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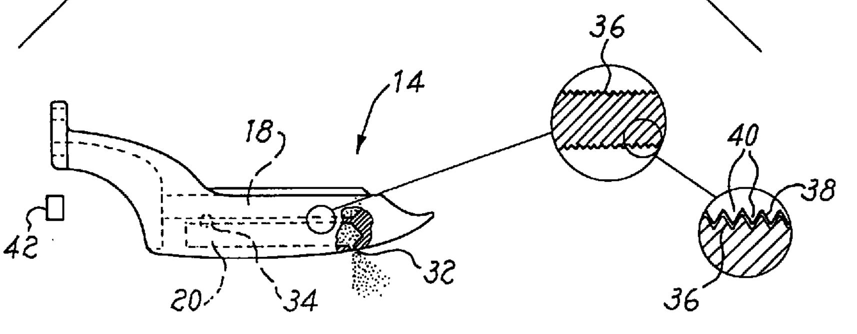
(54) Iron

(57) An iron (10) especially suitable to be used in footwear and leatherware sectors, comprises a tool (14) tied to a grip and handling body (12), made from metal and provided internally with a plurality of ducts and seats forming one or more chambers (18) and/or (20), for a fluid to be atomised, and an adjoining cavity for a heating body (24), at least one of said chambers having a partly or entirely irregular internal surface (36), communicating with the outside of the tool (14) though a nozzle (32). Preferably, the iron if fed by a system delivering, through an atomising device (14), a mix of air and water let in one of said chambers (18), (20).

Fig.4



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Description

[0001] The present invention relates to an iron.

[0002] More particularly, the present invention relates to an iron of the type suitable to be used in footwear and leatherware sectors.

[0003] As is known, in the aforesaid sectors, there are used for the finishing operations of the artefacts several tools, including a special iron. This tool is utilised to eliminate, for instance in shoes, the possible localised curlings of leather, so as to obtain aesthetically perfect products.

[0004] The ironing operation is made by hand by qualified personnel, as it requires particular ability and attention; the application of a body heated at a high temperature may in fact damage leather irreversibly, forming burnings on the same. It is easy to understand that, especially in the presence of artefacts from precious leathers, for instance, reptilian skin, an unsatisfactory ironing intervention may cause a relevant economic loss.

[0005] In order to prevent this danger, usually the person that performs the ironing provides each time to humidify the part to be submitted to the ironing treatment with water or chemical substances; this avoids the formation of burnings on leather.

[0006] The above necessity, which causes the formation of a light insulating layer between the ironing tool and the part of the artefact to be treated, involves, as can be understood, an increase in production costs. On the other hand, it would not be possible to use conventional steam-delivering tools as there would easily form on the surface to be treated an uncontrolled plurality of drops of hot liquid, or condensate, that are prejudicial to leather.

[0007] Object of this invention is to obviate the aforesaid drawback.

[0008] More particularly, object of this invention is to realise an iron utilisable in footwear and leatherware sectors suitable to avoid the manual humidifying intervention by the operator.

[0009] A further object of the invention is to realise an iron as defined above, autonomously integrating means for an adequate humidifying of the artefacts, that can be activated, when necessary, in a simple, prompt and calibrated manner by the operator.

[0010] A not least object of the invention is to realise an iron capable of delivering constantly and quickly atomised liquid, avoiding, as a consequence, the distribution of hot fluid on the artefacts to be treated.

[0011] A further object of the invention is to provide users with an iron for footwear and leatherware products suitable to ensure a high level of resistance and reliability in the time, and also such as to be easily and economically realisable.

[0012] Advantageously, to the iron of the present invention a fluid feeding system is associated that allows the calibrated administration of liquid to the heated tool of said iron.

[0013] These and still other objects are achieved by the iron of the present invention, which, being especially suitable to be used in footwear and leatherware sectors, comprises a tool, connected to a grip and handling body, made from metal and provided internally with a plurality of ducts and seats forming one or more chambers for the liquid to be atomised and an adjoining cavity for a heating body, at least one of said chambers having a partly or entirely irregular internal surface, communicating with the outside of the tool through a nozzle.

