Facial Mask Aseptic-Filling Apparatus and Facial Mask Preparation Method Thereof

Cross-reference to Related Applications

The present application claims the priority to the Chinese patent application with the filing No. CN201710069759.9, filed on February 8, 2017 with the State Intellectual Property Office, entitled “Aseptic Filling Apparatus for Facial Masks and Facial Mask Production Method thereof”, the contents of which are incorporated herein by reference in its entirety.

Technical Field

The present disclosure belongs to the technical field of cosmetics, and particularly relates to a facial mask aseptic (sterile) filling apparatus and a facial mask preparation method thereof.

Background Art

Facial mask products are liable to microbial contamination as the facial mask has very high water content, and therefore demand relatively high sterilizing and preserving capabilities. The existing facial masks usually use preservatives, which serve the preserving effect for ingredients of the facial mask, to protect the product against microbial contamination and deterioration and prolong the shelf-life of the product. However, the preservatives are useless to skin care itself, and even may increase skin irritation, sensitization and so on. The product safety should be ensured, and the consumers should be protected against possible infection caused by using a microorganism-contaminated product. If an amount of the preservatives added is insufficient, the microorganisms may be adapted to the surrounding growth environment and develop resistance to drugs, thus causing failure of preservation. An ideal preservative, which should have spectrum activity, can relatively quickly inactivate the microorganisms and stabilize the ingredients, and are safe to use in long term, without irritation or sensitization. Generally speaking, most preservatives are either effective against bacteria or effective against fungi, but cannot be effective against both simultaneously. Currently, compound preservatives are predominant in the market. The preservatives are useless to skin care itself, instead, even will increase the skin irritation, sensitization and so on, for example, burning sensation caused by phenoxyethanol, sensitization possibly caused by methylisothiazolinone (MIT) and so on. Therefore, it is also explicitly stipulated in relevant existing regulations of cosmetics the requirements of amounts of added restricted substances (preservatives). At present, the conventional hot-press sterilizing process is used in the production of facial mask products, which method has the defect of causing deformation, inflation, and rupture of a facial mask bag of pasting type facial mask. As the idea of intrinsic quality, nature and safety

gradually spread among the domestic cosmetic consumers, “zero additive”, “zero burden”, “no preservatives added” etc. are getting valued and popular, especially with the hot sale of facial masks in recent years, the development and application of sterilizing technologies play an increasing significant role in the field of safe and natural research and development of cosmetics.

Summary

Based on the above reasons, the applicant, after years of efforts, obtains a new apparatus, which apparatus includes a high-temperature drying box, a high-temperature high-pressure sterilizing tank, a delivery pipeline capable of being sterilized with high-temperature steam, a filling machine capable of being sterilized with high-temperature steam, and a hundred-class-cleanliness filling workshop. This apparatus can well sterilize the facial masks, i.e. ensuring the facial masks are aseptic without adding preservatives to the facial masks.

The present disclosure is realized through the following technical solution.

A facial mask aseptic-filling apparatus includes the high-temperature drying box, the high-temperature high-pressure sterilizing tank, the delivery pipeline capable of being sterilized with high-temperature steam, the filling machine capable of being sterilized with high-temperature steam, and the hundred-class-cleanliness filling workshop.

The facial mask aseptic-filling apparatus includes the high-temperature drying box, the high-temperature high-pressure sterilizing tank, the delivery pipeline capable of being sterilized with high-temperature steam, the filling machine capable of being sterilized with high-temperature steam, and the hundred-class-cleanliness filling workshop. The high-temperature sterilizing tank is sterilized with high-temperature steam, and the device consists of an air filter, a material supplementing opening, a peristaltic pump, a temperature sensor, a control system and a hermetic tank body having a gripping sleeve and an agitating paddle; the delivery pipeline for materials at an inner side of a facial mask consists of a feeding valve connected with the sterilizing tank, a stainless delivery pipe, a steam inlet valve, a dead angle vent valve, a drain valve, a drain pipe, and a discharge valve connected with the filling machine; the filling machine capable of being sterilized consists of a top punched transparent protection cover, a high-temperature resistant conveying hose, a high-temperature resistant gear pump, stainless filling head(s), ultraviolet lamp system(s), an anti-ultraviolet lamp outer cover, and a drain pipeline; and the hundred-class-cleanliness filling workshop consists of a dressing room, a buffer room, an air shower, a buffer corridor, all-fresh-air clean air conditioner(s), high-efficiency filter(s), UV lamp(s), and differential pressure gauge(s). A facial mask packaging member is sterilized by the high-temperature drying box, the facial mask raw material is sterilized by the sterilizing tank, conveyed via the delivery pipeline to the filling machine, and

filled to and sealed in the sterilized facial mask packaging member in a hundred-class-cleanliness environment.

