

620259

SPRUSON & FERGUSON

COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952
APPLICATION FOR A STANDARD PATENT

Dideco S.P.A., of Via Galilei 3-41037, Mirandola (MO), ITALY, hereby apply for the grant of a standard patent for an invention entitled:

Blood Container for Medical Apparatus

which is described in the accompanying complete specification.

Details of basic application(s):-

<u>Basic Applic. No:</u>	<u>Country:</u>	<u>Application Date:</u>
21387 A/89	IT	31 July 1989

The address for service is:-

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DATED this THIRTIETH day of JULY 1990

Dideco S.P.A.

By:

Registered Patent Attorney

TO: THE COMMISSIONER OF PATENTS
OUR REF: 134908
S&F CODE: 60030

8016360 30/07/90

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DECLARATION IN SUPPORT OF A
CONVENTION APPLICATION FOR A PATENTIn support of the Convention Application made for a
patent for an invention entitled:AUSTRALIA
CONVENTION
STANDARD
& PETTY PATENT
DECLARATION
SFP 4

PC(HOSH)7780

Title of Invention Blood Container for Medical Apparatus

XX/We— Allen J. Spiegel on behalf of DIDEKO S.P.A.

Full name(s) and
address(es) of
Declarant(s)of 235 East 42nd Street, New York, State of New York
United States of America

do solemnly and sincerely declare as follows:—

Full name(s) of
Applicant(s)

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

(or, in the case of an application by a body corporate)

1. I am/XXXX authorised by DIDEKO S.P.A.

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 Italy

Priority Date(s)

on July 31, 1989

Basic Applicant(s)

by DIDEKO S.P.A.

Full name(s) and
address(es) of
inventor(s)XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

(or where a person other than the inventor is the applicant)

3. Pietro Vescovini and Nicola Ghelli

of Via degli Artigiani, 2a trav., 10 41036 Medolla, Modena
and Via 1° Maggio, 1640018 S. Pietro in Casale, Bologna,
both in Italy

(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)DIDEKO S.P.A. is entitled by Contract of Employment
between the inventors as employees and DIDEKO S.P.A.
as employer, as a person who would be entitled to have
the patent assigned to it if a patent were granted
upon an application made by the inventors4. 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.Declared at New York this 21st day of June 1990
New York DIDEKO S.P.A.

Signature of Declarant(s)

SFP 4

To: The Commissioner of Patents

11/81

ALLEN J. SPIEGEL
DIRECTOR

(12) PATENT ABRIDGMENT (1') Document No. AU-B-59991/90
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 620259

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BLOOD CONTAINER FOR MEDICAL APPARATUS
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- (71) Applicant(s)
DIDECO S.P.A.
- (72) Inventor(s)
PIETRO VESCOVINI; NICOLA GHELLI
- (56) Prior Art Documents
AU 41009/85 A61M 1/34
EP 146708
AU 79450/75 A61M 1/34
- (57) Claim

1. A blood container comprising:

a generally cylindrically shaped outer housing having a wall of transparent material defining an upper portion and a lower portion, the outer housing including a bottom portion which tapers downwardly to an outlet;

a generally cylindrically shaped filter enclosed concentrically within the upper portion of said outer housing for receiving blood at the top of the filter and discharging filtered blood at an annular planar surface which extends to the wall for permitting the discharged filtered blood to descend along the wall wherethrough the filtered blood is visible during descent to the base of the filter;

a generally cylindrically shaped inner housing extending from the base of said filter to the bottom portion of said outer housing; and means for directing and restricting the flow of blood from the base of said filter for a gradual and smooth descent to said outlet.

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FORM 10

S & F Ref: 134908

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE:

Class Int Class

Complete Specification Lodged:
Accepted:
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Priority:

Related Art:

Name and Address
of Applicant:

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Complete Specification for the invention entitled:

Blood Container for Medical Apparatus

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

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Abstract of the Invention

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BLOOD CONTAINER FOR MEDICAL APPARATUS

The invention relates to a blood container known as a cardiectomy reservoir for medical apparatus.

