

SEARCH HISTORY

Application Number	PCT/US 19/68209
Search Conducted By	RBB
Search Approved By	RBB

CPC/IPC Classifications Searched	IPC (8): F16D 61/00; F16D 65/78; B60L 7/10; B60L 11/00; B62M 6/40; B62M 6/80; H02P 3/14 (2020.01) CPC: F16D 61/00; F16D 65/02; F16D 65/78; B60T 1/02; B60L 7/10; B60L 11/00; B62M 6/40; B62M 6/80; H02P 3/14
Date Conducted	09 March 2020 (09.03.2020)

Documentation Searched	IPC (8): F16D 61/00; F16D 65/78; B60L 7/10; B60L 11/00; B62M 6/40; B62M 6/80; H02P 3/14 (2020.01) CPC: F16D 61/00; F16D 65/02; F16D 65/78; B60T 1/02; B60L 7/10; B60L 11/00; B62M 6/40; B62M 6/80; H02P 3/14 (Classifications, Keyword limited)
Search Terms Used	Regenerative, recovery, KERS, braking, stopping, slowing, lightweight, electric, vehicle, EV, dissipater, dissipator, heat, sink, convection, exchanger, radiator, mounting, attaching, resistor, bicycle, motorcycle, e-bike
Date Conducted	09 March 2020 (09.03.2020)

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	09 March 2020 (09.03.2020)

Search Logic:

Classification search

- Search 18: IPC=(F16D61/00 OR F16D65/78 OR B60L7/10 OR B60L11/00 OR B62M6/40 OR B62M6/80 OR H02P3/14) (Results 16567)
 Search 19: CPC=(F16D61/00 OR F16D65/02 OR F16D65/78 OR B60T1/02 OR B60L7/10 OR B60L11/00 OR B62M6/40 OR B62M6/80 OR H02P3/14) (Results 5092)
 Search 20: 18 OR 19 (Results 18084)
 Search 21: 20 AND FT=(regenerative OR recovery OR KERS) NEAR brak* (Results 3679)
 Search 22: 21 AND FT=dissipator% OR dissipate% OR exchanger% OR radiator% OR fins (Results 226)
 Search 23: 22 AND FT=(bicycle% OR motorcycle% OR e-bike%) (Results 43)
 Search 34: 20 AND FT=plate% W10 (dissipator% OR dissipate% OR sink% OR exchang* OR radiator%) (Results 106)
 Search 35: 34 AND FT=resistor% W15 plate% (Results 3)

Keyword only search

- Search 36: FT=(airflow* OR air-flow*) NEAR (passage% OR tunnel% OR channel%) (Results 25857)
 Search 37: 36 AND FT=(dissipate% OR dissipator% OR (heat WF1 sink%) OR (heat-sink%) OR heatsink%) (Results 1572)
 Search 38: 37 AND FT=(mount* OR attach*) NEAR (plate% OR surface%) (Results 653)
 Search 39: 38 AND FT=fins (Results 447)
 Search 40: 38 AND FT=(regenerat* OR recover* OR KERS) NEAR (energy OR power OR electric*) (Results 30)
 Search 43: FT=batter* NEAR plate% (Results 76516)
 Search 44: 43 AND FT=(heat* OR thermal*) NEAR (sink% OR exchang* OR radiator%) (Results 2917)
 Search 45: 44 AND FT=(dissipat* OR releas*) NEAR plate% (Results 281)
 Search 46: 45 AND FT=(airflow* OR air-flow*) NEAR (passage% OR tunnel% OR channel%) (Results 17)
 Search 47: 45 AND FT=(airflow* OR air-flow*) (Results 29)

Forward/backward search

- Search 2: PN=US8973690 (Results 1)
 Search 3: CTF=2 OR CTB=2 (Results 97)
 Search 4: PN=(US2015274020 OR US2017106866) (Results 2)
 Search 5: CTF=4 OR CTB=4 (Results 87)
 Search 6: 5 AND FT=heat W3 (dink% OR exchanger%) (Results 1)
 Search 7: PN=(US6170617 OR WO2010051135) (Results 2)
 Search 8: CTF=7 OR CTB=7 (Results 97)
 Search 9: 8 NOT (5 OR 3) (Results 97)
 Search 10: PN=CN106246772 (Results 1)
 Search 11: CTF=10 OR CTB=10 (Results 10)
 Search 13: PN=US2007126284 (Results 1)
 Search 14: CTF=13 OR CTB=13 (Results 55)
 Search 24: PN=(US2019363208 OR WO19053297) (Results 2)
 Search 25: CTF=24 OR CTB=24 (Results 8)
 Search 26: PN=CN103368470 (Results 1)
 Search 27: CTF=26 OR CTB=26 (Results 11)
 Search 30: PN=US2005067207 (Results 1)
 Search 31: CTF=30 OR CTB=30 (Results 192)
 Search 32: 31 AND FT=resistor% (Results 6)
 Search 41: PN=WO17173001 (Results 1)

