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(54) Heater mixer device

(57) A device formed by a sandwich heat exchanger (1), by a container (2) made of heat-conducting material for housing the products to be heated and mixed, by a fan assembly (4) with which to accelerate heat exchanges and particularly the cooling of the heated products and by an agitator element (3), with the heat exchanger (1) formed by a tray (5) made of heat conducting material constituting the heating base, by a radiating assembly (6) with fins and by an electric heater (7).

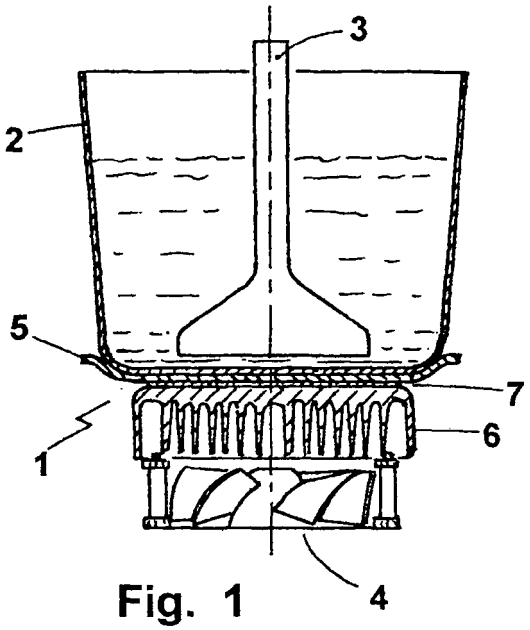

Fig. 1

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Description

[0001] The invention relates to a heater mixer device, aimed at the production of cosmetics, such as lotions, cosmetic ointments, shampoo, bubble bath soap, liquid soaps and balsams for hair, hereafter indicated, for the sake of brevity, as "cosmetics".

[0002] Known emulsifier devices comprise a heater whereby fatty substances and oil are made to melt, then mixed with water and active ingredients and agitated for their uniform mixing by means of an immersion agitator. Such devices comprise a container, destined to receive the substances to be dissolved, provided with encompassing gap with inlet hole, wherefrom is inserted heating water, and outlet hole, through which it is emptied.

[0003] In the gap is housed an electric heater of the immersion type that is activated first for reaching and then for maintaining the temperature required for the heating water.

[0004] Once the solid and the highly viscous substances are dissolved, water and active ingredients are added to in the container, and then the whole is mixed with the aid of an immersion mixer. Once the desired mixing is reached, the mixture thus obtained is maintained at the temperature reached for the prescribed time, then the heater assembly is deactivated and said mixture is cooled, first opening the outlet of the gap to drain the heated water, then feeding, through the inlet, cool water to said gap, until bringing the product to room temperature, whereat it assumes the appearance of an emulsion (cold phase).

[0005] Such a device is constructively complex, has considerable thermal inertia, entails heating a mass of water that, at the end of the operation, is sent into the drain conduits together with the cooling water, which entails a high consumption of electrical energy and potable water from the water supply system.

[0006] An object of the present invention is to provide a constructively simple, economical device, with which to mix fatty substances, oils, water and active ingredients.

[0007] Another object of the invention is to provide a device that enables to heat rapidly the substances to be mixed, with minimal thermal inertia.

[0008] Another object of the invention is to provide a device in which high thermal efficiency is achieved, i.e. a minimal dispersion into the environment of the thermal energy developed during its utilisation.

[0009] Another object of the invention is to provide a device that consumes minimal quantities of potable water from the water supply system.

[0010] These and other objects are achieved with the present invention, which is embodied in a device in which are combined: - a sandwich heat exchanger; - a container for housing the products to be heated and mixed; - a fan assembly with which to accelerate heat exchanges; - an agitator element with which to facilitate the mixing of the products to be mixed.

[0011] The heat exchanger assembly is formed by a tray made of metal, or of another material with high heat conductivity, constituting the heating base, by a fin radiator assembly and by an electrical heater.

[0012] The invention is advantageous because it is structurally simple and it has low cost.

[0013] It is advantageous because the heat produced by the heat exchanger assembly heats by conduction the container and the products housed therein, with concentration of the heat absorbed by the cold bodies, i.e. those that have to be heated, with minimal thermal inertia and hence with rapid and uniform, as well as easily measurable and controllable, instant by instant, heating of the products to be mixed.

[0014] The invention is also advantageous because the heating phase, too, is equally fast through the direct contact of the heated product, and hence of its container, with the tray and with the finned dissipator that provides for heat dispersion into the environment which is accelerated by the action of the fan.

