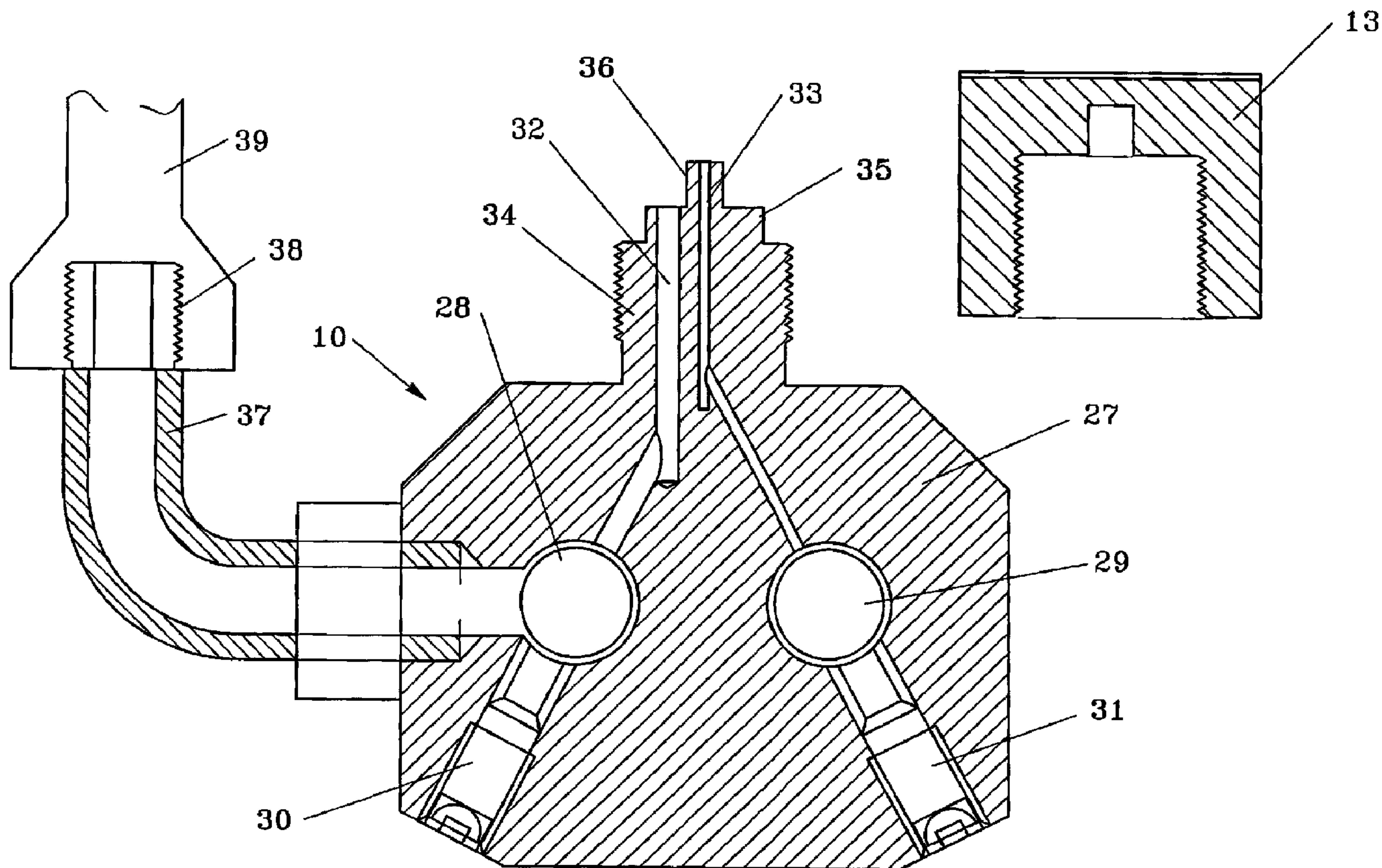




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(54) Titre : DISPOSITIF DE DOSAGE ET DE COMPTAGE POUR ADHESIF A UN OU A DEUX COMPOSANTS
 (54) Title: DISPENSING/METERING DEVICE FOR TWO-COMPONENT OR ONE-COMPONENT ADHESIVE



(57) Abrégé/Abstract:

The invention relates to a metering device comprising: • a base plate (1) fitted with heating means (25) and a pipe (7) which connects two openings, at least one (4) of which is located on the upper wall of the said plate • two or more tanks (2, 2') designed

(57) **Abrégé(suite)/Abstract(continued):**

to rest on the plate, which are fitted with a connector (5) designed to be inserted into the said pipes • metering means (8) designed to be connected to the other end of the said pipes (7) to convey the product from the interior of the said tanks through the said plate; the outlet of the said metering means (8) leading to a dispensing head (10) which contains two chambers (28, 29), connected to feed devices that convey the adhesive from each tank, while two nozzles (32, 33) connect the said chambers to two outlets, one of the said chambers (28) also being connected to a second pipe (37) which dispenses the adhesive.

ABSTRACT

The invention relates to a metering device comprising:

- a base plate (1) fitted with heating means (25) and a pipe (7) which connects two openings, at least one (4) of which is located on the upper wall of the said plate
- two or more tanks (2, 2') designed to rest on the plate, which are fitted with a connector (5) designed to be inserted into the said pipes
- metering means (8) designed to be connected to the other end of the said pipes (7) to convey the product from the interior of the said tanks through the said plate;

the outlet of the said metering means (8) leading to a dispensing head (10) which contains two chambers (28, 29), connected to feed devices that convey the adhesive from each tank, while two nozzles (32, 33) connect the said chambers to two outlets, one of the said chambers (28) also being connected to a second pipe (37) which dispenses the adhesive.

