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(54) Title
MEDICAL APPLIANCE FOR INHALING METERED AEROSOLS

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(57) Claim

1. **Medical appliance for inhaling metered aerosols comprising:**
 - a) **a cylindrical housing having an accommodation chamber for an aerosol container, and axially orientated primary main air ducts,**
 - b) **a mouthpiece arranged to be connected coaxially with the housing, which, together with the housing forms an atomizing and vortexing chamber, and having secondary main air ducts connecting with the primary main air ducts, and**
 - c) **a partition between the accommodation chamber and the vortexing chamber, said partition having a stepped hole, the bore section of which with the larger diameter connecting with the accommodation chamber, and the bore section of which with the smaller diameter connecting with the vortexing chamber as an aerosol outlet, and said partition being provided with branch air ducts connected to the primary main air ducts, which run obliquely to the partition and the stepped hole, and open directly into the vortexing chamber.**



INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

<p>(51) Internationale Patentklassifikation 5 : A61M 15/00</p>	<p>A1</p>	<p>(11) Internationale Veröffentlichungsnummer: WO 93/04718 (43) Internationales Veröffentlichungsdatum: 18. März 1993 (18.03.93)</p>
<p>(21) Internationales Aktenzeichen: PCT/DE92/00723 (22) Internationales Anmeldedatum: 28. August 1992 (28.08.92) (30) Prioritätsdaten: P 41 28 666.9 29. August 1991 (29.08.91) DE G 91 13 361.0 U 28. Oktober 1991 (28.10.91) DE G 92 02 198.0 U 20. Februar 1992 (20.02.92) DE G 92 04 938.9 U 9. April 1992 (09.04.92) DE (71)(72) Anmelder und Erfinder: KLEIN, Christoph [DE/DE]; Bahnhofstr. 102, D-5205 St. Augustin (DE). (74) Anwalt: SROKA, P.-C.; Dominikanerstr. 37, Postfach 111038, D-4000 Düsseldorf (DE). <i>(71) SROKA, Peter-Christian 36, Lembkestrasse D-4330 Mulheim/Ruhr Germany</i></p>		<p>(81) Bestimmungsstaaten: AU, BG, BR, CA, CS, FI, HU, JP, KR, NO, PL, RO, RU, US, europäisches Patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, SE). Veröffentlicht Mit internationalem Recherchenbericht. Vor Ablauf der für Änderungen der Ansprüche zugelassenen Frist. Veröffentlichung wird wiederholt falls Änderungen eintreffen.</p> <p style="font-size: 2em; text-align: center;">653634</p> 

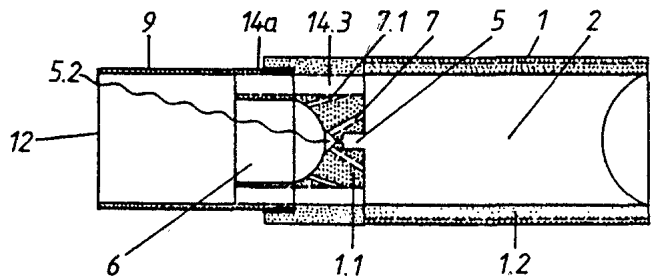
see folio 7

(54) Title: MEDICAL DEVICE FOR INHALATING DOSES OF SPRAY

(54) Bezeichnung: MEDIZINISCHES GERÄT ZUR INHALATION VON DOSIER-AEROSOLEN

(57) Abstract

Disclosed is a medical device for use in the inhalation of doses of spray, the device comprising the following elements: a) a cylindrical housing (1) with a chamber (2) designed to hold an aerosol can (3) and with longitudinally running first main air-channels (14; 14.1; 14.3). b) A mouth-piece (9) fitting coaxially against the housing (1), the mouth-piece (9) and housing (1) together forming an atomization/turbulence chamber (6), and second main air-channels (14a) connecting with the first main air-channels (14; 14.1; 14.3). c) A dividing wall (1.1) located between the can-holding chamber (2) and the atomization/turbulence chamber (6), the dividing wall (1.1) having a stepped bore (5) whose larger-diameter section connects with the can-holding chamber (2) and whose smaller-diameter section connects with the atomization/turbulence chamber (6) to act as an aerosol outlet (5.2). Connected to the first main air-channels are branch air-channels (7) which run at an angle in the dividing wall (1.1) and open out in the atomization/turbulence chamber while surrounding the stepped bore (5).



