(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 133 577 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
22.02.2017 Bulletin 2017/08

(21) Application number: **15779313.4**

(22) Date of filing: **14.04.2015**

(51) Int Cl.:
G09F 7/00 *(2006.01)* ***G09F 7/02*** *(2006.01)*
G09F 7/18 *(2006.01)* ***G09F 13/04*** *(2006.01)*
G09F 19/22 *(2006.01)*

(86) International application number:
PCT/JP2015/061478

(87) International publication number:
WO 2015/159886 (22.10.2015 Gazette 2015/42)

(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:
MA

(30) Priority: **16.04.2014 JP 2014084629**
12.05.2014 JP 2014098504
24.02.2015 JP 2015034200

(71) Applicant: **Tama River Craft Inc.**
Chofu-shi, Tokyo 182-0025 (JP)

(72) Inventor: **SUITSU, Shingo**
Chofu-shi,
Tokyo 182-0025 (JP)

(74) Representative: **Schön, Christoph**
Dr. Schön, Neymeyr & Partner mbB
Bavariaring 26
80336 München (DE)

(54) **SIGN**

(57) PROBLEM TO BE SOLVED

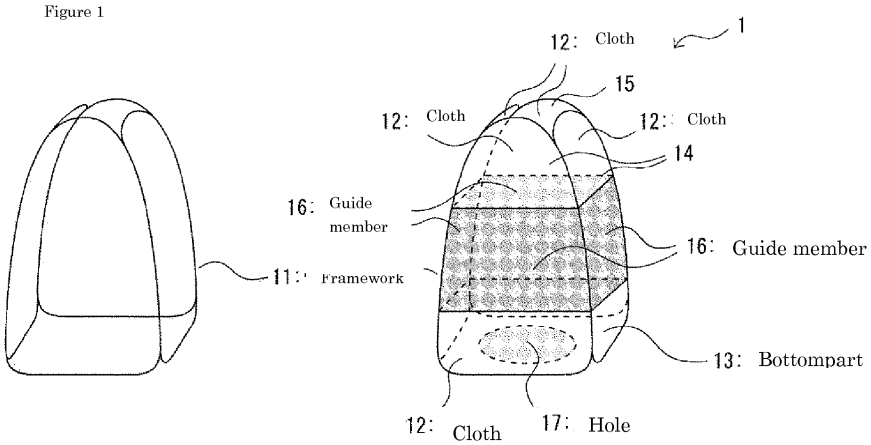
A signboard which can be carried around by folding easily and can be visible from any directions is provided.

SOLUTION

A signboard of the present invention having a bottom part and three or more side parts comprising a foldable framework and an integrated sheet stretched over the framework to cover it, wherein a display part for displaying information for guidance or advertisement is provided on the surface of the sheet stretched over at least one of the side parts, and the framework has flexibility so that the framework and said sheet can be folded integrally by elastic deformation. Therefore, the signboard of the present invention can be carried around by folding easily and can be visible even from any directions and the displayed information can be changed easily.

[FIG. 1]

Figure 1



EP 3 133 577 A1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a signboard which can be folded and can be assembled easily.

BACKGROUND ART

[0002] Signboards are used to deliver various information to a viewer. For example, signboards include a signboard indicating the guiding information such as a route to a destination (guide board) and a signboard for the purpose of advertisements. Also, signboards are used as a guide board to guide people who are seriously injured and slightly injured to the appropriate place respectively, for medical purposes such as triage at the time of disasters.

[0003] Conventional signboards include a signboard attached directly to a roof or a side of a building, a stand-up signboard and a signboard hung from a ceiling.

[0004] For example, the patent document 1 discloses a stand-up signboard in which a sheet is attached to a frame. The stand-up signboard described in the patent document 1 is a signboard in which the sheet is attached in a stretched state to the frame formed by attaching the lateral frame to the vertical frame.

[0005] Furthermore, the patent document 2 discloses a signboard comprising a curtain body comprising a surface coated with a material having adhesiveness; a frame to which the curtain body is stuck; and ink which is transferred onto the coated surface of the curtain body in a desired letter form or a line drawing form in a manner of an ink-jet method.

[0006] Moreover, the patent document 3 discloses a simple stand-up signboard using a card case made of transparent or semitransparent plastic having flexibility and durability in which advertisement display can be replaced simply and easily.

[0007] The patent document 4 also discloses a stand-up signboard having a tabular face board which can display advertisements and signs; a back board for supporting the face board from the back side; and an approximately tabular connecting plate for connecting and supporting separate bottoms of the face board and the back board.

[0008] However, there are problems that it is not easy to carry these conventional signboards to an installation site and that it takes much time to install them. In addition, there is a problem that the information displayed on the signboards could be visible only from one direction.

