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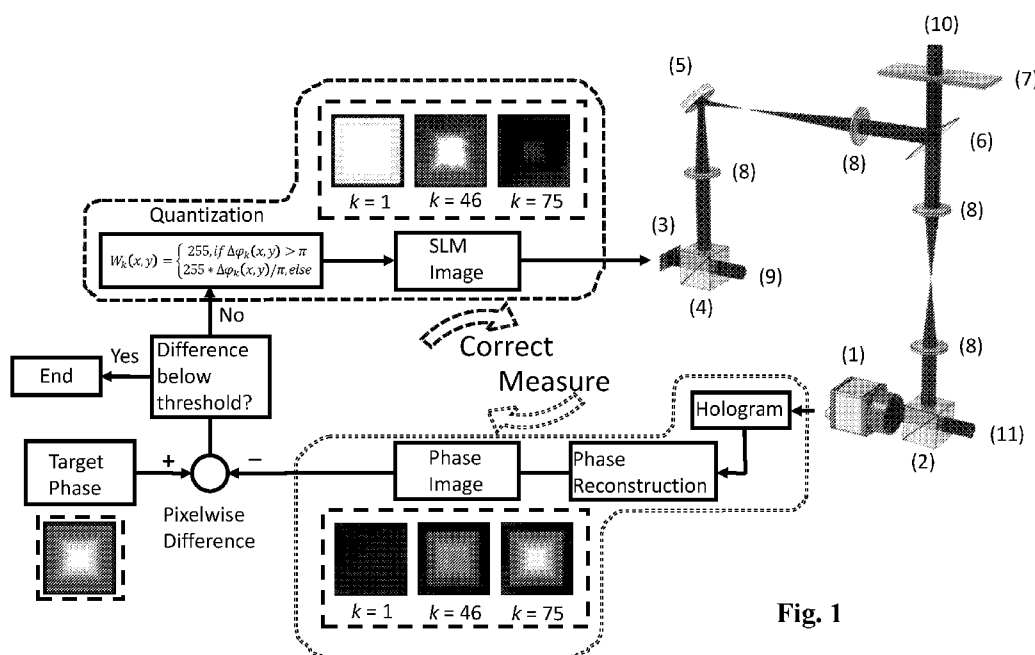


Fig. 1

(57) **Abstract:** A photolithography method characterized by steps of providing a target phase, transmitting a beam from an EM radiation source (9) to a spatial light modulator (3) and the beam reflected from the spatial light modulator (3) to a sample (5), dividing a beam provided by a light source (10) into two as an object wave (7) and a reference wave (8) and transmitting the object wave (7) to the sample (5), merging and sending the object wave (7) went through the sample (5) and the reference wave (8) to an image receiving element (11) and obtaining a phase image, comparing the phase image and the target phase and the quantizing the phase image to create a new image for the spatial light modulator (3), if a difference between the phase image and the target phase is above a predetermined value.



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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2011255064 A1 (ST MICROELECTRONICS ROUSSET [FR]) 20 October 2011 (2011-10-20) Whole document	1-15
A	US 2010119961 A1 (YE JUN,) 13 May 2010 (2010-05-13) Whole document	1-15
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Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
US	2011255064	A1	20 October 2011	FR	2959025	A1	21 October 2011
				FR	2959025	B1	15 November 2013
US	2010119961	A1	13 May 2010	US	8418088	B2	09 April 2013
				CN	101738872	A	16 June 2010
				CN	101738872	B	10 April 2013
				JP	2010114444	A	20 May 2010
				JP	5191975	B2	08 May 2013
				NL	2003654	A	10 May 2010
				US	2013232457	A1	05 September 2013
				US	9009647	B2	14 April 2015
US	2005118528	A1	02 June 2005	US	7196772	B2	27 March 2007
				CN	1614514	A	11 May 2005
				CN	100517073	C	22 July 2009
				DE	602004017400	D1	11 December 2008
				JP	2005150714	A	09 June 2005
				JP	4397791	B2	13 January 2010
				JP	2009021618	A	29 January 2009
				JP	4860674	B2	25 January 2012
				KR	20050044295	A	12 May 2005
				KR	100592826	B1	26 June 2006
				SG	112084	A1	29 June 2005
				TW	200527151	A	16 August 2005
				TW	I265382	B	01 November 2006
				US	2007165203	A1	19 July 2007
				US	7826035	B2	02 November 2010