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(54) **PORTABLE BUILDING UNIT**

(57) A portable building unit, comprises an interior space bounded by
a convex rear wall,
a concave front wall,
left-hand and right-hand side walls,
a floor, and
a roof
wherein, viewed from above, the building unit is arcuate in shape,
wherein the building unit fits inside a rectangle of dimensions 7m by 3m, and
wherein the angle between left-hand and right-hand side walls is 110 degrees or less.

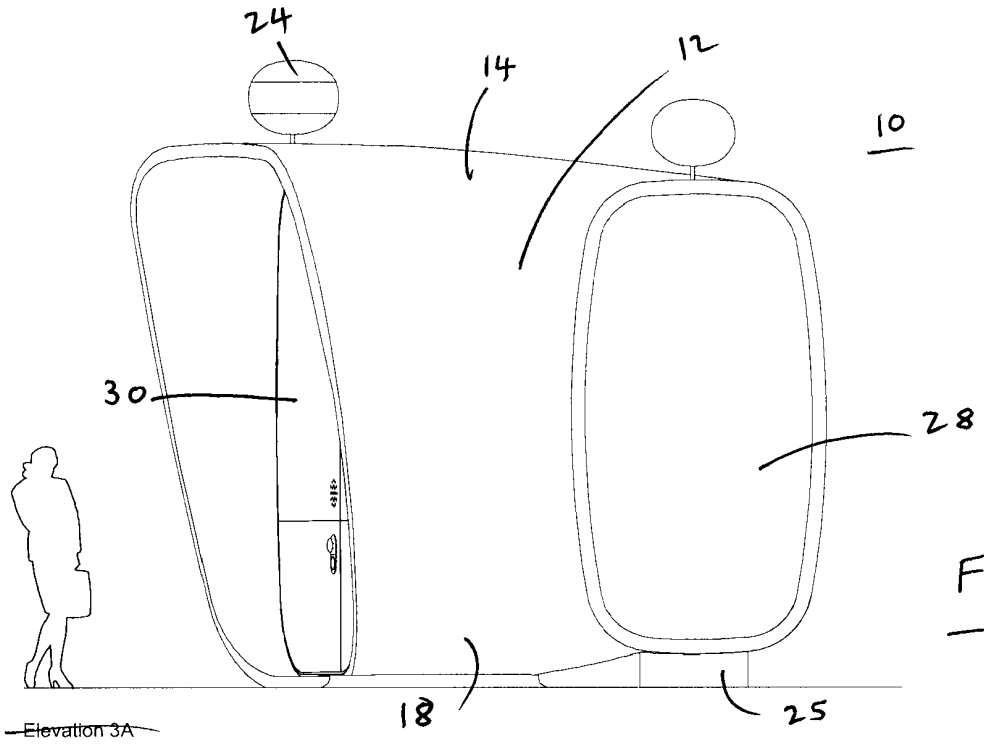


Fig. 1

Elevation 3A

EP 4 105 409 A1

Description

Introduction

[0001] The present invention relates to an urban alcove, also referred to as a portable building unit, for urban use and to manufacture and installation thereof.

Background to the Invention

[0002] A variety of portable buildings e.g. kiosks are known, generally for use in central urban environments. These can be of square or rectangular appearance, with various doors and windows.

[0003] The designs have not changed much over the years though have identifiable deficiencies: they tend not to fit in well with existing urban architecture nor into smaller spaces found in towns and cities. Access points on opposite sides of their square or rectangular shaped format often mean that only one side of the units can effectively be used if the other fronts onto e.g. a wall or road. Even when accessed on adjacent sides, these units fail to define an exterior space for use or enjoyment by those who wish to benefit from the services provided from the units.

[0004] Accordingly, there remains a need for an improved portable building to provide multiple functionality in an accessible format while retaining portability for ease of installation.

[0005] An aim of the present invention is to ameliorate or preferably overcome problems and inadequacies in known portable building units. An aim of preferred embodiments is to provide an improvement therein whereby the unit is portable, fits onto available lorry transportation and provides a welcoming and multifunctional facility for users, taking advantage of spaces or niches created in front of and around the unit.

Summary of Invention

[0006] A portable building unit of a first embodiment of the invention has an interior space bounded by

a convex rear wall,
a concave front wall,
left-hand and right-hand side walls,
a floor, and
a roof

wherein, viewed from above, the building unit is arcuate in shape and wherein the building unit fits inside a rectangle of dimensions 7m by 3m.

[0007] Another portable building unit of a second embodiment of the invention has an interior space bounded by

a convex rear wall,
a concave front wall,
left-hand and right-hand side walls,
a floor, and
a roof,

and comprises substantially flat / planar left-hand and right-hand side wall portions, wherein the angle between left-hand and right-hand side walls or wall portions is 110 degrees or less.

