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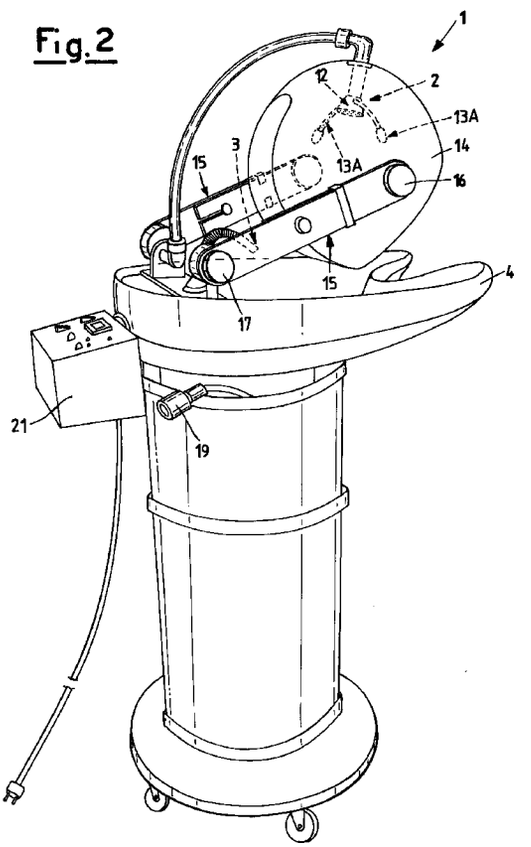
zz(54) Method for applying active substance to scalp and apparatus for implementing said method

(57) In order to allow for a liquid active solution to be applied to the scalp of an individual, the present method provides for a same amount of liquid active solution to be closed-loop sprayed by means of a plurality of spray nozzles (12,13) arranged along the scalp, with said amount of liquid solution being always kept at a desired optimal temperature for the absorption of said active solution through the pores of the treated individual. The active solution may possibly be a shampoo. In this case, the method may provide for a subsequent rinsing step.

Fig.2



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Description

The object of the present invention is a method for applying an active substance to scalp and an apparatus for implementing said method.

At present, the application of active substances (whether of cosmetic type, or the like) to scalp is usually carried out by working said substance through hair, or by dipping.

However, the experience demonstrated such methods for applying an active substance not always proved to be adequate in order to obtain an optimal absorption of said active substance by the scalp of the individual being treated.

That drawback mostly occurs in those case when the active substance is dissolved in an amount of liquid carrier substance which may tend to be very large, so as to obtain a clear solution of active substance complying with the principles of homeopathy.

Furthermore, in both cases when the application takes place by working into hair and by dipping, not always the liquid active solution can be easily kept at the optimal temperature to maximize the phenomena of absorption of the active substance.

It derives from the above that during the above said treatments, besides absorption of the active liquid solution being non-optimal, the treated individual will always feel discomfortly, -- which uncomfortable feeling will prevent him from reaching the necessary relax condition.

In fact, the experience demonstrated that if during the treatment the treated individual does not succeed in relaxing, the effectiveness of the treatment may furthermore decrease, even to a considerable extent.

The purpose of the present invention consists in providing a method for applying to the scalp of an individual an active substance, which method is capable of obviating the above said drawbacks, i.e.:

-- it makes it possible liquid active solutions to be effectively applied to scalp even if they possibly contain rather low levels of active substances;
-- it makes it possible liquid active solutions to be applied to scalp, which have a constant temperature, always equal to the optimal temperature for solution effectiveness;
-- it does not cause the treated individual to feel discomfortably, so as to predispose and maintain her/him under the best relax conditions during the application of the liquid active solution;
-- it enables said active substance(s) to be applied also during a shampoo, or it also enables hair and scalp to be shampooed.

Such purposes are achieved by a method according to claim 1, which can be implemented by means of the apparatus according to claims 2-following.

Spraying the liquid active solution by means of a plurality of jets arranged along the surface of scalp secures that the sprayed solution and scalp will come into mutual contact in an optimal way. Furthermore, solution spraying also performs a massaging action which is relaxing and consequently synergistic for absorption of active substance.

The recovery of the sprayed liquid active solution makes it possible:

-- the solution to be further heated so that it will always be at the desired temperature throughout the treatment time;
-- the liquid active solutions to be applied under optimal condition also, and above all, in those cases when said solutions are of homeopathic type;
-- the method to be applied with even small solution amounts, so that in the event of particularly expensive active substances, the used amount can be considerably reduced -- with costs being appreciably reduced too;
-- the undesired sebum emission due to mechanical action of fingers, in the case of a shampoo treatment, to be prevented as far as possible; furthermore, inasmuch as the shampoo amount can be reduced (owing to the recovery effect) relatively to the amount of used water, hair and scalp are treated with the greatest delicacy also from a chemical view point, with the advantages previously mentioned in the instant point becoming still more considerable.

