

## SEARCH HISTORY

<b>Application Number</b>	PCT/US 19/65101
<b>Search Conducted By</b>	RBB
<b>Search Approved By</b>	RBB

<b>CPC/IPC Classifications Searched</b>	IPC (8): G02B 26/08; G02B 27/00; G02B 27/01; G06F 3/01; H04N 13/365 (2020.01) CPC: G02B 26/08; G02B 27/00; G02B 27/01; G03B 21/142; H04N 13/30; G06 F3/011; G06 F3/013; H04N 13/365
<b>Date Conducted</b>	16 March 2020 (16.03.2020)

<b>Documentation Searched</b>	IPC (8): G02B 26/08; G02B 27/00; G02B 27/01; G06F 3/01; H04N 13/365 (2020.01) CPC: G02B 26/08; G02B 27/00; G02B 27/01; G03B 21/142; H04N 13/30; G06 F3/011; G06 F3/013; H04N 13/365 (Classifications, Keyword limited)
<b>Search Terms Used</b>	Steering, steer, steerable, directing, redirecting, display, screen, projection, position, reposition, Y-axis, X-axis, vertical, axis, horizontal, imperceptible, range, span, near, eye, display, HUD
<b>Date Conducted</b>	16 March 2020 (16.03.2020)

<b>Electronic Database Searched</b>	PatBase
<b>Files Searched</b>	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
<b>Date Conducted</b>	16 March 2020 (16.03.2020)
<b>Search Logic:</b>	
<b>Classification search</b>	

Search 51: IPC=(G02B26/08 OR G02B27/00 OR G02B27/01 OR G06F3/01 OR H04N13/365) (Results 133244)  
 Search 52: CPC=(G02B26/08 OR G02B27/00 OR G02B27/01 OR G03B21/142 OR H04N13/30 OR G06F3/011 OR G06F3/013 OR H04N13/365) (Results 27157)  
 Search 53: 51 OR 52 (Results 138297)  
 Search 54: 53 AND FT=(piezoelectric% OR PZT) NEAR (counter\* OR balanc\*) (Results 36)  
 Search 57: 53 AND FT=(magnet\*) NEAR (counter\* OR balanc\*) (Results 209)  
 Search 59: 57 AND FT=(PZT OR piezoelectric%) (Results 65)  
 Search 60: 53 AND FT=diffract\* (Results 11111)  
 Search 61: 60 AND FT=(axis) NEAR (vertical OR horizontal OR Y OR X) (Results 3504)  
 Search 62: 61 AND FT=(piezo\* OR PZT) (Results 839)  
 Search 63: 62 AND FT=(steer\* OR redirect\*) NEAR (beam% OR laser%) (Results 349)  
 Search 64: 63 AND FT=(second) NEAR controller% (Results 30)  
 Search 65: 63 AND FT=(second) NEAR control\* (Results 83)

#### Keyword only search

Search 34: FT=(steer\* NEAR (mirror% OR display%)) (Results 13486)  
 Search 35: 34 AND FT=position% W2 (verif\* OR valid\*) (Results 41)  
 Search 36: FT=set\* W2 (time% OR second%) (Results 228547)  
 Search 37: 36 AND FT=(steer\*) NEAR (display\* OR project\* OR beam%) (Results 1049)  
 Search 38: 37 AND PA=avegant (Results 0)  
 Search 39: 37 AND FT=(PZT OR piezoelectric OR PZT) (Results 222)  
 Search 40: 37 AND FT=(PZT OR piezoelectric OR transducer%) (Results 313)  
 Search 41: 40 AND FT=actuator% (Results 145)  
 Search 42: 41 AND FT=set\* W2 (second% OR time%) (Results 145)  
 Search 43: 42 AND FT=(diameter OR radius) NEAR (( mm, ) OR ( mm. ) OR ( mm ) OR millimeter%) (Results 48)  
 Search 44: FT=steer\* W2 (display\* OR project\* OR beam%) (Results 24620)  
 Search 45: 44 AND FT=(control\* NEAR (unit% OR system%)) OR controller% (Results 14847)  
 Search 46: 45 AND FT=control\* NEAR (y-axis OR (y axis) OR vertical OR second) (Results 3643)  
 Search 47: 46 AND FT=steer\* NEAR (y-axis OR (y axis) OR vertical OR second) (Results 754)  
 Search 48: 47 AND FT=(piezo\* OR PZT OR transducer%) (Results 253)  
 Search 49: 48 AND FT=(steer\* OR redirect\* OR direct\*) W10 (position% OR location%) (Results 214)