DISPENSING/METERING DEVICE FOR TWO-COMPONENT OR ONE-COMPONENT ADHESIVE

This invention relates to a dispensing/metering device for two-component
5 or one-component adhesive, which is designed for use particularly, but not
solely with film bonding machines.

In accordance with one aspect of the invention, two tanks are fitted to
contain the component(s), namely resin and hardener in the case of two-
component adhesive, whereas a single tank can be used in the case of
10 one-component adhesive.

These tanks are fitted to a heated support in such a way that they can
easily be removed, so that heat is transmitted to the products through the
base of the containers.

In accordance with another aspect of the invention, the level of the
15 components in the tanks is monitored by an ultrasound sensor, thus
avoiding the use of mechanical devices, which would be difficult to clean
when the type of adhesive is changed.

The result is a much simpler device than those already known, which is
functional and eliminates practically all the down time required for cleaning
20 of tanks when changing from one type of adhesive to another.

The known devices used to measure out and dispense adhesive are
equipped with fixed tanks for the products that constitute the adhesive, the
tanks being heated by a resistor fitted inside a jacket which surrounds the
side wall of each tank.

25 Each tank is connected to a pump which conveys the required amount of

product to a mixer, where the two components are mixed before use.

These machines are completed by various accessories, including float devices which monitor the product level in the tanks.

However, these machines present a considerable drawback when the time comes to change over from one type of adhesive to another; the machine has to be shut down for a considerable time to allow thorough cleaning of the tanks and the devices inside them, so as not to contaminate the new products with residues of the previous ones. This is a fairly long, inconvenient and difficult operation which, as mentioned, requires the machine to be shut down for several hours in order to perform sufficiently thorough cleaning.

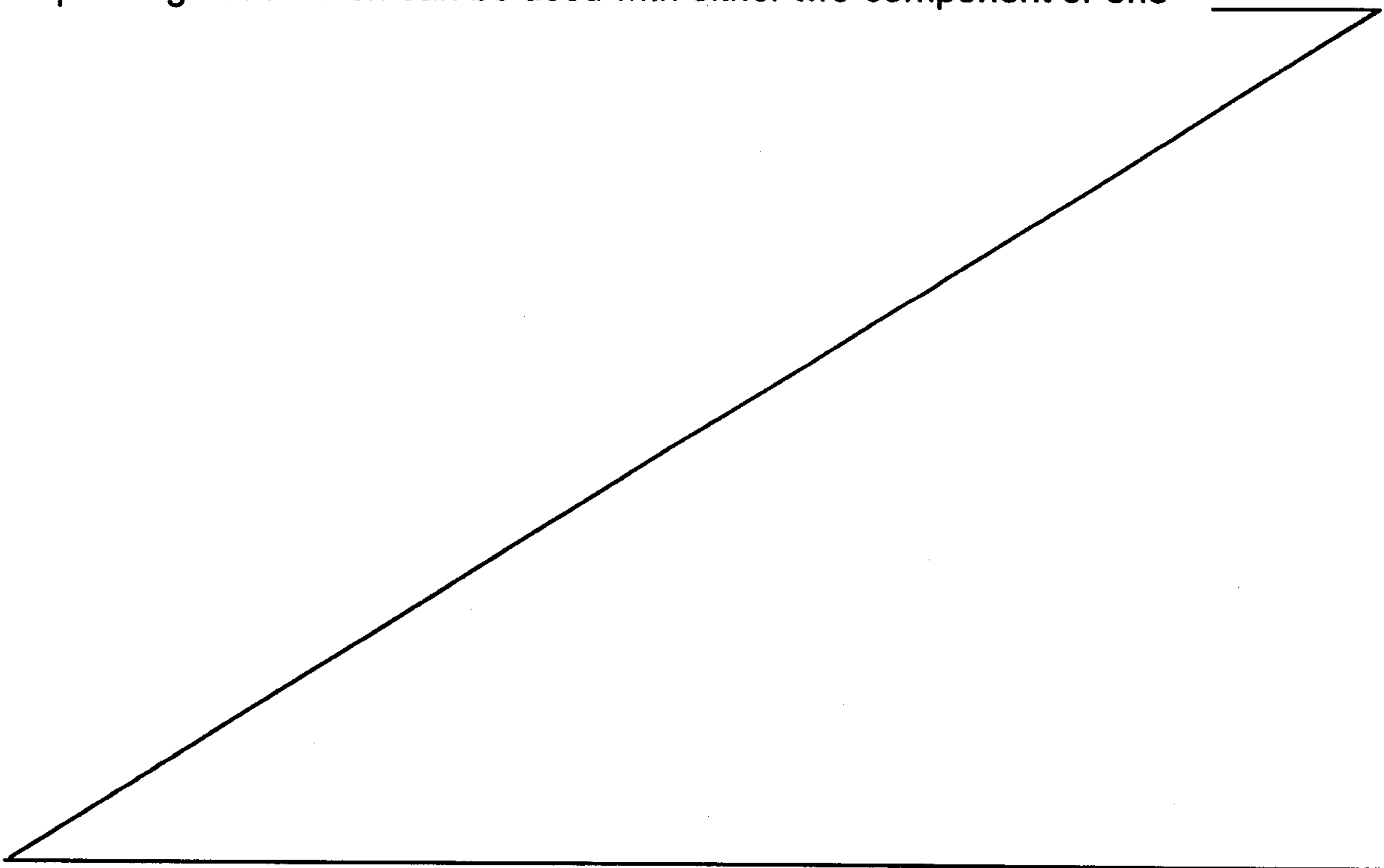
The same problem also applies to cleaning of other parts of the machine, especially the dispensing nozzles, which have a complex shape and are therefore difficult to clean as thoroughly as necessary, with the result that when the type of adhesive is changed, the operators often replace the dispensing head as well as cleaning the machine because of the difficulty of cleaning the head properly.

