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(54) Title: AIR PURIFYING PROCEDURE AND SALINE OF SPONGY STRUCTURE MATERIAL

(57) Abstract: The innovation refers to a complex air purifying procedure and the saline spongy structure necessary to purify the air and other gases used in breathing, by passing them through salt granule layers of microcrystalline structure situated in the filtering cartridges of the autonomously used equipment or filtering elements for the air purification in the environment areas, having therapeutic effects in the breathing affections.

Air purifying procedure and saline of spongy structure material

The innovation refers to an air purifying procedure and a saline made spongy material to be used in the complex treatment of air and other breathing gases. The common air purifying procedures by filtering the dust through spongy textures, the system of blowing air through water curtains or different chemical treatments are well known.

One may also mention the air purifying procedures by blowing air through layers of active carbon or active carbon impregnated textures in order to prevent various chemical elements in the air; additionally, such procedures as air UV sterilization.

The weakness of all the above procedures may be the fact that they work only separate stages of purification, most of the times in complex equipment that can be installed only in special places and the resulting purified air, by these procedures, is most frequently hard to breath, especially by persons with breathing problems.

The therapeutic effect of the saline air in the salt mines or the sear air are well known.

Another recognized complex air purifying procedure is the forced air blow through a salt plug (patent RO 117126B).

The disadvantage of this method is that the contact surface of the salt to the air is small and requests special devices.

A saline material is known to be obtained by a flow and recycling of a saturated solution of sodium chlorate in which 2...20% ordinary salts can be dissolved (patent RO 112025).

The problem, solved by this innovation, is represented by obtaining a saline material of spongy structure for the purpose of applying the complex air purification method. The complex air purification procedure, according to this innovation, discards the above disadvantages by using saline granules of microcrystalline structure as effect of microcrystalline sediments (patent RO 112025).

The granules are loaded into the filtering cartridges, filtering elements etc. from special equipment or commonly used for purifying gases with absorbing granular materials which can be, optionally, over-impregnated with mineral waters or salts used for health purposes. The over-impregnation operation produces links among the microcrystalline granules, creating a 3D structure.

By applying this procedure and the saline material, according to the innovation, the following advantages result:

- Increased contact time between the purifying air and the saline granules;

- The control of the contact time by determining the size of the saline granules and the thickness of the filtering layer;
- The possibility of making filtering elements in various shapes;
- The possibility of creating filtering elements under the form of compact cartridges to be used in artificial breathing systems or as a special addition of oxygen;
- The possibility of creating filtering elements of 3D structure for supporting large and extra large shapes;
- The possibility of using air treatment devices to be used as other granular absorbent materials ;
- The equivalence of some qualities of the saline granules as purifying materials;
- The possibility of including the procedure and the saline material according to the innovation, in various existing equipment of air conditioning-treatment-ventilation;
- The complex purification of the air and other gases used for breathing in the environment or in special apparatus;
- A complex purification of the air is obtained by retaining the fine dust in the air, the smoke, unpleasant odors, by reducing the number of bacteria in the air and producing small quantities of saline ions;
- Getting significant therapeutic effects in breathing affections;
- Getting notable effects at the sick people having mucous affections within 8-10 hours from using the mask breathing system;
- Getting an agreeable atmosphere with favorable effects for asthmatic people, suffering from rhinitis, sinuses, breathing allergies.

Three examples of complex air purification and the saline spongy structured material are thereafter presented, as per the innovation.

The complex air purification procedure, according to the innovation, represents the blowing of the air through a microcrystalline spongy granule layer, created from salts, mainly sodium chlorate. The granules can have various sizes, normally of 0.5 – 5 mm width, of cylindrical, spherical, odd shapes, created by microcrystalline deposits themselves. The granules may contain different quantities of salts from the existing mineral waters in the health spas: sulphurous waters, bicarbonate waters, arsenious waters, iodate waters.

The salts may be carried in by using mineral waters in the process of obtaining the granules or directly by adding the respective mineral salts.