[0014] The construction and functional characteristics of the iron of the present invention can be better understood thanks to the following description, wherein reference is made to the attached drawings which represents a preferred non limiting embodiment and wherein:

- Figure 1 represents schematically, in side view, the iron of the present invention;
- Figure 2 represents schematically a partly sectioned side view of the heating body of the iron;
- Figure 3 represents schematically a cross-section of the same heating body;
- Figure 4 represents schematically a further partly sectioned side view of the heating body, with magnified details of the internal surface of the chambers wherein the fluid is fed;
- Figure 5 represents schematically the same heating body with a magnified detail of the atomiser inserted in the heating body;
- Figure 6 represents schematically a further partly sectioned side view of the heating body;
- Figure 7 represents schematically the feeding device advantageously connected to the iron of the present invention.

[0015] With reference to the above figures, the iron of the present invention, indicated as a whole by 10 in Figure 1, is basically constituted by a body 12 having an elongated shape, with a section, by way of example circular or ovoid, forming the support and the handle of the heating body, or tool 14, connected to the front end of said body 12 by means known in the art, such as screws 16. Tool 14, whose shape is of a conventional type and is shown by way of example by the figures, is obtained from metal, from instance brass, by casting, and, according to the invention, is provided in its inside with a plurality of ducts and seats variously located and developed, to cause a controlled and calibrate steam delivery through an end nozzle. In particular, tool 14 has, according to a preferred embodiment, a couple of tubular ducts communicating with one another which constitute as many chambers 18, 20 for the atomisation of the fluid, as well as a cavity 22 forming the seat housing a conventional heating body 24 and a hole 26 for a thermocouple 28 connected to said body 24. Chambers 18, 20, preferably parallel to one another, may be aligned on the same plane in the lower part of tool 14, as shown in Figure 3, or superposed, as shown in Figures 4 and 5. The heating body 24 is advantageously constituted by an electric resistor or the like, fed through a conventional cable 30 which develops in body 12 forming the handle of iron 10 and comes out from the back of the same, to connect with the mains.

[0016] The longitudinal development of chambers 18, 20 is such that at least one of them reaches the portion near to the front end of tool 14, in whose correspondence a small opening 32 is formed that constitutes the steam outlet nozzle. Chambers 18, 20, communicate radially between one another though one or more connecting openings 34; in the preferred embodiment, opening 34 is the only one, and is formed near the back front, opposite to nozzle 32, of chambers 18, 20.

[0017] According to a further characteristic of the invention, the walls of said chambers 18, 20 have a rough surface 36, as shown in detail in Figure 4; the surface roughness, which is preferably formed by a continuous threading, may be alternatively obtained by broaching interventions or the like, or directly during the casting of tool 14.

[0018] This configuration of the walls of the chambers 18, 20 which markedly increases the contact surface between the fluid and the metal in the inside of tool 14, is particularly effective as it substantially limits the outlet from nozzle 32 of the non atomised fluid, contrasting its tendency to the known calefaction phenomenon. In fact, during the utilisation of iron 10, tool 14 is heated by body 24 to a temperature higher than 100°C, which may exceed even 200°C; the drops of fluid, generally water, that are let in evaporation chambers 18, 20, would be immediately enveloped by a steam layer about the hot metal surface and would have the tendency to "skipping", without keeping in contact with said surface. As a consequence, in the presence of smooth walls of chambers 18, 20, water droplets might come out, together with steam, with ensuing danger of deteriorating the artefact parts that are being ironed.

[0019] The increase in contact surface between fluid and metal in the inside of chambers 18, 20, obtained by threading, broaching or like systems, allows also to create a continuous seat or a plurality of adjoining seats, for a covering from suitable material, fit for further modifying the interface tension, i.e. the force that acts tangentially between two phases of a liquid-solid system represented by the metal surface of the walls of chambers 18, 20 and the fluid let in the same.