Medical apparatus, for example, of cardiectomies and oxygenators are well-known which include a blood container which has a filter which receives the inflowing blood. In these containers it is important that the blood flows through the filter without stagnating or coagulating to avoid reducing filtration effectiveness and lowering the physiological properties of the blood. This requirement leads to containers in which the blood can be kept at a distinctly lower level than the base of the filter, in a reservoir which readily provide a good read out scale of the free surface level and blood volume in order to facilitate the operator in his functions. In such containers the blood drops by gravity from the level of the base of the filter to the level of the underlying free surface, and this consequently causes a severe danger of formation of bubbles and microemboli and of blood cell damage.

An object of the present invention is to provide a blood container for medical apparatus in which the blood flows through the filter and descends gradually and smoothly toward the underlying free surface and outlet in such a manner as to ensure the absence of bubbles and provide assurances against any blood cell trauma.

The proposed object is achieved in accordance with the present invention by a blood container comprising:

a generally cylindrically shaped outer housing having a wall of transparent material defining an upper portion and a lower portion, the outer housing including a bottom portion which tapers downwardly to an outlet;

a generally cylindrically shaped filter enclosed concentrically within the upper portion of said outer housing for receiving blood at the top of the filter and discharging filtered blood at an annular planar surface which extends to the wall for permitting the discharged filtered blood to descend along the wall wherethrough the filtered blood is visible during descent to the base of the filter;

a generally cylindrically shaped inner housing extending from the base of said filter to the bottom portion of said outer housing; and



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means for directing and restricting the flow of blood from the base of said filter for a gradual and smooth descent to said outlet.

In a preferred embodiment, the flow directing means comprises a plurality of horizontal radial steps formed in the bottom portion; a
5 plurality of radial baffles extending substantially vertically from the bottom portion, an arcuate partition extending downwardly from the inner housing towards and above the outlet of the inner housing; and a plurality of flutes extending radially from the inner housing.

The proposed object is equally achieved by a second embodiment
10 wherein the inner housing further comprises an annular duct extending only partially about the filter for directing blood from the base of the filter to the upper end of the tapered bottom portion of the outer housing and a plurality of radial partitions extending substantially vertically between the inner housing and the outer housing for
15 restricting the flow path between the outer housing and the inner housing.

Further characteristics and advantages will become apparent from the description of two preferred but not exclusive embodiments of the invention, illustrated only by way of non-limiting example in the accompanying drawings, wherein:

20 Figure 1 is a front perspective view of a first embodiment of the invention;

Figure 2 is a front perspective view of a further embodiment of the invention.

With reference to Figure 1, a blood container comprises a generally
25 cylindrically shaped outer housing 1 enclosing a concentric filter 2 within the upper portion thereof, and which has a bottom portion which tapers downwardly to an outlet 3. The container includes an inlet (not shown) for receiving blood within the interior of the filter. The outer housing is preferably formed of a suitable transparent plastic material.
30 The container includes a generally cylindrically shaped inner housing 4 which extends from the

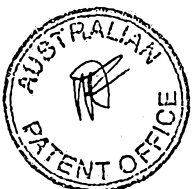


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base of the filter to the bottom portion of the container. The inner housing 4 is provided with radial ridges or flutes 5 which define a plurality of ducts for the gravity descent of the blood in streams 6 which adhere to the wall and flow toward the free blood level surface 7 proximate to the bottom portion of the container. A partially annular planar surface 8 is provided near the base of the filter 2 and forms the uppermost surface of the ^{tapered} ~~declined~~ bottom portion of the housing. The ^{tapered} ~~declined~~ bottom continues downwardly via a series of generally horizontal radial steps 9 and 10 which are interconnected by sloping surfaces and which tend to help control the gradual descent of the blood. The bottom portion further includes a series of ridges or baffles 9a and 9b which extend vertically from the bottom portion and extend radially from the inner housing 4 to form a narrow opening adjacent to the outer housing to further provide a gradual and smooth descent of the blood flow.

