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DE-C-2 545 795
FR-A-1 282 279
GB-A-1 517 708
GB-A-1 554 725
GB-A-2 010 926
GB-A-2 044 297
US-A-2 590 295
US-A-2 899 816
US-A-3 089 327

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Description

This invention relates to a combined machine for washing laundry and subsequently drying it by continuously circulating heated air there-through.

Machines of this type are conventionally provided with a washing assembly and in addition with at least one fan and associated heater elements for generating a stream of hot air flowing within the drum of the washing assembly and the laundry contained therein. The washing assembly itself is provided with at least one dampening mass for its equilibration during rotation of the drum, particularly during the centrifuging phases.

For ensuring the stability of a machine of this type in any of its operating conditions it is thus necessary to suitably dimension and mount the assembly formed of said fan and said heater elements as well as said at least one dampening mass within the frame of the machine.

Conventionally, the assembly formed by the fan and the heater elements is enclosed in a separate housing mounted within the frame of the machine and provided with suitable heat-insulation for ensuring efficient heating of the air employed for drying.

Due to the relatively great dimensions of the assembly formed by the fan, the heater elements and the associated ducting, its accommodation within the frame of the machine in addition to the at least one dampening mass and the remaining functional components presents considerable difficulties and results in a complicated overall construction of the machine.

It is therefore an object of the present invention to avoid the above-noted difficulties and to provide a combined washing and drying machine comprising a reduced number of functional components the mounting of which within the frame of the machine can be carried out in a simple and effective manner.

This and other objects are attained according to the invention by a combined washing and drying machine, comprising a tub, a drum mounted for rotation within said tub and adapted to contain the laundry to be washed and dried, a dampening mass for equilibrating the oscillating system formed of said tub and drum, a fan, and heater elements for generating a flow of heated air and for circulating the heated air through said laundry.

A machine of the above specified type is characterized in that said dampening mass consists of a plate of a material having a high specific weight and designed to form a seat for mounting said fan, and provided with an opening for receiving a first duct communicating with said tub, the plate also comprising a heat-insulated chamber for containing said heater elements, said chamber communicating with the outlet of said fan on the one side, and with a second duct connected to said tub on the other.

The characteristics of the invention will become evident from the following description of an

exemplary and non-limiting embodiment with reference to the accompanying drawings, wherein:

Fig. 1 shows a diagrammatic front view of a combined washing and drying machine incorporating a dampening mass and associated components in a preferred embodiment of the invention, and

Fig. 2 shows a longitudinal sectional view of the dampening mass and associated components of the machine of Fig. 1.

A combined washing and drying machine shown in Fig. 1 generally comprises a frame 3, a wash tub 4 resiliently mounted within said frame in a per se known manner, a drum 5 adapted to contain the laundry disposed within the tub and adapted to be rotated by a (not shown) motor, and conventional functional components (not shown) for controlling the operation cycles of the machine.

The machine shown in the drawings is in addition provided with a dampening mass in the form of a plate 6 formed of a material having a high specific weight, preferably cast iron, and mounted fixedly on said tub 4 for equilibrating the assembly formed of the tub and the drum.

According to the invention, plate 6 is designed to carry at least one fan 7 and associated electric heater elements 8 for generating a flow of heated air to be supplied to drum 5 via a conduit 9 connected to plate 6 for drying the laundry contained in drum 5.

As shown in Fig. 2, plate 6 is formed with a bottom wall 10 surrounded by a peripheral wall 11. Bottom wall 10 itself includes two planar portions 12 and 13 connected to one another in parallel relationship and formed each with a through-opening 14 and 15, respectively.

Fan 7 is mounted in a per se known manner on planar portion 12, so that its inlet 16 is aligned with opening 14, while its outlet 17 is directed towards planar portion 13.

Disposed on planar portion 13 is a panel 18 formed of a thermally insulating material so as to cover the entire surface of planar portion 13 as well as the interior surface of the peripheral wall portion 11 surrounding it. Panel 18 is further formed with a through-opening 19 aligned with opening 15.

Heater elements 8 are disposed above planar portion 13 with their terminals 20 and 21 extending through peripheral wall 11 for connection to electric leads (not shown). Heater elements 8 are retained in position by suitable spacers 22 and 23 disposed between heater elements 8 and panel 18 on the one hand and a further panel 24 formed of a heat-insulating material and removably attached to plate 6, so that heater elements 8 are retained at a suitable distance from both panels 18 and 24.

