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(54) **Steam ironing apparatus**

Dampfbügelvorrichtung

Dispositif de repassage à vapeur

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Description

[0001] The present invention relates to a steam ironing apparatus comprising an ironing board provided with a plurality of through holes distributed on its surface, a chamber whereinto said through holes open inferiorly associated to said ironing board, fluid dynamic means able selectively to generate a positive pressure and a negative pressure within said chamber.

[0002] As is well known, in some steam ironing apparatuses, whether steam is produced by a boiler integrated within the iron, or obtained by means of independent boilers, to improve the results of the ironing operation ironing boards are adopted that are provided with a plurality of through holes distributed throughout the surface and ending in a chamber inferiorly associated to the ironing board itself. Appropriate fluid dynamic means allow to generate selectively a positive pressure, i.e. an over-pressure with respect to atmospheric pressure, or a negative pressure, i.e. a vacuum also with respect to atmospheric pressure, in said chamber so that the through holes serve the functions respectively of blowing air upwards or of taking in air mixed with steam.

[0003] The first function allows, especially in the case of clothing articles made of thin and light fabric, to inflate and lay the fabric down on the ironing board preventing the formation of spurious creases. The second function facilitates the passage of steam through the fabric of the article to be ironed, reduces its drying time and improves its stability and adherence to the plane of the ironing board.

[0004] In a device realised in accordance with the prior art, especially widespread in professional systems, the fluid dynamic means that generate, in the aforementioned chamber, the positive pressure, i.e. the emission of air from the through holes, and the negative pressure, i.e. the intake of air and steam through the holes, generally comprise two independent ventilators which can be selectively started, each being exclusively dedicated to the specific function of blowing or drawing a suction. Each ventilator is placed in communication with the chamber underlying the ironing board through its own conduit. In this technical solution it is necessary for each of such conduits to be provided with a movable shutter closure gate, usually able to be actuated manually by electromechanical devices so that, when a fan is operating, the passage of the conduit of the other fan is occluded and vice versa, to prevent the specific blowing or suction action of each fan from being ineffective.

[0005] The technique described above, although it is effective in reaching an improvement of the ironing operation, is nonetheless costly and complex and hence also not economical for applications in home systems, especially for the necessary presence, in the two flow conduits of the fans, of the movable gates and of the mechanisms controlling their operation.

[0006] A similar technical solution, even if with some differences, is disclosed in the United States patent US

4,274,214, where the steam ironing apparatus has a conduit having a single first end connected inferiorly to the chamber, and two second ends.

[0007] Each second end is then connected to an independent ventilator, a first one to create the positive pressure, and a second one to create the negative pressure.

[0008] Between the air outlet of the first ventilator and the conduit, and between the air outlet of the second ventilator and the conduit, two shutter closure gates are interposed, to selectively open and close the respective air passages, to prevent the specific blowing or suction action of each fan from being ineffective.

[0009] In the attempt to overcome the aforementioned drawback a second known technique, described in European patent application EP 0750066 A1, provides for the replacement of the two independent ventilators with a single axial flow ventilator controlled by electronic means which allow to select the direction of rotation according to whether a positive pressure or a negative pressure is to be exerted. However, this second solution too, while it does eliminate the movable gates and the related actuation mechanisms, thereby indeed reducing the complexity and manufacturing and maintenance costs of the first known technique, is not yet fully optimal both from the standpoint of lowering manufacturing costs and of the overall reliability of the apparatus, since the additional electronic circuitry, to control the direction of rotation of the fan, constitutes, especially for a home apparatus, a delicate part, subject as it is to its own statistical rate of possible failures, and one with relatively high cost.

[0010] In this situation the general aim of the present invention is to devise a steam ironing apparatus that is able substantially to overcome the aforementioned drawbacks. The object of the present invention is to devise a steam ironing apparatus that, in addition to maintaining the effectiveness of the known techniques based on the selective generation of blowing and intake flows on an ironing board, allows to contain to a minimum level the addition of specific mechanisms and components and thus presents the utmost constructive simplicity and a very low manufacturing cost.

[0011] The specified aims are substantially attained by a steam ironing apparatus having the features of claim 1.

[0012] The description shall now be provided, purely by way of indicative example, of a preferred embodiment of a steam ironing apparatus according to the invention, illustrated in the accompanying drawings, wherein:

- Figure 1 shows a longitudinal section view of an ironing apparatus according to the invention;
- Figure 2 shows a section according to plane (II-II) of Figure 1.

[0013] With reference to the aforementioned figures,

the steam ironing apparatus is globally indicated with the number 1. It comprises an ironing board 2 provided with a plurality of through holes 3 distributed on its upper surface and a chamber 4 whereinto said through holes open, formed by an appropriately shaped wall and inferiorly associated to the ironing board itself.