The method according to the present invention is implemented by means of an apparatus displayed in the accompanying figures. In the drawing:

Figure 1 shows a schematic view of the apparatus of the present invention, according to a first embodiment thereof mainly designed to apply an active substance to scalp.
Figure 2 shows a perspective view of the apparatus of Figure 1, according to an embodiment thereof.
Figure 3 shows a schematic view of the apparatus of the invention according to a third embodiment mainly designed for shampooing and suitable for being moved inside the premises inside which said apparatus is used, if so necessary.
Figure 4 shows a schematic view of the apparatus according to the present invention, according to a fourth embodiment mainly designed for shampooing purposes and suitable for being installed either fixed or moveable.
Figure 5 shows a schematic view of the apparatus of the invention according to a second embodiment mainly designed for shampooing and for fixed installation, fastened onto a wall of the premises inside which said apparatus is used.

Referring in particular to above mentioned figures 1 and 2, the apparatus according to the present invention, generally indicated with 1, is preferably useable for applying an active substance to scalp, preferably before, after, or during a possible shampooing.

The apparatus (1) essentially comprises a shower-like delivery device (2), a jet delivery device (3), a receiver tray (4) to receive the liquid delivered by the delivery device, a pump (5), a heat exchanger (6), or a preferably electric-powered heating means, a first (7), a second (8) and a third (9) solenoid, a tank (10) and an emptying pump (11) connected with an emptying hose (19).

The shower-like delivery device (2) comprises a first (12) and a second (13) delivery means, and a splash-preventing hair-dryer (14).

The first delivery means (12) generates a jet, which can be referred to as the "main jet", which is constituted by a plurality of parallel, closely approached gushings.

The second delivery means (13) is constituted by two bent tube portions (13A), having along their length, small-diameter bores, equally spaced apart from each other. The delivery means (13) generates a jet which can be defined as being the "secondary jet" which is constituted by a plurality of spaced apart gushings, substantially converging at the centre of the hair-dryer (14) which performs the function of collecting delivered water and driving it to the receiver tray (4) in which it is collected. The hair-dryer (14) and the delivery means (12) and (13) are supported by telescopic arms (15) which are hinged in (16) to the hair-dryer (14), and in (17) to the receiver tray (4) which preferably is a traditional shampooing basin.

The jet delivery device (3) delivers one single gushing according to the same modalities as of a traditional tap. It is usually used in order to recirculate the liquid active solution during the initial treatment steps, so that said solution can rapidly increase in temperature up to reach the envisaged treatment temperature (usually comprised within the range of from 35° to 38°) and becomes homogeneous, so that the active substance(s) may best dissolve in the liquid carrier substance (water). The apparatus furthermore comprises a control unit (21), which may also comprise means to perform the treatment according to an automated procedure.

The operating way of the apparatus (1) for applying an active substance to scalp is as follows.

The active substance is poured into the receiver tray together with a liquid carrier substance, so as to obtain, by mixing, the liquid active solution. The first solenoid valve (7) is closed to prevent the solution, which can at least partially collect inside the tray (4), from draining into the storage tank (10).

The pump (5) and the heat exchanger (6) are enabled; both solenoid valves (8) and (9) or, however, at least either of them, are opened, thus making it possible the liquid active solution to be delivered through the devices (2) and (3). The delivered solution falls into the receiver tray (4) from which it is sent to the pump (5) which recycles it. The heat exchanger (6) increases the temperature of the liquid active solution up to the programmed temperature (usually equal to body temperature) and keeps said solution at that temperature throughout the necessary time for the treatment to be carried out.

When the liquid active solution has reached its necessary temperature, the treatment can be started up. The second solenoid valve (8) is closed and the third solenoid valve (9) is left opened. The individual to be treated enters her/his head into the hair-dryer and the streams generated by the first (12) and the second (13) delivery means wet scalp. Thanks to the hinges (16) and (17), the position of the delivery means (12) and (13) relatively to scalp can be varied as a function of the position of the head of the individual and also during the treatment, so as to enable a large area of scalp to be submitted to the desired treatment. The liquid active solution leaving the scalp of the individual under treatment gathers inside the tray (4), is possibly filtered by the (usually present) filter (18), and is recycled by the pump (6). By flowing through the heat exchanger (6), the solution, if so necessary, is heated again up to the programmed treatment temperature.

When the treatment is over, the liquid active solution is drained from the receiver tray (10) by opening the solenoid valve (7). The storage tank can contain a plurality of doses of liquid active solution, and therefore it makes it possible a plurality of applications to be carried out with no interruptions.

Summing-up, the method for applying an active substance to the scalp of an individual under treatment, which can be implemented by means of the just disclosed apparatus essentially comprises the following steps:

-- a step of dilution of at least an active substance into at least one liquid carrier substance, so as to obtain a liquid active solution;
-- a step of heating said liquid active solution up to a close temperature to body temperature;
-- a step of liquid active solution spraying by means of a plurality of spray nozzles arranged along the surface of scalp;
-- a step of recovery of said sprayed liquid active solution;
-- a step of heating of said recovered liquid active solution in order to keep it at a close temperature to body temperature;
-- a step of recovered liquid active solution spraying;
-- repeating both above steps for a pre-established number of times, as a function of both the nature of the active substance and its dilution in the liquid carrier substance;
-- the possible step of hair and scalp rinsing.

The rinsing can be carried out a plurality of times by means of the same liquid substance.

Experience demonstrated that shower-like delivering an active solution simultaneously to a wide scalp area and a close to body temperature, allows scalp to absorb the active substance at best.

The massage undergone by scalp transmits a relax feeling to the treated individual, which contributes to further improve the effectiveness of the treatment.

