innovative needle assembly, a needle rack, and a cylinder with lock or screw thread, wherein the innovative needle assembly is removable and ejects mildly; and the needle rack is moveable and stores the innovative needle assembly and is disposable after use; and the cylinder, with lock or screw thread, that the innovative needle assembly attaches to.

From FIG 2 to FIG 13 show four representative kinds of the ejecting needle assembly.

FIG 2 is an enlarged side view of the ejecting needle assembly (arch shaped elastic structures and interior screw threading).

FIG 3 is a top view of the ejecting needle assembly (arch shaped elastic structures and interior screw threading).

FIG 4 is an enlarged 3D view of the ejecting needle assembly (arch shaped elastic structures and interior screw threading).

FIG 5 is an enlarged side view of the ejecting needle assembly (reed shaped elastic structures and L-shaped locking slot).

FIG 6 is a top view of the ejecting needle assembly (reed shaped elastic structures and

L-shaped locking slot).

FIG 7 is an enlarged 3D view of the ejecting needle assembly (reed shaped elastic structures and L-shaped locking slot).

FIG 8 is a sectional side view of the ejecting needle assembly (reed shaped elastic structures and interior threading style).

FIG 9 is a top view of the ejecting needle assembly (reed shaped elastic structures and interior threading style).

FIG 10 is an enlarged 3D view of the ejecting needle assembly (reed shaped elastic structures and interior threading style).

FIG 11 is a side view of the ejecting needle assembly (arch shaped elastic structures and L-shaped locking slot).

FIG 12 is a top view of the ejecting needle assembly (arch shaped elastic structures and L-shaped locking slot).

FIG 13 is an enlarged 3D view of the ejecting needle assembly (arch shaped elastic structures and L-shaped locking slot).

FIG 14 is an enlarged 3D sectional view of the needle rack.

FIG 15 is an enlarged top view of the needle rack.

FIG 16 is an enlarged side view of the needle rack.

FIG 17 is a 3D sectional view of the cylinder with a tab for the L-shaped locking style.

FIG 18 is a 3D sectional view of the cylinder (screw threaded style)

FIG 19-21 illustrates the method of use for the disposable safety needle rack system (the ejecting needle assembly includes arch shaped elastic structures and screw threaded style).

FIG 22-24 illustrates the method of use for the disposable safety needle rack system (the ejecting needle assembly includes reed shaped elastic structures and L-shaped lock.)

DETAILED DESCRIPTION

The following detailed description outlines specific aspects of the invention in order to provide a thorough understanding of it and its uniqueness.

As show in FIG. 1, the syringe with the disposable safety needle rack system includes an innovative needle assembly 10, a needle rack 20, and a cylinder with L-shaped lock or screw threading 30. There is a removable needle rack 20 that surrounds protects and stores the needle assembly 10.

FIG 2, FIG 3, FIG 4 are the views of the ejecting needle assembly comprised of a needle 11, two small sticks on each side 12 (which act as a lever to rotate and guide the ejecting

needle assembly), two pieces of arch shaped elastic structures 13 (which are pressed by the top surface of the cylinder and provide an ejective force symmetrically from the needle assembly, helping it to depart from the cylinder of the syringe), and screw threads 16, shown in phantom.

FIG 5, FIG 6, FIG 7 are the views of the ejecting needle assembly comprised of a needle 11, two small sticks on each side 12, two pieces of reed shaped elastic structures 14 (which are pressed by the top surface of the cylinder and provide an ejective force symmetrically from the needle assembly, helping it to depart from the cylinder of the syringe) and L-shaped lock 15.

FIG 8, FIG 9, FIG 10 are the views of the ejecting needle assembly comprised of a needle 11, two small sticks on each side 12, two pieces of reed shaped elastic structures 14 and screw threads 16, which are shown in phantom.

FIG 11, FIG 12, FIG 13 are the views of the ejecting needle assembly, comprised of a needle 11, two small sticks on each side 12, two pieces of arch shaped elastic structures 13 and L-shaped lock 15.

FIG 14, FIG 15, FIG 16 are the views of the needle rack comprised of two "ears" 21, which make the needle rack easier to rotate, two slots 22, a finger grip 23, a protected end 24, which holds the point of needle when the needle rack is in the extended position.

FIG 17 is a 3D sectional view of the cylinder (locking style), including a barrel 31, which stores the fluid to be injected, with the tab 32 which inserts into the L-shaped lock of the needle assembly, attaching the needle assembly to the cylinder head via the L-shaped locking mechanism.

FIG 18 is a 3D sectional view of the cylinder (screw threaded style) including a barrel 31, which stores fluid to be injected, a positive screw thread 33 ,which firmly attaches the screw threaded version of the needle assembly 16 in FIG 2, 4,8,10 to the cylinder head.

The method of removal of the disposable safety needle rack system - arch shaped elastic structures and screw threaded style (illustrated in figures 19, 20 and 21).

STEP 1 - FIG 19: After the needle has been removed from the patient the needle rack 20 is still in the locked, retracted position. The first step is to apply pressure to the underside edges of the "ears" 21 or on the sides of the rack on the finger grips 23 and slide the rack into the extracted position, as shown in FIG 20, until the sticks lock into position at the bottom of the guide slot 22, also shown in FIG 14, FIG 16.

STEP 2 – FIG 20: Once the needle rack 20 is safely locked into position with the tip of the needle inside of the protective end cap apply a counter-clockwise rotational pressure to

the needle rack 20 until both the needle rack and needle assembly 10 unscrew from the cylinder body 30, as shown in FIG 21. In the design incorporating the arch shaped leaf springs 13, also shown in FIG 2, FIG 4, FIG 11, FIG 13, an additional ejective force is given by the leaf springs.

STEP 3 – FIG 21: After the needle assembly 10 and the needle rack 20 have been separated they may both be disposed of in their designated, individual disposal containers. Ideally this will allow for specific and unique waste handling treatments for both parts of the syringe.

The method of removal of the disposable safety needle rack system – arch shaped elastic structures and L-shaped lock style (illustrated in figures 22, 23 and 24).

STEP 1 - FIG 22: After the needle has been removed from the patient the needle rack 20 is still in the locked, retracted position. The first step is to apply pressure to the underside edges of the "ears" 21 or on the sides of the rack on the finger grips 23 and slide the rack into the extracted position, as shown in FIG 23, until the sticks lock into position at the bottom of the guide slot 22, also shown in FIG 14, FIG 16.

STEP 2 – FIG 23: Once the needle rack 20 is safely locked into position with the tip of the needle inside of the protective end cap apply a counter-clockwise rotational pressure to the needle rack 20 until both the needle rack and needle assembly 10 unlock from the cylinder body 30, as shown in FIG 24. In the design incorporating the reed shaped leaf springs 14, also shown in FIG 5, FIG 7, FIG 8, FIG 10, an additional ejective force is given by the leaf springs.

STEP 3 – FIG 24: After the needle assembly 10 and the needle rack 20 have been separated they may both be disposed of in their designated, individual disposal containers. Ideally this will allow for specific and unique waste handling treatments for both parts of the syringe.

CLAIMS

1. Disposable safety needle rack system for syringes comprising: an innovative needle assembly, a needle rack, and a cylinder with lock or screw thread, wherein the innovative needle assembly is removable and ejects mildly; and the needle rack is moveable and stores the innovative needle assembly and is disposable after use; and the cylinder, with lock or screw thread, that the innovative needle assembly attaches to.
2. The system of claim 1, wherein the innovative needle assembly has two small sticks on each side; two pieces of elastic structure symmetrically on the bottom and lock (or screw thread inside).
3. The system of claim 2, wherein the innovative needle assembly can be rotated, guided, locked and removed from the syringe by two small sticks on each side at the base of the needle assembly. The sticks will allow the guide to be locked in both the covered and exposed positions.
4. The system of claim 2, wherein the innovative needle assembly ejects mildly by the force created by the two pieces of elastic structures (like leaf spring) that are placed symmetrically on the sticks or on the base of the needle assembly and pressed by the top surface of cylinder in locked or screwed position, while the needle assembly is being removed.
5. The system of claim 2, wherein the needle assembly will be firmer and safer during the use of the syringe by means of a lock or screw thread as part of the innovative needle assembly. Rotation of the needle rack will provide the means by which the needle assembly is safely removed via its attachment by the symmetrical sticks at the base of the needle assembly.
6. The system of claim 1, wherein the needle rack is partially open, tubular and disposable, and is comprised of a protective end, two ears, two slots, two finger grips, and two locks.
7. The system of claim 6, wherein the needle rack holds the top of the needle in the protective end, thus protecting the user from needle stick.
8. The system of claim 6, wherein the needle rack slides forward, guided by two slots and locks by means of two indentations at both the bottom and the top of the slots. Along both exterior sides of the plastic guide are two impressions for gripping the slide more easily when moving the needle rack into the safe position.
9. The system of claim 6, wherein the needle rack is easier to rotate by pushing on two ears located symmetrically on the bottom of the needle rack.
10. The system of claim 6, wherein the needle rack is easier to hold and rotate by finger

grip.

