

645331

SPRUSON & FERGUSON

AUSTRALIA

PATENTS ACT 1990

PATENT REQUEST: STANDARD PATENT

I/We, the Applicant(s)/Nominated Person(s) specified below, request I/We be granted a patent for the invention disclosed in the accompanying standard complete specification.

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[54] Invention Title:

Apparatus for Blending Gaseous or Vaporious Substances

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[31] Appl'n No(s):

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Details of Basic Application(s):

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CH


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31 July 1990

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L. Givaudan & Cie

By:



Registered Patent Attorney

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COMMONWEALTH OF AUSTRALIA
THE PATENTS ACT 1952
DECLARATION IN SUPPORT OF A
CONVENTION APPLICATION FOR A PATENT
In support of the Convention Application made for a
patent for an invention entitled:

AUSTRALIA
CONVENTION
STANDARD
& PETTY PATENT
DECLARATION

Ref. 6550/31

Title of Invention Apparatus for blending gaseous or vaporous substances

Full name(s) and address(es) of Declarant(s)
1. Roland Borer
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do solemnly and sincerely declare as follows:--

Full name(s) of Applicant(s)
1. I am authorised by
L.GIVAUDAN & CIE Société Anonyme
of 5 Chemin de la Parfumerie, CH-1214 Vernier, Geneva, Switzerland

the applicant(s) for the patent to make this declaration on its/~~their~~ behalf.

2. The basic application(s) as defined by Section 141 of the Act was/~~were~~ made

Basic Country(ies) in Switzerland

Priority Date(s) on July 31, 1990

Basic Applicant(s) by L.GIVAUDAN & CIE Société Anonyme

the inventor(s) cited in paragraph 3.

3.

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(respectively)

is/are the actual inventor(s) of the invention and the facts upon which the applicant(s) is/~~are~~ entitled to make the application are as follows:

Set out how Applicant(s) derive title from actual inventor(s) e.g. The Applicant(s) is/~~are~~ the assignee(s) of the invention from the inventor(s).

(X) the Applicant is the assignee of the invention from the inventor(s).

4. The basic application(s) referred to in paragraph 2 of this Declaration was/~~were~~ the first application(s) made in a Convention country in respect of the invention(s) the subject of the application.

To: Declared at Basle this 14th day of June 1991

The Commissioner of Patents,
COMMONWEALTH OF AUSTRALIA

Roland Borer
Signature of Declarant(s)



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- (54) Title
APPARATUS FOR BLENDING GASEOUS OR VAPOROUS SUBSTANCES
- (51)⁵ International Patent Classification(s)
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- (21) Application No. : **81259/91** (22) Application Date : **22.07.91**
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- (56) Prior Art Documents
DE 2941975
- (57) Claim

1: Apparatus for the admixing of a gaseous or vaporous substance, to a gas stream in a mixing chamber, to which the gaseous substance is fed by means of a carrier gas via a line, wherein the line contains a capillary, which is arranged in an advancing device with two defined positions in such a way that in one position it extends through an opening of the mixing chamber in the interior of the latter and in the second position opens out outside the mixing chamber in a suction removal space surrounding the mixing chamber.

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COMPLETE SPECIFICATION

FOR A STANDARD PATENT

ORIGINAL

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Invention Title:

Apparatus for Blending Gaseous or Vaporious Substances

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

5

10 The invention relates to an apparatus for the admixing of a gaseous or vaporous substance, especially an odoriferous substance, to a gas stream in a mixing chamber, to which the gaseous or vaporous substance is fed by means of a carrier gas via a line.

15 An apparatus for the mixing of odoriferous substances is known from US Patent Specification No. 4,520,651. In this apparatus, the vapours of the odoriferous substances to be mixed are mixed with odourless carrier gas and these individual gas mixtures are brought together in a mixing chamber in order to produce an odoriferous substance composition. The lines which lead the odourless gas to the storage tanks containing the odoriferous substances have controllable valves, with which the odourless gas can be switched on and off and the quantities of gas can be individually controlled.

20 This known apparatus has the disadvantage that when opening the valves, i.e. when switching in an individual odoriferous substance component or else when increasing the concentration in the lines, first of all the surfaces have to be saturated. The concentration of the odoriferous substance in the mixing chamber increases slowly until reaching a state of equilibrium. Conversely, during switching-out so-called memory effects occur, because odoriferous substances desorbing from the surfaces can get into the mixing chamber by diffusion. The waiting time until in each instance a state of equilibrium is reached and an assessment of the odour of the composition can be carried out is relatively long.

25 A further disadvantage of the known mixing apparatus is that measurements of odour threshold values, at which precisely defined quantities of a gas saturated with odoriferous substance can be added to an odourless rarefaction gas, are not possible with it.

30 ~~The object of the invention is to provide an apparatus with which both odoriferous substance mixtures can be produced or varied quickly and~~



It is the object of the present invention to overcome or substantially ameliorate the above disadvantages.