(57) Zusammenfassung

Medizinisches Gerät zum Inhalieren von Dosier-Aerosolen, enthaltend a) ein zylindrisches Gehäuse (1) mit einer Aufnahmekammer (2) für einen Aerosol-Behälter (3) und mit axial verlaufenden ersten Lufthauptkanälen (14; 14.1; 14.3), b) ein an das Gehäuse (1) koaxial anschließendes Mundstück (9), das gemeinsam mit dem Gehäuse (1) eine Zerstäubungs- und Verwirbelungskammer (6) bildet, und an die ersten Lufthauptkanäle (14; 14.1; 14.3) anschließende zweite Lufthauptkanäle (14a) aufweist, und c) eine zwischen der Aufnahmekammer (2) und der Verwirbelungskammer (6) liegende Zwischenwand (1.1), die mit einer Stufenbohrung (5), deren den größeren Durchmesser aufweisender Bohrungsabschnitt in die Aufnahmekammer (2) und deren den kleineren Durchmesser aufweisender Bohrungsabschnitt als Aerosol-Auslaßöffnung (5.2) an die Verwirbelungskammer (6) anschließt, und mit an die ersten Lufthauptkanäle angeschlossenen Luftzweigkanälen (7) versehen ist, die schräg zur Zwischenwand (1.1) verlaufen und die Stufenbohrung (5) umgebend in die Verwirbelungskammer münden.

Medical appliance for inhaling metered aerosols

The invention relates to a medical appliance for aerosol containers, in which the aerosol is released and inhaled simultaneously or by changing over to an intermediate chamber, into which the medicament is first sprayed, to be inhaled then from that chamber. Conventional aerosol containers frequently have a nozzle needle which can be pushed into the aerosol container in order to spray the medicament out for inhalation atomized to the fullest possible extent.

An inhalation appliance in accordance with EP 00 08 667 A1 has a housing with an accommodation chamber to hold the aerosol container, to which are coaxially connected a vortexing chamber and a mouthpiece. A support, which has a central stepped hole, into the section of which having the larger bore diameter the nozzle needle of the aerosol container located in the accommodation chamber can be inserted, projects relatively deeply into the vortexing chamber.



Air inlets, through which the air breathed in inhaling is sucked into the vortexing chamber and through the mouthpiece into the lungs, open into the vortexing chamber at a relatively large distance from the stepped hole. Located in the mouthpiece area are separate inlet and outlet valves which make it possible on the one hand to inhale through the vortexing chamber, and, on the other, to exhale independently of the vortexing chamber. The air inlets opening into the vortexing chamber are of relatively small dimensions, and incapable, in consequence of their spatial position, of exerting a significant effect on the atomisation and vortexing of the medicament. The appliance is relatively long, being equivalent to roughly three times the height of the usual aerosol container, so that it is impossible as a rule to carry the appliance around all the time as a hand or pocket appliance.

With an inhaler in accordance with US-PS 48 52 561, the mouthpiece and the housing forming the aerosol container accommodation chamber are located one behind the other, the aerosol container metering valve opening mechanism being fitted to the opposite end of the inhaler to the mouthpiece. The aerosol container accommodation chamber forms a medicament vortexing chamber, into which the relatively small sized inlets open. When the aerosol container metering valve opens, the medicament released with the propellant agent must be turned through an approximate angle of 90° , so that the metering valve can close early.

In using familiar inhalers, there is a danger, due to the relatively small inlets opening into the vortexing chamber, of so-called "anxiety over breathing", which is additionally reinforced if the valve components are located in front of the inhalation mouthpiece, obstructing respiration, and forming an extra obstacle on which the
5 medicament can collect.

A preferred object of the invention is to create a medical appliance for inhaling metered aerosols in such a way that, when the appliance is used, the atomisation and vortexing of the medicament leaving the aerosol container by way of the air inhaled
10 through the appliance is improved in comparison with familiar appliances in order to introduce the highest possible quantity of medicament into the bronchial area, and largely eliminate the frequently occurring anxiety over breathing.