This drawback is now solved by the present invention, which offers a metering device for both two-component and one-component adhesive, in which the tank or tanks that contain the adhesive are fitted removably on a heated plate so that they can easily be removed or replaced with other tanks containing the new product, and can be thoroughly washed at a distance from the machine.

2a

According to the present invention, there is provided a metering device for an one-component or two-component adhesive, comprising two tanks suitable for containing two components of adhesive, heating means for heating said tanks, independently regulated means for conveying a required amount of adhesive from the tanks to a dispensing head, said head comprising two chambers each separately connectable to each tank, and two nozzles which connect said chambers to two outlets of the dispensing head, said outlets leading to a first adhesive dispensing connector, one of the chambers further being connected to an outlet pipe; said outlet pipe is closable so each component of the adhesive
10 contained in each of two tanks is dispensed, as said two-component adhesive, through said nozzles at the first adhesive dispensing connector, and the first adhesive dispensing connector is closable so said one-component adhesive contained in one of two tanks is dispensed through said outlet pipe.

Preferably, the machine in accordance with the invention also has an innovative dispensing head which can be used with either two-component or one-



component adhesives, and can easily be cleaned thoroughly.

This invention will now be described in detail, by way of example but not of limitation, with reference to the annexed figures in which:

- figure 1 is a view of a device in accordance with the invention
- 5 • figure 2 is a side view of the device shown in figure 1
- figure 3 is a plan view of the device in accordance with the invention
- figure 4 is a cross-section of the dispensing head in a device in accordance with the invention
- 10 • figure 5 is a vertical cross-section of the device in accordance with the invention
- figure 6 is a schematic plan view of the device in accordance with the invention.

With reference to the annexed figures, the device basically comprises a base 1, which also constitutes the adhesive heating plate, on which a pair
15 of tanks 2 and 2' are mounted. Each of the said tanks contains one of the components of the mixture in the case of two-component adhesive, and the said components are pumped out and metered by devices which will be described below.

In the case of one-component adhesive, one of the tanks could be
20 bypassed, and the corresponding pump with associated control electronics and heating devices could also be bypassed with a selector switch.

The said selector switch could also select the tank from which the adhesive is pumped.

A control unit 3, containing a PLC or an analog computer, controls the
25 functions of the machine and the various units of which it is composed.

In particular, there is a hole 4 in heated base 1 in correspondence with each tank 2 and 2' into which is inserted a connector with a suitable gasket such as an O-ring or the like, the said connector being fitted to the base of the tank.

5 Hole 4 leads on the opposite side to a pipe 7 which is connected to the inlet of a motorised metering pump 8, in particular a gear pump, the outlet of which is connected to a product dispensing head 10.

Each tank can be secured to baseplate 1 with a set of snap hooks 14 of known type or the like, and a cap 15 with an O-ring 16 is fitted to close the
10 bottom of the tank.

Tank 2 is closed by a lid 17 to which a pipe 18 leads from a container 19 filled with moisture-absorbing material such as silica gel; the air which penetrates into the tank passes through the said moisture-absorbing material as the level of the product in the tank falls.

15 Lid 17 also contains an ultrasound sensor 20 designed to monitor the level of the product in the tank and send a corresponding signal to control unit 3.

A membrane pressure sensor 21 is connected to the outlet of each pump 8, and is also connected to control unit 3.

20 A temperature sensor 24 is positioned in a seating in the wall of tank 2.

A plurality of heating elements are inserted in baseplate 1; in this specific case they are constituted by electrical resistors 25, but they could also be constituted by any heating device of known type.

Preferably, as illustrated in figure 6, at least one pair of resistors 25 is
25 located in the immediate proximity of hole 4 through which the product

exits from the tanks, and is thus immediately heated.

The tanks and the various distribution pipes are enclosed in a casing 26 lagged with a suitable layer of heat insulation material which is secured around the tanks to prevent heat dispersion and maintain a suitable
5 temperature in the tanks.

Finally, the pipes which convey the adhesive component to the dispensing head are also suitably provided with heat insulation means, which may include heating means such as an electrical resistor.

Dispensing head 10 is illustrated in detail in figure 4.

10 The said head comprises a body 27 with a pair of inlets or chambers 28 and 29 fitted with connectors, not shown in the figure, for the pipes leading from tanks 2 and 2' which contain the components of the adhesive.

A pair of inspection and cleaning pipes 30 and 31, each closed by a cap, lead to chambers 28 and 29.

15 Pipes or nozzles 32 and 33 lead from chambers 28 and 29 to a connector 34 on head 10.

The end of connector 34 presents two consecutive lengths 35 and 36 of a different diameter. Nozzles 32 and 33 lead to the end walls of these lengths 35 and 36 respectively.

20 Connector 34 is threaded, and a closing cap 13 is screwed to it. The shape of the end wall of the said cap 13 complements that of the end of connector 34, so that it rests against the end wall of the latter and seals nozzles 32 and 33.

An outlet pipe 37, with a thread 28 for fitting a dispensing syringe or the
25 like 39, leads to one of chambers 28 and 29; in the case illustrated in the

figure it leads to chamber 28. Chamber 28 is connected to the adhesive tank when a one-component adhesive is used.

The device operates as follows.

