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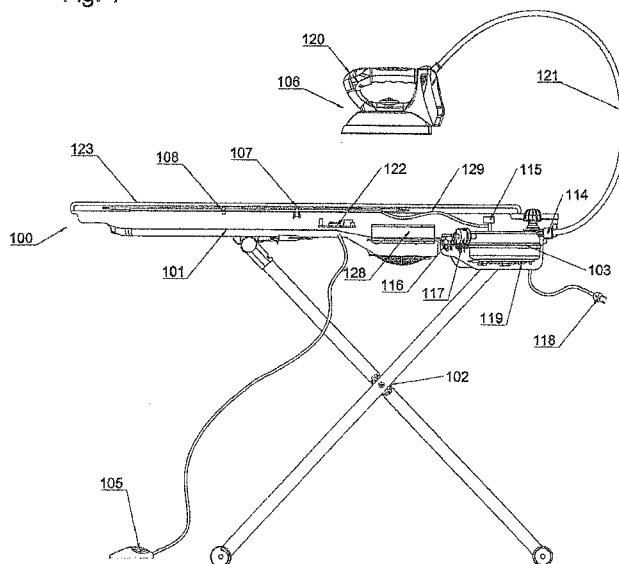
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(54) Title: IRONING BOARD WITH STEAM-RELEASING BOARD FOR DOMESTIC USE WITH VARIOUS IRONING MODES

Fig. 1



(57) Abstract: Ironing board for domestic use with heated and ventilated board with steam-release function and built-in boiler. Said ironing board has several ironing modes and automatic mechanisms that make it especially easy and intuitive to use. In particular, the three following ironing modes: ironing by hand only (without using any iron); ironing with steam iron and release of steam from the board at the same time; ironing with dry iron and release of steam from the board at the same time. The by-hand-only ironing mode (without any iron) has to a new automatic system of ventilation change from suction to blowing and the contemporary release of steam from the ironing board by simply operating a foot-pedal control. This enables the user to keep his/her hands completely free to flatten the item to be ironed on the board by exploiting the air suction first and then pressing the foot-pedal to obtain the blowing function and steam release. The user can then iron the item by using air and steam and eliminate any creases by using his/her hands only. After releasing the foot-pedal, the ironing board stops ejecting steam and changes the ventilation from blowing into suction: during this phase the residual steam is sucked and the garment is dried up, while the user flattens and folds it. The ironing mode with steam iron has a ventilation mechanism controlled

by the iron that starts the ventilation either in blowing or suction mode according to the selection made each time steam is released. Each time the foot-pedal is operated, the ventilation changes from suction into blowing and at the same time steam is released from the ironing board, so that steam can come from the iron and the worktop for greater effect and penetration of steam into the item being ironed. When the foot-pedal is released, the ironing board stops ejecting steam and the ventilation is changed back into the previous mode. In the ironing mode with dry iron, the ventilation is set as continuous suction and the user irons with dry iron and the heated board in suction mode. In this case too, by pressing the foot-pedal steam is released from the board and the ventilation is changed from suction into blowing. When releasing the foot-pedal, the steam ejection from the board stops and the ventilation is changed back into suction.

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**“IRONING BOARD WITH STEAM-RELEASING BOARD FOR  
DOMESTIC USE WITH VARIOUS IRONING MODES”**

**DESCRIPTION**

This patent concerns a new ironing board for non-professional use with  
5 heated steam-releasing board with sucking and blowing functions for two  
ironing methods: without using any iron (by hand only) and with iron.

**BACKGROUND:**

Some industrial ironing equipment is known, mainly used in professional  
ironing shops, which consists in a high-pressure steam generator (usually  
10 separated) and an ironing board with one or more worktops, equipped with a  
suction, blowing and steam-releasing system for the board. The complex  
structure of such equipment, its cost and the several operations necessary to  
use it fully make it unsuitable for non-professional users so that its domestic  
use is ruled out.

**15 DESCRIPTION OF THE SYSTEM:**

This ironing board consists of a framework, preferably made of  
thermoplastic material, to which the legs are connected that can be adjusted  
in the height and are preferably made of metal.

The framework supports a boiler for steam generation that is equipped with  
20 a heating plate, a thermostat, and one or more electrovalves for steam  
release as well as a system for pressure adjustment, preferably an  
electromechanical and/or electronic pressure gauge.

The framework also supports a worktop, preferably made of metal, which is  
heated up to a temperature between 80°C and 140°C and is provided with  
25 holes to let steam and air through.

