



December 23, 2021

Attorney Docket No.: 25955-0013007

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Street Address
Fish & Richardson P.C.
500 Arguello Street
Suite 400
Redwood City, CA 94063-1526

Mail Address
P.O. Box 1022
Minneapolis, MN 55440-1022
650 839 5070 main
877 769 7945 fax

Presented for filing is a new continuation patent application for prioritized examination of:

Inventor(s): WERNER MOHL

Title: DEVICE TO ASSIST THE PERFORMANCE OF A HEART

This application claims the benefit of the filing date and priority of the following application(s):

<u>Application No.</u>	<u>Country or Region</u>	<u>Filing Date (MM/DD/YYYY)</u>
17/558,979	United States	12/22/2021
17/446,046	United States	8/26/2021
16/282,948	United States	2/22/2019
14/454,965	United States	8/8/2014
13/555,318	United States	7/23/2012
12/449,632	United States	8/18/2009
PCT/IB2008/000421	WIPO	2/27/2008
A306/2007	Austria	2/27/2007

The requirement for a certified copy of the foreign priority document under 37 CFR 1.55 is satisfied in this application, as the certified copy is contained in the file of the related Application No. **13/555,318**, filed **July 23, 2012**.

Enclosed are the following papers, including those required to receive a filing date under 37 CFR 1.53(b):

	<u>Pages</u>
Specification	7
Claims	3
Abstract	1
Declaration	1
Drawing(s)	3

Enclosures:

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- Application Data Sheet, 9 pages.
- Power of Attorney, 2 pages.
- Certification and Request for Prioritized Examination (Track One), 2 pages

The applicant claims small entity status under 37 CFR 1.27.

Basic Filing Fee			\$80
Search Fee			\$350
Examination Fee			\$400
Publication fee			\$0
Track One processing fee			\$70
Track One prioritized examination fee			\$2100
Total Claims 18	over 20	0 x \$50	\$0
Independent Claims 1	over 3	0 x \$240	\$0
Fee for Multiple Dependent claims			\$0
Application size fee for each 50 pages over 100			
Total Sheets: 6 x .75 - 100/50 = 0 x			\$0
Total Filing fee			\$3000

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If this application is considered to be incomplete, or if a telephone conference would otherwise be helpful, call the undersigned at +1 (650) 839-5047.



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Page 3

Send all correspondence to:

26191
Customer Number

Respectfully submitted,

/Michael T. Hawkins/

Michael T. Hawkins

Registration No. 57,867

Enclosures

MTH/kay
41563708.doc

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		DEVICE TO ASSIST THE PERFORMANCE OF A HEART		
First Named Inventor/Applicant Name:		Werner Mohl		
Filer:		Michael T. Hawkins/Kirstin Matteo		
Attorney Docket Number:		25955-0013007		
Filed as Small Entity				
Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	80	80
UTILITY SEARCH FEE	2111	1	350	350
UTILITY EXAMINATION FEE	2311	1	400	400
REQUEST FOR PRIORITIZED EXAMINATION	2817	1	2100	2100
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				3000

Electronic Acknowledgement Receipt	
EFS ID:	44598002
Application Number:	17560468
International Application Number:	
Confirmation Number:	7399
Title of Invention:	DEVICE TO ASSIST THE PERFORMANCE OF A HEART
First Named Inventor/Applicant Name:	Werner Mohl
Customer Number:	26191
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Attorney Docket Number:	25955-0013007
Receipt Date:	23-DEC-2021
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		25955-0013007_Application.pdf	109200	yes	11
			00c19d23ce7a50951dc8a2731d0882ef88af27d2		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	7	
	Claims		8	10	
	Abstract		11	11	
Warnings:					
Information:					
2	Oath or Declaration filed	25955-0013007_Declaration.pdf	2693047	no	1
			7ac70f7033144a72c9ac11ba9ebba988adb5b285		
Warnings:					
Information:					
3	Drawings-only black and white line drawings	25955-0013007_Drawing.pdf	494725	no	3
			4b9214685ef9c3296c7ca886dd1377d8c23565f2		
Warnings:					
Information:					
4	Application Data Sheet	25955-0013007_ADS.pdf	1823482	no	9
			8f8749a15211a867a5803399e7ad9276da15a53a		
Warnings:					
Information:					
5	Power of Attorney	25955-0013007_POA.pdf	1405911	no	2
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Warnings:					
Information:					
6	TrackOne Request	25955-0013007_Track1.pdf	136477	no	2
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Warnings:					
Information:					
7	Transmittal of New Application	25955-0013007_Transmittal.pdf	172751	no	3
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Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	50871	no	2
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Information:					
Total Files Size (in bytes):			6886464		
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DEVICE TO ASSIST THE PERFORMANCE OF A HEART

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is a continuation of and claims priority to U.S. Application Serial No. 17/558,979, filed on December 22, 2021, which is a continuation of U.S. Application Serial No. 17/446,046 filed on August 26, 2021, which is a continuation of U.S. Application Serial No. 16/282,948 filed on February 22, 2019 (now issued as U.S. Patent No. 11,123,540), which is a continuation of U.S. Application Serial No. 14/454,965 filed
10 on August 8, 2014 (now issued as U.S. Patent No. 10,251,984), which is a continuation of U.S. Application Serial No. 13/555,318 filed on July 23, 2012 (now issued as U.S. Patent No. 8,801,590), which is a divisional of U.S. Application Serial No. 12/449,632 filed on August 18, 2009 (now issued as U.S. Patent No. 8,255,050), which is the U.S. national phase of International Application PCT/IB2008/000421 filed on February 27, 2008,
15 which designated the U.S. and claims benefit of AT A 306/2007 filed February 27, 2007, the entire contents of these prior applications are hereby incorporated by reference.

BACKGROUND

After a heart failure, for example a cardiac infarction or other reasons for the decrease in
20 the performance of a heart, it is of essential importance for intensive care medicine to normalise and stabilise the cardiac function again as rapidly as possible. When for example the volume output of the heart is distinctly reduced as a result of a failure, it is particularly important to reliably and rapidly re-establish a corresponding peripheral blood flow in order to prevent secondary damage. The use of heart-lung machines
25 basically allows the essential vital functions to be maintained. A specific adaptation to the respective actual requirements generally does not take place with such devices, however. Rather, conventional heart-lung machines are devices which, using external pumps, maintain a forced circulation of blood without systematically entering into the respective requirements of the heart which has been weakened or subjected to a failure.

30

In surgical interventions, particularly in the vein area, it has already been proposed to carry out retroinfusion, controlled by venous pressure, from or in veins of the body with the suction" of fluid and return of the fluid via a pump. Conventional catheters are used here, the lumina of which allow a suction of fluid and via the lumina of which the return is made possible at a suitable site. Known devices, particularly for the retroinfusion of blood in coronary veins in the area of myocardial protection during a brief coronary artery closure within a cardiological intervention, are generally devised so that a balloon dilatation of an arteriosclerotically constricted coronary artery is carried out. In these cases, a compensation which is adapted to the intervention briefly taking place respectively can be carried out by the return of blood which has been drawn off in veins. For a continuous restitution of the full function of a heart, however, the criteria are not taken into account which would be relevant for the full function of the heart, and an intensive provision over a particular period of time is therefore not provided with such devices. At the same time, the provision of the other organs must also be maintained.

In the device known from AT 407 960 B for assisting the performance of a heart, fluid is removed from blood vessels via an external pump and is returned into blood vessels via a return catheter, in which the returned quantity of fluid is regulated as a function of measurement values, with a heart ventricle catheter being provided to obtain these measurement values. The known device comprised a heart ventricle catheter which is equipped in the cardiac chamber with sensors to measure the volume of fluid per unit of time, in which these sensors, in the introduced state of the heart ventricle catheter, lie in the cardiac chamber and these sensors are connected with an evaluation circuit in which the ratio of the diastolic volume to the systolic volume is evaluated per heartbeat or per unit of time in particular the discharge rate and/or the deviation of the volume conveyed per unit of time by the heart from a defined rated value is evaluated, for example the rated value, calculated from physically specific data for the cardiac output. The signal which is generated in this way is passed to the pump, via which fluid is withdrawn from the cardiac chamber and is recirculated as a function of the generated signal.

SUMMARY

The invention now aims to further develop this known device to the effect that an external pump can be dispensed with and, at the same time, the desired pressure increase can be brought into effect systematically at particular locations. In particular, the fluid

5 flow which is improved by the pump is to be developed in a way in which the mechanical stress of highly sensitive fluids, such as blood for example, can be kept as low as possible and nevertheless the corresponding improvement to circulation can be ensured at desired locations. To solve this problem, the initially mentioned device of the catheter according to the invention, which can be used within the scope of the device described above,

10 consists substantially in that the pump is constructed as a rotary pump at the distal end of the catheter, in which the rotor lying distally on the outside is coupled via a magneto coupling with a drive wheel which is arranged inside the catheter and is formed as a paddle wheel which is operated hydraulically or pneumatically and the driving fluid is supplied to the paddle wheel via a lumen of the catheter and is carried off via a further

15 lumen of the catheter. Such an axial pump, which is directly connected with the catheter, can be brought with the catheter directly into the desired position and, at the same time, can be used here with further therapeutic additions such as, for example, a retroper-fusion through cyclic occlusion of the blood vessel by means of a balloon. In order to guarantee a complete uncoupling from the driving medium driving the pump and in particular to

20 ensure that simple driving means such as, for example, hydraulically or pneumatically operated paddle wheels can be used, a completely impervious separation of the rotor from the drive wheel is achieved by the magneto coupling which is provided according to the invention, which eliminates axial passages between the drive wheel and the rotor lying distally on the outside. The embodiment is hereby devised according to the

25 invention so that the drive wheel is formed as a hydraulically or pneumatically operated paddle wheel, with the driving fluid being supplied to the paddle wheel via a lumen of the catheter and being carried off via a further lumen of the catheter, in which preferably the paddle wheel is constructed with axial or semi-axial blades. The operation of such an arrangement can take place in a simple manner by means of correspondingly regulated

30 hydraulic or pneumatic reservoirs, with the driving medium being supplied via

corresponding regulating valves to the drive wheel which is coupled magnetically with the rotor.

The device is designed in a structurally particularly simple manner such that the axis of rotation of the rotor is in alignment with the longitudinal axis of the catheter or is parallel thereto. A development of the catheter which has a correspondingly low wear and is impervious, with, at the same time, a secure mounting of the rotor, can be achieved in that the coupling is formed by bar magnets which, in adjacent chambers separated from each other hydraulically by a sealing wall, at the distal end of the catheter are respectively connected with the rotor and with the drive wheel so as to be locked against relative rotation, in which preferably the connections: locked against relative rotation, of the drive wheel or of the rotor with the respective bar magnets are respectively mounted in the walls of the chambers facing away from the sealing wall and facing the drive wheel or the rotor respectively.

The rotor itself can follow design principles such as described for example in WO 01/70300 A1. The rotary pump shown and described there for conveying blood and other highly sensitive fluids is formed as an external electromagnetically driven pump which is not directly suitable for incorporation into a catheter. The known design namely assumes that centrifugal flow components and flow components directed against a housing are present, in which the flow components directed against the housing serve primarily for the non-contact mounting and stabilizing of the rotor in the housing. However, with an arrangement of the rotor at the distal end of a catheter, a closed housing can not be readily realised with regard to flow technology, because such housing walls must in fact lie at a precisely defined distance from the rotor, which, however, is not readily guaranteed at the distal end of a catheter. However, for the desired conveying capacity with the axial pump according to the invention, provision is also made according to the invention that the rotor has guide surfaces to produce centrifugal flow components.

The driving fluid can be used within the scope of the invention in order to be able to operate a balloon for retroperfusion. The embodiment is preferably devised hereby so

that the lumina for the driving fluid are guided through an expandable balloon surrounding the catheter in a sealing manner, and that the lumina have separately controllable closure members via which driving fluid can arrive in the balloon or out of the balloon into the respective lumina, in which preferably the closure members are
5 formed as magneto valves. On inflation of the balloon, additional driving medium is required which can be discharged again on collapsing of the balloon. This is possible extracorporally on the drive side by means of a reservoir.

The embodiment to assist the performance of a heart according to the invention, in which
10 fluid is conveyed in blood vessels with the use of a pump and the conveyed quantity is able to be regulated as a function of measurement values of a heart ventricle catheter, from which the cardiac output is determined, proceeds from a development according to AT 407 960 B and is characterised substantially in that the pump is formed as an intravasal rotary pump at the periphery or at the distal end of the catheter, the rotor of
15 which, lying on the outside, is connected via a magneto coupling with the drive which is arranged inside the catheter.

BRIEF DESCRIPTION OF DRAWINGS

The invention is explained in further detail below by use of an exemplary embodiment
20 which is illustrated diagrammatically in the drawings, in which Fig. 1 shows a diagrammatic illustration of the arrangement of the pump and of the drive, Fig. 2 shows a diagrammatic illustration of the distal end of a catheter which is used according to the invention, and Fig. 3 shows an enlarged illustration of the part of the catheter bearing the balloon, in section.

25

DETAILED DESCRIPTION

In Fig. 1, a heart is designated by 1, into which a heart ventricle catheter 2 is introduced. The catheter is introduced here for example via the femoral artery and the aortic arch 3 into the heart chamber and carries a series of sensors 4 via which the volume can be
30 determined. The measurement signals are passed to a control arrangement 5. The heart ventricle catheter is formed with several lumina, as additionally illustrated below in

further figures of the drawings, with fluid being supplied via such lumina to drive a rotor, arranged at the distal end, which forms the pump to assist the blood circulation and is designated by 6 in Fig. 1. The positioning of this rotor is indicated in Fig. 1 by the arrow 8. The driving medium for the rotor or the pump is guided in a circular flow by means of a fluid pump 7 which can be regulated in a synchronised manner as a function of the control signals generated in the control arrangement 5. The distal region in which the pump is arranged is designated diagrammatically by 8, the catheter 2 having at its distal end a tube 9 leading to the suction end 10. A reservoir for driving fluid is designated by 11, which provides additional driving medium for filling the balloon 12 serving for an occlusion of the artery, and which receives again the volume of driving medium occurring on deflation of the balloon.

The volumetric measurement in the cardiac chamber allows differences to be reliably detected between the diastolic and systolic volume and allows corresponding correction signals to be made available for the output of the synchronised fluid pump 7.

Furthermore, in the control circuit 5, corresponding fixed values can be provided, such as for example a defined cardiac output, which is referred to on deviation of the measured cardiac output to control the pump.

A retroperfusion can take place via a conventional balloon catheter which is occluded in a correspondingly synchronized manner, so that the directed return is in fact guaranteed during the diastole. Hereby the corresponding measurement values for the heart rate or for the correct moment of the diastole can be obtained from ECG data.

In Fig. 2, the distal end of a modified catheter 2 is now illustrated. The end side 13 of this catheter has two pocketshaped chambers 14 and 15, in which bar magnets are respectively arranged. The bar magnet 16 is connected here at the distal end outwards via a shaft 17 with a rotor 18, whereas the bar magnet 19 lying on the inside is connected via a shaft 20 with a drive wheel 21. The drive wheel 21 is formed here as a paddle wheel and is acted upon with fluid via a lumen 22, this fluid flowing off again via the lumen 23 of the catheter. The rotation of the paddle wheel 21 is regulated here accordingly by

corresponding control of the fluid pressure in the lumen 22 serving for the supply of fluid, in which the magnet 19, which is connected so as to be locked against relative rotation with the paddle wheel 21, is set into corresponding rotation. At the outer side, which is completely sealed with respect to the lumina 22 and 23, the magnet 16 is subsequently entrained accordingly and drives the rotor 18 via the shaft 17, whereby a flow is formed in the region of the tube 9, as is indicated by the arrows 24, and which assists the natural blood flow in the vessel 26, illustrated by the arrow 25.

In Fig. 3, the partial region of the balloon 12, which is connected in a sealing manner to the catheter 2, is illustrated on an enlarged scale. The two lumina leading away from the fluid pump 7 and back to the fluid pump 7 are designated in turn by 22 and 23. In the region of the balloon 12, the wall of these lumina is provided with valves which can be actuated magnetically for example. The valves are indicated diagrammatically by 27 and 28. An opening of the valve 27 leads to the fluid, coming from the fluid pump 7, which is under pressure, which is indicated by the "+" sign, being pumped into the balloon 12, with which the overall quantity of the circulating driving fluid would of course be reduced, in so far as the reservoir 11, indicated diagrammatically in Fig. 1, is not provided. By closing the valve 27, the occlusion is closed off, the collapsing of the balloon 12 being able to be brought about by opening the valve 28 and the fluid now being drawn off via the lumen 23, leading back to the pump, which lumen 23 is at a slightly lower pressure which is indicated by the "-" sign. As the overall volume of the fluid in the circulating system is now to be reduced, a portion of this volume must be pumped back again into the reservoir 11 according to Fig. 1.

Claims

1. A method for assisting the blood circulation of a heart, comprising:
delivering a heart assist pump device to the heart so that a suction end of an
5 inflow tube of the heart assist pump device is inserted into a ventricle of the heart while a
magnetically driven rotor of the heart assist pump device is positioned outside the
ventricle of the heart, wherein the magnetically driven rotor is axially aligned with the
inflow tube and is rotatable within a surrounding rotor housing of the heart assist pump
device to act upon blood flowing from the inflow tube toward the magnetically driven
10 rotor, the magnetically driven rotor being rotatable about a central axis and being rigidly
coupled to a first magnetic device that is located within the surrounding rotor housing at a
position axially adjacent to the magnetically driven rotor, wherein the heart assist pump
device further includes: a second magnetic device axially aligned with the inflow tube
and positioned to magnetically drive rotation of the magnetically driven rotor via a
15 magneto coupling with the first magnetic device while being spaced apart and sealed
from both the magnetically driven rotor and the first magnetic device, and a blood
outflow port positioned radially adjacent the magnetically driven rotor such that blood
driven by the magnetically driven rotor is configured to exit the surrounding rotor
housing in a direction substantially perpendicular from the blood inflow path and the
20 central axis of the magnetically driven rotor, wherein the magneto coupling orients the
magnetically driven rotor so that, in response to rotation of the magnetically driven rotor,
the magnetically driven rotor remains entirely spaced apart from the surrounding rotor
housing by the blood flowing from the inflow tube and to the blood outflow port; and
connecting an external control unit to the heart assist pump device for regulating
25 operation of the second magnetic device to thereby magnetically drive the rotation of the
magnetically driven rotor via the magneto coupling with the first magnetic device, the
external control unit being positioned exterior to a body while the inflow tube of the heart
assist pump device is implanted in the heart.

2. The method of claim 1, wherein in response to the rotation of the magnetically driven rotor via the magneto coupling, guide surfaces of the magnetically driven rotor to produce centrifugal flow components.

5 3. The method of claim 2, wherein the surrounding rotor housing comprises at least one sealing wall between the first magnetic device and the second magnetic device, and the first magnetic device is positioned between the second magnetic device and the magnetically driven rotor.

10 4. The method of claim 3, wherein the first magnetic device rotates together with the magnetically driven rotor relative to the surrounding rotor housing.