[0020] Said covering is formed, for instance, by a thin layer of inorganic salt, calcium chloride or the like, which is dissolved in the fluid and deposits spontaneously and homogeneously in the unevenness of the walls of chambers 18, 20, after a limited use of tool 14; obviously, the covering may be obtained before the use of tool 14 feeding chambers 18, 20, at suitably additivated water temperature. In Figure 4, said covering is schematised by 38 and constitutes a thin layer that covers, in a substantially homogeneous manner, the whole rough surface of atomising chambers 18, 20 of tool 14. By the protracted use of iron 10, the accumulation of covering material along the rough surface of chambers 18, 20 tends to increase, filling progressively the unevennesses indicated by 40 and reducing the span of said chambers. Such increase takes place spontaneously if, for instance, non distilled water is used. It is therefore hypotisable that from time to time it will be necessary to remove the deposit layer whenever it reaches a high consistency; cleaning may be easily carried out by conventional tools such us milling machines and the like and, given the rough configuration of chambers 18, 20, it does not remove the material deposit in the inside of unevennesses 40. As a consequence, also following a cleaning intervention, the interface tension between the phases of the liquid-solid system is not modified and tool 14 can be immediately re-utilised without any danger of hot liquid drops coming out from nozzle 32. Advantageously, at the mouth of chambers 18, 20, which are closed by means of conventional threaded stoppers or like means (not shown), a metal bush 42 is fitted in, schematised in Figure 4. Said bush has preferably an inner diameter such as to allow the stabilisation by simple mechanical interference in the mouths of said chambers, without excluding however the possibility of realising the connection by means of glues or other systems. The inner diameter of bush 42 conditions suitably the size of the tool to be inserted in chambers 18, 20, to carry out the cleaning; the tool, consequently, will have a diameter such as no to notch the tops of the rough surface of said chambers.

[0021] The roughness of the walls of chamber 18, 20, obtained initially with mechanical working or during the casting of tool 14, and the covering formed afterwards along the same walls cause the breaking of the drops of liquid, excluding the calefaction phenomenon and ensuring as a consequence that only steam comes out from nozzle 32. The development of chambers 18, 20, communicating with one another through passage 34, determines a labyrinth-like course, sufficiently long for the fluid that, from the entering tool 14 to the exiting through nozzle 32, has time enough to pass into an atomised state.

[0022] To iron 10 of the present invention, there is advantageously but not critically connected a feed system suitable to mix with air the fluid prior to its entering chambers 18, 20, through an atomising device. Said atomising device, indicated by 44 in Figures 5 and 7, is constituted by a tubular body 46, wherein two separate ducts 40, 50 are obtained, for delivering air and water, flowing into a mixing chamber 52. Body 46 extends, before said chamber 52, into a tube 54 having a smaller diameter, whose front end 56 is fitted in and restrained, with known means, in the mouth of one of chambers 18, 20 of tool 14. With reference to the aforesaid Figure 5, the front end 56 of tube 54 is fitted in chamber 18 which develops above chamber 20 in tool 12. Ducts 48, 50 are connected through conventional connecting means to the feeding system, schematised as a whole by 60 in Figure 7. Said system consists of a circuit fed with air, through a filter 64 and a pressure reducer 62, which is regulated as concerns both pressure and capacity. The circuit develops into two distinct branches 66, 68, the first of which is connected, with the interposition of an electrovalve 70, to duct 48 of the atomising device 44. The second branch 68 of the circuit enter a water-containing tank 72, exits from the same and connects, with the interposition of an electrovalve 74, to duct 50 of said atomising device 44. A pressure control means, such as for instance a pressure-gauge 76, allows the control of air pressure in the circuit, which is preferably comprised between 0.005 and 0.5 bar.

[0023] Once the feeding system is activated, for instance through button 12' protruding from the handle-body 12 of iron 10, the system is caused to operated thanks to the simultaneous opening of electrovalves 70, 74, respectively located near branches 66, 68, and the ensuing separate entering of a quantity of air and water in chamber 52 of the atomising device 44, wherein it mixes. The pressured air-water mix passes then into tube 54 and, through its front end 56, into chamber 18 of tool 14. The hole of tube 14 and the related front end 56 is suitably calibrated to realise the atomisation of the air-water mix. At the end of the cycle or when button 12' is released, electrovalve 74 of the water-delivering branch closes, while electrovalve 70 of the air-delivering branch remains advantageously open for a fraction of second, so as to eliminate water residues from device 44. This prevent the undesired generation of steam that would spontaneously form if the operator should not re-activate, within a short time, the feeding system; in fact, tube 54 of the atomising device 44 is inserted at least partly in chamber 18 of tool 14, and would heat by conduction, said tool being brought to a high temperature, generally higher than 200°C.

[0024] Through the feeding system 60, in chambers 18, 20 of tool 14, there does not enter water in the form of drops, but an atomised air-water mix; in this way, the formation of steam in tool 14 and its exiting from nozzle 32 are accelerated. Besides, through system 60, it is possible to perfectly calibrate the quantity of water to be atomised, which quantity preferably does not exceed 3 ml/min, and which can be in any case exactly regulated.

