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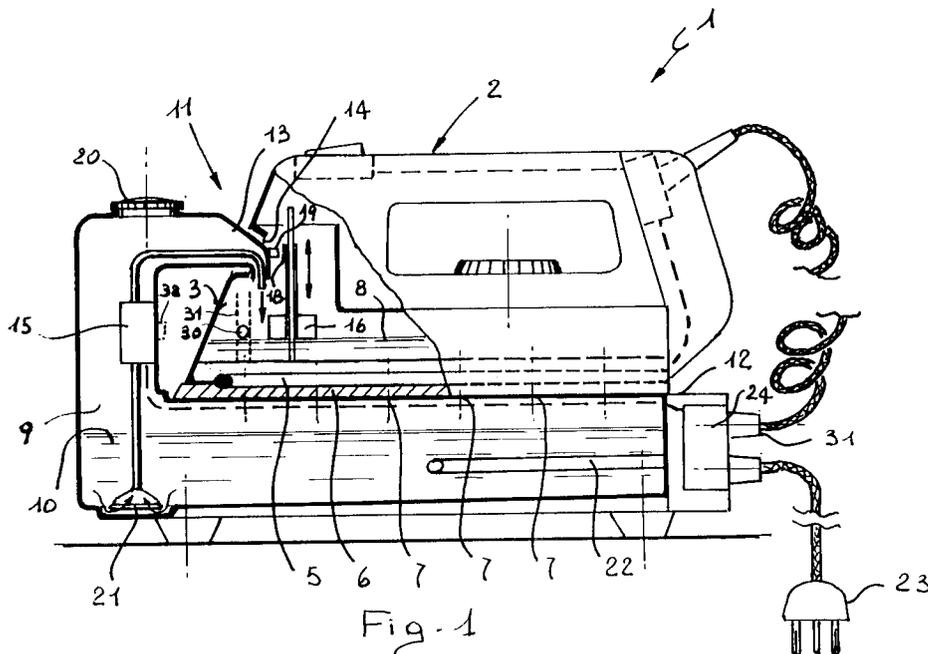
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**Device for steam ironing fabrics.**

A device for steam ironing fabrics comprises an electric iron having a water vessel (3) and members for generating and delivering the water steam from the electric iron, an auxiliary vessel (9) for holding supplementary water (10), which is removably asso-

ciated with the electric iron, and automatic recovering means (10) for automatically recovering the level of the water held in the vessel (3), by using the supplementary water (10) of the auxiliary vessel (9).



**EP 0 574 602 A1**

## BACKGROUND OF THE INVENTION

The present invention relates to a device for steam ironing fabrics.

As is known, at present the steam ironing of fabrics, such as linen fabric and the like, is conventionally performed by using a water steam electric iron, or a so-called ironing machine, that is an apparatus the water boiler or vessel of which is separated from the electric iron and in which the latter is steam supplied by suitable flexible hoses.

An advantage of a steam electric iron with respect to an ironing machine is that said electric iron has a greater handling facility since it is devoid of the mentioned flexible hoses, and includes exclusively the electric power supply cord.

On the other hand, a disadvantage of a steam electric iron with respect to a steam ironing machine is that, after a set comparatively small time, the water vessel arranged inside the steam electric iron, because of its reduced size, must be frequently filled up by fresh water, which involves a comparatively high time loss for the user.

From the steam ironing machine standpoint, the advantages of the steam electric iron become disadvantages for said machine, whereas, on the contrary, the disadvantages of the steam electric iron represent advantages for the steam ironing machine.

Actually, a steam ironing machine, as already stated, has the drawback of a poor handling facility of its steam iron member, which is connected to said machine by the mentioned flexible hoses which also cause the size of the ironing machine to be greatly increased in its not use condition.

Contrarily to a steam electric iron, a steam ironing machine has a comparatively large water capability vessel, which greatly reduces the frequency of the water filling up operations.

## SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks of prior art devices.

Within the scope of the above mentioned aim, a main object of the present invention is to provide a device for steam ironing fabrics which has like handling features as a conventional steam electric iron, while including all of the the advantages included in a steam ironing machine, for example that of performing a long duration ironing operation.

Another object of the present invention is to provide such a device for steam ironing fabrics which is very flexible in operation by allowing the user to indifferently use, depending on the requirements, a conventional steam electric iron or a conventional electric iron provided with a supplemen-

tary vessel adapted to generate a high steam amount, without any rest times in the ironing operation.

Yet another object of the present invention is to provide such a device for steam ironing fabrics which releases the operator from the job of continuously filling up water at set time periods in order to recover the level of the water held in the vessel of the iron, and which, moreover, overcomes the inconvenience related to the provision and size of the mentioned flexible hoses.

According to one aspect of the present invention, the above aim and objects, as well as yet other objects, are achieved by a device for steam ironing fabrics, characterized in that said device comprises an electric iron including a water vessel and members for generating and delivering water steam from said iron, an auxiliary vessel holding therein supplementary water, which can be removably associated with said iron, and automatic recovering means for automatically recovering the level of the water held in said vessel by using said supplementary water of said auxiliary vessel

## BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages will become more apparent hereinafter from the following detailed disclosure of a device according to the invention, which is illustrated, by way of an indicative example, in the accompanying drawing, where:

Figures 1 and 2 are a partially cross-sectioned elevation side view respectively showing a device for steam ironing fabrics according to the invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figure 1 of the drawing, the device for steam ironing fabrics, according to the invention, has been herein indicated generally by the reference number 1, and comprises an electric iron, generally indicated at 2, which include a water vessel 3 and members for generating and delivering water steam from the electric iron, said members being indicated at 4.

More specifically, the members for generating and delivering the water steam from the iron comprise an electric resistance 5 for heating to a set temperature the heating plate 6 of the iron, there-through there are formed, in a manner known per se, a plurality of holes 7 for delivering the steam generated by the contact, performed in a known per se manner, between the water which is ejected by small doses from the vessel 3 and the over-heated plate 6 of the iron.

The device for steam ironing fabrics further comprises an auxiliary water vessel, generally

indicated at 9, provided for holding a comparatively high amount of water 10, and specifically adapted to water fill up, as it will be disclosed in a more detailed way hereinafter, the vessel 3 of the iron.

Advantageously, the auxiliary vessel 9 is adapted to be removably associated with the iron 2 and comprises means, generally indicated at 11, for automatically recovering the level of the water 8 held in the vessel 3 by using the supplementary water 10 of the auxiliary vessel 9.

More specifically, the auxiliary vessel 9 comprises a bearing surface 12 for supporting there-on the electric iron 2 at a set position, and a beak portion 13 which extends for a first length perpendicular to the surface 12 and for a second length parallel to said surface 12 so as to engage, as shown in Figure 1, inside the inlet mouth 14 of the iron 2.

The inlet mouth 14 communicates with the vessel 3 so that the latter, as it will become more apparent, can be supplied by the supplementary water 10 of the auxiliary vessel 9.

The suction of the supplementary water 10 from the auxiliary vessel 9 and the delivery there-of into the vessel 3 of the iron 2 are performed by a pump 15 which is housed inside the auxiliary vessel 9.

In particular, the pump 15 is actuated, through a second sensor member 19, by means of a first sensor, such as, for example, a float member 16 arranged inside the vessel 3.

The float 16 is slidably associated with a rod 17 connected to the vessel 3 in order to allow the float member to be raised and lowered depending on the water amount 8 which is present in said vessel 3, or it can also be constituted by a small ball 30 adapted to slide in a suitable channel 31 provided inside the iron 2 and shown by a dashed line in Figure 1

The float member 16 is provided with a portion 18 thereof which can be detected by said second sensor 19 arranged on the end of the beak portion 13 and which will be arranged, as the iron 2 is coupled to the auxiliary vessel 9, inside the vessel 3 or in a region facing said vessel 3.