[0008] Preferably, a portable building unit comprises the features of both first and second embodiments.

Details of the Invention

[0009] According, the invention provides a portable building unit, comprising an interior space bounded by

a convex rear wall,
a concave front wall,
left-hand and right-hand side walls,
a floor, and
a roof

wherein, viewed from above, the building unit is arcuate in shape and wherein the building unit fits inside a rectangle of dimensions 7m by 3m.

[0010] The 7m x 3m dimensions refer to the footprint on the ground. This footprint advantageously facilitates transportation on known vehicles e.g. lorries and transporters licensed in the UK and Europe for use on public roads; this enhances portability.

[0011] The invention also provides a portable building unit comprising an interior space bounded by

a convex rear wall,
a concave front wall,
left-hand and right-hand side walls,
a floor, and
a roof,

and which also comprises substantially flat / planar left-hand and right-hand side wall portions, wherein the angle between left-hand and right-hand side walls / portions thereof is 110 degrees or less. Preferably for this embodiment, when viewed from above the building unit is arcuate in shape and fits inside a rectangle of dimensions 7m by 3m.

[0012] The discussion below refers to all embodiments, i.e. the first and the second and embodiments combining features of both.

[0013] Referring thus to all embodiments, in cross section the rear wall, roof and front wall suitably form a single, continuous curve. This gives a pleasing appearance and may facilitate one-piece construction - see below.

[0014] The portable building unit also typically comprises substantially flat / planar left hand- and right-hand side wall portions. These optionally include one or more doors or windows or window sections, preferably windows and preferably windows on both walls or a window

on one and a screen on the other.

[0015] One (e.g. the left-hand) side wall can comprise a window horizontally hinged at or towards the top and opening to provide walk-in access to the interior space. Thus when closed there is a window, which can include one or more hatches and/or grilles and/or microphone(s) and/or speaker(s) for communicating between users (outside) and occupants (inside) the unit. When opened, convenient walk-in access to the unit is possible. One (e.g. the right-hand) side wall may then comprise a window - see below for more optional features thereof. As will be appreciated these respective features of the sides can be mirrored in an alternative embodiment.

[0016] The unit suitably comprises substantially flat / planar left-hand and right-hand side wall portions, wherein the angle between left-hand and right-hand side walls is 110 degrees or less. In preferred embodiments, this angle is a consequence of the unit being curved, looking down on the unit from above, with its curved rear and front walls. The curvature of respective concave and convex outer walls reduces the angle between the side walls from 180 degrees (which is the case e.g. in known square units) down to 110 degrees or less, e.g. 100 degrees or less, more usually 90 degrees or less. In an example below the angle is about 85 degrees. The extent of curvature can reduce down to zero, with the side walls parallel. Generally the angle is at least 30 degrees, usually at least 45 degrees. The effect is partially to enclose an area between the side walls (which as noted preferably comprise windows or touch screen(s) etc - see elsewhere herein) presenting a more user friendly area more amenable to functioning of the unit in its intended urban environment. Existing street kiosks use a squarer or completely circular design with the counters for public interaction adjacent or facing oppositely outwards. This creates a less welcoming experience. The use of the curved alcove shape of the invention gives the urban alcove a 'bubble-like' safe space partially surrounding / protecting the users on the street in front of it. Due to its curved shape it can be placed in corners in a 'street niche' form which can help it fit in tight spaces and still have both side walls, i.e. the interactive front of the unit facing the same direction - a known kiosk would have to be adapted for a corner as some of the entrances or sides would be covered or obscured. The curved form enables better use of the outside space between the side walls adjacent the front wall.

[0017] Also preferably, the curvature of the unit and the angles noted above are such that from a point of view perpendicular to and spaced some distance back from the left-hand side wall, the right-hand side wall is visible.

[0018] One side wall, e.g. the right-hand wall in preferred embodiments, comprises one or more or all of:

a touch screen display,
an interactive display,
an interface connected a digital assistant, and
an information screen.

[0019] The digital assistant interface generally comprises a microphone and speaker, optionally operatively linked to a display screen, which may also be a touch screen. The unit may also have a call button for summoning and/or communicating with the emergency services; this can be a video call button. The unit can accommodate up to two public service providers, each being such as a police officer, security personnel, medical provider, information provider, F&B preparation or vendor, stationed in the alcove and together with the digital assistant screen, suitably incorporating AI, it provides a well-rounded level of support to the public. The result is a wide range of uses and possibilities to provide safety and a service to the public. A screen can help combat language barriers and makes the unit more accessible for people with disabilities or other needs. There are multiple different options for and uses of the screen, e.g. for display of information, advertising and / or as a helpline service. The functionality in combination with the portable size and its curved format provides an effective unit both when manned and also when unmanned.