[prior art documents]

[patent document]

[0009]

[patent document 1]
Japanese Unexamined Patent Publication No.H07-020790
[patent document 2]
Japanese Unexamined Patent Publication No. 2008-176077
[patent document 3]
Japanese Unexamined Patent Publication No. 2010-243795
[patent document 4]
Japanese Unexamined Patent Publication No. 2011-248007

SUMMARY OF THE INVENTION

PROBLEM TO BE SOLVED BY THE INVENTION

[0010] As mentioned above, conventional signboards were difficult to carry around, and also took time for installation. Particularly at the time of disasters, the signboard is required which is easy to carry around and install and is visible from any directions. Furthermore, triage is performed at the time of disasters, but signs cannot be often installed easily at the time of disasters. Therefore, it is assumed that triage does not function enough because people cannot find the place where each classification is installed. In such cases, the signboard is required which is easy to carry around and install, and is visible from any directions.

[0011] Thus, the present invention is intended to provide a signboard which can be carried around easily by folding and assembled easily, and can be visible from any directions.

[0012] Furthermore, the signboard which can be changed easily a display of the signboard is desirable when it is necessary to change the information displayed on the signboard.

[0013] For this reason, the present invention is intended to provide a signboard which can be carried around easily by folding and assembled easily, and can be visible from any directions, and furthermore, which can be changed easily the displayed information.

MEANS TO SOLVE THE PROBLEM

[0014] The inventors newly developed a signboard having a bottom part and three or more side parts comprising a foldable framework and an integrated sheet stretched over said framework to cover it sheet. The inventors found that such a signboard could be carried around easily by folding and assembled to install at an installation site easily..Furthermore, the inventors found that the signboard having three or more side parts could be visible from any directions by displaying guidance information or advertisement on the side parts. Also, the inventors found that the signboard which is removably provided a display member displaying guidance information or advertisement could change the displayed infor-

mation on the signboard easily and keep costs lower than remaking the whole signboard.

[0015] That is, the present invention provides a signboard having a bottom part and three or more side parts comprising a foldable framework and an integrated sheet stretched over said framework to cover it, wherein a display part for displaying information for guidance or advertisement is provided on the surface of the sheet stretched over at least one of the side parts, and the framework has flexibility so that the framework and the sheet can be folded integrally by elastic deformation.

[0016] The present invention also provides the signboard wherein the display part can be removably attached with a display member displaying the information and the display member is removably provided to surround the side parts.

[0017] The present invention also provides the signboard wherein the display member is in the form of a belt-like shape or an annular shape and is annularly wrapped around the side parts.

[0018] The present invention also provides the signboard wherein the display member is in the form of a cap and a cover the signboard from the top of the side parts.

[0019] The present invention also provides the signboard wherein an opening which is smaller than the size of the bottom part is provided in the sheet stretched over the bottom part.

[0020] The present invention also provides the signboard wherein a light source is provided in the inside surrounded by the bottom part and the side parts.

[0021] The present invention also provides the signboard wherein the height from the bottom to the top of the part is from 150cm to 200cm.

[0022] The present invention also provides the signboard having four side parts in four directions.

[0023] The present invention also provides the signboard wherein the framework has flexibility so that the framework and the sheet can be folded integrally by elastic deformation.

[0024] The present invention also provides the signboard wherein an opening is provided in the sheet stretched over the bottom part.

[0025] The present invention also provides the signboard wherein the display part can be removably attached with a display member displaying the information.

[0026] The present invention also provides the signboard provided with a light source in the inside surrounded by the bottom part and the side parts.

[0027] The present invention provides the signboards wherein the height from the bottom to the top of the side part is from 150 cm to 200 cm.

[0028] The present invention provides the signboard having four side parts in four directions and provided with the display part on the surface of the sheet stretched over all of the side parts.

EFFECT OF THE INVENTION

[0029] The signboard of the present invention can be carried around easily by folding and can be assembled easily and can be visible from any directions. Also, the signboard of the present invention can be carried around easily by folding and can be assembled easily and can be visible from any directions, and furthermore, which can be changed easily the displayed information.

BRIEF DESCRIPTION OF DRAWINGS

[0030]

FIG. 1 is a figure indicating one example of the signboard of the present invention.

FIG. 2 (A), (B), (C), (D) and (E) are figures indicating an example of a method for folding the signboard of the present invention.

FIG. 3 (A), (B) and (C) are figures indicating the specific examples of the display member of the signboard of the present invention, respectively.

FIG. 4 is a figure indicating an example of use of the signboard of the present invention.

FIG. 5 (A), (B) and (C) are figures indicating the specific examples of the display member of the signboard of the present invention, respectively.

FIG. 6 is a figure indicating a specific example of the display member of the signboard of the present invention.

FIG. 7 is a figure indicating a specific example of the display member of the signboard of the present invention.

EMBODIMENT FOR CARRYING OUT THE INVENTION

[0031] A signboard of the present invention comprises a foldable framework and an integrated sheet stretched over the framework to cover it. The signboard of the present invention has two forms with an assembled form and a folded form. In an assembled form, the signboard of the present invention has a bottom part and three or more side parts and can be used as a signboard. Also, the signboard of the present invention can be carried around in a folded form easily.

[0032] The framework is a frame of the signboard which is placed in the rim of the bottom part and each side part of the signboard. As for the framework, two surfaces may share one framework in the boundary section of two surfaces such as the boundary section between the bottom part and the side part or the boundary section between two side parts next to each other. Also, in the entire signboard, the framework may be connected or may be divided. The framework may be fixed to the sheet and constructed integrally with the sheet.