11. The system of claim 6, wherein the needle rack slides and locks the innovative needle assembly and is rotated to remove it together with the assembly from the cylinder.

12. This invention is the ability to remove and store the needle safely, comprising: sliding a needle rack forward and locking the innovative needle assembly, then rotating the needle rack and unlocking the innovative needle assembly from the cylinder, and finally removing the needle safely and storing it and the cylinder for disposal or processing.

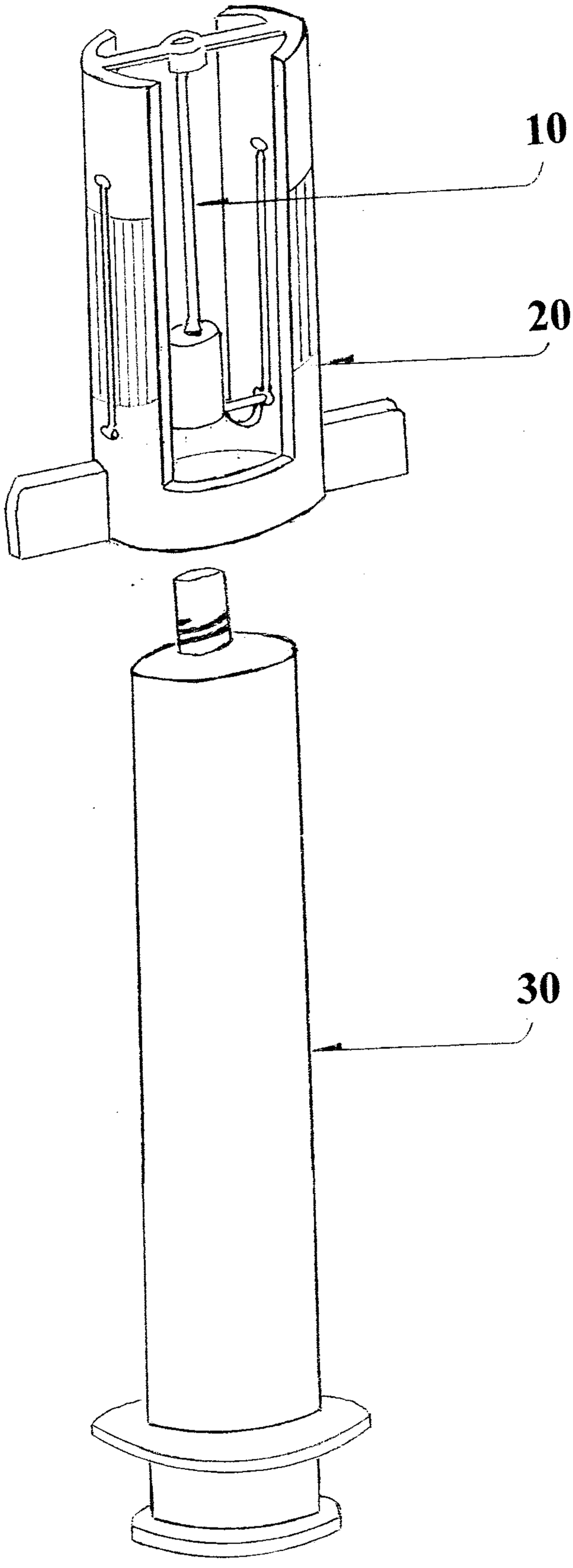


FIG 1

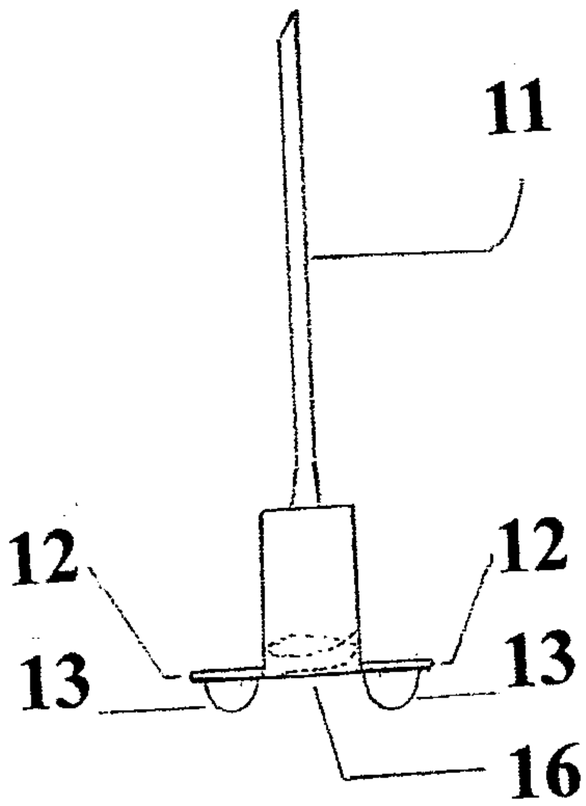
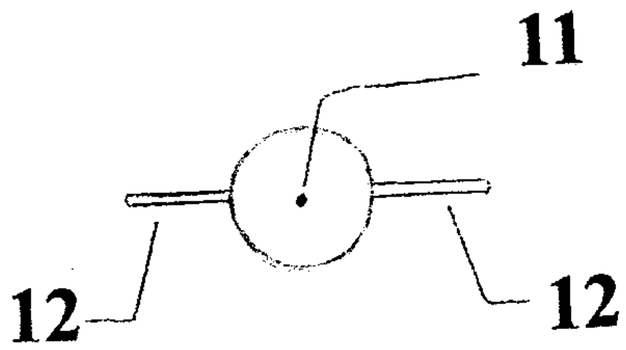


FIG 2



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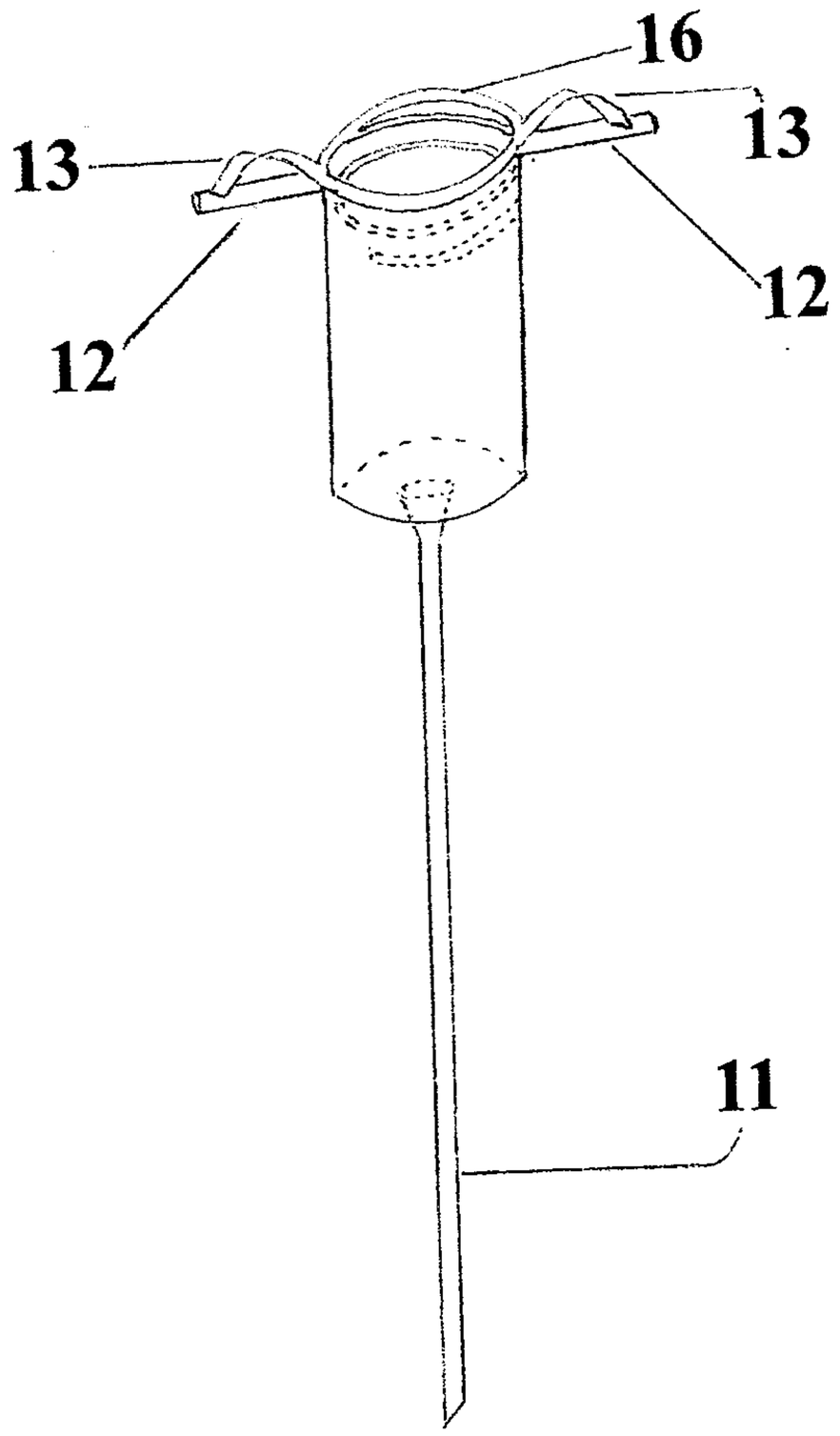