In the above, the facial mask packaging member is treated in the high-temperature drying box at 90 ºC for 2 hours, and can be used only after it is detected to be aseptic, and the facial mask packaging member is sealed in an aseptic sealed bag during a transportation process.

In the above, after sterilizing the facial mask raw material, aseptic air is supplied by the air filter to keep a positive pressure in the sterilizing tank.

In the above, sterilization of the delivery pipeline and sterilization of the filling machine are conducted simultaneously, wherein high-temperature steam is introduced through a steam inlet valve, and the steam is discharged via the delivery pipeline, the discharge valve, the high-temperature resistant conveying hose, the high-temperature resistant gear pump, the stainless filling head(s), and the drain pipeline; and the dead angle vent valve is open when sterilizing the delivery pipeline to ensure thorough sterilization.

In the above, an aseptic wind exit of the filling machine is located at a top of the filling machine, and the aseptic wind directly enters the inside of the filling machine via the top punched protection cover to keep a positive pressure inside the filling machine.

In the above, the ultraviolet lamp system(s) is/are switched on inside the filling machine during a filling process, and the filling process is conducted under the protection of the ultraviolet lamp(s).

In the above, a sterilizing method includes the following steps:

Step (1): adding prepared facial mask raw materials to the sterilizing tank, sealing the sterilizing tank, and activating the agitating paddle to stir respective components evenly;

Step (2): supplying, by a steam generator, high-temperature high-pressure steam to increase the temperature of the sterilizing tank, stopping increase of raising the temperature when the temperature of the tank is increased to 105 ºC, keeping the facial mask raw materials at the temperature of 105 ºC for 15~30 minutes, then starting cooling to lower the temperature to 20-40 ºC;

Step (3): sterilizing, with the high-temperature steam, the air filter while sterilizing the facial mask raw material, and keeping the air filter hermetic after the sterilization;

Step (4): supplying compressed air by an air compressor, and introducing the compressed air into the sterilizing tank via the air filter to keep a positive pressure inside the tank;

Step (5): introducing the steam into the delivery pipeline via the steam inlet valve for 20-40 minutes, to sterilize the delivery pipeline and the filling machine, and then sealing all pipeline systems;

Step (6): sterilizing the filling room space with the ultraviolet lamp(s) for more than 20 minutes, turning off the ultraviolet lamp(s), and introducing aseptic wind to keep a positive pressure in the filling room; and

Step (7): turning on the UV lamp system(s) of the filling machine, opening the feeding valve and the discharge valve of the delivery pipeline, to make the material liquid enter the filling machine via the delivery pipeline to start the filling.

In the above, the facial mask raw material comprises the following components in parts by weight: coenzyme Q10 0.01-0.1, olive oil 5-10, thioctic acid 0.1-0.5, niacinamide 0.1-0.5, ß-glucan 0.1-0.5, vitamin B_6 0.1-0.5, vitamin C 1.0-3.0, vitamin B_2 0.1-0.5, dipotassium glycyrrhizinate 0.1-0.5, citric acid 0.1-0.5, vitamin E 0.5-2.0, 1,2-propanediol 5.0-10.0, 1,3-butanediol 1.0-5.0, polyglutamic acid 3.0-5.0, hydroxyethyl cellulose 0.1-0.3, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer 4.0-8.0, triethanolamine 0.1-0.5, sodium lactate 1.0-3.5 and ethylhexylglycerin 0.1-0.3, with deionized water added to 100.

A method for preparing the facial mask raw material is as follows: adding coenzyme Q10 to olive oil, and shaking at 35 ºC for 30 minutes, so that the coenzyme Q10 is fully dissolved in the olive oil for subsequent use; mixing the deionized water, 1,3-butanediol, polyglutamic acid, and hydroxyethyl cellulose, and heating them to 85 ºC for full dissolution, adding them to the coenzyme Q10 and the olive oil, adding triethanolamine, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer, sodium lactate, niacinamide, ß-glucan, thioctic acid, and dipotassium glycyrrhizinate at 50 ºC, and stirring them until full dissolution; and adding vitamin C, vitamin B_6, citric acid, ethylhexylglycerin and other raw materials at a temperature below 45 ºC, to obtain a prepared facial material raw material.