In this manner the blood which flows out of the filter 2 and collects on the planar surface 8, and the blood conveyed by the ducts defined by the flutes 5 on the cylindrical surface of the inner housing 4, descends along the radial steps 9 and 10 and sloping surfaces, retarded by the partially restricting baffles 9a and 9b and is forced thereby to flow adjacent to the wall of the outer housing; the blood is further slowed down by an arcuate partition 11 which limits the vertical drop of the blood along flutes 5 above the outlet 3 and allows the blood to flow only at a narrow port adjacent to the surface of the ^{tapered} ~~declined~~ bottom.

The container of the invention provides the desired advantages in which the blood quickly and smoothly passes through the filter and descends gradually and smoothly to the free surface. An operator can easily keep the free surface 7 of the blood well below the base of the filter 2 by means of an appropriate choice of the operating parameters. A blood level or blood volume scale indicating the level of the free surface 7, can be provided on the transparent housing above the outlet to further facilitate the utility of the



container. The smooth gradual gravity descent of the blood toward the free surface 7 and the outlet occurs by virtue of the described system of ridges and baffles which divide the entire flow of blood into small streams which flow in contact with the walls of the housing, so as to avoid the forming of bubbles and any blood cell damage.

A further variation of the described embodiment can be provided in which the flutes 5 extend radially from the inner housing 4 to a position closely adjacent the outer housing 1; thereby providing the function of both the flutes 5 and the baffles 9a and 9b to direct and control the flow of blood for a gradual and smooth descent to the free surface 7.

Figure 2 illustrates a second embodiment of a blood container which comprises a cylindrically shaped outer housing and a steeped sloping bottom portion 13, 15 and 16 which ~~declines~~^{tapers} downwardly similarly to the outer housing of Figure 1. The housing encloses a concentric filter 12 in the upper portion thereof and for receiving blood from an inlet (not shown) and discharging blood from the wall of the filter. The container includes a generally cylindrically shaped inner housing which extends from the base of the filter to the bottom portion of the outer housing. The bottom portion includes the partially annular planer surface 13 at the uppermost part thereof near the base of the filter for receiving flow directly from a portion of the filter. The inner housing includes a partially annular duct formed by a surface 14 and a flange 14a which partially encircles the base of the filter and directs the remainder of the flow from the filter onto surface 13. The container includes radial partitions 17, 18 and 19 extending vertically from the bottom portion between the inner housing and the outer housing and having alternate passageways near the inner and outer housing walls for directing flow to the free surface 20 and the outlet.

The blood flow thus descends quickly and completely through the filter 12; and then partially directly and partially by duct 14 and 14a onto the surface 13; and then

5

The claims defining the invention are as follows:

1. A blood container comprising:

5 a generally cylindrically shaped outer housing having a wall of transparent material defining an upper portion and a lower portion, the outer housing including a bottom portion which tapers downwardly to an outlet;

10 a generally cylindrically shaped filter enclosed concentrically within the upper portion of said outer housing for receiving blood at the top of the filter and discharging filtered blood at an annular planar surface which extends to the wall for permitting the discharged filtered blood to descend along the wall wherethrough the filtered blood is visible during descent to the base of the filter;

15 a generally cylindrically shaped inner housing extending from the base of said filter to the bottom portion of said outer housing; and means for directing and restricting the flow of blood from the base of said filter for a gradual and smooth descent to said outlet.

2. A blood container according to claim 1 wherein said flow directing means comprises a plurality of horizontal radial steps formed in the bottom portion of said outer housing.

20 3. A blood container according to claim 1 wherein said flow directing means comprises a plurality of radial baffles extending substantially vertically from the bottom portion of said outer housing for restricting the flow path between said outer housing and said inner housing.

25 4. A blood container according to claim 1 wherein said flow directing means comprises a plurality of flutes extending radially from said inner housing.

30 5. A blood container according to claim 1 wherein said flow directing means includes an arcuate partition extending downwardly from said inner housing towards and above the outlet of said outer housing.

35 6. A blood container according to claim 2 wherein said flow directing means comprises a plurality of radial baffles extending vertically from the bottom portion; an arcuate partition extending downwardly from said inner housing towards and above the outlet of said outer housing; and a plurality of flutes extending radially from said inner housing.