FIG 4

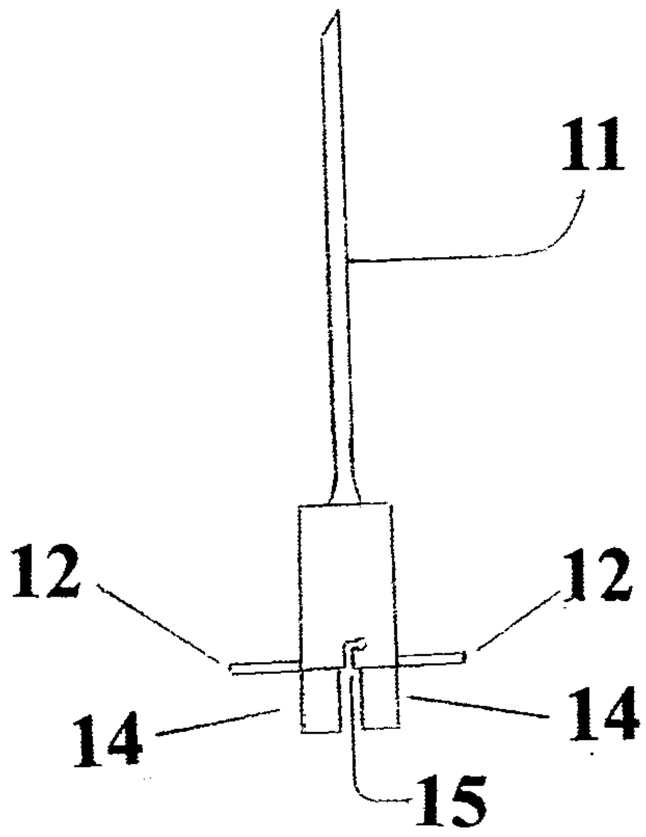


FIG 5

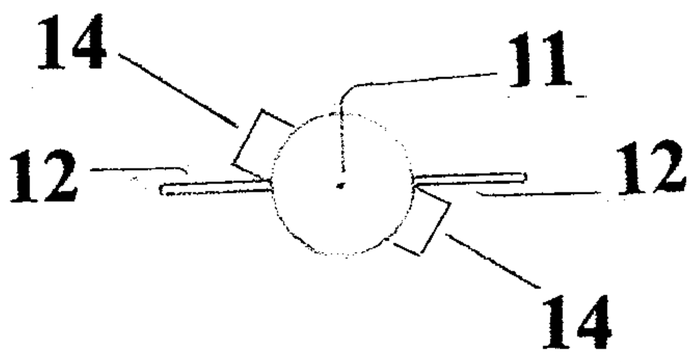


FIG 6

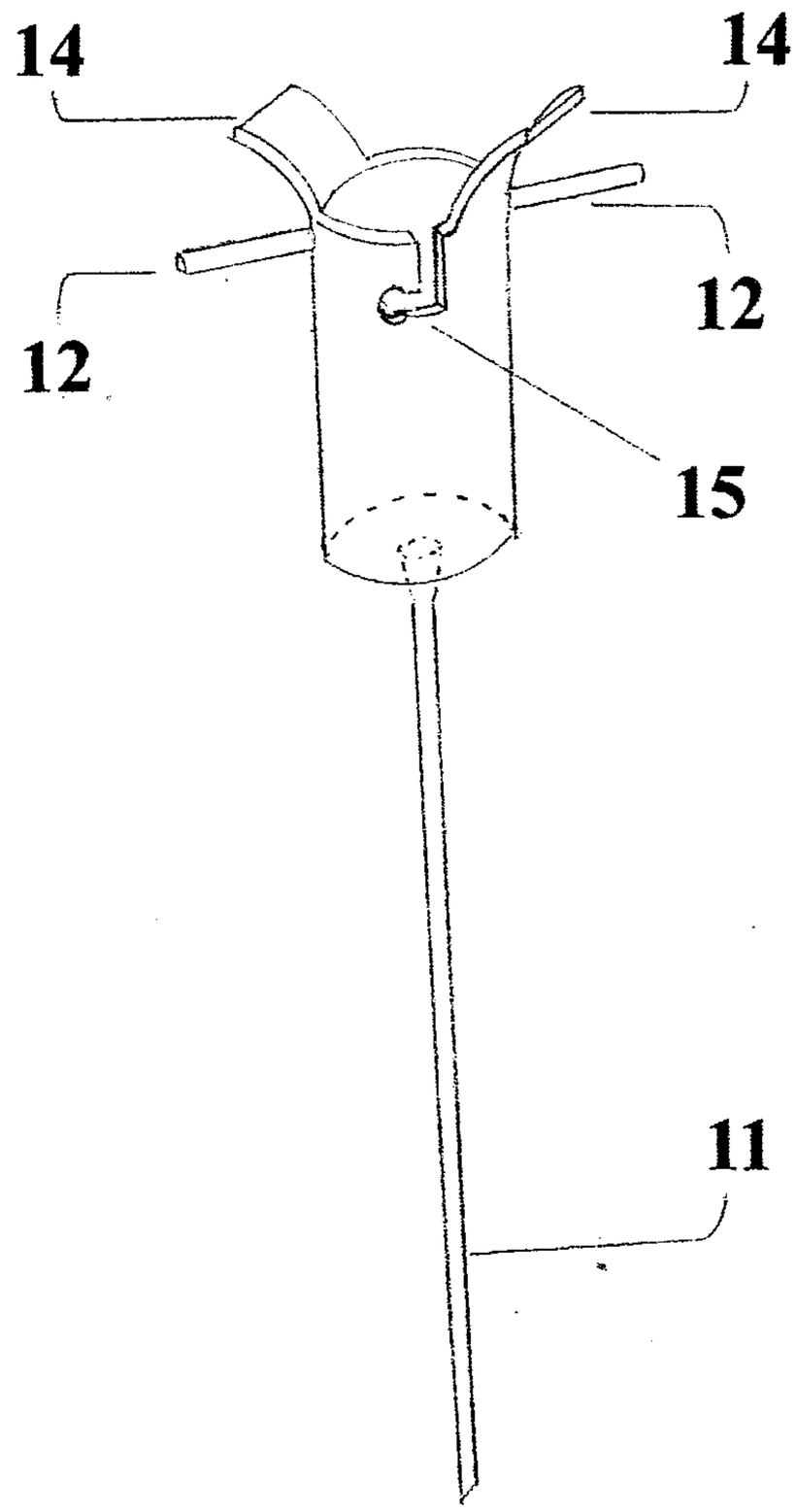


FIG 7

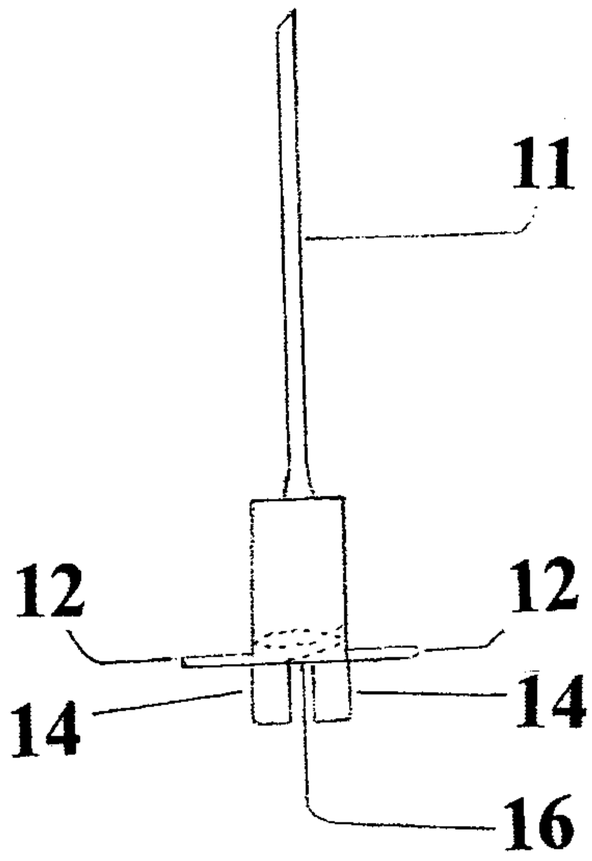