The present disclosure, compared with the prior art, has the following advantages and prominent effects: completely changing the current situation that a preservative or a preservative substance needs to be added to the facial mask raw material, being capable of producing the facial mask raw material totally free of preservatives or preservative substances using the system and process of the present disclosure, considerably improving the safety of the product, reducing usage limitations to population sensitive to the preservative substances, and thoroughly eliminating the potential hidden usage danger. In the present disclosure, the sterilization is conducted using a purely physical means to achieve the preserving purpose, no chemical or radiation residue is present in the product, moreover, a product, sealed after filling, is theoretically completely aseptic, and the shelf life of the product is considerably prolonged,

up to several years in cases where the sealing packaging member is not damaged. The conditions required by the system and process of the present disclosure are easy to be achieved in normal production enterprises of cosmetics, suitable for large-scale production and application.

Brief Description of Drawings

Fig. 1 is a schematic view showing a structure of an aseptic filling system structure provided in the present disclosure.

In the figure, 1-high-temperature high-pressure sterilizing tank; 2-delivery pipeline; 3-filling machine capable of being sterilized with high-temperature steam; 4-gripping sleeve; 5-stirring paddle; 6-air filter; 7-material supplementing opening; 8-peristaltic pump; 9-temperature sensor; 10-feeding valve; 11-steam inlet valve; 12-dead angle vent valve; 13-drain valve; 14-drain pipe; 15-discharge valve; 16-top punched transparent protection cover; 17-high-temperature resistant conveying hose; 18-high-temperature resistant gear pump; 19-stainless filling head; 20- ultraviolet lamp system; 21-anti-ultraviolet lamp outer cover; 22-drain pipeline; 23-high-efficiency filter; 24-material supplementing bottle.

Fig. 2 is a simplified flow diagram of an aseptic filling process provided in the present disclosure.

Detailed Description of Embodiments

Technical solutions of the present disclosure will be illustrated below through specific examples, while the scope of protection of the present disclosure is not limited thereto.

The contents in the examples of the present description are merely exemplifications of the forms for implementing the concept of the present disclosure. The scope of protection of the present disclosure should not be considered as merely limited to the specific forms stated in the examples, while the scope of protection of the present disclosure also encompasses equivalent technical means which can be envisaged by the person skilled in the art according to the concept of the present disclosure. Although the examples of the present disclosure are described below, the present disclosure is not limited to the above specific examples or application fields, and the specific examples below are merely exemplary and instructional, rather than limited. A person ordinarily skilled in the art, under the inspiration of the present description, without departing from the scope of protection of the claims of the present disclosure, still can make various variants, all of which all with in protection scope of the present disclosure.

Below, the specific structures, principles, and technological processes of the present disclosure are further described in conjunction with the figures.

Example 1

A formula of a facial mask comprises: coenzyme Q10 0.01 kg, olive oil 5 kg, thioctic acid 0.1 kg, niacinamide 0.1 kg, ß-glucan 0.1 kg, vitamin B_6 0.1 kg, vitamin C 1.0 kg, vitamin B_2 0.1 kg, dipotassium glycyrrhizinate 0.1 kg, citric acid 0.1 kg, vitamin E 0.5 kg, 1,2-propanediol 5.0 kg, 1,3-butanediol 1.0 kg, polyglutamic acid 3.0 kg, hydroxyethyl cellulose 0.1 kg, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer 4.0 kg, triethanolamine 0.1 kg, sodium lactate 1.0 kg and ethylhexylglycerin 0.1 kg, with the deionized water added to 100 kg.

A method for preparing a facial mask raw material comprises: adding coenzyme Q10 to olive oil, shaking at 35 ºC for 30 minutes, so that coenzyme Q10 is fully dissolved in the olive oil for subsequent use; mixing the deionized water, 1,3-butanediol, polyglutamic acid, and hydroxyethyl cellulose, and heating them to 85 ºC for full dissolution, adding them to the coenzyme Q10 and the olive oil, adding triethanolamine, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer, sodium lactate, niacinamide, ß-glucan, thioctic acid, and dipotassium glycyrrhizinate at 50 ºC, and stirring them until full dissolution; and adding vitamin C, vitamin B_6, citric acid, ethylhexylglycerin and other raw materials at a temperature below 45 ºC, to obtain the prepared facial material raw material.

