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(71) Applicant: **ELWATT S.r.l. Impianti Tecnologici Civili ed Industriali**
Via Volta, 28
I-20090 Cusago (Milano)(IT)

(72) Inventor: **Ronchi, Costantino**
Via Giordano, 5
I-20090 Trezzano s/Naviglio (MI)(IT)

(74) Representative: **Misitano, Angiolino Giulio**
Novelty Service Ing. Misitano Angiolino Giulio Via Padova 217
I-20127 Milano(IT)

(54) **Improvements in steam generators for use with electrodomestic appliances such as a steam iron.**

(57) A steam generator for use with an electrodomestic appliance comprises a water reservoir, a steam generator comprising a metallic block with a high thermical inertia and incorporating an electric heating resistor associated with a thermostat, an electromagnetic pump for injecting water to be vaporized into a steam chamber under the control of a push-button provided on the electrodomestic appliance. The steam generator with pump and steam hose may be relatively connected to any one of a number of different appliances such as a coffee machine, an electric steam brush, a floor washing apparatus, a steam disinfecting device and like.

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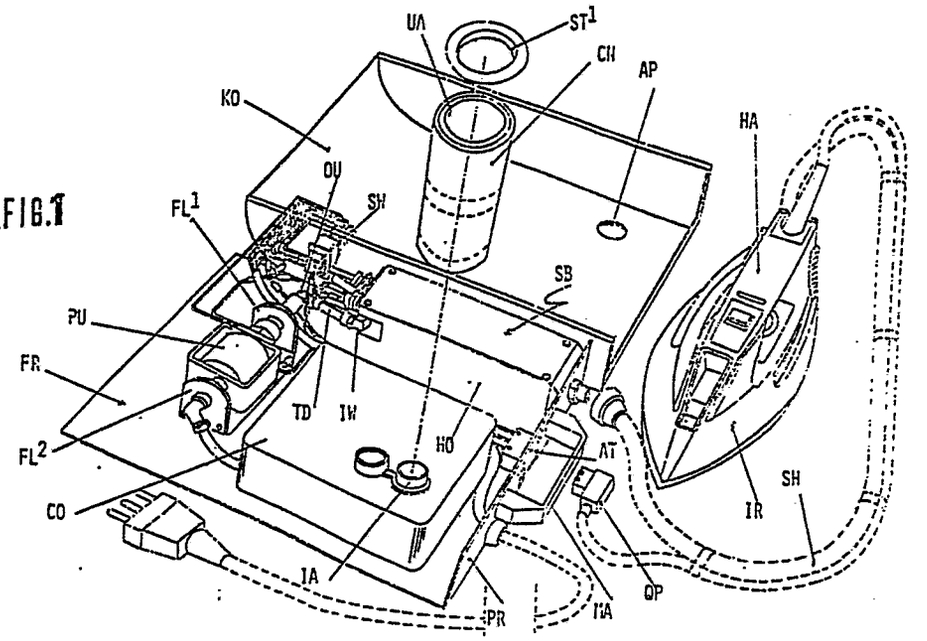
FIG.1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IMPROVEMENTS IN STEAM GENERATORS FOR USE WITH ELECTRODOMESTIC APPLIANCES SUCH AS A STEAM IRON.

Combination of steam iron and steam generator are per se known. Such a combination is known from a USA patent in which a reciprocating membrane pump pumps water from a water container and to a steam generator from which steam is supplied to a steam iron under the control of a push button provided in the iron handle. The reciprocating membrane pump is connected to an inlet pipe and an outlet pipe, each provided of a non-return valve.

A first drawback of the known combination resides in the calciferous deposits that render the steam iron inefficient after a very short period of time.

A second drawback of such known very expensive and not operative combination is that it is not a compact construction.

A third drawback of such known combination resides in the fact that the operator most press the control bush button with a high frequency since the steam generator has no thermic inertia.

A fourth drawback of such known combination is that the combination is necessarily limited to steam irons.

The present invention aims to render operative such a combination of a steam generator and an electrodomestic appliance, such as a steam iron, by proposing novel means that eliminate the drawbacks present in the prior art as above outlined.

According to the present invention a steam generator combination and electrodomestic appliance such as an iron

steam combination is provided comprising as steam generator consisting of a metallic block with a high thermal inertia incorporating the heating resistor and defining a steam chamber, a water inlet pipe connected to the steam chamber ans a steam outlet nipple, for connection through a hose to an electrodomestic appliance such as a steam iron, a water reservoir, a vibration piston electric pump operable to suck water from the water reservoir and inject the same into the steam generator, and thermostat means connected in series to the heating resistor, and cooperating with a warning lamp.