There is thus formed an interior chamber 25 containing heater elements 8 and communicating on one side with the outlet 17 of fan 7, and on the other, with duct 9 via the aligned through-openings 15 and 19.

The provision of the heat-insulating panels permits efficient heating of the air flow generated by the fan and prevents the generated heat to be transmitted to other functional components of the machine located adjacent plate 6.

The heater elements 8 are enclosed in a protective sheath 26 of stainless steel or another suitable material, to prevent incandescent scales possibly set free by the heater elements from being carried into the drum and from damaging the laundry therein.

The plate forming the dampening mass thus provides seats for the fan and for the heater elements, eliminating the necessity of the formerly employed separate housing for this purpose.

The construction of the washing and drying machine is accordingly simplified, so that the mounting of the remaining functional components of the machine can be carried out in a simple and economical manner.

In addition, the fan and the heater elements are readily accessible in case of damage or malfunction and for normal maintenance work. It is of course possible to mount the fan and heater elements on the dampening plate, or the dampening plate itself with respect to the tub, in a different manner without leaving the scope of the present invention.

Claims

1. A combined washing and drying machine, comprising a tub, a drum mounted for rotation within said tub and adapted to contain the laundry to be washed and dried, a dampening mass for equilibrating the oscillating system formed of said tub and drum, a fan, and heater elements for generating a flow of heated air and for circulating the hot air through said laundry, characterized in that said dampening mass consists of a plate (6) of a material having a high specific weight and designed to form a seat for mounting said fan (7) and provided with an opening (14) for receiving a first duct (16) communicating with said tub (4), the plate also comprising a heat-insulated chamber (25) for containing said heater elements (8), said chamber communicating with the outlet (17) of said fan on the one side, and with a second duct (15) connected to said tub on the other.

2. A combined washing and drying machine according to claim 1, characterized in that said plate (6) is mounted on top of said tub (4), and in that said chamber (25) containing said heater elements (8) in the form of armoured electric resistors is internally lined with a panel (18) formed of a heat-insulating material and has its top closed by a removable panel (24) formed of the same material.

Revendications

1. Une machine combinée de lavage et de séchage, comprenant une cuve, un tambour monté à rotation à l'intérieur de ladite cuve et

adapté pour contenir le linge à laver et à sécher, une masse d'amortissement pour équilibrer le système oscillant formé de ladite cuve et dudit tambour, un ventilateur, et des éléments chauffants pour engendrer un écoulement d'air chaud et pour faire circuler l'air chaud au travers dudit linge, caractérisée en ce que ladite masse d'amortissement se compose d'une plaque (6) formée d'un matériau ayant un poids spécifique élevé et conçue pour former un siège pour le montage dudit ventilateur (7), en étant pourvue d'une ouverture (14) pour recevoir un premier conduit (16) communiquant avec ladite cuve (4), la plaque comprenant également une chambre isolée thermiquement (25) pour contenir lesdits éléments chauffants (8), ladite chambre communiquant avec la sortie (17) dudit ventilateur d'un côté, et avec un second conduit (15) relié à ladite cuve de l'autre côté.

2. Une machine combinée de lavage et de séchage selon la revendication 1, caractérisé en ce que ladite plaque (6) est montée sur le haut de ladite cuve (4) et en ce que ladite chambre (25) contenant lesdits éléments chauffants (8) se présentant sous la forme de résistances électriques blindées, est revêtue intérieurement d'un panneau (18) formé d'un matériau thermiquement isolant et est fermée en haut par un panneau amovible (24) constitué du même matériau.

Patentansprüche

1. Eine kombinierte Wasch- und Trockenmaschine, enthaltend eine Wanne, eine in der Wanne drehbar gelagerte und zur Aufnahme der zu waschenden und zu trocknenden Wäsche eingerichtete Trommel, eine Dämpfungsmasse zum Beruhigen des aus Wanne und Trommel bestehenden schwingenden Systems, einen Lüfter und Heizelemente zum Erzeugen einer Strömung erwärmter Luft und zum Durchleiten der Heißluft durch die Wäsche, dadurch gekennzeichnet, daß die Dämpfungsmasse aus einer Platte (6) aus einem Material hohen spezifischen Gewichts besteht und so gestaltet ist, daß sie einen Sitz zur Montage des Lüfters (7) bildet und mit einer Öffnung (14) zur Aufnahme einer ersten Leitung (16), die mit der Wanne (4) verbunden ist, versehen ist, daß die Platte weiterhin eine wärmeisolierte Kammer (25) zur Aufnahme der Heizelemente (8) enthält, wobei die Kammer mit dem Auslaß (17) des Lüfters auf der einen Seite und mit einer mit der Wanne verbundenen zweiten Leitung (15) auf der anderen Seite in Verbindung steht.