According to the present invention there is provided a medical appliance for inhaling
15 metered aerosols comprising:

- a) a cylindrical housing having an accommodation chamber for an aerosol container, and axially orientated primary main air ducts,
- b) a mouthpiece arranged to be connected coaxially with the housing, which, together with the housing forms an atomizing and vortexing chamber, and having
20 secondary main air ducts connecting with the primary main air ducts, and
- c) a partition between the accommodation chamber and the vortexing chamber, said partition having a stepped hole, the bore section of which with the larger diameter connecting with the accommodation chamber, and the bore section of which with the smaller diameter connecting with the vortexing chamber as an aerosol
25 outlet, and said partition being provided with branch air ducts connected to the primary main air ducts, which run obliquely to the partition and the stepped hole, and open directly into the vortexing chamber.

Anxiety over breathing is overcome in embodiments of the invention by providing
30 correspondingly large diameter main air ducts and an air supply adequate for the purpose.

Optimum inhalation of a large quantity of medicament is preferably ensured by means of an atomizing and vortexing chamber, which feeds part of the air through the secondary branch ducts, preferably in the immediate vicinity of the stepped hole, and therefore the aerosol container metering valve, the medicament being
5 additionally broken down to a size of 3 μm and smaller as required for the lungs and bronchi.

Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings in which:-

10

Figures 1 to 5 are cross-sectional views of different embodiments of the inhaler in accordance with the present invention.

15

The appliance illustrated in Figure 1 comprises a housing, which can be axially assembled with a mouthpiece 9, with an accommodation chamber 2 which is bounded on one side by a partition 1.1, and has a stepped hole 5. The chamber 2 accommodates an aerosol container 3, the nozzle needle 3a of which is inserted into the larger diameter section of the stepped hole 5. The accommodation chamber 2 is encircled by axially orientated primary main air ducts which have on the whole a
20 large orifice cross section. Connected to the smaller diameter section 5.1 of the stepped hole 5 is a vortexing chamber 6, into which the branch air ducts, connected with the main air ducts 14, and led through the partition 1.1, preferably near the nozzle opening, open.

25

The mouthpiece 9 has a cylindrical section forming part of the vortexing chamber 6. In the mouthpiece 9 area, the vortexing chamber 6 is bounded by a wall 9a with a central opening 13, and is provided with secondary main air ducts 14a connected with the main air ducts 14.

30

The housing 1 and the mouthpiece 9 are designed as a double wall, with webs between the cylinder walls, for forming the main air ducts 14 and 14a.



The mouthpiece 9 can be connected to the housing 1 by means of a screw thread for example. At its outer end, the mouthpiece 9 can assume a shape suitable for the mouth, e.g. an oval shape.

- 5 The vortexing chamber 6 walls are preferably polished. The branch air ducts 7 are inclined, and the stepped hole 5, 5.1 so arranged that the aerosol leaving the container 3 is atomized and vortexed to the maximum.

10 With the embodiment of the inhaler depicted in Figure 2 open, relatively short, axially orientated main air ducts 14.1, into which the outgoing connecting ducts 14.2 open from the outer shell surface of the housing 1, are provided on the side of the housing 1 facing the mouthpiece 9. The branch air ducts 7 are connected to ducts 14.1 and open into the vortexing chamber 6.

- 15 In the embodiment of the inhaler depicted in Figure 3 the stepped hole section with the smaller diameter is widened into a nozzle-shaped or conical aerosol outlet 5.2 opening into the vortexing chamber 6, the orifice angle of which is between 60° and 120°, preferably approximately 90°, the branch air ducts 7 opening into the outlet 5.2.

20 Additional branch air ducts 7.1, which also branch off from the main air ducts 14.1, are oriented in the vortexing chamber 6 in such a way that a casing flow directed along the walls of the vortexing chamber 6 is created.

- 25 The central opening 13.1, connecting with the vortexing chamber 6, is of relatively large cross section.

30 In the embodiment illustrated in Figure 4, the housing 1 is provided, in contrast to Figure 3, with axially orientated spacing webs 1.2 on the inner wall, so that axially orientated air ducts remain open between the aerosol container and the inner wall following the insertion of an aerosol container into the accommodation chamber 2. Branch air ducts 7 connecting with the accommodation chamber 2 open into the

aerosol outlet 5.2, which widens into the shape of a nozzle.

5 The mouthpiece 9 consists of a cylindrical tube, the interior of which forms part of the vortexing chamber 6, which has a similarly shaped cylindrical cross section essentially over its entire length, so that the mouthpiece orifice 12 has the same cross section as the interior of the mouthpiece 9.