[0033] The framework has only to be foldable structure. The framework can also be the structure that can be folded integrally with the sheet .The framework in the present

invention may have any structure. For example, the framework has the structure that can be folded and can be assembled by one worker easily. Also, the framework in the present invention can be the size and weight that can be carried by one worker easily when it is folded.

[0034] In the signboard of the present invention, the framework may have flexibility (or elasticity) so that the framework and the sheet can be folded integrally by elastic deformation. Such a signboard, the can be assembled almost in one-touch with adding almost no power from the folded state by elastic deformation.

[0035] For example, the signboard can be two folded by pushing the framework of one or several side parts inside of the signboard if the framework is flexible. For example, it can also be made to the size for one side part by folding to overlay each side part with one another. Furthermore, it can be folded smaller by bending the top of the upper side of this folded signboard to the bottom part side and rolling inward, and overlaying the right and left frameworks curled in a circle with one another.

[0036] As used herein, "flexibility" refers to a property to be flexible and be flexed when force is applied.

[0037] Materials used for the framework can be any materials commonly used as the framework of the structures and, for example, steel materials, synthetic resins and alloys can be used. Also, materials used for the framework can be any materials which can give the framework flexibility. For example, the framework can be a thin steel material of approximately 0.5-1cm in width and approximately 0.5-3mm in thickness. Materials used for the framework may also be natural materials such as bamboos. Furthermore, the framework may be comprised of four steel materials with the sheet material so that each steel material forms an arch as shown in the upper left section of FIG. 1.

[0038] The sheet is an integrated sheet covering the entire surface of the framework, namely the bottom part and each side part. The sheet has only to cover the framework integrally and may have a seam or a joint at some midpoint. The sheet may cover the entire framework. The sheet is widened tightly by the tension of the framework when the signboard is in the assembled form. The signboard becomes the stronger structure by the tension being added to the sheet in the assembled form. The material which is superior in tensile strength and can be folded together with the framework, can be used for the materials of the sheet. The sheet can be made of, but not limited to, synthetic fiber sheet s such as nylon, Tetoron and polyester and any other cloth materials.

[0039] The bottom part is an area formed between the lower ends of each side part and is the part which contacts with the installation surface such as the ground or the floor when the signboard is installed. The bottom part is comprised of the framework placed in the rim of the bottom part and the sheet stretched over this framework.

[0040] The sheet stretched over the bottom part may be provided with an opening. For example, the opening may be a hole opened in the sheet or may be a slit. The opening allows to access inside from the opening to separate easily the sheet s sticking each other by static electricity when the signboard is assembled from a folded state. The size of the opening may be the same as the bottom part size and may be smaller than the bottom part size. When the opening is smaller than the bottom part size, a weight for supporting the signboard or baggage can be placed on the cloth stretched over the area of the bottom part except the opening.

[0041] The side parts are parts located on the side of the signboard in an assembled form. The side part is comprised of the framework placed in the rim of the side part and the sheet stretched over this framework. Each side part is located next to each other to surround around the signboard. The size and the shape of each side part may be the same as or different from each other. The number of the side parts which the signboard of the present invention has is three or more, but not limited to, preferably 3-8, more preferably 3-6, most preferably four. For example, the signboard of the present invention may have four sides parts in four directions.

[0042] The lower part of the sheet stretched over at least one of the sides parts may be provided with an opening such as a hole or a slit. The opening provided in the side part facilitates that a weight is placed inside.

[0043] The signboard of the present invention may further have an upper surface formed between the upper ends of each side part. Furthermore, the signboard of the present invention may not have an upper surface but its upper part may be covered by the upper end of each side part.

[0044] In the signboard of the present invention, the display part is provided on the surface of the sheet stretched over at least one of the side part. The display part is an area to display information for guidance or advertising. The information for guidance is, for example, information to guide a viewer to the appropriate place, and specifically, a route to the destination or an arrow indicating the direction of the destination. The information for guidance may be information for so-called triage to guide people to the appropriate place for institutionalization depending on the severity of the injured person in states of emergency such as at the time of disasters. For example, the information for advertising is, for example, the advertisement, etc.

[0045] The display part may be the surface of the sheet itself, and the information for guidance or advertising may be printed directly on the surface of the sheet. In the display part, the display member displaying the information for guidance or advertising may also be attached on the surface of the sheet. For example, the display member can be made of any cloth and may be made of materials same as or different from the sheet.