5. The method of claim 1, wherein the external control unit controls the second magnetic device in response to measurement values indicative of cardiac output of the
15 heart.

6. The method of claim 1, wherein both the magnetically driven rotor and first magnetic device are entirely spaced apart from the surrounding rotor housing by a gap during rotation of the magnetically driven rotor.

20 7. The method of claim 10, further comprising providing deliver feedback signals to the external control unit from one or more sensors.

8. The method of claim 10, further comprising delivering energy the second
25 magnetic device in response to the external control unit.

9. The method of claim 11, wherein the external control unit delivers energy to the second magnetic device via delivery of a driving fluid.

30 10. The method of claim 10, wherein the external control unit is configured to regulate operation of the second magnetic device based on a fixed control value.

11. The method of claim 11, wherein the fixed control value comprises a defined cardiac output for control of the heart assist pump device.

12. The method of claim 1, wherein the second magnetic device is positioned closer to the blood outflow port than the suction end of the inflow tube.

5 13. The method of claim 1, wherein heart assist pump device is a catheter device.

14. The method of claim 1, wherein the magnetically driven rotor is positioned at a distal end of a catheter.

10 15. The method of claim 1, wherein the second magnetic device is configured to rotate during rotation of the magnetically driven rotor.

16. The method of claim 17, further comprising a drive wheel configured to urge rotation of the second magnetic device.

15 17. The method of claim 1, wherein the first magnetic device comprises a bar magnet.

18. The method of claim 1, wherein the second magnetic device comprises a bar magnet.

20

25

Abstract:

A device to assist the performance of a heart with at least one pump that is formed as a rotary pump and driven via a magneto coupling.

5

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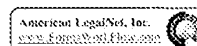
**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	CATHETER TO ASSIST THE PERFORMANCE OF A HEART
As the below named inventor, I hereby declare that: This declaration ☐ The attached application, or is directed to: ☒ United States application or PCT international application number <u>14/454,965</u> filed on <u>August 8, 2014.</u>	
The above-identified application was made or authorized to be made by me.	
I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.	
I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.	
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LEGAL NAME OF INVENTOR Inventor: <u>Werner Mohl</u> Date (Optional): <u>Aug 15th 2014</u> Signature: 	
Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.	

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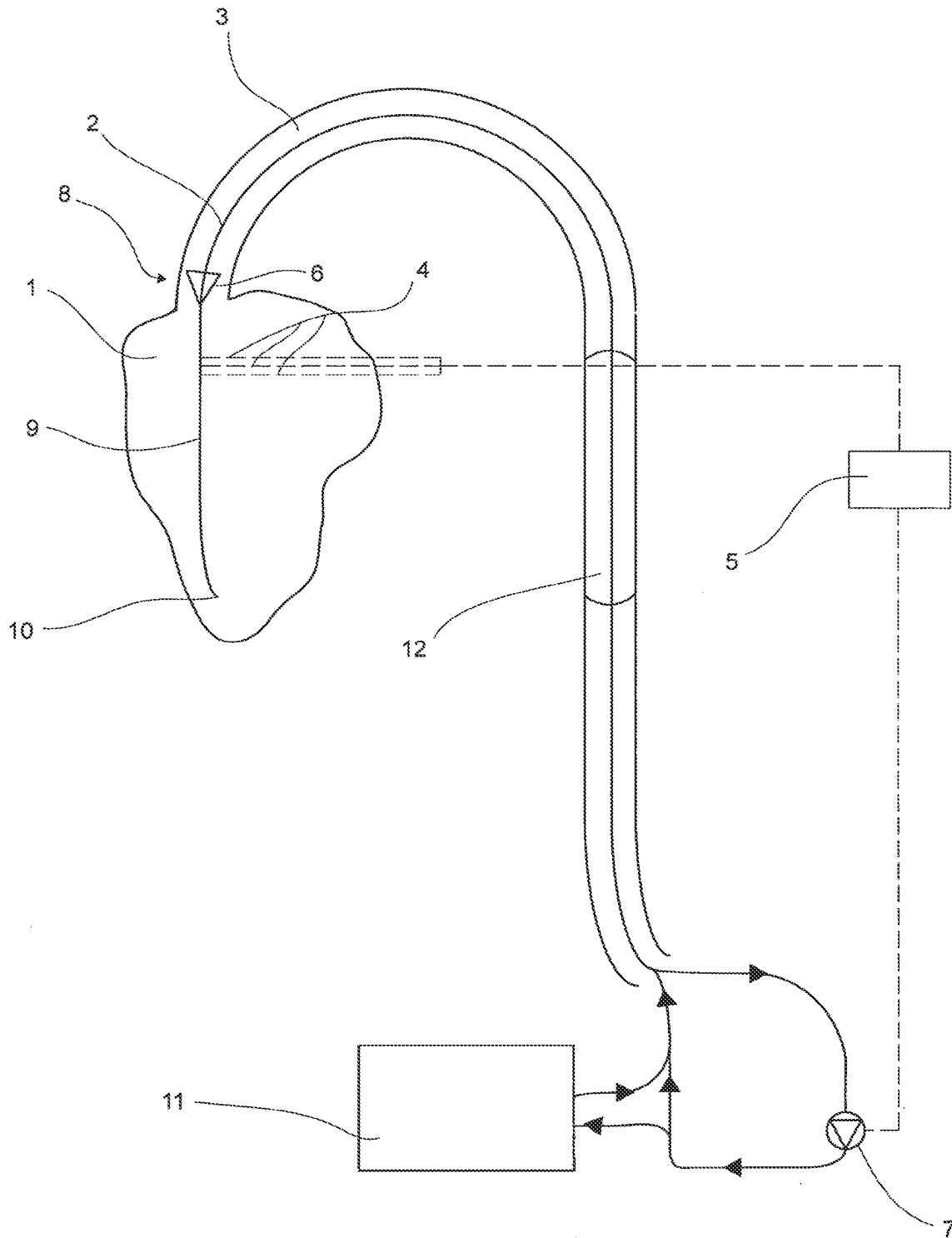


Fig.1

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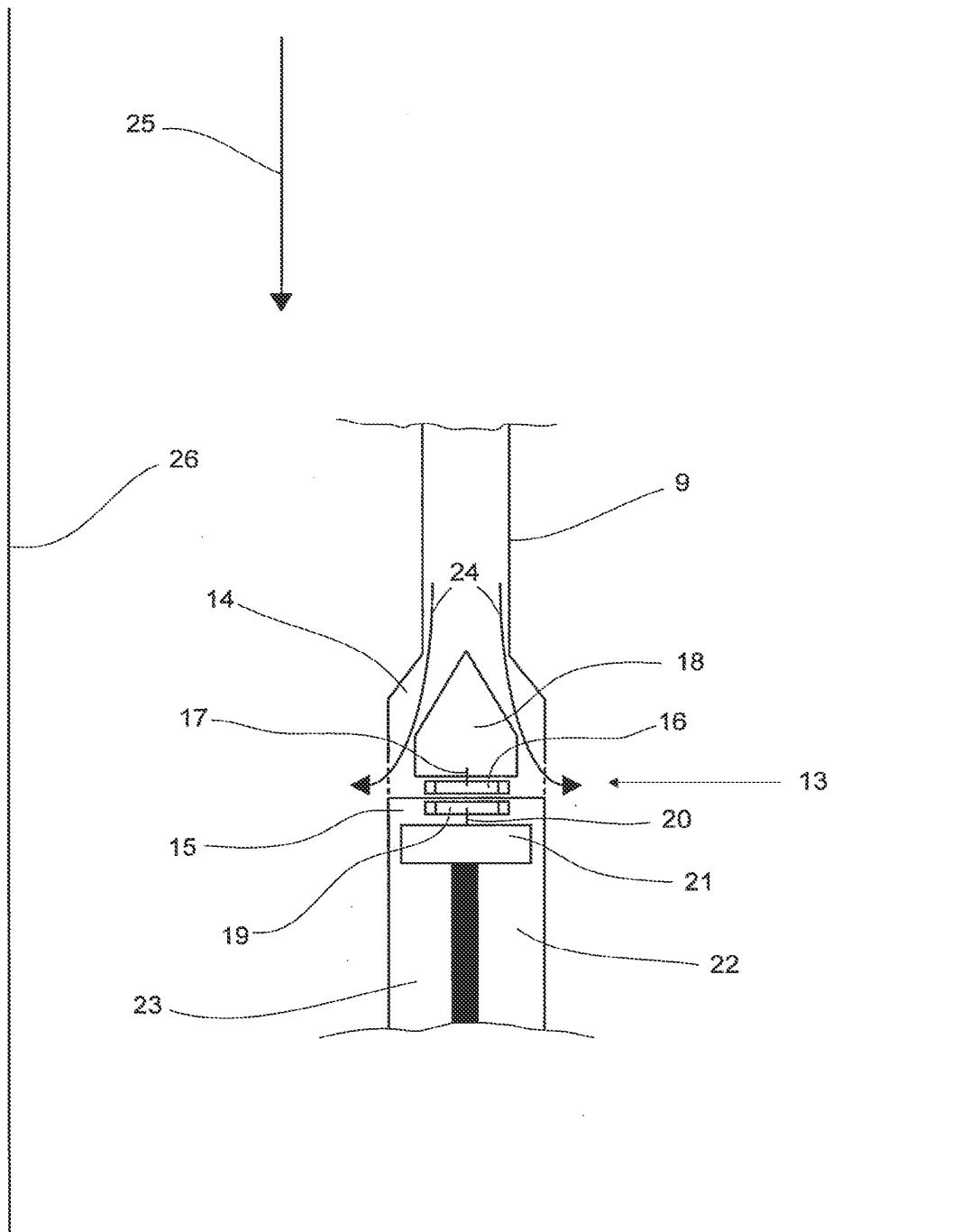


Fig. 2

3/3

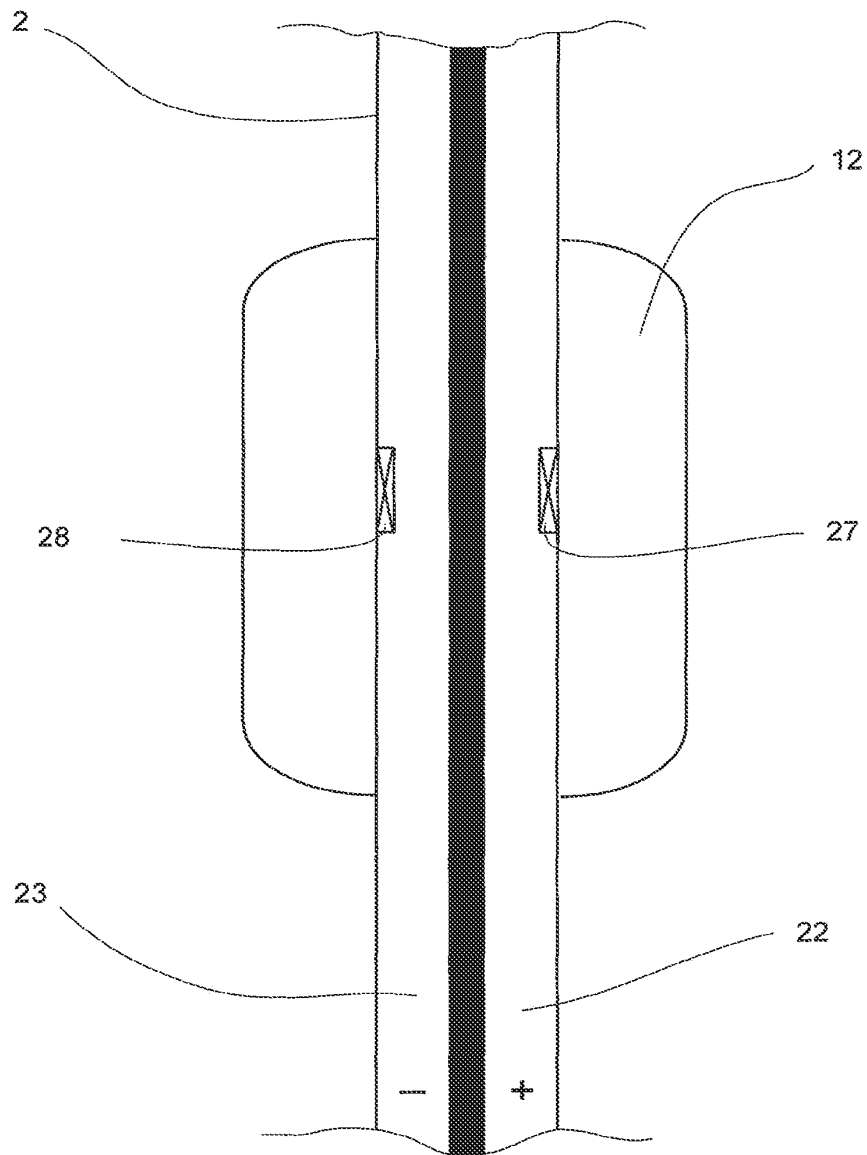


Fig. 3

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor	1				<input type="button" value="Remove"/>
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Werner		Mohl		
Residence Information (Select One) US Residency • Non US Residency Active US Military Service					
City	Altenmarkt-Thennenberg		Country of Residenceⁱ	AT	
Mailing Address of Inventor:					
Address 1	Hafnerberg 66				
Address 2					
City	Altenmarkt-Thennenberg		State/Province		
Postal Code	2571		Countryⁱ	AT	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. <input type="button" value="Add"/>					

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	26191		
Email Address	apsi@fr.com		<input type="button" value="Add Email"/> <input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		
Attorney Docket Number	25955-0013007	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	3	Suggested Figure for Publication (if any)	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	26191		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	17558979	2021-12-22

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		25955-0013007	
		Application Number			
Title of Invention		DEVICE TO ASSIST THE PERFORMANCE OF A HEART			

Prior Application Status		Pending		Remove	
Application Number		Continuity Type		Prior Application Number	
17558979		Continuation of		17446046	
Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
17446046		Continuation of		16282948	
Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
16282948		Continuation of		14454965	
Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
14454965		Continuation of		13555318	
Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
13555318		Division of		12449632	
Prior Application Status		Expired		Remove	
Application Number		Continuity Type		Prior Application Number	
12449632		a 371 of international		PCTIB2008000421	
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					
Add					

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number		Country ⁱ		Filing Date (YYYY-MM-DD)		Access Code ⁱ (if applicable)	
A306/2007		AT		2007-02-27		Remove	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		
Additional Foreign Priority Data may be generated within this form by selecting the Add button. <div style="float: right; border: 1px solid black; padding: 2px 10px;">Add</div>			

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐	This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.
--------------------------	--

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant	1	<input type="button" value="Remove"/>	
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p>			
		<input type="button" value="Clear"/>	
☒ Assignee	Legal Representative under 35 U.S.C. 117		Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>			
Name of the Deceased or Legally Incapacitated Inventor: <div style="border: 1px solid black; width: 400px; height: 20px;"></div>			
If the Applicant is an Organization check here. ☒			
Organization Name	Miracor Medical SA		
Mailing Address Information For Applicant:			
Address 1	E40 Business Park		
Address 2	Rue de Bruxelles 174		
City	Awans	State/Province	
Country	BE	Postal Code	B-4340
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. <input type="button" value="Add"/>			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Assignee 1				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				<input type="button" value="Remove"/>
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
Prefix	Given Name	Middle Name	Family Name	Suffix
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1		<input type="text"/>		
Address 2		<input type="text"/>		
City	<input type="text"/>	State/Province	<input type="text"/>	
Country i	<input type="text"/>	Postal Code	<input type="text"/>	
Phone Number	<input type="text"/>	Fax Number	<input type="text"/>	
Email Address	<input type="text"/>			
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Michael T. Hawkins/		Date (YYYY-MM-DD)	2021-12-23
First Name	Michael T.	Last Name	Hawkins	Registration Number
				57,867
Additional Signature may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	
Filing Date	
First Named Inventor	Werner Mohl
Title	DEVICE TO ASSIST THE PERFORMANCE OF A HEART
Art Unit	
Examiner Name	
Attorney Docket Number	25955-0013007

SIGNATURE of Applicant or Patent Practitioner

Signature	/Michael T. Hawkins/	Date (Optional)	
Name	Michael T. Hawkins	Registration Number	57,867
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			
NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.			
☐ *Total of _____ forms are submitted.			

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on the Transmittal.)

- ☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter, which may be an application filed after the date of this power of attorney, or identified above:

26191

OR

- ☐ I hereby appoint Practitioner(s) named in the attached list as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter, which may be an application filed after the date of this power of attorney, or identified above.

Please recognize or change the correspondence address for the application identified in the attached transmittal letter to:

- ☐ The address associated with the above-mentioned Customer Number

OR

- ☒ The address associated with Customer Number: 26191

OR

Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

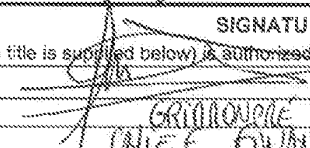
I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Miracor Medical SA

- ☐ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	MARCH 15, 2018
Name	GRIGORE BERTRAUD		
Title	CHIEF FINANCIAL OFFICER		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

- ☒ *Total of 1 forms are submitted.

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION
UNDER 37 CFR 1.102(e)** (Page 1 of 1)

First Named Inventor:	Werner Mohl	Non provisional Application Number (if known):	
Title of Invention:	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1), the prioritized examination fee set forth in 37 CFR 1.17(c), and if not already paid, the publication fee set forth in 37 CFR 1.18(d) have been filed with the request. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.
2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims.
3. The applicable box is checked below:
 - I. ☒ **Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)**
 - i. (a) The application is an original non provisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.
---OR---
 - (b) The application is an original non provisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.
 - ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, or the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.
 - II. ☐ **Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)**
 - i. A request for continued examination has been filed with, or prior to, this form.
 - ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
 - iii. The application is an original non provisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
 - iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
 - v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Michael T. Hawkins/	Date December 23, 2021
Name (Print/Typed) Michael T. Hawkins	Practitioner Registration Number 57,867
Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.*	
☐ *Total of _____ forms are submitted.	

41563654.doc

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
17/560,468	12/23/2021	3746	830	25955-0013007	18	1

CONFIRMATION NO. 7399

26191

FISH & RICHARDSON P.C. (TC)

PO BOX 1022

MINNEAPOLIS, MN 55440-1022

FILING RECEIPT



0000000130918333

Date Mailed: 01/06/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

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Inventor(s)

Werner Mohl, Altenmarkt-Thennenberg, AUSTRIA;

Applicant(s)

Miracor Medical SA, Awans, BELGIUM;

Power of Attorney: The patent practitioners associated with Customer Number 26191

Domestic Priority data as claimed by applicant

This application is a CON of 17/558,979 *
which is a CON of 17/446,046 08/26/2021
which is a CON of 16/282,948 02/22/2019 PAT 11123540
which is a CON of 14/454,965 08/08/2014 PAT 10251984
which is a CON of 13/555,318 07/23/2012 PAT 8801590
which is a DIV of 12/449,632 08/18/2009 PAT 8255050
which is a 371 of PCT/IB2008/000421 02/27/2008
(*)Data provided by applicant is not consistent with PTO records.