[0020] Returning to the unit's dimensions, preferably it fits inside a rectangle 3.5m deep or less, more preferably 3m or less deep, in particular 2.7m deep or less. The unit also fits inside a rectangle 7m wide or less, preferably 6.6m wide or less, in particular 6m wide or less. A unit described below in an example fits inside a rectangle of dimensions 6m by 2.7m; this has the advantage of fitting into a conventional sized parking bay in the UK and fitting onto a flat bed lorry without the need for a police escort.

[0021] For enhanced portability, and also ease of manufacture, the building unit can be a single piece construction, e.g. comprising a single-piece main shell, optionally moulded. This external structure can be made of either a monocoque shell of PU foam, concrete or fibre reinforced polymer composite with an outer metal alloy skin. This can make the urban alcove's weight and security adaptable depending on the location where is it required. The alloy skin helps hide scratches and marks by allowing them to oxides naturally. An alternative construction comprises steel and/or timber ribs attached or bonded to internal and external skins (or just external skin) to provide a composite monocoque type structural shell. With these features, it is anticipated that little maintenance for the unit is required. The unit can be made in many colours to fit in with different cultures or surrounding environments. A further advantage of the easy portability is that the unit can be readily moved and redeployed.

[0022] The invention is now described with reference to the accompanying drawings, in which:

Fig. 1 shows a view from the front of an alcove of the invention;
Fig. 2 shows a view from the front of the alcove from Fig.1, with the service window opened;
Fig. 3 shows a plan view of the alcove from above;
Fig. 4 shows a view of the alcove from above, show-

ing internal detail and contents;
Fig. 5 shows an alternative view of the alcove from the front and to the side;
Fig. 6 shows a view of the alcove from the rear; and
Figs. 7 a, b, c and d show views from above and behind (a, b) and in front (c, d) of the alcove.

[0023] Referring to all of the figures, an alcove shown generally as 10 is constructed from a shell portion 12 divided into a roof 14, back wall 16, front wall 18 and left-hand and right-hand side walls 20 and 21.

[0024] Roof lights 24 are mounted on the roof 14 and there are rear windows 34 on the back wall 16.

[0025] The shell (12) is mounted on height adjustable legs with pad base supports for ease of installation onto variable street surfaces, discretely hidden behind the outer shell (12) and/or the lower skirting (25) of the unit. Alternatively the adjustable legs can be attached directly to a pre-prepared screw pile of foundation.

[0026] The right-hand side wall is up to approx. 3.6m high at its highest point; on the right-hand side wall 21 is provided a full-length interactive screen 28 (more details below). This part of the unit is approx. 1.81m wide at the exterior of the front and rear walls with a window approx. 1.61m wide. On the right-hand wall can be mounted a screen based interface, designed to catch people's eye with information and media, and invite them in to interact and discover more. The display may be interactive via touch screen, voice activated conversational AI and / or direct sound or video link to an assisting operator.

[0027] The left-hand side wall is up to approx. 3.85m high at its highest point; on the left-hand side wall 20 there is an opening and hinged surface window 30, shown open for example in Fig. 2 and closed in Fig. 1 (and also in open/closed positions in other Figures). The left-hand side wall is approx. 2.8m wide at its widest point, with its mounted and hinged window approx. 2.45m wide. The unit fits inside a footprint of 6m x 2.7m with both sides and their respective access points (window / screen) accessible from the same side as a result of the unit's curved form.

[0028] The window 30 is also referred to as the main service or gallery window; it provides a main glass frontage that can work as a manned service window, or swung open to provide a sheltered 'forecourt' area for direct interactions, merchandise, queuing, activities, cafe tables, etc. The service window 30 opens to allow access to occupants of the alcove who might be standing in the interior space or seated e.g. at chairs 40 in front of bench 38 by the front wall. Furthermore, when unoccupied this front window can provide a digital media display, or just provide a clear window to view displayed items located within the unit. A separate work bench 36 is provided in front of the right-hand wall.

[0029] Access to the interior space, when the service window has been opened, is through doorway 32.

[0030] On the service window there is provided a call button (not shown), a lock 31 and speaker grille 33. A rear access door 42 is also located in the rear wall 16, giving access to the interior space when the service window is hinged closed.

[0031] As apparent from Figs. 1 and 5, shown respectively looking straight on at the interactive screen 28 and the service window 30, the respective angles of the left-hand and right-hand side walls are such that when standing back from the interactive screen, the service window is partially visible or when standing back from the service window, the interactive screen is partially visible.