#### Forward/backward search

Search 1: PN=US8752969 (Results 1)  
 Search 2: CTF=1 OR CTB=1 (Results 131)  
 Search 3: 2 AND FT=(display% OR screen%) (Results 61)  
 Search 4: PN=US10241328 (Results 1)  
 Search 5: CTF=4 OR CTB=4 (Results 72)  
 Search 6: 5 AND FT=beam\* NEAR steer\* (Results 12)  
 Search 12: PN=US10444488 (Results 1)  
 Search 13: CTF=12 OR CTB=12 (Results 20)  
 Search 14: PN=(US2013278907 OR US2003202264) (Results 2)  
 Search 15: CTF=14 OR CTB=14 (Results 288)  
 Search 16: 15 AND FT=piezoelectric (Results 35)

Search 24: PN=US2019278102 (Results 1)  
 Search 25: CTF=24 OR CTB=24 (Results 4)

**Supplemental search**

Search 50: PA=avegant (Results 17)

<b>Electronic Database Searched</b>	Google Patents
<b>Date Conducted</b>	16 March 2020 (16.03.2020)
<b>Search Logic:</b>	
<p>(steer* OR direct* OR redirect*)          About 104,723 results</p> <p>((steer* OR direct* OR redirect*) NEAR (beam OR ray OR laser))          About 67,374 results</p> <p>((steer* OR direct* OR redirect*) NEAR (beam OR ray OR laser)) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis))          About 70,630 results</p> <p>((steer* OR direct* OR redirect*) NEAR (beam OR ray OR laser)) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND ((near eye display) OR HUD OR (heads up display))          About 41,345 results</p> <p>beam steering piezoelectric          About 7,245 results</p> <p>beam steering piezoelectric AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis))          About 6,417 results</p> <p>beam steering piezoelectric AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND mirror          About 3,411 results</p> <p>beam steering piezoelectric AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND mirror AND ((near eye display) OR HUD OR (heads up display))          About 1,261 results</p>	

<b>Electronic Database Searched</b>	Google Scholar
<b>Date Conducted</b>	16 March 2020 (16.03.2020)
<b>Search Logic:</b>	
<p>((near eye display) OR HUD OR (heads up display))          About 1,860,000 results</p>	

((near eye display) OR HUD OR (heads up display)) AND (steering OR steer OR steerable OR directing OR redirecting)  
 About 258,000 results

((near eye display) OR HUD OR (heads up display)) AND (steering OR steer OR steerable OR directing OR redirecting) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis))  
 About 74,500 results

((near eye display) OR HUD OR (heads up display)) AND (steering OR steer OR steerable OR directing OR redirecting) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND (imperceptible)  
 About 8,550 results

((near eye display) OR HUD OR (heads up display)) AND (steering OR steer OR steerable OR directing OR redirecting) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND (beam OR ray OR laser)  
 About 53,700 results

((near eye display) OR HUD OR (heads up display)) AND (steering OR steer OR steerable OR directing OR redirecting) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND (beam OR ray OR laser) AND (position OR reposition)  
 About 49,500 results

beam steering axis eye tracking  
 About 22,200 results

beam steering axis eye tracking AND fresnel  
 About 2,580 results

<b>Electronic Database Searched</b>	Google Web
<b>Date Conducted</b>	16 March 2020 (16.03.2020)
<b>Search Logic:</b>	
(steering OR steer OR steerable OR directing OR redirecting) About 1,100,000,000 results	
(steering OR steer OR steerable OR directing OR redirecting) AND (beam OR ray OR laser) About 297,000,000 results	
(steering OR steer OR steerable OR directing OR redirecting) AND (beam OR ray OR laser) AND (display OR screen OR projection) About 170,000,000 results	
(steering OR steer OR steerable OR directing OR redirecting) AND (beam OR ray OR laser) AND (display OR screen OR projection) AND (position OR reposition) About 48,500,000 results	
(steering OR steer OR steerable OR directing OR redirecting) AND (beam OR ray OR laser) AND (display OR screen OR projection) AND (position OR reposition) AND (Y-axis	

OR X-axis OR (vertical axis) OR (horizontal axis))

About 25,800,000 results

(steering OR steer OR steerable OR directing OR redirecting) AND (beam OR ray OR laser) AND (display OR screen OR projection) AND (position OR reposition) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND (imperceptible)

About 373,000 results

(steering OR steer OR steerable OR directing OR redirecting) AND (beam OR ray OR laser) AND (display OR screen OR projection) AND (position OR reposition) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND (imperceptible) AND (range OR span)

About 384,000 results

(steering OR steer OR steerable OR directing OR redirecting) AND (beam OR ray OR laser) AND (display OR screen OR projection) AND (position OR reposition) AND (Y-axis OR X-axis OR (vertical axis) OR (horizontal axis)) AND (imperceptible) AND (range OR span) AND ((near eye display) OR HUD OR (heads up display))

About 149,000 results