The second sensor 19 is a known type of sensor and is adapted to detect the position of the float 16; for example, the second sensor 19 can be an IR sensor provided for energizing and/or dis-energizing the pump 15 for sucking water from the auxiliary vessel 9; on the other hand, in the case in which the float is formed by said ball 30, the sensor can also be an electronic read-out optical device adapted to detect the position of the ball through a small window (not shown) of the iron 2.

In a modified embodiment, the means 11 for automatically recovering the water level 8 comprise, as a first sensor member, the supporting

surface or panel 12, movable under the weight of the iron to be supported thereby and, as a second sensor member, a known type of sensor for detecting the lowering of the supporting surface or panel depending on the amount of water held in the iron and adapted to consequently energize the pump 15.

The auxiliary vessel 9, in addition to being provided with a plug 20 for filling water 10 therein, can also comprise a softening filter 21 so as to allow the possibility of using normal water and supplying the iron with water having a low limestone contents to protect the plate of the iron 2 from possible scales.

Moreover, the auxiliary vessel 9 can also comprise an additional electric resistance 22 adapted to increase the temperature of the water 10 so that the latter, as it is introduced into the vessel 3, has a temperature slightly greater than the room temperature thereby facilitating the steam generation.

To the foregoing it should be also added that the steam iron 2 is electrically connected to the vessel 9 through a plug 31, while the vessel 9 is electrically connected by a plug 23 to the power supply of the ironing room or place.

Owing to the provision of the plugs 23 and 31 and the socket 24, the iron 2 can be electrically connected either to the auxiliary vessel 9 or to the mains, depending on the requirements of the user.

The operation of the device according to the invention will be apparent from the above disclosure.

In particular, as a small amount of fabrics or linen must be ironed, for which the steam generated from the water held in the vessel 3 of the iron will be sufficient, the iron 2 will be used in a conventional way by directly connecting it to the mains.

On the other hand, as a comparatively high amount of linen must be ironed, the steam electric iron will be connected to the auxiliary vessel 9 and then the latter will be connected to the mains.

Each time the iron is put on the panel or surface 12 of the auxiliary vessel, the beak portion 13 will enter the inlet mouth 14, and the second sensor will detect the position of the float 16.

If the float position has lowered because of an excessive consume of the water inside the vessel 3, then the second sensor will actuate the pump 15 which, in a very small time, will recover the water level to the start optimum operation level

Thus, during the necessary operation interruptions required by the operator in order to fold or properly arrange the cloth article to be ironed, the iron will be automatically supplied with the amount of water consumed thereby, by taking up this water from the auxiliary vessel 9 and this operation will not require dead times and can be always per-

formed in a very easy way, since the iron is connected to the auxiliary vessel exclusively by an electric cord.

In a different solution (Fig. 2) the means 11 for automatically recovering the level of the water held in the vessel 3 comprise a float 40 movable in the inner of a second vessel 41 communicating with the beak portion 13 through two holes 42. The float 40 permits the passage of the water 10 into the second vessel 41 through an hole 60.

The beak portion 13 comprises a first valve element 43 for closing, when moved by the spring 44, the passage 45. The beak portion 13 further comprises a seal 50, housed on the end of the beak portion 13, in order to avoid the exit of the water from the second vessel 41.

The inlet mouth 14 of the iron 2 comprises a second valve element 46 actioned by a spring 47 for closing the passage 49.

The inlet mouth 14 communicates, through the holes 48, with the vessel 3 of the iron.

When the inlet mouth 14 enters in the beak portion 13 the movement of the first and second valve element 43 and 46 opens the passage 45 and 49 and the water automatically flows from the second vessel 41 into the vessel 3 of the iron 2.

In practicing the invention, the used material, as well as the contingent size can be any according to requirements.