In order to prevent calciferous deposits this invention proposes a disposable funnel partially charged with a resin and presenting a lower outlet aperture to be coupled to the inlet opening of the water container and an upper inlet water intake aperture for receiving the water to be purified for filling the water container.

In order to prevent these calciferous deposits in the event that such a resin charged disposable funnel is not provided the present invention provides a purification of the water by a hollow and pierced outlet nipple, removably connected to the steam generating chamber and presenting an axial screw to be screwed-unscrewed from the outside in order to permit cleaning of the inside of the nipple only, the end of the nipple and the cylindrical steam chamber defining therewith an annular lamination

passage reducing the calciferous deposits.

The invention will be more clearly understood from the following detailed description of a preferred embodiment thereof, illustrated in the enclosed drawings, wherein:

Fig. 1 shows the steam iron and steam generator combination with the cover disconnected for representation consistency;

Fig. 2 is an electric diagram of the proposed combination;

Fig. 3 shows according to a sectional view the novel disposable device for decalcifying the water to be supplied to the water reservoir;

Fig. 4 shows partially according to a longitudinal sectional view the steam outlet embodying the steam outlet nipple permitting the cleaning of the steam generator chamber as well of the steam outlet nipple only;

Fig. 5 shows with some portions removed an horizontal sectional view of the steam generator;

Fig. 6 shows the different possible applications of the proposed combination.

The following specification will deal separately with:

I : General construction

II : Anticalciferous means

III : Steam generator

IV : Operation

I - GENERAL CONSTRUCTION

With reference to the Figure 1 the invention provides a support frame FR made of metallic sheet or of plastics material supporting a steam generator SB, an electrical vibration piston pump PU, and a water reservoir CO. A cover or closure KO is provided having an opening AP to provide access to the water inlet opening IA pf the water reservoir CO. The cover KO may be fixed to the support frame FR with screws and the frame has an up-standing side flange PR with a carrying handle MA.

The cover has an aperture which receives a switch SW associated with a warning lamp WL.

The piston pump PU is supported by two spaced rubber flanges FL^1-FL^2 which absorb the pump vibrations.

II - ANTICALCIFEROUS MEANS

Reference is made to the Figures 3, 4 and 5.

A container CN is partially charged with known resin RS and has an upper aperture UA and a lower aperture LA, the latter cooperating with the inlet opening IA of the water reservoir.

UA and LA are designed respectively to receive stoppers ST^1-ST^2 and the exchange resin container is of the disposable kind. The resin layer RS is confined between two spongy layers SR^1-SR^2, leaving an upper cavity CV so that the resin container CN operates as illustrated as a funnel. When the resin container is removed from the water

reservoir CO a rubber stopper SR closes the water inlet as shown in dotted lines in Figure 3.

When the resin is exhausted the resin coloration changes, alerting the operator that a fresh container should be substituted.

With reference now to the Figure 4 novel means are illustrated for the removal of calciferous deposits in the event that a resin container is not used.

The steam generator SB has a steam chamber CA and comprises a metallic body BL incorporating an electric heating resistor RE associated with a thermostat TH. A threaded bushing TB is fixed to the outlet of the cylindrical steam chamber having an internal threaded portion which receives an outlet steam nipple ON. The latter is hollow and machined with a set of holes and presents an inside threaded portion IR cooperating with a screw SC that presents a longitudinal hole LH.

To a cylindrical portion CY of nipple a steam hose SH may be secured with a band BN in known manner.

If it is required to clean only the nipple ON it is sufficient to unscrew the screw SC. If it is required to clean the whole steam chamber, the nipple ON may be unscrewed and removed to give access to steam chamber CA for cleaning with a brush (non represented).

A "teflon" insulating sleeve is provided for the protection of the steam hose SH.

III - STEAM GENERATOR

The steam generator SB comprises a metallic block BL embodying a heating resistor RE. The inlet water duct has been shown at IW and is close to the water outlet OU from the pump to which it is connected by a teflon duct ID as shown. An insulating layer LY covers the metallic block BL, and the layer LY and the block BL are surrounded by metallic housing HO as shown. In this way the invention provides a steam generator that has a very high thermal inertia.

IV - OPERATION

From the foregoing and particularly from the Fig. 2 the operation of the proposed novel combination is apparent.