Example 2

A formula of a facial mask comprises: coenzyme Q10 0.05 kg, olive oil 7.5 kg, thioctic acid 0.25 kg, niacinamide 0.25 kg, ß-glucan 0.25 kg, vitamin B_6 0.25 kg, vitamin C 2 kg, vitamin B_2 0.25 kg, dipotassium glycyrrhizinate 0.25 kg, citric acid 0.25 kg, vitamin E 1.5 kg, 1,2-propanediol 7.5 kg, 1,3-butanediol 2.5 kg, polyglutamic acid 4 kg, hydroxyethyl cellulose 0.2 kg, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer 6 kg, triethanolamine 0.25 kg, sodium lactate 2.5 kg and ethylhexylglycerin 0.2 kg, with the deionized water added to 100 kg.

A method for preparing a facial mask raw material comprises: adding coenzyme Q10 to olive oil, shaking at 35 ºC for 30 minutes, so that coenzyme Q10 is fully dissolved in the olive oil for subsequent use; mixing the deionized water, 1,3-butanediol, polyglutamic acid, and hydroxyethyl cellulose, and heating them to 85 ºC for full dissolution, adding them to the coenzyme Q10 and the olive oil, adding triethanolamine, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer, sodium lactate, niacinamide, ß-glucan, thioctic acid, and dipotassium glycyrrhizinate at 50 ºC, and stirring them until full dissolution; and adding vitamin C, vitamin B_6, citric acid, ethylhexylglycerin and other raw materials at a temperature below 45 ºC, to obtain the prepared facial material raw material.

Example 3

Coenzyme Q10 0.1 kg, olive oil 10 kg, thioctic acid 0.5 kg, niacinamide 0.5 kg, ß-glucan 0.5 kg, vitamin B_6 0.5 kg, vitamin C 3 kg, vitamin B_2 0.5 kg, dipotassium glycyrrhizinate 0.5 kg, citric acid 0.5 kg, vitamin E 2 kg, 1,2-propanediol 10 kg, 1,3-butanediol 5 kg, polyglutamic acid 5 kg, hydroxyethyl cellulose 0.3 kg, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer 8 kg, triethanolamine 0.5 kg, sodium lactate 3.5 kg and ethylhexylglycerin 0.3 kg, with the deionized water added to 100 kg.

A method for preparing a facial mask raw material comprises: adding coenzyme Q10 to olive oil, shaking at 35 ºC for 30 minutes, so that coenzyme Q10 is fully dissolved in the olive oil for subsequent use; mixing the deionized water, 1,3-butanediol, polyglutamic acid, and hydroxyethyl cellulose, and heating them to 85 ºC for full dissolution, adding them to the coenzyme Q10 and the olive oil, adding triethanolamine, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer, sodium lactate, niacinamide, ß-glucan, thioctic acid, and dipotassium glycyrrhizinate at 50 ºC, and stirring them until full dissolution; and adding vitamin C, vitamin B_6, citric acid, ethylhexylglycerin and other raw materials at a temperature below 45 ºC, to obtain a prepared facial material raw material.

Fig. 1 is a schematic view showing a structure of an aseptic filling system provided in the present disclosure. This system includes a packaging member sterilizing system, a facial mask raw material preparing and sterilizing system, a facial mask raw material delivering and aseptic filling system, i.e. mainly includes a high-temperature drying box, a high-temperature high-pressure sterilizing tank 1, a delivery pipeline 2 capable of being sterilized with high-temperature steam, a filling machine 3 capable of being sterilized with high-temperature steam, and a hundred-class-cleanliness filling workshop. The high-temperature sterilizing tank is sterilized with high-temperature steam, and the device consists of an air filter 6, a material supplementing opening 7, a peristaltic pump 8, a temperature sensor 9, and a hermetic tank body having a gripping sleeve 4 and an agitating paddle 5; the facial mask raw material delivery pipeline 2 consists of a feeding valve 10 connected with the sterilizing tank, a steam inlet valve 11, a dead angle vent valve 12, a drain pipe 14, and a discharge valve 15 connected with the filling machine; the filling machine capable of being sterilized consists of a top punched transparent protection cover 16, a high-temperature resistant conveying hose 17, a high-temperature resistant gear pump 18, stainless filling heads 19, ultraviolet lamp systems 20, an anti-ultraviolet lamp outer cover 21, and a drain pipeline 22; and the hundred-class-cleanliness filling workshop consists of a dressing room, a buffer room, an air shower, a buffer corridor, an all-fresh-air-clean air conditioner, a high-efficiency filter 23, ultraviolet lamps, and a differential pressure gauge. The packaging member for facial mask raw material is sterilized by the high-temperature drying box, and the facial mask raw material