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)
AUSTRIA A 306/2007 02/27/2007 No Access Code Provided

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 01/05/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/560,468**

Projected Publication Date: 04/14/2022

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

DEVICE TO ASSIST THE PERFORMANCE OF A HEART

Preliminary Class

417

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative,

page 2 of 4

this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 17/560,468				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	80		N/A				
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	350		N/A				
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	400		N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	18 minus 20 =	*	x 50 =	0.00	OR					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 240 =	0.00						
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00						
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	830		TOTAL				
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
<div style="font-size: x-small;"> * If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1. </div>										



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO.	TOT CLAIMS	IND CLAIMS
17/560,468	12/23/2021	OPAP	830	25955-0013007	18	1

CONFIRMATION NO. 7399
CORRECTED FILING RECEIPT



0000000130939883

26191
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

Date Mailed: 01/07/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

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Inventor(s)

Werner Mohl, Altenmarkt-Thennenberg, AUSTRIA;

Applicant(s)

Miracor Medical SA, Awans, BELGIUM;

Power of Attorney: The patent practitioners associated with Customer Number 26191

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This application is a CON of 17/558,979 12/22/2021
which is a CON of 17/446,046 08/26/2021
which is a CON of 16/282,948 02/22/2019 PAT 11123540
which is a CON of 14/454,965 08/08/2014 PAT 10251984
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which is a DIV of 12/449,632 08/18/2009 PAT 8255050
which is a 371 of PCT/IB2008/000421 02/27/2008

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AUSTRIA A 306/2007 02/27/2007 No Access Code Provided

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Projected Publication Date: 04/14/2022

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

DEVICE TO ASSIST THE PERFORMANCE OF A HEART

Preliminary Class

600

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25955-0013007	Application No. 17/560,468
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Miracor Medical SA	
		Filing Date December 23, 2021	Group Art Unit OPAP
(37 CFR §1.98(b))			

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Filing Date If Appropriate	Class	Subclass
	1.	4674518	6/23/1987	Salo			
	2.	5308319	5/3/1994	Ide et al.			
	3.	5449342	9/12/1995	Hirose et al.			
	4.	5470208	11/28/1995	Kletschka			
	5.	5964694	10/12/1999	Siess et al.			
	6.	6007478	12/28/1999	Siess et al.			
	7.	6083260	7/4/2000	Aboul-Hosn			
	8.	6155969	12/5/2000	Schima et al.			
	9.	6176848	1/23/2001	Rau et al.			
	10.	6506146	1/14/2003	Mohl			
	11.	6508787	1/21/2003	Erbel et al.			
	12.	6540658	4/1/2003	Faschiano			
	13.	6623475	9/23/2003	Siess			
	14.	7699586	4/20/2010	LaRose et al.			
	15.	8255050	8/28/2012	Mohl			
	16.	9616157	4/11/2017	Akdis			
	17.	2008/0214888	9/4/2008	Ben Shalom, Zvi			
	18.	2011/0238172	9/29/2011	Akdis			

Foreign Patent Documents or Published Foreign Patent Applications							
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Translation	Class	Subclass
	19.	EP 0075606	4/6/1983	EP			
	20.	EP 0503839	9/16/1992	EP			
	21.	EP 1011753	6/28/2000	EP			
	22.	EP 1034808	9/13/2000	EP			
	23.	FR 1187249	8/8/1959	FR			
	24.	WO 1997/37698	10/16/1997	WO			

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form

Substitute Disclosure Form	U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25955-0013007	Application No. 17/560,468
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant Miracor Medical SA	
		Filing Date December 23, 2021	Group Art Unit OPAP
(37 CFR §1.98(b))			

Foreign Patent Documents or Published Foreign Patent Applications							
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Translation	Class	Subclass
	25.	WO 1999/15213	4/1/1999	WO			
	26.	WO 2000/44417	8/3/2000	WO			
	27.	WO 2001/70300	9/27/2001	WO			

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	28.	AUTHORIZED OFFICER MALTE KADEN, International Search Report for Application No. PCT/IB2008/000421, dated November 7, 2008, 3 pages.
	29.	Mohl et al., "Intermittent Pressure Elevation of the Coronary Venous System as a Method to Protect Ischemic Myocardium," Interactive CardioVascular and Thoracic Surgery, Volume 4, 2005, pp. 66-69
	30.	Syeda et al., "The Salvage Potential of Coronary Sinus Interventions: Meta-Analysis and Pathophysiologic Consequences," The Journal of Thoracic and Cardiovascular Surgery, Volume 127, Number 6 (June 2004), pp. 1703-1712

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
27. September 2001 (27.09.2001)

PCT

(10) Internationale Veröffentlichungsnummer
WO 01/70300 A1

(51) Internationale Patentklassifikation⁷: **A61M 1/10**

(21) Internationales Aktenzeichen: PCT/AT01/00086

(22) Internationales Anmeldedatum:
22. März 2001 (22.03.2001)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:
A 510/2000 24. März 2000 (24.03.2000) AT

(71) Anmelder und

(72) Erfinder: **SCHIMA, Heinrich** [AT/AT]; Körnergasse 7/9,
A-1020 Wien (AT).

(72) Erfinder; und

(75) Erfinder/Anmelder (nur für US): **SCHMALLEGGER,**

Helmut [AT/AT]; Wildgasse 2-4, A-1230 Wien (AT).
SCHISTEK, Roland [AT/AT]; Santnerstrasse 458,
A-5071 Wals-Siezenheim (AT). **RADERER, Franz**
[AT/AT]; Landstrasser Hauptstrasse 66/23, A-1030 wien
(AT).

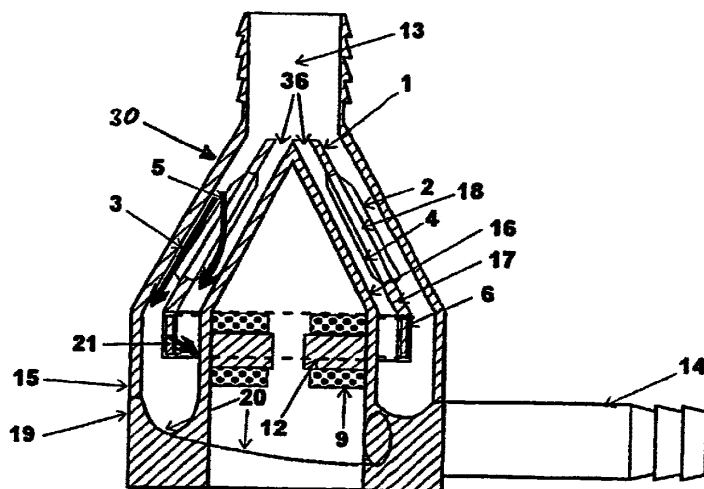
(74) Anwälte: **PUCHBERGER, Rolf** usw.; Singerstrasse 13,
Postfach 55, A-1010 Wien (AT).

(81) Bestimmungsstaaten (national): AE, AG, AL, AM,
AT, AT (Gebrauchsmuster), AU, AZ, BA, BB, BG,
BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, CZ (Ge-
brauchsmuster), DE, DE (Gebrauchsmuster), DK, DK
(Gebrauchsmuster), DM, DZ, EE, EE (Gebrauchsmuster),
ES, FI, FI (Gebrauchsmuster), GB, GD, GE, GH, GM,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK
(Gebrauchsmuster), SL, TJ, TM, TR, TT, TZ, UA, UG,
US, UZ, VN, YU, ZA, ZW.

[Fortsetzung auf der nächsten Seite]

(54) Title: ROTARY PUMP COMPRISING A HYDRAULICALLY MOUNTED ROTOR

(54) Bezeichnung: ROTATIONSPUMPE MIT HYDRAULISCH GELAGERTEM ROTOR



(57) Abstract: The invention relates to a rotary pump for delivering blood and other fluids that are susceptible to shearing. Said rotary pump comprises a rotor that is hydraulically and, optionally, magnetically mounted in a casing, whereby the rotor (1) has guiding surfaces (2, 4, 35, 33, 37, 41) for producing centrifugal flow components (3) and flow components (5) that are directed against the casing (30) in order to allow the centrifugal flow components (3) to act prior to the generation of the externally effective delivery rate and to allow the flow components (5) that are directed against the casing to act prior to the contactless mounting and stabilization of the rotor in the housing.

(57) Zusammenfassung: Die Erfindung betrifft eine Rotationspumpe zur Förderung von Blut und anderen scherempfindlichen Flüssigkeiten mit einem in einem Gehäuse hydraulisch und gegebenenfalls magnetisch gelagerten Rotor, und wobei der Rotor (1) Leitflächen (2, 4, 35, 33, 37, 41) zur Erzeugung zentrifugaler Strömungskomponenten (3) und gegen das Gehäuse (30) gerichteter Strömungskomponenten (5) aufweist, um die zentrifugalen Strömungskomponenten (3) vorrangig zur Erzeugung der extern wirksamen Förderleistung und die gegen das Gehäuse gerichteten Strömungskomponenten (5) vorrangig zur berührungslosen Lagerung und Stabilisierung des Rotors im Gehäuse wirken zu lassen.

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(84) Bestimmungsstaaten (*regional*): ARIPO-Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI-Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Veröffentlicht:

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— vor Ablauf der für Änderungen der Ansprüche geltenden Frist; Veröffentlichung wird wiederholt, falls Änderungen eintreffen

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ROTATIONSPUMPE MIT HYDRAULISCH GELAGERTEM ROTOR

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Die vorliegende Erfindung betrifft eine Rotationspumpe zur Förderung von Blut und anderen scherempfindlichen Flüssigkeiten mit einem in einem Gehäuse hydraulisch und gegebenenfalls magnetisch gelagerten Rotor.

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Für die Förderung von Blut und anderen scherempfindlichen Flüssigkeiten werden unter anderem Rotationspumpen verwendet. Um eine möglichst geringe Zerstörung des Blutes zu gewährleisten, dürfen dabei die lokal auftretenden Geschwindigkeitsgradienten nicht übermäßige Werte annehmen, da sonst die korpuskulären Anteile des Blutes zerrissen und aufgrund der durch Reibung auftretenden Erwärmung chemische Degradationsprozesse verursacht werden. Darüber hinaus müssen strömungsarme Zonen und Totwasserzonen möglichst vermieden werden, um eine Anlagerung von Bestandteilen hintanzuhalten. Bei der Förderung von Blut spricht man dabei von Gerinnsel- beziehungsweise Thrombenbildung.

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Diese Aufgaben verursachen aber bei den konventionellen, in Achsen gelagerten Pumpen beträchtliche Schwierigkeiten, da an der Durchführung der Achse durch eine allfällige Dichtung beziehungsweise bei der Lagerung der Achse in Spitzenlagern innerhalb des Pumpraumes ein Auftreten von Bereichen hoher Scherkraft, Reibung und oftmals auch, aufgrund der Achsnähe, niedriger Strömungsgeschwindigkeiten kaum vermeidbar ist.

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Es wurden daher verschiedene Lösungen vorgeschlagen, Pumpen ohne Achse und mechanische Lagerung zu bauen. So hat Akamatsu et al. (siehe z.B. Artificial Organs 1997, Vol 21,Nr. 7, 645-638) eine Pumpe vorgeschlagen, bei der ein Rotor einer Zentrifugalpumpe zugleich von einer Seite durch einen konventionellen Motor angetrieben und von der anderen Seite durch gesteuerte Elektromagneten stabilisiert wird. Allerdings erfordert diese Pumpe eine komplexe Antriebsgestaltung und gleichzeitig geringe Spaltweiten zwischen Rotor und Gehäuse, um einen vertretbaren elektrischen Wirkungsgrad zu erreichen.

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- 5 Kung und Hart (Artificial Organs 1997, Vol21,Nr.7, 645-650) haben eine Pumpe vorgeschlagen, bei der die Stabilisierung rein hydraulisch durch eine geometrische Anordnung von Spalten über und unter der Pumpe erfolgt, die durch die axiale Bewegung der Pumpe jeweils erweitert und verkleinert werden und die damit verbundenen Änderungen im Druck zwischen Rotor und Gehäuse zur Stabilisierung der Pumpe herangezogen werden.
- 10 Dieses System funktioniert allerdings nur bei relativ geringen Spaltweiten und würde bereits durch kleinen Auflagerungen von Blutbestandteilen in einen instabilen Zustand gebracht werden.

- Weiters haben Allaire und Mitarbeiter (siehe z.B. Artificial Organs 1996, Vol 20, Nr.7, 582-
15 590) eine Zentrifugalpumpe vorgeschlagen, bei der der Rotor durch ein relativ aufwendiges System von Elektromagneten stabilisiert wird. Bei diesem System sind aber ebenfalls geringe Spaltweiten und eine komplexe Ansteuerung erforderlich.

- Ferner hat Golding (US PS 5324177 und 5370509) vorgeschlagen, einen kegelförmigen Rotor
20 mit schraubenförmigem Flügel auf einem Konus aufschwimmen zu lassen und durch die sich ausbildenden Tragkräfte zwischen einer flach gestalteten Rotorinnenwand und einem Konus der Gehäuserückseite eine Zentrierung des Rotors zu erreichen. Dieses Verfahren ermöglicht allerdings nur die Ausbildung sehr geringer Spaltweiten und damit hoher Scherkräfte, zugleich ergeben sich lange Verweilzeiten der im Spalt befindlichen Flüssigkeit und nur
25 vergleichsweise geringe zentrierende Kräfte.

- Schließlich haben Woodard et al. (WO 99/12587) eine Pumpe vorgeschlagen, deren Rotor hydrodynamisch gelagert ist, wobei der Rotationskörper aus mehreren zylindrischen Elementen besteht, deren schräg gestellte Stirnflächen gemeinsam mit der
30 Gehäuseoberfläche verjüngende Spalte geringer Distanz ergeben. Die sich darin aufbauenden Staudruckkräfte oder zwischen den sich verjüngenden Flächen sozusagen eingefangenen Flüssigkeit verursachen eine achsiale Zentrierung des Rotors. Zugleich wird durch die kegelförmige Gestalt der Gehäuse-Oberseite eine radiale Zentrierung erreicht. Diese Erfindung scheint eine zweckmäßige Erzeugung stabilisierender Kräfte zu ermöglichen,
35 verlangt aber in nachteiliger Weise kleine Spalte in der Größenordnung von weniger als 0,3 mm, was einerseits hohe Scherkräfte bedingt und beim Auftreten auch geringer biologischer Anlagerungen oder Gerinnsel zu massiven Änderungen der Strömungsverhältnisse führen kann. Darüber hinaus weisen die dort vorgeschlagenen Rotorformen eine Reihe von Staupunkten und Stagnationszonen auf.

- 40 Demgegenüber stellt sich die vorliegende Erfindung die Aufgabe, die vorstehenden Nachteile zu überwinden. Mechanische Lagerungen, Totwasserzonen oder Zonen verringerter

- 5 Strömungsgeschwindigkeiten und kleine Spaltabstände sollen vermieden werden. Die Zahl der Bauteile soll klein und der Aufbau einfach sein.

Die Erfindung ist dadurch gekennzeichnet, dass der Rotor Leitflächen zur Erzeugung zentrifugaler Strömungskomponenten und gegen das Gehäuse gerichteter Strömungskomponenten aufweist, um die zentrifugalen Strömungskomponenten vorrangig zur Erzeugung der extern wirksamen Förderleistung und die gegen das Gehäuse gerichteten Strömungskomponenten vorrangig zur berührungslosen Lagerung und Stabilisierung des Rotors im Gehäuse wirken zu lassen. Weiters bevorzugte Merkmale sind, dass das Gehäuse einen kegelförmigen Mittelteil und/oder einen hohlkegelförmigen Oberteil umfasst, und dass der dazwischen angeordnete Rotor kegelmantelförmig ausgebildet ist. Weiters können am Kegelmantel des Rotors Flügel als Leitflächen innen und/oder außen angeordnet sein. Bevorzugt weist der Rotor zum Strömungsdurchtritt Rotoröffnungen auf, an denen die Leitflächen angeordnet sind. Weitere vorteilhafte Merkmale sind den Ansprüchen, der Beschreibung und den Zeichnungen zu entnehmen.

20 Die Erfindung wird im Folgenden beispielsweise anhand von 17 Figuren beschrieben. Die Figuren 1 bis 5 zeigen Querschnitte durch verschiedene Ausführungen der Pumpe und Fig. 6 die Schrägansicht eines Rotors. Fig. 7 ist der Schnitt durch den Rotor und Fig. 8 die Schrägansicht des Schnittes nach Linie V – V in Fig. 7. Die Fig. 9 und 11 zeigen Rotoren in Schrägansicht und die Fig. 10,12 und 13,14 zugehörige Schnitte. Fig. 15 zeigt ein weiteres Beispiel für den Rotor und Fig. 16,17 zeigen mögliche Querschnitte des Rotorflügels. Alle Figuren sind schematisch gehalten.

Fig. 1 zeigt einen Querschnitt durch die Pumpe. Der Rotor 1 weist als Leitflächen 2,4 Flügel zur Erzeugung zentrifugaler Strömungskomponenten 3 und gegen das Gehäuse gerichteter Strömungskomponenten 5 auf. Dabei sind diese Leitflächen 2,4 auf einem kegelförmigen Grundkörper 17 aufgebracht, der Rotoröffnungen 18 zur Anströmung der inneren Flügel 4 aufweist. Dieser hohlkegelförmig aufgebaute Rotor 1 läuft in dem Pumpengehäuse 30 bestehend aus dem Gehäuseunterteil 19 mit dem kegelförmigen Mittelteil 16 und einem hohlkegelartigen Oberteil 15, wodurch eine Zentrierung des hohlkegelförmigen Rotors 1 auf dem Mittelteil 16 des Gehäuseunterteils 19 durch die gegen das Gehäuse gerichteten Strömungskomponenten 5 gegeben ist, wobei diese Strömung in vorzugsweise axialer Richtung gegen die Kegeloberfläche des Mittelteiles 16 stattfindet. Diese Zentrierung kann aber auch gänzlich oder zusätzlich durch insbesondere gegen das Gehäuse gerichtete (5), aber auch zentrifugale (3) Strömungskomponenten gegen das hohlkegelförmige Oberteil 15 erfolgen. Ein im unteren Gehäuseteil 19 eingearbeiteter spiralförmiger Auslaufkanal 20 führt zu einem Auslauf 14. Der Rotor enthält Rotormagnete 6 zur vorzugsweisen Übertragung der Rotationsenergie, die einzeln oder als durchlaufender magnetischer Ring ausgeführt sein

5 können. Diesen Rotormagneten steht ein Antrieb gegenüber, der wie in Fig. 1 ausgeführt, als Stator 12 innen im Gehäuseunterteil 19 angeordnet sein kann und über Spulen 9 mit einem magnetischen Drehfeld versorgt wird. Durch einen achsialen Versatz der Rotormagnete 6 und des Stators 8 kann die Kopplungskraft 21 schräg einwirken und eine achsiale Komponente zur zusätzlichen Stabilisierung des Rotors 1 verursachen, wobei die Richtung dieser
10 achsialen Komponente durch entsprechenden Versatz des Stators 12 nach oben oder nach unten gerichtet sein kann. Am Einlauf 13 weist der Rotor 1 eine Einlauföffnung 36 auf, um die einlaufende Flüssigkeit zu beiden Seiten des Rotors und gegen die Spitze des kegelförmigen Mittelteiles 16 zu lenken.