If the switch SW is operated to connect the electrical supply (compare Fig. 2) the heating resistor RE produces steam from the water injected into the steam chamber if the pump is energized. This is rendered possible by activating the switch push button PP provided in the iron handle HA. The warning lamp is not energized. If the temperature in the steam generator chamber is too high the thermostat disconnects the heating resistor from the electrical supply and the warning lamp is energized. Namely the lamp is energized as soon as the thermostat opens.

For preventing calciferous deposits the resin container

operating as funnel may be used, as already stated (see II).

If the resin container is not used the calciferous deposits may be removed from the steam outlet nipple ON or from the steam generator chamber CA as stated (see II).

As will be apparent the steam iron rests on the cover KO, when ironing is not required.

FU shows a fuse and RY the electrical resistor of the steam iron combination.

With reference now to the Figures 1, 2 and 6 it results apparently that the electrodomestic appliance such a steam iron may be disconnected and the steam generator may be used alternatively for a steam floor washing apparatus SA, a coffee machine CM or an electric steam brush VB and so like. This is permitted thanks to the provision of a quadripolar plug QP and a quadripolar socket AT which latter is fixed to the flanged portion PR.

Since the steam hose and the electric quadripole cable may be disconnected the whole Fig. 1 steam generator may be alternatively used for the Fig. 6 uses.

The objects and advantages of the invention well result from the foregoing.

The Mandatory: MISIANO Ing. Angiolino Giulio

CLAIMS :

1. A steam generator for use with an electrodomestic appliance such as a steam iron characterized in that the steam generator comprises a metallic block with a high thermal inertia incorporating the heating resistor and defining a steam chamber, a water inlet pipe connected to the steam chamber and a steam outlet nipple, for connection through a hose to an electrodomestic appliance such as a steam iron, a water reservoir, a vibration piston electric pump operable to suck water from the water reservoir and inject the same into the steam generator, and thermosta means connected in series to the heating resistor, and cooperating with a warning lamp.

2. A steam generator according to the claim 1, consisting of a prismatic metallic block surrounded by an insulating layer and associated in the front side adjacently to the electromagnetic pump to a thermostat and fixed to the frame, said metallic hole presenting a longitudinal hole defining the steam chamber.

3. A steam generator according to claims 1 and 2, characterized in that in order to prevent calciferous deposits provision is made for a disposable funnel partially charged with resin and presenting a lower outlet aperture for communication with the inlet opening of the water reservoir and an upper inlet water intake

aperture for receiving water for filling in the water container.

4. A steam generator according to claim 1, 2 or 3, characterized in that in order to prevent calciferous deposits the steam outlet nipple is removably connected to the steam chamber and is removable to permit cleaning of the inside only of the nipple, the flat end of the nipple and the adjacent steam chamber wall defining an annular laminating passage reducing the calciferous deposits.

5. A steam generator according to the claim 1, characterized in that the steam generator may be disconnected in view of its new connection to an another appliance such as a coffee machine, an electric steam brush, a floor washing apparatus, and like, thanks to a plug removably connected to a socket fixed to the frame and thanks to the provision of a steam hose removably connected to the steam generator.

