(54) Title: APPARATUS (CUSHION AND LEGGING-DIFFUSER CONSTITUTED BY DIFFERENTLY THICKED AND POROUS MATERIAL) FOR LOCALIZED OXYGEN-THERAPY CHARACTERIZED BY CONTINUOUS FLUX

(57) Abstract: On the ground of what the scientific literature has reported in the last years about the efficacy of the oxygen-therapy and from experimental studies we have put into evidence that the only increase of the concentration of the oxygen, in a condition of firm pressure, is efficacious for the therapy of the lesions on not more vital tissues. At this end, with this patent for industrial invention we aimed to render excellent this kind of treatment, to cure the bed-sores and the lower limbs ulcers. The systems we are suggesting are a cushion-diffuser to treat the bed-sores, and a legging-diffuser to extend the therapy to lower limbs lesions. The cushion is made of different thick and porous material, lined with polyethylene on one side, and in direct contact with the lesions we have no-sticking and with no allergic reaction material (non-woven or something similar). The legging is constituted by flexible chamber (double polyethylene-nongrown or something similar) . These two above mentioned apparatus are linked to a bottle which continually distributes oxygen to ill tissues.
RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, 
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published: 
— without international search report and to be republished 
upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ing of each regular issue of the PCT Gazette.
Apparatus (cushion and legging-diffuser constituted by differently thicked and porous material) for localized oxygen-therapy characterized by continuous flux.

The treatment by firm pressure is a therapy which uses the pressure as therapeutical element. For chamber by firm pressure we mean an ambient where is possible to increase the internal pressure with air until limited values (maximum 5 bar). For oxygen-therapy by firm pressure we mean to give oxygen by inhalation until the 100% to a pressure not superior than the atmospheric one, (maximum 1.8 bar, for a longer than 60minutes), so that we can use its best solubility in biological liquids and its best diffusion throughout the tissues. The treatment by firm pressure is in this way a therapeutical technique used to get better the feeding of not more vital or very little vital tissues.

This kind of therapy is useful to revive the tissues which have their volume reduced. Because of many contra-indications not all the patients can use it and the therapy must have done necessarily in special sanitary structures.

The use of district chambers by firm pressure partly resolves the problem.

From a long research, about this argument, we have found the following patents:

- Pat. Num. U.S. 4224941, inventor Stivala Oscar G.

The systems above mentioned present the following disadvantages:
• Are not very practical (many chambers are rigid and cumbersome).
• Are difficult to apply (some chambers must be hermetically stuck to the skin surrounding the lesion, which in patient with ulcers and bed-sores is particularly thin and easily damageable).
• The humidity tends to increase in the chambers if there isn’t an appropriate control system.
• Not all the chambers have single usage (many chambers must be cleaned and sterilized after use; so we can find traces of the disinfectant used for and which can cause further inflammation to the lesion).
• All the chambers function by firm pressure, about 22 mg/Hg (the operation by firm pressure can reduce the afflux of the blood to the ulcer or to the sore so to retard the healing and even to cause the worsening of the symptomatology).
• Many apparatus for the treatment of bed-sores are used on patient in supine position for more than one hour (position very uncomfortable for an old patient, excessively fat or with joints pathology).
On the ground of what we have above shown, it is right to treat the bed-sores and the varicose ulcers in a condition of firm pressure.
The idea of resolution for this kind of treatment, consist of creating some apparatus to allow the treatment of the skin lesions, particularly the cure of the bed-sores and the varicose ulcers. This kind of treatment consists of the continuous passage of the oxygen widely spread off all over the lesion.

To realize this kind of treatment we have conceived a peculiar cushion and legging, both by single usage, sterile and made of double stratum material, of which the active part consists of no-sticking, antistatic, with no allergic reaction properties and so porous to get better the spread of the therapeutic gas on the lesion. The stratum on the inactive side, opposite the lesion, is made of impermeable (waterproof) and antistatic material.

This idea of resolution is clearly explained by the enclosing table where is reported the realization with an indicative purpose only but not binding.
The figure n°1 refers to the cushion-diffuser and the figure n°2 suggests the legging-diffuser.

Referring to the figures, the two apparatus have in common the realization in double stratum material; near the lesion to be treated it is porous (1) to get better the spread of the gas, while on the inactive side (2) and opposite the lesion is impermeable (waterproof).

The two apparatus are joined, by a connector tube (3),
to an oxygen bottle.
By this little tube it is delivered the oxygen in a regular continuous flux.
The gas is spread off through the internal micro-porous material and it is uniformly delivered on the zone to be treated.
The cushion and the legging-diffuser by continuous flux of oxygen, present, in comparison with the other apparatus, the following advantages:
1. the material used is not rigid, it fits to the part of the body to treat, can be easily applied and is extremely light.
2. the continuous flux with oxygen humidity (moistureness), doesn’t request the use of systems to control the humidity. Infact, the relative humidity values obtained in the inner micro-climate of the apparatus vary from the 30% to the 70%.
3. the continuous flux of the oxygen creates a superficial light massage which gets better the feeding of the tissues and it eliminates at the case the sweat induced, rendering constant the percentage of relative humidity achieved.
4. the apparatus have an easy usage, even at home.
To sum up, the cushion-diffuser and the legging-diffuser for localized oxygen-therapy by continuous flux are very useful apparatus, without contraindications and of lower cost. These apparatus can be validly applaied in the treatment of non-vital lesions (in particular bed-sores and varicose ulcers to lower limbs).
To this idea of resolution can be brought formal and structural changes concerning of the inventive concept which is well defined in the following claims.
CLAIMS

1. The oxygen-therapy by continuous flux to treat the bed-sores and lower limbs lesions uses an apparatus suitable to the zone to cure and is characterized by having the side in contact with the lesion made of material permeable to the gas, while the remaining side impermeable (waterproof), so that by connecting it to a tube which delivers oxygen, the flux of the gas is spread off on the zone to be treated.

2. Apparatus according to the claims 1, concerning the cushion-diffuser.

3. Apparatus according to the claim 2, concerning of the cushion-diffuser characterized by having the external surface covered with polythene (impermeable and antistatic material) in the inside folds up along the borders and an internal surface, of which that one in inner contact with the lesion, made of permeable, sterile, no-sticking, antistatic and with no allergic reaction material.

4. Apparatus according to the claims 2, 3 or 4, concerning of a cushion connected to an oxygen bottle through an appropriate tube which comes out from the inner to the sideways of the cushion.

5. Apparatus according to the claims 1, concerning of a legging of bigger dimensions than the part of the limb to cure, closed on the upper side of the limb, not in an hermeutical manner, to unable the oxygen to flow down.
6. Apparatus according to the claims 5, characterized by the fact that the legging is constituted of an external surface in polythene, (impermeable and antistatic material) and of an internal surface, in inner contact with the lesion, made of material permeable to the gas, with no allergic reaction, sterile, no-sticking, antistatic.

7. Apparatus according to the claims 5, concerning of the fact that the legging is joined through an appropriate connecting to a tube from which comes out oxygen.

8. Apparatus according to the claims 5, concerning of the fact that the legging more easily can be made of joined in couple and impermeable (waterproof) material in the external side and in the internal one of sterile, no-sticking, antistatic and with no allergic reaction material.

9. Apparatus according to the claims 5, concerning of the fact that the legging can be made of flexible material.