[0046] Furthermore, the display part may removably be able to attach with the display member displaying the information for guidance or advertising. For example, the display part and the display member may be provided with a hook-and-loop fastener to be removably attached

each other. For the hook-and-loop fastener, MAGIC-TAPE™ and VELCRO®, etc. can be used. The display part is also not limited to them and may removably be able to attach with the display member by any means. For example, in the signboard of the present invention, the display member displaying the information for guidance or advertising may be provided removably to surround the sides parts. Thereby, the information for guidance or advertising is displayed on the surface of the sheet stretched over at least one of the sides parts. Surrounding the sides parts refers to surrounding around all sides parts while covering the surface of each side part. The display member may cover at least a portion of the surface of each side part and may cover the entire surface. The display member may be any shapes such as a belt-like shape or an annular shape. For example, the display member may be wrapped around the sides parts annularly. The place where the display member is wrapped around may be any of the upper part, the intermediate part, the lower part and the entire surface of the side part. When the display member is in the form of a belt-like shape, it may be the constitution that both ends can be connected to be looped after it is wrapped around the side part. The display member may also be in the form of a cap, and may be the constitution that can cover the upper part of each side part or whole each side part by covering it from the upper part of the side part. The display member is not limited to them and can be any shape that can surround the sides parts. One or more display members may be provided on the signboard. For example, the display member may be a combination of a plurality of belt-shaped or annularly-shaped display members, a combination of a plurality of cap-shaped display members or a combination with a belt-shaped or an annularly-shaped display member and a cap-shaped display member.

[0047] The display part may be able to attach with one display member or may be able to attach a plurality of display members at the same time. When the display part can attach with the display member removably, the signboard can be used for different application by changing only the display member without changing the framework and the sheet of the signboard. Therefore, for example, the display members can be exchanged for those displaying the appropriate information easily and quickly when the information that should be displayed is changed during the use as the signboard.

[0048] The display member may be the structure that can be folded together with the signboard. For example, the display member can be a sheet such as any cloth and may be made of the materials same as or different from the sheet constructing the signboard. For example, the display member may also be comprised of the framework having flexibility and the sheet stretched over this framework same as the signboard. Furthermore, the display member may be the structure that cannot be folded together with the signboard. In this case, the display member is installed after assembling the signboard, and is removed before folding the signboard.

[0049] The signboard of the present invention can be used for different application by changing only the display member without changing the framework and the sheet of the signboard where the display member is removable. Therefore, for example, the display member can be exchanged for those displaying the appropriate information easily and quickly when the information that should be displayed is changed during the use as the signboard. Also, costs can be controlled because it is not required to change the whole signboard and only display member is changed without changing the framework and the sheet of the signboard.

[0050] The display member may display information on the surface of one side part or may display information on two or more sides parts or may display information on all sides parts. When the display member displays information on two or more sides parts, each side part may display same information or different information, respectively. When the display member displays information on all sides parts, information displayed on the signboard can be visible from all 360 degrees directions.

[0051] The signboard of the present invention may be provided with a light source in the inside surrounded by the bottom part and the sides parts. The light source may be any lighting equipment, for example, LED. The light source may be provided removably and may be installed after the signboard is assembled and be removed when it is folded. Because the signboard can be lighted up brightly from the inside by being provided with the light source, the viewer can find the signboard easily even from far away.

[0052] Information displayed on the display member may be, for example, not only any color painted on a part of or the entire surface of the display member, but also a letter and a figure. For example, the signboard comprising the display member painted in the particular color can be used as the signboard to indicate the meeting place of the particular group corresponding to the particular color. Because such a signboard is easy to be visible even from the distance, a viewer can find a destination quickly.

[0053] In the signboard of the present invention, the height from the bottom part to the part top of the side part may be, but not limited to, 150cm or more. This height allows a viewer to find the signboard easily even from the distance. The height from the bottom part to the part top of the side part may also be, but not limited to, 200cm or less. This height allows one worker to fold it easily.

[0054] The signboard of the present invention can be used with a weight which is placed on the inside, for example, on the inside of the sheet stretched over the bottom part. Thereby, the signboard can be fixed to the desired place to be installed even when its weight is light.

EXAMPLE

[0055] One example of the present invention will be

described below. FIG. 1 is a figure which shows one example of the signboard of the present invention.

[0056] The signboard 1 shown in FIG. 1 comprises the framework 11 and the cloth 12. The signboard 1 shown in FIG. 1 is in the assembled form, and has the bottom part 13, four sides parts 14 having the same shape at the front, the rear, the right and the left respectively, and the upper surface 15. The framework 11 comprises about 1 cm in width and several mm in thickness of the thin steel material, and has flexibility. Because the signboard 1 which uses such a thin steel material is light, and the signboard 1 can be carried around by one worker easily when it is folded.

[0057] The framework 11 is placed in each rim of four sides parts 14 as shown in the left of FIG. 1. The rim of the side part 14 of the signboard 1 shown in the right of FIG. 1 is formed into a pipe form by being seamed the border along the rim. The framework 11 can be placed in an arch form in the rim of the side part 14 by putting the framework 11 through this pipe-formed portion. The bottom part 13, each side part 14 and the upper surface 15 are covered with the integrated cloth 12. Note that the integrated cloth 12 is united by seaming the border of each surface integrally. The steel materials of the framework 11 contained in a pipe-formed rim of the front and rear sides parts 14 are flexed into an arch form to make the covered cloth 12stretched. Thus, the strength of the signboard 1 can be strong because the covered integrated cloth 12 is stretched.

[0058] The bottom part 13 is a quadrangle and each side of the bottom part 13 shares the sides with each of four sides parts 14. The hole 17 is formed in the bottom part 13 as an opening. Thus, the hole 17 allows accessing inside from the hole 17 to separate easily the cloth 12 sticking each other by static electricity when the signboard is assembled from a folded state. Because the hole 17 is smaller than the size of the bottom part 13, the cloth 12 is also stretched over the part except the hole 17, and a weight or baggage can be placed on this cloth 12.