[0032] Viewed from above, e.g. Fig. 3 and Fig. 4, the angle of the right-hand side wall to the left-hand side wall is approximately 85 degrees, as a result of the curved nature of the shell 12.

[0033] Portions of the roof over both side windows extend outwardly, providing shelter from rain or sun.

[0034] Suitably the alcove comprises one or more connectors for connection to more or more or all of supplies of water, gas, electricity, waste water and communications. This further enhances ease of and speed of installation.

[0035] Preferably the alcove has a shape that, viewed from above, comprises curved section for the front and back walls. The back wall, being the longer wall has a curve which assists in offering protection from blasts and/or impacts. In use that side is generally directed outwardly towards traffic.

[0036] The alcove is fitted with a series of user interfaces. These include a touch screen accessible from the outside, and thus accessible while the alcove is occupied or uncopied, open or closed. There is a service counter behind a service/display window. This latter window can also be adapted to act as a digital screen orfurthertouch screen. Thus it can double as a digital screen overnight or while the alcove is otherwise unoccupied or closed. The alcove is also equipped with one or more video cameras, microphones and speakers. A conversational AI and voice command capability can also be provided at the alcove.

[0037] Speakers are on the front wall and located so as to project sound into the space next to this shorter, concave wall. The inwardly curing shape provide an improved auditorium for users / passers-by enhancing the transmission of sound, audio etc in that area adjacent the alcove. In urban environments there can be many and different competing sounds. An advantage of this area within the short, concave wall is some protection from competing noise and improved deliver of sounds from the alcove speaker(s).

[0038] The unit can also have integrated, onsite power generation and storage (e.g. photovoltaics, power cell and battery cells), and water and waste storage. This enhances functionality offgrid scenarios

[0039] One specific application for the unit is as a service point (or hub) for the provision of both digital and human based services. It can hold 2 policemen (or other occupants) with its large service window at one end and the large interactive screen at the other end for digital

services.

[0040] Other potential uses include for retail of food and beverages, e.g. as a cafe, or other retail, for example with items can be advertised and ordered on the interactive screen and picked up at the main service window, or as a marketing and media hub / gallery or a unit for human and digital based marketing, advertising with physical and media displays presentations in public spaces.

[0041] The unit can have accessible flooring (the floor panels are removable from within the unit), allowing access to the adjustable legs and footings of the unit, as well as other equipment, storage tanks and plant that can be housed there. Equipment and plant installed within the shell of the unit for operation of the unit may include an air conditioning unit, ventilation fans, ventilation control, IT equipment and electrical control equipment, AV equipment, pumps, security equipment. Heating and cooling of the unit can be facilitated by manually and/or dynamically controlled ventilation and heat transfer from the electrical and AV equipment also housed within the unit. The unit is designed such that this equipment is housed within the unit, and not mounted proud on the units external surfaces, to provide additional protection for this equipment and greatly improve the ability of the unit withstand vandalism, attack, blast, impact and/or accidental damage, and still remain fully operational.

[0042] The unit is adapted to take utilities and data connections as required by the internal equipment. It is also proposed that for 'off grid' installations, the unit can have a degree of self sufficiency with water tank, independent power unit and septic tank.

[0043] The invention thus provides an urban alcove with the described functions and advantages.

Claims

1. A portable building unit, comprising an interior space bounded by

   a convex rear wall,
   a concave front wall,
   left-hand and right-hand side walls,
   a floor, and
   a roof

   wherein, viewed from above, the building unit is arcuate in shape and
   wherein the building unit fits inside a rectangle of dimensions 7m by 3m.

2. A portable building unit according to claim 1, wherein in cross section the rear wall, roof and front wall form a single, continuous curve.

3. A portable building unit according to claim 1 or 2, comprising substantially flat / planar left hand- and right- hand side wall portions.

4. A portable building unit according to claim 3, wherein the angle between left-hand and right-hand side walls is 110 degrees or less.

5. A portable building unit according to claim 4, wherein the angle between left-hand and right-hand side walls is 90 degrees or less.

6. A portable building unit according to any previous claim, wherein from a point of view perpendicular to and spaced back from the left-hand side wall, the right-hand side wall is visible.

7. A portable building unit according to any previous claim, wherein one (e.g. the left-hand) side wall comprises a window horizontally hinged at or towards the top and opening to provide walk-in access to the interior space.

8. A portable building unit according to any previous claim, wherein one (e.g. the right-hand) side wall comprises a window.

9. A portable building unit according to any previous claim, wherein one (e.g. the right-hand) side wall comprises one or more or all of:

   a touch screen display,
   an interactive display,
   an interface connected a digital assistant, and
   an information screen.