15 Wie in Fig. 2 gezeigt, kann der Antrieb auch über einen Elektromotor 26 erfolgen, der über einen Schaft 25 eine rotierende Scheibe 24 mit Magneten 10 antreibt. Diese Ausführung bietet den Vorteil, dass zur Lagerung des Rotors keine elektrische Energie benötigt wird und dennoch durch den achsialen Versatz der Scheibe 24 eine achsiale Komponente der magnetischen Kraft 21 sichergestellt werden kann.

20 Fig. 3 zeigt, dass der Antrieb auch über einen Scheibenläufermotor erfolgen kann, bei dem die Scheibe 11 mit eingelagerten Magneten 10 oder einer entsprechenden mehrpoligen Magnetisierung mit einer gelagerten Achse 29 gleichzeitig als Rotor für den Motor-Stator 44 und für die Einkopplung der magnetischen Energie in den Rotor 1 dient.

25 Wie in Fig. 4 dargestellt, kann der Antrieb 7 mit einem von außen wirkenden Stator 8 versehen sein, der wahlweise anstatt oder zusätzlich zum von innen wirkenden Stator 12 vorhanden sein kann. Zusätzlich zur hydraulischen Stabilisierung des Rotors 1 kann in allen Ausführungen des Antriebs zusätzlich eine magnetische Stabilisierung in Nähe des Einlaufs
30 13 angeordnet sein, indem ein in den Rotor 1 eingearbeiteter Ring 27 aus ferromagnetischem Eisen oder permanentmagnetischem Material vorgesehen ist, auf den von außen und/oder innen angebrachte Permanent- oder Elektromagnete 22, 28 mit Spulen 23 einwirken und damit eine strömungsbedingte Instabilität des Rotors ausgleichen können. Der ferromagnetische Ring 27 kann außen mit einer elektrisch sehr gut leitfähigen Beschichtung
35 34 versehen sein, um die Ausbildung von elektrischen Wirbelströmen und dadurch zur Zentrierung beitragenden magnetischen Kräften zu ermöglichen.

Darüber hinaus ist eine Kombination von außen und innen liegenden Antriebssystemen (Statoren 8,12) am unteren Umfang des Rotors 1 möglich, von denen dann eines
40 vorzugsweise für die Aufbringung der Rotationsenergie und das andere für die Stabilisierung eingesetzt werden kann.

- 5 Die Positionierung (Laufverhalten) des Rotors kann z.B. durch entsprechende Positions-
sensoren ermittelt werden, wie in Fig. 4 durch das Bezugszeichen 42 in verschiedenen
Positionen schematisch angedeutet ist. Beispielsweise können Hallsensoren Verwendung
finden. Zur Positionsermittlung können aber auch in den Spulen rückinduzierte Spannungen
oder die Rückwirkung auf hochfrequente Speisespannungsanteile gemessen und ausge-
10 wertet werden, wobei keine zusätzlichen Sensoren nötig sind.

In den Figuren 5 bis 15 sind verschiedene Ausführungen des Pumpenrotors erläutert.

- Fig. 5 zeigt die Ausführung der Pumpe mit einem Rotor 1, der aus zwei
15 übereinanderliegenden Kegelmänteln 31,32 besteht, die durch zentrifugale Flügel oder
Leitflächen 33 miteinander verbunden sind. Die Rotoröffnungen 18 und die äußeren Flügel 4
dienen zur Erzeugung von Strömungskomponenten 5 gegen das Oberteil 15 des Gehäuses,
sowie gegen den kegelförmigen Mittelteil 16 des Gehäuseunterteils 19. Dadurch wird eine
hydrodynamische Stabilisierung des Rotors im Gehäuse erzielt.

- 20 Die Fig. 6 bis 8 zeigen in Schrägriß, Aufriß und Schnitt die Grundform eines Rotors 1 in einer
Ausführung mit kegelförmigem Grundkörper 17, an dem außen als Leitflächen 2 Flügel zur
vorzugsweisen Erzeugung zentrifugaler Strömungskomponenten angebracht sind. Diese
Flügel können in an sich von Zentrifugal-Blutpumpen bekannter Weise eine Krümmung 39
25 aufweisen, die beispielsweise eine Einrichtung der Schaufeln gegen die Drehrichtung 40
ermöglicht. Der Grundkörper 17 weist am einlaufseitigen Ende die Einlauföffnung 36 auf, die
eine direkte Anspülung der Spitze des kegelförmigen Mittelteils 16 des Gehäuseunterteils 19
ermöglicht. In den Grundkörper sind weiters die Rotoröffnungen 18 eingearbeitet, durch die
Flüssigkeit treten kann, die von den Flügeln 4 gegen das Gehäusemittelteil 16 gelenkt wird.
30 Die Wirkung der Flügel 2,4 kann durch eine Abschrägung 35 der Öffnung 18 verstärkt oder
bei genügender Wandstärke des kegelförmigen Grundkörpers 17 sogar ersetzt werden, in
welch letzterem Fall die Flügel 2,4 entfallen könnten. Die Leitflächen sind dabei somit nur
durch die Abschrägung der Kanten der Rotoröffnungen 18 gebildet.

- 35 Die Fig. 9 und 10 zeigen in Schrägriß und Schnitt die ebenfalls mögliche Variante, dass die
Flügel 4 zur Erzeugung der Strömungskomponenten 5 gegen das Gehäuse auf der
Außenseite des kegelförmigen Grundkörpers 17 und die Flügel 2 zur vorzugsweisen
Erzeugung zentrifugaler Strömungskomponenten 3 auf der Innenseite des Grundkörpers 17
liegen.

- 40 Diese beiden beschriebenen gegensinnigen Rotorkonstruktionen sind durch einen wie oben
beschriebenen nach oben oder nach unten möglichen achsialen Versatz der Rotormagneten
6 und der Antriebsmagneten 8,12,24 und die dadurch erreichbare wahlweise nach oben oder

5 unten gerichtete axiale Komponente der Magnetkraft 21 gleichermaßen realisierbar, siehe Fig. 1 bis 5.

In Fig. 11 bis 13 ist ein Rotor mit zwei übereinanderliegenden Kegelmänteln dargestellt. Er ermöglicht eine Strömungsbildung gegen beide Gehäusewände 16,19. Er wurde bereits
10 im Querschnitt in Fig. 5 beschrieben und ist detailliert in der Fig. 11 im Schrägriß, in der Fig. 12 im Aufriß und in der Fig. 13 in einem Schnitt quer zur Achsialrichtung der Pumpe dargestellt. Dabei sind der innere Kegelmantel 31 und der äußere Kegelmantel 32 durch Stege 33 miteinander verbunden, die zugleich als Flügel für die Strömung wirksam sind. Die Rotoröffnungen 18 weisen an den Kanten Abschrägungen oder Flügel (4) zur Erzeugung der
15 gegen das Gehäuse gerichteten Strömungskomponenten auf.

Weiters ist durch eine entsprechende Anordnung der beiden Leitflächen (2,4) in Kombination mit der Abschrägung 35 der Rotoröffnung 18 im Kegelmantel ein Verschmelzen zu einer einzigen Flügelkonstruktion möglich, wie in Fig. 14 gezeigt ist. Diese Ausbildung ist auch bei
20 übereinanderliegenden Kegelmänteln möglich.

Schließlich kann die Pumpe gemäß Fig. 15 auch einen Rotor enthalten, bei dem die einzelnen Flügel 37 selbstständig ohne durchgängigen kegelförmigen Grundkörper gestaltet sind. Diese Flügel sind entweder mit einem keilförmigen Profil (siehe Fig. 16) oder einem schräggestellten
25 Profil (siehe Fig. 17) realisierbar, wobei eine deutliche Anschrägung der Seitenflächen zur Erzielung der gegen das Gehäuse gerichteten Strömungskomponenten vorgesehen ist. Somit sind die zuvor beschriebenen Leitflächen 2 und 4 durch die Abschrägungen 37 als Leitflächen ersetzt. Die Rotoröffnungen 18 erstrecken sich bis zum unteren Rand 41 des Rotors 1. Diese unteren Ränder können ebenfalls schräg zur Laufrichtung gestellt sein, sodass sie als
30 Leitflächen zur Erzeugung einer Auftriebskomponente bzw. einer Förderkomponente für die Flüssigkeitsströmung dienen. An den Enden der Flügel können die Magnete 38 für den Antrieb und zusätzliche magnetische Lagerung angeordnet sein.

In den Figuren 1 bis 5 ist der Auslauf 14 stets unterhalb des unteren Randes 41 angeordnet.
35 Wenn der Auslauf 14 höher angesetzt werden soll, etwa in der Ebene des unteren Randes 41 des Rotors 1, kann es vorteilhaft sein, zwei symmetrisch angeordnete Ausläufe vorzusehen, oder einen Auslauf zweigeteilt auszubilden, um die Strömung der Flüssigkeit zu stabilisieren.

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PATENTANSPRÜCHE

1. Rotationspumpe zur Förderung von Blut und anderen scherempfindlichen Flüssigkeiten mit einem in einem Gehäuse hydraulisch und gegebenenfalls magnetisch gelagerten Rotor, dadurch gekennzeichnet, dass der Rotor (1) Leitflächen (2,4,35,33,37,41) zur Erzeugung zentrifugaler Strömungskomponenten (3) und gegen das Gehäuse (30) gerichteter Strömungskomponenten (5) aufweist, um die zentrifugalen Strömungskomponenten (3) vorrangig zur Erzeugung der extern wirksamen Förderleistung und die gegen das Gehäuse gerichteten Strömungskomponenten (5) vorrangig zur berührungslosen Lagerung und Stabilisierung des Rotors im Gehäuse wirken zu lassen.
2. Pumpe nach Anspruch 1, dadurch gekennzeichnet, dass das Gehäuse (30) einen kegelförmigen Mittelteil (16) und/oder einen hohlkegelförmigen Oberteil (15) umfasst, und dass der dazwischen angeordnete Rotor (1) kegelmantelförmig ausgebildet ist.
3. Pumpe nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass als Leitflächen Flügel (2,4) am Kegelmantel des Rotors innen und/oder außen angeordnet sind.
4. Pumpe nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, dass der Rotor (1) zum Strömungsdurchtritt Rotoröffnungen (18) aufweist, an denen die Leitflächen (2,4,35,33,37,41) angeordnet sind.
5. Pumpe nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, dass die Kanten der Rotoröffnungen (18) als Leitflächen (35,37) schräg ausgebildet sind.
6. Pumpe nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, dass sich die Rotoröffnungen (18) bis zum unteren Rand (41) des Kegelmantels erstrecken und die unteren Ränder (41) gegebenenfalls als Leitflächen zur Erzeugung einer Auftriebskomponente ausgebildet sind.
7. Pumpe nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, dass der Rotor (1) aus zwei übereinanderliegenden Kegelmänteln (31,32) besteht, zwischen denen verbindende Flügel als Leitflächen (33) zur Erzeugung der zentrifugalen Strömungskomponente (3) angebracht sind, und wobei die beiden Kegelmäntel (31,32) Rotoröffnungen (18) und wahlweise Flügel (4) zur Erzeugung der gegen das Gehäuse gerichteten Strömungskomponenten (5) aufweisen.

- 5 8. Pumpe nach einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, dass der Rotor (1) am Einlauf (13) eine Einlauföffnung (36) aufweist, um einen Teil der einlaufenden Flüssigkeit gegen die Spitze des kegelförmigen Mittelteils (16) des Gehäuses (30) zu lenken.
- 10 9. Pumpe nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, dass im Bereich des unteren Randes (41) des Rotors (1) mehrere Rotormagnete (6) oder ein Magnetring angeordnet sind, denen im Gehäuse (30) Magnete (10,12) und/oder ein Magnetantrieb zugeordnet sind.
- 15 10. Pumpe nach Anspruch 9, dadurch gekennzeichnet, dass der Magnetantrieb durch einen Stator (8,12) mit umlaufendem Magnetfeld gebildet ist.
- 20 11. Pumpe nach Anspruch 9, dadurch gekennzeichnet, dass der Magnetantrieb durch einen Scheibenläufer gebildet ist, wobei über einem Stator (38) eine rotierende Scheibe (24) mit eingelagerten Magneten (10) oder mehrfach magnetisierten Bereichen vorgesehen ist.
- 25 12. Pumpe nach einem der Ansprüche 1 bis 11, dadurch gekennzeichnet, dass die Rotormagnete (6) und die magnetkrafterzeugenden Anteile des Antriebsmotors (8,11,12) in achsialer Richtung so versetzt sind, dass zusätzlich zur Rotationsenergie eine in achsialer Richtung wirkende Kraftkomponente (21) auf den Rotor (1) gegeben ist, die zur Lagerung und/oder Stabilisierung des Rotors (1) beiträgt.
- 30 13. Pumpe nach einem der Ansprüche 1 bis 12, dadurch gekennzeichnet, dass zusätzlich zum Antrieb ein Ring (27) aus ferromagnetischem Eisen oder permanentmagnetischem Material im Rotor (1) um den Einlauf vorhanden ist und in diesem gegenüberliegenden Gehäuseteilen Permanent- oder Elektromagnete (22,23,28) zur zusätzlichen magnetischen Stabilisierung vorgesehen sind, und dass bevorzugt zur Ansteuerung dieser Magneten zusätzlich Positionssensoren (42) für die Erfassung der genauen Lage des Rotors (1) vorgesehen sind (Fig. 4).
- 35 14. Pumpe nach einem der Ansprüche 1 bis 13, dadurch gekennzeichnet, dass der Ring (27) aus ferromagnetischem Eisen um den Einlauf (13) eine gut elektrisch leitfähige Oberflächenbeschichtung (34) aufweist, sodass die darin auftretenden Wirbelströme und
- 40 Magnetfelder zur Zentrierung des Rotors (1) beitragen.
15. Pumpe nach einem der Ansprüche 1 bis 14, dadurch gekennzeichnet, daß zur Rotation und Stabilisierung des Rotors (1) am Umfang von außen ein Stator (8) und von innen

- 5 wahlweise ein Stator (12) oder ein Motor (26) oder ein Scheibenläufermotor (24,29) über einer Magnetscheibe (11,24) angeordnet sind, wobei vorzugsweise die inneren Komponenten (12,26,29,11,24) zur Erzeugung der Rotationsenergie und der äußere Stator zur Stabilisierung des Rotors (1) wirksam sind.

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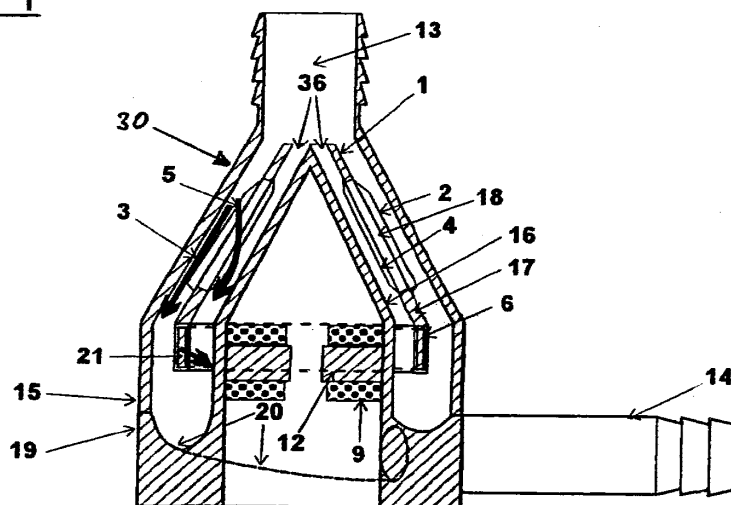
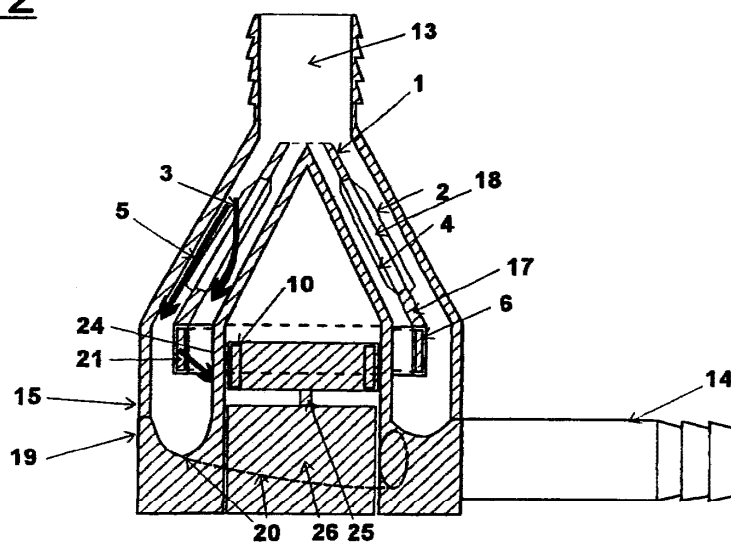
Abb. 1Abb. 2