[0059] Each side part 14 is provided with the guide member (the display member) 16. The guide member 16 is in the form of an annular shape and is wrapped annularly around the side part 14. Thus, the guide member 16 provided on all side parts 14 allows the guidance information to be visible from four directions.

[0060] (A), (B), (C), (D) and (E) of FIG. 2 are figures indicating an example of the method to fold the signboard of the present invention. (A) of FIG. 2 shows the signboard 1 in an assembled state. The signboard 1 overlays the frameworks 11 of the front and rear side parts 14 with one another and the right and left sides parts 14 can be folded in half and put inside of the signboard 1 respectively from an assembled state. As a result, it can be made into the size of one side part as shown in (B) of FIG. 2. Then, the top of the upper side is bent to the bottom part side and rolled inward as shown in (C) of FIG. 2. Then, it can be folded further smaller as shown in (D) of FIG. 2 by overlaying the framework 11 of both right and left sides curled in a circle with one another. Then, as shown in (E) of FIG. 2, it can be stored in a case with the handle for carrying.

[0061] As for the signboard folded as shown in (E) of FIG. 2, the framework 11 is bent small. Therefore, the steel materials extend the sheet by force by the elasticity of bent steel materials when the signboard is taken out of the case. As a result, the signboard can be assembled instantly only by taking out of the case as (A) of FIG. 2.

[0062] (A), (B) and (C) of FIG. 3 are figures indicating the specific examples of the display part of the signboard of the present invention, respectively. The display part 16a, 16b and 16c are an example of the display part displaying the information for triage separating injured people depending on their severity at the time of disasters.

[0063] FIG. 4 is a figure which shows an example of use of the signboard of the present invention. The signboard 1 shown in FIG. 4 is provided with the light 21 comprising LED22 as the light source inside. Because the signboard 1 can be lighted up brightly from the inside by being provided with the light source in this way, a viewer can find the signboard 1 easily even from far away.

[0064] (A), (B) and (C) of FIG. 5 are figures indicating the specific examples of the guide member (the display member) of the signboard of the present invention, respectively. (A) of FIG. 5 shows one development view of the guide member 16 of the signboard of the present invention. The guide member 16 shown in (A) of FIG. 5 has a shape of four parts being connected in a belt form, wherein the number of the parts is same as the number of the side parts, and wherein the shape of each part is same as the shape of the are a covering each side part 14 when it is wrapped around the sides parts 14. The guide member 16d shown in (B) of FIG. 6 comprises joints 18a to connect both ends when the belt-formed guide member 16d is wrapped around the side parts 14. The joint 18a can be the hook-and-loop fasteners such as, but not limited to, MAGICTAPE™ and VELCRO®. In the guide member 16e shown in (C) of FIG. 6, both ends of the belt-shaped guide member 16e are connected with an elastic member 18b. The guide member 16e can be installed easily around the sides parts by being connected with the elastic member 18b. For example, the elastic member 18e can be rubber.

[0065] FIG. 6 is a figure which shows another specific example of the guide member (the display member) of the signboard of the present invention. The guide member 16f shown in FIG. 6 is in the form of a cap and can cover the signboard from the upper part of the side part, namely the upper part of the signboard. The guide member 16f is comprised of the foldable framework and the sheet stretched over this framework and can be folded together with the signboard when the signboard is folded. The signboard of the present invention may also be provided with an opening 19 on the side part as shown in FIG. 6. Thereby, it is allowed to access to the inside of the signboard through the opening 19 and the inside can

also be used for another application such as a locker room or a baggage place at the same time using as the signboard.

[0066] FIG. 7 is a figure which further shows another specific example of the guide member (the display member) of the signboard of the present invention. The guide member 16g shown in FIG. 7 is also in the form of a cap. Furthermore, the guide member16g shown in FIG. 7 makes displayed letters and a sign emit light by illuminations. Thereby, the displayed information becomes easy to be visible even in the night. The guide member16g may also make the displayed letters and the sign emit light by the materials such as phosphorescence paintings and reflectors.

[industrial applicability]

[0067] Because the signboard of the present invention can be carried around easily by folding and can be assembled easily and can be visible from any directions, and it is widely available for such as a guidance signboard or an advertising tower at the time of disasters.

DENOTATION OF REFERENCE NUMERALS

[0068]

1	signboard
11	framework
12	cloth (sheet)
13	bottom part
14	side part
15	upper surface
16	guide member (display member)
17	hole (opening)
18a	joint
18b	elastic member
19	opening
21	light (light source)
22	LED (light source)

Claims

1. A signboard having a bottom part and three or more side parts comprising a foldable framework and an integrated sheet stretched over said framework to cover it,
wherein a display part for displaying information for guidance or advertisement is provided on the surface of said sheet stretched over at least one of said side parts, and
said framework has flexibility so that said framework and said the sheet can be folded integrally by elastic deformation.