10 The main air ducts 14.1 and the connecting ducts 14.2, together with the branch air ducts 7.1 opening into the vortexing chamber 6, are essentially equivalent to the main version of the inhaler shown in Figure 3. In the version of the inhaler shown in Figure 4, the mouthpiece 9 interior has a diameter of 12-18 mm, preferably 15 mm, the main air ducts 14a being relatively short, so that the outgoing air forms a casing flow along the inner mouthpiece wall.

15 In the version of the inhaler shown in Figure 5 (without priority), main air ducts 14.3 axially orientated directly to the accommodation chamber 2, connect, in contrast to Figure 4, through the housing 1 provided with spacing webs 1.2, so that, for example, the laterally outgoing connecting ducts 14.2 (in accordance with Figure 4) are dispensed with.

20

The housing 1 and the mouthpiece 9 preferably may be made of stainless steel, aluminium or plastic.

25 The linear lay out of the appliance particularly facilitates and optimizes use in the prone position, e.g. in the night, or with bed-ridden patients.

The mouthpiece 9 can be screwed to the housing in various peripheral positions for controlling the quantity of air flowing through the secondary main air ducts 14a on the one hand, and that flowing through the branch air ducts 7; 7.1 on the other.

30

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", or variations such as "comprises" or "comprising", will

be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Medical appliance for inhaling metered aerosols comprising:
 - a) a cylindrical housing having an accommodation chamber for an aerosol
5 container, and axially orientated primary main air ducts,
 - b) a mouthpiece arranged to be connected coaxially with the housing, which, together with the housing forms an atomizing and vortexing chamber, and having secondary main air ducts connecting with the primary main air ducts, and
 - c) a partition between the accommodation chamber and the vortexing chamber,
10 said partition having a stepped hole, the bore section of which with the larger diameter connecting with the accommodation chamber, and the bore section of which with the smaller diameter connecting with the vortexing chamber as an aerosol outlet, and said partition being provided with branch air ducts connected to the primary main air ducts, which run obliquely to the partition and the stepped hole,
15 and open directly into the vortexing chamber.
2. Medical appliance in accordance with claim 1, wherein the branch air ducts are connected to the primary main air ducts.
- 20 3. Medical appliance in accordance with claim 1, wherein the housing has a number of primary main air ducts open to the side of the housing facing the mouthpiece, into which lateral connecting ducts open.
4. Medical appliance in accordance with claim 1, wherein the primary main air
25 ducts connect the accommodation chamber with the atomizing and vortexing chamber.
5. Medical appliance in accordance with claim 3 or claim 4, wherein the partition has additional ducts connecting the main air ducts with the vortexing
30 chamber, and that air flowing through these ducts creates an essentially axially casing flow along the inner wall of this chamber.

6. Medical appliance in accordance with any one of claims 1 to 5, wherein the mouthpiece has a cylindrical section open to the user's side, the orifice cross section of which is essentially equivalent to the inside cross section of the section of the vortexing chamber formed by the mouthpiece.

5

7. Medical appliance in accordance with claim 1, wherein the housing has axially orientated spacer webs on its inner wall.

8. Medical appliance in accordance with claim 1, wherein the housing and the
10 mouthpiece can be screwed to each other.

9. Medical appliance in accordance with claim 1, wherein the aerosol outlet has a cross section with an opening angle between 60° and 120° and which widens conically to the vortexing chamber in the form of a nozzle.

15

10. Medical appliance in accordance with claim 9 wherein the opening angle is 90° .

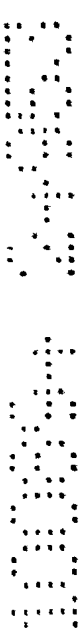
11. Medical appliance in accordance with claim 9 or claim 10, wherein the branch
20 air ducts open into the conically widening section of the aerosol outlet.

12. Medical appliance in accordance with claim 1 or claim 5, wherein the branch air ducts open radially into the vortexing chamber.

25 13. Medical appliance in accordance with claim 1, wherein the mouthpiece has a diameter of between 12-18 mm, and projects directly into the mouthpiece orifice.

14. Medical appliance according to claim 13 wherein the diameter is 15 mm.

30 15. Medical appliance in accordance with claim 1, characterised by the fact that, for controlling the air quantity flowing through the secondary main air ducts on the one hand, and the air quantity flowing through the branch air ducts on the other, the



mouthpiece can be screwed to the housing in various peripheral positions.