### Claims

1. A device for steam ironing fabrics, characterized in that said device comprises an electric iron (2) including a water vessel (3) and members (4) for generating and delivering water steam from said iron, an auxiliary vessel (9) holding therein supplementary water (10), which can be removably associated with said iron, and automatic recovering means (11) for automatically recovering the level of the water (8) held in said vessel (3) by using said supplementary water (10) of said auxiliary vessel (9).
2. A device according to Claim 1, characterized in that said auxiliary vessel (9) comprises a supporting panel (12) for supporting said iron and a beak portion (13) extending from said panel and having an end thereof adapted to engage, as said iron is arranged on said panel, with an inlet mouth (14) of said iron, said inlet mouth (14) communicating with said vessel (3).
3. A device according to Claim 1, characterized in that said automatic recovering means (11) comprise at least a first sensor member (12; 16; 30) for sensing the level of said water, said

first sensor member being housed inside said vessel (3), and a second sensor member (19; 32) cooperating with said first sensor member for controlling the recovering of said water level of said vessel (3) by using said supplementary water (10) of said auxiliary vessel (9).

4. A device according to Claim 3, characterized in that said first sensor member comprises at least a float (16) which is movably associated with a rod (17) coupled to said vessel (3), said float including at least a portion (18) thereof which can be detected by said second sensor member (19).
5. A device according to Claim 3, characterized in that said first sensor member comprises a ball (34) which can slide in a channel (31) associated with said vessel (3).
6. A device according to Claim 3, characterized in that said first sensor member comprises said supporting panel (12).
7. A device according to Claim 3, characterized in that said second sensor member (19; 32) actuates a pump (15) for delivering said supplementary water to said iron vessel.
8. A device according to Claim 3, characterized in that said second sensor member (19; 32) detects the level lowering of said supporting panel or of said float or of said ball with respect to the water held in said iron vessel.
9. A device according to Claim 1, characterized in that said auxiliary vessel (9) comprises at least an electric resistance (22) for heating said supplementary water to a set temperature.
10. A device according to Claim 1, characterized in that said auxiliary vessel comprises at least a water softening filter (21) for softening said supplementary water before delivering said supplementary water to said iron.
11. A device according to claims 1 and 2, characterized in that said automatic recovering means 11 comprise a float 40 movable in the inner of a second vessel 41 in order to permit the passage of the water 10 into said second vessel 41, said second vessel 41 communicating with said beak portion 13.
12. A device according to claim 2, characterized in that said beak portion 13 comprises a first valve element 43 and that said inlet mouth 14

comprises a second valve element 46, the movement of said two valve elements, when said inlet mouth is arranged in said beak portion, automatically recovers the level of water (8) held in said vessel (3) by using said supplementary water (10) of said auxiliary vessel (9).