2. The signboard according to claim 1, wherein the display part can be removably attached with a display member displaying the information and said display member is removably provided to surround said side parts.

3. The signboard according to claim 2, wherein said display member is in the form of a belt-like shape or an annular shape and is annularly wrapped around said side parts.

4. The signboard according to claim 2, wherein said display member is in the form of a cap and cover said signboard from the top of said side parts.

5. The signboard according to claim 1 or 2, wherein an opening which is smaller than the size of said bottom part is provided in said sheet stretched over said bottom part.

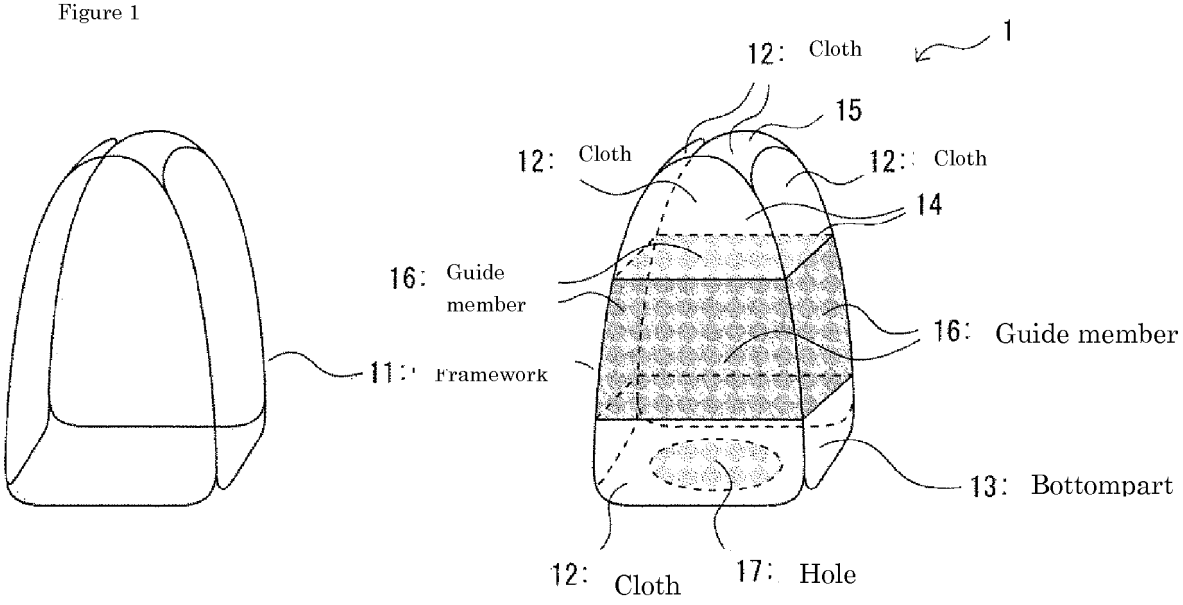
6. The signboard according to claim 1 or 2, wherein a light source is provided in the inside surrounded by said bottom part and said side parts.

7. The signboard according to claim 1 or 2, wherein the height from the bottom to the top of the side part is from 150cm to 200cm.

8. The signboard according to claim 1 or 2 having four side parts in four directions.

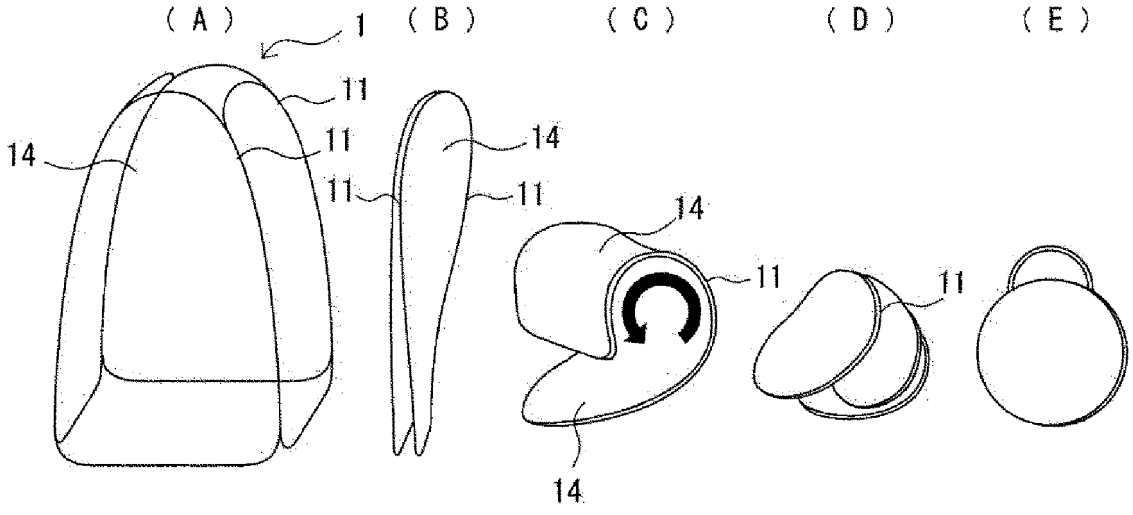
[FIG. 1]