FIG 8

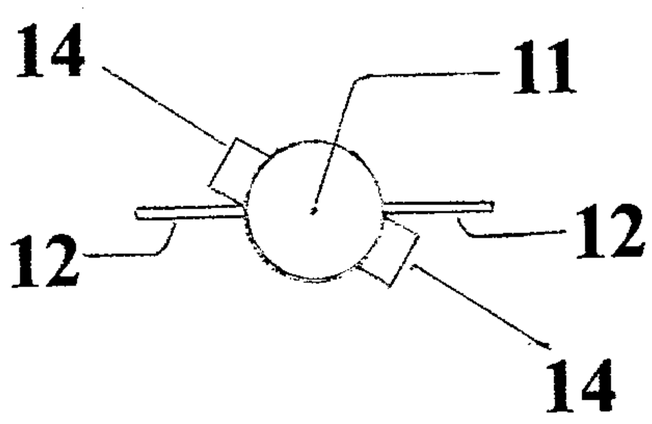


FIG 9

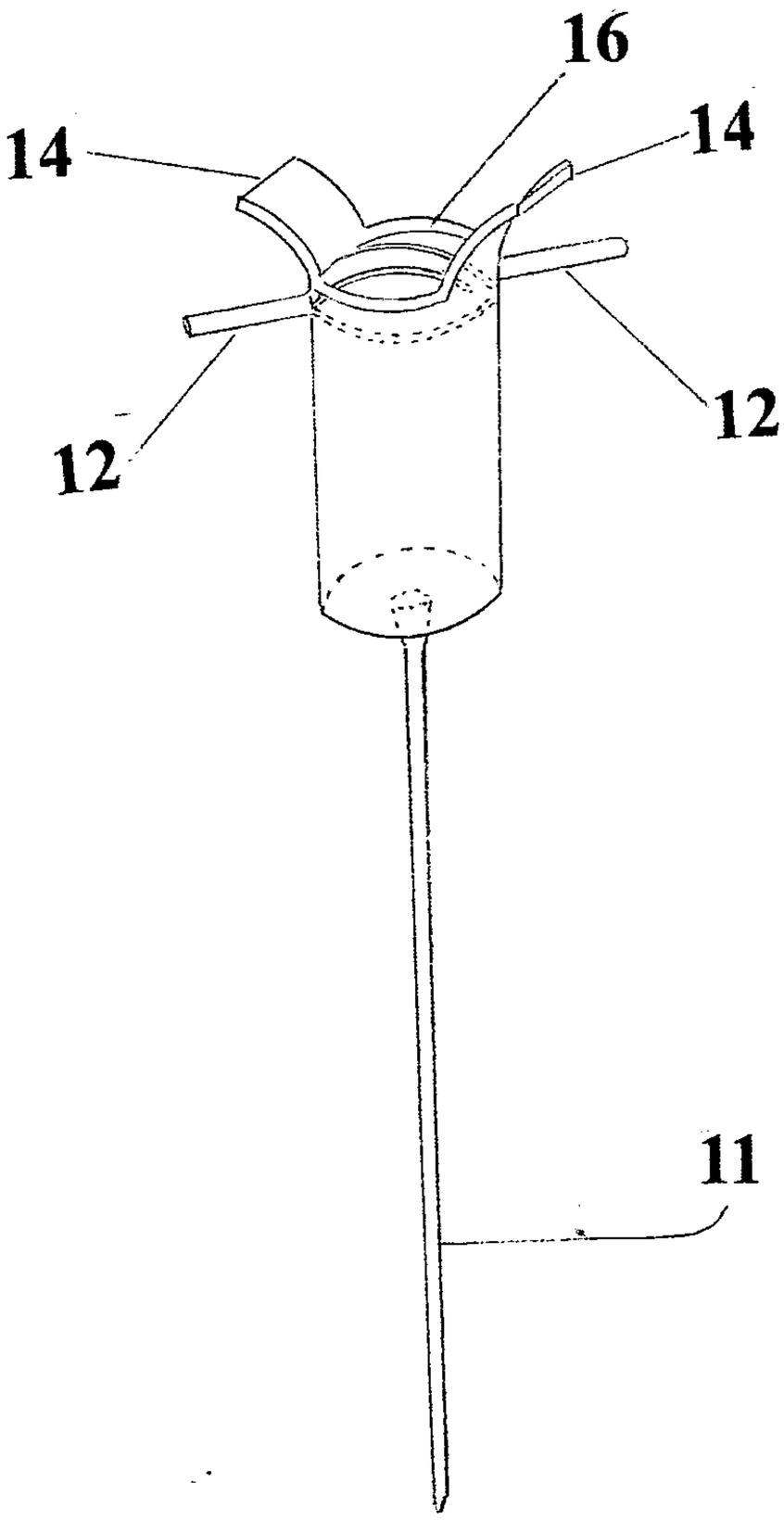


FIG 10

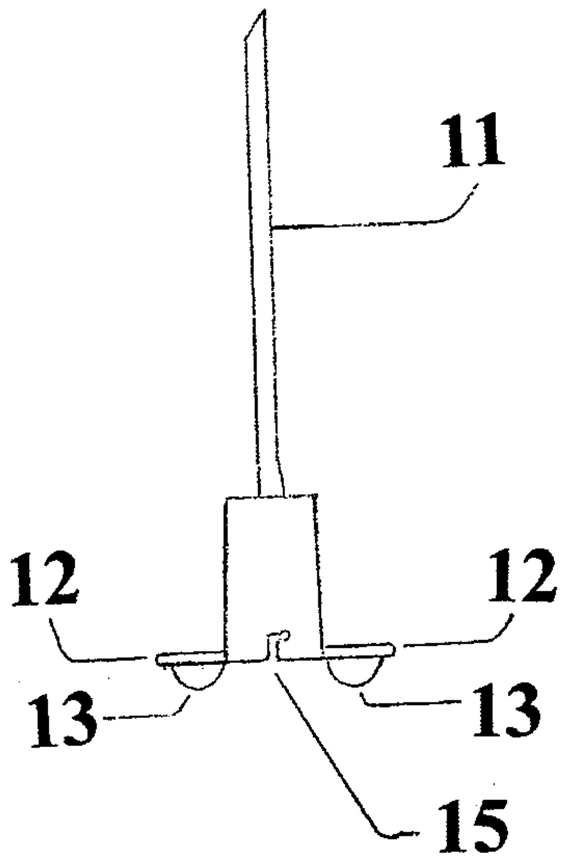


FIG 11