As an alternative, such worktop can be made of metal grid heated as described above.

The framework also hosts a fan - preferably a two-direction one - with suction and/or blowing function.

- 5 The framework also supports a control panel with function selectors and lights showing the system status.

Moreover, the framework hosts a PC board to enable and control the ironing board functions.

- 10 The ironing board is also equipped with a foot-pedal control connected by means of a duly insulated electric cable for the selective ejection of steam from the ironing top. The pedal can be operated with the foot so that both hands remain free to iron.

- 15 This foot-pedal not only controls steam release but also the worktop ventilation, preferably in the blowing direction, in order to facilitate the steam coming out of the worktop and getting through the fibres of the garment being ironed.

The ironing board is also provided with a fabric cover for the ironing worktop, called ironing board cover, so that the item being ironed is not in direct contact with the heated plate.

- 20 The ironing board cover can also be coupled with a padding, whose thickness can range between 4 and 10 mm in order to make ironing operations more comfortable. This padding is preferably made of a breathing material such as for example an open-cell foam material.

- 25 The ironing board is also provided with a socket for ancillary connection that allows both electric and steam connection.

The socket described above can also be used to connect a steam iron provided with a microswitch that controls the ejection of steam from the same iron through the socket. The steam ejection control operates at the same time the fan hosted in the ironing board. The system described above  
5 allows different combinations of ironing techniques that are listed below:

- IRONING WITHOUT IRON (BY HAND ONLY)

This ironing mode is selected by the user by means of a selector on the control panel.

When in this mode, the ironing board automatically starts the fan that will  
10 run continuously in the suction direction. In this way, the user can easily lay the item on the ironing worktop.

When the foot-pedal is pressed, the ironing board reverses - through the PC board - the direction of the blowing motor and enables the ejection of steam from the ironing worktop. In this way, the steam combined with the air  
15 blown by the fan hits the item to be ironed and stretches its fibres.

When the foot-pedal is released, the ironing board reverses again - through the PC board - the direction of the motor, thus re-establishing the initial suction function and cutting the ejection of steam from the worktop. In this way, the combination between heated board and suction allows drying the  
20 item being ironed, while the operator can stretch its fibres completely by using the hands and then finally fold it.

- IRONING WITH STEAM IRON

This ironing mode is set by the user by means of a selector on the control panel. When in this mode, the fan direction can be decided by the user in a  
25 selective way.

In this mode, the ventilation is operated by the iron.

The iron shall be properly connected to the socket of the ironing board.

When the dedicated pushbutton on the iron is pressed, the release of steam from the iron is enabled and at the same time the fan starts in the direction  
5 selected by the user by means of the selector on the control panel (suction or blowing).

When the iron pushbutton is released, steam is no longer released and the ventilation stops.

When both the iron pushbutton and the foot-pedal are pressed, the ironing  
10 board enables the steam release from both the iron and the ironing board and the fan starts in the blowing direction, irrespective of the selection made by the user on the control panel.

#### - IRONING WITH DRY IRON

When in this mode, the ironing board does not automatically start the  
15 ventilation that must be started by the user in the suction function by means of the pushbuttons on the control panel of the ironing board.

The iron shall be properly connected to the socket on the ironing board.

Dry ironing does not require pressing any pushbutton on the iron and therefore the iron board ventilation does not start automatically. If the user  
20 wants the ventilation, it shall be started by pressing a pushbutton on the control panel in the suction direction as it was explained before.

However, in this ironing mode too it is possible to change the ventilation from suction to blowing by pressing the foot-pedal and at the same time steam will be released from the ironing board too.

25 The characteristics and functioning modes can be better explained in one of

the possible variants that were realised, with reference to the figures from 1 to 3.

Figure 1 shows the section of a sample of the new ironing board.

Figure 2 shows the control panel of a sample of the new ironing board.

5 Figure 3 shows a section of the element conveying and distributing steam from the ironing worktop that also hosts the heating element.

With reference to Figure 1, the ironing board (100) consists of the framework (101), to which the adjustable legs are connected (102). The framework also hosts the boiler (103) for steam generation, provided with a  
10 heating element (119), a first electrovalve (115) for steam release from the ironing worktop, a second electrovalve (116) for steam release from the iron and a pressure switch (117) for adjusting pressure inside the boiler.