[0014] To chamber 4 are connected fluid dynamic means 5 able selectively to generate therein a positive pressure so that small air flows exit from the through holes 3 and a negative pressure whereby the same through holes 3 draw a suction.

[0015] The fluid dynamic means 5 are defined by a pair of independent axial ventilators, i.e. a first ventilator 6 to generate, for instance, said positive pressure and a second ventilator 7 to realise said negative pressure, both situated, originally, in a single conduit 8 in communication with the chamber 4 in such a way that the respective fans 6a and 7a present their axes 6b and 7b aligned in said conduit.

[0016] In practice the latter is travelled through by a flow of air directed towards the chamber 4 and thus towards the through holes 3 when the first ventilator 6 is operated, or by a flow in the opposite direction when the second ventilator 7 is operated, thereby creating a vacuum in the chamber 4.

[0017] The conduit 8 presents towards the exterior a mouth closed by a protective grid 9 which is traversed by a flow of air travelling in one or the other direction depending on the ventilator in operation.

[0018] Advantageously the first and the second ventilator 6 and 7 are identical, positioned specularly opposite, and are sustained by a respective support 10, in the conduit 8, so that the corresponding fans 6a and 7a present rotatory motions oriented in opposite directions. The supports 10 are formed by a plurality of radial elements 10a which render optimal the passage of the flow of air through the fans.

[0019] The first ventilator 6 which realises the positive pressure in the chamber 4, shown (Figure 1) in a position above the second ventilator 7, which instead generates the vacuum, can be exchanged therewith with no change in the effectiveness of the operation of the apparatus.

[0020] Preferably the ventilator motors are connected in such a way as to be interposed between the fans 6a and 7a thereby maximising the distance therebetween and minimising the fluid dynamic interference that the fan of the inactive ventilator could cause on the fan of the operating ventilator.

[0021] It is obviously possible to conceive other technical solutions similar to the one described above that allow to obtain air flows in opposite direction from two independent ventilators located in the same conduit.

[0022] The two ventilators are arranged in series in the conduit and their motors can rotate in opposite directions. Positioning the two ventilators in successions, the ventilators can have motors that rotate in the same direction and their fans are mounted mutually opposite,

thereby obtaining air flows that travel in opposite directions.

[0023] The invention attains important advantages.

[0024] The apparatus according thereto presents simple constructive solutions, with limited cost.

[0025] It should be stressed first of all that movable gates and related actuating means are unnecessary since the single conduit wherein the two ventilators of the apparatus are located must always be in communication with the exterior regardless of the ventilator in operation.

[0026] Moreover, the ventilators can be commanded from very simple control devices, since only the start or stop of each ventilator is required, but not the reversal of their motion.

[0027] In practice the constructive simplicity of the apparatus allows to obtain, in addition to low manufacturing costs, a very high overall operational reliability.

Claims

1. Steam ironing apparatus comprising:

- an ironing board (2) provided with a plurality of through holes (3) distributed on its surface,
- a chamber (4) whereinto said through holes (3) open, inferiorly associated to said ironing board (2),
- a conduit (8) connecting said chamber (4) to the outside, and
- fluid dynamic means (5) able selectively to generate a positive pressure and a negative pressure in said chamber (4), and including a pair of independent ventilators (6), (7), a first ventilator (6) able to generate positive pressure and a second ventilator (7) able to generate negative pressure, each one having a fan (6a), (7a), and a motor, **characterised in that** said first ventilator (6) and said second ventilator (7) are arranged in series in said conduit (8).

2. Apparatus according to claim 1, **characterised in that** said first ventilator (6) and said second ventilator (7) are mutually identical and positioned specularly opposite in said conduit in such a way that the respective fans (6a), (7a) generate flows oriented in opposite directions.

3. Apparatus according to claim 1, **characterised in that** said first ventilator (6) and said second ventilator (7) present motors rotating in opposite directions.

4. Apparatus according to claim 1, **characterised in that** said first ventilator (6) and said second ventilator (7) are arranged in series in said conduit (8) and present motors rotating in the same direction

and fans (6a), (7a) with blades mounted mutually opposite able to generate flows travelling in opposite directions.