Abb. 3

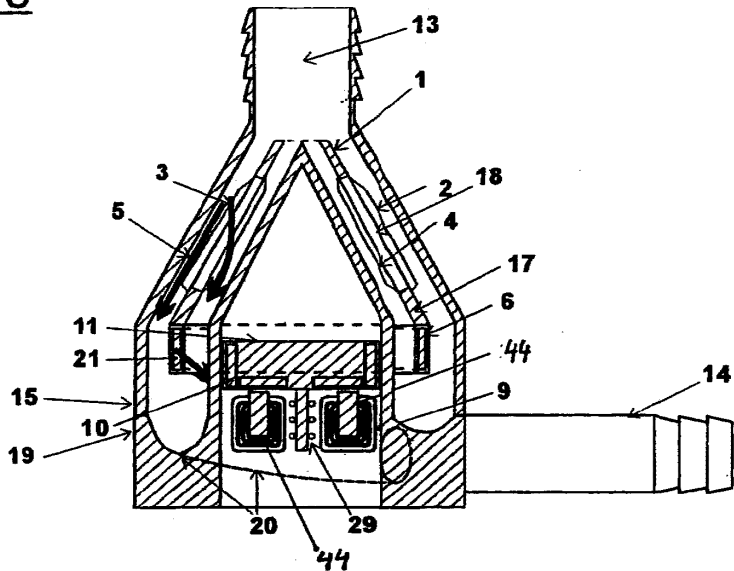


Abb. 4

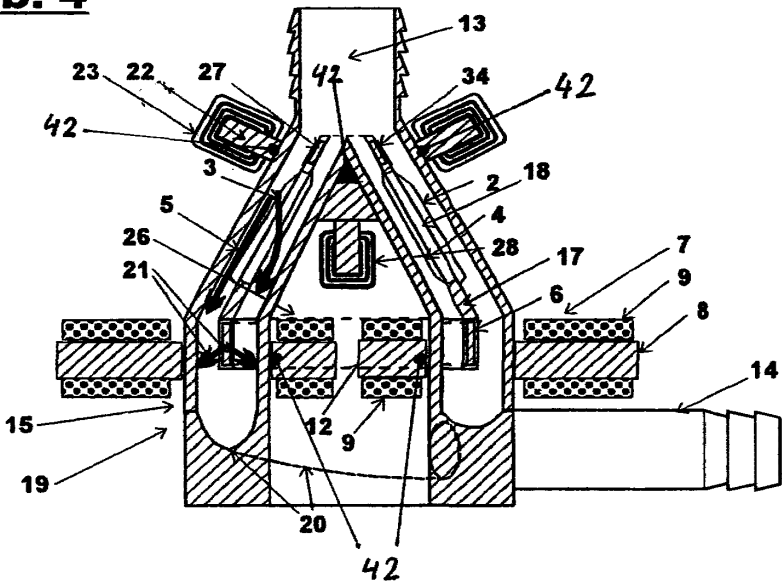


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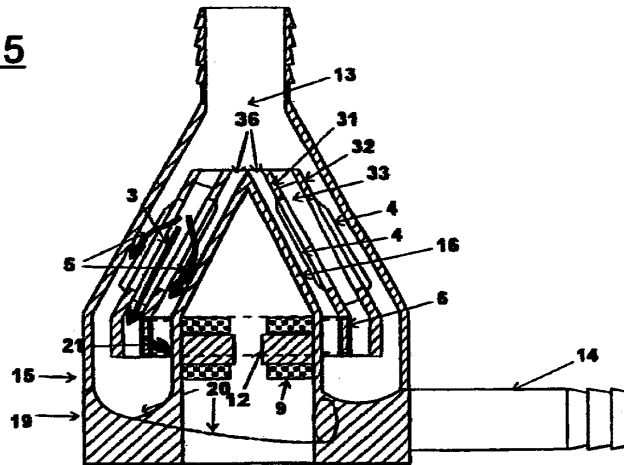


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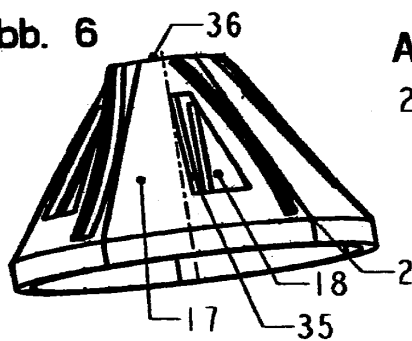


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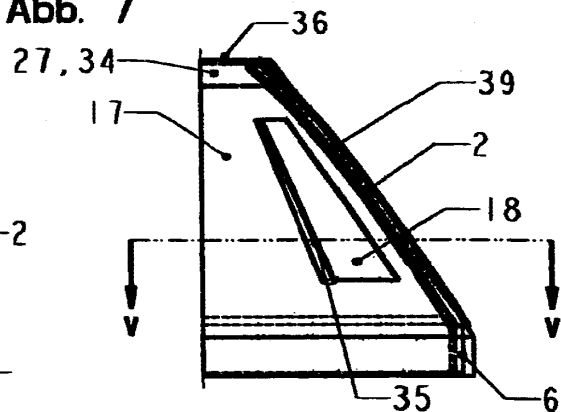


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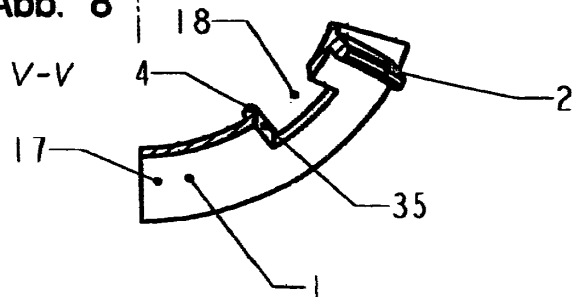


Abb. 9

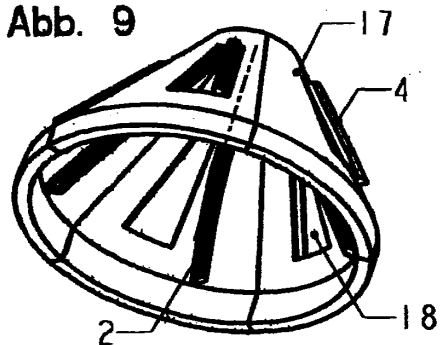


Abb. 10

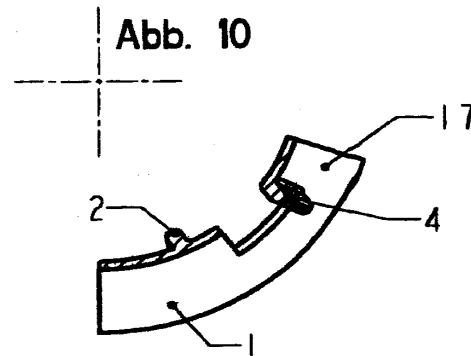


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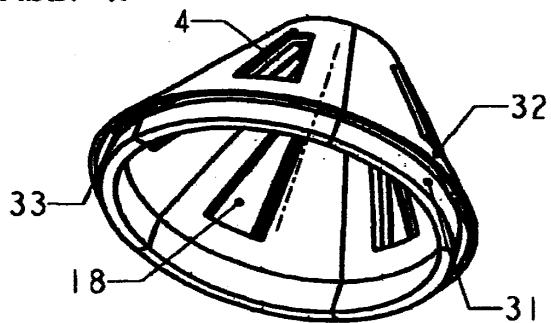


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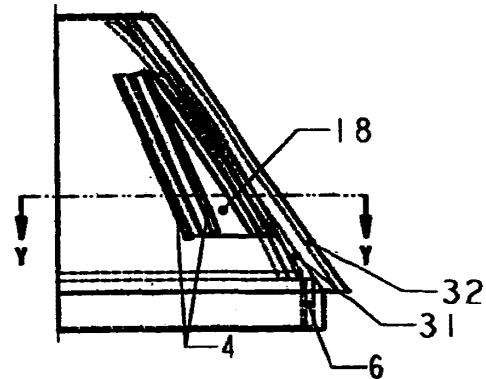


Abb. 13 Schnitt Y-Y

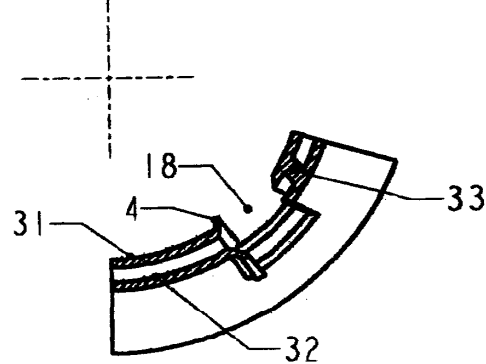


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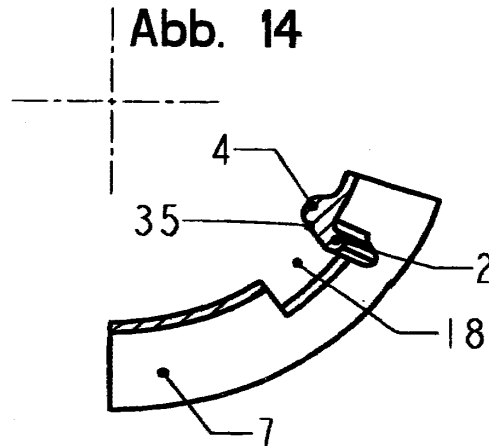


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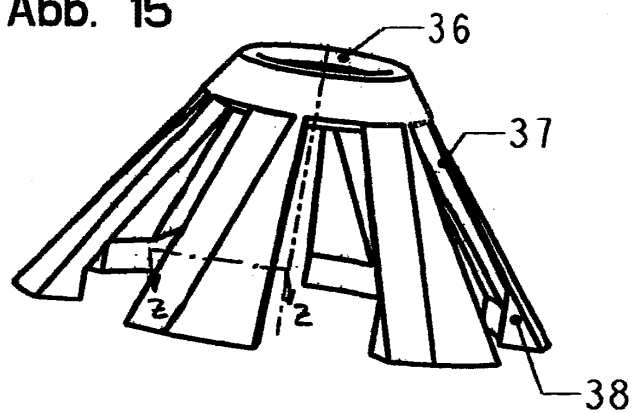


Abb. 16

Schnitt z-z

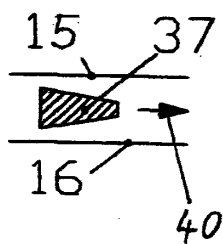
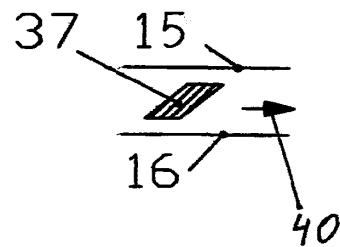


Abb. 17

Schnitt z-z



INTERNATIONAL SEARCH REPORT

International Application No
PCT/AT 01/00086

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61M1/10

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)

IPC 7 A61M F04D

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 00 32256 A (IMPELLA CARDIOTECH AG ;SIESS THORSTEN (DE)) 8 June 2000 (2000-06-08) page 2, line 16 -page 4, line 18; figures 1-4	1-4
X	US 5 938 412 A (IZRAELEV VALENTIN M) 17 August 1999 (1999-08-17) column 5, line 18 - line 67; figure 2	1,2,9,10
A	---	7,8
	--- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in 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.
- *G* document member of the same patent family

Date of the actual completion of the international search

9 July 2001

Date of mailing of the international search report

16/07/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040. Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Schönleben, J

INTERNATIONAL SEARCH REPORT

International Application No
PCT/AT 01/00086

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 12587 A (CORTRONIX PTY LTD ;WOODARD JOHN CAMPBELL (AU); TANSLEY GEOFFREY DO) 18 March 1999 (1999-03-18) cited in the application page 7, line 2 -page 8, line 10 page 13, line 17 - line 32 page 15, line 6 -page 16, line 8 figures 1,2	1-4,8,9
A	---	13
X	EP 0 901 797 A (KRITON MEDICAL INC) 17 March 1999 (1999-03-17) column 13, line 35 -column 14, line 17; figures 7,11-13	1
A	---	12,15
A	EP 0 834 326 A (JMS CO LTD) 8 April 1998 (1998-04-08) figure 3 -----	9,10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/AT 01/00086

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0032256 A	08-06-2000	DE 29821565 U AU 1554000 A	15-06-2000 19-06-2000
US 5938412 A	17-08-1999	US 5685700 A AU 8264398 A EP 1003970 A WO 9901663 A AU 2729997 A EP 1012477 A WO 9846879 A US 6206659 B US 5924848 A	11-11-1997 25-01-1999 31-05-2000 14-01-1999 11-11-1998 28-06-2000 22-10-1998 27-03-2001 20-07-1999
WO 9912587 A	18-03-1999	AU 726752 B AU 8965498 A CN 1278188 T EP 1019116 A US 2001002234 A US 2001004435 A	23-11-2000 29-03-1999 27-12-2000 19-07-2000 31-05-2001 21-06-2001
EP 0901797 A	17-03-1999	US 5840070 A AU 730235 B AU 7993698 A JP 11123239 A US 6080133 A US 6234998 B	24-11-1998 01-03-2001 25-02-1999 11-05-1999 27-06-2000 22-05-2001
EP 0834326 A	08-04-1998	JP 10099429 A US 6135710 A	21-04-1998 24-10-2000

Form PCT/ISA/210 (patent family annex) (July 1992)

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen

PCT/AT 01/00086

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES

IPK 7 A61M1/10

Nach der Internationalen Patentklassifikation (IPK) oder nach der nationalen Klassifikation und der IPK

B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)

IPK 7 A61M F04D

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

EPO-Internal

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
P,X	WO 00 32256 A (IMPELLA CARDIOTECH AG ;SIESS THORSTEN (DE)) 8. Juni 2000 (2000-06-08) Seite 2, Zeile 16 -Seite 4, Zeile 18; Abbildungen 1-4	1-4
X	US 5 938 412 A (IZRAELEV VALENTIN M) 17. August 1999 (1999-08-17) Spalte 5, Zeile 18 - Zeile 67; Abbildung 2	1,2,9,10
A	---	7,8
	--- -/--	



Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen



Siehe Anhang Patentfamilie

* Besondere Kategorien von angegebenen Veröffentlichungen :

A Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist

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O Veröffentlichung, die sich auf eine mündliche Offenbarung, eine Benutzung, eine Ausstellung oder andere Maßnahmen bezieht

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G Veröffentlichung, die Mitglied derselben Patentfamilie ist

Datum des Abschlusses der internationalen Recherche

9. Juli 2001

Absendedatum des internationalen Recherchenberichts

16/07/2001

Name und Postanschrift der Internationalen Recherchenbehörde

Europäisches Patentamt, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Bevollmächtigter Bediensteter

Schönleben, J

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen

PCT/AT 01/00086

C.(Fortsetzung) ALS WESENTLICH ANGESEHENE UNTERLAGEN		
Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
X	WO 99 12587 A (CORTONIX PTY LTD ;WOODARD JOHN CAMPBELL (AU); TANSLEY GEOFFREY DO) 18. März 1999 (1999-03-18) in der Anmeldung erwähnt Seite 7, Zeile 2 -Seite 8, Zeile 10 Seite 13, Zeile 17 - Zeile 32 Seite 15, Zeile 6 -Seite 16, Zeile 8 Abbildungen 1,2	1-4,8,9
A	----	13
X	EP 0 901 797 A (KRITON MEDICAL INC) 17. März 1999 (1999-03-17) Spalte 13, Zeile 35 -Spalte 14, Zeile 17; Abbildungen 7,11-13	1
A	----	12,15
A	EP 0 834 326 A (JMS CO LTD) 8. April 1998 (1998-04-08) Abbildung 3 -----	9,10

INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen
PCT/AT 01/00086

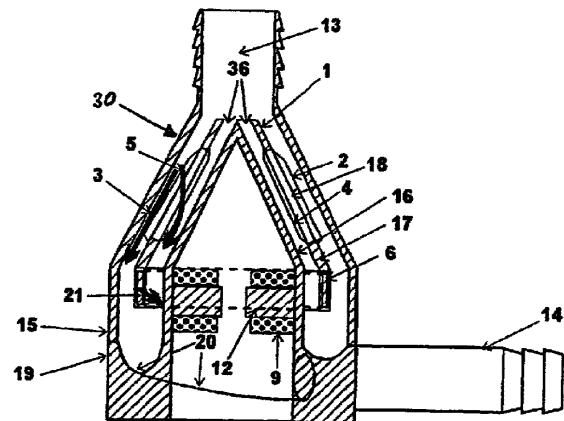
im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
WO 0032256 A	08-06-2000	DE 29821565 U AU 1554000 A	15-06-2000 19-06-2000
US 5938412 A	17-08-1999	US 5685700 A AU 8264398 A EP 1003970 A WO 9901663 A AU 2729997 A EP 1012477 A WO 9846879 A US 6206659 B US 5924848 A	11-11-1997 25-01-1999 31-05-2000 14-01-1999 11-11-1998 28-06-2000 22-10-1998 27-03-2001 20-07-1999
WO 9912587 A	18-03-1999	AU 726752 B AU 8965498 A CN 1278188 T EP 1019116 A US 2001002234 A US 2001004435 A	23-11-2000 29-03-1999 27-12-2000 19-07-2000 31-05-2001 21-06-2001
EP 0901797 A	17-03-1999	US 5840070 A AU 730235 B AU 7993698 A JP 11123239 A US 6080133 A US 6234998 B	24-11-1998 01-03-2001 25-02-1999 11-05-1999 27-06-2000 22-05-2001
EP 0834326 A	08-04-1998	JP 10099429 A US 6135710 A	21-04-1998 24-10-2000

Formblatt PCT/ISA/210 (Anhang Patentfamilie), (Juli 1992)

Title (Translation)	Rotary pump comprising a hydraulically mounted rotor		
Publication Number	<u>WO2001070300A1</u>	Publication Date	27 Sep 2001
Application Number	PCT/AT2001/000086	Application Date	22 Mar 2001
Assignee Name (Translated)	SCHIMA, HEINRICH SCHMALLEGGER, HELMUT SCHISTEK, ROLAND RADERER, FRANZ		
Standardized Inventor	SCHIMA HEINRICH SCHMALLEGGER HELMUT SCHISTEK ROLAND RADERER FRANZ		
Inventor Name	SCHIMA, HEINRICH SCHMALLEGGER, HELMUT SCHISTEK, ROLAND RADERER, FRANZ		
IPC	A61M1/10		
CPC	A61M2001/1017 A61M1/101 A61M60/824 A61M60/205 A61M60/419 A61M60/422 A61M60/148		
Priority Data	2000000510 24 Mar 2000 AT		
External Link	<u>Espacenet</u>	<u>WIPO</u>	

Abstract (Translated)

The invention relates to a rotary pump for delivering blood and other fluids that are susceptible to shearing. Said rotary pump comprises a rotor that is hydraulically and, optionally, magnetically mounted in a casing, whereby the rotor (1) has guiding surfaces (2, 4, 35, 33, 37, 41) for producing centrifugal flow components (3) and flow components (5) that are directed against the casing (30) in order to allow the centrifugal flow components (3) to act prior to the generation of the externally effective delivery rate and to allow the flow components (5) that are directed against the casing to act prior to the contactless mounting and stabilization of the rotor in the housing.