10. A portable building unit according to any previous claim, wherein the building unit fits inside a rectangle of dimensions 6m by 2.7m.

11. A portable building unit according to any previous claim, wherein the building unit comprises a main shell that is a single piece construction.

12. A portable building unit according to any previous claim, wherein the building unit is moulded of PU foam, concrete or fibre reinforced composite.

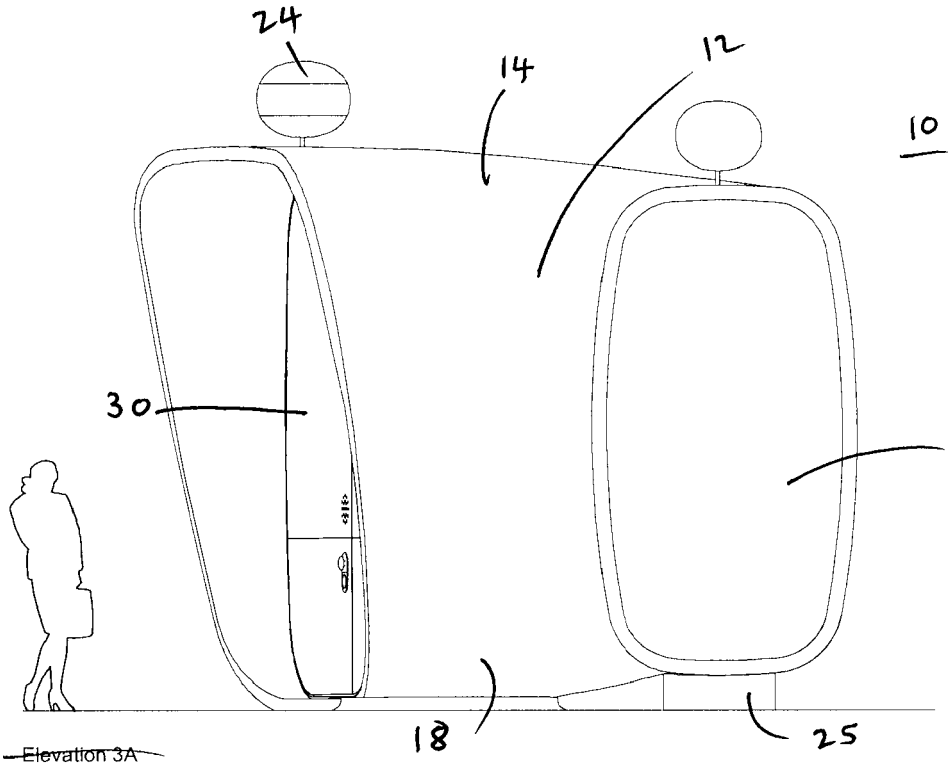
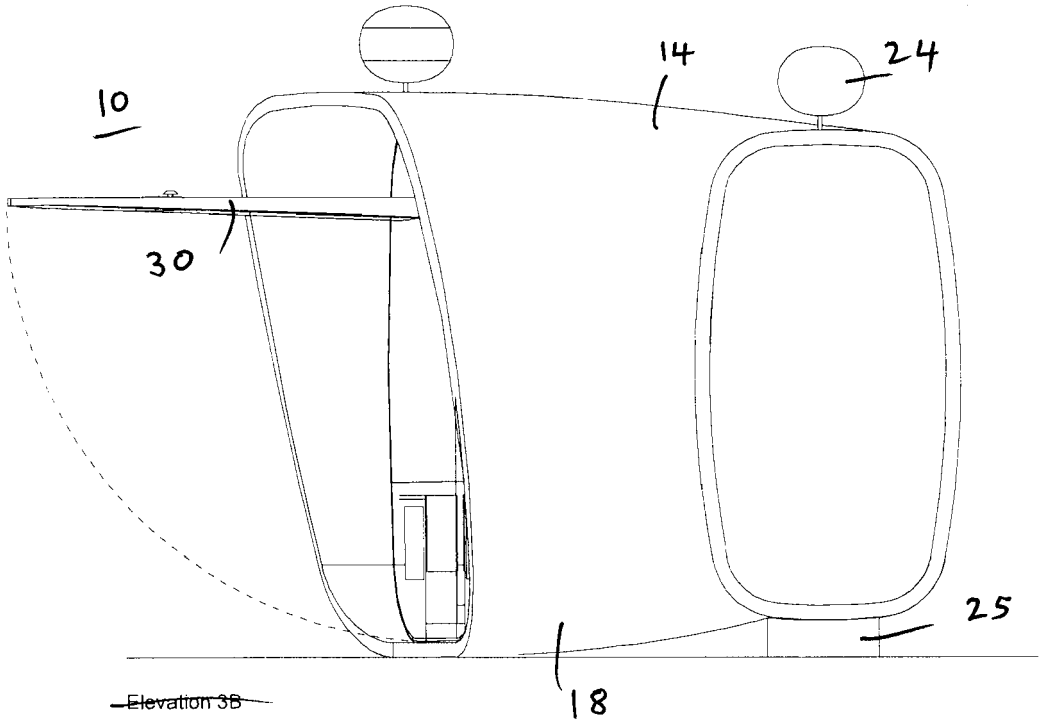