[0025] As can be inferred from the above, the advantages of the invention are obvious.

[0026] The iron of the present invention allows the substantially immediate delivery from nozzle 32 of tool 14 of steam to be locally distributed on the artefact to be ironed; no danger exists of delivering hot water drops, given the presence in tool 14 of labyrinth-like chambers 18, 20, their internal configuration and the related covering. The operator who performs the ironing can work rapidly, being not obliged to humidify by hand the artefact before ironing the same with the heated tool 14. The connection of iron 10 to mains 60, through the atomising device 44, allows to exactly dose minimum water quantities and to accelerate the atomisation in the inside of tool 14.

[0027] The invention, as described hereabove and claimed hereafter, has been proposed, however, by way of mere example, being understood that the same may be susceptible of many modifications and variants, all of which fall anyhow within the inventive concept.

[0028] For instance, tool 14 may have a different number of evaporation chambers 18, 19, not necessarily having a rectilinear development, to form a more or less extended labyrinth, and the roughness of the internal walls of said chambers may be discontinuous and/or differentiated, to form more or less deep unevennesses 40. Besides, the fluid feeding iron 10 may be obtained by any means, even though the connection to a system 60 of the above described type is preferred.

[0029] Lastly, also possible structural inversions or alternative locations of the components or the parts that form as a whole the iron of the present invention are also possible.

Claims

1. An iron (10), especially suitable to be used in footwear and leatherware sectors, comprising a tool (14), tied to a grip and handling body (12), made from metal and provided internally with a plurality of ducts and seats forming one or more chambers (18, 20), for a fluid to be atomised and an adjoining cavity for a heating body (24), at least one of said chambers having a partly or entirely irregular internal surface (36), communicating with the outside of the tool (14) though a nozzle (32).

2. The iron according to the preceding claim, wherein the evaporation chambers (18, 20) of tool (14) define a labyrinth-like course for the fluid fed to the same, heated at a temperature of more than 100°C from body (24) and flowing outside through said nozzle (32) of tool (14), the latter being provided with a cavity (26) for a thermocouple connected to said body (24).

3. The iron according to the preceding claims, wherein at least two evaporation chambers (18, 20), communicating with one another through an opening (34), develop in the tool (14) parallel to one another, at least one of them having a partly or entirely rough inner surface:

4. The iron according to the preceding claims, wherein the irregular surface (36) of at least one of said chambers (18, 20) is obtained by continuous or discontinuous threading, broaching or equivalent mechanical workings.

5. The iron according to the preceding claims, wherein

the irregular surface (36) of at least one of said chambers (18, 20) is obtained on casting the tool (14).

6. The iron according to the preceding claims, wherein at least one of said chambers (18, 20) develops in tool (14) almost up to the end of its advanced part, on whose lower front nozzle (32) communicating with the outside is formed.

7. The iron according to the preceding claims, wherein the irregular surface (36) of said chambers (18, 20) is covered by a layer (38) from material.

8. The iron according to the preceding claims, wherein said material covering surface (36) is constituted by an inorganic salt.

9. The iron according to the preceding claims, wherein the mouth of chambers (18, 20) of tool (14) is provided with a metal bush (42) whose inner diameter is equal to or smaller than the span of minimum diameter of said chambers.

10. The iron according to one or more of the preceding claims, wherein the fluid let in chambers (18, 20) of tool (14) is constituted by water or an air-water mix coming from a feeding system (60).

11. The iron according to one or more of the preceding claims; wherein the feeding system (60) develops into two separate branches (66, 60) which feed respectively, in at least one of chambers (18, 20), a pressurised air-water mix.

12. The iron according to one or more of the preceding claims, wherein at least to one of chambers (18, 20) an atomising device is connected (44), connected in itr turn to said feeding system (60), comprising two separate ducts (48, 50) and a mixing chamber (52) for the pressurised air and water.

13. The iron according to one or more of the preceding claims, wherein branch (68) of system (60) fits in and exits from a water-containing tank (72).

14. The iron according to one or more of the preceding claims, wherein electrovalves (70, 74), regulated by a timer, are respectively interposed between branches (66, 68) of the feeding system (60).

