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(71) Applicant (for all designated States except US): **PATHWAY MEDICAL TECHNOLOGIES, INC.** [US/US]; 10801 - 120th Avenue N.E., Kirkland, Washington 98033 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **JARNAGIN, Scott, Patrick** [US/US]; P.O. Box 9063, Seattle, Washington 98109 (US). **LAM, Gordon, W** [US/US]; 330 Cedar Av-

enue S., Renton, Washington 98057 (US). **EUBANKS, Shannon** [US/US]; 15116 N.E. 195th Street, Woodinville, Washington 98072 (US).

(74) Agents: **SPECKMAN, Ann, W.** et al.; Speckman Law Group PLLC, 2014B East Union Street, Seattle, Washington 98122 (US).

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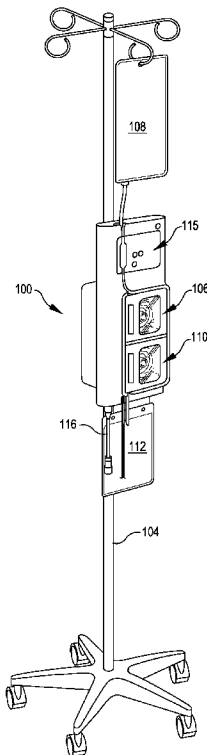
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(54) Title: PERISTALTIC PUMP ASSEMBLIES AND SYSTEMS INCORPORATING SUCH PUMP ASSEMBLIES

(57) Abstract: Peristaltic pump assemblies in which the closing and opening of a pivoting or sliding door is coordinated with movement of the occlusion bed toward and away from the rotor assembly to engage and disengage tubing within the occlusion pathway are disclosed. Linkage mechanisms provided by the interaction of cam surfaces with rollers, as well as bar linkage mechanisms, are disclosed. The linkage mechanism, in addition to providing precise displacement of the occlusion bed, may also provide an over-center feature that enhances safety and pump operation when the door is in a closed position. Latching mechanisms and sensors may be incorporated. Adaptive components such as tubing cassettes routing aspiration and/or infusion tubing in a predetermined configuration to mate with occlusion pathways in aspiration and/or infusion pump assemblies provided in various types of medical devices and control consoles are also provided.

FIG. 1



WO 2012/009697 A4



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AMENDED CLAIMS

received by the International Bureau on 16 February 2012 (16.02.2012).

1. A peristaltic pump assembly comprising a rotor assembly having a plurality of rollers mounted in a rotatable housing in operable communication with a drive motor for rotating the rotor assembly; an occlusion bed slidably mounted in a spaced apart relationship to the rotor assembly and having a curved surface facing the rotor assembly that forms an occlusion surface for tubing retained in an occlusion pathway during operation of the peristaltic pump; a pivoting or sliding door adjustable between an open condition providing access to the occlusion pathway and a closed condition in which access to the occlusion pathway is blocked; wherein a linkage mechanism is provided that moves the occlusion bed in concert with the pivoting or sliding of the door.
2. The peristaltic pump assembly of claim 1, wherein the door is a pivoting door and the linkage mechanism comprises a pair of cam surfaces mounted on the door and a pair of rollers mounted directly or indirectly to the occlusion bed and positioned to contact the cam surfaces as the pivoting door is closed and opened.
3. The peristaltic pump assembly of claim 2, wherein the cam surfaces are curved over a portion that contacts the rollers during closing and opening of the pivoting door and have a different curved profile or a flat profile that contacts the rollers at the far end of travel when the pivoting door is closed.
4. The peristaltic pump assembly of claim 1, wherein the linkage mechanism comprises a pair of bars pivotably mounted at one end to the door and at the other end, directly or indirectly, to the occlusion bed.
5. The peristaltic pump assembly of claim 1, wherein the linkage mechanism provides an over-center feature that facilitates positive positioning of the door in a closed position.
6. The peristaltic pump assembly of claim 1, wherein the linkage mechanism provides a linear actuation relationship between the position of the door and the position of the occlusion bed.

7. The peristaltic pump assembly of claim 1, wherein the linkage mechanism provides a non-linear actuation relationship between the position of the door and the position of the occlusion bed.
8. The peristaltic pump assembly of claim 7, wherein progressively less force is required to move the door as the door approaches the closed position.
9. The peristaltic pump assembly of claim 1, additionally comprising a mechanical latch that maintains the door in a closed position.
10. The peristaltic pump assembly of claim 1, additionally comprising a magnetic latch that maintains the door in a closed position.
11. The peristaltic pump assembly of claim 1, additionally comprising a latch that maintains the door in an open position.
12. The peristaltic pump assembly of claim 1, additionally comprising a sensor that senses when the door is in a closed position and allows pump motor operation when door is closed.
13. The peristaltic pump assembly of claim 1, additionally comprising a sensor that senses when the door is in an open position and disables pump operation when the door is open.
14. The peristaltic pump assembly of claim 1, wherein the occlusion surface comprises a material having a dynamic coefficient of friction in the range of 0.15-0.25.
15. The peristaltic pump assembly of claim 1, wherein the occlusion surface contacts a support surface having greater stiffness properties than those of the material forming the occlusion surface.
16. The peristaltic pump assembly of claim 1, wherein the relative position between the axis of rotation of the rotor assembly and the occlusion surface is adjustable.

17. The peristaltic pump assembly of claim 1, additionally comprising a sensor that senses the relative rotational position of the rotor assembly and stops the rotor assembly at one of a plurality of predetermined relative angular positions.
18. A control console incorporating at least one peristaltic pump assembly of claim 1.
19. A control console incorporating two peristaltic pump assemblies of claim 1, wherein one of the peristaltic pump assemblies comprises a high pressure peristaltic pump capable of infusing fluid at a pressure of up to 160 psi and another peristaltic pump assembly comprises a lower pressure peristaltic pump capable of aspirating liquid or liquid/solids mixtures at a pressure of up to (-)15psi.