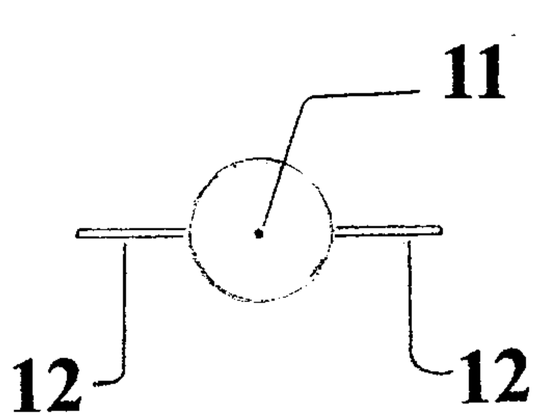


FIG 12

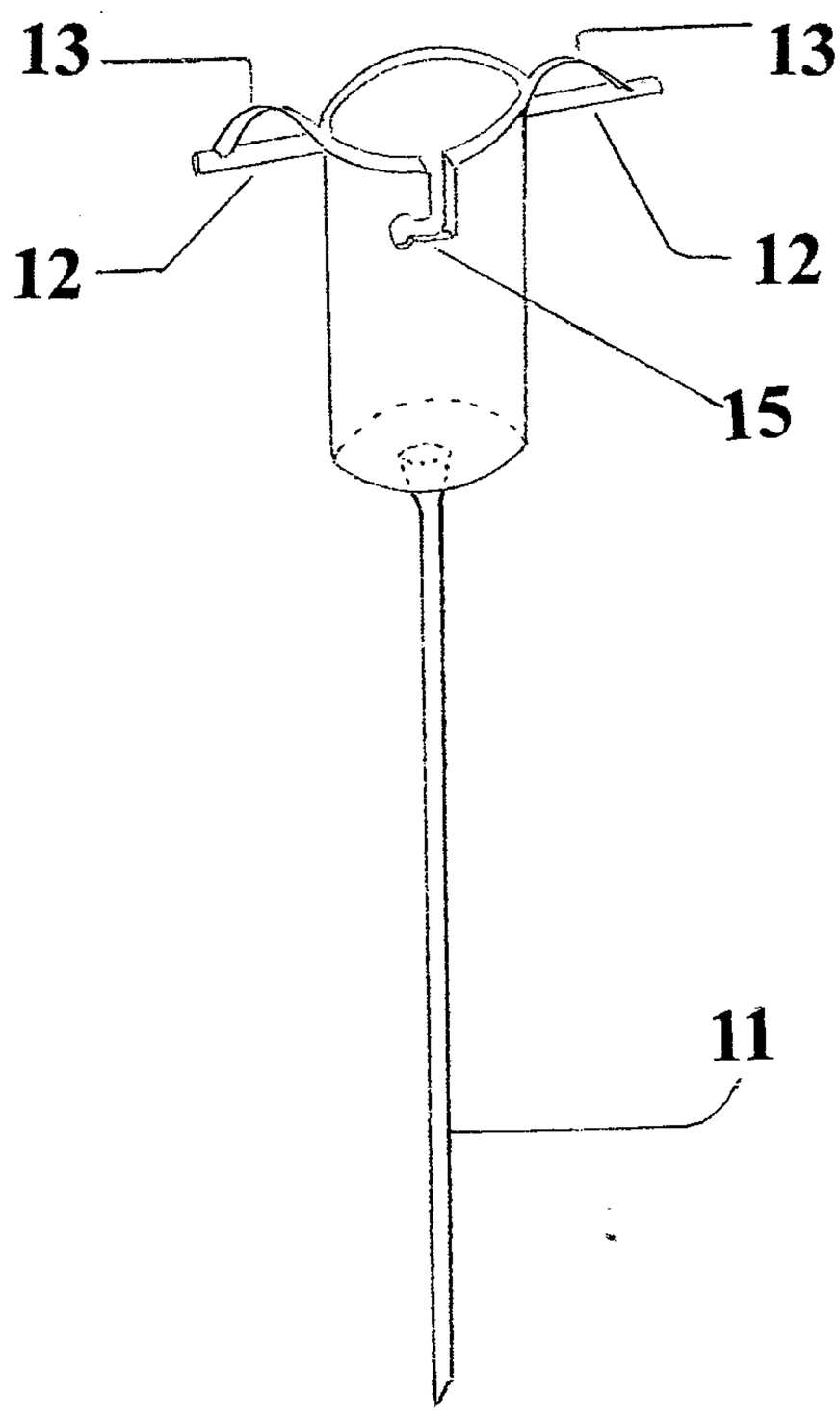


FIG 13

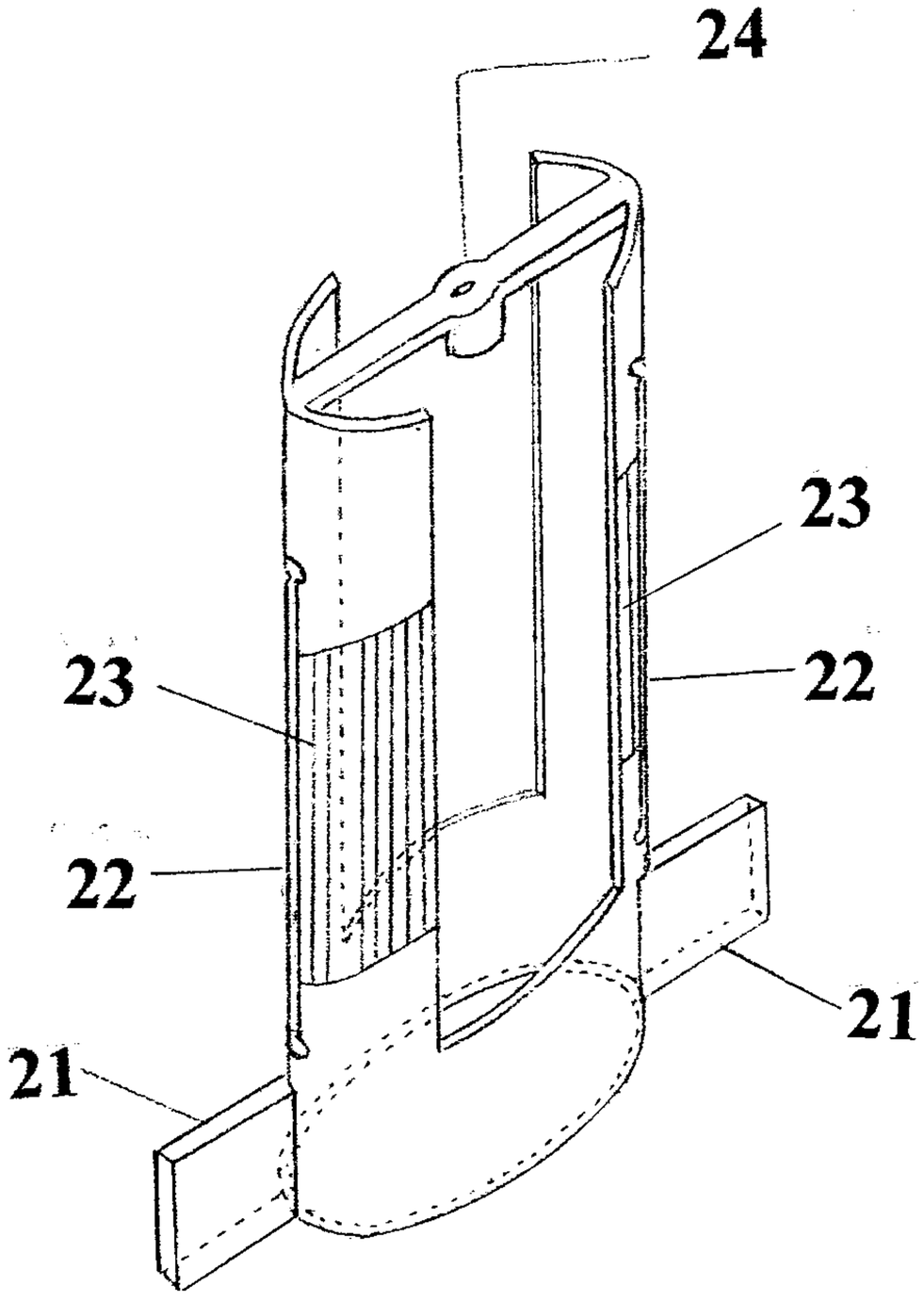


FIG 14

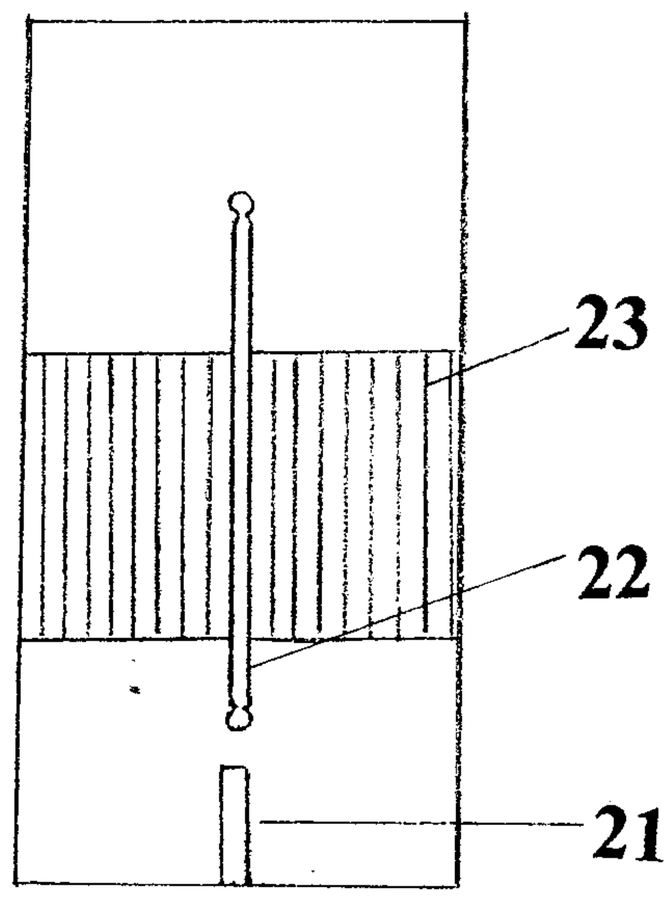


