



(43) International Publication Date
25 April 2019 (25.04.2019)

(51) International Patent Classification:
A63H 33/04 (2006.01) A63H 33/08 (2006.01)

(21) International Application Number:
PCT/EP20 18/077662

(22) International Filing Date:
11 October 2018 (11.10.2018)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PA201770787 17 October 2017 (17.10.2017) DK

(71) Applicant: LEGO A/S [DK/DK]; Aastvej 1, 7190 Billund (DK).

(72) Inventor: ASHTON, Matthew James; c/o LEGO A/S, Aastvej 1, 7190 Billund (DK).

(74) Agent: GUARDIAN IP CONSULTING I/S; Diplomvej, Building 381, 2800 Kgs. Lyngby (DK).

(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, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, 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, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(54) Title: A TOY CONSTRUCTION AND USE OF SUCH A TOY CONSTRUCTION SET

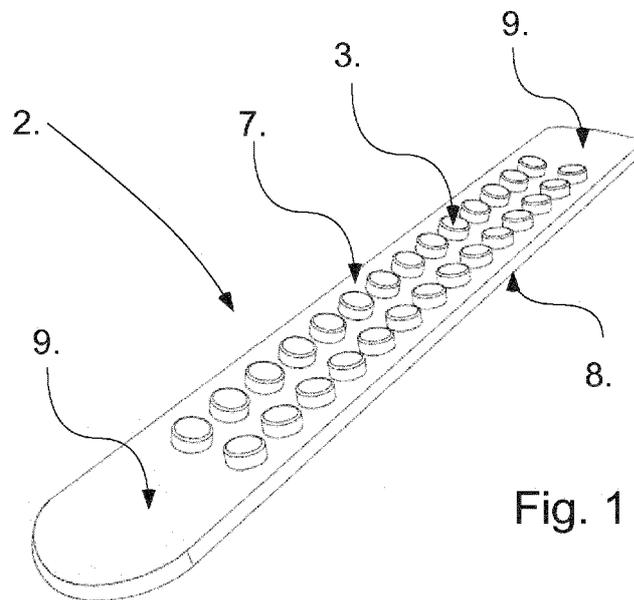


Fig. 1

(57) Abstract: A toy construction set comprising a number of toy building blocks with one or more coupling knobs and coupling sockets adapted for releasable frictional engagement with the couplings knobs on another building block in the toy construction set, and wherein the toy construction set further comprises a building element comprising a bistable band, and where the band has a first stable shape where it is curved about a first curvature axis extending parallel with the longitudinal direction of the band and at a distance from a first side of the band, and a second stable shape where it is curved about a second curvature axis extending substantially perpendicular with the first curvature axis, and where the bistable band on the first side of the bistable band comprises multiple coupling knobs arranged in a uniform, preferably square pattern, and where each coupling knob is adapted for frictional engagement with a coupling socket of another building block in the toy construction set.



(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, *ML*, NA, RW, 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, 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).

Published:

— *with international search report (Art. 21(3))*

Title:

A toy construction and a use of such a toy construction set.

5 The prior art:

The present invention relates to a toy construction set comprising a number of toy building blocks each having an upper surface provided with one or more coupling knobs arranged equidistantly in a uniform, preferably square, pattern, and a lower surface provided with one or more coupling sockets adapted for releasable frictional engagement with the couplings knobs on another building block in the toy construction set,

Today construction sets of the above mentioned kind exists in countless different embodiments all for the purpose of providing new and intriguing functionality to the user.

The object of the invention:

20 On this background it is the purpose of the present invention to provide a construction set as mentioned in the introduction, and providing the user with further options for building more different constructions with new and intriguing functionality.

25 This is obtained by the toy construction set according to claim 1 and eg. by using such a toy construction set as defined by claim 11, by using a bistable building element/band having a first stable shape where it is curved about a first curvature axis extending parallel with the longitudinal direction of the band and at a distance from a first side of the band, and a second stable shape where it is curved about a second curvature axis extending substantially perpendicular with the first curvature axis, and where the bistable band

on the first side of the bistable band comprises multiple coupling knobs arranged in a uniform, preferably square pattern, and where each coupling knob is adapted for frictional engagement with a coupling socket of another building block in the toy construction set according to the invention.

5

It is thereby possible to build constructions where one or more building blocks of different sizes are mounted onto the bistable band, and when the bistable band is urged to alter its shape from one stable position to another, then this will result in e.g. the ejection of the building blocks from the bistable
10 band.