Figure 1



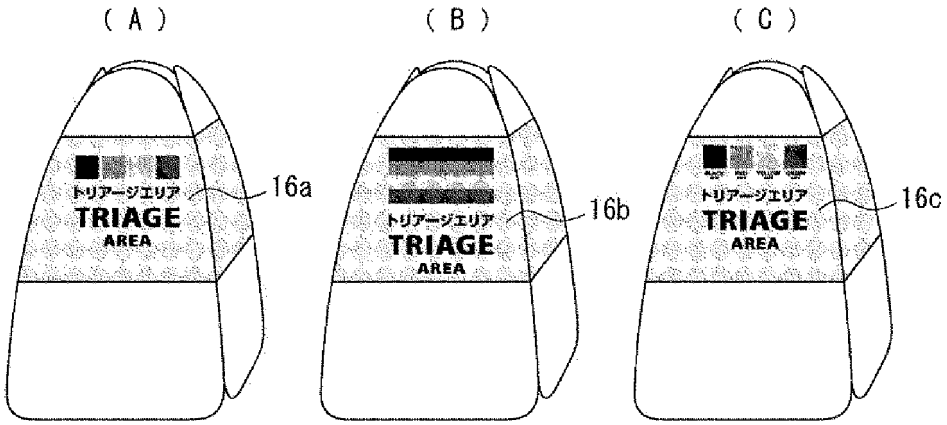
[FIG. 2]

Figure 2

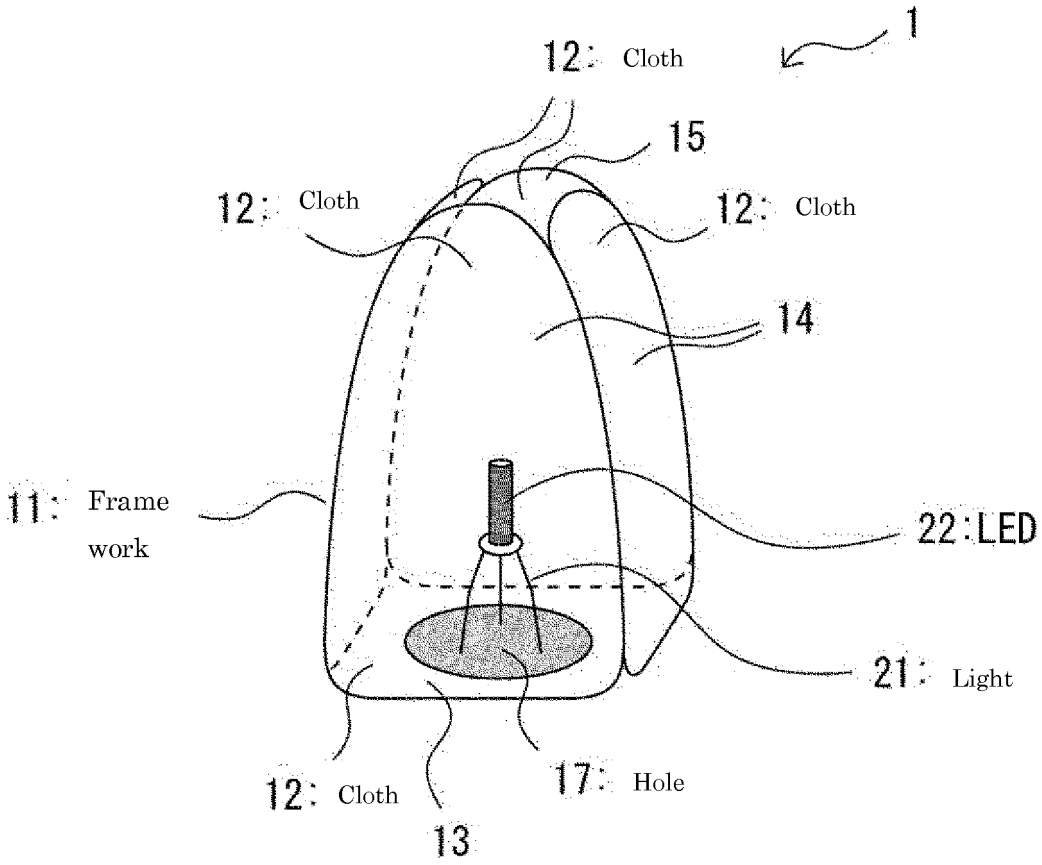


[FIG. 3]

Figure 3

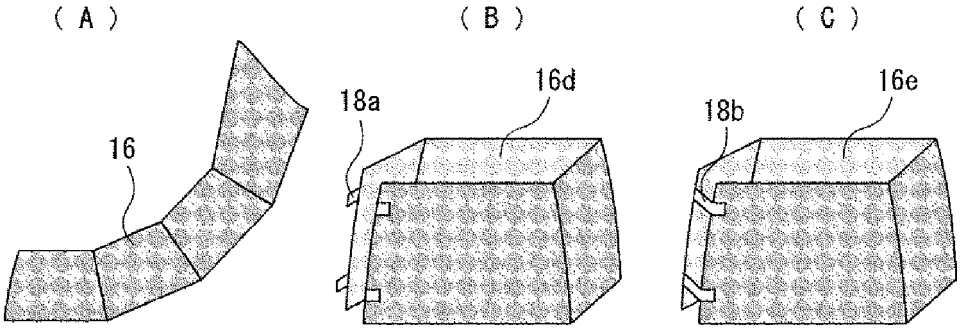


[FIG. 4]



