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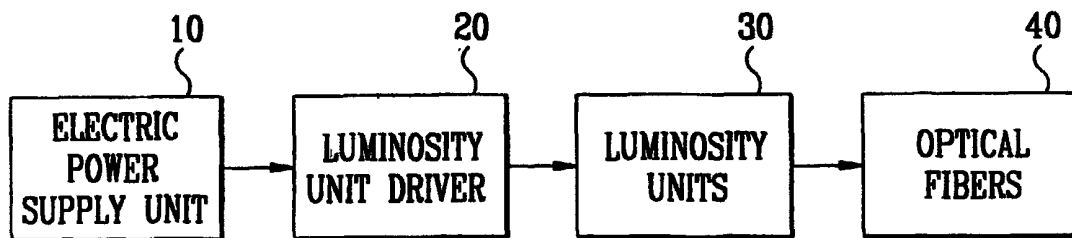
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(54) Title: MOBILE DISPLAY APPARATUS USING OPTICAL FIBERS



(57) Abstract: A mobile display apparatus using optical fibers is disclosed which enables desired letters and figures designed on fancy goods, accessories, stationery, toys, miscellaneous goods, and so on with optical fibers to be displayed as the optical fibers are lit. In the present invention, desired letters or figures are designed on fancy goods, accessories, stationery, toys, miscellaneous goods, electric signs, and signboards by using optical fibers, and a small-sized and portable electric power supply unit such as a battery for supplying an electric power to luminosity units is equipped, to thereby display desired letters and figures from all the mobile products and obtain excellent decorative effect and advertising effect.

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# MOBILE DISPLAY APPARATUS USING OPTICAL FIBERS

## BACKGROUND OF THE INVENTION

### 5 1. Field of the Invention

The present invention relates to a mobile display apparatus using optical fibers, and more particularly to a mobile display apparatus using optical fibers enabling desired letters and figures designed on fancy goods, accessories, stationery, toys, miscellaneous goods, and so on with optical fibers to be displayed as the optical fibers  
10 are lit.

### 2. Description of the Prior Art

Recently, shapes or colors of goods is getting more diverse in order to differentiate the goods from the others as well as to elevate customers' interest. Further, a variety of characters in which customers would have interest is applied to  
15 goods in the market.

As stated above, in diversely changing goods, goods suppliers designs letters or figures on goods by using luminous materials. Only the designed letters or figures of the goods having the luminous materials on them are brightly illuminated at night, which arouses an interest to a user who wears, puts on, or carries the goods, as well as a  
20 spectator of it.

However, as stated above, even in case that luminous materials are used on fancy goods, toys, stationery, ornamental goods, miscellaneous goods, or the like, there exists a problem in that gorgeous luminosity is not made to an extent that a user expects.

25 Further, there exists a problem in that phrases, figures, and the like designed by using luminous materials are maintained in a fixed form all the time, so that a user loses an interest in them easily.

In the meantime, optical fibers are widely used for pictures or ornamental goods shaped in a fountain, rather than fancy goods, stationery, toys, ornamental goods such as headbands, miscellaneous goods, or the like, which are placed in a fixed position and generally driven by an electric power for home use.

Accordingly, since light is emitted from optical fibers by using a household electric power, there exists a problem in that optical fibers can not be applied to articles movable by a person.

### **SUMMARY OF THE INVENTION**

In order to solve the above problems, it is an object of the present invention to provide a mobile display apparatus using optical fibers enabling desired letters and figures designed on fancy goods, accessories, stationery, toys, miscellaneous goods, and so on with optical fibers to be displayed as the optical fibers are lit.

Further, it is an object of the present invention to provide a mobile display apparatus using optical fibers applied to fancy goods, accessories, stationery, toys, miscellaneous goods, and so on to emit light with a portable battery supplying a small electric power to luminosity units for displaying designed letters and figures.

In order to achieve the above objects, the mobile display apparatus using optical fibers according to the first embodiment of the present invention comprises an electric power supply unit which is portable and supplies a small electric power; a luminosity unit driver for supplying the small electric power of the electric power supply unit to plural luminosity units to light the plural luminosity units; and optical fibers disposed in front of the plural luminosity units and luminesced by light emitted from the plural luminosity units in case that the plural luminosity units are lit.

The mobile display apparatus using optical fibers according to the second embodiment of the present invention comprises an electric power supply unit which is portable and supplies a small electric power; a luminosity unit driver for supplying the

small electric power of the electric power supply unit to plural luminosity units to light the plural luminosity units in response to a control signal inputted from external; optical fibers disposed in front of the plural luminosity units and luminesced by light emitted from the plural luminosity units in case that the plural luminosity units are lit; and a control unit for outputting a control signal to the luminosity unit driver to control turning-on or turning-off of the luminosity units according to luminosity control patterns stored in an internal memory.