On the other hand the bistable band may e.g. be used as a slap bracelet allowing only building blocks that are covering only a single knob in a row on the bistable band to stay attached to the bistable band after it is slapped onto
15 the wrist or other body part of the user. In this way it is possible to build different and customized slap bracelets, where the "single knob" blocks resembles ornaments on the slap bracelet.

In this relation the longitudinal direction means the direction where the bistable
20 band has its longest measure.

In a preferred embodiment the second curvature axis extends at a distance from the second opposite side of the bistable band in order to ensure the highest possible stability of the two stable positions.

25

In this relation the bistable band may advantageously comprise a body made from a bistable metal band.

Furthermore the couplings knobs may advantageously be made from a plastic material attached to the bistable metal band by injection moulding.
30

In a preferred embodiment the bistable metal band is embedded in a plastic cover so that at least the edges of the band are covered by the plastic cover. In this relation the plastic cover may advantageously be injection moulded onto the bistable metal band, so that the bistable metal band is completely enclosed by the plastic cover, and where the plastic coupling knobs are integrally moulded with the plastic cover.

Preferably the coupling knobs are arranged in one, two or three, or even more rows extending parallel with the longitudinal direction of the bistable band.

Furthermore the length of the bistable band measured in the longitudinal direction of the bistable band may advantageously be so long that the ends in the longitudinal direction of the bistable band are overlapping when the bistable band is in said second stable shape being curved about the second curvature axis. Thereby the bistable band forms a closed loop when it is resting in its second stable position. The length of the bistable band in this relation furthermore be so that it may conveniently be curved about the wrist of a person when it forms a closed loop.

In this relation the rows of knobs may furthermore end at a distance from one end of the bistable band seen in the longitudinal direction, and so that the first side of the bistable band, when it is positioned in the second stable shape, abuts the second side of the bistable band.

In a preferred embodiment the number of toy building blocks comprises one or more building blocks without couplings knobs and having only one coupling socket adapted for frictional engagement with only one coupling knob of the bistable band. Thereby the toy building set is especially useful as a slap bracelet where the "one socket" building elements may resemble ornamental

stones that keeps attached to the slap bracelet even when transforming it from one stable position to another.

5 **The drawing:**

In the following one or more embodiments of the invention will be described in more detail and with reference to the drawing, where:

10 Fig. 1: Is a perspective view showing one embodiment of a bistable band for the toy construction set according to the present invention.

Fig. 2: Is a perspective view of a building block for the toy construction set according to the invention.

15

Fig. 3: Is a bottom view of the building block shown in figure 2.

Fig. 4: Is a perspective view of the bistable band shown in figure 1, but in a second stable position, and with a building block attached.

20

Fig. 5: Is a perspective view of a different building element for the toy construction set according to the invention.

Fig. 6: Is a cross section view of the bistable band in the stable position shown in figure 1.

25

Description of exemplary embodiments:

Fig. 1 shows one embodiment of the bistable band 2 forming part of the toy construction set according to the present invention. In this embodiment the

30

bistable band is formed in the shape as a slap bracelet 2, having coupling knobs 3 arranged in two parallel rows on the first side 7 of the slap bracelet. In this embodiment the slap bracelet is made from a bistable metal band 11 as shown in figure 5. Such bistable metal bands are well known in the art, and they provide the option of slapping the bracelet against e.g. the wrist of a person when it is in its first stable position as shown in figure 1, where the bistable metal band 11. Keeps the slap bracelet straight and having a curvature as shown in figure 5 about a curvature axis (not shown on the figures) extending along the longitudinal length of the slap bracelet, substantially parallel with the two rows of coupling knobs 3 arranged on the first side 7 of the slap bracelet.

By doing so the bistable metal band may be urged to be transformed from this first stable position and into the second stable position as shown in figure 4, where the bistable metal band curves about a second curvature axis (not shown in the figure) being substantially perpendicular to the first curvature axis.

In this embodiment the bistable metal band 11 is provided with a cover 14 of a soft and elastic plastic material extending so that it covers the sharp edges 13 of the bistable metal band 11.

The cover 14 is in this embodiment injection molded onto the bistable metal band 11, and for this reason holes 12 are extending through the cover 14 and into the bistable metal band 11. Apart from these holes 12, resulting from the necessity of using holding pins for positioning the bistable metal band in the correct position in the mold cavity of an injection molding tool, then the bistable metal band 11 is in this embodiment completely enclosed in the cover 14.