The Mandatory: Ing. MISITANO Angiolino Giulio

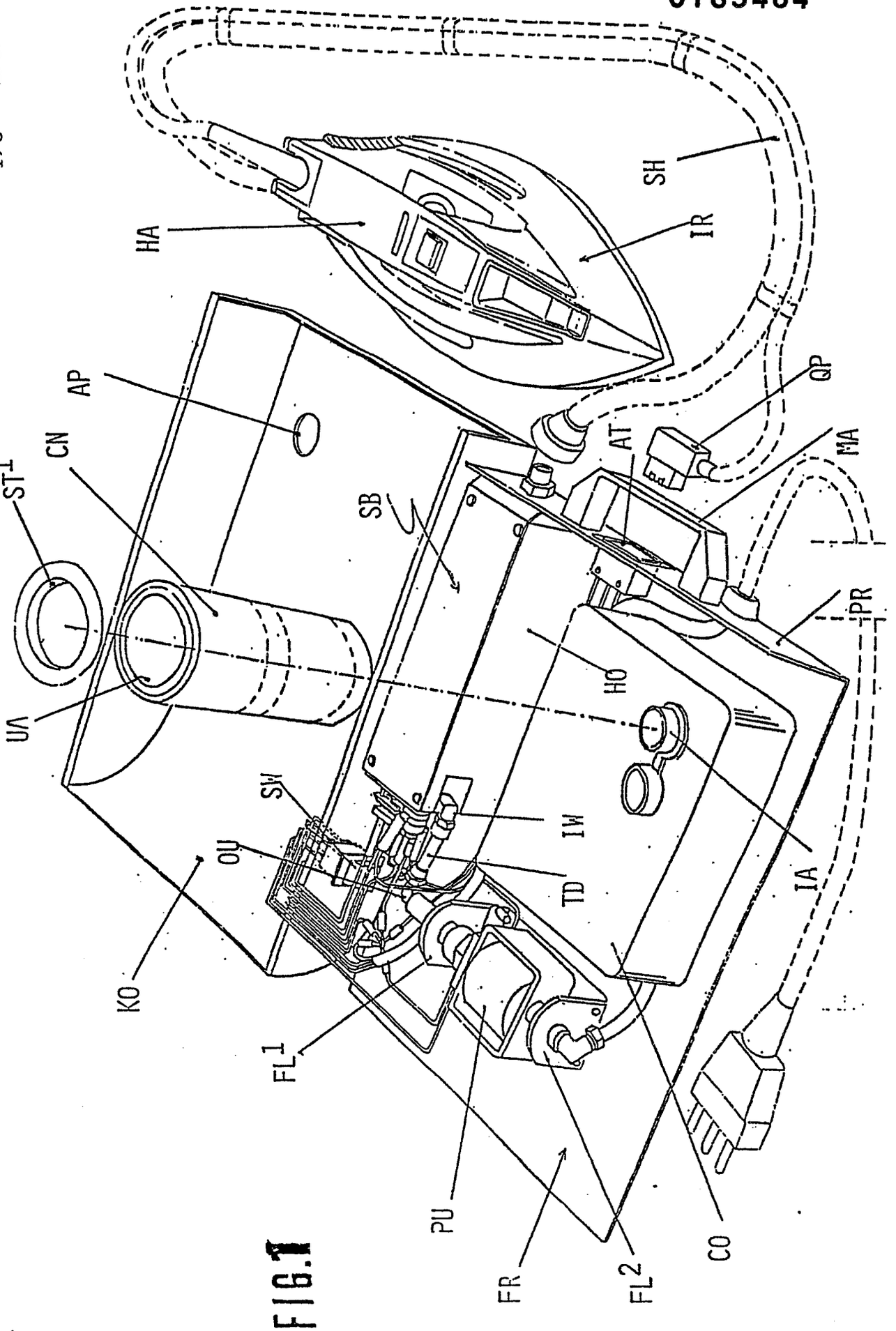
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FIG.1