To prepare the device for operation, it is sufficient to fit the tanks to plate
5 1, insert connector 5 into hole 4, and secure the tanks with snap hooks 14. When the tanks are filled with the required products, they can be closed with hermetically sealing lid 17, and the machine is switched on. Resistors
25 heat plate 1, from which heat is transmitted to the product through the bottom of the tanks; the temperature of the product is monitored by sensor
10 24, which transmits the data to the control unit.

At the same time pumps 8 are activated to pump the product from the bottom of the tanks and convey it through hole 4 and pipe 7 to dispensing head 10. The speed of the pumps can be independently regulated to allow perfect metering of the two fluids when they are discharged.

15 In the case of two-component adhesive, the two components reach chambers 28 and 29, from which they are dispensed through nozzles 32 and 33 which lead to connector 34, to which dispensing syringe 39 is fitted.

In the case of one-component adhesive, cap 13 is screwed to connector
20 34, thus sealing nozzles 32 and 33 to prevent hardening of the product, and dispensing syringe 39 is fitted to connector 38 on outlet pipe 37, from which the adhesive conveyed from the tank to chamber 28 is dispensed.

If cleaning operations are necessary, it is sufficient to connect to connector 38 or 34 devices able to pump a cleaning fluid such as a solvent, and to
25 remove the closing caps from inspection pipes 30 and 31.

- If the fluid is pumped through nozzles 32 and 33, thorough cleaning can be performed easily and quickly, and all debris is removed, exiting through inspection pipes 30 and 31, which are of larger diameter. When the type of adhesive needs to be changed, it is no longer necessary to shut down the machine before a thorough tank cleaning operation can be performed; it is sufficient to loosen snap hook 14 and remove the tanks, which can thus be cleaned conveniently at a later stage. When the pipes have been washed with a suitable solvent, the tanks containing the new adhesive can be attached, and the machine started up again.
- 10 An expert in the field could devise numerous modifications and variations, all of which should be deemed to fall within the scope of this invention.

WHAT IS CLAIMED IS:

1. Metering device for an one-component or two-component adhesive, comprising two tanks suitable for containing two components of adhesive, heating means for heating said tanks, independently regulated means for conveying a required amount of adhesive from the tanks to a dispensing head, said head comprising two chambers each separately connectable to each tank, and two nozzles which connect said chambers to two outlets of the dispensing head, said outlets leading to a first adhesive dispensing connector, one of the chambers further being connected to an outlet pipe; said outlet pipe is closable so each
10 component of the adhesive contained in each of two tanks is dispensed, as said two-component adhesive, through said nozzles at the first adhesive dispensing connector, and first adhesive dispensing connector is closable so said one-component adhesive contained in one of two tanks is dispensed through said outlet pipe.
2. Metering device as claimed in claim 1, characterised in that said first adhesive dispensing connector is fitted with means allowing an application of a cap which closes said nozzles.
3. Metering device as claimed in claim 2, characterised in that said nozzles lead to an end wall of the said connector, and that the said cap blocks said nozzles
20 when fitted to said connector.
4. Device as claimed in any one of claims 1 to 3, characterised in that said pipe is fitted with a connector allowing an application of a dispensing syringe.
5. Device as claimed in any one of claims 1 to 4, characterised in that said tanks are removable, and said heating means are constituted by a support plate with resistors on which said tanks rest.

6. Metering device as claimed in claim 5, wherein said support plate is a baseplate fitted with said heating means and at least two pipes which connects two openings, said two openings being located on an upper wall of the said plate; in that said tanks are capable of resting on the plate, which are fitted with a connector capable of being inserted into said at least two pipes; in that said independently regulated means comprises metering means capable of being connected to an end of said at least two pipes to convey a product from an interior of said tanks through said plate; and in that an outlet of the said metering means leads to the dispensing head which contains said two chambers, connected to said feed devices that
10 convey the adhesive from each tank, while said two nozzles connect said chambers to said two outlets, one of the said chambers being connected to said pipe which dispenses the adhesive.
7. Device as claimed in claim 6, characterised in that said metering means are constituted by gear pumps.
8. Metering device as claimed in claim 7, comprising coupling means for securing said tanks to said plate.
9. Metering device as claimed in any one of claims 5 to 8, comprising ultrasound sensors for monitoring a product level in said tanks.
10. Metering device as claimed in claim 9, in which said ultrasound sensors are
20 located in lids of said tanks.
11. Metering device as claimed in any one of claims 1 to 10, comprising membrane pressure sensors located at an outlet of said independently regulated means, which send a signal indicating a fluid pressure to a control unit which controls the metering device.

12. Metering device as claimed in any one of claims 1 to 4, comprising at least one temperature sensor housed in a seating in a wall of said tanks respectively, said at least one sensor detecting a temperature of the components of the adhesive and sending a corresponding signal to a control unit.