Search 42: CTF=41 OR CTB=41 (Results 9)
Supplemental search
Search 1: PA=(saiki, Neal) (Results 9)

Electronic Database Searched	Google Patents
Date Conducted	09 March 2020 (09.03.2020)
Search Logic:	
<p>heat sink for bicycle brake About 11,197 results</p> <p>regenerative braking energy (motorcycle OR bicycle) About 38,584 results</p> <p>(regenerative OR recovery OR KERS) About 82,855 results</p> <p>(regenerative OR recovery OR KERS) AND (bicycle OR motorcycle OR e-bike) About 59,085 results</p> <p>(regenerative OR recovery OR KERS) AND (EV OR electric vehicle OR battery) About 57,862 results</p> <p>(regenerative OR recovery OR KERS) AND (EV OR electric vehicle OR battery) AND fins About 25,354 results</p> <p>(regenerative OR recovery OR KERS) AND (heat sink OR exchanger OR radiator) AND (overcharge OR overvoltage OR excess charge) About 46,856 results</p> <p>(bicycle OR motorcycle OR e-bike) AND (regenerative OR recovery OR KERS) AND (braking OR stopping OR slowing) AND (electric vehicle OR EV) AND (dissipate OR heat sink OR convection OR heat exchanger OR radiator) AND (resistor) About 24,525 results</p>	

Electronic Database Searched	Google Scholar
Date Conducted	09 March 2020 (09.03.2020)
Search Logic:	
<p>(regenerative OR recovery OR KERS OR energy recovery) About 4,100,000 results</p> <p>(regenerative OR recovery OR KERS OR energy recovery) AND (electric vehicle OR EV) About 1,120,000 results</p> <p>(regenerative OR recovery OR KERS OR energy recovery) AND (electric vehicle OR EV)</p>	

AND (bicycle OR motorcycle OR e-bike)
 About 40,500 results

(regenerative OR recovery OR KERS OR energy recovery) AND (electric vehicle OR EV)
 AND (bicycle OR motorcycle OR e-bike) AND (dissipate OR dissipator OR heat sink OR
 convection OR heat exchanger OR radiator)
 About 4,610 results

(heat sink OR heat exchanger OR radiator OR dissipator OR dissipate)
 About 960,000 results

(heat sink OR heat exchanger OR radiator OR dissipator OR dissipate) AND (braking OR
 stopping OR slowing)
 About 144,000 results

(heat sink OR heat exchanger OR radiator OR dissipator OR dissipate) AND (braking OR
 stopping OR slowing) AND (electric vehicle OR EV)
 About 54,600 results

battery heat sink
 About 153,000 results

battery heat sink AND fins AND regeneration
 About 8,300 results

Electronic Database Searched	Google Web
Date Conducted	09 March 2020 (09.03.2020)
Search Logic:	
<p>(bicycle OR motorcycle OR e-bike) About 3,100,000,000 results</p> <p>(bicycle OR motorcycle OR e-bike) AND (regenerative OR recovery OR KERS) About 234,000,000 results</p> <p>(bicycle OR motorcycle OR e-bike) AND (regenerative OR recovery OR KERS) AND (braking OR stopping OR slowing) About 13,900,000 results</p> <p>(bicycle OR motorcycle OR e-bike) AND (regenerative OR recovery OR KERS) AND (braking OR stopping OR slowing) AND (electric vehicle OR EV) About 6,860,000 results</p> <p>(bicycle OR motorcycle OR e-bike) AND (regenerative OR recovery OR KERS) AND (braking OR stopping OR slowing) AND (electric vehicle OR EV) AND (dissipate OR heat sink OR convection OR heat exchanger OR radiator) About 1,680,000 results</p> <p>(bicycle OR motorcycle OR e-bike) AND (regenerative OR recovery OR KERS) AND (braking OR stopping OR slowing) AND (electric vehicle OR EV) AND (dissipate OR heat sink OR convection OR heat exchanger OR radiator) AND (resistor)</p>	

About 412,000 results

regenerative braking dissipate

About 18,100 results

braking AND (dissipate OR dissipator OR heat sink OR convection OR heat exchanger OR radiator)

About 82,500,000 results

braking AND (dissipate OR dissipator OR heat sink OR convection OR heat exchanger OR radiator) AND energy recovery

About 8,240,000 results