The framework also hosts a PC board (122), which controls the ironing board functions. The PC board enables the foot-pedal (105) to start the  
15 ejection of steam from the ironing worktop.

The ironing worktop is formed by a pierced metal plate (107), to which an aluminium duct (108) is thermally connected, which hosts a steam circuit (124) and a tubular heating element (125) (Figure 3). On the surface in contact with the pierced plate, the duct (108) shows calibrated holes (126)  
20 for the release of steam going through the pierced plate (107).

The electrovalve (115) is connected to the duct (108) through the pipe (129). In this way, when the foot-pedal is pressed (105) and the electrovalve (115) lets the steam through, the steam goes through the steam circuit (124) and comes out of the holes (126). The tubular heating element (125) warms up  
25 the duct (108) so that the steam is kept at a constant temperature and does

not cause any drops that would moisten the garment being ironed.

The two-direction fan (128) is located under the pierced plate (107) on a special support of the framework (101).

The ironing board is switched on by plugging in the plug of the power supply cable (118) and by pressing the illuminated pushbutton (110) located on the control panel (109) (Figure 2).

When switching on the ironing board, the heating element is powered (119) that generates steam by warming up the boiler (103) and the water inside the boiler. When the pre-set pressure is reached, the pressure switch (117) cuts off the power supply to the heating element and turns on the indicator light (111) that shows that steam is ready. The pressure switch cyclically cuts off and restarts the power supply to the heating element in order to keep constant the pressure inside the boiler.

When turning on the ironing board, the tubular heating element is also powered (125) and warms up the duct (108) and through it the pierced plate (107) too. When the pre-set temperature is reached, the thermostat (127) cuts off the power supply to the tubular heating element. The thermostat cyclically starts and cuts off the power supply to the heating element in order to keep constant the duct temperature (108) and consequently the temperature of the ironing worktop.

Now the ironing operations can start. The user can choose the ironing mode by means of the selector (112) on the control panel (109) in figure 2

- Ironing mode without steam iron (by hand only).

By means of the selector (112) the user chooses the ironing mode without

iron. Automatically, the ironing board enables the fan (128) in the suction direction. The sucked air goes through the pierced plate (107) and the ironing board cover (123), thus helping the user flatten the item.

When the foot-pedal is pressed (105), the ironing board enables the  
5 electrovalve (115) that, through the pipe (129) and the duct (108), lets the steam generated in the boiler go through the calibrated holes (126). At the same time, the ironing board reverses the fan direction from suction into blowing.

The steam and the air generated by the fan get through the pierced plate and  
10 the ironing board cover and flood the garment. The user can flatten the garment by hand, thus removing creases.

When releasing the foot-pedal, the ironing board cuts off the power supply to the electrovalve (115), thus breaking up the release of steam. At the same time, the ironing board reverses the ventilation direction from blowing into  
15 suction. The combination of suction and heated ironing board allows the garment to lose the moisture generated by steam, thus resulting in long-lasting ironing. The user can further remove residual creases by hand and fold the garment.

This ironing mode is extremely simple because the user shall only operate  
20 the foot-pedal during ironing when wanting to release steam, while the ironing board automatically manages the ironing worktop ventilation in order to obtain the best possible results. The user's hands are always free and can be used to flatten the garment by acting directly on it. The operator can keep the foot-pedal pressed or push it impulse-like. In any case, every  
25 time the foot-pedal is released, the suction is enabled to dry up the garment

or however to eliminate excessive steam.

At the present state of the art, no ironing board, even of professional type, is provided with such an automatic mechanism.

- Ironing mode with steam iron

5 The iron (106) shall be connected through the cord (121) to the socket (114) of the ironing board. Such socket allows the electric connection of the iron to the ironing board. Moreover, the socket is connected to the electrovalve (116) to enable the release of steam.

The iron is provided with a pushbutton control (120).

10 By means of the selector (112) the user chooses the ironing mode with steam iron.

By means of the selector (113) the user chooses the direction of ventilation, either suction or blowing. When pressing the pushbutton (120) on the iron, the ironing board enables the electrovalve (116), which allows the release of  
15 steam generated in the boiler (103) from the iron (106) through the cord (121).

In addition to releasing steam, the ironing board also enables the fan in the direction selected by the user by means of the selector (113).

When releasing the pushbutton on the iron, the steam ejection and the  
20 ventilation stop.

The user can keep the pushbutton pressed or press it impulse-like. In any case, when the pushbutton is pressed, steam is released from the iron and the ventilation of the ironing board is performed in the selected direction.

