



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
03.05.2023 Bulletin 2023/18

(51) International Patent Classification (IPC):
H01Q 1/32 (2006.01) **H01Q 1/42** (2006.01)
H01Q 1/44 (2006.01)

(43) Date of publication A2:
01.03.2023 Bulletin 2023/09

(52) Cooperative Patent Classification (CPC):
H01Q 1/3233; H01Q 1/422; H01Q 1/44

(21) Application number: **22190462.6**

(22) Date of filing: **16.08.2022**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

- **Field, Simon David**
Lonsdale 5160 (AU)
- **Koehne, Shane Randell**
Lonsdale 5160 (AU)
- **Herrmann, Andreas**
70327 Stuttgart (DE)
- **Edwards, Scott**
Lonsdale 5160 (AU)
- **Stoehr, Bastian**
Lonsdale 5160 (AU)
- **Symonds, Tim**
Lonsdale 5160 (AU)

(30) Priority: **30.08.2021 US 202117460727**

(71) Applicant: **Motherson Innovations Company Ltd.**
London EC2N 2AX (GB)

(74) Representative: **Holzwarth-Rochford, Andreas**
Jones Day
Nextower
Thurn-und-Taxis-Platz 6
60313 Frankfurt am Main (DE)

(72) Inventors:
• **Caruso, Dean**
Lonsdale 5160 (AU)
• **Belcher, Simon**
Lonsdale 5160 (AU)

(54) **DECORATIVE PVD COATED ITEMS AND RADOMES AND METHODS OF MAKING SAME**

(57) A decorative radome including a radio-transmissive substrate having a first surface on a first side and a second surface on a second side; and a first surface radio-transmissive decorative coating; methods of manufacturing a PVD coated system include applying a hard coating to the substrate; applying a PVD coating by magnetron sputtering to the substrate; and laser etching one or more of a pattern or a graphic into the PVD coating; and A decorative PVD coated item, comprising: a substrate; a hard coating applied to the substrate; a PVD coating provided on the hard coating and the substrate, wherein the PVD coating is laser etched with one or more of a pattern or a graphic so that the PVD coating is at least partially removed and the pattern or the graphic is revealed as a result of the contrast between the substrate and the PVD coating.

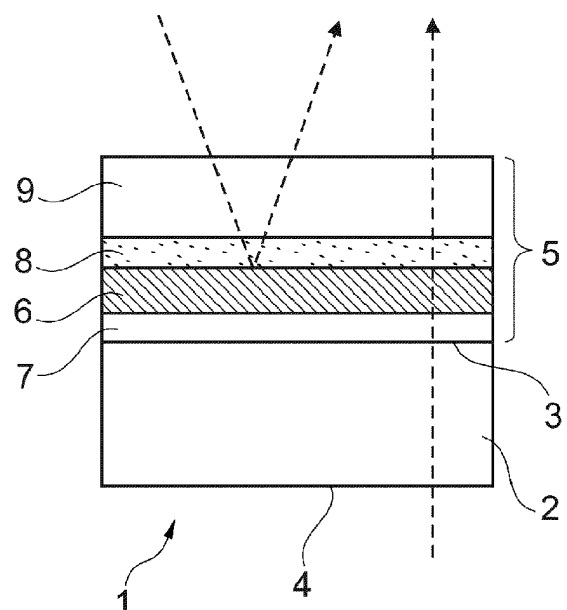


Fig. 1



EUROPEAN SEARCH REPORT

Application Number

EP 22 19 0462

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2021/122301 A1 (LIN YI-KUAN [TW] ET AL) 29 April 2021 (2021-04-29) * paragraphs [0002] - [0038]; figures 1-7 *	1-10	INV. H01Q1/32 H01Q1/42 H01Q1/44
X	WO 2021/018422 A1 (MOTHERSON INNOVATIONS CO LTD [GB]) 4 February 2021 (2021-02-04) * paragraphs [0001] - [0288]; claims 1-55; figures 1-18 *	1-14, 17-22	
A	WO 2020/144351 A1 (MOTHERSON INNOVATIONS CO LTD [GB]) 16 July 2020 (2020-07-16) * pages 1-22; figures 1-7 *	11-14, 17-22 15,16	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) H01Q B60R
Place of search The Hague			Examiner E1-Shaarawy, Heba
Date of completion of the search 28 March 2023			
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document



Application Number

EP 22 19 0462

5

10

15

20

25

30

35

40

45

50

55

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 22 19 0462

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-10

**Protection of a RADAR from environmental damage, while
maintaining good RF transmission characteristics**

2. claims: 11-22

**Reduction of the delamination of the decorative layer from
the substrate and the overall residual stress of the
radio-transmissive decorative layer**

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 22 19 0462

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-03-2023

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2021122301 A1	29-04-2021	CN 112706469 A	27-04-2021
		DE 102020122841 A1	29-04-2021
		JP 7026180 B2	25-02-2022
		JP 2021066427 A	30-04-2021
		TW 202116583 A	01-05-2021
		US 2021122301 A1	29-04-2021

WO 2021018422 A1	04-02-2021	CN 114270626 A	01-04-2022
		EP 4005022 A1	01-06-2022
		JP 2022542791 A	07-10-2022
		WO 2021018422 A1	04-02-2021

WO 2020144351 A1	16-07-2020	DE 102019100669 A1	16-07-2020
		EP 3909096 A1	17-11-2021
		JP 2022516921 A	03-03-2022
		US 2021344110 A1	04-11-2021
		WO 2020144351 A1	16-07-2020