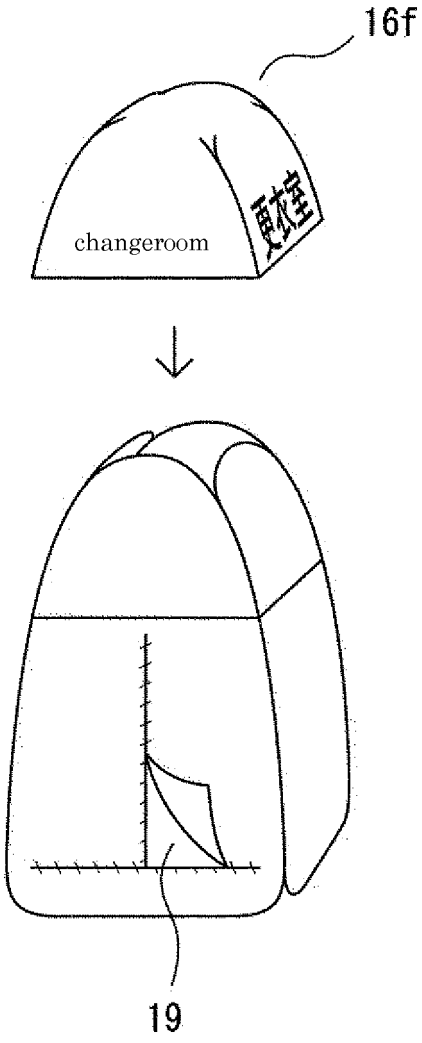
[FIG. 5]

Figure 5



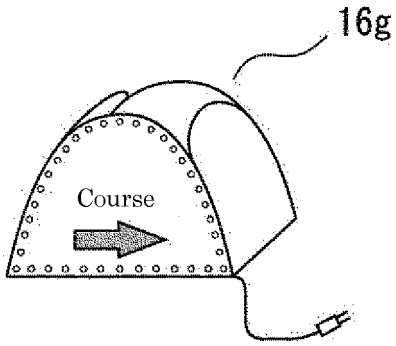
[FIG. 6]

Figure 6



[FIG. 7]

Figure 7



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2015/061478

A. CLASSIFICATION OF SUBJECT MATTER
G09F7/00(2006.01)i, *G09F7/02*(2006.01)i, *G09F7/18*(2006.01)i, *G09F13/04*(2006.01)i, *G09F19/22*(2006.01)i

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)
G09F7/00-7/22, G09F13/00-13/46, G09F19/00-27/00, E01F9/00-11/00, E04H15/00-15/64

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2015
Kokai Jitsuyo Shinan Koho 1971-2015 Toroku Jitsuyo Shinan Koho 1994-2015

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 197934/1981(Laid-open No. 98676/1983) (Toshiba Glass Co., Ltd.), 05 July 1983 (05.07.1983), entire text; all drawings (Family: none)	1-8
A	JP 2001-140503 A (Worlds Apart Ltd.), 22 May 2001 (22.05.2001), paragraphs [0057] to [0060], [0066], [0077] to [0082]; fig. 1, 2, 13, 14, 20 to 22 & US 6325086 B1 & GB 2355472 A & GB 2369381 A & EP 1094177 A2 & DE 10000249 C & AT 443193 T	1-8

☒ 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
"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	Date of mailing of the international search report
15 May 2015 (15.05.15)	26 May 2015 (26.05.15)
Name and mailing address of the ISA/ Japan Patent Office 3-4-3,Kasumigaseki,Chiyoda-ku, Tokyo 100-8915,Japan	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2015/061478

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 44-24922 Y1 (Toshikazu SANO), 20 October 1969 (20.10.1969), entire text; all drawings (Family: none)	2-8
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 135060/1989(Laid-open No. 72921/1991) (Kabushiki Kaisha Safety House, Nippon Telegraph and Telephone Corp.), 23 July 1991 (23.07.1991), page 4, line 13 to page 10, line 19; fig. 1 to 3 (Family: none)	2-8
A	JP 2011-221275 A (Teramoto Corp. Ltd.), 04 November 2011 (04.11.2011), paragraphs [0015] to [0032]; fig. 1 to 10 (Family: none)	2-8
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 197307/1987(Laid-open No. 102357/1989) (River Steel Kabushiki Kaisha), 11 July 1989 (11.07.1989), page 5, line 20; fig. 4 (Family: none)	5
A	JP 10-25928 A (Masao OSADA), 27 January 1998 (27.01.1998), paragraph [0013]; fig. 1 & TW 393534 B	7

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP H07020790 B **[0009]**
- JP 2008176077 A **[0009]**
- JP 2010243795 A **[0009]**
- JP 2011248007 A **[0009]**