The new ironing board described above has a further function consisting in  
25 the release of steam at the same time from the iron and the ironing worktop

and this is possible by simply pressing the foot-pedal (105).

By pressing the foot-pedal (105) together with the pushbutton on the iron (120), the ironing board enables both electrovalves (115) and (116), thus allowing the release of steam from both the ironing worktop and the iron.

5 The ironing board also enables the fan (128) in the blowing direction, irrespective of the choice made by the user on the selector (113), to obtain a more effective distribution of the steam coming from the ironing worktop.

When releasing the foot-pedal (105), the release of steam from the worktop stops and the ventilation restarts, as it was set by means of the selector  
10 (113), while when releasing both controls, no more steam is released and the ventilation stops.

- Ironing mode with dry iron

The iron (106) shall be connected through the cord (121) to the socket (114) of the ironing board. Such socket allows the electric connection of the iron  
15 to the ironing board.

By means of the selector (112), the user chooses the ironing mode without steam iron.

The ironing board automatically enables the fan (128) in the suction direction. The sucked air goes through the pierced plate (107) and the  
20 ironing board cover (123), thus helping the user flatten the garment and hold it during the ironing with dry iron. Moreover, by pressing the foot-pedal (105), the ironing board enables the electrovalve (115) that allows the release of steam from the worktop and changes at the same time the fan direction from suction into blowing.

25 When the foot-pedal is released (105), the release of steam from the

worktop stops and the fan direction changes into suction.

This ironing mode enables the user to combine the effectiveness of steam coming from the worktop with the thermo-mechanical action of the dry iron in a simple and intuitive manner, thus removing creases in a faster and more effective way.

5

- This is the basic information sufficient for any expert person to realise the invention and, as a consequence, during the practical application some changes may be made that will not jeopardise in any way the content of the idea.

### CLAIMS

- 1) Ironing board for domestic use with built-in boiler (103), heated board (107), two-direction ventilation system (suction and blowing) (128), steam-delivering system for steam output from the board (fig 3), characterised by  
5 the fact of having an automatic system for steam output from the board operated simply by means of a pedal (105) that triggers at the same time the delivery of steam from the board and the change of the ventilation function from suction to blowing, a control panel (fig 2) featuring a on-off pushbutton and an indicator light showing that steam is ready, a dial to  
10 select the ironing mode, a two-position selector to set the ventilation either on suction or on blowing function.
- 2) Ironing board, as in the previous claim, characterised by the fact of having an ironing board consisting of a metal plate (preferably aluminium or Aluzinc) (107), which supports a metal profile with great heat exchange  
15 properties, preferably in aluminium, linked to the ironing board so that they are thermally coupled. The aluminium profile (figure 3) has a section with a longitudinal hole through which steam flows and a cavity to host a tubular heating element. This tubular heating element is mechanically coupled with the ironing board to heat the ironing board. The aluminium profile described  
20 above is thermally regulated by an electro-mechanical thermostat installed on it and suitable to keep the profile temperature between 140 °C and 80 °C. This temperature level prevents steam flowing through the profile from getting condensed, thus preventing the formation of water drops that would dampen the garment being ironed.
- 25 3) Ironing board as described in the previous claims, characterised by the

fact of having a socket (114) whose shape allows the electrical and hydraulic connection of a steam iron (106) to iron garments. The iron connected to the ironing board through this special socket is equipped with a pushbutton (120) that enables the steam output from the iron and the  
5 ventilation of the board at the same time - either in suction or blowing mode.

