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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/876,038	10/06/2015	Baris Taskin	DRX.P007.US.01	7177
120281	7590	03/02/2016	EXAMINER	
Schott, P.C. 687 West Lancaster Ave. Wayne, PA 19087			JOHNSON, RYAN	
			ART UNIT	PAPER NUMBER
			2842	
			NOTIFICATION DATE	DELIVERY MODE
			03/02/2016	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.

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1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

DETAILED ACTION

Claim Rejections - 35 USC § 112

2. The following is a quotation of 35 U.S.C. 112(d):

(d) REFERENCE IN DEPENDENT FORMS.—Subject to subsection (e), a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), fourth paragraph:

Subject to the [fifth paragraph of 35 U.S.C. 112 (pre-AIA)], a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

3. **Claims 19 and 20 are rejected under 35 U.S.C. 112(d) or pre-AIA 35 U.S.C. 112, 4th paragraph**, as being of improper dependent form for failing to further limit the subject matter of the claim upon which it depends, or for failing to include all the limitations of the claim upon which it depends. **Claim 19 depends upon itself**. Applicant may cancel the claim(s), amend the claim(s) to place the claim(s) in proper dependent form, rewrite the claim(s) in independent form, or present a sufficient showing that the dependent claim(s) complies with the statutory requirements.

4. Claim 20 is rejected merely for inheriting the above deficiency.

Claim Rejections - 35 USC § 103

5. 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:

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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 title, if 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 claimed invention 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.

6. Claims 1-5 are rejected under 35 U.S.C. 103 as being unpatentable over Wood (US 2005/0225365) in view of Wood (US 7,812,648, hereinafter “Wood2”).

7. Regarding claim 1, Wood discloses a dynamic rotary traveling wave oscillator circuit (a divider for a RTWO, shown in Figs.2b and 3) comprising:

a plurality of multi-output spot-advancing blocks (MOSABs) (e.g. the devices on the top of Fig.3, which are spot advancing blocks and can be considered as having both multi-input and multi-output, i.e. the two “spot” inputs as well as the two “spot” outputs);

a plurality of multi-input spot-advancing blocks (MISABs) (e.g. the devices on the bottom of Fig.3, which are spot advancing blocks and can be considered as having both multi-input and multi-output, i.e. the two “spot” inputs as well as the two “spot” outputs; see [0076, which refers to the device as a “moving spot” generator”);

wherein depending on a desired division ratio, a connection connects blocks on the MOSABs and MISABs to create the desired division ratio (see [0075], where “selection on the MUX allows variation on the length of the sequence”, thus the desired division ratio; see also [0098]).

8. Wood does not disclose the MOSABs “forming a main loop” and the MISABs “forming a sub-loop”, as required by claim 1. Wood2 discloses in a similar “moving spot” generator, providing a “main loop” (e.g. 58) and a “sub-loop” (e.g. 60) with a moving spot generator (see Fig.3A) in order to cut down on the amount of hardware for large divide ratios (see col.1,40-56).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the application was filed to have provided the SABs of Wood (being considered both MISABs and MOSABs) within main loops and sub-loops in order to have provided a large divide ratio with minimal hardware.

9. Regarding claim 2, Wood and Wood2 disclose multi-phase input clock signals driving the main loop and sub-loop (see col.4,48-56). While Wood2 does not explicitly disclose providing the particular relationship of phase delays provided as clock signals, Wood2 does disclose providing a particular phase arrangement to provide a desired divided clock signal (see col.1,40-52 and col.4,36-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time the application was filed to have provided the largest phase delay between the multi-phase input clock signals is $(m-1/m)*2\pi$, and wherein the phase delays of the sub-loop is selected to be the second largest phase delay for an m phase clock signal, which is $(m-1/m) * 2\pi$, and wherein the phase delay of a connection from a block in the main-loop to a block in the sub-loop is the second largest phase delay for an m phase clock signal, which is given by $(m-2/m)*2\pi$ in order to have provided a particular frequency division response.

10. Regarding claim 3, Wood2 does not disclose the exact configuration with 8 main-loop stages and 5 sub-loop stages. However, Wood2 does establish a relationship between the number of stages and the divider ratio (see col.1,40-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time the application was filed to have provided the circuit is a 13 stage circuit topology comprising 8 main-loop stages and 5 sub-loop stages in order to have provided a desired frequency divider ratio.

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11. Regarding claims 4 and 5, see the discussion above, where providing a particular phase delay is established to provide a particular desired frequency ratio, thus the particular choice of phase relationships and/or stage numbers would have been recognized as a mere matter of design choice.

Allowable Subject Matter

12. Claims 6-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. Claims 11-18 are allowed.

14. The following is a statement of reasons for the indication of allowable subject matter: Regarding claims 6 and 11, the prior art does not explicitly disclose where each of the MOSABs and MISABs comprise a "4-to-1 multiplexer". Regarding claim 10, the prior art does not disclose "one MOSAB regulates the voltage on an adjacent MOSAB through a Spot-mid output".

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kommrusch (US 6,654,439) and Lee et al. (US 6,040,725) disclose similar divider circuits utilizing shift registers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Johnson whose telephone number is (571)270-1264. The

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examiner can normally be reached on Monday - Thursday, 8:00 am - 5:00 pm, Friday 8 am - 1 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Ryan Johnson/
Primary Examiner, Art Unit 2842