Electronic Acknowledgement Receipt	
EFS ID:	44693800
Application Number:	17560468
International Application Number:	
Confirmation Number:	7399
Title of Invention:	DEVICE TO ASSIST THE PERFORMANCE OF A HEART
First Named Inventor/Applicant Name:	Werner Mohl
Customer Number:	26191
Filer:	Alex Yu/Callie Bengé
Filer Authorized By:	Alex Yu
Attorney Docket Number:	25955-0013007
Receipt Date:	07-JAN-2022
Filing Date:	23-DEC-2021
Time Stamp:	13:21:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	209452 0a9b5eb50b5b7de64cb6044ecb61f0aa0ub4a850	no	3

Warnings:

Information:					
This is not an USPTO supplied IDS fillable form					
2	Foreign Reference	WO2001070300A1.PDF	944452	no	23
			9fa2c49d8ddfc90ae1a1d9b285c8a8ab9c9cf193		
Warnings:					
Information:					
Total Files Size (in bytes):			1153904		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/560,468	12/23/2021	Werner Mohl	25955-0013007	7399
26191 7590 02/11/2022 FISH & RICHARDSON P.C. (TC) PO BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER CENTRAL, DOCKET	
			ART UNIT OPAP	PAPER NUMBER
			NOTIFICATION DATE 02/11/2022	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

<i>Decision Granting Request for Prioritized Examination (Track I)</i>	Application No. 17/560,468	Applicant(s) Mohl, Werner	
	Examiner CHERYL P GIBSON BAYLOR	Art Unit OPET	AIA (FITF) Status No
<p>1. THE REQUEST FILED <u>23 December 2021</u> IS GRANTED .</p> <p>The above-identified application has met the requirements for prioritized examination</p> <p>A. ☒ for an original nonprovisional application (Track I).</p> <p>B. ☐ for an application undergoing continued examination (RCE).</p> <p>2. The above-identified application will undergo prioritized examination. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:</p> <p>A. filing a <u>petition for extension of time</u> to extend the time period for filing a reply;</p> <p>B. filing an <u>amendment to amend the application to contain more than four independent claims, more than thirty total claims</u>, or a multiple dependent claim;</p> <p>C. filing a <u>request for continued examination</u> ;</p> <p>D. filing a notice of appeal;</p> <p>E. filing a request for suspension of action;</p> <p>F. mailing of a notice of allowance;</p> <p>G. mailing of a final Office action;</p> <p>H. completion of examination as defined in 37 CFR 41.102; or</p> <p>I. abandonment of the application.</p> <p>Telephone inquiries with regard to this decision should be directed to CHERYL GIBSON BAYLOR at (571)272-3213. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.</p>			
/CHERYL GIBSON BAYLOR/ Paralegal Specialist, OPET			



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/560,468	12/23/2021	Werner Mohl	25955-0013007	7399

26191	7590	03/02/2022
FISH & RICHARDSON P.C. (TC)		
PO BOX 1022		
MINNEAPOLIS, MN 55440-1022		

EXAMINER	
MARLEN, TAMMIE K	

ART UNIT	PAPER NUMBER
3792	

NOTIFICATION DATE	DELIVERY MODE
03/02/2022	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Priority

2. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, 365(c), or 386(c) is acknowledged.

Information Disclosure Statement

3. The information disclosure statement(s) (IDS) submitted on 1/7/2022 has/have been acknowledged and is/are being considered by the Examiner.

Drawings

4. The Applicant is reminded to carefully review the drawing figures and the accompanying specification to ensure that all reference numerals present in the drawing figures are defined within the specification.

Specification

5. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. The abstract should also mention by way of example any preferred modifications or alternatives.

Where applicable, the abstract should include the following: (1) if a machine or apparatus, its organization and operation; (2) if an article, its method of making; (3) if a chemical compound, its identity and use; (4) if a mixture, its ingredients; (5) if a process, the steps.

Extensive mechanical and design details of an apparatus should not be included in the abstract. The abstract should be in narrative form and generally limited to a single paragraph within the range of 50 to 150 words in length.

See MPEP § 608.01(b) for guidelines for the preparation of patent abstracts.

6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words in length. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. In addition, the form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided.

7. The abstract of the disclosure is objected to because the abstract is not of sufficient length to reasonably convey to one having ordinary skill in the art what is the technical disclosure what is new in the art to which the invention pertains. Correction is required. See MPEP § 608.01(b).

Claim Objections

8. Claim 13 objected to because of the following informalities: the word "the" is missing between "wherein" and "heart" on line 1. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-18 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

11. Claim 1 recites the limitation "a body" in line 25. It is unclear what the metes and bounds are of this recitation in the claim. Specifically, is "a body" any object or "body", or is the claim intending for the "a body" to be a human body and, if so, is the "a body" the body in which the heart assist pump is delivered?

12. Claim 2 recites the limitation "wherein in response to the rotation of the magnetically driven rotor via the magneto coupling, guide surfaces of the magnetically driven rotor to produce centrifugal flow components" in lines 1-3. It is unclear what is meant by such a recitation. It appears that words may be missing from the recitation, but it is unknown what those words are and therefore what is intended to be claimed.

13. Claim 7 recites the limitation "further comprising providing deliver feedback signals to the external control unit from one or more sensors" in lines 1-2. It is unclear what is meant by such recitation. It appears that words may be missing from the recitation, but it is unknown what those words are and therefore what is intended to be claimed.

14. Claim 8 recites the limitation "further comprising delivering energy the second magnetic device in response to the external control unit" in lines 1-2. It is unclear what is meant by such recitation. It appears that words may be missing from the recitation, but it is unknown what those words are and therefore what is intended to be claimed. Is the claim intending to claim delivering energy *to* the second magnetic device, in which case, it is unclear what it is in response to relating to the control unit?

15. Claim 10 recites the limitation "The method of claim 10" in line 1. It is unclear from which claim the claim is intended to depend.

16. Claim 11 recites the limitation "The method of claim 11" in line 1. It is unclear from which claim the claim is intended to depend.

17. Claim 11 recites the limitation "the fixed control value" in line 1. There is insufficient antecedent basis for this limitation in the claim.

18. Claim 12 recites the limitation "the second magnetic device is positioned closer to the blood outflow port than the suction end of the inflow tube" in lines 1-2. It is unclear from the claim if the second magnetic device is positioned closer to the blood outflow port than it is positioned relative to the suction end of the inflow tube or if the second magnetic device is positioned closer to the blood outflow port than the suction end of the inflow tube is positioned relative to the blood outflow port.

19. Claim 14 recites the limitation "the magnetically driven rotor is positioned at a distal end of a catheter" in lines 1-2. It is unclear from the claim if the catheter is part of the heart assist pump device or if the claim is intending the heart assist pump device to be at the end of a catheter.

Allowable Subject Matter

20. Claims 1-18 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), 2nd paragraph, set forth in this Office action.

21. The following is a statement of reasons for the indication of allowable subject matter: It is the opinion of the examiner that the art of record (considered as a whole) neither anticipates nor renders obvious delivering a heart assist pump device to a heart so that a suction end of an inflow tube of the heart assist pump device is inserted into a ventricle of the heart while a magnetically driven rotor of the heart assist pump device is positioned outside the ventricle of the heart, wherein the magnetically driven rotor is axially aligned with the inflow tube and is rotatable within a surrounding rotor housing of the heart assist pump device to act upon blood flowing from the inflow tube toward the magnetically driven rotor, the magnetically driven rotor being rotatable

about a central axis and being rigidly coupled to a first magnetic device that is located within the surrounding rotor housing at a position axially adjacent to the magnetically driven rotor, wherein the heart assist pump device further includes: a second magnetic device axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via a magneto coupling with the first magnetic device while being spaced apart and sealed from both the magnetically driven rotor and the first magnetic device, and a blood outflow port positioned radially adjacent the magnetically driven rotor such that blood driven by the magnetically driven rotor is configured to exit the surrounding rotor housing in a direction substantially perpendicular from the blood inflow path and the central axis of the magnetically driven rotor, wherein the magneto coupling orients the magnetically driven rotor so that, in response to rotation of the magnetically driven rotor, the magnetically driven rotor remains entirely spaced apart from the surrounding rotor housing by the blood flowing from the inflow tube and to the blood outflow port in combination with the rest of the claimed limitations set forth in claim 1.

22. While the prior art to Terentiev (U.S. 2001/0039369) discloses delivering a heart assist pump 10 to the heart, where the heart assist pump comprises an inflow tube 22, a magnetically driven rotor 26 rigidly coupled to a first magnetic device 27/28, and a second magnetic device 40 axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via a magneto coupling with the first magnetic device (see Figure 1 and paragraph [0068]), Terentiev fails to disclose that the first magnetic device is located in a rotor housing that surrounds the magnetically driven rotor. Rather, the first magnetic device of Terentiev is integral with the magnetically driven rotor. The prior art to Akdis (U.S. 2011/0238172) which was cited by the Applicant discloses a structure very similar to Terentiev and likewise fails to disclose that the first magnetic device is located in a rotor housing that surrounds the magnetically driven rotor. The prior art, neither alone nor in combination, anticipates nor renders obvious the claimed invention and no motivation is found to modify the prior art to obtain the claimed invention.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAMMIE K MARLEN whose telephone number is (571)272-1986. The examiner can normally be reached Monday through Friday from 8 am until 4 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno can be reached on 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TAMMIE K MARLEN/
Primary Examiner, Art Unit 3792

<i>Notice of References Cited</i>	Application/Control No. 17/560,468		Applicant(s)/Patent Under Reexamination Mohl, Werner	
	Examiner TAMMIE K MARLEN		Art Unit 3792	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20010039369-A1	11-2001	Terentiev, Alexandre N.	F04D29/048	600/16
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<i>Search Notes</i> 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

CPC - Searched*		
Symbol	Date	Examiner
A61M60/40,405,148,135,422,857,205,833,414	02/23/2022	TKM
F04D13/027	02/23/2022	TKM
A61M1/101,1015,1008,1031,1032,1036,1029,122,125	02/23/2022	TKM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor name and assignee search	02/23/2022	TKM
Text-limited and related application search – see search history printout	02/23/2022	TKM

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	
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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	99	((("MOHL") near3 ("Werner"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/02/23 09:58 AM
L2	10	((("MIRACOR") near3 ("MEDICAL") near3 ("SA"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/02/23 09:59 AM
L3	30167	A61M60/40,405,148,135,422,857,205,833,414.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/23 10:03 AM
L4	2422	F04D13/027.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/23 10:03 AM
L5	2766	A61M1/101,1015,1008,1031,1032,1036,1029,122,125.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO;	OR	ON	ON	2022/02/23 10:04 AM

L6	34465	3 4 5	JPO; DERWENT; IBM_TDB) (US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO)); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/23 10:05 AM
L9	10025	6 AND (magnet magneto magnetic\$6) AND blood	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO)); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/23 10:13 AM
L10	3067	9 AND @ad<="20070227"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO)); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/23 10:14 AM
L11	18	("20080214888" OR "20110238172" OR "4674518" OR "5308319" OR "5449342" OR "5470208" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/02/25 02:23 PM

		"5964694" OR "6007478" OR "6083260" OR "6155969" OR "6176848" OR "6506146" OR "6508787" OR "6540658" OR "6623475" OR "7699586" OR "8255050" OR "9616157").pn.					
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PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Sheet 1 of 2

Substitute Disclosure Form U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25955-0013007	Application No. 17/560,468
Information Disclosure Statement by Applicant (Use several sheets if necessary)		
(37 CFR §1.98(b))	Applicant Miracor Medical SA	Filing Date December 23, 2021
		Group Art Unit OPAP

U.S. Patent Documents							
Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Filing Date If Appropriate	Class	Subclass
	1.	4674518	6/23/1987	Salo			
	2.	5308319	5/3/1994	Ide et al.			
	3.	5449342	9/12/1995	Hirose et al.			
	4.	5470208	11/28/1995	Kletschka			
	5.	5964694	10/12/1999	Siess et al.			
	6.	6007478	12/28/1999	Siess et al.			
	7.	6083260	7/4/2000	Aboul-Hosn			
	8.	6155969	12/5/2000	Schima et al.			
	9.	6176848	1/23/2001	Rau et al.			
	10.	6506146	1/14/2003	Mohl			
	11.	6508787	1/21/2003	Erbel et al.			
	12.	6540658	4/1/2003	Faschiano			
	13.	6623475	9/23/2003	Siess			
	14.	7699586	4/20/2010	LaRose et al.			
	15.	8255050	8/28/2012	Mohl			
	16.	9616157	4/11/2017	Akdis			
	17.	2008/0214888	9/4/2008	Ben Shalom, Zvi			
	18.	2011/0238172	9/29/2011	Akdis			

Foreign Patent Documents or Published Foreign Patent Applications							
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Translation	Class	Subclass
	19.	EP 0075606	4/6/1983	EP			
	20.	EP 0503839	9/16/1992	EP			
	21.	EP 1011753	6/28/2000	EP			
	22.	EP 1034808	9/13/2000	EP			
	23.	FR 1187249	8/8/1959	FR			
	24.	WO 1997/37698	10/16/1997	WO			

Examiner Signature	Date Considered
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

Sheet 2 of 2

Substitute Disclosure Form U.S. Department of Commerce Patent and Trademark Office	Attorney Docket No. 25955-0013007	Application No. 17/560,468
Information Disclosure Statement by Applicant (Use several sheets if necessary)		
(37 CFR §1.98(b))	Applicant Miracor Medical SA	Filing Date December 23, 2021

Foreign Patent Documents or Published Foreign Patent Applications							
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Translation	Class	Subclass
	25.	WO 1999/15213	4/1/1999	WO			
	26.	WO 2000/44417	8/3/2000	WO			
	27.	WO 2001/70300	9/27/2001	WO			

Other Documents (include Author, Title, Date, and Place of Publication)		
Examiner Initial	Desig. ID	Document
	28.	AUTHORIZED OFFICER MALTE KADEN, International Search Report for Application No. PCT/IB2008/000421, dated November 7, 2008, 3 pages.
	29.	Mohl et al., "Intermittent Pressure Elevation of the Coronary Venous System as a Method to Protect Ischemic Myocardium," Interactive CardioVascular and Thoracic Surgery, Volume 4, 2005, pp. 66-69
	30.	Syeda et al., "The Salvage Potential of Coronary Sinus Interventions: Meta-Analysis and Pathophysiologic Consequences," The Journal of Thoracic and Cardiovascular Surgery, Volume 127, Number 6 (June 2004), pp. 1703-1712

Examiner Signature /TAMMIE K MARLEN/	Date Considered 02/25/2022
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Substitute Disclosure Form

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.K.M./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor : Werner Mohl Art Unit : OPAP
Application No. : 17/560,468 Examiner : Central, Docket
Filed : December 23, 2021 Conf. No. : 7399
Title : DEVICE TO ASSIST THE PERFORMANCE OF A HEART

MAIL STOP AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Please consider the documents listed on the disclosure form submitted with this statement. Copies of the documents are being submitted with this statement to the extent required under 37 C.F.R. § 1.98(a)(2).

Under 35 U.S.C. § 120, this application relies on the earlier filing date of application number 17/558,979, 17/446,046, and 16/282,948, filed on December 22, 2021, August 26, 2021, and February 22, 2019. The document corresponding to Desig. ID No. 27 has not been submitted to and/or cited by the Office in the prior applications. All other listed documents were submitted to and/or cited by the Office in the prior applications, and so copies of those documents are not provided in this application.

This statement is being filed within three months of the filing date of the application or before the receipt of a first action on the merits.

Apply any necessary charges or credits applicable under 37 C.F.R. § 1.17(p) to deposit account 06-1050, referencing the above attorney docket number.

Please contact the undersigned if there are any questions regarding this statement.

Respectfully submitted,

Date: January 7, 2022

/Alex Yu/

Alex Yu, Reg. No. 74,295

Customer Number 26191
Fish & Richardson P.C.
Telephone: +1 (650) 839-5047
Facsimile: (877) 769-7945

62853341.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor :	Werner Mohl	Art Unit :	3746
Application No. :	17/560,468	Examiner :	Tammie K. Marlen
Filed :	December 23, 2021	Conf. No. :	7399
Title :	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Mail Stop Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

REPLY TO ACTION OF MARCH 2, 2022

Please consider the following reply.

Amendments to Claims:

Listing of Claims.

1. (Currently Amended) A method for assisting the blood circulation of a heart in a body, comprising:

delivering a heart assist pump device to the heart so that a suction end of an inflow tube of the heart assist pump device is inserted into a ventricle of the heart while a magnetically driven rotor of the heart assist pump device is positioned outside the ventricle of the heart, wherein the magnetically driven rotor is axially aligned with the inflow tube and is rotatable within a surrounding rotor housing of the heart assist pump device to act upon blood flowing from the inflow tube toward the magnetically driven rotor, the magnetically driven rotor being rotatable about a central axis and being rigidly coupled to a first magnetic device that is located within the surrounding rotor housing at a position axially adjacent to the magnetically driven rotor, wherein the heart assist pump device further includes: a second magnetic device axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via a magneto coupling with the first magnetic device while being spaced apart and sealed from both the magnetically driven rotor and the first magnetic device, and a blood outflow port positioned radially adjacent the magnetically driven rotor such that blood driven by the magnetically driven rotor is configured to exit the surrounding rotor housing in a direction substantially perpendicular from the blood inflow path and the central axis of the magnetically driven rotor, wherein the magneto coupling orients the magnetically driven rotor so that, in response to rotation of the magnetically driven rotor, the magnetically driven rotor remains entirely spaced apart from the surrounding rotor housing by the blood flowing from the inflow tube and to the blood outflow port; and

connecting an external control unit to the heart assist pump device for regulating operation of the second magnetic device to thereby magnetically drive the rotation of the magnetically driven rotor via the magneto coupling with the first magnetic device, the external control unit being positioned exterior to ~~the~~ a body while the inflow tube of the heart assist pump device is ~~implanted~~ in the heart.

2. (Currently Amended) The method of claim 1, wherein in response to the rotation of the magnetically driven rotor via the magneto coupling, guide surfaces of the magnetically driven rotor ~~to~~ produce centrifugal flow components.
3. (Original) The method of claim 2, wherein the surrounding rotor housing comprises at least one sealing wall between the first magnetic device and the second magnetic device, and the first magnetic device is positioned between the second magnetic device and the magnetically driven rotor.
4. (Original) The method of claim 3, wherein the first magnetic device rotates together with the magnetically driven rotor relative to the surrounding rotor housing.
5. (Original) The method of claim 1, wherein the external control unit controls the second magnetic device in response to measurement values indicative of cardiac output of the heart.
6. (Original) The method of claim 1, wherein both the magnetically driven rotor and first magnetic device are entirely spaced apart from the surrounding rotor housing by a gap during rotation of the magnetically driven rotor.
7. (Currently Amended) The method of claim 1-claim 10, further comprising providing ~~deliver~~ feedback signals to the external control unit from one or more sensors.
8. (Currently Amended) The method of claim 1-claim 10, further comprising delivering energy to the second magnetic device ~~in response to~~ from the external control unit.
9. (Currently Amended) The method of claim 8-claim 11, wherein the external control unit delivers energy to the second magnetic device via delivery of a driving fluid.
10. (Currently Amended) The method of claim 1-claim 10, wherein the external control unit is configured to regulate operation of the second magnetic device based on a fixed control value.

11. (Currently Amended) The method of claim 1-claim 11, wherein the fixed control value comprises a defined cardiac output for control of the heart assist pump device.
12. (Currently Amended) The method of claim 1, wherein the second magnetic device is positioned closer to the blood outflow port than the second magnetic device is positioned relative to the suction end of the inflow tube.
13. (Currently Amended) The method of claim 1, wherein the heart assist pump device is a catheter device.
14. (Currently Amended) The method of claim 13-claim 1, wherein the magnetically driven rotor is positioned at a distal end of the a-catheter device.
15. (Original) The method of claim 1, wherein the second magnetic device is configured to rotate during rotation of the magnetically driven rotor.
16. (Original) The method of claim 17, further comprising a drive wheel configured to urge rotation of the second magnetic device.
17. (Original) The method of claim 1, wherein the first magnetic device comprises a bar magnet.
18. (Original) The method of claim 1, wherein the second magnetic device comprises a bar magnet.

First Named Inventor : Werner Mohl
Application No. : 17/560,468
Filed : December 23, 2021
Page : 5 of 6

Attorney Docket No.: 25955-0013007

REMARKS

Claims 1, 2, and 7-14 have been amended to correct minor typographical errors or to add clarity (as suggested in the Office Action). Written description support for these amendments is found throughout the original specification. No new matter has been added. Applicant respectfully requests reconsideration and allowance of all claims 1-18.