There is disclosed herein apparatus for the admixing of a gaseous or vaporous substance, to a gas stream in a mixing chamber, to which the gaseous substance is fed by means of a carrier gas via a line, wherein
5 the line contains a capillary, which is arranged in an advancing device with two defined positions in such a way that in one position it extends through an opening of the mixing chamber in the interior of the latter and in the second position opens out outside the mixing chamber in a
10 suction removal space surrounding the mixing chamber.

According to a preferred embodiment of the invention, the line, including its moving parts, comprises a metal capillary and has the carrier gas saturated with the gaseous substance continuously flowing through it. The advancing device may preferably be a pneumatically
15 operated piston in a cylinder. The shut-off means of the opening of the mixing chamber expediently comprise a flexible diaphragm. From the suction removal space surrounding the mixing chamber, the air, or the mixture of air, carrier gas and the gaseous substance produced there, is expediently removed continuously by suction.

A special embodiment serves for the production of a mixture of a plurality of odoriferous substances in one gas stream and for this purpose has a plurality of lines with capillaries and a corresponding number of advancing devices and of openings, provided with shut-off means, of the mixing chamber.
20

A preferred exemplary embodiment of the invention is described below with reference to the attached drawings.
25

The single figure of the drawing shows, partly in perspective representation and partly in section, an apparatus for the admixing of a plurality of odoriferous substances to a gas stream, i.e. in other words
30 for the production of odoriferous substance mixtures in a gas stream. This apparatus can likewise be used for the so-called threshold value determination, by only a single odoriferous substance being fed in and varied in its concentration. An apparatus which is used exclusively for threshold value determination is constructed on the same principle as the
35 embodiment described below.



In the case of the apparatus shown in the drawing, the mixtures are produced in a mixing chamber 1, which essentially comprises an elongated tube 2, which is open at both ends and at the upper end of which the opening 3 is widened into a triangular shape adapted to the human nose.

5 A continuous air stream 5 is fed in through the lower opening 4. The said stream expediently

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corresponds to the rate usual for normal breathing of about 8 to 10 litres per minute.

The mixing chamber preferably consists of glass. In its lower part, it has a series of openings 6, which are all arranged at the same height and are distributed evenly around the circumference. Alternatively, the openings may also be arranged at different heights, in particular on two levels for example, if more openings are provided than there is room for on one level. The openings are covered by a flexible diaphragm 7. The diaphragm consists for example of rubber and has the characteristic that it closes again after perforation by a needle and withdrawal of the needle.

The covering of the openings 6 may also be effected by other mechanical devices instead of membranes, such as flaps etc., or may be entirely omitted if the diameter of the openings is narrow enough.

Arranged around the lower part, provided with the openings 6, of the mixing chamber 1 is a feed system 8 for the odoriferous substance components which are mixed in the mixing chamber. The feed system 8 essentially comprises an advancing device 9 and a line system 10 for supplying odoriferous substance components from storage tanks 11 to the mixing chamber 1.

The advancing device 9 comprises an annular housing 12, in which bores 13 are arranged evenly around the circumference, distributed at the same angular positions as the openings 6, in which bores push rods 14 are disposed in an axially displaceable manner. In the inner housing area, the bores 13 are widened into chambers 15 of greater cross-section, which have the function of cylinders. The push rods 14 are surrounded approximately in their centre by an annular, sleeve-like piston 16, which divides the chambers 15 into two parts, separated airtightly from each other. To each of the two parts there leads a supply line 17, via which compressed air is alternately fed in, in order to move within the cylinder 15 the pistons 16, and consequently the push rods 14, pneumatically in one direction or the other. The compressed air feeding is symbolised by the arrows 18.

The push rods 14 are provided with central axial bores, in which capillaries 19 are arranged. On the side of the push rods facing the mixing chamber, the capillaries protrude far enough beyond the push rods that their end 20 projects into the mixing chamber when, as shown on the left side of the figure, the push rod is pneumatically pushed inwards, while the end 20 remains outside the mixing chamber, as shown on the right side, when the push rod is pneumatically displaced outwards.

As an alternative to pneumatic operation, a mechanical, electromechanical or hydraulic operation of the advancing device may also be provided. The structural design of these alternative possibilities does not make any special demands on a person skilled in the art.

5 The capillaries 19 are connected by lines 21 to the already mentioned storage vessels 11 for the odoriferous substance. In the case of the present exemplary embodiment, the capillaries 19 and the associated moving connecting lines 21 in each case comprise a single steel capillary. If required, a different metal, for example platinum, may also be provided.

10 Via a feed line 22, an inert carrier gas, for example nitrogen, which is symbolised by the arrow 23, is passed to the storage tanks 11. Valves 24, with which the carrier gas stream can be metered, are arranged in the lines 22.