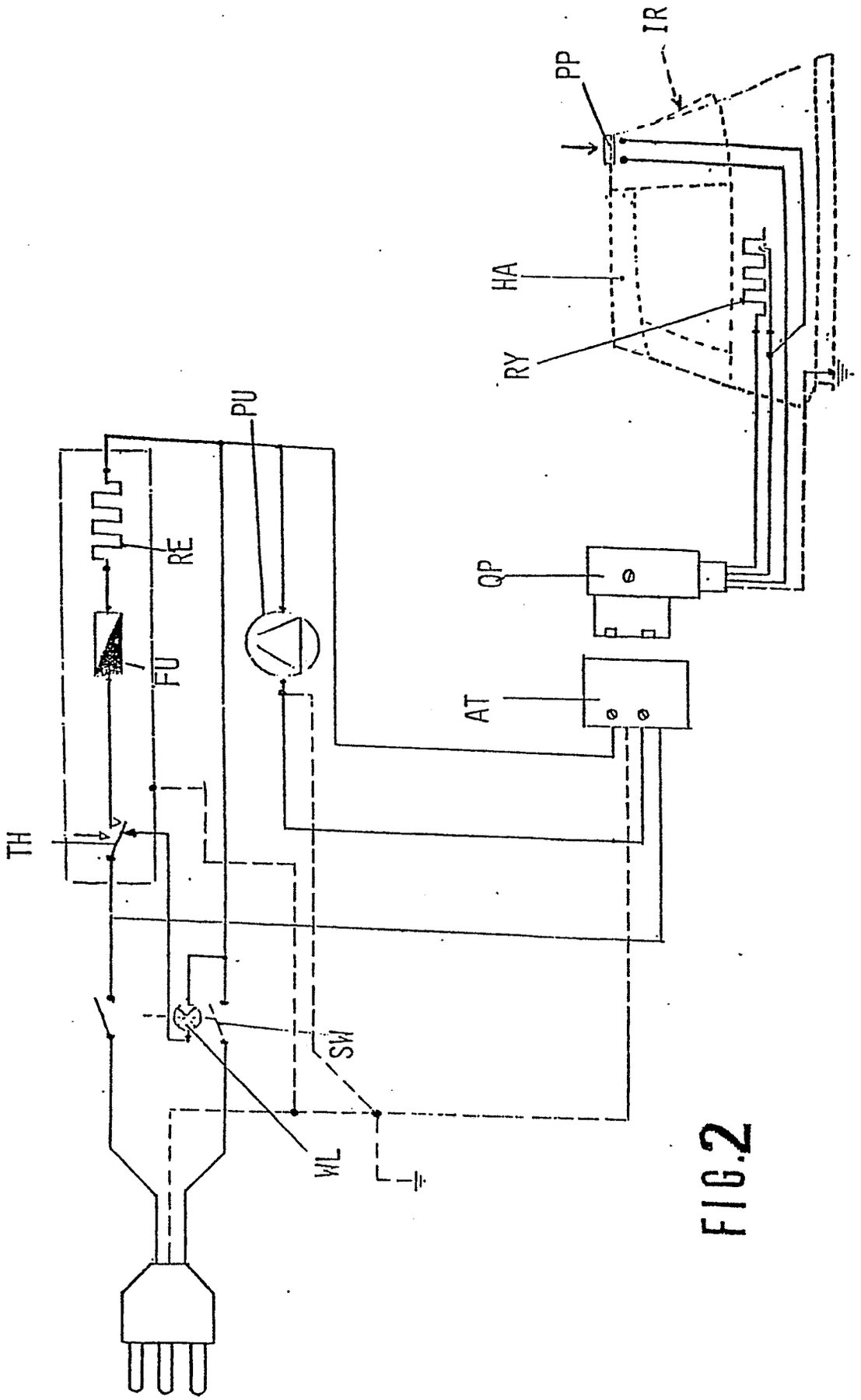


FIG.2