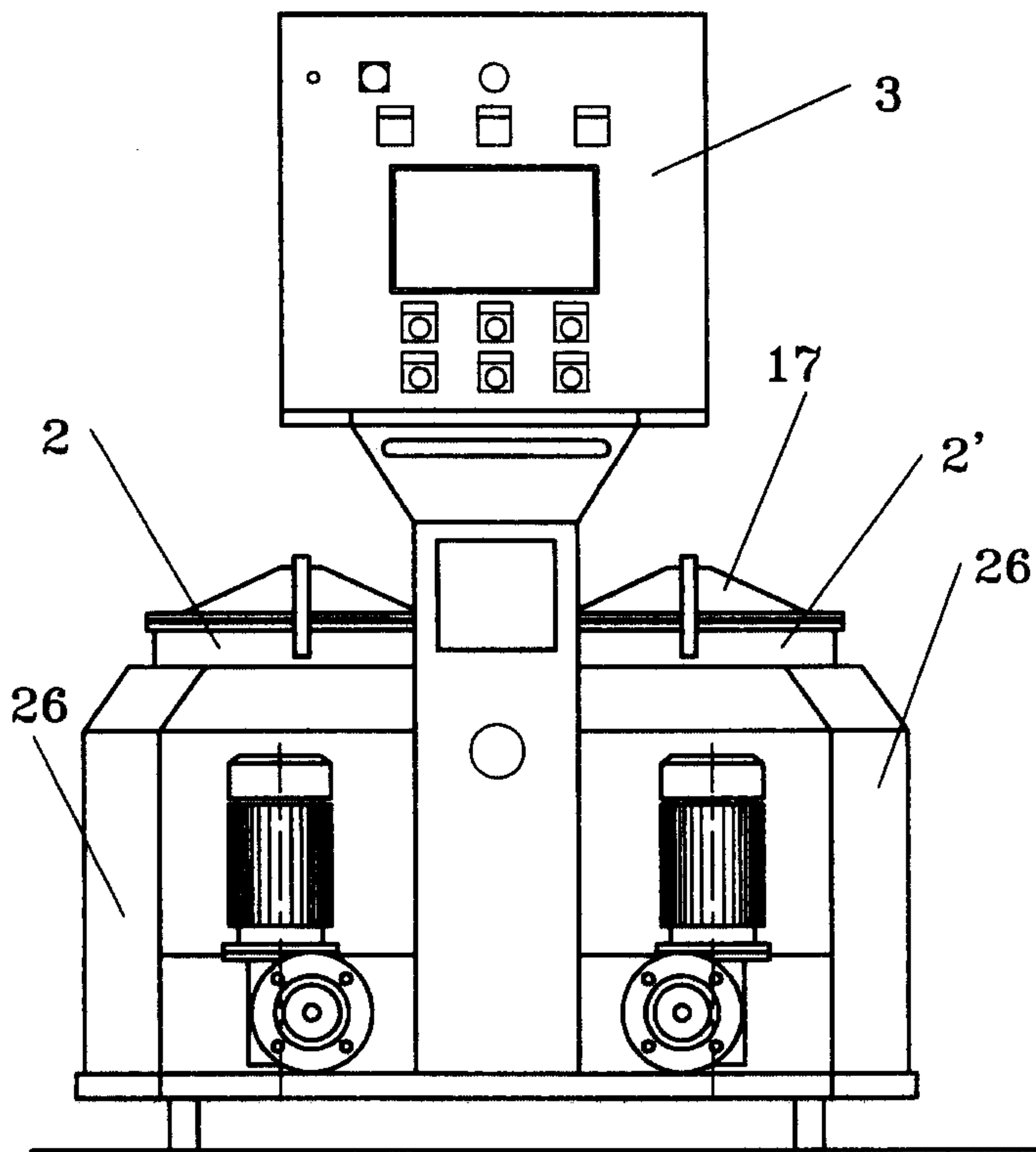


Fig. 1

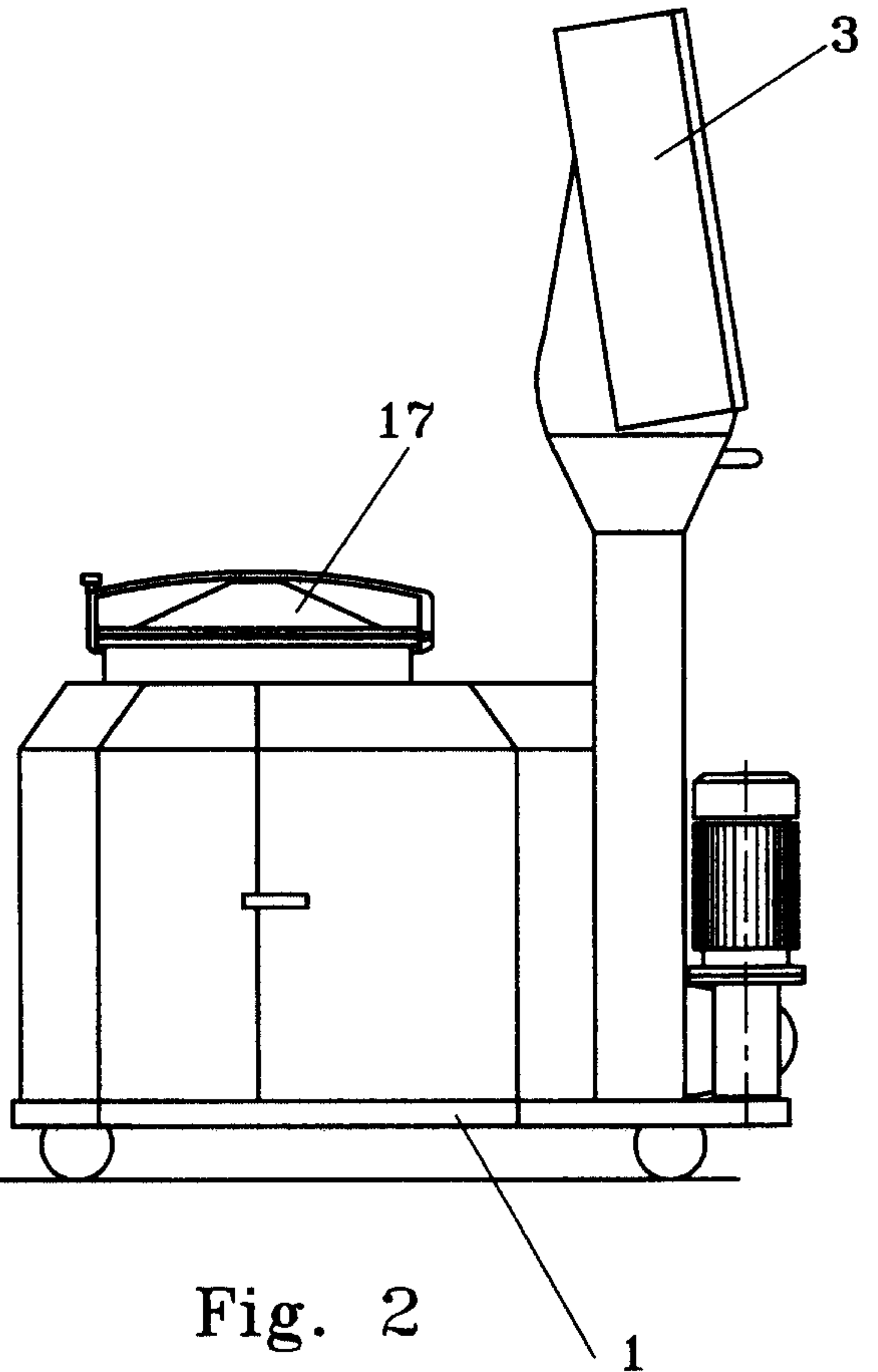