16. Medical appliance in accordance with claim 1, wherein the primary main air ducts are led continuously through the housing.

5

17. Medical appliance substantially as hereinbefore described with reference to the accompanying drawings.

10

DATED this 10th day of August 1994

Christoph Klein AND Peter-Christian Sroka

By Their Patent Attorneys

15 DAVIES COLLISON CAVE



Summary

Medical appliance for inhaling metered aerosols, containing

- a) a cylindrical housing (1) with an accommodation chamber (2) for an aerosol container (3), and with axially orientated primary main air ducts (14; 14.1; 14.3),
- b) a mouthpiece (9) coaxially connected to the housing (1), which forms an atomizing and vortexing chamber (6) together with the housing (1), and has secondary main air ducts (14a) connecting with the primary main air ducts (14; 14.1; 14.3), and
- c) between the accommodation chamber (2) and the vortexing chamber (6), a partition, which, with a stepped hole (5), the section of which having the larger diameter hole connects with the accommodation chamber (2), and the section of which having the smaller diameter hole connects with the vortexing chamber as an aerosol outlet (5.2), and is provided with branch air ducts (7) connected with the primary main air ducts, which run diagonally to the partition (1.1) and the stepped hole (5), and which open directly into the vortexing chamber.

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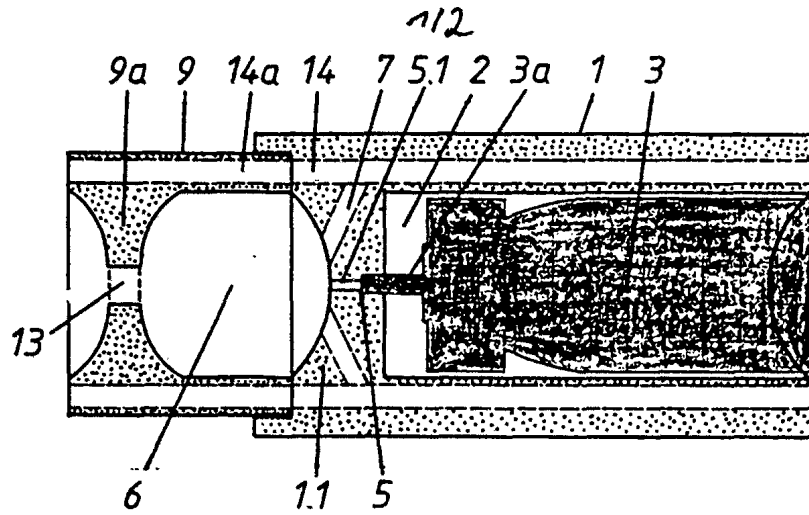