24
14
12
10
30
28
18
25
Elevation 3A

Fig. 1


14
24
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30
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18
Elevation 3B

Fig. 2

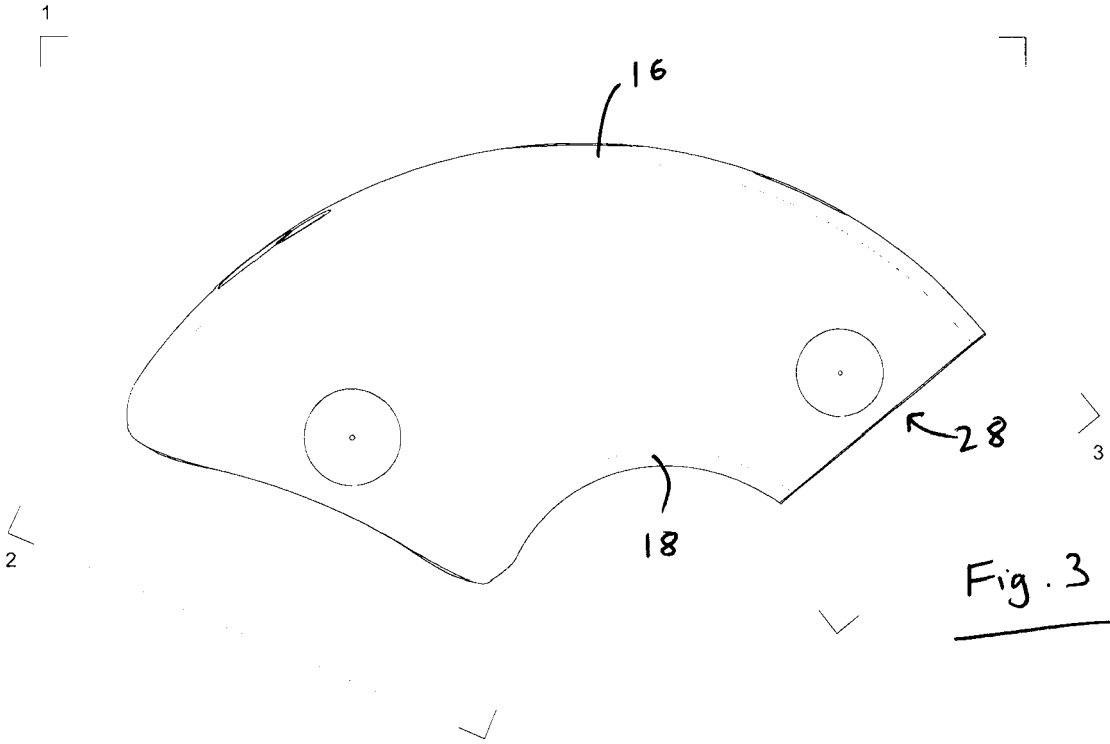

Fig. 3

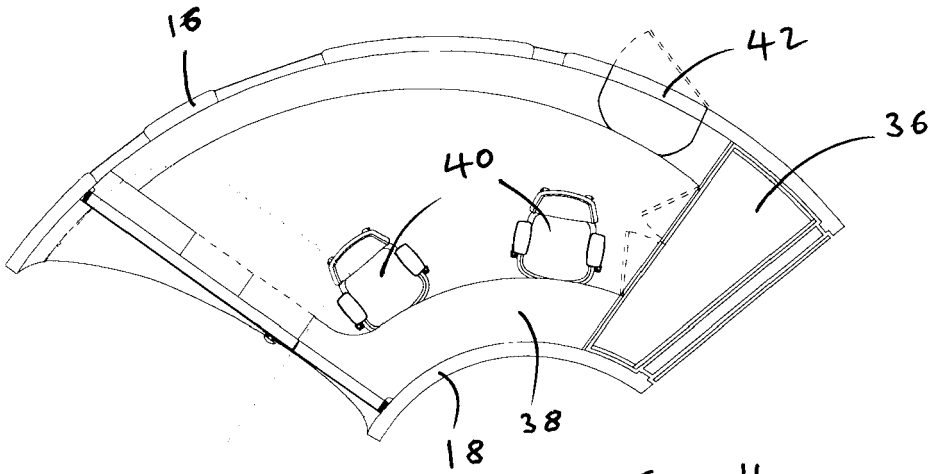

Fig. 4

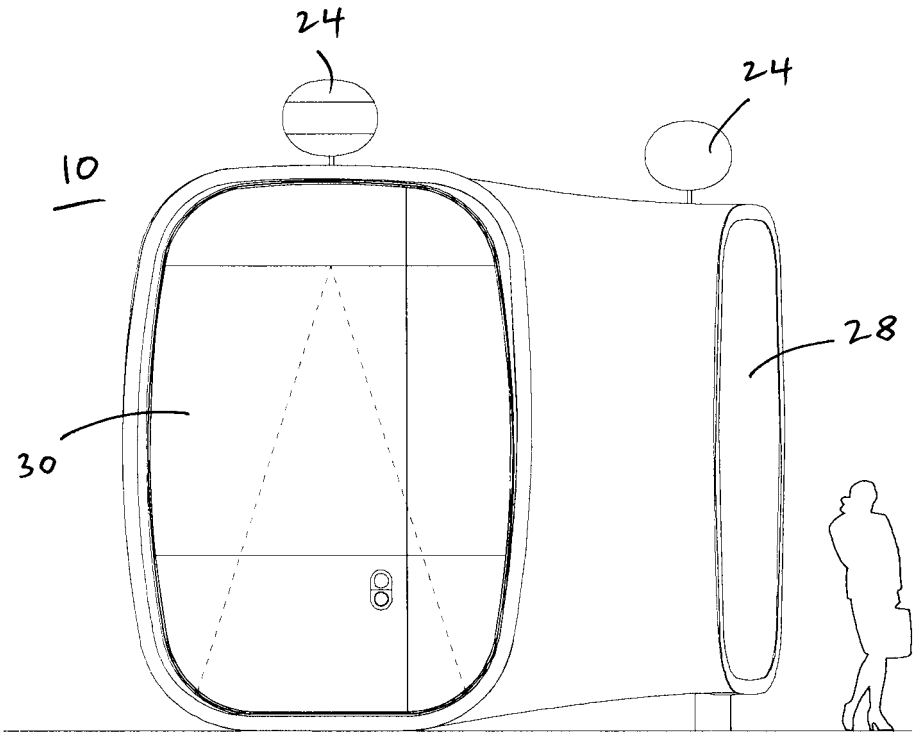

Fig 5

Elevation 2