FIG 16

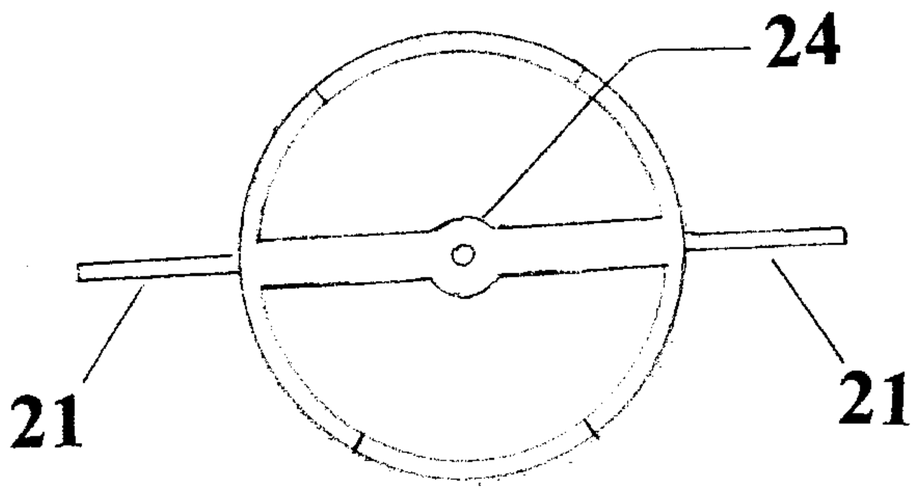


FIG 15

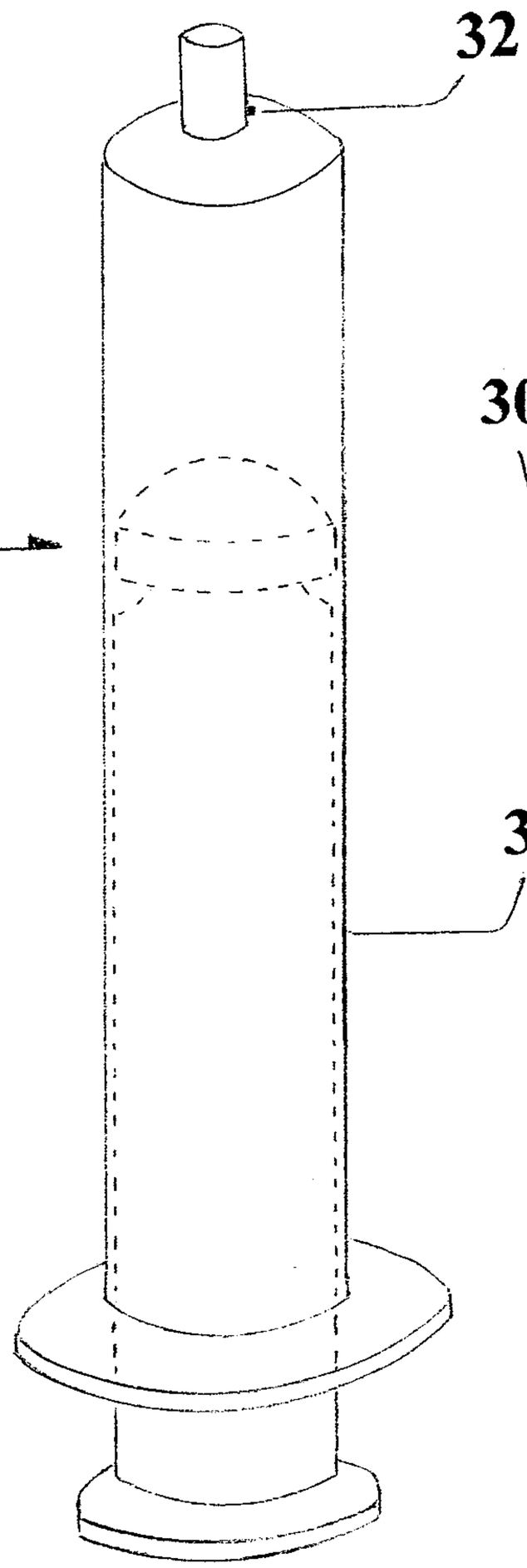


FIG 17

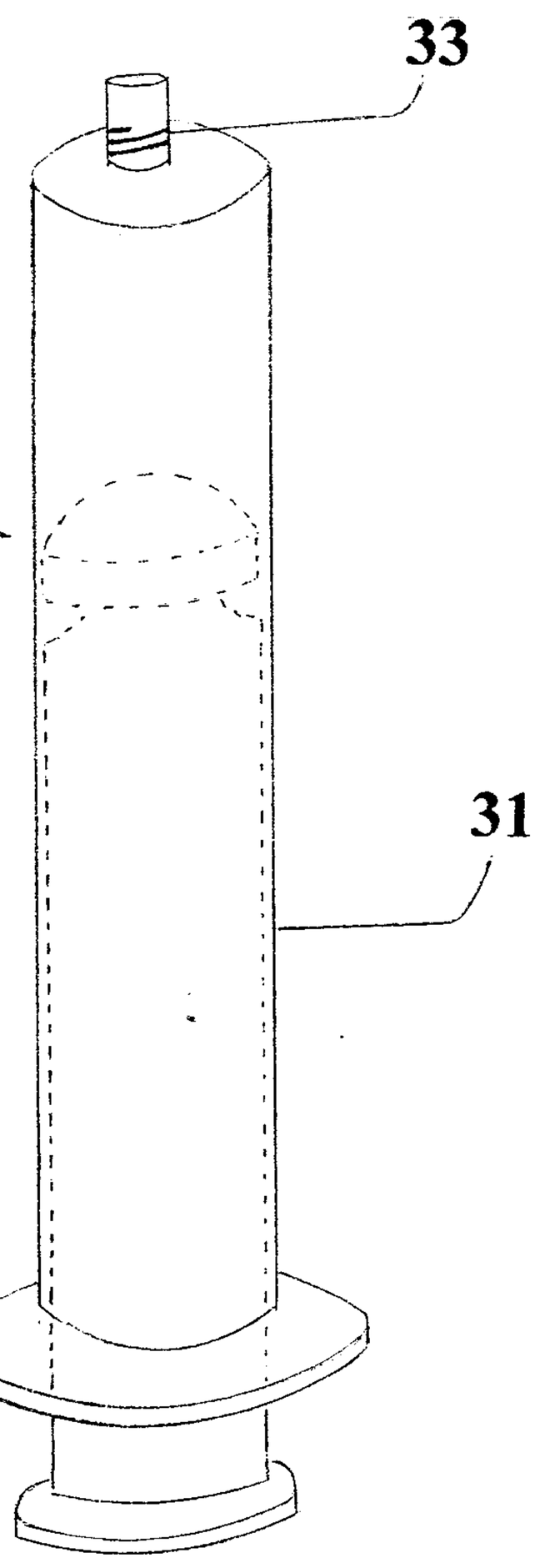


FIG 18

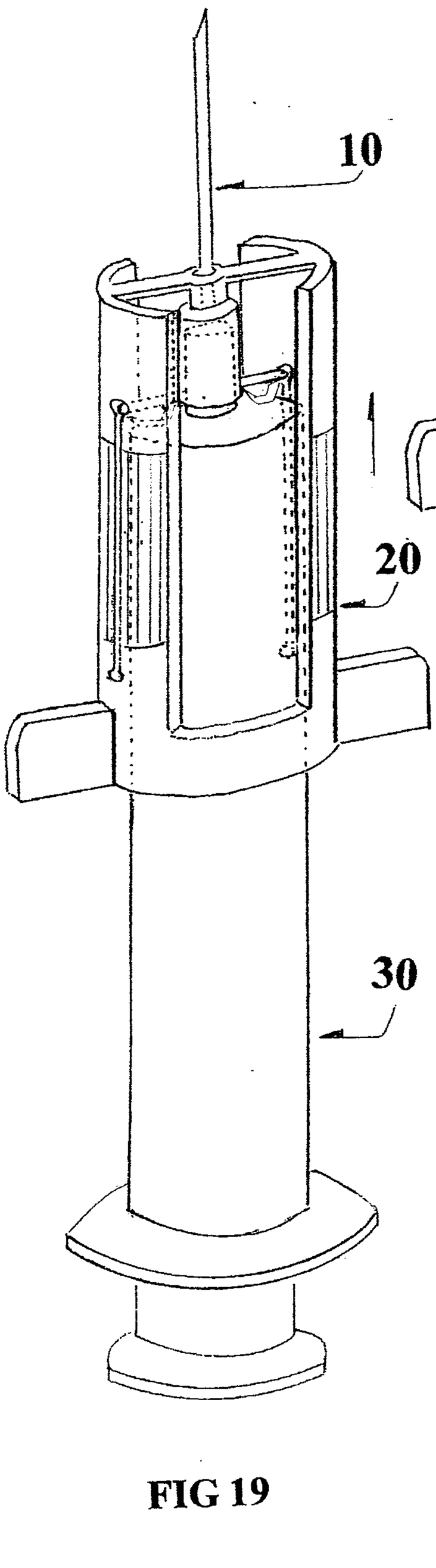


