(54) Title: BATCHER FOR PACKAGING FLUID OR HEAT FLUIDIZED COSMETIC PRODUCTS

(57) Abstract: A batcher for cosmetic products, fluid or fluidized by heating, has a buffer chamber (8) in the feed duct (2). The level of the product in the buffer chamber is monitored by a level sensor (10) for controlling the actuator means of a valve purposely introduced in the feed duct (2) upstream of the buffer chamber (8) to maintain a substantially constant level of product within said buffer chamber (8). The buffer chamber (8) includes a mechanical mixer (9) that maintains homogeneous the composition of the fluid product by preventing stratifications and/or disuniformity of temperature in the mass of product contained therein. The conditions of operation of the gear pump (4) downstream of the buffer chamber (8) and of the outlet valve (6s) are maintained constant notwithstanding changes of the level of product in an overhead supply reservoir and prolonged interruptions of the sequence of delivery cycles.
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"BATCHER FOR PACKAGING FLUID OR HEAT FLUIDIZED COSMETIC PRODUCTS"

The present invention relates to packaging lines of fluid or fluidizable cosmetic products such as waxes, pastes and the like and more in particular to a batcher apparatus.

The cosmetic industry employs dosing apparatuses as batchers of waxes and pastes or more in general of a cosmetic product that is either fluid at room temperature or fluidizable by heating it to a certain temperature, to fill tubes, vases or other suitable packaging containers for its sale in retail shops.

Commonly, these apparatuses consist of a body defining therein an inlet duct, usually provided with thermostatically controlled heaters to maintain the fluid or fluidized product at a certain constant temperature, connected directly to a reservoir of the product. A gear pump thrusts the product from the inlet duct to an outlet duct that is closed by an outlet or delivery valve. The dose is fixed by precisely timing the opening of the delivery valve, often in coordination with an intermittent activation of the gear pump.

Of course, the dose of product for filling the packaging container for retail sale must be precisely established and remain constant in time in order to ensure the outletting of exactly the fixed quantity of product into each container by respecting a rather strict tolerance range.

These requisites of precision of the dosing impose frequent controls and trimming interventions of the timing of the pump and of the delivery valve, to ensure respect of the tolerances.

Factors of perturbation are indeed numerous. Among these, the accuracy of control of the temperature of the product in the duct is of primary importance because variations of the temperature may change the rheologic characteristics of the product and cause variations of the volume of product released at every
opening cycle of the delivery valve.

Homogeneity of the composition of the product is also important.

Another perturbing cause of the outlet dose is due to changes of the level of the product in the reservoir that is commonly placed at a higher level of the packaging batcher apparatuses and from which the product is gravity fed as the level of the product progressively lowers in the reservoir.

It has now been found and forms the object of the present invention, an improved batcher for fluid or heat fluidized cosmetic products, which under comparable conditions, sensibly improves the reproducibility of the amount of product delivered at every cycle, making altogether easier a precise setting of the dose and above all ensuring a remarkable constancy of the amount of product released at every cycle, independently of the variations of the level of product in the reservoir.

Basically, the batcher of the present invention differs from the known batchers by having defined therein an accumulation or buffer chamber of the product flowing into the batcher. The level of the product in the accumulation chamber thus defined within the body of the batcher, is monitored by a level sensor to which the actuator of an intercepting valve purposely included in the inlet duct of the fluid product is slaved, in order to maintain a level substantially constant of the fluid product in said chamber of accumulation (buffer) chamber.

Preferably, in the buffer chamber is installed a thermostatically controlled heater to maintain the product contained in the buffer chamber at a constant preset temperature.

Within the buffer chamber, there is a mechanical mixer that maintains homogeneous the composition of the fluid product by preventing stratifications and/or temperature disuniformities throughout the volume of product contained therein.
The operating conditions of the gear pump that thrusts the fluid product toward the delivery nozzle as well as of the outlet valve and more precisely the level of the product contained in the buffer chamber, the temperature and the rheological characteristics of the fluid product, are thus maintained outstandingly constant and uniform in time, irrespectively of the lowering of the level of the product in the supply reservoir as well as of prolonged interruptions of the delivery cycles.