Fig. 1

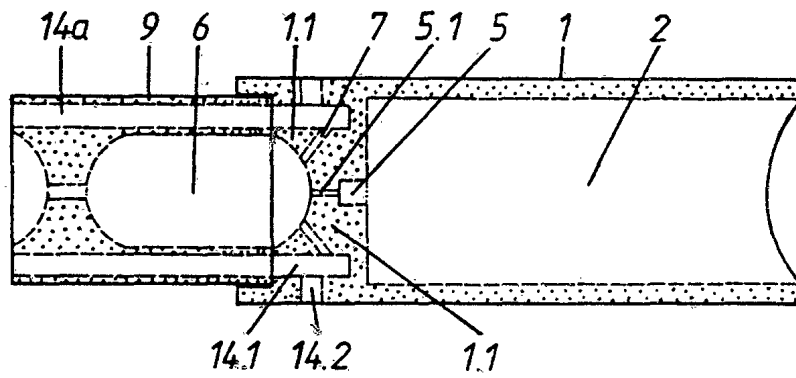


Fig. 2

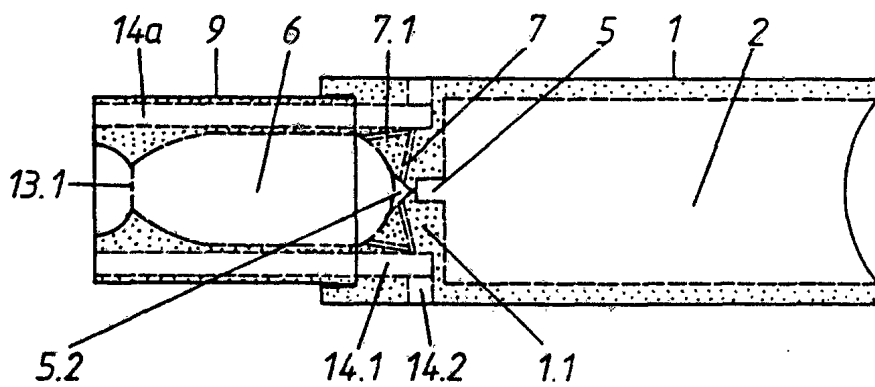


Fig. 3

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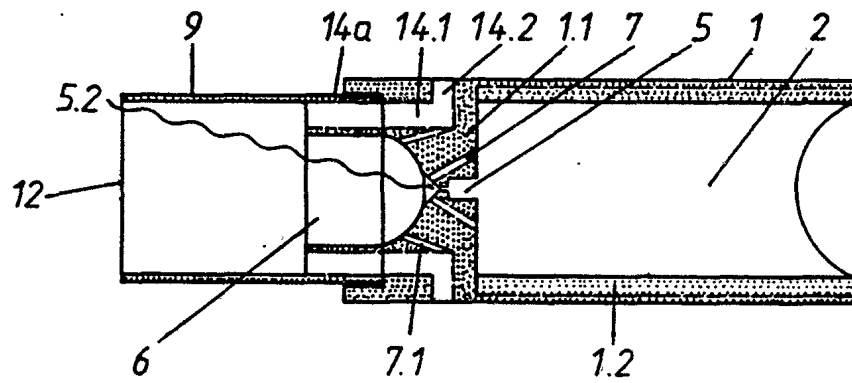


Fig. 4

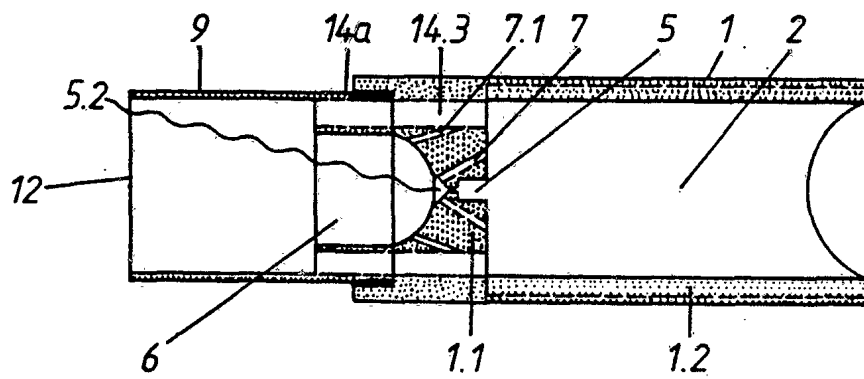


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DE92/00723

A. CLASSIFICATION OF SUBJECT MATTER		
Int.Cl.5	A61M 15/00	
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)		
Int.Cl. 5	A61M	
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 practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR, A,1 378 213 (LABORATOIRES GOUPIL S.A.) 5 October 1964; see page 2, left hand column, line 3- right hand column , line 2; figures	1
A	EP, A,0 009 667 (NEWHOUSE) 16 April 1980 see abstract; figures 1-3	1
A	US, A,3 980 074 (WATT ET AL) 14 September 1976 see abstract; figures 1-3	1
A	EP, A, 0 308 524 ((VORTRAN MEDICAL TECHNOLOGY, INC.) 29 March 1989; see abstract; figures 1,7	1
X,P	DE, U,9 202 198 (KLEIN) 11 June 1992 see the whole document cited in the application	1-3,5,8-14
P,X	DE, U,9 113 361 (KLEIN) 12 December 1991 see the whole document	1-3,8,11,13, 14
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 14 December 1992 (14.12.92)		Date of mailing of the international search report 11 January 1993 (11.01.93)
Name and mailing address of the ISA/ European Patent Office Facsimile No.		Authorized officer Telephone No.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO. DE 9200723
SA 64713**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 14/12/92

