REMARKS

Status of the Claims

This amendment is filed in response to the Final Office Action mailed February 4, 2025.

Claims 1 through 20 are pending and stand rejected.

Claims 1, 3 through 7, 10, 11, 13, 15, 16, and 19 are amended.

Support for the amendments in the claims as-filed and paragraphs [0043], [0044], [0052] of the application as filed.

No new matter is added.

For at least the reasons presented below, Applicant respectfully submits that each of the pending claims is in condition for allowance.

35 U.S.C. § 102

Claims 1 through 7, 19, and 20 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Phillips (US 20190203579A1) (hereinafter "Phillips").

Claims 1 through 7

Applicant respectfully asserts that claims 1 through 7 are not anticipated by Phillips under 35 U.S.C. § 102(a)(1) at least because Phillips does not describe each and every element of independent claim 1, as currently amended.

In particular, Phillips does not describe the sensor system of amended claim 13 including a processor subsystem to:

> detect axial movement of the at least one component of the downhole pumping system with the magnetometer of the axial motion sensor subsystem, the detecting axial movement comprising:
>
> sensing a direction change in the at least one component of the downhole pumping system ***to determine when a stroke of the at least one component of the downhole pumping system has been completed and to determine that a new stroke is beginning***; and
>
> ***after the direction change in the at least one component of the downhole pumping system has been detected***, ***begin to determine rotation*** of the at least one component of the downhole pumping system with the rotation sensor subsystem by sampling rotational values generated by the rotation of the at least one component of the downhole pumping system, the determining the rotational

values of the at least one component of the downhole pumping system comprising:

continuing sampling the rotational values through a second direction change of the at least one component of the downhole pumping system; and

ceasing sampling the rotational values at a third direction change of the at least one component of the downhole pumping system.

The Final Office Action points to various generic statements in Phillips references stokes and potential differences in sensing rotation and/or axial movement.

However, there is no disclosure in Phillips of the particular chain of sensing events, including explicitly reciting the conditions for the starting and stopping events of the rotational sensing, as detailed in amended claim 1.

First, there is no disclosure in Phillips that rotation sensing only occurs once a direction change is sensed, indicating that a new stroke is beginning.

Second, there is no disclosure in Phillips that the sensing then continues during a second change in direction.

Finally, there is no disclosure in Phillips of then ceasing the sensing once a third change in direction is detected.

There appears to be no particulars in Phillips relating to other actions taking during only single stroke besides looking to the data from a single stroke.

Thus, claims 1, and claims 2 through 7 depending therefrom, are believed to be in condition for allowance.

Claims 19 and 20

Applicant respectfully asserts that claims 19 and 20 are not anticipated by Phillips under 35 U.S.C. § 102(a)(1) at least because Phillips does not describe each and every element of independent claim 19, as currently amended.

In particular, Phillips does not describe the method of amended claim 19 including:

when detecting no change in the axial direction, ceasing any sensing of rotation movement;

when verifying the first change in the axial direction:

begin detecting rotational movement of the at least one component of the downhole pumping system with a rotational sensor generated by rotation of the at least one component of the downhole pumping system;
continuing detecting the rotational movement of the at least one component of the downhole pumping system ***through a second direction change*** of the at least one component of the downhole pumping system; and
ceasing detecting the rotational movement of the at least one component of the downhole pumping system ***after a third direction change*** of the at least one component of the downhole pumping system.

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As above, there is no disclosure in Phillips of the particular chain of sensing events, including explicitly reciting the conditions for the starting and stopping events of the rotational sensing, as detailed in amended claim 19.

Thus, claim 19, and claim 20 depending therefrom, are believed to be in condition for allowance.

35 U.S.C. § 103

Claims 10 and 11 are rejected under 35 U.S.C. 103 as being unpatentable over Phillips.

Claims 10 and 11 depend from claim 1 and are allowable for at least some of the reasons discussed above.

Claims 8, 9, and 16 through 18 are rejected under 35 U.S.C. 103 as being unpatentable over Phillips in view of Hurst et al. (US9140113B2) (hereinafter "Hurst").

Claims 8 and 9

Claims 8 and 9 depend from claim 1 and are allowable for at least some of the reasons discussed above. Hurst does not remedy the deficiencies of Phillips noted above.

Claims 16 through 18

Applicant respectfully asserts that claims 16 through 18 would not have been obvious in view of Phillips and Hurst at least because Phillips and Hurst do not teach or suggest describe each and every element of independent claim 18, as currently amended.

In particular, Phillips and Hurst do not disclose the sensor system of amended claim 16 including a processor subsystem to:

> detect the axial movement of the at least one component of the downhole pumping system with the axial motion sensor subsystem;
> ***when the axial movement of the at least one component is detected, begin detecting the rotational movement of the tubing rotator of the downhole pumping system with the rotational sensor***;
> ***continue detecting the*** rotational movement of the tubing rotator of the downhole pumping system through a second direction change of the at least one component of the downhole pumping system; and
> ***cease detecting*** the rotational movement of the tubing rotator of the downhole pumping system after a third direction change of the at least one component of the downhole pumping system.

As above, there is no disclosure in Phillips of the particular chain of sensing events, including explicitly reciting the conditions for the starting event of the rotational sensing, as detailed in amended claim 16.

Hurst does not remedy the deficiencies of Phillips noted above.

Thus, claim 16, and claims 17 and 18 depending therefrom, are believed to be in condition for allowance.

Claims 12 through 15 are rejected under 35 U.S.C. 103 as being unpatentable over Phillips in view of Puwanto (US 20200362686A1) (hereinafter "Puwanto").

Claim 12

Claim 12 depends from claim 1 and is allowable for at least some of the reasons discussed above. Puwanto does not remedy the deficiencies of Phillips noted above.

Claims 13 through 15

Applicant respectfully asserts that claims 13 through 15 would not have been obvious in view of Phillips and Puwanto at least because Phillips and Puwanto do not teach or suggest describe each and every element of independent claim 13, as currently amended.

In particular, Phillips and Puwanto do not disclose the sensor system of amended claim 13 including a processor subsystem to:

> verify the axial movement of the at least one component of the downhole pumping system with the axial motion sensor subsystem;
> ***when the axial movement has been verified, detecting the rotational values with the rotation sensor subsystem during a current stroke of the downhole pumping system***; and
> ***comparing*** the rotational values with previously sensed rotational values detected by the rotation sensor subsystem ***during a previous stroke*** of the downhole pumping system ***to determine if rotation of the at least one component of the downhole pumping system has occurred***.

As above, there is no disclosure in Phillips of the particular chain of sensing events, including explicitly reciting the conditions for the starting event of the rotational sensing, as detailed in amended claim 13.

Further, while Phillips discussed some comparison of values, Phillips does not disclose using the value detected during a previous stroke ***to determine if rotation of the at least one component of the downhole pumping system has occurred***.

Puwanto is cited for a vibration sensor and does not remedy the deficiencies of Phillips noted above.

Thus, claim 13, and claims 14 and 15 depending therefrom, are believed to be in condition for allowance.

Conclusion

In view of the foregoing, Applicant believes all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please contact the undersigned at (801) 554-8311.

Respectfully submitted,

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