2. Ein kombinierte Wasch- und Trockenmaschine nach Anspruch 1, dadurch gekennzeichnet, daß die Platte (6) auf der Oberseite der Wanne (4) montiert ist und daß die Kammer (25), die die Heizelemente (8) in Form gepanzerter elektrischer Widerstände enthält, innen mit einer Platte (18) aus einem wärmeisolierenden Material ausgekleidet ist und an ihrer Oberseite von einer lösbaren Platte (24) aus demselben Material verschlossen ist.

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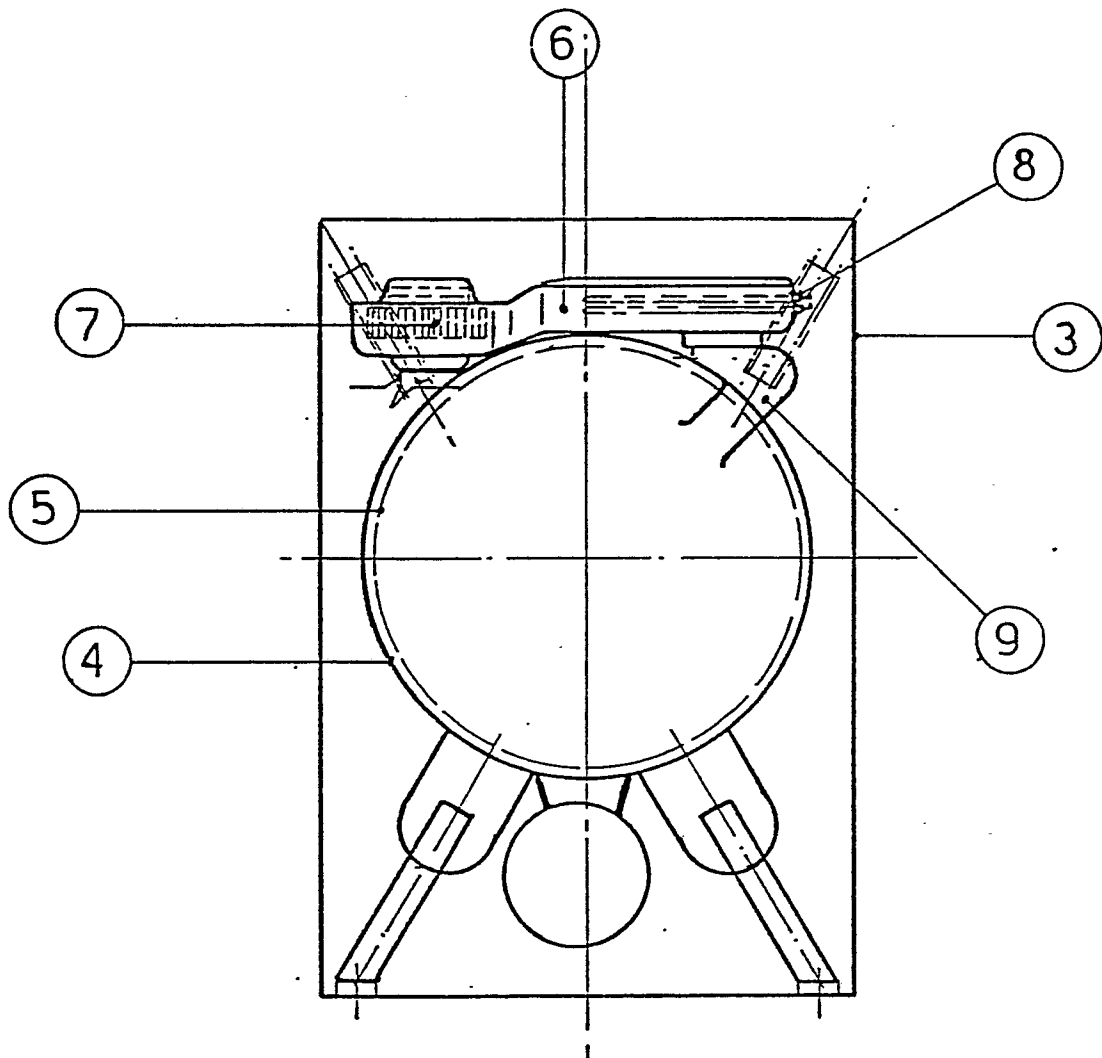