Fig. 2

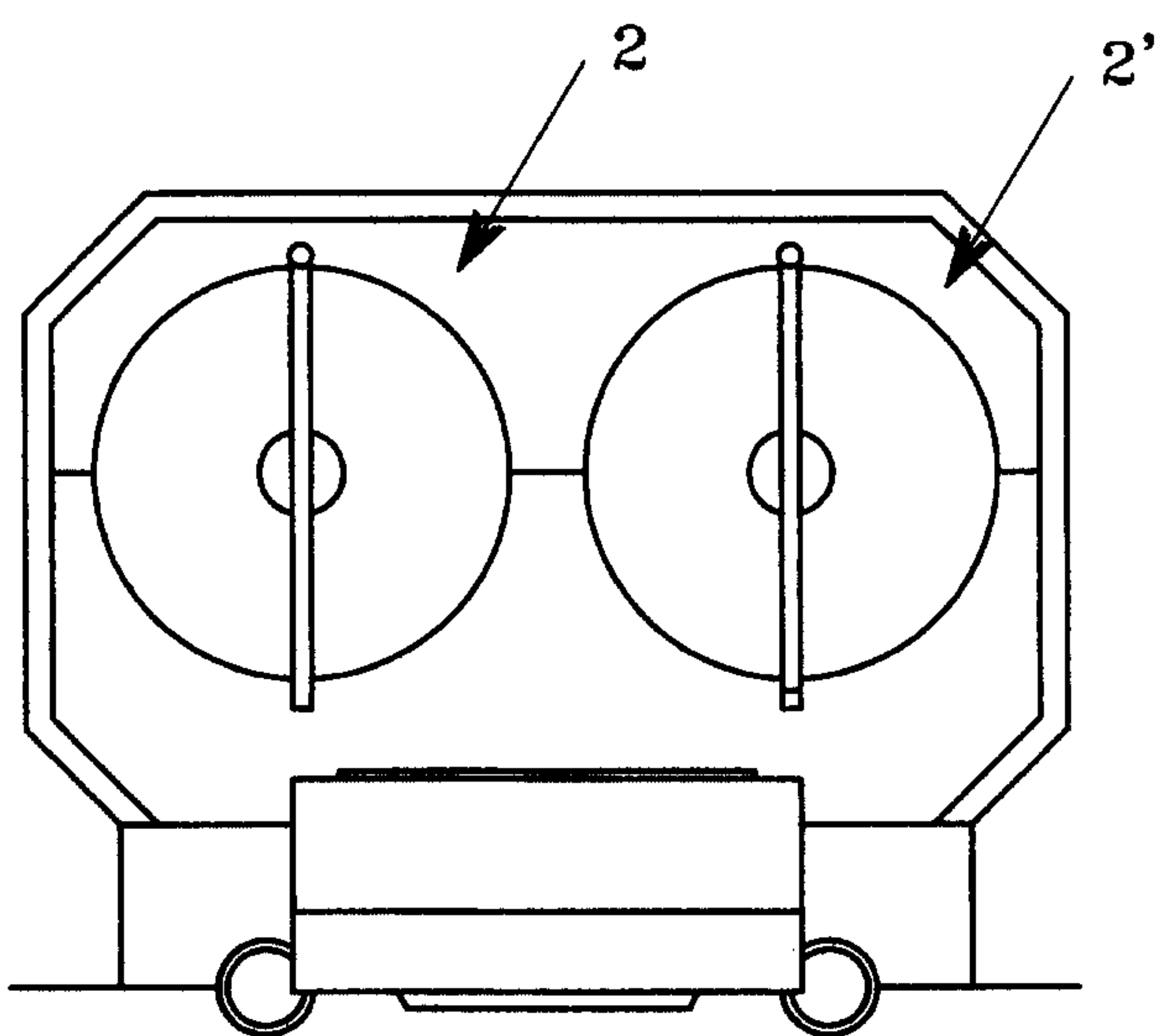


Fig. 3

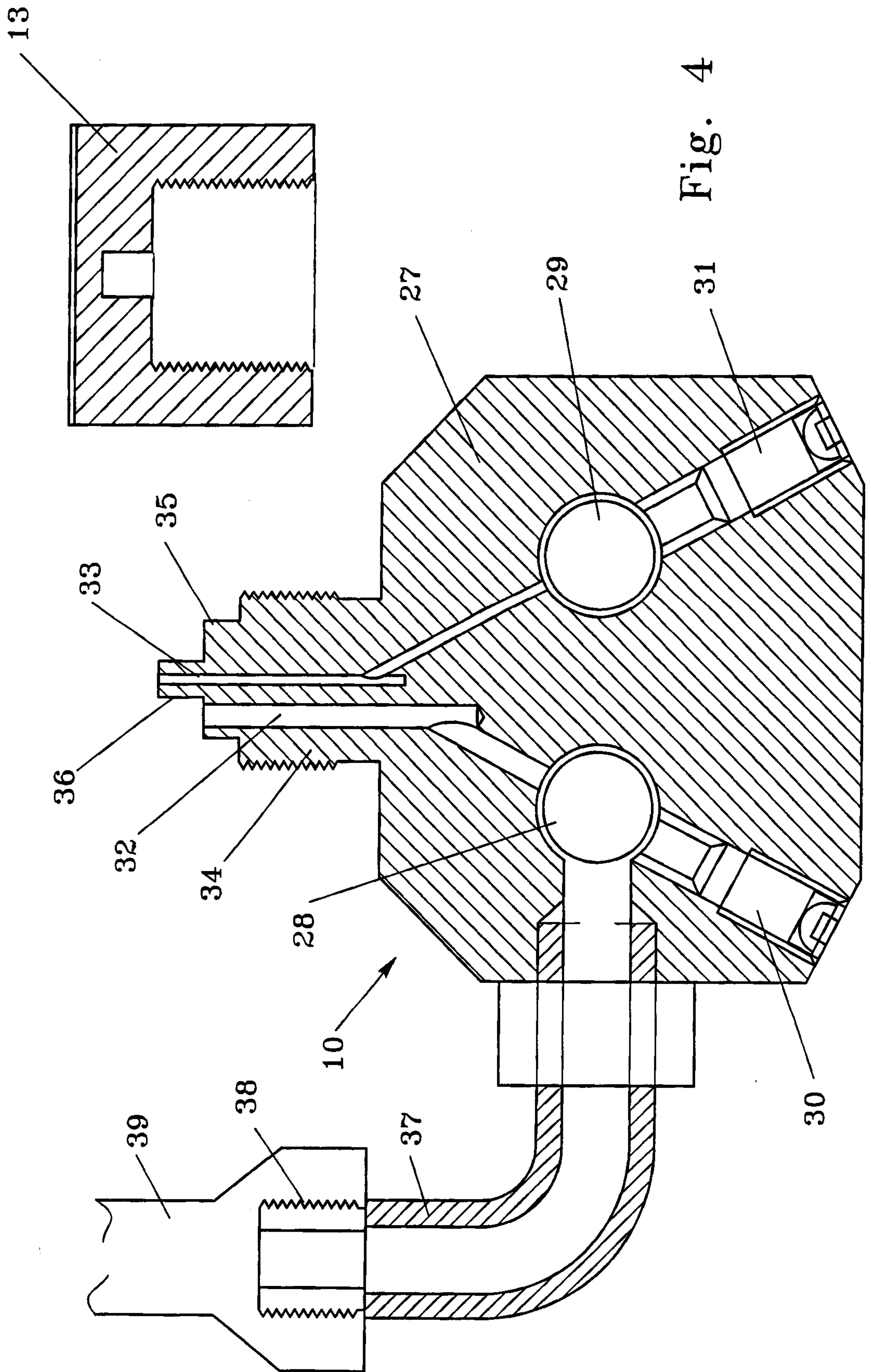