Patentansprüche

1. Dampfbügelvorrichtung, enthaltend:

ein Bügelbrett (2), versehen mit einer Anzahl von durchgehenden Bohrungen (3), die an seiner Oberfläche verteilt sind;

eine Kammer (4), in welche sich die genannten durchgehenden Bohrungen (3) öffnen, und die unten dem genannten Bügelbrett (2) zugeordnet ist;

einen Kanal (8), welcher die genannte Kammer (4) mit dem Aussenbereich verbindet; und strömungsdynamische Mittel (5), in der Lage, wahlweise einen positiven Druck und einen negativen Druck in der genannten Kammer (4) zu erzeugen, und enthaltend ein Paar von unabhängigen Ventilatoren (6), (7), von denen ein erster Ventilator (6) in der Lage ist, einen positiven Druck zu erzeugen und ein zweiter Ventilator (7) in der Lage ist, einen negativen Druck zu erzeugen, wobei jeder einen Lüfter (6a), (7a) und einen Motor aufweist,

dadurch gekennzeichnet, dass der genannte erste Ventilator (6) und der genannte zweite Ventilator (7) in dem genannten Kanal (8) in Serie angeordnet sind.

2. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** der genannte erste Ventilator (6) und der genannte zweite Ventilator (7) miteinander identisch und in dem genannten Kanal sich auf solche Weise spiegelgleich gegenüberliegend angeordnet sind, dass die jeweiligen Lüfter (6a), (7a) in entgegengesetzte Richtungen gerichtete Strömungen erzeugen.

3. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** der genannte erste Ventilator (6) und der genannte zweite Ventilator (7) Motoren aufweisen, die sich in entgegengesetzten Richtungen drehen.

4. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** der genannte erste Ventilator (6) und der genannte zweite Ventilator (7) in Serie in dem genannten Kanal (8) angeordnet sind und Motoren aufweisen, die sich in der gleichen Richtung drehen, sowie Lüfter (6a), (7a) mit Schaufeln, die entgegengesetzt zueinander montiert und in der Lage sind, Strömungen zu erzeugen, die in entgegengesetzte Richtungen fließen.

Revendications

1. Dispositif de repassage à vapeur comprenant :

- une planche à repasser (2) avec de nombreux orifices débouchants (3) distribués sur sa surface,
- une chambre (4) dans laquelle lesdits orifices (3) débouchent, associés inférieurement à ladite planche à repasser (2)
- un conduit (8) mettant en communication ladite chambre (4) avec l'extérieur, et
- un moyen fonctionnant selon la dynamique des fluides (5) en mesure de générer de façon sélective une pression positive et une pression négative dans ladite chambre (4), incluant une paire de ventilateurs indépendants (6), (7), un premier ventilateur (6) en mesure de générer une pression positive et un second ventilateur (7) en mesure de générer une pression négative, chacun d'entre eux ayant une hélice (6a), (7a) et un moteur, **caractérisé en ce que** ledit premier ventilateur (6) et ledit second ventilateur (7) sont disposés en série dans ledit conduit (8) .

2. Dispositif selon la revendication 1, **caractérisé en ce que** ledit premier ventilateur (6) et ledit second ventilateur (7) sont réciproquement identiques et positionnés l'un en face de l'autre de façon spéculaire dans ledit conduit de telle manière que les hélices respectives (6a), (7a) génèrent des courants d'air allant dans des directions opposées.

3. Dispositif selon la revendication 1, **caractérisé en ce que** ledit premier ventilateur (6) et ledit second ventilateur (7) ont des moteurs tournant dans des directions opposées.

4. Dispositif selon la revendication 1, **caractérisé en ce que** ledit premier ventilateur (6) et ledit second ventilateur (7) sont disposés en série dans ledit conduit (8) et ont des moteurs qui tournent dans la même direction et des hélices (6a), (7a) dont les pales sont montées réciproquement de façon opposée en mesure de produire des courants d'air allant dans des directions opposées.