When the storage tank (10) is full, it can be emptied by actuating the pump (11) which expels the liquid solution through the hose (19) suitably hydraulically collected to a drain.

Referring in particular to Figure 3, the apparatus of the invention, generally indicated with (1A), is a second embodiment mainly designed for shampooing and for being installed with no need for it to be hydraulically connected to a drinkwater source and to the sanitation for draining exhausted liquid solutions.

In order to simplify the disclosure and allow it to be more easily understood, the functionally corresponding elements to the elements which constitute the apparatus according to the first embodiment are indicated in Figure 3 with the same reference numerals complemented with the suffix "A". Hence, the same consideration already made with reference to the first embodiment holds through for them too.

Differently from the apparatus according to the first embodiment (Figures 1 and 2), the apparatus (1A) of the second embodiment (Figure 3) also comprises a non-return valve (22A), a storage tank (23A) for containing clean water, a pump (24A) for emptying said water storage tank (23A). To increase the heating efficiency with its overall dimensions being the same, the heat exchanger (6A) is so arranged as to display two heating bodies, respectively indicated with (25A) the first one, and, respectively, (26A) the second one. The heating bodies (25A) and (26A) are of the type which subdivide the incoming stream into two partial streams which are then combined again at heat exchanger outlet, with an optimal effectiveness being thus obtained with all other conditions being the same.

The apparatus (1A) operates as follows. Clean water, drawn from tank (23A) is driven by the pump (24A) (arrow "F") through the non-return valve (22A), the first heating bbdy (25A), the recycle pump (5A) (which is not operating), and it finally enters the shampooing basin (4A), filling it. The amount of water to be pumped at the temperature to which it must be heated in the first heating body (25A), can be established either manually or automatically through the control unit (21A), as a function of the cycle to be realized. The first solenoid valve (7A) (i.e., the drain valve) is closed, thus preventing pumped water from flowing, by gravity, to the storage tank for the used liquid solution (10A). The active substance (preferably a shampoo) is added to water contained in shampooing basin (4A). The recycle pump (5A) is started up and the liquid active solution flows (arrow "G") through the second heating body (26A) (which, if so needed, further heats it, so as to keep it constantly at the programmed temperature), the third solenoid valve (9A), the second jet delivery device (3A) (arrow "H"), and then returns back to the receiver basin (4A), from which it came.

As already seen for the preceding embodiment, such an operation favours the mixing of the active substance into the carrier substance and desired temperature reaching by the liquid solution which therefore becomes ready for use.

By closing the solenoid valve (9A) and opening the second solenoid valve (8A), the liquid active solution is delivered as jets from the first delivery means (12A) (arrow "L"), wetting the head of the patient. When the treatment is ended, the first solenoid valve (7A) is opened and the second (8A) and third (9A) solenoid valves are closed; the by now exhausted liquid active solution is drained into the storage tank (10A). The possible emptying of tank (10A) is carried out by connecting the emptying hose (19A) to the sanitation and subsequently starting up the emptying pump (11A).

It is wished to underline that the scalp cleansing carried out a plurality of times with no mechanical actions on the same scalp, but using a plurality of jets under a suitable pressure makes it possible considerably advantageous results to be obtained even in the presence of tendentially reduced amounts of active substances (shampoo). The head of the treated individual can be then rinsed with clean water drawn from clean water tank (23A) and subsequently heated, by operating according to the same modalities as disclosed hereinabove. It is wished to underline that, if one so desires, also the rinsing can be carried out many times, with always using again same water. Such a possibility makes it possible balsamic substances to be added to rinse water which, delivered a plurality of times to hair and scalp, even if in relatively small amount, perform considerably advantageous effects which are usually not obtained with a simple single-passage rinse, therefore not foreseeable in advance.

A further advantage is that the machine can automatically operate according to the cycle as selected by the operator, with no risks for the individual who is being submitted to treatment. Therefore, the attending operator may limit her/himself to monitor the apparatus, thus remaining free of performing other tasks during the same machine operating. As to its external appearance, the apparatus (1A) has substantially the same appearance as that of the machine of Figure 2, while displaying the following advantageous features: it can be moved to those areas of the operating premises in which it is necessary, does not require that the furnishings of the shop in which it is designed to operate are modified, and can be sequentially used by more persons.

Referring in particular to Figure 4, the apparatus according to the present invention, generally indicated with (1B) is a third embodiment of the invention mainly designed for shampooing and for being installed either hydraulically connected with a drinkwater supply and with a drain fitting for exhausted liquors, or not connected either to the drinkwater supply and to exhausted liquids drain.

In order to simplify the disclosure and allow it to be more easily understood, the functionally corresponding elements to the elements which constitute the apparatus according to the first and second embodiments are indicated in Figure 4 with the same reference numerals complemented with the suffix "B". Hence, the same

consideration already made with reference to the first and second embodiment holds through for them too.

One will easily observe that the apparatus (1B) according to Figure 4 is different from the apparatus (1A) of Figure 3, in that it comprises:

-- downstream from the first solenoid valve (7B), a first tubular portion (27B) suitable for being connected, according to requirements, with the tank (10B) or with a drain leading to sanitation;
-- downstream from non-return valve (22B), a fourth solenoid valve (29B) provided with a second tubular portion (28B) suitable for being connected with drinkwater supply.

