

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(10) International Publication Number  
**WO 2024/151933 A3**

(43) International Publication Date  
18 July 2024 (18.07.2024)

(51) International Patent Classification:

*F41C 33/06* (2006.01)      *B65D 81/05* (2006.01)  
*B65D 81/107* (2006.01)

US 18/494,400 (CIP)  
Filed on 25 October 2023 (25.10.2023)

(21) International Application Number:

PCT/US2024/011373

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(22) International Filing Date:

12 January 2024 (12.01.2024)

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(25) Filing Language:

English

(26) Publication Language:

English

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(30) Priority Data:

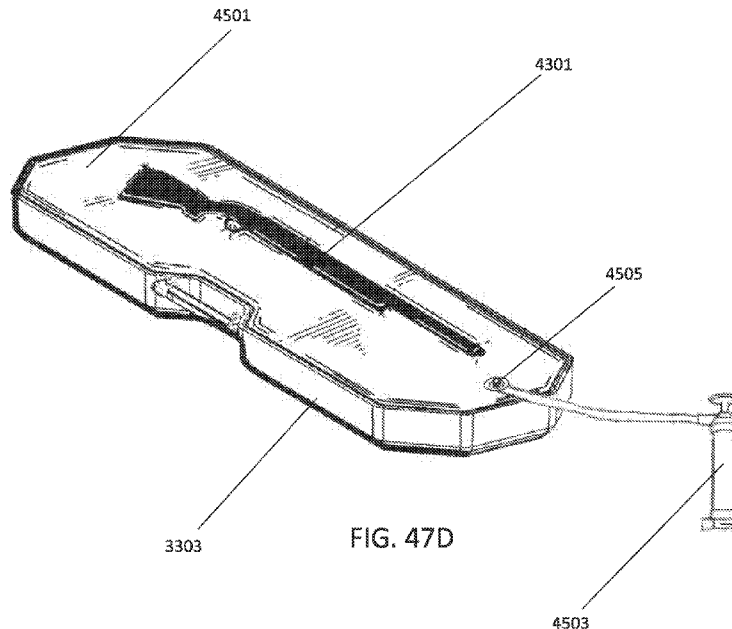
18/154,529      13 January 2023 (13.01.2023)      US  
18/112,325      21 February 2023 (21.02.2023)      US  
18/494,400      25 October 2023 (25.10.2023)      US

(81) Designated States (unless otherwise indicated, for every kind of national protection available): 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, MU, 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,

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:

US 18/154,529 (CIP)  
Filed on 13 January 2023 (13.01.2023)  
US 18/112,325 (CIP)  
Filed on 21 February 2023 (21.02.2023)

(54) Title: FLEXIBLE CASE HAVING RETAINING BAG INCLUDING BEAD REFILL MECHANISM



(57) Abstract: A protective carrying case for an object is disclosed, wherein the protective carrying case includes a top component, a bottom component, and semi-hexagonal ends, wherein the top component and the bottom component are constructed from carbon fiber. The protective carrying case additionally includes a retaining element with vacuum split functionality to retain elements within the case.



WO 2024/151933 A3

TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,  
ZA, ZM, ZW.

- (84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (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).

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

**(88) Date of publication of the international search report:**

06 September 2024 (06.09.2024)

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2024/011373

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
F41C 33/06(2006.01)i; B65D 81/107(2006.01)i; B65D 81/05(2006.01)i		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) F41C 33/06(2006.01); A61B 19/00(2006.01); B65D 33/16(2006.01); B65D 81/02(2006.01); B65D 81/05(2006.01); B65D 85/84(2006.01)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models Japanese utility models and applications for utility models		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS(KIPO internal) & Keywords: flexible bag, article, object, air intake valve, case, packaging materials, pump, antimicrobial layer		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5788078 A (FUSS, GUNTER G.) 04 August 1998 (1998-08-04) column 2, line 42 - column 4, line 8, column 5, lines 51-59, column 6, line 38 - column 7, line 14 and figures 1-8	1-10
Y	US 6033392 A (FREY et al.) 07 March 2000 (2000-03-07) claim 1 and figure 1	1-10
Y	US 2009-0032429 A1 (MORRIS et al.) 05 February 2009 (2009-02-05) paragraph [0033] and figure 1	3
A	US 2002-0066678 A1 (SHARON et al.) 06 June 2002 (2002-06-06) claim 1 and figure 1	1-10
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "D" document cited by the applicant in the international application "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search <b>31 July 2024</b>		Date of mailing of the international search report <b>31 July 2024</b>
Name and mailing address of the ISA/KR <b>Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon 35208, Republic of Korea</b> Facsimile No. +82-42-481-8578		Authorized officer <b>PARK, Tae Wook</b> Telephone No. +82-42-481-3405



**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

Claims 1-10 are directed to an article comprising: a flexible bag including air intake valve and a plurality of packaging materials; and at least one outer antimicrobial layer.

Claims 11-16 are directed to a system comprising: a case; a flexible bag including an air intake valve and a plurality of packaging materials; a pump; and at least one bead containment pod.

Claims 17-20 are directed to an article comprising: a flexible container including a top component and a bottom component; and at least one retaining element including a plurality of packaging materials and a first chamber and a second chamber separated by a seam, wherein the top component and the bottom component are able to be bound in closed position via at least one zipper mechanism.

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: **1-10**

**Remark on Protest**

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.

**PCT/US2024/011373**

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
US	5788078	A	04 August 1998	EP	0816228	A2	07 January 1998
				EP	0816228	A3	20 May 1998
				EP	0816228	B1	02 October 2002
				EP	0978455	A2	09 February 2000
				EP	0978455	A3	12 July 2000
				US	5778642	A	14 July 1998
				US	5782061	A	21 July 1998
				US	5782067	A	21 July 1998
				US	5826404	A	27 October 1998
				US	5899049	A	04 May 1999
				US	6128889	A	10 October 2000
				WO	95-03974	A1	09 February 1995
				US	6033392	A	07 March 2000
US	2009-0032429	A1	05 February 2009	US	7757854	B2	20 July 2010
				WO	2009-017774	A1	05 February 2009
US	2002-0066678	A1	06 June 2002	None			
US	2023-0194204	A1	22 June 2023	CA	3162178	A1	15 July 2021
				US	11435161	B2	06 September 2022
				US	11635278	B2	25 April 2023
				US	2020-0191522	A1	18 June 2020
				US	2021-0080224	A1	18 March 2021
				US	2022-0412691	A1	29 December 2022
				US	2023-0243619	A1	03 August 2023
				US	2023-0251059	A1	10 August 2023
				US	2024-0053121	A1	15 February 2024
				WO	2021-141679	A2	15 July 2021
				WO	2021-141679	A3	16 September 2021
WO	2021-141679	A4	18 November 2021				