[0015] These and other advantages shall be readily apparent, particularly for those skilled in the art, from reading the detailed description that follows, with reference to the schematic drawings exemplifying the preferred embodiment illustrated purely by way of example in the accompanying table, in which:

- fig. 1 is the front view of the functional components of the invention, some of which are sectioned with a median axial plane;
- fig. 2 is the axonometric view of the components of the invention on a support base;
- fig. 3 is the lateral elevation view of an embodiment of the invention in the open state.

[0016] The drawings are exemplifying in nature, with the sole purpose of facilitating comprehension of the invention, without constituting any limitation therefor.

[0017] Substantially, the invention relates to a device with which to heat and mix components in the production of cosmetics. It is embodied in the combination of multiple assemblies, such as a heat exchanger 1 with sandwich conformation, a container 2 made of metal or otherwise of material with high heat conductivity, an agitator element 3 and a fan assembly 4.

[0018] The assemblies or components, which with their combination embody the invention, are nearly coaxial to each other or anyway are intended to operate in this arrangement.

[0019] The heat exchanger 1 comprises a tray 5 made of heat conducting material, normally made of metal or metal alloy, constituting the heating base whereon the container 2, which is to house the products to be heated and mix in the production of cosmetics, is lain. It comprises a finned heat radiating assembly 6 with high heat conductivity and high heat exchange surface. Lastly, it comprises the electric heater 7, normally constituted by a resistor. The tray 5, made of heat conducting material, and the heat radiating assembly 6 have mutually adher-

ing surfaces through which is favoured the propagation of the heat to be dispersed, hence the heat associated to the products mixed in the container 2, prevalently by the radiator assembly 6 whose radiating fins are oriented towards the support base 8.

[0020] Said fins originate a discontinuous structure, in order to favour the passage and hence the circulation of the flows of gases aspirated by the fan assembly 4. Said fan assembly 4 intervenes to favour heat propagation also downwards in order to accelerate the cooling phase. It will therefore be made to operate in the most appropriate manner in each case, i.e. with the flow of gases moved with a velocity regulated by the operator and in the selected direction, possibly alternating it.

[0021] Said fan assembly 4 produces in any case a flow of cooling gas with vertical direction, normally directed downwards, thus aspirating a flow of air from the exterior which laps the radiator assembly 6 and its cooling fins, removing heat and hence operating a cooling action thereon, then thrusting said flow into the direction towards the support base 8.

[0022] The agitator assembly 3 is immersed in the heated product to be mixed and it operates coaxially with the other components or assemblies of the machine and it is actuated by its own motor installed in the rotatable lid 10 of the machine itself, as highlighted in the embodiment reproduced in fig. 3.

[0023] The outer structure of the machine may in any case be varied, without altering the functional logic of the heater mixer device in its interior, whose functional characteristics and hence whose scope of protection are defined by the appended claims.

Claims

1. A heater mixer device, with which to produce cosmetics, **characterised by** the combination of a sandwich heat exchanger (1), a container (2), an agitator element (3) and a fan assembly (4), in that the heat exchanger (1) comprises a tray (5) made of heat conducting material constituting the heating base, an electric heater (7) and a finned heat radiator assembly (6), and **characterised in that** the fan assembly (4) intervenes to operate the acceleration of the cooling phase.

2. The heater mixer device, as claimed in claim 1), **characterised in that** the components that comprise it are nearly coaxial to each other, or intended to operate in this arrangement.

3. The heater mixer device, as claimed in claim 1), **characterised in that** the tray (5) made of heat conducting material is made of metal or metal alloy.

4. The heater mixer device, as claimed in claim 1), **characterised in that** the tray (5) made of heat conducting material and the heat radiator assembly (6) have mutually adhering surfaces.

5. The heater mixer device, as claimed in claim 1), **characterised in that** the heat radiator assembly (6) has the radiating fins oriented towards the support base (8).

6. The heater mixer device, as claimed in claim 1), **characterised in that** the heat radiating assembly (6) has the fins originating a discontinuous structure for the passage and circulation of the flows of gases aspirated by the fan assembly (4).

7. The heater mixer device, as claimed in claim 1), **characterised in that** the fan assembly (4) produces a flow of cooling gas with vertical direction.