Fig. 1

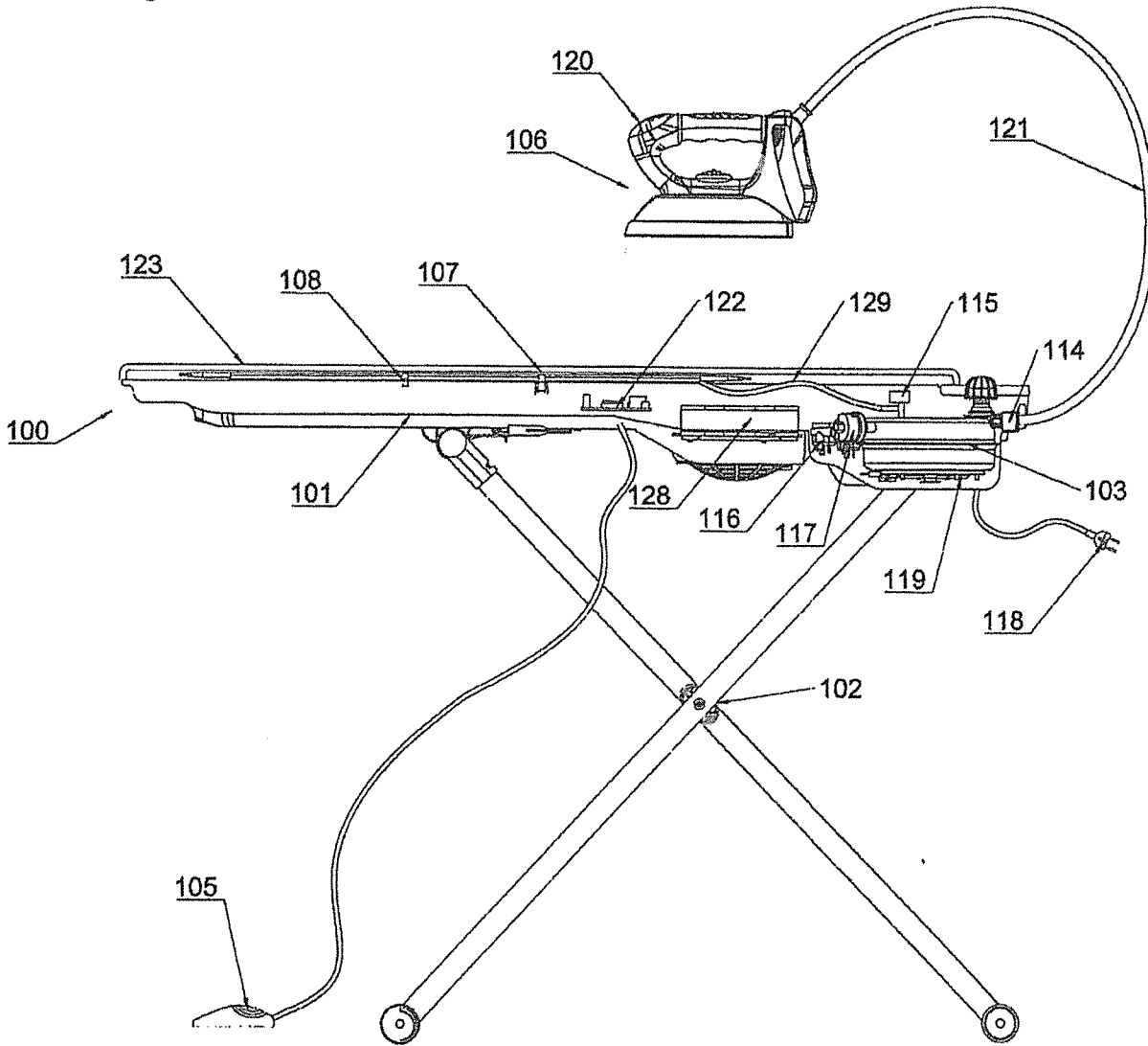


Fig. 2

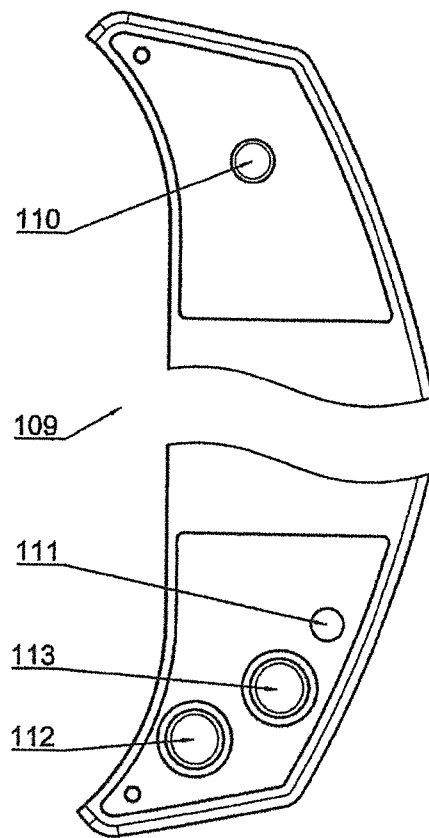
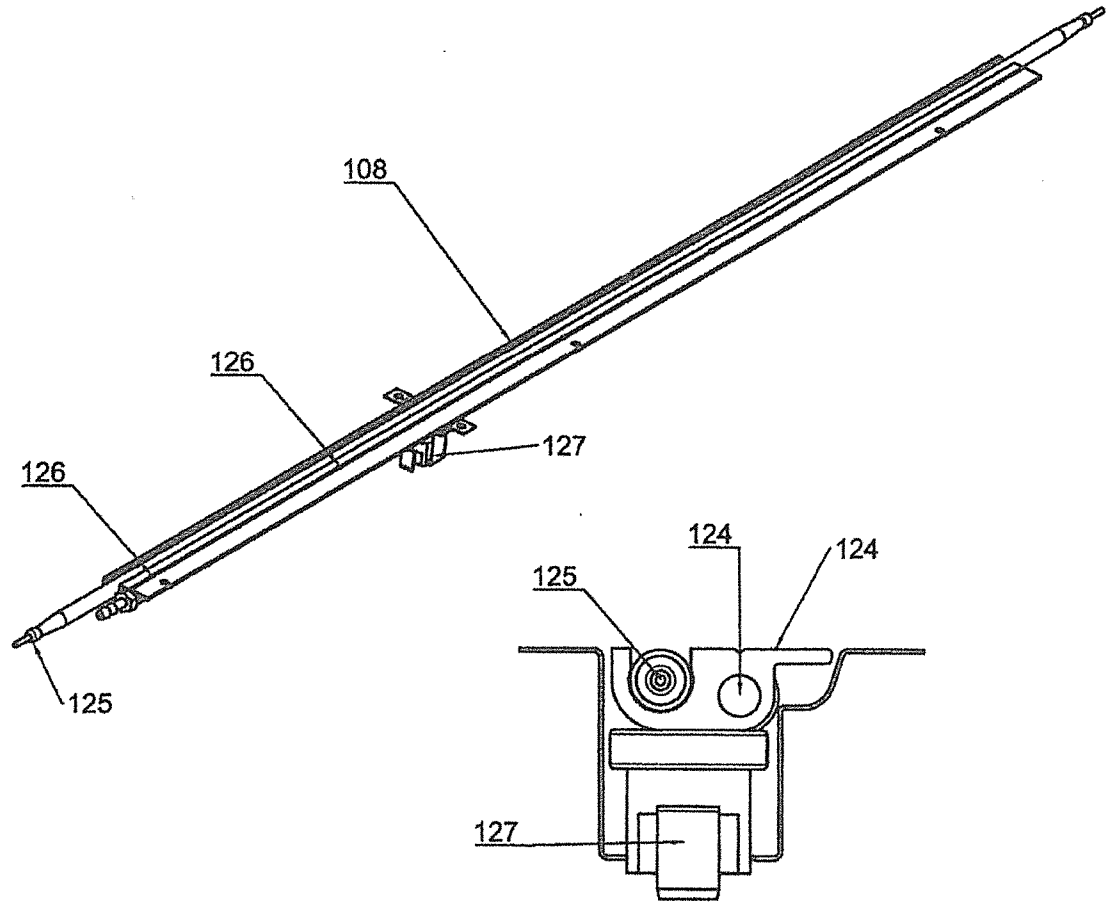


Fig. 3



INTERNATIONAL SEARCH REPORT

International application No  
PCT/IT2016/000180

A. CLASSIFICATION OF SUBJECT MATTER  
INV. D06F81/08  
ADD.  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 200 447 292 Y1 (PARK) 18 January 2010 (2010-01-18) abstract; figures 1-8	1-3
A	GB 1 519 356 A (SIMMONDS M) 26 July 1978 (1978-07-26) page 2, line 65 - page 2, line 106 page 3, line 72 - page 3, line 84 page 4, line 64 - page 5, line 6; figures 1,4	1-3
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Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <b>Fachin, Fabiano</b>
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/IT2016/000180

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 36 33 087 A1 (NORMBAU GMBH [DE]) 31 March 1988 (1988-03-31) column 2, line 26 - column 3, line 1; claim 1 column 3, line 35 - column 3, line 46 column 4, line 53 - column 4, line 66 column 5, line 42 - column 6, line 20; figures 1-3 -----	1-3
A	US 2 229 260 A (SMITH ALVA T) 21 January 1941 (1941-01-21) column 2, line 12 - column 2, line 31 column 3, line 2 - column 3, line 11; figures 1-3 -----	1-3
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IT2016/000180

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