is sterilized by the sterilizing tank, conveyed via the delivery pipeline to the filling machine, and filled to and sealed in the sterilized packaging member for facial mask raw material in the hundred-class-cleanliness environment.

Fig. 2 is a simplified flow diagram of an aseptic filling process provided in the present disclosure. This filling process mainly includes packaging member sterilization, facial mask raw material preparation, facial mask raw material sterilization, material supplementation, delivery pipeline sterilization, filling machine sterilization, filling room sterilization, filling and other process steps, and it specifically includes the following steps:

treating the packaging member for facial mask raw material in the high-temperature drying box at 90 ºC for 2 hours, wherein the packaging member can be used only after it is detected to be aseptic, and the facial mask raw material packaging member is sealed in an aseptic sealed bag during the transportation process;

adding the facial mask raw material in Example 1, Example 2, or Example 3 to the sterilizing tank 1, sealing the sterilizing tank, and activating the stirring paddle 5 to stir respective components evenly;

supplying, by a steam generator, high-temperature high-pressure steam to the sterilizing tank to increase the temperature, stopping increasing of the temperature when the temperature of the tank is increased to 105 ºC, keeping the facial mask raw material at the temperature of 105 ºC for 15~30 minutes, then starting cooling to lower the temperature to below 40 ºC, sampling and testing the facial mask raw material, and conducting next step when it is tested to be qualified;

sterilizing, with the high-temperature steam, the air filter for 15 minutes to 30 minutes while sterilizing the facial mask raw material, and keeping the air filter hermetic after the sterilization;

connecting, if the material needs to the supplemented, a sterilized material supplementing bottle 24 to the sterilizing tank 1 through the material supplementing opening 7, pumping the supplemented material into the sterilizing tank by the peristaltic pump 8, and stirring for 20 minutes to 40 minutes to evenly mixed the same with the facial mask raw material liquid in the tank;

supplying compressed air by an air compressor, introducing the compressed air into the sterilizing tank via the air filter 6, and keeping the pressure inside the tank at 0.05 MPa~0.1 MPa (gauge pressure);

introducing the steam into the delivery pipeline 2 via the steam inlet valve 11 for more than 20 minutes, to sterilize the delivery pipeline 2 and the filling machine 3, then sealing all pipeline systems;

sterilizing the filling room space with the ultraviolet lamp for more than 20 minutes, turning off the ultraviolet lamp, and introducing aseptic wind to keep a positive pressure in the filling room, with a pressure difference between the filling room and a buffer corridor being of more than 8 Pa;

turning on the ultraviolet lamp system 20 of the filling machine, opening the feeding valve 10 and the discharge valve 11 of the delivery pipeline to make the material liquid enter the filling machine 3 via the delivery pipeline 2 to start the filling, to obtain a facial mask.

Comparative example: a formula of a facial mask comprises: coenzyme Q10 0.05 kg, olive oil 7.5 kg, thioctic acid 0.25 kg, niacinamide 0.25 kg, ß-glucan 0.25 kg, vitamin B_6 0.25 kg, vitamin C 2 kg, vitamin B_2 0.25 kg, dipotassium glycyrrhizinate 0.25 kg, citric acid 0.25 kg, vitamin E 1.5 kg, 1,2-propanediol 7.5 kg, 1,3-butanediol 2.5 kg, polyglutamic acid 4 kg, hydroxyethyl cellulose 0.2 kg, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer 6 kg, triethanolamine 0.25 kg, sodium lactate 2.5 kg, phenoxyethanol 0.2 g and ethylhexylglycerin 0.2 kg, with deionized water added to 100 kg.