Interview Summary

Applicant thanks the Examiner for participating in a telephone interview on March 25, 2022, during which the § 112 rejection of claim 1 was discussed. It was agreed that the amendment to claim 1 would overcome the § 112 rejection so that claim 1 would be in condition for allowance.

Claim Rejections – 35 U.S.C. § 112

Claims 1-18 were rejected under 35 U.S.C. § 112, ¶ 2 as being allegedly being indefinite. Applicant respectfully submits that the amendments to claims 1, 2, and 7-14 address the issues identified in the Office Action, and requests withdrawal of the § 112 rejections.

Accordingly, claims 1-18 are in condition for allowance.

Request for Reconsideration

The Applicant respectfully requests prompt consideration and a Notice of Allowance. **In the event that no Notice of Allowance will be provided in the next communication, Applicant requests that the Examiner telephone the undersigned attorney (612-337-2569) prior to the next communication so that prosecution on the merits may be expedited.**

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper. Applicant hereby specifically reserves the right to prosecute claims of different or broader scope

First Named Inventor : Werner Mohl
Application No. : 17/560,468
Filed : December 23, 2021
Page : 6 of 6

Attorney Docket No.: 25955-0013007

in a continuation application. The Patent Office should infer no (i) adoption of a position with respect to patentability, (ii) change in the Applicant's position with respect to any claim or subject matter of the invention, or (iii) acquiescence in any way to any position taken by the Office Action, based on the amendments made herein.

No fees are believed to be due at this time. If necessary, please apply any required charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: March 25, 2022

/Michael T. Hawkins/

Michael T. Hawkins, Reg. No. 57,867

Customer Number 26191
Fish & Richardson P.C.
Telephone: +1 (650) 839-5047
Facsimile: (877) 769-7945

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Electronic Acknowledgement Receipt	
EFS ID:	45323805
Application Number:	17560468
International Application Number:	
Confirmation Number:	7399
Title of Invention:	DEVICE TO ASSIST THE PERFORMANCE OF A HEART
First Named Inventor/Applicant Name:	Werner Mohl
Customer Number:	26191
Filer:	Michael T. Hawkins/Kirstin Matteo
Filer Authorized By:	Michael T. Hawkins
Attorney Docket Number:	25955-0013007
Receipt Date:	25-MAR-2022
Filing Date:	23-DEC-2021
Time Stamp:	16:57:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		25955-0013007_Resp-NFOA.pdf	108969	yes	6
			29be0eb243001c01628bbb15235b9302e2d8dfa2		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Request for Reconsideration-After Non-Final Rejection	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	6
Warnings:			
Information:			
Total Files Size (in bytes):		108969	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>			

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 17/560,468		Filing Date 12/23/2021		☐ To be Mailed	
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO									
APPLICATION AS FILED - PART I									
		(Column 1)	(Column 2)						
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)		
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))		N/A	N/A		N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A				
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =	*		x \$50 =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*		x \$240 =				
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).							
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL				
APPLICATION AS AMENDED - PART II									
		(Column 1)	(Column 2)		(Column 3)				
AMENDMENT	03/25/2022	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 18	Minus	** 20	= 0		x \$50 =		0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x \$240 =		0
	☐ Application Size Fee (37 CFR 1.16(s))								
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
							TOTAL ADD'L FEE		0
AMENDMENT		(Column 1)	(Column 2)		(Column 3)				
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x \$0 =		
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x \$0 =		
	☐ Application Size Fee (37 CFR 1.16(s))								
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
							TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.							SLIE		
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".							/DESHONNE T. MARTINO-RAY/		
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".									
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

26191 7590 04/13/2022
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER

MARLEN, TAMMIE K

ART UNIT

PAPER NUMBER

3792

DATE MAILED: 04/13/2022

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/560,468	12/23/2021	Werner Mohl	25955-0013007	7399

TITLE OF INVENTION: DEVICE TO ASSIST THE PERFORMANCE OF A HEART

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	07/13/2022

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26191 7590 04/13/2022
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/560,468	12/23/2021	Werner Mohl	25955-0013007	7399

TITLE OF INVENTION: DEVICE TO ASSIST THE PERFORMANCE OF A HEART

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	07/13/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
MARLEN, TAMMIE K	3792	600-016000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/560,468	12/23/2021	Werner Mohl	25955-0013007	7399
26191	7590	04/13/2022	EXAMINER	
FISH & RICHARDSON P.C. (TC)			MARLEN, TAMMIE K	
PO BOX 1022			ART UNIT	PAPER NUMBER
MINNEAPOLIS, MN 55440-1022			3792	

DATE MAILED: 04/13/2022

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.** Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 17/560,468	Applicant(s) Mohl, Werner	
	Examiner TAMMIE K MARLEN	Art Unit 3792	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 3/25/2022.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-18 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
Certified copies:
a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)	5. ☒ Examiner's Amendment/Comment
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.	6. ☒ Examiner's Statement of Reasons for Allowance
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.	7. ☐ Other _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	
--	--

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Please amend the Abstract as follows:

A method and device to assist the performance of a heart with at least one pump that is formed as a rotary pump and driven via magneto coupling. The pump includes a magnetically driven rotor rotatable within a surrounding rotor housing to act upon blood flowing from an inflow tube toward the magnetically driven rotor, and a second magnetic device axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via the magneto coupling.

In the claims:

In claim 11, line 1, immediately after "...method of claim", please delete "1" and insert --10--.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance: It is the opinion of the examiner that the art of record (considered as a whole) neither anticipates nor renders obvious delivering a heart assist pump device to a heart so that a suction end of an inflow tube of the heart assist pump device is inserted into a ventricle of the heart while a magnetically driven rotor of the heart assist pump device is positioned outside the ventricle of the heart, wherein the magnetically driven rotor is axially aligned with the inflow tube and is rotatable within a surrounding rotor housing of the heart assist pump device to act upon blood flowing from the inflow tube toward the

magnetically driven rotor, the magnetically driven rotor being rotatable about a central axis and being rigidly coupled to a first magnetic device that is located within the surrounding rotor housing at a position axially adjacent to the magnetically driven rotor, wherein the heart assist pump device further includes: a second magnetic device axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via a magneto coupling with the first magnetic device while being spaced apart and sealed from both the magnetically driven rotor and the first magnetic device, and a blood outflow port positioned radially adjacent the magnetically driven rotor such that blood driven by the magnetically driven rotor is configured to exit the surrounding rotor housing in a direction substantially perpendicular from the blood inflow path and the central axis of the magnetically driven rotor, wherein the magneto coupling orients the magnetically driven rotor so that, in response to rotation of the magnetically driven rotor, the magnetically driven rotor remains entirely spaced apart from the surrounding rotor housing by the blood flowing from the inflow tube and to the blood outflow port in combination with the rest of the claimed limitations set forth in claim 1.

5. While the prior art to Terentiev (U.S. 2001/0039369) discloses delivering a heart assist pump 10 to the heart, where the heart assist pump comprises an inflow tube 22, a magnetically driven rotor 26 rigidly coupled to a first magnetic device 27/28, and a second magnetic device 40 axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via a magneto coupling with the first magnetic device (see Figure 1 and paragraph [0068]), Terentiev fails to disclose that the first magnetic device is located in a rotor housing that surrounds the magnetically driven rotor. Rather, the first magnetic device of Terentiev is integral with the magnetically driven rotor. The prior art to Akdis (U.S. 2011/0238172) which was cited by the Applicant discloses a structure very similar to Terentiev and likewise fails to disclose that the first magnetic device is located in a rotor housing that surrounds the magnetically driven rotor. The prior art, neither alone nor in combination, anticipates nor renders obvious the claimed invention and no motivation is found to modify the prior art to obtain the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAMMIE K MARLEN whose telephone number is (571)272-1986. The examiner can normally be reached Monday through Friday from 8 am until 4 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno can be reached on 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TAMMIE K MARLEN/
Primary Examiner, Art Unit 3792

<i>Search Notes</i> 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

CPC - Searched*		
Symbol	Date	Examiner
A61M60/40,405,148,135,422,857,205,833,414	02/23/2022	TKM
F04D13/027	02/23/2022	TKM
A61M1/101,1015,1008,1031,1032,1036,1029,122,125	02/23/2022	TKM
Updated above	04/06/2022	TKM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

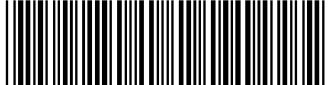
Search Notes		
Search Notes	Date	Examiner
Inventor name and assignee search	02/23/2022	TKM
Text-limited and related application search – see search history printout	02/23/2022	TKM
Updated above	04/06/2022	TKM

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	
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<i>Search Notes</i> 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	PGPUB text search -- see interference search printout	04/06/2022	TKM

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	
--	--

Issue Classification 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

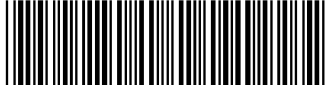
CPC						
Symbol					Type	Version
A61M	/	60	/	40	F	2021-01-01
A61M	/	60	/	205	I	2021-01-01
F04D	/	13	/	027	I	2013-01-01
A61M	/	60	/	857	I	2021-01-01
A61M	/	60	/	135	I	2021-01-01
A61M	/	60	/	148	I	2021-01-01
A61M	/	60	/	405	I	2021-01-01
A61M	/	60	/	422	I	2021-01-01
A61M	/	60	/	833	A	2021-01-01
A61M	/	60	/	414	A	2021-01-01

CPC Combination Sets					
Symbol				Type	Set
	/		/		

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 18	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792 (Primary Examiner) _____ (Date) 06 April 2022		O.G. Print Claim(s) 1	O.G. Print Figure 2

U.S. Patent and Trademark Office

Part of Paper No.: 20220406

Issue Classification 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

INTERNATIONAL CLASSIFICATION			
CLAIMED			
A61M60/40		60	40

NON-CLAIMED			

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	18	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	06 April 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	10	10												
2	2	11	11												
3	3	12	12												
4	4	13	13												
5	5	14	14												
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7	7	17	16												
8	8	16	17												
9	9	18	18												

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 18	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792 (Primary Examiner) _____ (Date) 06 April 2022		O.G. Print Claim(s) 1	O.G. Print Figure 2

Bibliographic Data

Application No: 17/560,468

Foreign Priority claimed: ☒ Yes ☐ No

35 USC 119 (a-d) conditions met: ☒ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /TAMMIE K MARLEN/

Examiner's Signature

Initials

Title:

DEVICE TO ASSIST THE PERFORMANCE OF A HEART

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/23/2021	600	3792	25955-0013007
RULE			

APPLICANTS

Miracor Medical SA, Awans, BELGIUM

INVENTORS

Werner Mohl, Altenmarkt-Thennenberg, AUSTRIA

CONTINUING DATA

This application is a CON of 17558979 12/22/2021

17558979 is a CON of 17446046 08/26/2021

17446046 is a CON of 16282948 02/22/2019 PAT 11123540

16282948 is a CON of 14454965 08/08/2014 PAT 10251984

14454965 is a CON of 13555318 07/23/2012 PAT 8801590

13555318 is a DIV of 12449632 08/18/2009 PAT 8255050

12449632 is a 371 of PCT/IB2008/000421 02/27/2008

FOREIGN APPLICATIONS

AUSTRIA ATA 306/2007 02/27/2007

IF REQUIRED, FOREIGN LICENSE GRANTED**

01/05/2022

**** SMALL ENTITY ****

STATE OR COUNTRY

AUSTRIA

ADDRESS

FISH & RICHARDSON P.C. (TC)

PO BOX 1022

MINNEAPOLIS, MN 55440-1022

UNITED STATES

FILING FEE RECEIVED

\$3,000

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
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PE2E SEARCH - Search History (Interference)

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/560,468	12/23/2021	Werner Mohl	25955-0013007

CONFIRMATION NO. 7399

26191
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

PUBLICATION NOTICE



OC000000133170525

Title:DEVICE TO ASSIST THE PERFORMANCE OF A HEART

Publication No.US-2022-0111195-A1

Publication Date:04/14/2022

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

CORRECTED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	17/560,468
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove				
Legal Name				
Prefix	Given Name	Middle Name	Family Name	Suffix
	Werner		Mohl	
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service				
City	Altenmarkt-Thennenberg Altenmarkt-Thenneberg	Country of Residence ⁱ		AT
Mailing Address of Inventor:				
Address 1		Hafnerberg 66		
Address 2				
City	Altenmarkt-Thennenberg Altenmarkt-Thenneberg	State/Province		
Postal Code	2571	Country ⁱ	AT	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add				

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	26191		
Email Address	apsi@fr.com	Add Email	Remove Email

Application Information:

Title of the Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		
Attorney Docket Number	25955-0013007	Small Entity Status Claimed ☒	
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	3	Suggested Figure for Publication (if any)	

CORRECTED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	<u>17/560,468</u>
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	26191		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	17558979	2021-12-22

CORRECTED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number		25955-0013007	
		Application Number		17/560,468	
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART				

Prior Application Status		Pending		Remove	
Application Number		Continuity Type		Prior Application Number	
17558979		Continuation of		17446046	
Filing or 371(c) Date (YYYY-MM-DD)		2021-08-26			

Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
17446046		Continuation of		16282948	
Filing Date (YYYY-MM-DD)		2019-02-22		Patent Number	
Issue Date (YYYY-MM-DD)		2021-09-21			

Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
16282948		Continuation of		14454965	
Filing Date (YYYY-MM-DD)		2014-08-08		Patent Number	
Issue Date (YYYY-MM-DD)		2019-04-09			

Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
14454965		Continuation of		13555318	
Filing Date (YYYY-MM-DD)		2012-07-23		Patent Number	
Issue Date (YYYY-MM-DD)		2014-08-12			

Prior Application Status		Patented		Remove	
Application Number		Continuity Type		Prior Application Number	
13555318		Division of		12449632	
Filing Date (YYYY-MM-DD)		2009-08-18		Patent Number	
Issue Date (YYYY-MM-DD)		2012-08-28			

Prior Application Status		Expired		Remove	
Application Number		Continuity Type		Prior Application Number	
12449632		a 371 of international		PCTIB2008000421	
Filing or 371(c) Date (YYYY-MM-DD)		2008-02-27			

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number		Country ⁱ		Filing Date (YYYY-MM-DD)		Remove	
Access Code ⁱ (if applicable)							
A306/2007		AT		2007-02-27			

CORRECTED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	<u>17/560,468</u>
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

CORRECTED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	<u>17/560,468</u>
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

CORRECTED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	17/560,468
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant 1			
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p>			
<input type="button" value="Clear"/>			
☒ Assignee		☐ Legal Representative under 35 U.S.C. 117	
☐ Person to whom the inventor is obligated to assign.		☐ Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>			
Name of the Deceased or Legally Incapacitated Inventor: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>			
If the Applicant is an Organization check here. ☒			
Organization Name	Miracor Medical SA		
Mailing Address Information For Applicant:			
Address 1	E40 Business Park		
Address 2	Rue de Bruxelles 174		
City	Awans	State/Province	
Country	BE	Postal Code	B-4340
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

CORRECTED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	<u>17/560,468</u>
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		State/Province	
Country ⁱ		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	Michael T. Hawkins / <u>Alex Yu</u>	Date (YYYY-MM-DD)	<u>April 18, 2022</u> 2021-12-23
First Name	Michael T. <u>Alex</u>	Last Name	Hawkins <u>Yu</u>
Registration Number		57,867 <u>74295</u>	

Additional Signature may be generated within this form by selecting the Add button.

CORRECTED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	25955-0013007
		Application Number	<u>17/560,468</u>
Title of Invention	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt	
EFS ID:	45496916
Application Number:	17560468
International Application Number:	
Confirmation Number:	7399
Title of Invention:	DEVICE TO ASSIST THE PERFORMANCE OF A HEART
First Named Inventor/Applicant Name:	Werner Mohl
Customer Number:	26191
Filer:	Alex Yu/Kirstin Matteo
Filer Authorized By:	Alex Yu
Attorney Docket Number:	25955-0013007
Receipt Date:	18-APR-2022
Filing Date:	23-DEC-2021
Time Stamp:	15:14:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	25955-0013007_Supplemental-ADS.pdf	1527676	no	9
			c29c18b77dbd5c28679c5720c57d39f843487cd0c		

Warnings:

Information:	
This is not an USPTO supplied ADS fillable form	
Total Files Size (in bytes):	1527676
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor :	Werner Mohl	Art Unit :	3792
Application No. :	17/560,468	Examiner :	Tammie K. Marlen
Filed :	December 23, 2021	Confirmation No. :	7399
		Notice of Allowance Date: 4/13/2022	
Title :	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

MAIL STOP ISSUE FEE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE
PURSUANT TO 37 C.F.R. §1.312

Please amend the application as indicated on the following pages. This amendment is being filed prior to the payment of the issue fee.

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for assisting the blood circulation of a heart in a body, comprising:

delivering a heart assist pump device to the heart so that a suction end of an inflow tube of the heart assist pump device is inserted into a ventricle of the heart while a magnetically driven rotor of the heart assist pump device is positioned outside the ventricle of the heart, wherein the magnetically driven rotor is axially aligned with the inflow tube and is rotatable within a surrounding rotor housing of the heart assist pump device to act upon blood flowing from the inflow tube toward the magnetically driven rotor, the magnetically driven rotor being rotatable about a central axis and being rigidly coupled to a first magnetic device that is located within the surrounding rotor housing at a position axially adjacent to the magnetically driven rotor, wherein the heart assist pump device further includes: a second magnetic device axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via a magneto coupling with the first magnetic device while being spaced apart and sealed from both the magnetically driven rotor and the first magnetic device, and a blood outflow port positioned radially adjacent the magnetically driven rotor such that blood driven by the magnetically driven rotor is configured to exit the surrounding rotor housing in a direction substantially perpendicular from the ~~blood inflow tube path~~ and the central axis of the magnetically driven rotor, wherein the magneto coupling orients the magnetically driven rotor so that, in response to rotation of the magnetically driven rotor, the magnetically driven rotor remains entirely spaced apart from the surrounding rotor housing by the blood flowing from the inflow tube and to the blood outflow port; and

connecting an external control unit to the heart assist pump device for regulating operation of the second magnetic device to thereby magnetically drive the rotation of the magnetically driven rotor via the magneto coupling with the first magnetic device, the external control unit being positioned exterior to the body while the inflow tube of the heart assist pump device is in the heart.