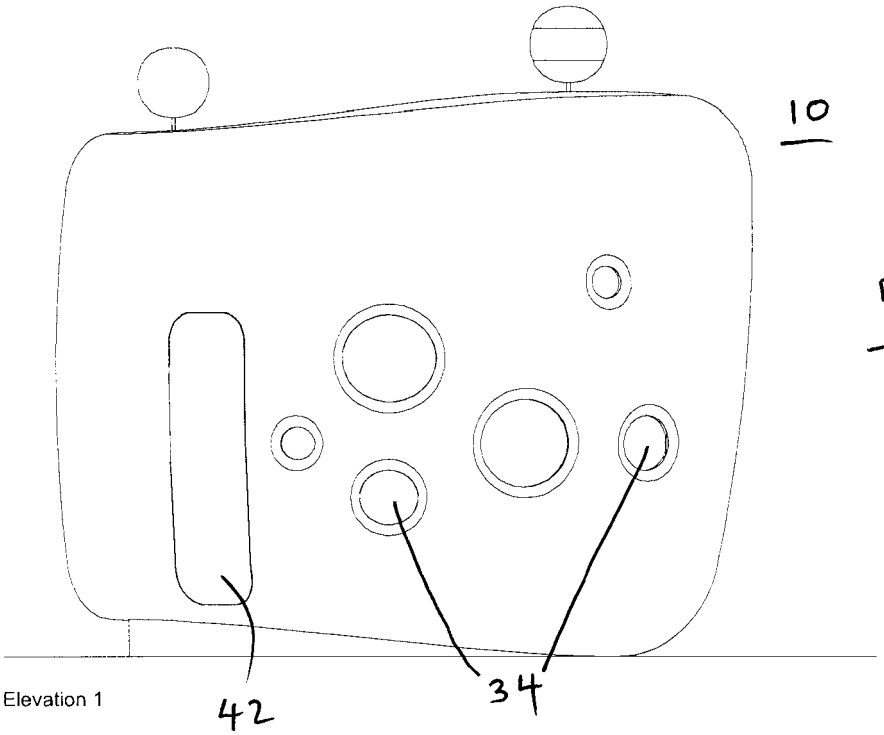

Fig. 6

Elevation 1

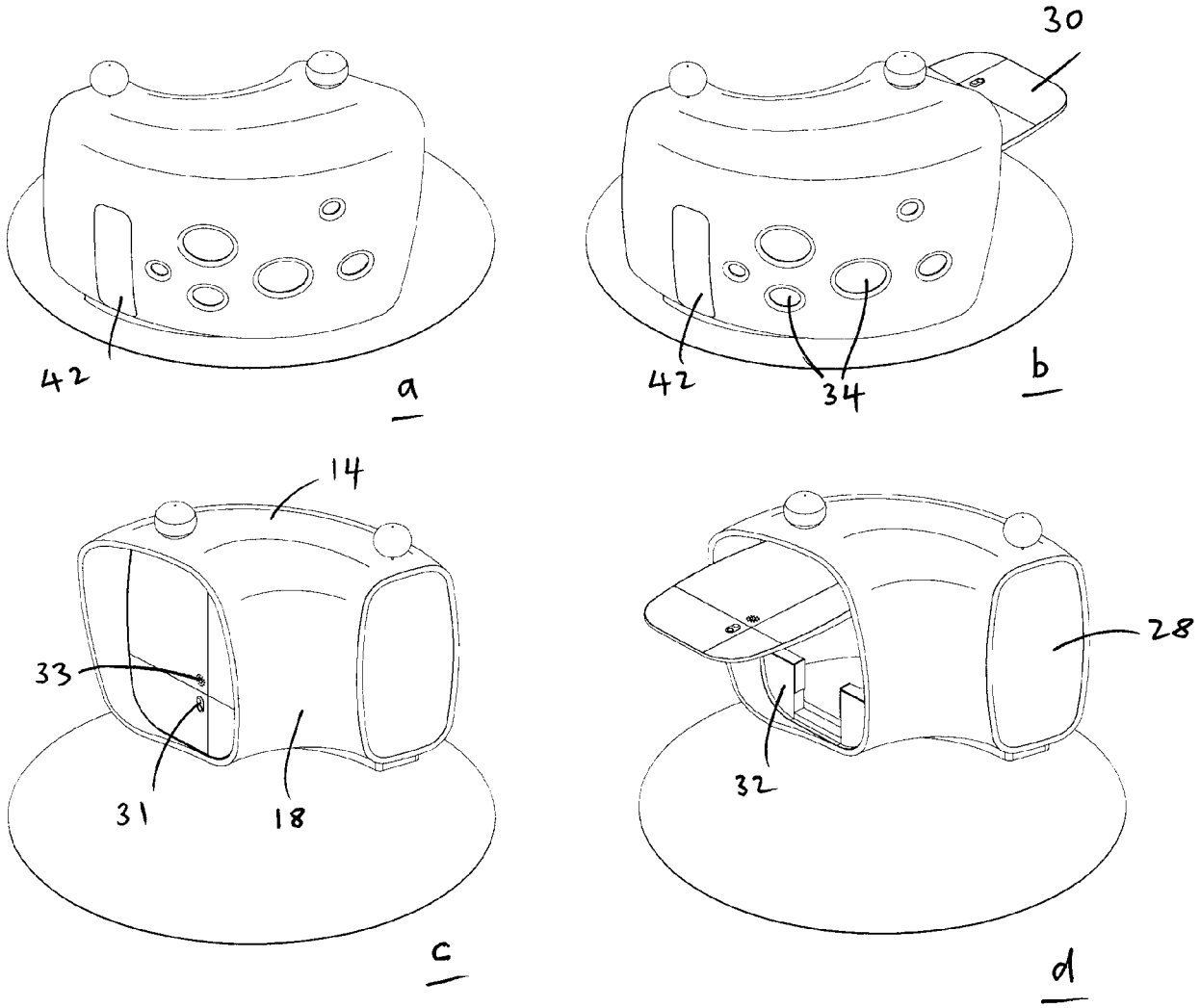

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 21 18 0294

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 514 809 A1 (GREZE ANDRE [FR]) 22 April 1983 (1983-04-22) * page 3, line 7 - page 5, line 40; figures *	1-8, 10-12	INV. E04H1/12 E04B1/343 ADD. E04B1/32
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A	CH 702 670 A2 (TSCHAGGELAR MARTIN [CH]) 15 August 2011 (2011-08-15) * paragraph [0014] - paragraph [0022]; figures *	2	TECHNICAL FIELDS SEARCHED (IPC) E04H E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 November 2021	López-García, G

CATEGORY OF CITED DOCUMENTS

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