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7. A blood container according to claim 2 wherein said inner housing further comprises an annular duct extending only partially about the filter for directing blood from the base of said filter to the upper end of the tapered bottom portion of said outer housing and a plurality
5 of radial partitions extending substantially vertically between said inner housing and said outer housing for restricting the flow path between said outer housing and said inner housing.

8. Blood container for medical apparatus substantially as hereinbefore described with reference to the accompanying drawings.

DATED this FOURTEENTH day of NOVEMBER 1991

Dideco S.P.A.

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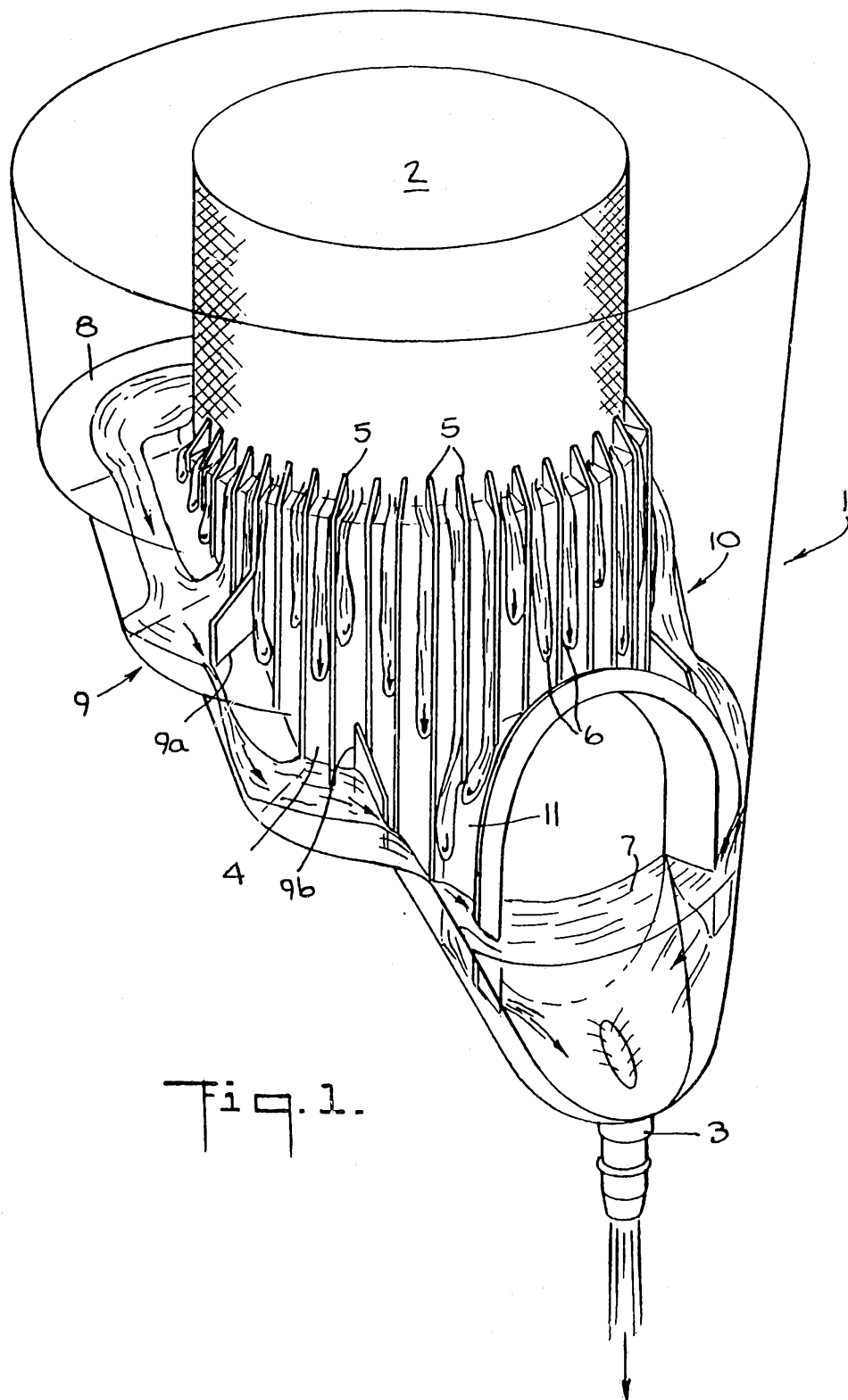


Fig. 1.