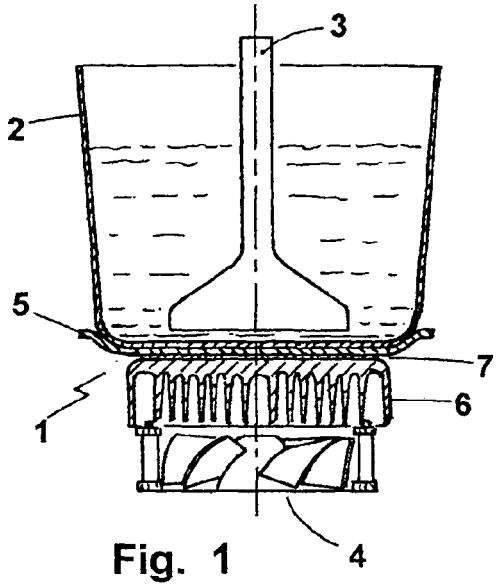

Fig. 1

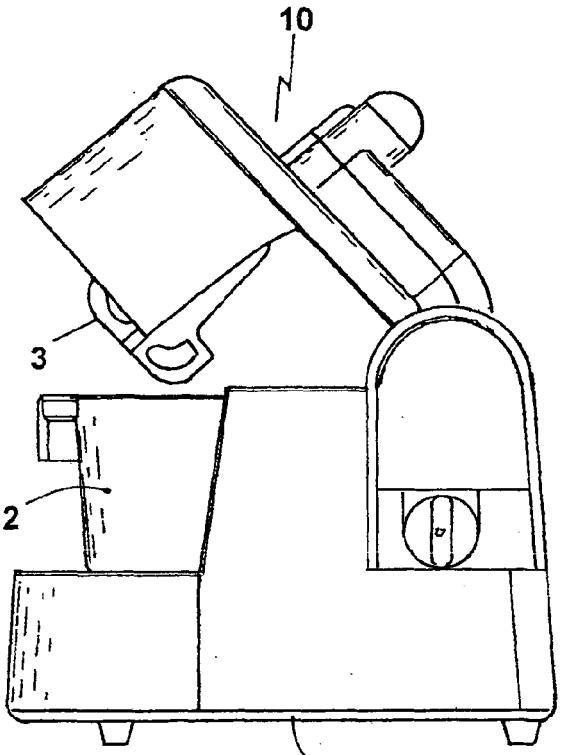

Fig. 3

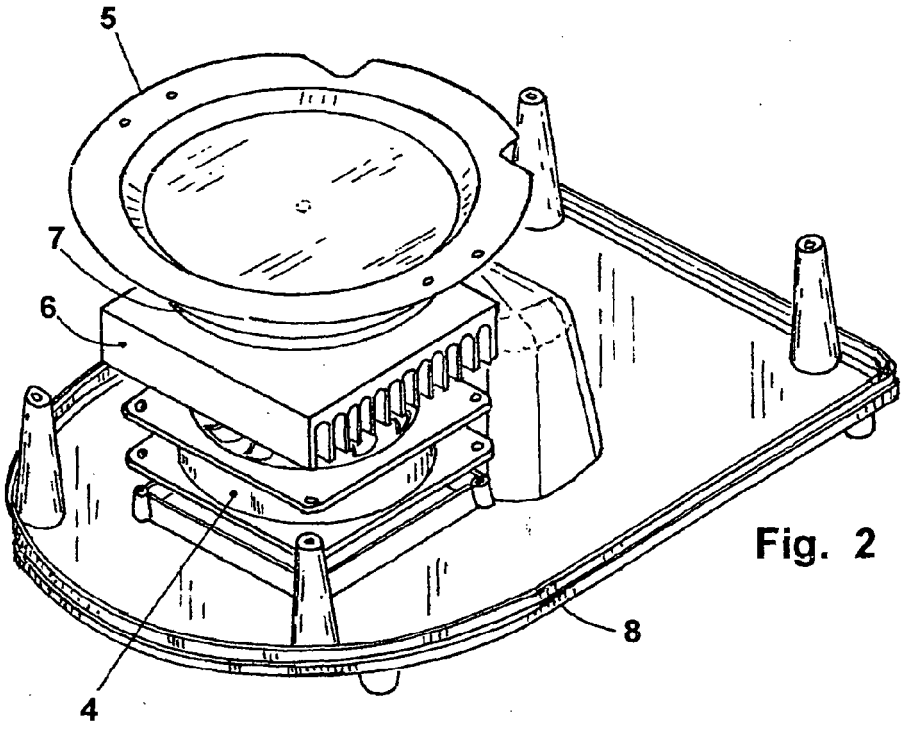

Fig. 2