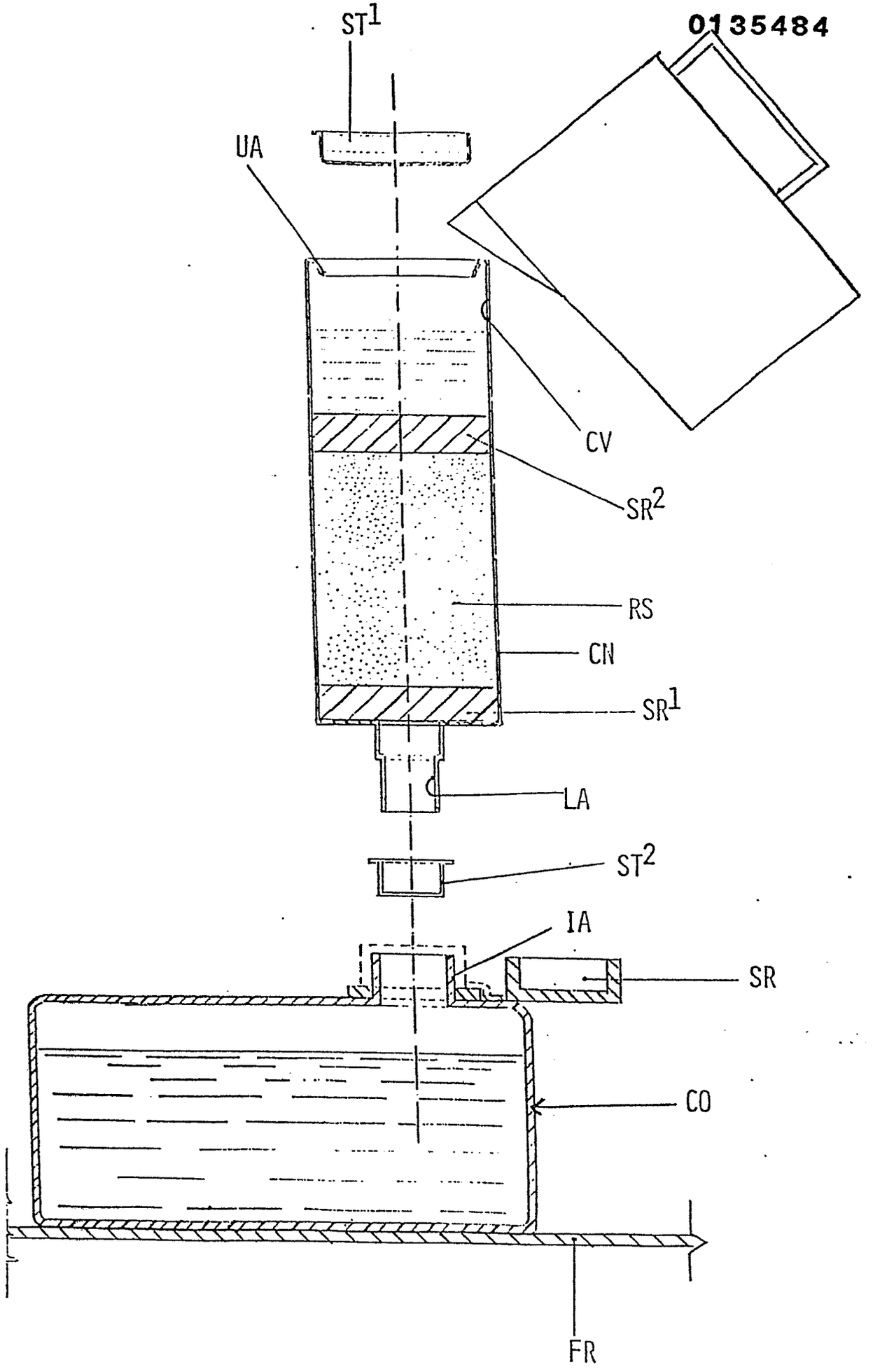
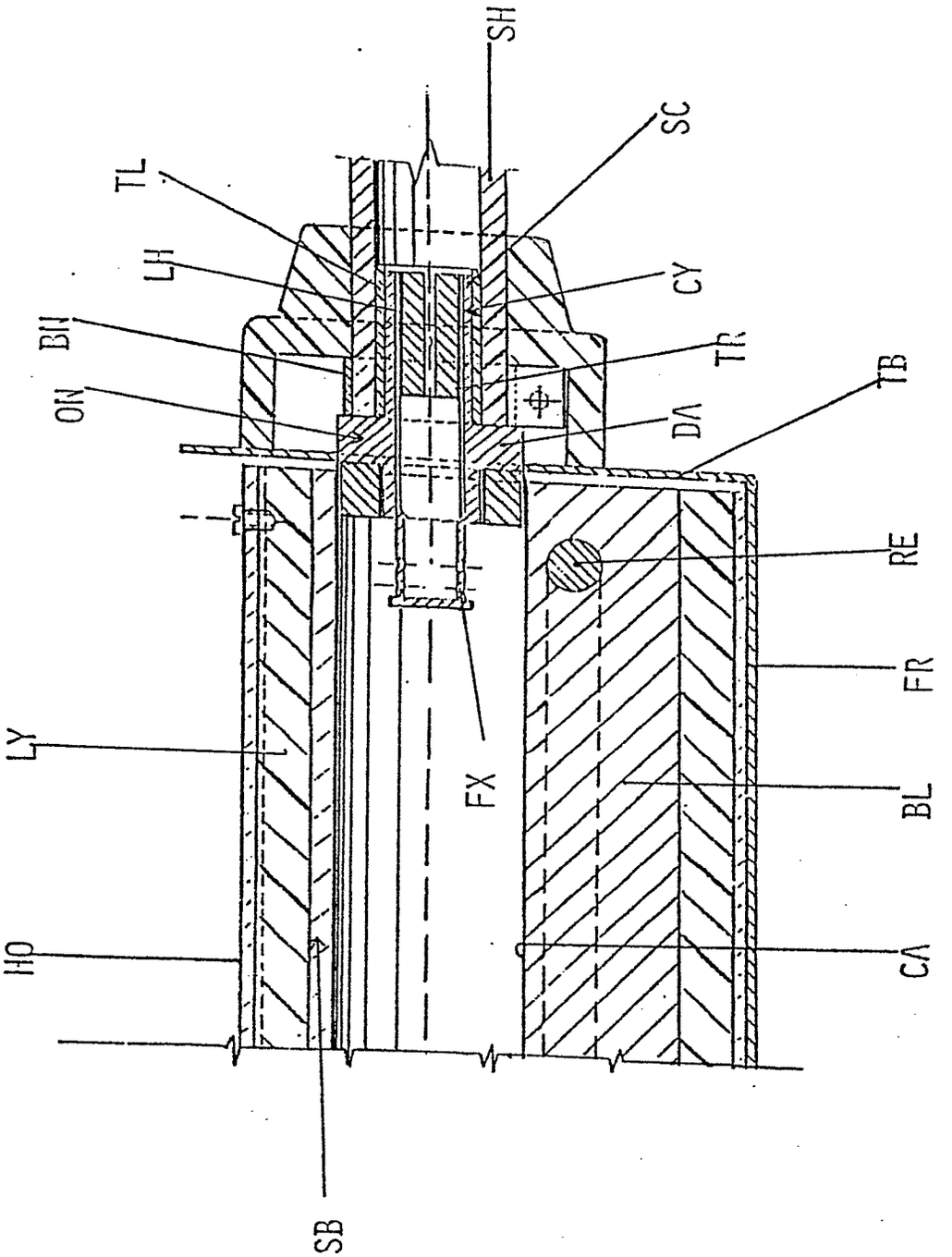