FIG 19

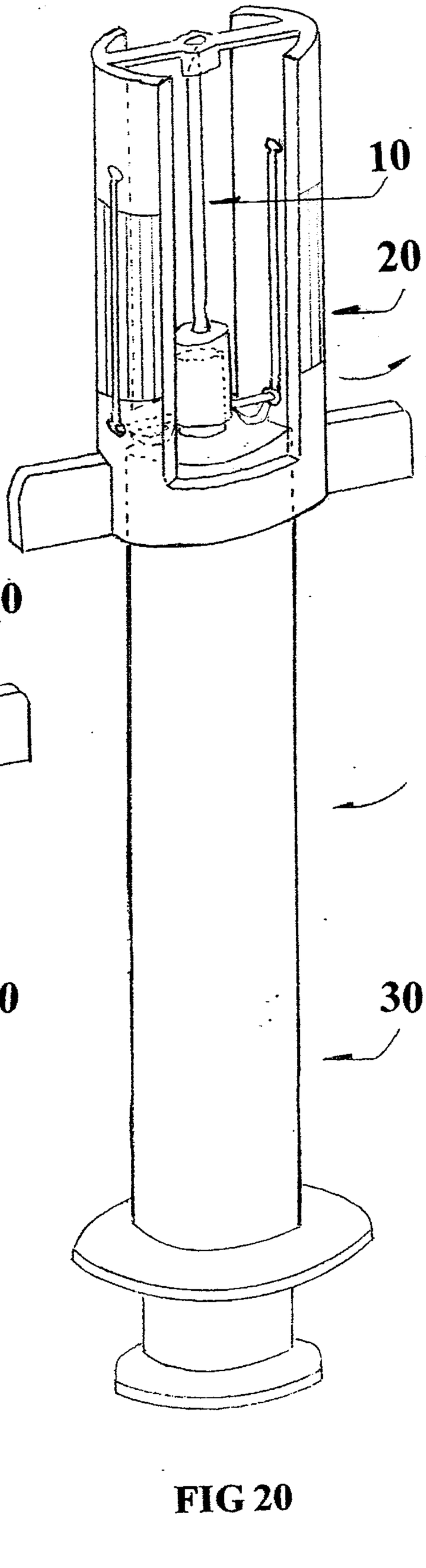


FIG 20

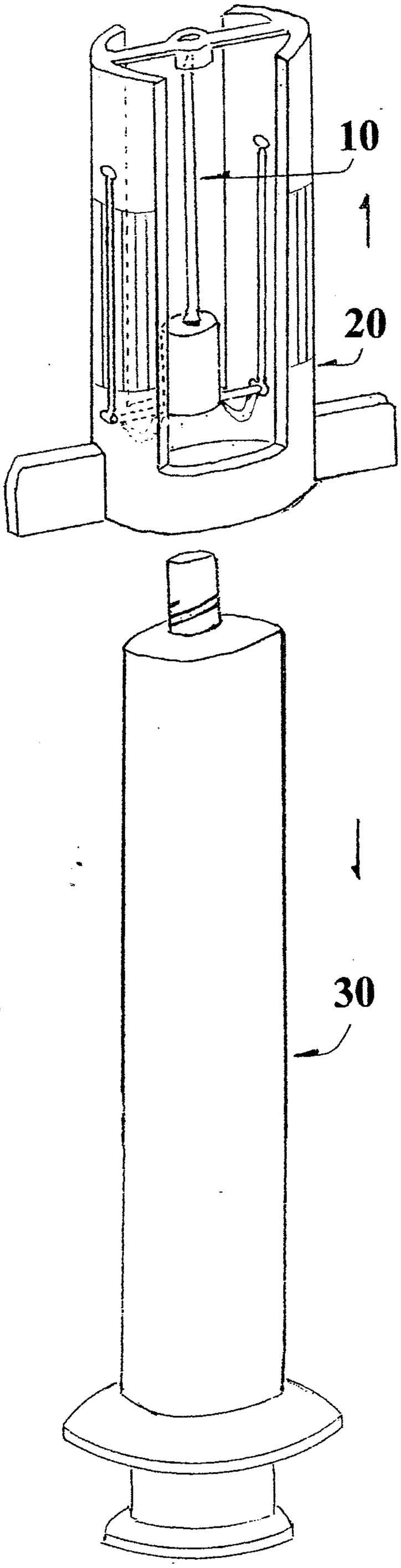


FIG 21

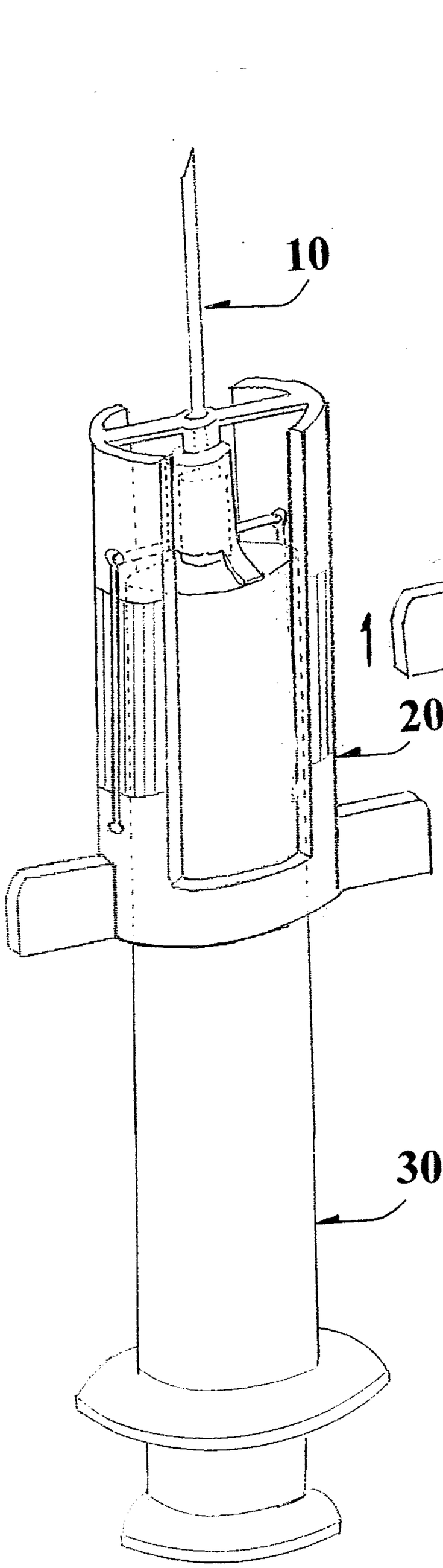


FIG 22