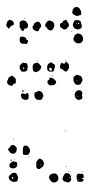
15 Between the mixing chamber 1 and the advancing device 9 there is provided a suction removal space 25, in which the capillary orifices are located when they are pushed outwards by the push rod 14. From this suction removal space 25, the air, or an air/odoriferous substance mixture produced there, is continuously removed by suction, as symbolised by the arrow 26.

20 For the production of an odoriferous substance composition of, for example, up to twelve components, which may for their part already represent mixtures, the apparatus has twelve openings 6 and, accordingly, the advancing device also has twelve pneumatic cylinders 15 with push rods 14 and the associated capillaries 19, which are connected in each case to corresponding storage vessels 11. For the components which are to be involved in the mixing, the capillary orifices are pushed by the advancing device into the mixing chamber. The continuous gas stream of carrier gas and odoriferous substance passes into the main air stream 5 which is flowing through the mixing chamber. All other capillaries of which the associated components are not to pass into the mixture but which will be needed later during the course of the series of tests, likewise have carrier gas with odoriferous substance flowing continuously through them, but this goes into the suction removal space and is removed by suction from there. When a component is then additionally to pass into the mixture, the corresponding capillary is pushed into the mixing chamber by means of the advancing device, as a result of which the component is immediately available in the desired constant concentration.

35 The concentration of the individual components is controlled via the flow of the carrier gas 23, i.e. by means of the valves 24. The valves 24 permit a control of the nitrogen stream between 0 and 1,000 ml per minute. If required,

greater flows of several litres per minute may also be provided by suitable choice of the capillaries and valves.

As already mentioned, the apparatus has the advantage that, due to the continuous through-flow of the capillary lines with the mixture of carrier gas and odoriferous substance, the problem of adsorption or desorption on the inner surfaces of the lines is eliminated. This has the consequence that the set odoriferous substance concentrations are always in equilibrium in the channels and consequently always exhibit constant values. Furthermore, no so-called memory effect can occur when a channel is switched off. In addition, by the method of pushing in the capillaries into the mixing chamber or withdrawing them from the mixing chamber, the intended mixing ratio is achieved virtually instantaneously, i.e. significantly quicker than with previously known methods.



The claims defining the invention are as follows:

1. Apparatus for the admixing of a gaseous or vaporous substance, to a gas stream in a mixing chamber, to which the gaseous substance is fed by means of a carrier gas via a line, wherein the line contains a capillary, which is arranged in an advancing device with two defined positions in such a way that in one position it extends through an opening of the mixing chamber in the interior of the latter and in the second position opens out outside the mixing chamber in a suction removal space surrounding the mixing chamber.

2. Admixing apparatus according to claim 1, wherein the carrier gas flows continuously.

3. Admixing apparatus according to claim 1 or claim 2, wherein suction removal means are provided which remove the carrier gas with the gaseous substance from the capillary by suction when the latter is in the said second position, in which it opens out in the suction removal space.

4. Admixing apparatus according to any one of claims 1 to 3, wherein the line comprises a continuous metal capillary, moved in the orifice region.

5. Admixing apparatus according to any one of claims 1 to 4, wherein the advancing device is a piston movable in a cylinder.

6. Admixing chamber according to any one of claims 1 to 5, wherein the opening is provided with shut-off means.

7. Admixing apparatus according to claim 6, wherein the shut-off means comprise a flexible diaphragm.

8. Admixing apparatus according to any one of the preceding claims, wherein for admixing a plurality of gaseous or vaporous substances to a gas stream, a plurality of lines with capillaries and a corresponding number of advancing devices and of openings, provided with shut-off means, of the mixing chamber are provided.



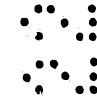
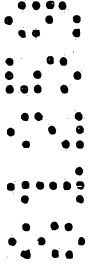
9. Apparatus for the admixing of a gaseous or vaporous substance, to a gas stream in a mixing chamber, to which the gaseous substance is fed by means of a carrier gas via a line substantially as hereinbefore described with reference to the accompanying drawings.

DATED this SEVENTEENTH day of JULY 1991

L. Givaudan & Cie

Patent Attorneys for the Applicant

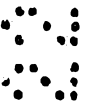
SPRUSON & FERGUSON



Abstract

APPARATUS FOR BLENDING GASEOUS OR VAPOROUS SUBSTANCES

For admixing a gaseous substance, especially an odoriferous substance, to a
5 gas stream the gaseous substance is fed by means of a carrier gas (23) via a line
(10) to a mixing chamber (1). The line contains at least one capillary (19), which
is arranged in an advancing device (9) with two defined positions. In one
position the capillary extends through an opening (6), into the mixing
chamber. In the second position it opens outside of the mixing chamber in a
10 suction removal space (25) surrounding the mixing chamber. The carrier gas
is preferably flowing continuously. Suction removal means (26) are provided
which suck off the carrier gas together with the gaseous substance from the
capillary when the latter is in the position where it opens in the suction
removal space.



(Fig. 1)

