**Claim rejection under 35 USC 112**

**The following is a quotation of the first paragraph of 35 U.S.C. 112(a):**

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilledin the art to which it pertains,or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplatedby the inventor or joint inventor of carrying out the invention.

**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 distinctlyclaiming 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.

Claims 1-19 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 pre-AIA the applicant regards as the invention.

**Claim rejection under 35 USC 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –(a)(1) the claimed invention was patented, described in a printed publication, orin public use, on sale or otherwise available to the public before the effectivefiling date of the claimed invention.

**Claims 1-19 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by XXXXX et al (US )**

Claim rejection under 35 USC 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this titleif the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimedinvention to a person having ordinary skill in the art to which the claimed invention pertains.Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 are rejected under 35 U.S.C. 103 as being unpatentable over XXXXXXX (US 20160142003) in view of XXXXXXX. (US ).

**Regarding claim 1**. An atherectomy control system comprising:  
a drive mechanism; a position sensor configured to sense a rotational position of the drive mechanism; an input/output port; a microcontroller in communication with the position sensor and the input/output port; and wherein: the microcontroller is configured to determine a speed of the drive mechanism based on received indications of the rotational position of the drive mechanism; and determine a control signal for adjusting the speed of the drive mechanism based on the determined speed of the drive mechanism and output the determined control signal via the input/output port.   
   
**Regarding claim 2**. The control system of claim 1, wherein the drive mechanism is a turbine.   
   
**Regarding claim 3**. The control system of claim 1, further comprising:  
a computing device in communication with the microcontroller and configured to receive the determined speed from the microcontroller; and wherein the computing device is configured to monitor operation of the drive mechanism based on the determined speed of the drive mechanism received over time.   
   
**Regarding claim 4**. The control system of claim 3, wherein data related to the received determined speed of the drive mechanism is password protected at the computing device.   
   
**Regarding claim 5**. The control system of claim 1, further comprising:  
an analog-to-digital converter configured to convert analog indications of rotational positions of the drive mechanism to digital indications of the rotational positions of the drive mechanism.   
   
**Regarding claim 6**. The control system of claim 1, wherein the microcontroller is configured to determine the control signal by comparing the determined speed of the drive mechanism to a speed set point.   
   
**Regarding claim 7**. The control system of claim 1, wherein the drive mechanism has a first mode and a second mode, and the microcontroller is configured to adjust the determined control signal based on whether the drive mechanism is in the first mode or is in the second mode.   
   
**Regarding claim 8**. The control system of claim 7, wherein the drive mechanism operates in the first mode upon start-up and the drive mechanism operates in the second mode starting at a predetermined time after start-up.   
   
**Regarding claim 9**. The control system of claim 1, wherein the microcontroller is configured to predict a stall of the drive mechanism will occur within a predetermined time period after a current time.   
   
**Regarding claim 10**. The control system of claim 9, wherein the microcontroller is configured to predict the stall of the drive mechanism will occur within the predetermined time period when a trend value based on the determined speed of the drive mechanism reaches or goes beyond a threshold value.   
   
**Regarding claim 11**. The control system of claim 10, wherein the trend value is a difference between a currently determined speed of the drive mechanism and a speed of the drive mechanism at a time that is the predetermined time period before a time at which the currently determined speed of the drive mechanism was taken.   
   
**Regarding claim 12**. The control system of claim 9, wherein the microcontroller is configured to predict a time until the predicted stall of the drive mechanism will occur.   
   
**Regarding claim 13**. A method of controlling a drive mechanism of an atherectomy system using firmware in a microcontroller, the method comprising:  
receiving a position indicator of the drive mechanism; determining a speed of the drive mechanism based on the position indicator of the drive mechanism; receiving a set point for the speed of the drive mechanism; determining a control signal to adjust the speed of the drive mechanism based on the determined speed of the drive mechanism and the received set point for the speed of the drive mechanism; and outputting the determined control signal to adjust the speed of the drive mechanism.   
   
**Regarding claim 14**. The method of claim 13, wherein determining the control signal comprises:  
determining an initial control signal based on the determined speed of the drive mechanism and the received set point for the speed of the drive mechanism; adjusting the initial control signal according to a first mode of operation to determine the control signal during a predetermined time period after startup of the drive mechanism; and adjusting the initial control signal according to a second mode of operation to determine the control signal after the predetermined time period after startup of the drive mechanism has elapsed.   
   
**Regarding claim 15**. The method of claim 13, further comprising:  
predicting a stall of the drive mechanism will occur within a predetermined time period after a current time.   
   
**Regarding claim 16**. The method of claim 13, further comprising:  
predicting when a stall of the drive mechanism will occur.   
   
**Regarding claim 17**. An atherectomy system comprising:  
an advancer assembly configured to operably connect to an elongate member, the advancer assembly configured to control a longitudinal position of the elongate member, the advancer assembly comprising:  
a drive mechanism configured to operably connect to the elongate member and adjust a rotational position of the elongate member;  
 a control console in communication with the advancer assembly, the control console comprising:  
an input/output port; and  
a microcontroller configured to determine a speed of the drive mechanism, determine a control signal for adjusting the speed of the drive mechanism, and output the control signal, via the input/output port, to adjust the speed of the drive mechanism.   
   
**Regarding claim 18**. The system of claim 17, further comprising:  
a computing device in communication with the control console for receiving drive mechanism speed data from the control console, the computing device is configured to monitor operation of the drive mechanism over time based on the received drive mechanism speed data.   
   
**Regarding claim 19**. The system of claim 17, wherein the microcontroller is configured to identify an initial control signal and adjust the initial control signal to determine the control signal based on whether the drive mechanism is in a startup mode or a steady state mode.   
   
**Regarding claim 20**. The system of claim 17, wherein the microcontroller is configured to determine when a stall of the drive mechanism will occur.