The mostly used minerals are the sodium and potassium iodides, potassium chlorate and magnesium sulphate.

Example nr. 1 – the saline material is obtained, in the first stage, by crushing and mashing on granule fractions of some massive known deposits of salts of microcrystalline structure (patent RO 112025). The fraction 1.5 – 2.5 mm is

selected, with which, in the second stage, it is created a cylindrical filtering element at the rate of 3:2 length-gauge. By an air-proof method, a flow of 2 l/minute air is blown through this spongy structured filtering element, for inhalation in the breathing mask.

Example nr. 2 – massive deposits of salts of microcrystalline structure, already known (patent RO 112025) is mixed, in the first stage, in a container of sodium chlorate and iodides sulphurous mineral water from Fisici Spa, until a paste is obtained in the second stage; this paste is flushed under pressure through a 2 mm grid, resulting a cylindrical granulose material, which, in a third stage, is dried up for 24 hours at 40 - 60°C. The cylindrical granulose material will crush and mash and the fraction of 1.5 – 2.5 mm is selected with which a cylindrical filtering element was obtained, having the length/gauge rate of 1:5. An air flow of 20 cm/h is blown through this spongy filtering element, in order to purify the air in a 80 cm room.

Example nr. 3 – massive deposits of salts of microcrystalline structure already known (patent RO 112025) are crushed and mashed on fraction of granulation. The 3.5 – 5 mm fraction was selected and placed on a 30 cm side and 4 cm thick square rubber shape. The granules were placed by intercalating in the layer two layers of plastic mesh of 1 mm gauge, at a 1 cm distance one against the other and against the margins. The layer of granules was soaked with a saturated solution of sodium chlorate and potassium iodide (a 10/1 rate) and, after 15 minutes, the glut was extracted from the solution. The procedure was repeated twice and after the last drying, the filtering element was extracted from the mould. The filtering element thus produced has a rigid structure, the granules being linked in a 3D web. The filtering element was mounted to a ventilation mouth in a 150 cm room. The air passed with a 3m/second speed.

The air filtered as per the above examples is purified of dust, unpleasant odors, smoke, the number of bacteria is reduced and small quantities of saline iodides result, while the air is fresh, good to breath. The filtering element in the example 1 applied to a breathing mask permitted a significant fluidity of the bronchia secretion with the sick people suffering from mucous affection, registering a remarkable effect after 8-10 hours of application.

The filtering elements in the examples nr. 2 and 3 assured a pleasant atmosphere, being appreciated by asthmatic people, suffering from rhinitis, sinuses, breathing allergies. The healthy people in the respective rooms noticed a diminish of colds, headaches, the air became pleasant to breath.

CLAIMS

1. Complex air purification procedure characterized by passing the air through a saline granule layer.
2. Complex air purification procedure, according to the claim 1, by which the granulose material is mainly realized from sodium chlorate, optionally by adding mineral waters in the spas and microcrystalline spongy structures of mechanic resistance.
3. Complex air purification procedure, according to the claims 1 and 2, by which the layer of granules is created by introducing saline granules into filtering cartridges or filtering elements usually applicable at granular absorbing materials.
4. complex air purification procedure, according to the claims 1 and 2, by which the granule layer is realized by inking the saline granules into the filtering elements to the 3D structures, by repeated wetting and drying of the granule layer with saline solutions, the structure of the layer allowing non-corrodible textures.
5. Saline material of spongy structure for the application of the procedure under the claim 1 and 2, by which it is created through rigid microcrystalline deposits of sodium chlorate, optionally with other salts from health resorts, in granular form or extracted from paste of 0.5 – 5 mm granules and dried at 50-60°C.
6. Saline material of spongy structure for the application of the procedure under the claims 1 and 2, by which it is created though rigid microcrystalline deposits of sodium chlorate, optionally with other salts from health resorts, in granular form or extruded and linked in 3D structures by repeated wetting and dryings.