Figure 2 and 3 shows a building block 1 also forming part of the toy building set according to the present invention. Building blocks of this kind are well

known in the prior art in various different shapes and embodiments all having a upper surface 4 with coupling knobs 3 arranged equidistantly in a square pattern, and a lower surface 5 having one or more sockets 6 arranged for frictional engagement with the coupling knobs 3 on the upper surface of another such building element 1, or according to the present invention with the couplings knobs 3 on the slap bracelet 2 shown in figure 1.

This is possible due to the fact that the rows of coupling knobs 3 on the slap bracelet 2 are arranged in accordance with the same square pattern as the coupling knobs 3 of the building element 1 shown in figure 2.

In this way the slap bracelet 2 may also be used as eg. a catapult for ejecting a building block 1 according to figure 2 and 3 away from the slap bracelet 2, if such a building element 1 is attached to the couplings knobs 3 on the slap bracelet 2 whereafter the slap bracelet 2 is urged to transform from the first stable position shown in figure 1 into the second stable position shown in figure 4.

On the other hand, when a smaller building element 10 as shown in figure 6, and having a coupling socket (not shown) arranged underneath and being shaped only for frictional attachment of the smaller building element 10 to a single coupling knob 3 on the slap bracelet, are attached to the slap bracelet, then this smaller building element may not be ejected from the slap bracelet 2, but stay on the slap bracelet as shown in figure 4.

Thereby the bistable band/slap bracelet 2 provides different options for the user to build constructions with very different functionality.

In this embodiment the slap bracelet 2 has opposite ends 9 being shaped without coupling knobs 3, so that first 7 and the second side 8 of the slap

bracelet 2, having a length allowing the opposite ends to overlap, are directly in contact with each other.



Claims:

1. A toy construction set comprising a number of toy building blocks each having an upper surface provided with one or more coupling knobs arranged equidistantly in a uniform, preferably square, pattern, and a lower surface provided with one or more coupling sockets adapted for releasable frictional engagement with the couplings knobs on another building block in the toy construction set, and wherein the toy construction set further comprises a building element comprising a bistable band, and where the band has a first stable shape where it is curved about a first curvature axis extending parallel with the longitudinal direction of the band and at a distance from a first side of the band, and a second stable shape where it is curved about a second curvature axis extending substantially perpendicular with the first curvature axis, and where the bistable band on the first side of the bistable band comprises multiple coupling knobs arranged in a uniform, preferably square pattern, and where each coupling knob is adapted for frictional engagement with a coupling socket of building block in the toy construction set.
2. A toy construction set according to claim 1, wherein the second curvature axis extends at a distance from the second opposite side of the bistable band.
3. A toy construction set according to claim 1 or 2, wherein the bistable band comprises a body made from a bistable metal band.
4. A toy construction set according to claim 3, wherein the coupling knobs are injection moulded onto the bistable metal band.

5. A toy construction set according to claim 4, wherein the bistable metal band is embedded in a plastic cover.
- 5 6. A toy construction set according to claim 5, wherein the plastic cover is injection moulded onto the bistable metal band, so that the bistable metal band is completely enclosed by the plastic cover, and where the plastic coupling knobs are integrally moulded with the plastic cover.
- 10 7. A toy construction set according to any of the preceding claims, wherein the coupling knobs are arranged in one or more rows extending parallel with the longitudinal direction of the bistable band.
- 15 8. A toy construction set according to claim 7, wherein the length of the bistable band measured in the longitudinal direction of the bistable band is so that the ends in the longitudinal direction of the bistable band are overlapping when the bistable band is in said second stable shape being curved about the second curvature axis
- 20 9. A toy construction set according to claim 2 and 8, wherein the rows of knobs ends at a distance from one end of the bistable band seen in the longitudinal direction, and so that the first side of the bistable band, when it is positioned in the second stable shape, abuts the second side of the bistable band.
- 25 10. A toy construction set according to claim 9, wherein the number of toy building blocks further comprises one or more building blocks without couplings knobs and having only one coupling socket adapted for frictional engagement with only one coupling knob of the bistable band.

11. Use of a toy construction set according to any of the preceding claims, wherein the bistable band is used as a slap bracelet, and the building blocks are used as ornaments on the slap bracelet.