A method for preparing a facial mask raw material comprises: adding coenzyme Q10 to olive oil, shaking at 35 ºC for 30 minutes, so that coenzyme Q10 is fully dissolved in the olive oil for subsequent use; mixing the deionized water, 1,3-butanediol, polyglutamic acid, and hydroxyethyl cellulose, and heating them to 85 ºC for full dissolution, adding them to the coenzyme Q10 and the olive oil, adding triethanolamine, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer, sodium lactate, niacinamide, ß-glucan, thioctic acid, and dipotassium glycyrrhizinate at 50 ºC, and stirring them until full dissolution; adding vitamin C, vitamin B_6, citric acid, ethylhexylglycerin and other raw materials at a temperature below 45 ºC, naturally cooling, filtering them via a 0.22μm membrane, pouring them into a container containing a face-shape non-woven fabric to impregnate the non-woven fabric, and packaging them after the impregnation.

Table 1 Experimental Data of Bacterium Contamination Rates of Facial Mask Products treated by Different Sterilizing Methods

Group	High-temperature Cultivation (35 ºC, 7 days)			Room-temperature Cultivation (25 ºC, 60 days)		
	Number of Products for Test	Number of Products Contaminated by Bacteria	Proportion of Products Contaminated Bacteria	Number of Products for Test	Number of Products Contaminated by Bacteria	Proportion of Products Contaminated Bacteria
Example 1	1000	0	0%	1000	2	0.2%
Example 2	1000	0	0%	1000	3	0.3%

Example 3	1000	0	0%	1000	2	0.2%
Comparative Example	1000	11	1.1%	1000	19	1.9%

Test conclusion: it can be seen from the above table that the facial mask products produced using the process of the present disclosure have the bacterium contamination rates of below 0.5%, possessing the valve of large-scale production.

Claims:

1. A facial mask aseptic-filling apparatus, characterized by comprising a high-temperature drying box, a high-temperature high-pressure sterilizing tank, a delivery pipeline capable of being sterilized with high-temperature steam, a filling machine capable of being sterilized with high-temperature steam, and a hundred-class-cleanliness filling workshop.

2. The facial mask aseptic-filling apparatus according to claim 1, characterized by comprising the high-temperature drying box, the high-temperature high-pressure sterilizing tank, the delivery pipeline capable of being sterilized with high-temperature steam, the filling machine capable of being sterilized with high-temperature steam, and the hundred-class-cleanliness filling workshop, wherein the high-temperature high-pressure sterilizing tank, which is configured to be sterilized with high-temperature steam, consists of an air filter, a material supplementing opening, a peristaltic pump, a temperature sensor, a control system, and a hermetic tank body having a gripping sleeve and an agitating paddle; the delivery pipeline for materials consists of a feeding valve connected with the sterilizing tank, a stainless delivery pipe, a steam inlet valve, a dead angle vent valve, a drain valve, a drain pipe, and a discharge valve connected with the filling machine; the filling machine capable of being sterilized with high-temperature steam consists of a top punched transparent protection cover, a high-temperature resistant conveying hose, a high-temperature resistant gear pump, stainless filling heads, ultraviolet lamp systems, an anti-ultraviolet lamp outer cover, and a drain pipeline; the hundred-class-cleanliness filling workshop consists of a dressing room, a buffer room, an air shower, a buffer corridor, an all-fresh-air clean air conditioner, a high-efficiency filter, ultraviolet lamps, and a differential pressure gauge; and a facial mask packaging member is sterilized by the high-temperature drying box, and a facial mask raw material is sterilized by the sterilizing tank, conveyed via the delivery pipeline to the filling machine, and filled to and sealed in the sterilized facial mask packaging member in a hundred-class-cleanliness environment.

3. The facial mask aseptic-filling apparatus according to claim 2, characterized in that the facial mask packaging member, which is treated in the high-temperature drying box at 90 ºC for 2 hours, is able to be used only after the facial mask packaging member is detected to be aseptic, and the facial mask packaging member is sealed in an aseptic sealed bag during a transportation process.

4. The facial mask aseptic-filling apparatus according to claim 2, characterized in that after sterilizing of the facial mask raw material is completed, aseptic air is supplied by the air filter to keep a positive pressure in the sterilizing tank.