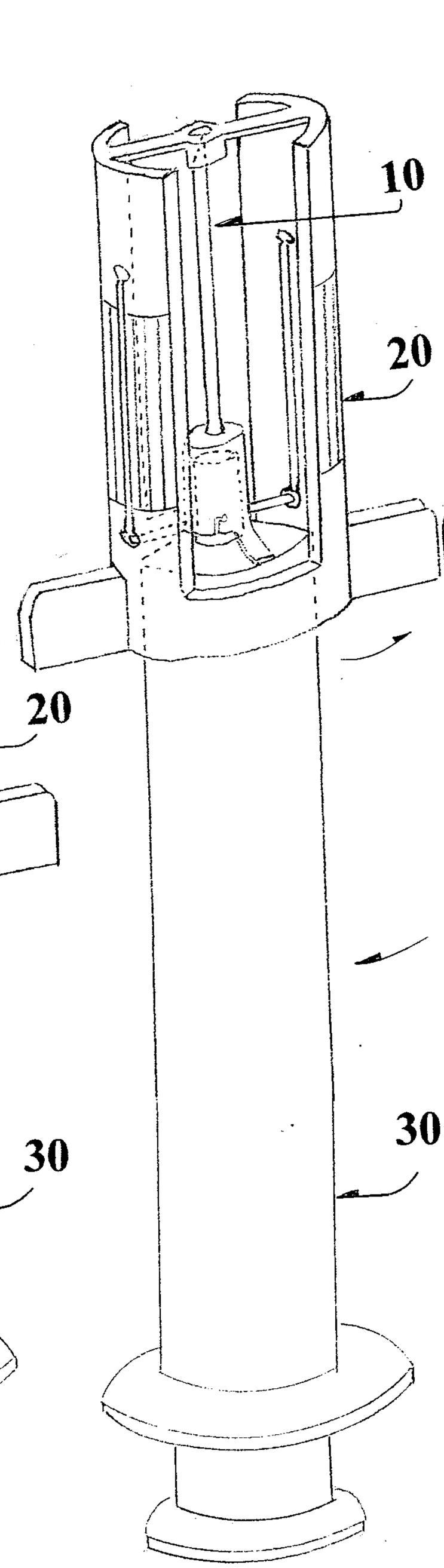


FIG 23

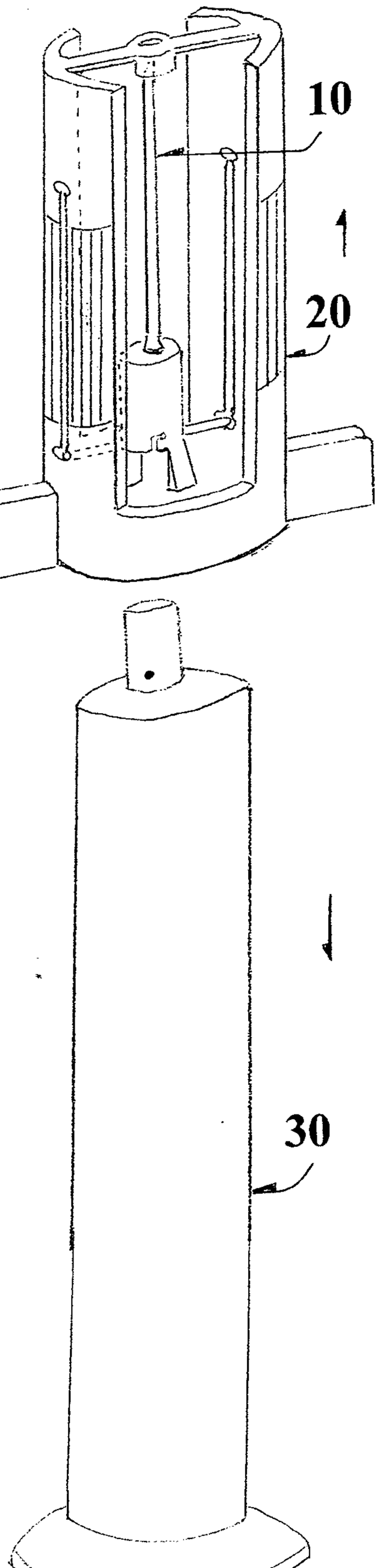
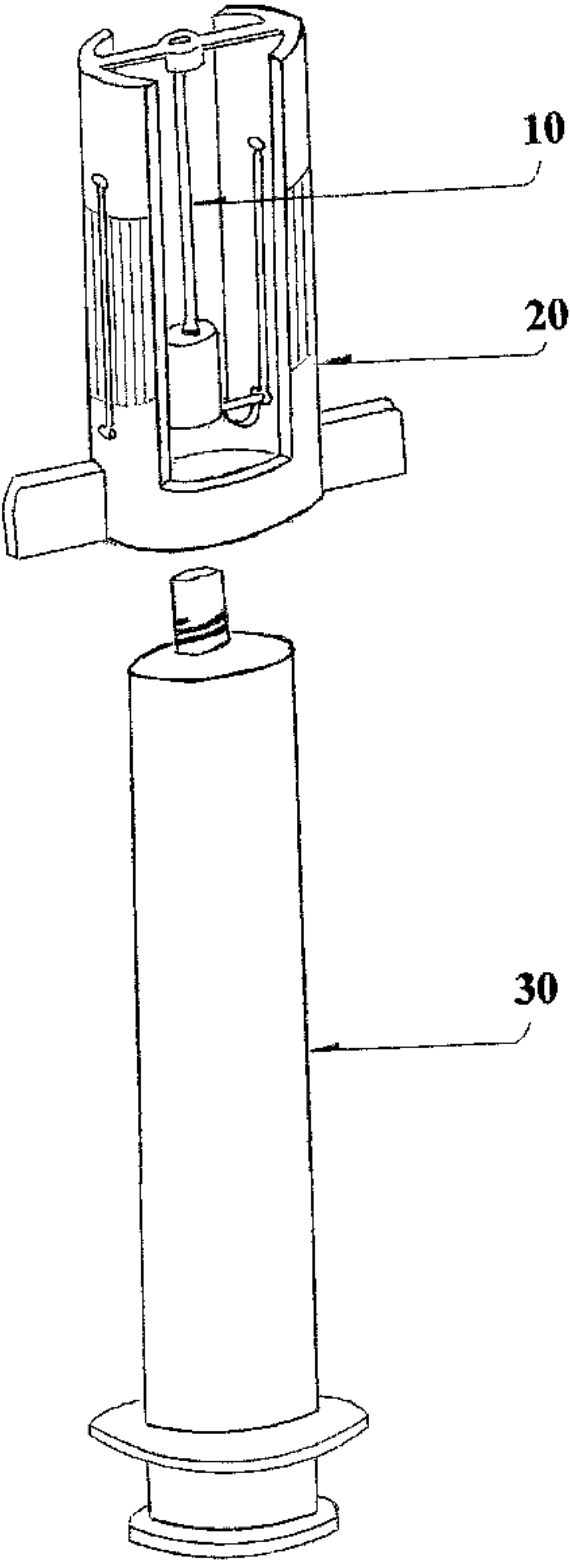


FIG 24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