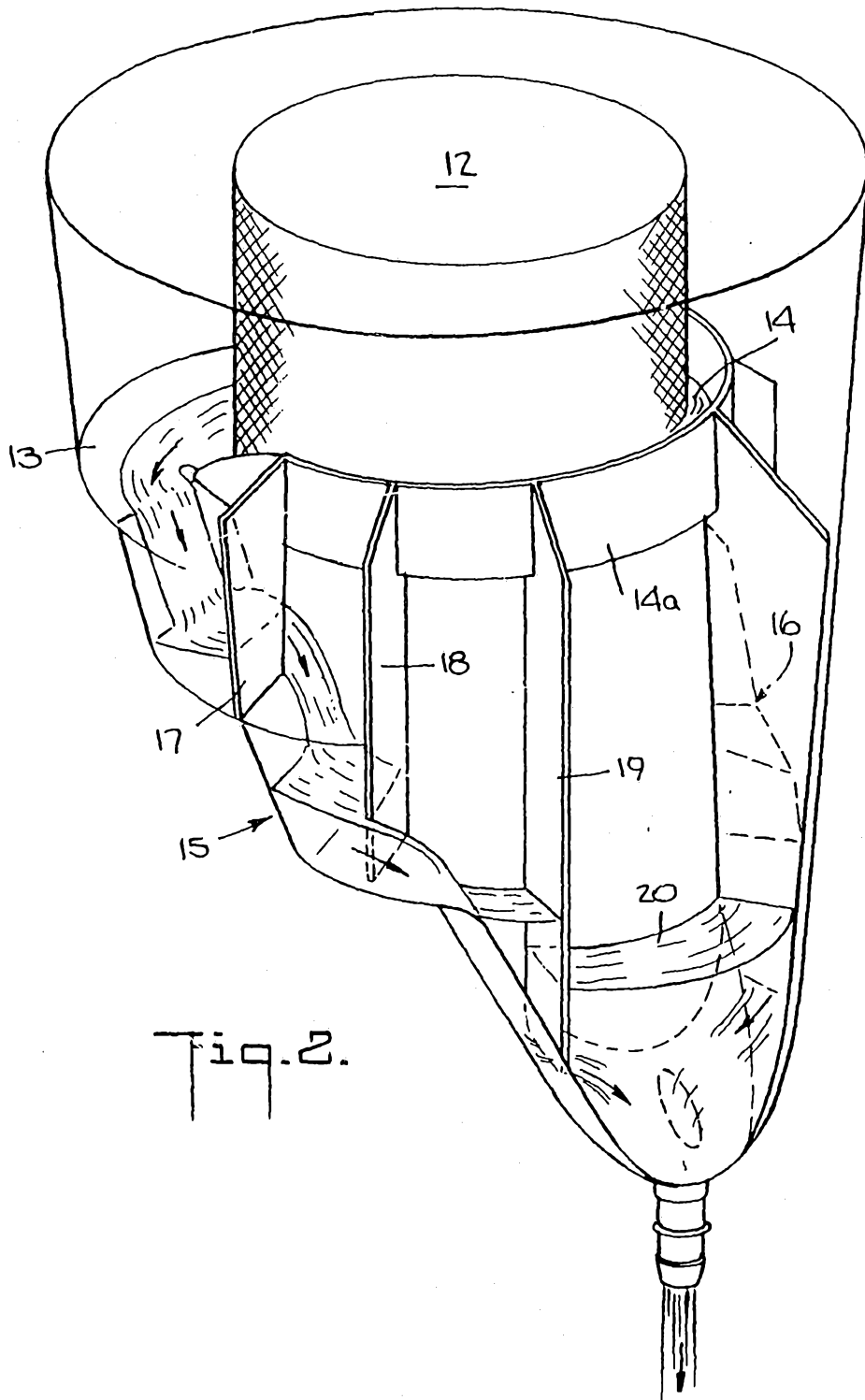


Fig. 2.