2. (Previously Presented) The method of claim 1, wherein in response to the rotation of the magnetically driven rotor via the magneto coupling, guide surfaces of the magnetically driven rotor produce centrifugal flow components.
3. (Original) The method of claim 2, wherein the surrounding rotor housing comprises at least one sealing wall between the first magnetic device and the second magnetic device, and the first magnetic device is positioned between the second magnetic device and the magnetically driven rotor.
4. (Original) The method of claim 3, wherein the first magnetic device rotates together with the magnetically driven rotor relative to the surrounding rotor housing.
5. (Original) The method of claim 1, wherein the external control unit controls the second magnetic device in response to measurement values indicative of cardiac output of the heart.
6. (Original) The method of claim 1, wherein both the magnetically driven rotor and first magnetic device are entirely spaced apart from the surrounding rotor housing by a gap during rotation of the magnetically driven rotor.
7. (Previously Presented) The method of claim 1, further comprising providing feedback signals to the external control unit from one or more sensors.
8. (Previously Presented) The method of claim 1, further comprising delivering energy to the second magnetic device from the external control unit.
9. (Previously Presented) The method of claim 8, wherein the external control unit delivers energy to the second magnetic device via delivery of a driving fluid.
10. (Previously Presented) The method of claim 1, wherein the external control unit is configured to regulate operation of the second magnetic device based on a fixed control value.

First Named Inventor : Werner Mohl
Application No. : 17/560,468
Filed : December 23, 2021
Page : 4

Attorney Docket No.: 25955-0013007

11. (Previously Presented) The method of claim 10, wherein the fixed control value comprises a defined cardiac output for control of the heart assist pump device.
12. (Previously Presented) The method of claim 1, wherein the second magnetic device is positioned closer to the blood outflow port than the second magnetic device is positioned relative to the suction end of the inflow tube.
13. (Previously Presented) The method of claim 1, wherein the heart assist pump device is a catheter device.
14. (Previously Presented) The method of claim 13, wherein the magnetically driven rotor is positioned at a distal end of the catheter device.
15. (Original) The method of claim 1, wherein the second magnetic device is configured to rotate during rotation of the magnetically driven rotor.
16. (Original) The method of claim 17, further comprising a drive wheel configured to urge rotation of the second magnetic device.
17. (Original) The method of claim 1, wherein the first magnetic device comprises a bar magnet.
18. (Original) The method of claim 1, wherein the second magnetic device comprises a bar magnet.

First Named Inventor : Werner Mohl
Application No. : 17/560,468
Filed : December 23, 2021
Page : 5

Attorney Docket No.: 25955-0013007

REMARKS

Applicant asks that all claims be examined in view of the amendment to the claims.
Applicant asserts that no new matter has been added by these amendments.

Applicant believes no fees are due with this submission. However, if applicant is incorrect, please apply any necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: April 21, 2022

/Alex Yu/
Alex Yu, Reg. No. 74,295

Customer Number 26191
Fish & Richardson P.C.
Telephone: +1 (650) 839-5047
Facsimile: (877) 769-7945

41586086.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor :	Werner Mohl	Art Unit :	3792
Application No. :	17/560,468	Examiner :	Tammie K. Marlen
Filed :	December 23, 2021	Conf. No. :	7399
Title :	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CORRECTED OFFICIAL FILING RECEIPT

Please correct the Filing Receipt for the above-referenced application to note the foreign priority application documents were submitted in parent application U.S. Application No. 12/449,632, filed 08/18/2009, patented as U.S. Patent No. 8,255,050.

Please supply a corrected Filing Receipt to the undersigned with respect to this application.

No fee is believed to be due. If, however, there are any necessary charges or credits, please apply them to Deposit Account No. 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: April 21, 2022

/Alex Yu/

Alex Yu, Reg. No. 74,295

Customer Number 26191
Fish & Richardson P.C.
Telephone: +1 (650) 839-5047
Facsimile: (877) 769-7945

41586588.doc

Electronic Patent Application Fee Transmittal				
Application Number:		17560468		
Filing Date:		23-Dec-2021		
Title of Invention:		DEVICE TO ASSIST THE PERFORMANCE OF A HEART		
First Named Inventor/Applicant Name:		Werner Mohl		
Filer:		Alex Yu/Kirstin Matteo		
Attorney Docket Number:		25955-0013007		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	600	600

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				600

Electronic Acknowledgement Receipt	
EFS ID:	45531157
Application Number:	17560468
International Application Number:	
Confirmation Number:	7399
Title of Invention:	DEVICE TO ASSIST THE PERFORMANCE OF A HEART
First Named Inventor/Applicant Name:	Werner Mohl
Customer Number:	26191
Filer:	Alex Yu/Kirstin Matteo
Filer Authorized By:	Alex Yu
Attorney Docket Number:	25955-0013007
Receipt Date:	21-APR-2022
Filing Date:	23-DEC-2021
Time Stamp:	15:58:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 600
RAM confirmation Number	E20224KF58224112
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Post Allowance Communication - Incoming	25955-0013007_Resp-NOA.pdf	68754	no	2
			7037bac311a963fce5796ea853ca31af970f6c9c		
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	25955-0013007_Issue-fee.pdf	147151	no	1
			08487804bd0bf65b6ceb3b82524460e0b45ed41		
Warnings:					
Information:					
3		25955-0013007_Amend312.pdf	85225	yes	5
			f7556d45bace1e2872d77f9fc2e357bdc8112153		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment after Notice of Allowance (Rule 312)		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	5	
Warnings:					
Information:					
4	Request for Corrected Filing Receipt	25955-0013007_Req-OFR.pdf	47036	no	1
			f7e03e103051ea61124b44a532ab8b881af0c845		
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	37942	no	2
			9b16962b0593f8fd632df63a5cfa2a2b032644da		

Warnings:	
Information:	
Total Files Size (in bytes):	386108
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

First Named Inventor : Werner Mohl
Application No. : 17/560,468
Filed : December 23, 2021
Page : 2 of 2

Attorney Docket No.: 25955-0013007

Respectfully submitted,

Date: April 21, 2022

/Alex Yu/

Alex Yu, Reg. No. 74,295

Customer Number 26191
Fish & Richardson P.C.
Telephone: +1 (650) 839-5047
Facsimile: (877) 769-7945

41586580.doc

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22314-1450

By fax, send to: (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26191 7590 04/13/2022

FISH & RICHARDSON P.C.
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below:

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/560,468	12/23/2021	Werner Mohl	25955-0013007	7399

TITLE OF INVENTION: DEVICE TO ASSIST THE PERFORMANCE OF A HEART

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0	\$0	\$600	07/13/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
MARLEN, TAMMIE K.	3792	600-016000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 Fish & Richardson P.C.
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE
Miracor Medical SA

(B) RESIDENCE: (CITY and STATE OR COUNTRY)
Vienna, Austria

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees Submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment (Please first reapply any previously paid fee shown above):

- ☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)
- ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account No. 06-1050

5. Change of Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27.
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid Certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken as a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken as a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Alex Yu/

Date April 21, 2022

Typed or printed name Alex Yu

Registration No. 74,295

PTOL-85 Part B (08-18). Approved for use through 3/31/2023

OMB 0651-0033

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO.	TOT CLAIMS	IND CLAIMS
17/560,468	12/23/2021	3792	830	25955-0013007	18	1

CONFIRMATION NO. 7399
CORRECTED FILING RECEIPT



26191
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

Date Mailed: 04/25/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Werner Mohl, Altenmarkt-Thenneberg, AUSTRIA;

Applicant(s)

Miracor Medical SA, Awans, BELGIUM;

Power of Attorney: The patent practitioners associated with Customer Number 26191

Domestic Priority data as claimed by applicant

This application is a CON of 17/558,979 12/22/2021
which is a CON of 17/446,046 08/26/2021
which is a CON of 16/282,948 02/22/2019 PAT 11123540
which is a CON of 14/454,965 08/08/2014 PAT 10251984
which is a CON of 13/555,318 07/23/2012 PAT 8801590
which is a DIV of 12/449,632 08/18/2009 PAT 8255050
which is a 371 of PCT/IB2008/000421 02/27/2008

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)
AUSTRIA A 306/2007 02/27/2007 No Access Code Provided

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 01/05/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/560,468**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

DEVICE TO ASSIST THE PERFORMANCE OF A HEART

Preliminary Class

600

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/560,468	12/23/2021	Werner Mohl	25955-0013007	7399
26191	7590	05/02/2022		
FISH & RICHARDSON P.C. (TC) PO BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER MARLEN, TAMMIE K	
			ART UNIT 3792	PAPER NUMBER
			NOTIFICATION DATE 05/02/2022	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Corrected Notice of Allowability	Application No. 17/560,468	Applicant(s) Mohl, Werner	
	Examiner TAMMIE K MARLEN	Art Unit 3792	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 4/21/2022.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-18 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
Certified copies:
 a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 12/449,632 .
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____. 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	5. ☒ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☒ Other <u>PTO-271</u> .
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/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	
--	--

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Please amend the Abstract as follows:

A method and device to assist the performance of a heart with at least one pump that is formed as a rotary pump and driven via magneto coupling. The pump includes a magnetically driven rotor rotatable within a surrounding rotor housing to act upon blood flowing from an inflow tube toward the magnetically driven rotor, and a second magnetic device axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via the magneto coupling.

In the claims:

In claim 11, line 1, immediately after "...method of claim", please delete "1" and insert --10--.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance: It is the opinion of the examiner that the art of record (considered as a whole) neither anticipates nor renders obvious delivering a heart assist pump device to a heart so that a suction end of an inflow tube of the heart assist pump device is inserted into a ventricle of the heart while a magnetically driven rotor of the heart assist pump device is positioned outside the ventricle of the heart, wherein the magnetically driven rotor is axially aligned with the inflow tube and is rotatable within a surrounding rotor housing of the heart assist pump device to act upon blood flowing from the inflow tube toward the

magnetically driven rotor, the magnetically driven rotor being rotatable about a central axis and being rigidly coupled to a first magnetic device that is located within the surrounding rotor housing at a position axially adjacent to the magnetically driven rotor, wherein the heart assist pump device further includes: a second magnetic device axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via a magneto coupling with the first magnetic device while being spaced apart and sealed from both the magnetically driven rotor and the first magnetic device, and a blood outflow port positioned radially adjacent the magnetically driven rotor such that blood driven by the magnetically driven rotor is configured to exit the surrounding rotor housing in a direction substantially perpendicular from the blood inflow path and the central axis of the magnetically driven rotor, wherein the magneto coupling orients the magnetically driven rotor so that, in response to rotation of the magnetically driven rotor, the magnetically driven rotor remains entirely spaced apart from the surrounding rotor housing by the blood flowing from the inflow tube and to the blood outflow port in combination with the rest of the claimed limitations set forth in claim 1.

5. While the prior art to Terentiev (U.S. 2001/0039369) discloses delivering a heart assist pump 10 to the heart, where the heart assist pump comprises an inflow tube 22, a magnetically driven rotor 26 rigidly coupled to a first magnetic device 27/28, and a second magnetic device 40 axially aligned with the inflow tube and positioned to magnetically drive rotation of the magnetically driven rotor via a magneto coupling with the first magnetic device (see Figure 1 and paragraph [0068]), Terentiev fails to disclose that the first magnetic device is located in a rotor housing that surrounds the magnetically driven rotor. Rather, the first magnetic device of Terentiev is integral with the magnetically driven rotor. The prior art to Akdis (U.S. 2011/0238172) which was cited by the Applicant discloses a structure very similar to Terentiev and likewise fails to disclose that the first magnetic device is located in a rotor housing that surrounds the magnetically driven rotor. The prior art, neither alone nor in combination, anticipates nor renders obvious the claimed invention and no motivation is found to modify the prior art to obtain the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAMMIE K MARLEN whose telephone number is (571)272-1986. The examiner can normally be reached Monday through Friday from 8 am until 4 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Layno can be reached on 571-272-4949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TAMMIE K MARLEN/
Primary Examiner, Art Unit 3792

<i>Search Notes</i> 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

CPC - Searched*		
Symbol	Date	Examiner
A61M60/40,405,148,135,422,857,205,833,414	02/23/2022	TKM
F04D13/027	02/23/2022	TKM
A61M1/101,1015,1008,1031,1032,1036,1029,122,125	02/23/2022	TKM
Updated above	04/06/2022	TKM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

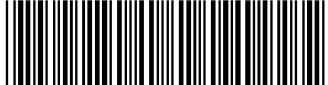
Search Notes		
Search Notes	Date	Examiner
Inventor name and assignee search	02/23/2022	TKM
Text-limited and related application search – see search history printout	02/23/2022	TKM
Updated above	04/06/2022	TKM

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	
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<i>Search Notes</i> 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	PGPUB text search -- see interference search printout	04/06/2022	TKM

/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	
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Issue Classification 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

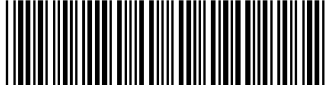
CPC						
Symbol					Type	Version
A61M	/	60	/	40	F	2021-01-01
F04D	/	13	/	027	I	2013-01-01
A61M	/	60	/	135	I	2021-01-01
A61M	/	60	/	148	I	2021-01-01
A61M	/	60	/	205	I	2021-01-01
A61M	/	60	/	405	I	2021-01-01
A61M	/	60	/	422	I	2021-01-01
A61M	/	60	/	857	I	2021-01-01
A61M	/	60	/	414	A	2021-01-01
A61M	/	60	/	833	A	2021-01-01

CPC Combination Sets					
Symbol				Type	Set
	/		/		

NONE (Assistant Examiner)		Total Claims Allowed: 18	
(Date) /TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792 (Primary Examiner)		(Date) 26 April 2022 O.G. Print Claim(s) 1	
		O.G. Print Figure 2	

U.S. Patent and Trademark Office

Part of Paper No.: 20220426

Issue Classification 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

INTERNATIONAL CLASSIFICATION			
CLAIMED			
A61M60/40		60	40
NON-CLAIMED			

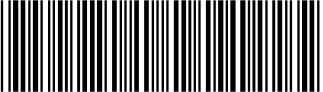
US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	18	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792	26 April 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

U.S. Patent and Trademark Office

Part of Paper No.: 20220426

Issue Classification 	Application/Control No. 17/560,468	Applicant(s)/Patent Under Reexamination Mohl, Werner
	Examiner TAMMIE K MARLEN	Art Unit 3792

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	10	10												
2	2	11	11												
3	3	12	12												
4	4	13	13												
5	5	14	14												
6	6	15	15												
7	7	17	16												
8	8	16	17												
9	9	18	18												

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 18	
/TAMMIE K MARLEN/ Primary Examiner, Art Unit 3792 (Primary Examiner) _____ (Date) 26 April 2022		O.G. Print Claim(s) 1	O.G. Print Figure 2

04/26/2022

Attorney's Docket No.: 25955-0013007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor :	Werner Mohl	Art Unit :	3792
Application No. :	17/560,468	Examiner :	Tammie K. Marlen
Filed :	December 23, 2021	Confirmation No. :	7399
		Notice of Allowance Date: 4/13/2022	
Title :	DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

MAIL STOP ISSUE FEE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE
PURSUANT TO 37 C.F.R. §1.312

Please amend the application as indicated on the following pages. This amendment is being filed prior to the payment of the issue fee.



UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/560,468	06/07/2022	11351356	25955-0013007	7399

26191 7590 05/18/2022
FISH & RICHARDSON P.C. (TC)
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional inventors):

Werner Mohl, Altenmarkt-Thenneberg, AUSTRIA;

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Miracor Medical SA, Awans, BELGIUM;

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor	: Werner Mohl	Art Unit	: 3792
Patent No.	: 11,351,356	Examiner	: Tammie K. Marlen
Issue Date	: June 7, 2022	Conf. No.	: 7399
Serial No.	: 17/560,468		
Filed	: December 23, 2021		
Title	: DEVICE TO ASSIST THE PERFORMANCE OF A HEART		

Attention Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION

Please issue a certificate of correction in accordance with the attached form.

All errors to be corrected were made in printing by the Patent and Trademark Office, and no fee is believed to be due.

Apply any other necessary charges or credits to Deposit Account 06-1050, referencing the above attorney docket number.

Respectfully submitted,

Date: June 22, 2022

/Alex Yu/

Alex Yu, Reg. No. 74,295

Customer Number 26191
Fish & Richardson P.C.
Telephone: +1 (650) 839-5047
Facsimile: (877) 769-7945

41598199.doc

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page ____ of ____

PATENT NO. : 11,351,356

APPLICATION NO.: 17/560,468

ISSUE DATE : 6/7/2022

INVENTOR(S) : Werner Mohl

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Column 5, Line 50, Claim 1, please replace "the bleed" with - - the - -.

In Column 5, Line 51, Claim 1, please replace "tube path" with - - tube - -.

MAILING ADDRESS OF SENDER (Please do not use Customer Number below):

FISH & RICHARDSON P.C.
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
17/560,468

RECEIPT DATE / TIME
06/22/2022 02:48:31 PM ET

ATTORNEY DOCKET #
25955-0013007

Title of Invention

DEVICE TO ASSIST THE PERFORMANCE OF A HEART

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # 11351356

CONFIRMATION # 7399

FILED BY Kirstin Matteo

PATENT CENTER # 60733519

FILING DATE 12/23/2021

CUSTOMER # 26191

FIRST NAMED
INVENTOR Werner Mohl

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY Alex Yu

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
25955-0013007__COC.pdf	3	Request for Certificate of Correction	941 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
25955-0013007__COC.pdf	D40F3ABE8750C1843A484966316EA7A8F6823E7A735E933CF0 FD388B9D71D1CCBDBE33830D22A8459A9E0A92F09AE69B79 E4DA5EC28EB6D85F42285258A1FA6F

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If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 11,351,356 B2
APPLICATION NO. : 17/560468
DATED : June 7, 2022
INVENTOR(S) : Werner Mohl

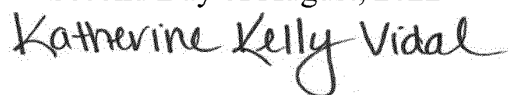
Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

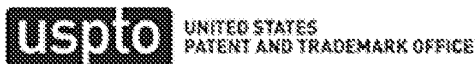
In the Claims

Column 5, Line 50, Claim 1, replace "the bleed" with -- the --.

Column 5, Line 51, Claim 1, replace "tube path" with -- tube --.

Signed and Sealed this
Second Day of August, 2022


Katherine Kelly Vidal
Director of the United States Patent and Trademark Office



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CORRESPONDENCE ADDRESS CHANGE

APPLICATION #	FILING OR 371(C) DATE	REQUEST ID
17/560,468	12/23/2021	129027

The following fields have been changed to Customer Number 95668 on 11/22/2023 via Patent Center in view of the certification copied below that authorized the change.

- Correspondence Address

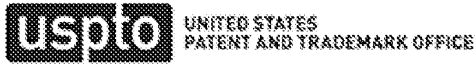
The address for Customer Number 95668 is:

95668 - Barnes & Thornburg LLP (MI)
225 South Sixth Street, Suite 2800
Minneapolis , MN 55402-4662

I certify, in accordance with 37 CFR 1.4(d)(4), that I am :

An attorney or Agent of Record registered to practice before the Patent and Trademark Office who has been given power of attorney in this application

Signature	Name	Registration #
/Michael T. Hawkins/	Michael Hawkins	57867



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FEE ADDRESS CHANGE

APPLICATION #	FILING OR 371(C) DATE	REQUEST ID
17/560,468	12/23/2021	129027

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An attorney or Agent of Record registered to practice before the Patent and Trademark Office who has been given power of attorney in this application

Signature	Name	Registration #
/Michael T. Hawkins/	Michael Hawkins	57867