By connecting the first (27B) and the second (28) tubular portions, the machine can operate by receiving water directly from water supply system and draining it directly to the sanitation without using the tanks (23B) and (10B). If so desired, according to an alternative operating way, the presence of tanks (10B) and (23B) makes it also possible the apparatus to draw fresh water and drain exhausted liquors, similarly to apparatus (1A). The outer appearance of the apparatus (1B) is substantially equivalent to the apparatus displayed in Figure 2.

The operating way is substantially similar to the operating way of apparatus (1A).

With particular reference to Figure 5, the apparatus of the invention, generally indicated with (1C), is a fourth embodiment mainly designed for shampooing and for being installed only hydraulically connected with a drinkwater supply and a drain point for exhausted liquors.

In order to simplify the disclosure and allow it to be more easily understood, the functionally corresponding elements to the elements which constitute the apparatus according to the first, second and third embodiments are indicated in Figure 5 with the same reference numerals complemented with the suffix "C". Hence, the same consideration already made with reference to the first, second and third embodiment holds through for them too.

One will easily observe that the apparatus (1C) according to Figure 5 is different from the apparatus (1B) of Figure 4, in that:

-- it is not equipped with the storage tank for exhausted liquors;
-- it is not equipped with the storage tank for clean water, the emptying pump (11B) and the emptying hose (19B);
-- the fourth solenoid valve (29C) is installed between the second tubular portion (28C) and the non-return valve (22C).

The operating way of the apparatus (1C) is substantially analogous to the operating way of the apparatus (1B) when the latter does not use tanks (10B) and (23B).

The apparatus (1C) results to be particularly advantageous because, besides advantageously operating like the embodiments discussed hereinabove, its overall dimensions are smaller than of each of them, and thus it requires less room. It can be directly fastened to the wall of the shop, and can also be aesthetically integrated with the existing furnishing.

For the sake of simplicity of display and disclosure, the apparatuses (1A)-(1C) were equipped with corresponding delivery means (12A)-(12C) of simplified type, which resulted to be more suitable for head shampooing. However, said delivery means (12A)-(12C) can be replaced by the delivery means indicated with (12) in Figure 1 which, as one will see from said Figure, is also provided with second delivery means (13A).

Claims

1. Method fo applying an active substance to scalp, which method provides for:

   -- a step of dilution of at least an active substance into at least one liquid carrier substance, so as to obtain a liquid active solution;
   -- a step of heating of said liquid active solution up to a close temperature to body temperature;

   characterized in that it comprises:

   -- a step of liquid active solution spraying by means of a plurality of spray nozzles arranged along the surface of scalp;
   -- a step of recovery of said sprayed liquid active solution;
   -- a step of heating of said recovered liquid active solution in order to keep it at a close temperature to body temperature;
   -- a step of recovered liquid active solution spraying;
   -- repeating both above steps for a pre-established number of times, as a function of both the nature of the active substance and its dilution in the liquid carrier substance;
   -- the possible step of hair and scalp rinsing.

2. Method according to claim 1, characterized in that said rinsing is carried out a plurality of times, always by means of a same said liquid substance.

3. Apparatus (1) for applying an active substance to scalp, characterized in that it essentially comprises: a shower-like delivery device (2), a jet delivery device (3), a liquid receiver tray (4) for receiving the liquid delivered by said delivery device, a pump (5), a heat exchanger (6), a first (7), a second (8), and a third (9) solenoid valves, a storage tank (10) to store the exhausted solution.

4. Apparatus (1A) for applying an active substance to scalp, characterized in that it essentially comprises: a shower-like delivery device (2A), a jet delivery device (3A), a receiver tray (4A) to receive the liquid

delivered by the delivery devices, a pump (5A), a heat exchanger (6A), a first (7A), a second (8), and a third (9) solenoid valves, a storage tank (10A) to store the exhausted solution, an emptying pump (11A), a water tank (23A) to store clean water, an emptying pump (24A) for emptying said tank (23A) and a non-return valve (22A) installed downstream from said emptying pump (24A).

5. Apparatus (1B) according to claim 4, characterized in that:

-- downstream from said non-return valve (22B) a fourth, multi-way solenoid valve is installed, with one of said ways being connected with a second tubular portion (28B) suitable for being connected with a drinkwater source;
-- the first solenoid valve (7B) is alternatively connectable, through a first tubular portion (27B) either with the tank (10B) for the used liquid solution, or with a drain fitting leading to sanitation.

6. Apparatus (1C) according to claim 5, characterized in that it does not comprise any liquid storage tanks, therefore the first tubular portion (27C) and the second tubular portion (27B) can only be connected with one fitting leading to sanitation and with a drinkwater supply point, respectively.

7. Apparatus according to one or more of claims 4-6, characterized in that the heat exchanger (6A-C) comprises at least one pair of heating bodies (25A-C; 26A-C) in which the stream is subdivided into two portions during the heating.

8. Apparatus according to one or more of claims 1-4, characterized in that it comprises an emptying pump (11, 11A-11B) for emptying said storage tank (10, 10A-10B) inside which the exhausted solutions are stored, connected with an emptying hose (19, 19A-19B).

