

SEARCH HISTORY

13Application Number	PCT/US 18/38956
Search Conducted By	TCT
Search Approved By	SV

CPC/IPC Classifications Searched	IPC - B22F 3/105, B23K 15/00, B23K 15/02 (2018.01) CPC - B22F 2003/1057, B22F 3/105, B22F 3/1055
Date Conducted	27 August 2018 – 27 August 2018 (27.08.2018 – 27.08.2018)

Documentation Searched	CPC - B22F 2003/1057, B22F 3/105, B22F 3/1055
Search Terms Used	additive manufacturing, three-dimensional printing, 3D printing, direct ink writing, DIW, robocasting, advanced manufacturing, fused deposition modeling, fused filament fabrication, FFF, stereolithography, powder bed, surface, platen, platform, panel, laser beam, energy beam, laser, laser, energy, beams, optics, moving, directing, direction, guiding, steering, polygon, polygonal, mirror, rotate, scan, scanning, control, modulate, power, powder bed fusion
Date Conducted	27 August 2018 – 27 August 2018 (27.08.2018 – 27.08.2018)

Electronic Database Searched	PatBase
Files Searched	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
Date Conducted	27 August 2018 – 27 August 2018 (27.08.2018 – 27.08.2018)

Search Logic:

Classification-Based Search

- 1) IC = (B22F3/105 OR B23K15/00 OR B23K15/02) (14750)
- 2) CPC = (B22F2003/1057 OR B22F3/105 OR B22F3/1055) (5032)

- 3) 1 OR 2 (15377)
- 4) 3 and FT = (("additive manufacturing" OR "three-dimensional print*" OR "3D print*" OR "Direct ink writing" OR DIW OR robocast* OR "advanced manufacturing" OR "fused deposition modeling" OR "fused filament fabrication" OR "FFF" OR stereolithograph*) AND ("powder bed%")) (1126)
- 5) 4 and FT = (surface% OR platen% OR platform% OR panel%) (1048)
- 6) 5 and FT = ((laser% OR energy) NEAR beam%) (898)
- 7) 6 and SP = (optic* AND (moving OR direct* OR guid* OR steer*)) (277)
- 8) 7 and SP = ((polygon* NEAR mirror%) AND rotat*) (7)
- 9) 8 and FT = (scan* AND (control* OR modulat*) and power) (7)

Keyword-Based Search

- 10) FT = (("additive manufacturing" OR "three-dimensional print*" OR "3D print*" OR "Direct ink writing" OR DIW OR robocast* OR "advanced manufacturing" OR "fused deposition modeling" OR "fused filament fabrication" OR "FFF" OR stereolithograph*) AND ("powder bed fusion")) (442)
- 11) 10 and FT = (surface% OR platen% OR platform% OR panel%) (407)
- 12) 11 and FT = ((laser% OR energy) NEAR beam%) (279)
- 13) 12 and SP = (optic* AND (moving OR direct* OR guid* OR steer*)) (90)
- 14) 13 and SP = ((polygon* NEAR mirror%) AND rotat*) (4)
- 15) 14 and FT = (scan* AND (control* OR modulat*) and power) (4)
- 16) 15 NOT 9 (4)

Forwards/Backwards Search

- 17) PN = (WO2016196223 OR US20170113303 OR US20170021455 OR US20170165792 OR US20130001834 OR US20160136730 OR US20160114432 OR WO2016077250) (7)
- 18) CTB 17 and CTF 17 (12)
- 19) 18 and FT = "powder bed" (10)
- 20) 19 and FT = (polygon* NEAR mirror%) (7)

Electronic Database Searched	Google
Files Searched	Google Scholar (Articles excluding patents)
Date Conducted	27 August 2018 – 27 August 2018 (27.08.2018 – 27.08.2018)
Search Logic:	
powder laser energy beams direction "polygon mirror" scanning power About 115 Results	
"3d print" powder laser energy beams direction "polygon mirror" scanning power No Results	
"additive manufacturing" powder laser energy beams direction "polygon mirror" scanning power 4 Results	
"powder bed" laser energy beams direction mirror scanning power control modulate About 249 Results	

"powder bed" laser energy beams direction mirror scanning power control modulate "three-dimensional structure"

11 Results

"powder bed fusion additive manufacturing" energy beams polygon mirror

8 Results

Electronic Database Searched	Google
Files Searched	Google Patents
Date Conducted	27 August 2018 – 27 August 2018 (27.08.2018 – 27.08.2018)
Search Logic:	
<p>powder laser energy beams direction "polygon mirror" scanning power About 15,669 Results</p> <p>"3d print" powder laser energy beams direction "polygon mirror" scanning power About 6 Results</p> <p>"additive manufacturing" powder laser energy beams direction "polygon mirror" scanning power About 25 Results</p> <p>"powder bed" laser energy beams direction "polygon mirror" scanning power About 13 Results</p> <p>"powder bed" laser energy beams direction mirror scanning power control modulate About 132 Results</p> <p>"powder bed" laser energy beams direction mirror scanning power control modulate "three-dimensional structure" About 31 Results</p> <p>"powder bed" laser energy beams direction mirror scanning power control modulate "three-dimensional structure" melt About 30 Results</p> <p>"powder bed fusion additive manufacturing" About 52 Results</p> <p>"powder bed fusion additive manufacturing" energy beams polygon mirror About 1 Result</p>	

supplemental

Electronic Database Searched	Google patents
Date Conducted	30 August 2018 (30.08.2018)
Search Logic:	

"additive manufacturing" platen rotating polygon mirror
About 15 results

"additive manufacturing" platen rotating energy beams
About 217 results