These conditions of enhanced stability and uniformity in time of the above mentioned factors ensure constancy of the amount of product delivered at every cycle, making trimming interventions less frequent and much easier.

The different aspects and advantages of the apparatus of this invention will become even more evident through the following description of preferred embodiments and by referring to the attached drawings, wherein:

Figures 1 and 2 are respectively an elevation view partially in section, and a plan view of a batcher made according to the present invention;

Figures 3 and 4 illustrate a different embodiment of a batcher of this invention.

A first embodiment of the batcher of this invention is shown in Figures 1 and 2.

The apparatus comprises a body 1 of a material resistant to the products to be handled, generally of a metal or a metal alloy and most commonly of stainless steel or anodized aluminum, within which a feed or inlet duct 2 is defined, the inlet hole of which is connectable to a reservoir of the product, commonly through a rigid or a flexible tube (not shown in the figures).

The reservoir is generally placed at certain height overhead of the array of batchers of the packaging lines, such that the fluid or the heat fluidized product may flow by gravity toward one or most commonly toward a plurality of batchers.

Within the body 1 of the batcher is fitted a gear pump 4 driven by an electric motor Mp, for thrusting the fluid product into the outlet duct 5 and eventually through the outlet or delivery valve 6s, to be finally released through the nozzle 7.
In the embodiment shown in Figures 1 and 2, the valve for outletting a certain quantity of product at every cycle is a needle valve driven by a solenoid 6a, the opening time of which is set by timers that may be adjusted from a control console for outletting a preestablished amount of product during every opening phase.

In case of a needle type outlet valve 6s, the control phase of the opening time of the valve generally controls also the operation of the pump 4.

More rarely, depending of the characteristics of the product and of the start/opening and/or of stop/closing characteristics of the pump and of the outlet valve, a small anticipation and/or delay (outphasing) of the instant of opening and closing of the flow aperture of the fluid through the outlet valve in respect to the start and stopping of the pump may be deliberately introduced.

According to an essential feature of the device of this invention, along the feed duct 2, a buffer chamber 8 is formed within the body 1. The dimensions of the chamber 8 are sufficient to contain a certain volume of fluid product.

Within this buffer chamber 8 is present a paddle mixer 9 driven by a respective motor Ma, preferably of adjustable speed, and a thermostatically controlled heater.

The level of the fluid product in the buffer chamber 8 is constantly monitored by a level sensor 10 and maintained constant at a preestablished level by controlling the actuators of an intercepting valve 11 installed in the feed conduct 2, upstream of the buffer chamber 8.

The valve 11 is preferably a rotating valve driven by a pneumatic cylinder 11a, controlled by the level sensor 10 through a control system.

In case of products that because of their characteristics should not remain still in the delivery ductings and/or to make closing and opening phases less abrupt than those typical of on/off actuating systems (needle valve driven by a solenoid), it is preferable to employ an outlet valve of a rotating type, similar to the intercepting
valve 11, also driven by a cylinder. An advantageous characteristic of rotating valves is of allowing a single implementation of a recirculation of the fluid product through a by-pass duct back into the buffer chamber 8 during the closing phases of the outlet valve. Therefore, in this case the pump may function in a continuous mode thus preventing intervals during which the fluid product remains still in the outlet duct.

This alternative embodiment of the batcher, employing a rotating outlet valve is illustrated in Figures 3 and 4.

In Figures 3 and 4 the same numbers are used to indicate the same functional parts of the device and as may be observed, the outlet valve 6r is of a rotating type driven by a cylinder 6b.

In the plan view of Fig. 4, the duct 5r of recirculation of the fluid product back into the buffer chamber 8, during the phases of closing of the outlet valve is visible.