Fig. 4

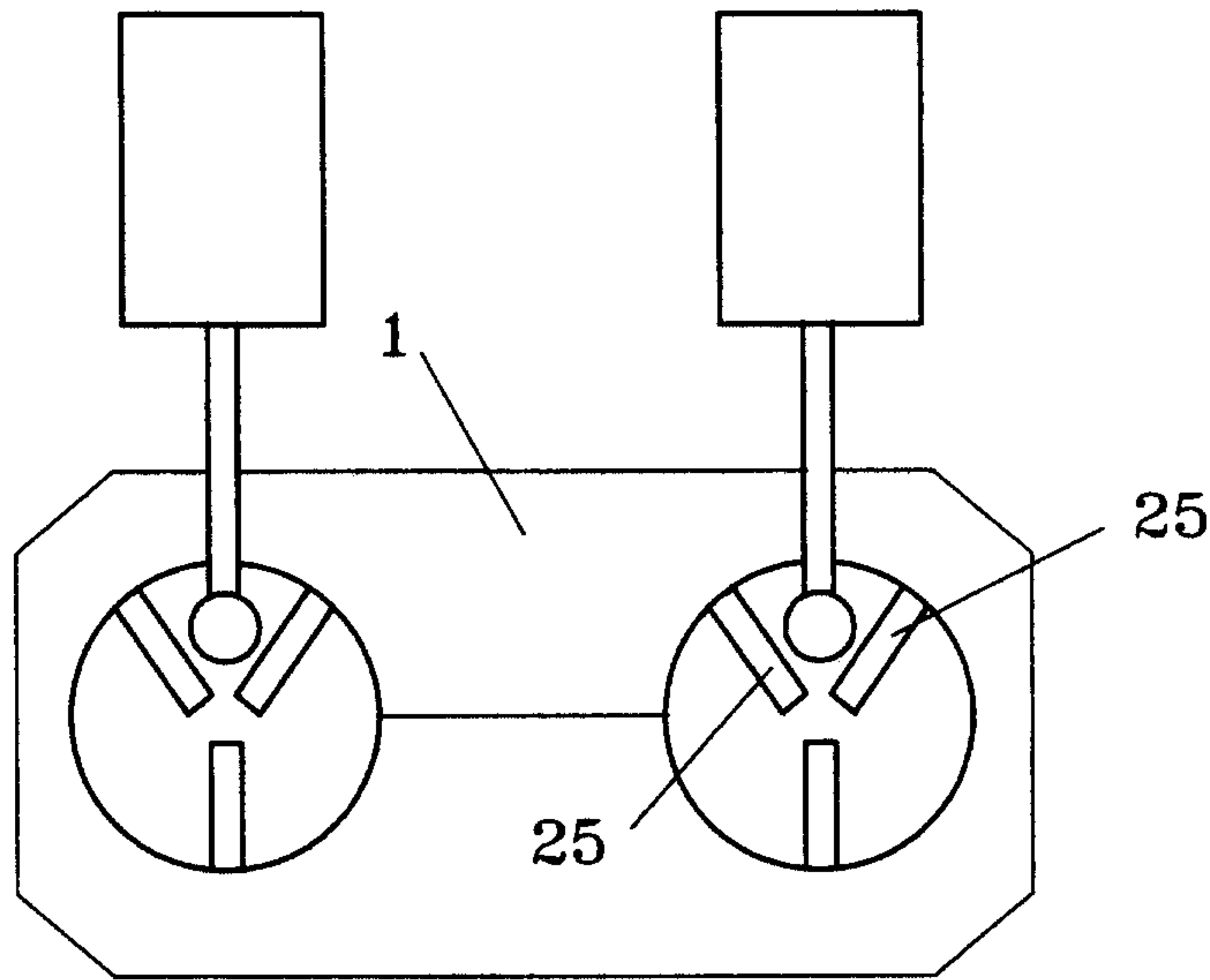


Fig. 6