FIG.3

FIG.4



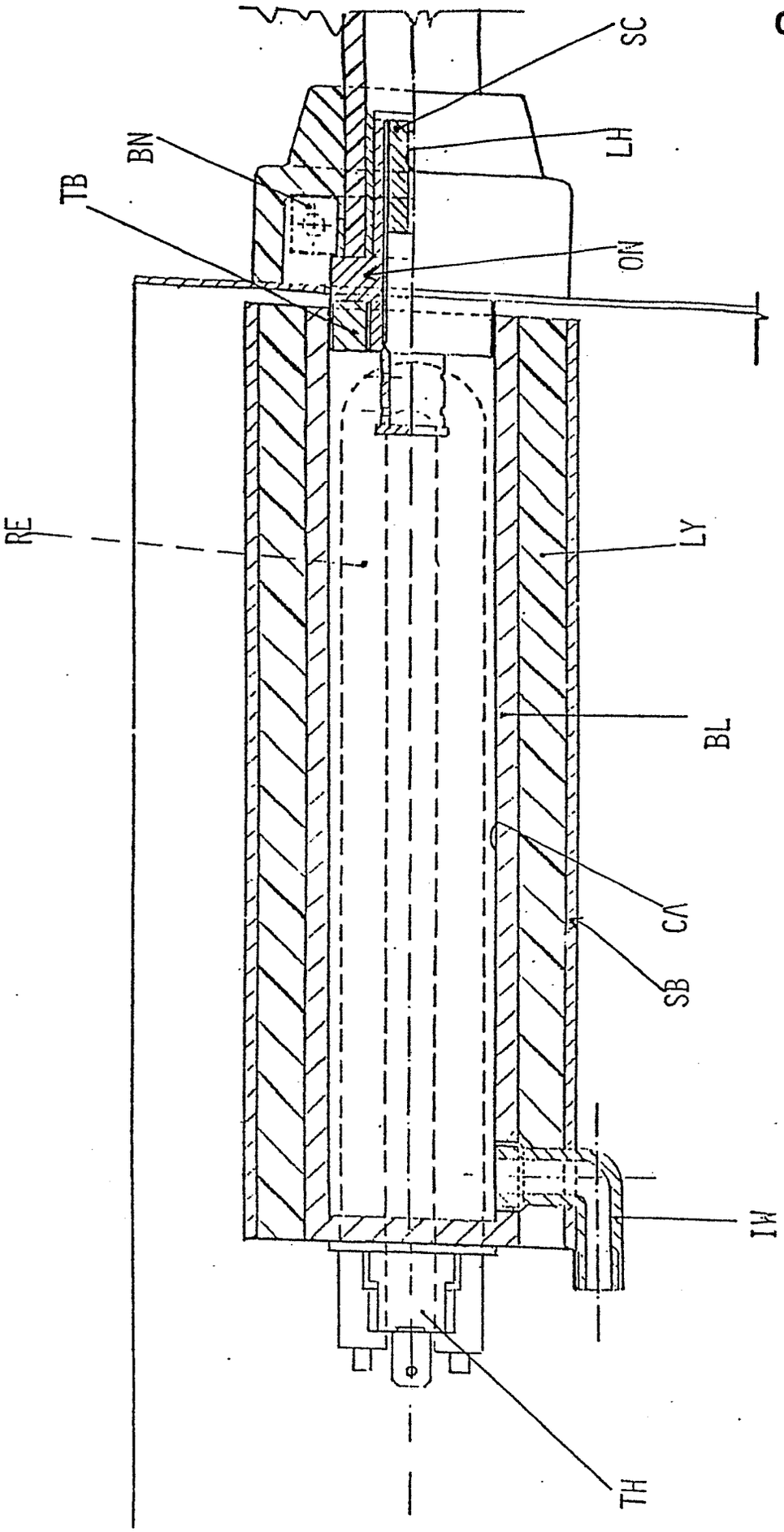


FIG.5