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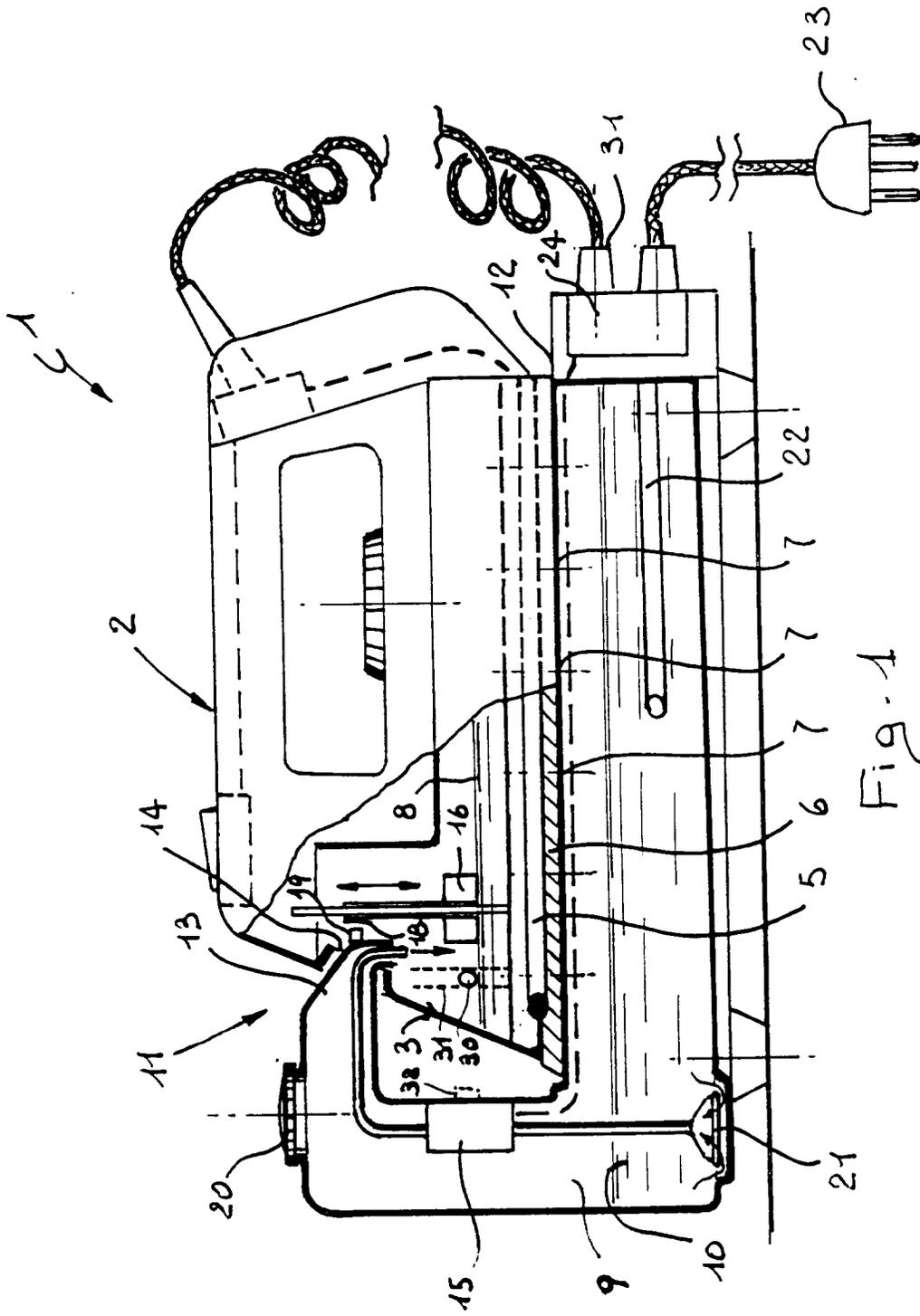