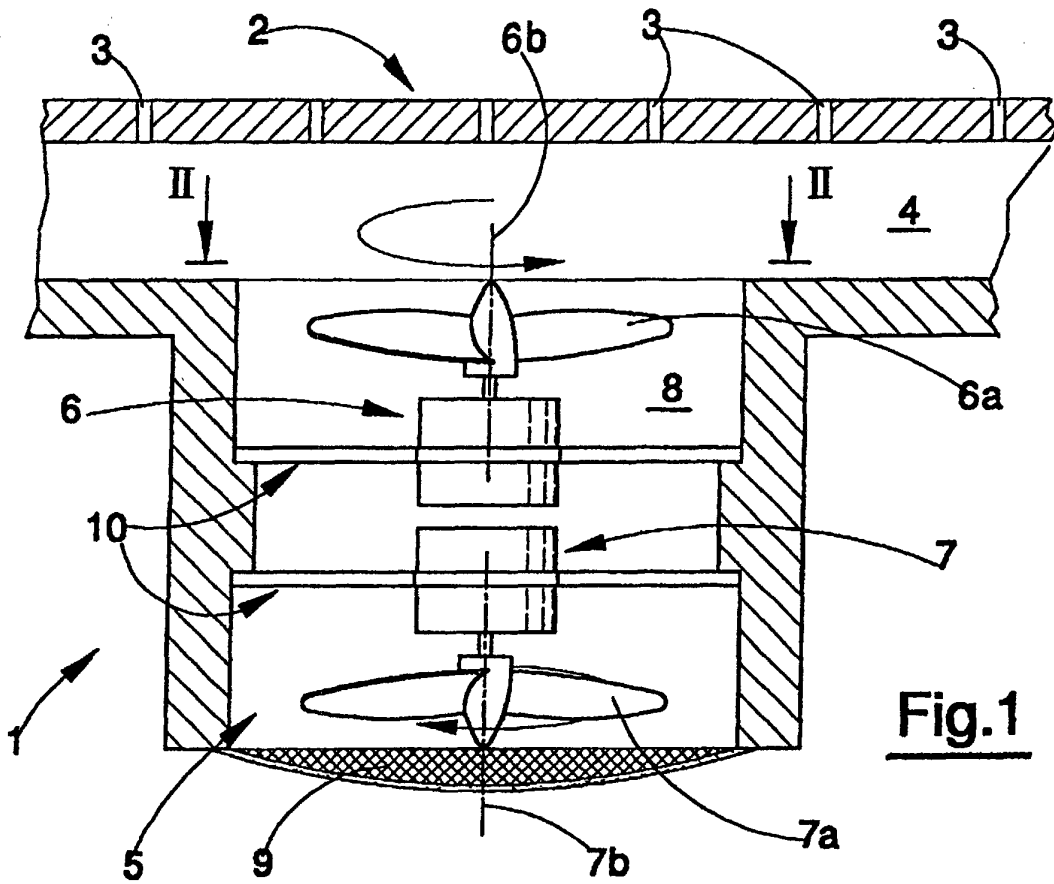


Fig. 1

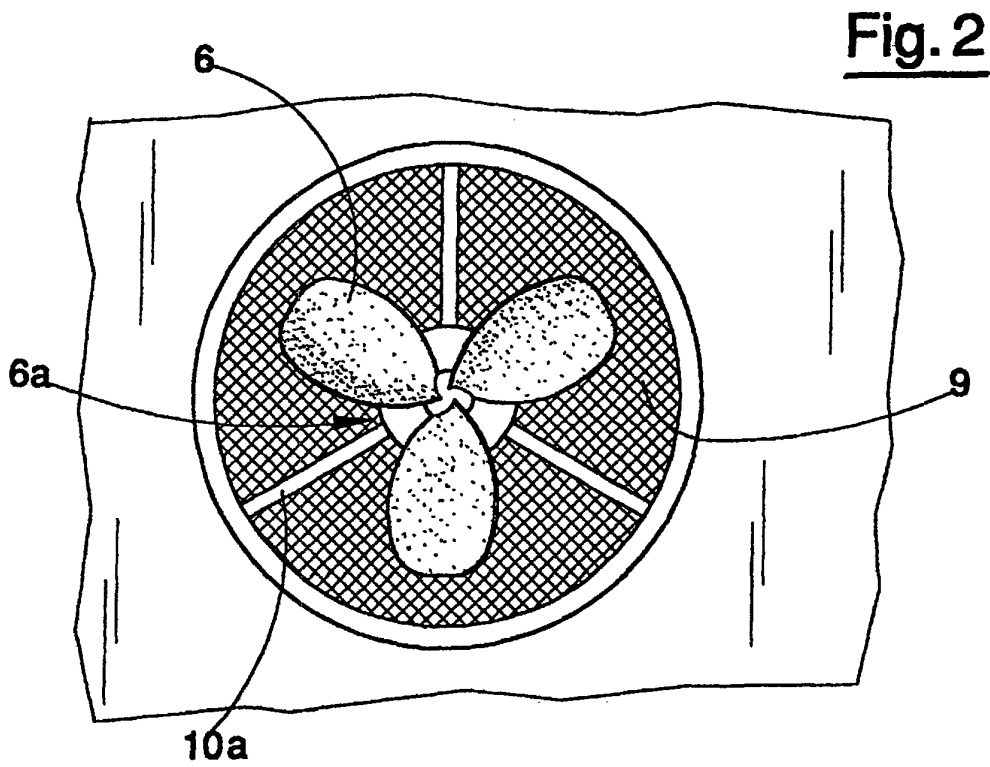


Fig. 2