

(12) 按照专利合作条约所公布的国际申请

(19) 世界知识产权组织
国际局



(10) 国际公布号
WO 2023/134551 A1

(43) 国际公布日
2023 年 7 月 20 日 (20.07.2023)

(51) 国际专利分类号:
B64F 1/20 (2006.01)

(21) 国际申请号: PCT/CN2023/070802

(22) 国际申请日: 2023 年 1 月 6 日 (06.01.2023)

(25) 申请语言: 中文

(26) 公布语言: 中文

(30) 优先权:
202210028026.1 2022 年 1 月 11 日 (11.01.2022) CN

(71) 申请人: 北京三快在线科技有限公司
(**BEIJING SANKUAI ONLINE TECHNOLOGY CO., LTD.**) [CN/CN]; 中国北京市海淀区北四环西路 9 号 2106-030, Beijing 100080 (CN)。

(72) 发明人: 蔡剑成 (**CAI, Jiancheng**); 中国北京市海淀区北四环西路 9 号 2106-030, Beijing 100080

(CN)。刘新民 (**LIU, Xinmin**); 中国北京市海淀区北四环西路 9 号 2106-030, Beijing 100080 (CN)。

毛一年 (**MAO, Yinian**); 中国北京市海淀区北四环西路 9 号 2106-030, Beijing 100080 (CN)。

(74) 代理人: 北京曼威知识产权代理有限公司 (**BEIJING MAVAI P INTELLECTUAL PROPERTY LAW FIRM**); 中国北京市海淀区上地三街 9 号嘉华大厦 B 座 411 室, Beijing 100085 (CN)。

(81) 指定国 (除另有指明, 要求每一种可提供的国家保护): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN,

(54) **Title:** METHOD AND APPARATUS FOR ALLOCATING BEACON CODES IN UNMANNED AERIAL VEHICLE AIRPORT, AND UNMANNED AERIAL VEHICLE LANDING METHOD AND APPARATUS

(54) 发明名称: 无人机机场中信标码的分配、无人机降落的方法及装置

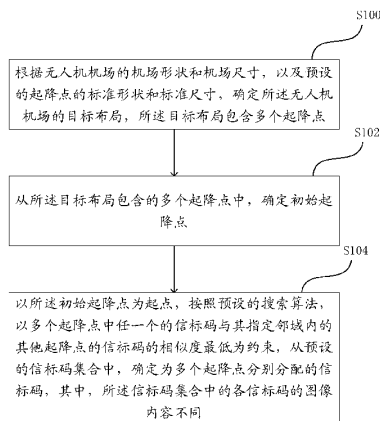


图 1

S100 Determine a target layout of an unmanned aerial vehicle airport according to the airport shape and the airport size of the unmanned aerial vehicle airport and a preset standard shape and a preset standard size of each takeoff/landing point, wherein the target layout contains a plurality of takeoff/landing points
S102 Determine an initial takeoff/landing point from the plurality of takeoff/landing points contained in the target layout
S103 By taking the initial takeoff/landing point as a starting point and taking, according to a preset search algorithm, the similarity between a beacon code of any one of the plurality of takeoff/landing points and a beacon code of the other takeoff/landing points in a specified neighboring region thereof being the lowest as a constraint, determine, from a preset beacon code set, beacon codes to be respectively allocated to the plurality of takeoff/landing points, wherein the image content of beacon codes in the beacon code set is different

(57) **Abstract:** A method and apparatus for allocating beacon codes in an unmanned aerial vehicle airport, and an unmanned aerial vehicle landing method and apparatus. The method for allocating beacon codes in an unmanned aerial vehicle airport comprises: determining, according to the airport shape and the airport size of an unmanned aerial vehicle airport and a standard shape and a standard size of each takeoff/landing point, a target layout of the unmanned aerial vehicle airport that contains a plurality of takeoff/landing points; then, determining an initial takeoff/landing point from the plurality of takeoff/landing points contained in the target layout; and by taking the initial takeoff/landing point as a starting point and taking, according to a preset search algorithm, the similarity between a beacon code of any one of the plurality of takeoff/landing points and a beacon code of the other takeoff/landing points in a specified neighboring region thereof being the lowest as a constraint, determining, from a preset beacon code set containing beacon codes of

[见续页]

WO 2023/134551 A1

MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW。

- (84) 指定国 (除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, RU, TJ, TM), 欧洲 (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, ME, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG)。

本国际公布:

— 包括国际检索报告 (条约第21条(3))。

different image contents, beacon codes to be respectively allocated to the plurality of takeoff/landing points. By means of the method, there is no need to manually determine the positions and correlation of takeoff/landing points and beacon codes within an airport range, thereby improving the allocation efficiency of beacon codes of unmanned aerial vehicles.

(57) 摘要: 一种无人机机场中信标码的分配、无人机降落的方法及装置, 根据无人机机场的机场形状和机场尺寸和起降点的标准形状和标准尺寸, 确定包含多个起降点的无人机机场的目标布局; 进而从目标布局包含的多个起降点中, 确定初始起降点; 并以该初始起降点为起点, 按照预设的搜索算法, 以多个起降点中的任一个的信标码与其指定邻域内的其他起降点的信标码的相似度最低为约束, 从预设的包含不同图像内容的信标码的信标码集合中, 确定为多个起降点分别分配的信标码。该方法不需要人工确定机场范围中各起降点和各信标码的位置以及对应关系, 提高了无人机信标码的分配效率。