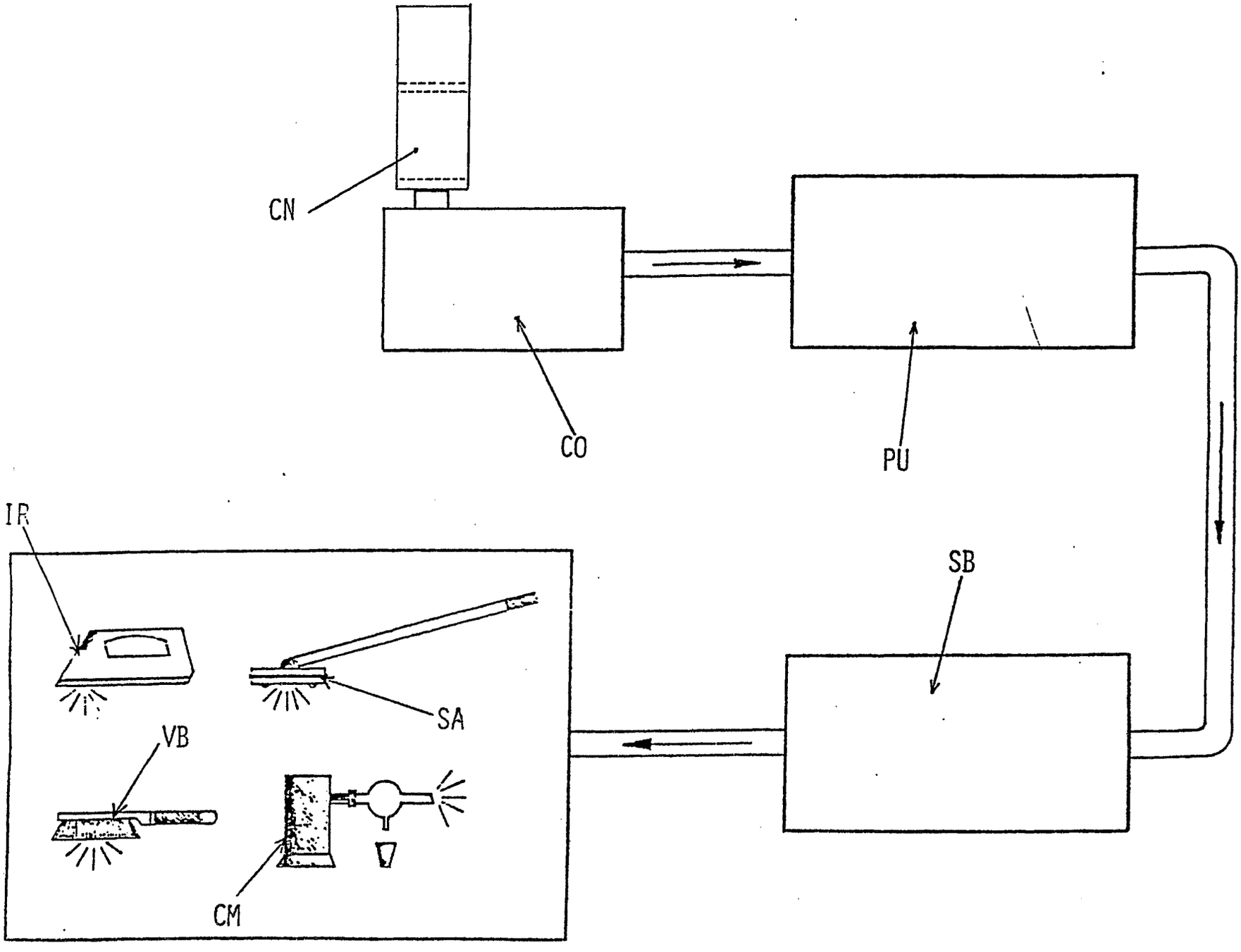


FIG.6

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