15. The iron according to one or more of the preceding claims, wherein the feeding system (60) comprises a pressure reducer (62), a filter (64) for the compressed air and a pressure-gauge (76).

16. The iron according to one or more of the preceding claims, wherein said atomising device (44) extends before the mixing chamber (52) into an integral tube (50) with an end (56) connected to one of chambers (18, 20) of tool (14).

17. The iron according to one or more of the preceding claims, wherein the heating body (22) of tool (14) and/or electrovalves (70, 74) of system (60) are connected to the mains through at least a cable (30) which develops in the handle-body (12) of said iron and are activated by a button (12') protruding from said body (12).

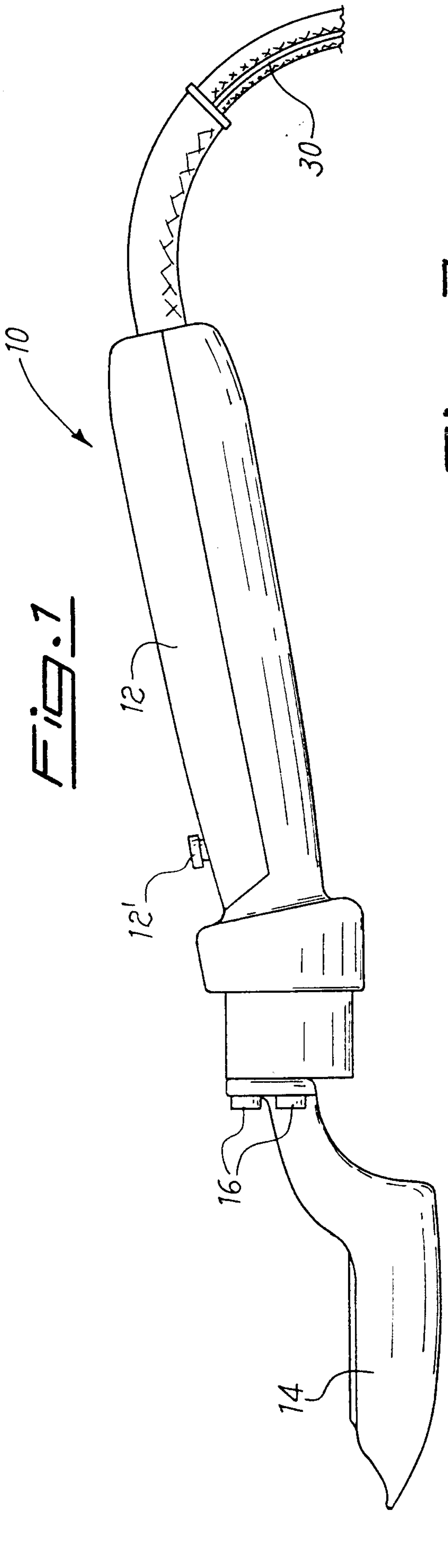

Fig.1

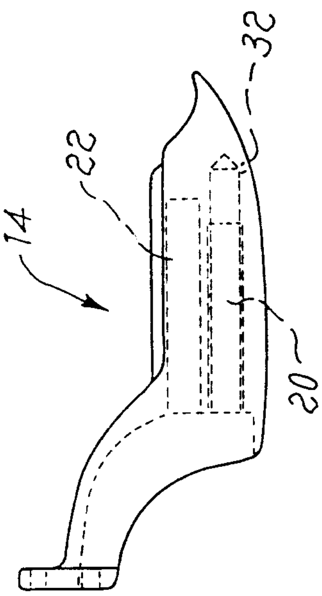

Fig.2

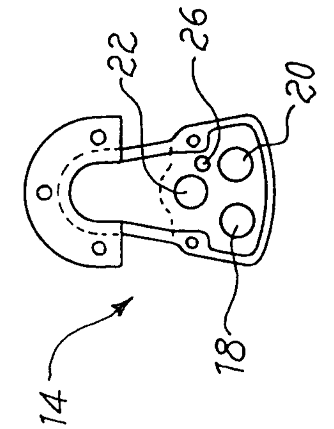

Fig.3

Fig.4

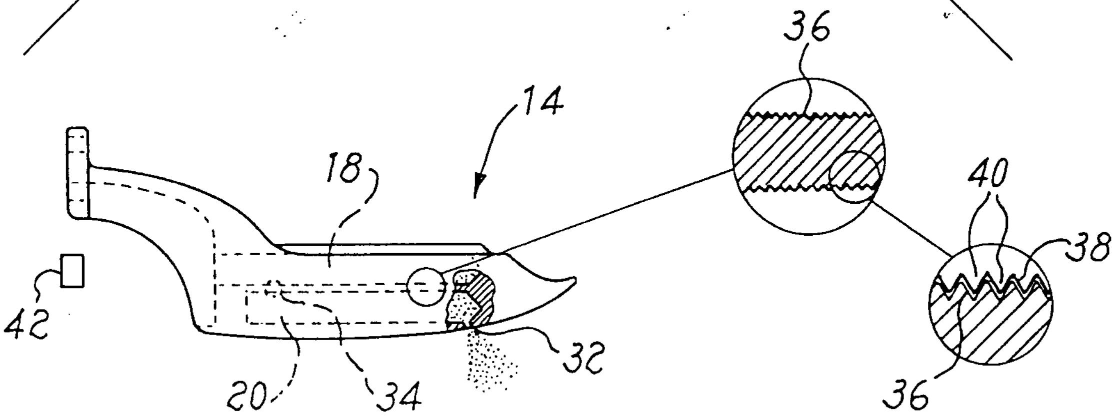

Fig.5

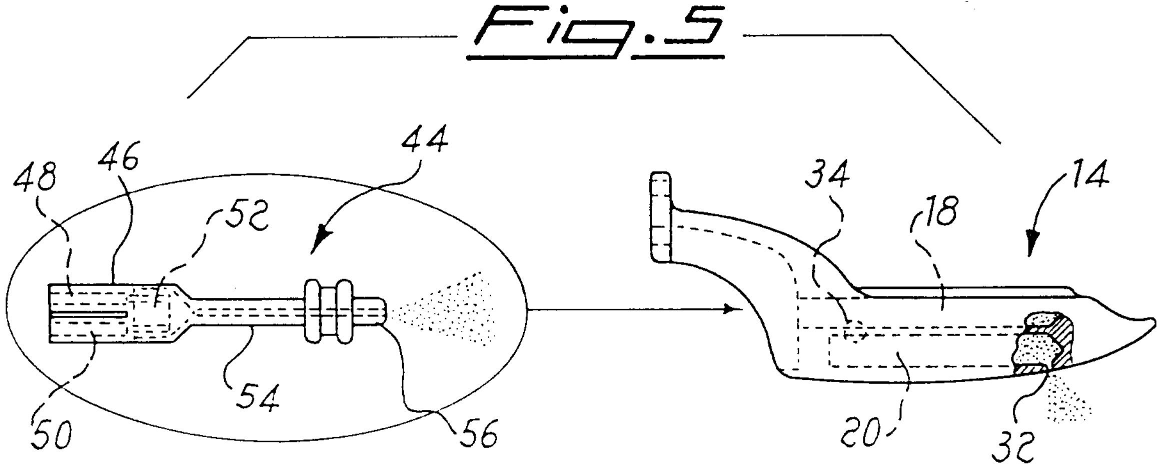

Fig.6

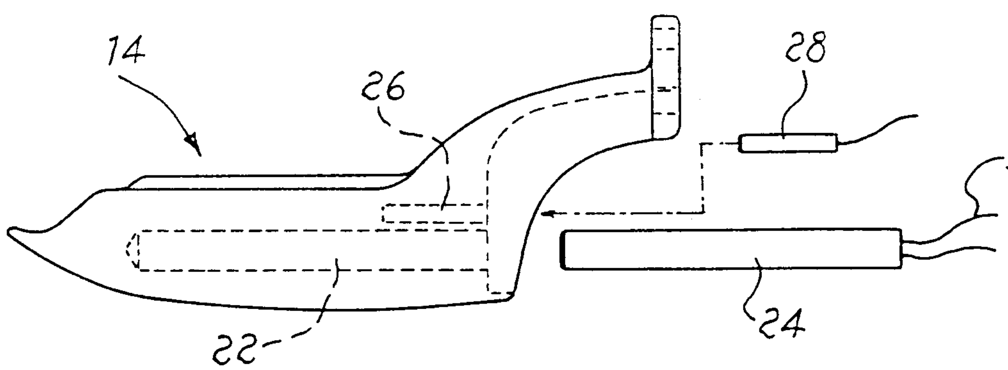

Fig.7