Of course, even the relative disposition of parts may be changed according to need or preferences, such as for example is the case of the drive motor of the mechanical mixer 9, which in the example shown in Figures 3 and 4, is located below the body 1 of the batcher instead of above it.

In the figures, electrical cables and wires for connecting to the control system the sensors, the heaters and the relative thermocouples, as well as the electric motors, are not shown and similarly not shown are the pneumatic connections of the valve drive cylinders.

A detailed description of support brackets, assembly fasteners, seals and motion transmission organs, that are anyway easily recognizable in the drawings, is not deemed necessary for a full comprehension of the features of the novel device of this invention by a person versed with the reading of mechanical drawings and with assembly techniques of pneumatic, mechanical and electrical parts that
commonly compose a packaging batcher apparatus.

Of course, other embodiments are possible. For example the gear pump 4 that pushes the fluid product through the outlet duct, instead of being driven by an electric motor as in the example shown, may be driven by a compressed air motor.

Also the timing devices may be of various types. For example electronic timers that may be preset through a keyboard or a control console, may be used. Alternatively, a magnetic or optical encoder mounted on the axle of the motor that drives the pump may be used, such that after a certain preset numbers of revolutions of the pump axle, the outlet valve 6a (6r) is closed and eventually the pump 4 itself is stopped.

For simplicity sake, in the above described and illustrated embodiments of packaging batchers for fluid cosmetic products according to the present invention, a single pump 4 and a single outlet valve 6s (6r), have been shown, included in a single delivery path 5-7 (provided also with a recirculation duct 5r in case of a rotating outlet valve). Of course, it is perfectly possible to make batchers according to the present invention wherein a plurality of delivery paths are defined therein, departing form a single buffer chamber 8 for maintaining the fluid product at a substantially constant level and to a constant temperature, while continuously mixing it.

Of course, each delivery paths will include its own pump 4 and its own outlet valve 6s (6r) for delivering precise amounts of product through a plurality of nozzles 7, thus multiplying the production capability of each single batcher of the packaging lines.
CLAIMS

1. A batcher for fluid or fluidizable by heating to a certain temperature cosmetic products, comprising a body defining therein a feed duct of the fluid product connectable to an overhead reservoir of the product, thermostatically controlled heating means of the product in said feed duct, at least a pump for thrusting the fluid product through an outlet duct and at least an outlet valve driven by a timed actuator for releasing a certain amount of product through a delivery nozzle, characterized in that it comprises further
   a buffer chamber defined along said feed duct;
   mechanical mixer means of the product in said buffer chamber;
   a level sensor in said buffer chamber;
   an intercepting valve in said feed duct upstream of said buffer chamber;
   driving means of said intercepting valve controlled for maintaining a substantially constant level of the fluid material within said buffer chamber.

2. The batcher according to claim 1, wherein said intercepting valve is a rotating valve driven by a cylinder.

3. The batcher according to claim 1, wherein said outlet valve is a rotating valve.

4. The batcher according to claim 3, wherein said outlet valve is driven by a cylinder.

5. The batcher according to claim 3, further comprising a recirculation bypass duct of the fluid material thrust by said pump through said rotating outlet valve back into said buffer chamber, during closing phases of the rotating outlet valve.

6. The batcher according to claim 1, wherein said outlet valve is a needle valve driven by a solenoid and said gear pump is intermittently driven together
with said needle valve.

7. The batcher according to claim 5, wherein the instant of starting and of opening and/or the instant of stopping and of closing respectively of said pump and of said needle valve are not coincident.

8. The batcher according to claim 1, including a plurality of outlet ducts departing from said buffer chamber of preestablished quantities of fluid material through as many delivery nozzles, each outlet duct comprising a pump and an outlet valve.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

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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)

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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 practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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**Date of the actual completion of the international search**

17 June 2003

**Date of mailing of the international search report**

26/06/2003

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