Fig. 1

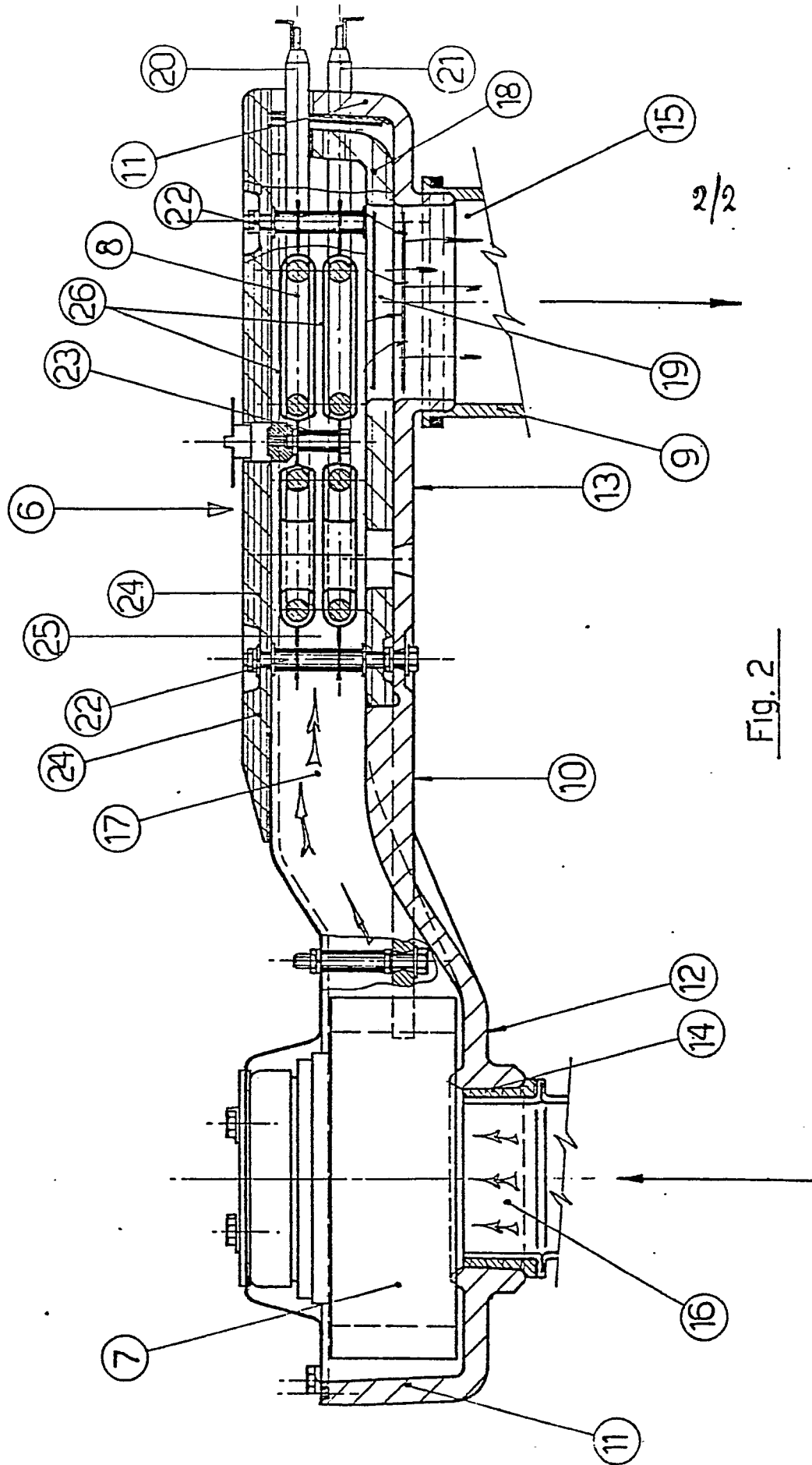


Fig. 2