5. The facial mask aseptic-filling apparatus according to claim 2, characterized in that sterilization of the delivery pipeline and sterilization of the filling machine are conducted simultaneously, high-temperature steam is introduced through the steam inlet valve, and the steam is discharged via the delivery pipeline, the discharge valve, the high-temperature resistant conveying hose, the high-temperature resistant gear pump, the stainless filling head, and the drain pipeline; and the dead angle vent valve is open when sterilizing the delivery pipeline, to ensure thorough sterilization.

6. The facial mask aseptic-filling apparatus according to claim 2, characterized in that an aseptic wind exit of the filling machine is located at a top of the filling machine, and the aseptic wind directly enters the filling machine via the top punched protection cover to keep a positive pressure inside the filling machine.

7. The facial mask aseptic-filling apparatus according to claim 2, characterized in that the ultraviolet lamp systems inside the filling machine are switched on during a filling process, so that the filling process is conducted under protection of the ultraviolet lamps.

8. The facial mask aseptic-filling apparatus according to claim 2, characterized in that a sterilizing method comprises following steps:

   Step (1): adding a prepared facial mask raw material to the sterilizing tank, sealing the sterilizing tank, and activating the agitating paddle to stir components evenly;

   Step (2): supplying high-temperature high-pressure steam by a steam generator to increase a temperature of the sterilizing tank, stopping increasing of the temperature when the temperature of the tank is increased to 105 ºC, keeping the facial mask raw material at the temperature of 105 ºC for 15~30 minutes, and then starting cooling to lower the temperature to 20-40 ºC;

   Step (3): sterilizing, with the high-temperature steam, the air filter while sterilizing the facial mask raw material, and keeping the air filter hermetic after the sterilization;

   Step (4): supplying compressed air by an air compressor, and introducing the compressed air into the sterilizing tank via the air filter to keep a positive pressure inside the tank;

   Step (5): introducing the steam into the delivery pipeline via the steam inlet valve for 20-40 minutes, to sterilize the delivery pipeline and the filling machine, and then sealing all pipeline systems;

Step (6): sterilizing a space of the filling room with the ultraviolet lamps for more than 20 minutes, turning off the ultraviolet lamps, and introducing aseptic wind to keep a positive pressure in the filling room; and

Step (7): turning on the ultraviolet lamp systems of the filling machine, and opening the feeding valve and the discharge valve of the delivery pipeline, to make a material liquid enter the filling machine via the delivery pipeline to start the filling.

9. The facial mask aseptic-filling apparatus according to claim 8, characterized in that the facial mask raw material comprises following components in parts by weight: coenzyme Q10 0.01-0.1, olive oil 5-10, thioctic acid 0.1-0.5, niacinamide 0.1-0.5, ß-glucan 0.1-0.5, vitamin B_6 0.1-0.5, vitamin C 1.0-3.0, vitamin B_2 0.1-0.5, dipotassium glycyrrhizinate 0.1-0.5, citric acid 0.1-0.5, vitamin E 0.5-2.0, 1,2-propanediol 5.0-10.0, 1,3-butanediol 1.0-5.0, polyglutamic acid 3.0-5.0, hydroxyethyl cellulose 0.1-0.3, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer 4.0-8.0, triethanolamine 0.1-0.5, sodium lactate 1.0-3.5 and ethylhexylglycerin 0.1-0.3, with deionized water added to 100.

10. The facial mask aseptic-filling apparatus according to claim 9, characterized in that a method for preparing the facial mask raw material comprises: adding coenzyme Q10 to olive oil, and shaking at 35 ºC for 30 minutes, so that the coenzyme Q10 is fully dissolved in the olive oil for subsequent use; mixing the deionized water, 1,3-butanediol, polyglutamic acid, and hydroxyethyl cellulose, and heating them to 85 ºC for full dissolution, adding them to the coenzyme Q10 and the olive oil, adding triethanolamine, glyceryl polymethacrylate/1,2-propanediol/PVM/MA copolymer, sodium lactate, niacinamide, ß-glucan, thioctic acid, and dipotassium glycyrrhizinate at 50 ºC, and stirring them until full dissolution; and adding vitamin C, vitamin B_6, citric acid, ethylhexylglycerin, vitamin B_2, vitamin E and 1,2-propanediol at a temperature below 45 ºC, to obtain a prepared facial material raw material.