9. Apparatus according to one or more of the preceding claims, characterized in that said shower-like delivery device (2) comprises a first (12) and a second (13) delivery means, and a hair-dryer (14), with said first delivery means (12) generating a jet which is formed by a set of parallel gushing closely arranged to each other, with said second delivery means (13) being constituted by two bent tubular portions (13A) having, along their length, equally spaced bores (20), with said second delivery means (13) generating a jet which is formed by a set of spaced gushings substantially converging in the centre of the hair-dryer (14).

10. Apparatus according to one or more of the preceding claims, characterized in that said hair-dryer (14) and the delivery means (12) and (13) are supported by telescopic arms (15) which are hinged in (16) onto said hair-dryer, and in (17) relatively to the receiver tray (4).

11. Apparatus according to one or more of the preceding claims, characterized in that said receiver tray (4) is a traditional shampooing basin.

12. Apparatus according to one or more of the preceding claims, characterized in that said jet delivery device (3) delivers one single gushing, like a traditional tap.

Fig.1

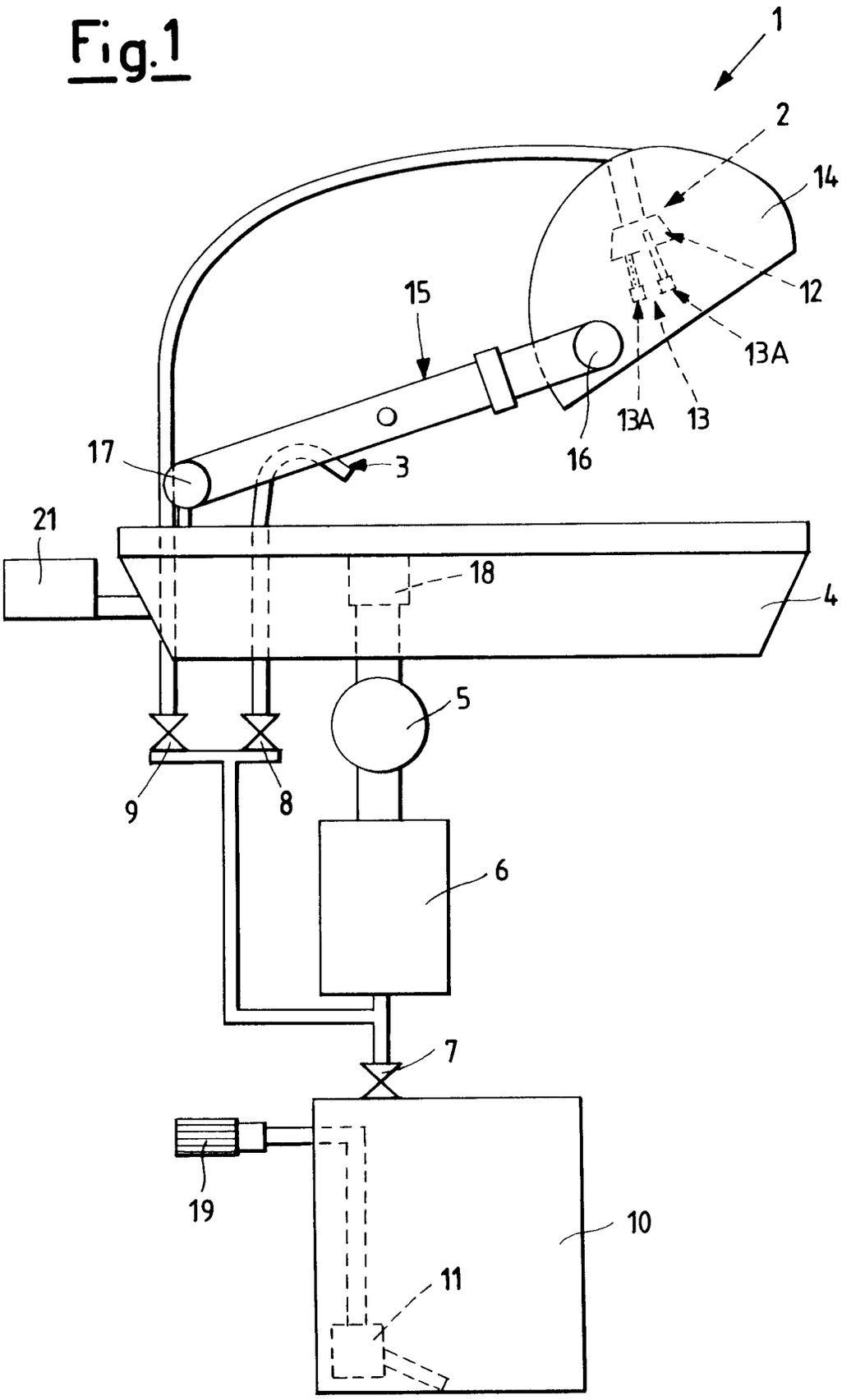

Fig.2

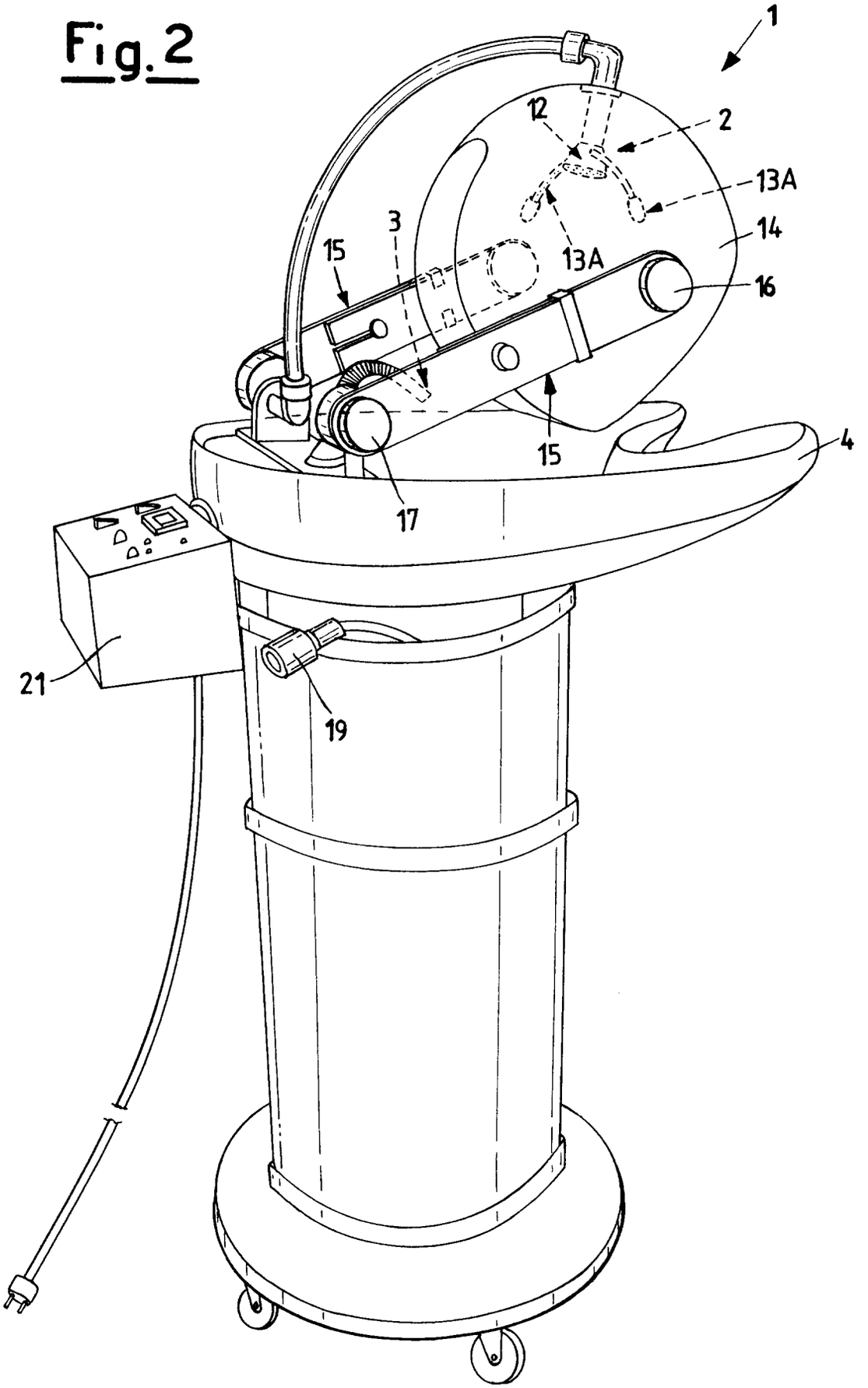

Fig.3

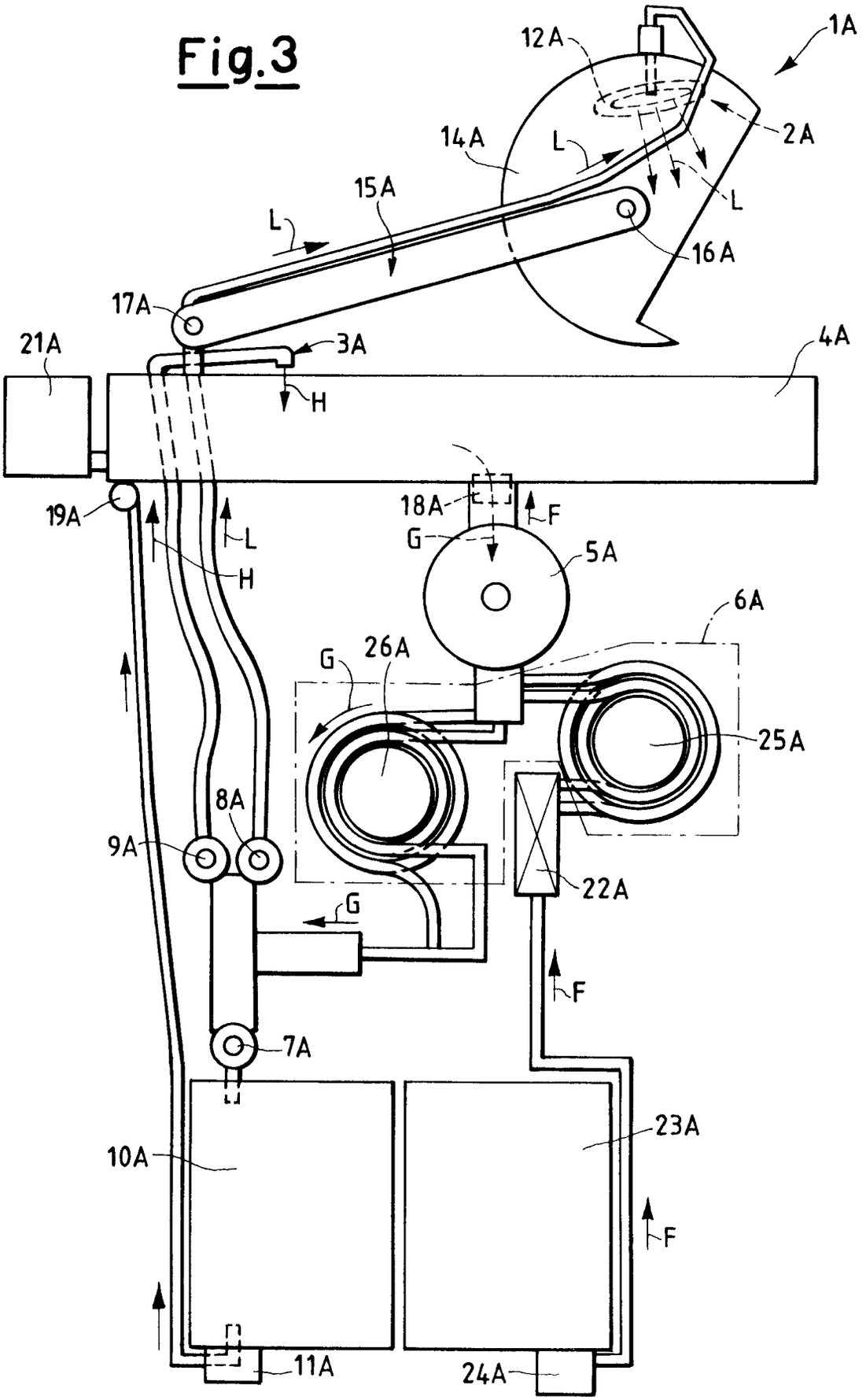
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Fig.4