5

1/2

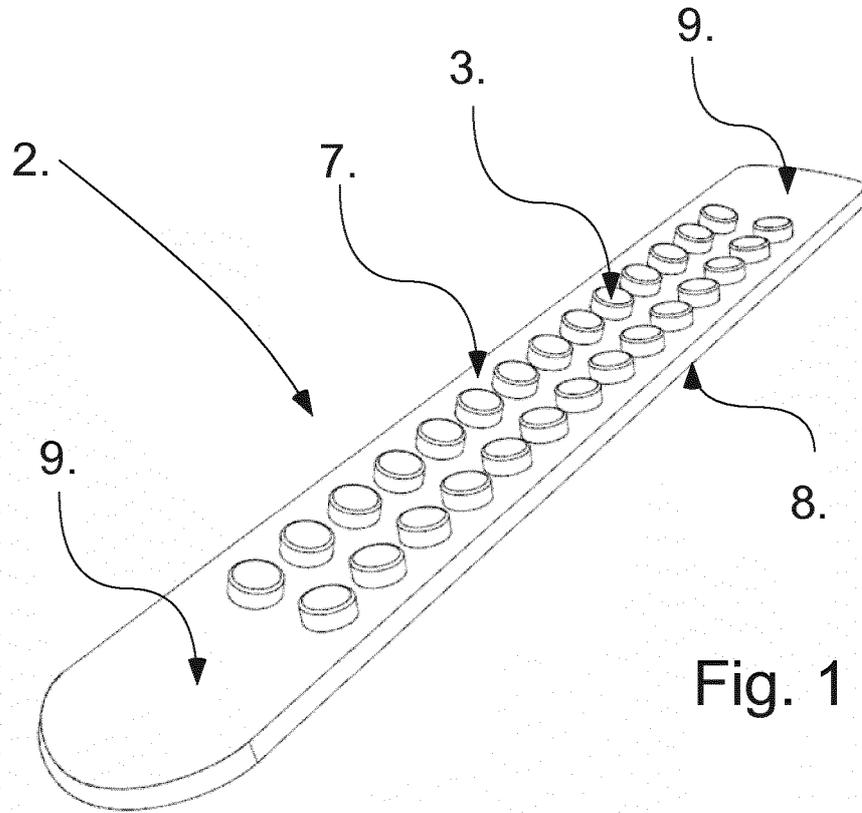


Fig. 1

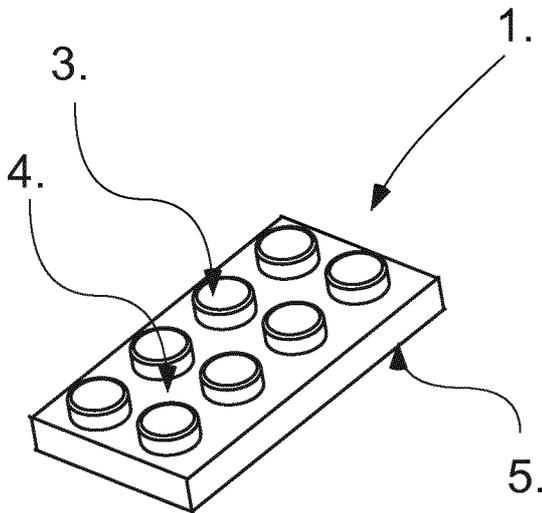


Fig. 2

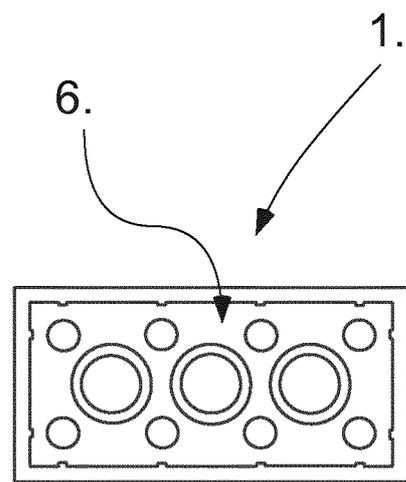


Fig. 3

2/2

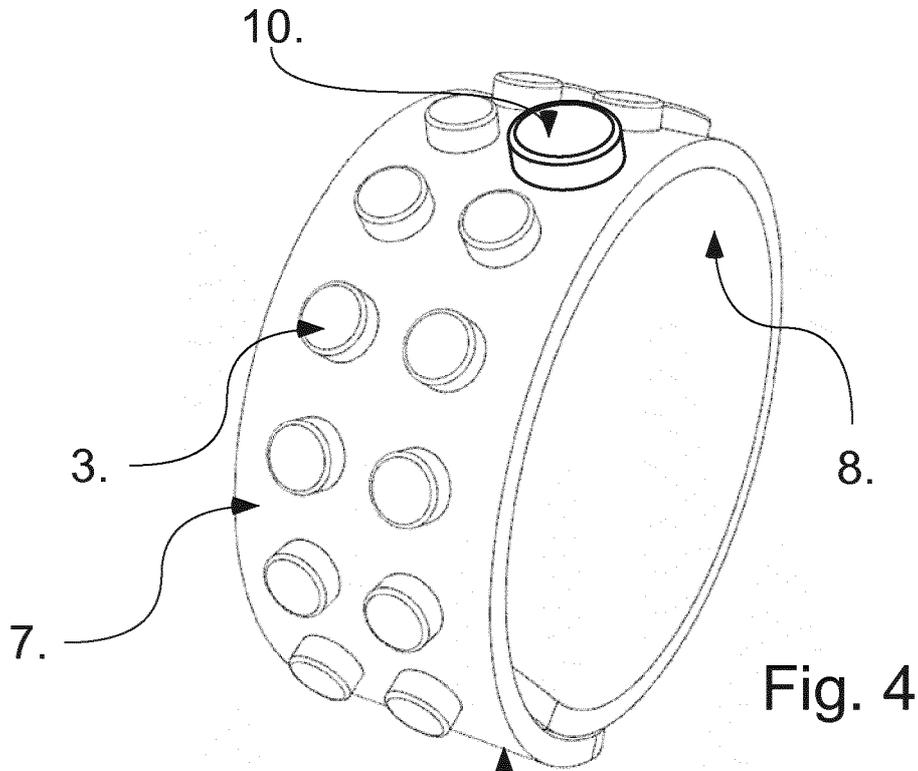


Fig. 4

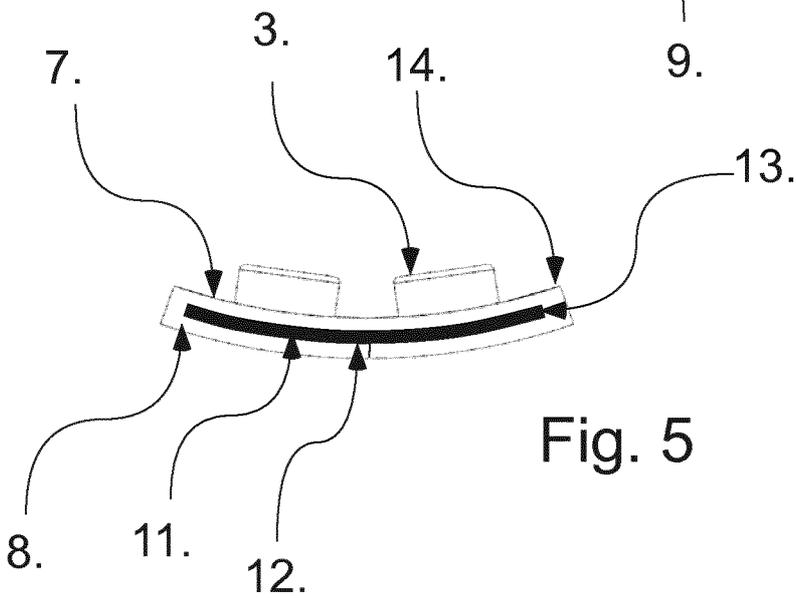


Fig. 5

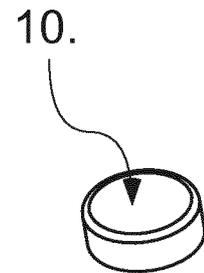


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/077662

A. CLASSIFICATION OF SUBJECT MATTER
INV. A63H33/04 A63H33/08
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
A63H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 9 480 931 B1 (SAMO JEBRAEIL [US] ET AL) 1 November 2016 (2016-11-01) column 9, line 57 - column 10, line 17 -----	1-11
A	EP 0 621 062 A2 (MESSERSCHMITT ENNO [DE]) 26 October 1994 (1994-10-26) column 14, line 23 - column 18, line 1 -----	1-11
A	US 2003/155389 A1 (SWAPJZENTRUBER VINCENT DALE [US]) 21 August 2003 (2003-08-21) paragraph [0050] ; figures 9, 10 -----	1-11
A	US 2017/095044 A1 (THREATT WILLIE [US]) 6 April 2017 (2017-04-06) paragraph [0012] - paragraph [0017] -----	1-11

Further documents are listed in the continuation of Box C. 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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 28 November 2018	Date of mailing of the international search report 06/12/2018
--	---

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Brumme, Ion
--	--

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2018/077662

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 9480931	B1	01-11-2016	NONE

EP 0621062	A2	26-10-1994	NONE

US 2003155389	A1	21-08-2003	NONE

US 2017095044	A1	06-04-2017	NONE