Fig. 1

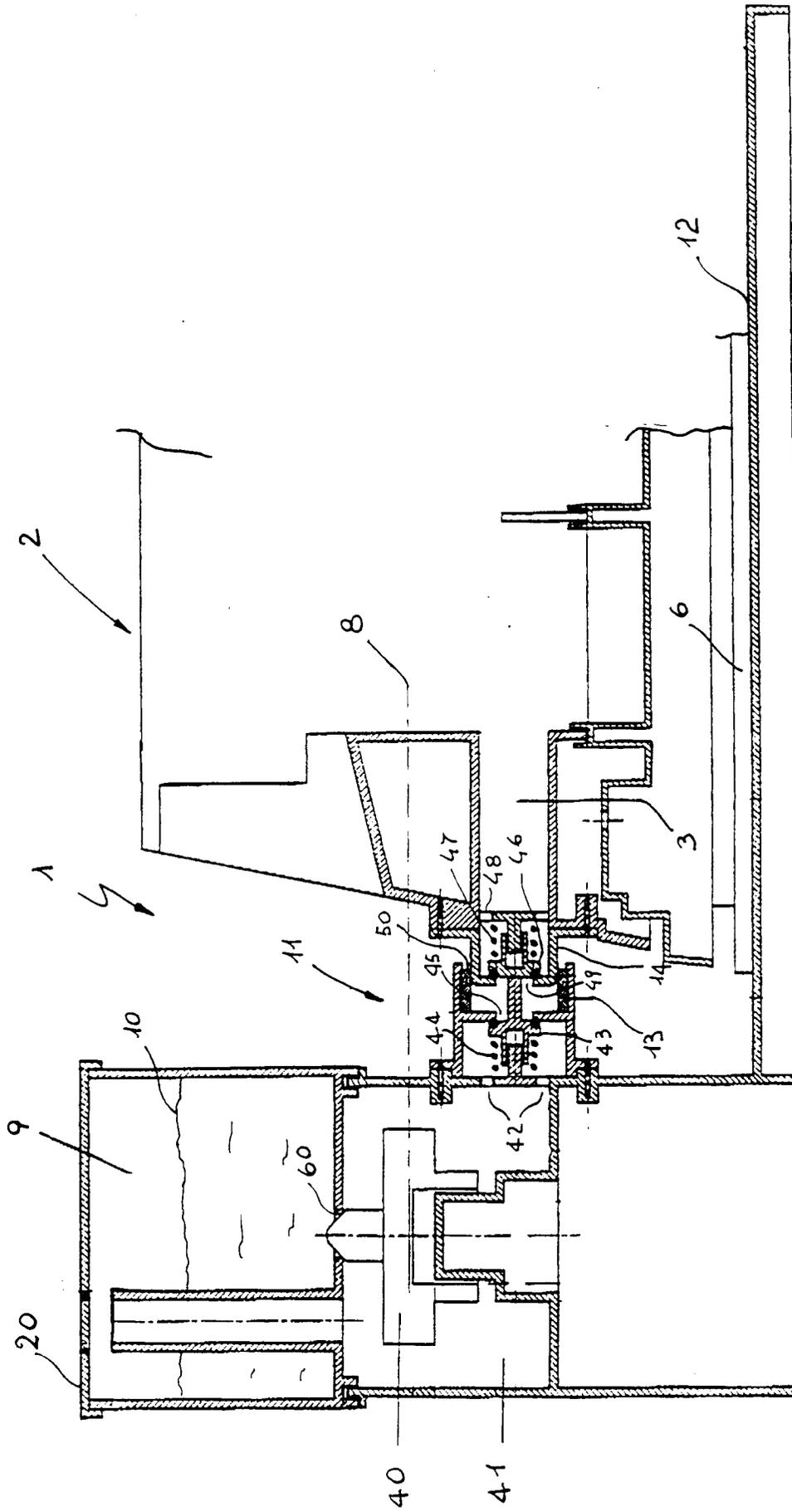


Fig. 2



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EUROPEAN SEARCH REPORT

Application Number

EP 92 11 0114

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.5)
X	PATENT ABSTRACTS OF JAPAN vol. 16, no. 400 (C-977)(5443) 25 August 1992 & JP-A-41 32 600 ( TOSHIBA HEATING APPLIANCE CO ) 6 May 1992 * abstract *	1-3,7,8	D06F79/02 D06F75/14
X	PATENT ABSTRACTS OF JAPAN vol. 16, no. 383 (C-974)17 August 1992 & JP-A-41 22 395 ( MATSUSHITA ELECTRIC IND CO LTD ) 22 April 1992 * abstract *	1-3,5,7,8	
X	JP-A-58 029 498 (MATSUSHITA ELEC IND KK...) * figures *	1,2,12	
A	GB-A-554 631 (W.H. FARMER & H.W. MARSDEN) * figure *	11	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D06F
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	08 MARCH 1993	COURRIER G.L.A.	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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