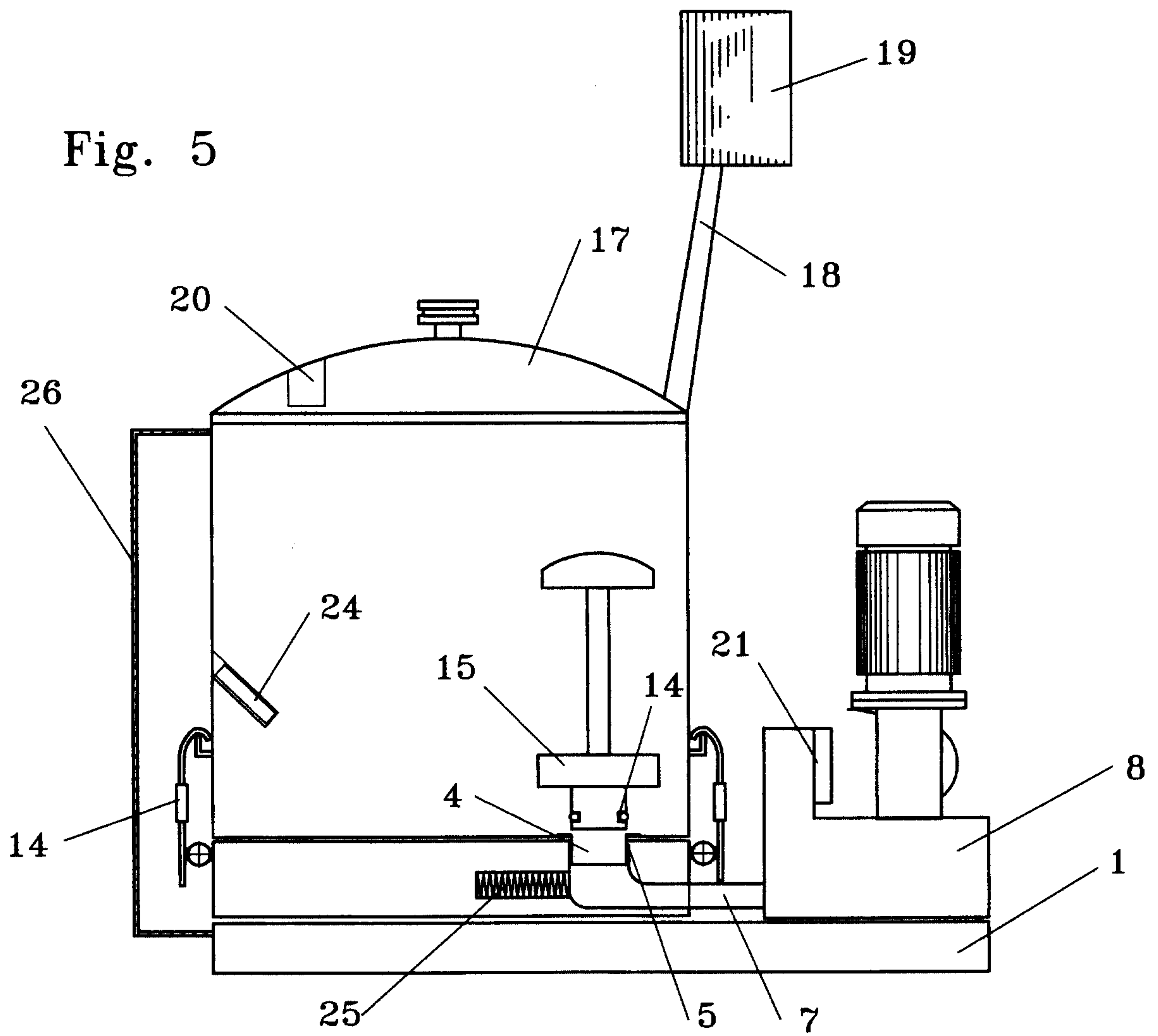


Fig. 5

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