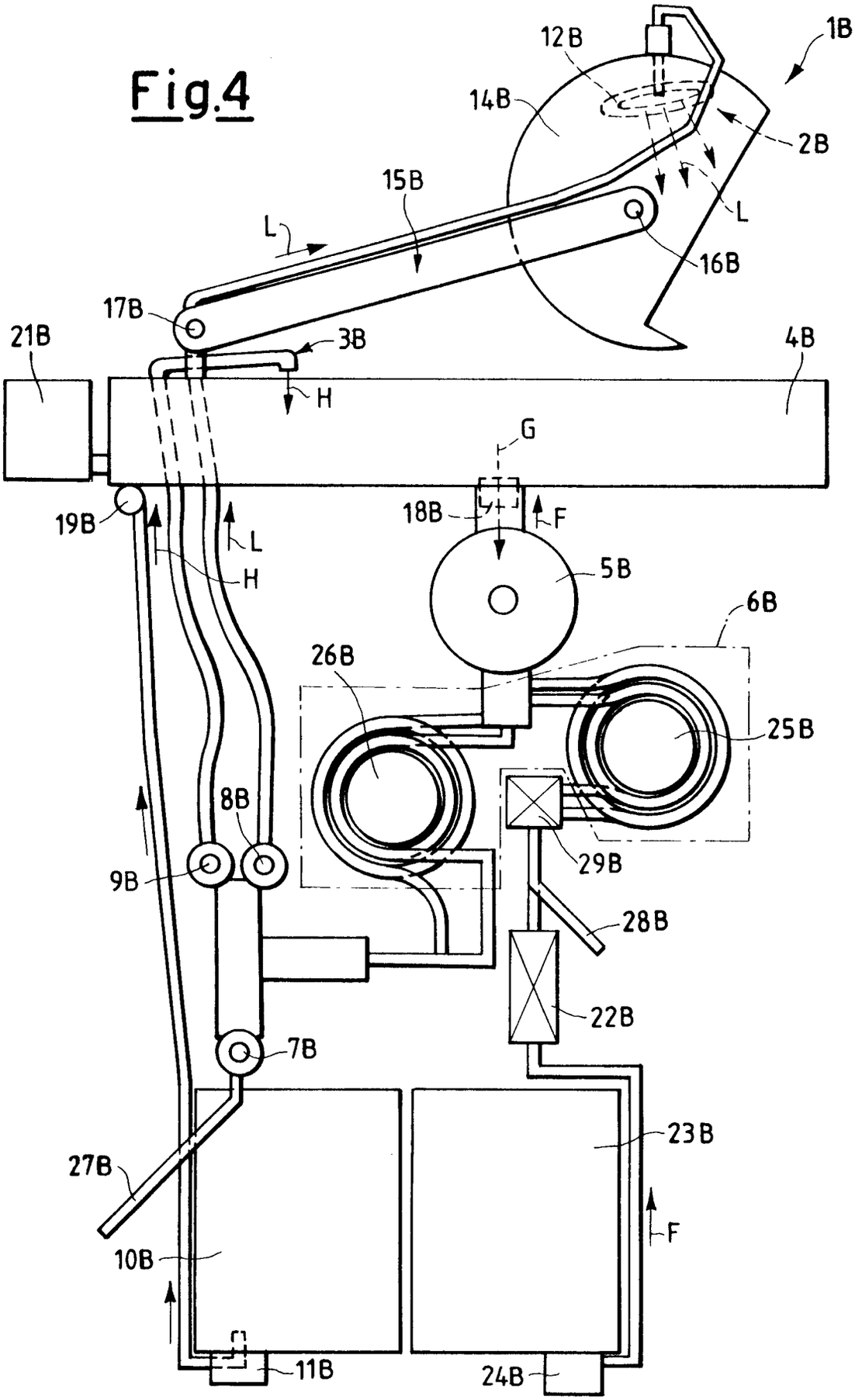
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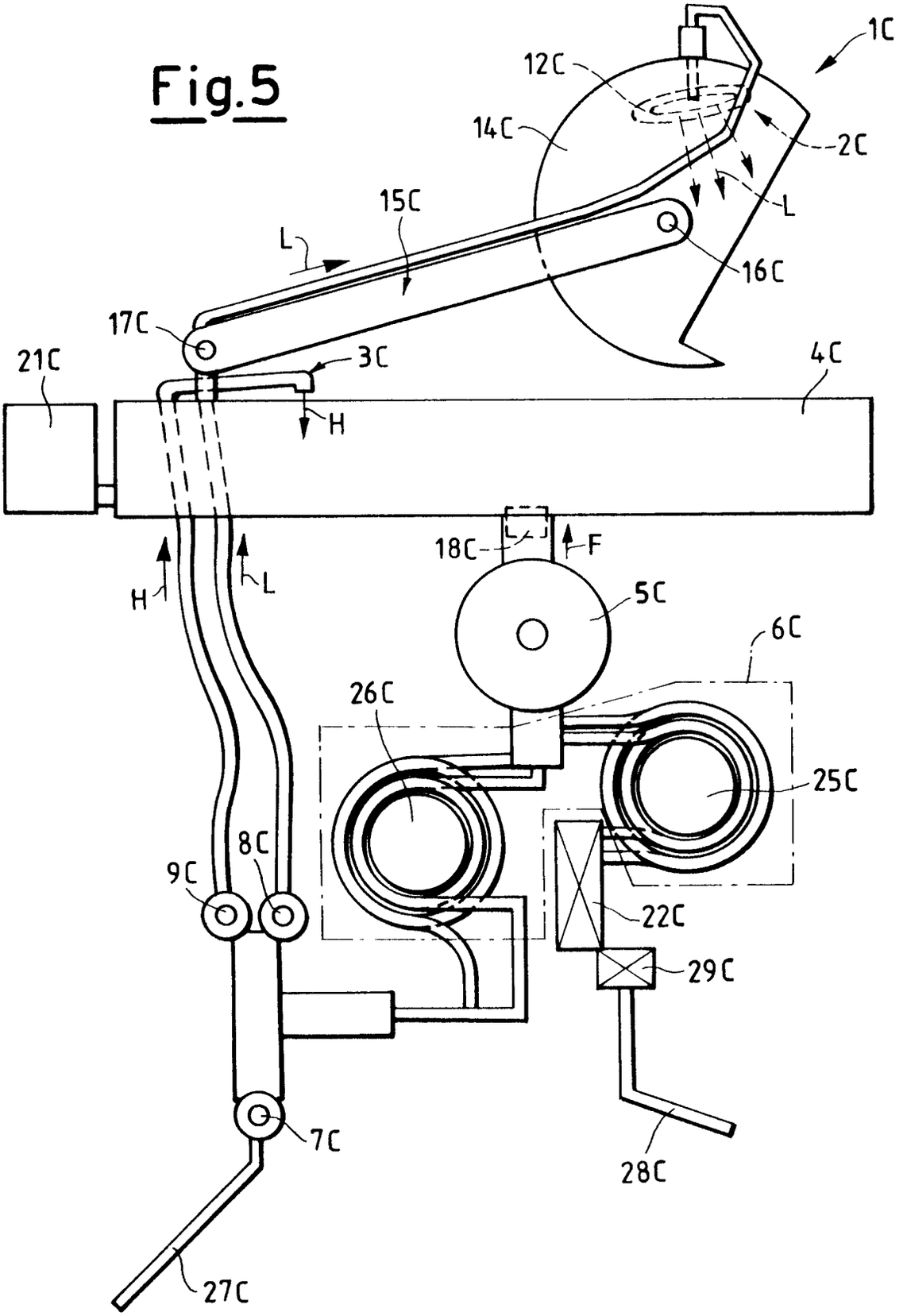
Fig.5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EUROPEAN SEARCH REPORT

Application Number
EP 95 20 1922

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	FR-A-2 098 149 (FAVA) * the whole document *	1-4	A45D19/14
A	GB-A-1 249 869 (MOULARD) * the whole document *	1,3,4	
A	US-A-4 074 369 (HARMON) * the whole document *	1-4	
A	US-A-2 854 969 (NOLAN) * the whole document *	1-4	
A	US-A-3 575 181 (RUDD)		
A	GB-A-2 030 450 (SMK INDUSTRIES)		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A45D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 December 1995	Riegel, R

CATEGORY OF CITED DOCUMENTS

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