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A-1378213		None	
EP-A-0009667	16-04-80	AU-A- 5070779 JP-A- 55040595	20-03-80 22-03-80
US-A-3980074	14-09-76	GB-A- 1478138 AT-B- 341110 AU-A- 7140874 BE-A- 817747 CA-A- 1027447 CH-A- 573754 DE-A- 2434421 FR-A- 2237646 JP-A- 50029285 NL-A- 7409646 SE-B- 412006 SE-A- 7409264	29-06-77 25-01-78 22-01-76 17-01-75 07-03-78 31-03-76 06-02-75 14-02-75 25-03-75 21-01-75 18-02-80 20-01-75
EP-A-0308524	29-03-89	None	
DE-U-9202198	11-06-92	None	
DE-U-9113361	12-12-91	None	

I. KLASSIFIKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben) ⁶		
Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC		
Int.Kl. 5 A61M15/00		
II. RECHERCHIERTE SACHGEBIETE		
Recherchiertes Mindestprüfstoff ⁷		
Klassifikationssystem	Klassifikationssymbole	
Int.Kl. 5	A61M	
Recherchierte nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Sachgebiete fallen ⁸		
III. EINSCHLAGIGE VERÖFFENTLICHUNGEN ⁹		
Art. ⁹	Kennzeichnung der Veröffentlichung ¹¹ , soweit erforderlich unter Angabe der maßgeblichen Teile ¹²	Betr. Anspruch Nr. ¹³
A	FR,A,1 378 213 (LABORATOIRES GOUPIL S.A.) 5. Oktober 1964 siehe Seite 2, linke Spalte, Zeile 3 - rechte Spalte, Zeile 2; Abbildungen ---	1
A	EP,A,0 009 667 (NEWHOUSE) 16. April 1980 siehe Zusammenfassung; Abbildungen 1-3 ---	1
A	US,A,3 980 074 (WATT ET AL.) 14. September 1976 siehe Zusammenfassung; Abbildungen 1-3 ---	1
A	EP,A,0 308 524 (VORTRAN MEDICAL TECHNOLOGY, INC.) 29. März 1989 siehe Zusammenfassung; Abbildungen 1,7 ---	1
-/--		
<p>* Besondere Kategorien von angegebenen Veröffentlichungen¹⁰:</p> <p>"A" Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist</p> <p>"E" Älteres Dokument, das jedoch erst am oder nach dem internationalen Anmeldedatum veröffentlicht worden ist</p> <p>"L" Veröffentlichung, die geeignet ist, einen Prioritätsanspruch zweifelhaft erscheinen zu lassen, oder durch die das Veröffentlichungsdatum einer anderen im Recherchenbericht genannten Veröffentlichung belegt werden soll oder die aus einem anderen besonderen Grund angegeben ist (wie ausgeführt)</p> <p>"O" Veröffentlichung, die sich auf eine mündliche Offenbarung, eine Benennung, eine Ausstellung oder andere Maßnahmen bezieht</p> <p>"P" Veröffentlichung, die vor dem internationalen Anmeldedatum, aber nach dem beanspruchten Prioritätsdatum veröffentlicht worden ist</p> <p>"T" Spätere Veröffentlichung, die nach dem internationalen Anmeldedatum oder dem Prioritätsdatum veröffentlicht worden ist und mit der Anmeldung nicht kollidiert, sondern nur zum Verständnis des der Erfindung zugrundeliegenden Prinzips oder der ihr zugrundeliegenden Theorie angegeben ist</p> <p>"X" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als neu oder auf erfinderischer Tätigkeit beruhend betrachtet werden</p> <p>"Y" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als auf erfinderischer Tätigkeit beruhend betrachtet werden, wenn die Veröffentlichung mit einer oder mehreren anderen Veröffentlichungen dieser Kategorie in Verbindung gebracht wird und diese Verbindung für einen Fachmann naheliegend ist</p> <p>"&" Veröffentlichung, die Mitglied derselben Patentfamilie ist</p>		
IV. BESCHEINIGUNG		
Datum des Abschlusses der internationalen Recherche		Absenddatum des internationalen Recherchenberichts
14. DEZEMBER 1992		11. 01. 93
Internationale Recherchenbehörde		Unterschrift des bevollmächtigten Bediensteten
EUROPAISCHES PATENTAMT		ZEINSTRÄ H.

III. EINSCHLAGIGE VERÖFFENTLICHUNGEN (Fortsetzung von Blatt 2)		
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**ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT
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In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben.

Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am
 Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

14/12/92

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