The mobile display apparatus using optical fibers according to the third embodiment of the present invention comprises an electric power supply unit which is portable and supplies a small electric power; a luminosity unit driver for supplying the small electric power of the electric power supply unit to plural luminosity units to light the plural luminosity units in response to a control signal inputted from external; optical fibers disposed in front of the plural luminosity units and luminesced by light emitted from the plural luminosity units in case that the plural luminosity units are lit; a control unit for outputting a control signal to the luminosity unit driver to control turning-on or turning-off of the luminosity units according to luminosity control patterns stored in an internal memory in response to a lamp driving signal inputted from external; and a luminosity detection unit for detecting a level of an ambient luminosity and outputting the lamp driving signal to the control unit in case that the detected level of an ambient luminosity is lower than a level of a predetermined luminosity.

The mobile display apparatus using optical fibers according to the fourth embodiment of the present invention comprises an electric power supply unit which is portable and supplies a small electric power; and a luminosity unit driver for supplying the small electric power of the electric power supply unit to plural luminosity units to light the plural luminosity units.

## BRIEF DESCRIPTION OF THE DRAWINGS

The above object and other advantages of the present invention will become more apparent by describing in detail a preferred embodiment thereof with reference to the attached drawings, in which:

FIG. 1 is a view for showing a movable display apparatus using optical fibers according to a first embodiment of the present invention;

5 FIG. 2 is a view for showing a movable display apparatus using optical fibers according to a second embodiment of the present invention;

FIG. 3 is a view for showing a movable display apparatus using optical fibers according to a third embodiment of the present invention;

10 FIG. 4 is a view for showing a movable display apparatus using optical fibers according to a fourth embodiment of the present invention; and

FIG. 5 to FIG. 7 are views for showing an applications of the movable display apparatuses using optical fibers according to the embodiments of the present invention.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

15 Hereinafter, first to fourth embodiments of the present invention will be described with reference to the accompanying drawings.

FIG. 1 is a view for showing a movable display apparatus using optical fibers according to a first embodiment of the present invention.

20 As shown in FIG. 1, the movable display apparatus using optical fibers according to a first embodiment of the present invention has an electric power supply unit 10 which is portable and supplies a small electric power, a luminosity unit driver 20 for supplying the small electric power of the electric power supply unit 10 to plural luminosity units 30 to light the plural luminosity units 30, and optical fibers 40 disposed in front of the plural luminosity units 30 and luminesced by light emitted from the plural luminosity units 30 in case that the plural luminosity units 30 are lit.

25 The electric power supply unit 10 may be embodied by any of a dry cell, a

rechargeable battery, a storage battery, and a solar battery, the plural luminosity units 30 may be embodied by any of light emitting diodes(LEDs), lighting LEDs, and light bulbs, and the LEDs, the lighting LEDs, and the light bulbs have a variety of colors.

The optical fibers 40 may have grooves in a certain depth on outer circumferences to emit light from the outer circumferences, and the optical fibers 40 are made up with transparent materials to emit light from the entire optical fibers 40.

The optical fibers 40 are applied to the first, second, and third embodiments.

In the movable display apparatus using optical fibers according to the first embodiment of the present invention having the above-mentioned structure, one or more bundles of optical fibers 40 are disposed in front of the luminosity units 30, as shown in FIG. 5, so that the luminosity units 30 are lit as an electric power is supplied and then the optical fibers 40 are also lit.

At this time, the electric power supplied to the luminosity units 30 is supplied from the electric power supply unit 10 which is any of a battery, a rechargeable battery, a solar battery, and a storage battery. As stated above, since the electric power supply unit 10 is portable and small-sized, as shown in FIG. 5, as letters are designed on a bag by disposing the optical fibers 40 and an electric power from the electric power supply unit 10 is applied to the luminosity units 30 positioned in the rear of the optical fibers 40, the luminosity units 30 starts to be lit and then the optical fibers 40 are lit, so that light is emitted from the designed letters.

Further, as shown in FIG. 6, the movable display apparatus using optical fibers according to the first embodiment may be applied to an electric sign or a signboard.

In the meantime, since luminous colors of the optical fibers 40 is determined according to luminous colors of the luminosity units 30, letters or figures of a variety of colors may be embodied. For example, in case that a luminous color of the luminosity units 30 is blue, a luminous color of the optical fibers 40 is also blue.

FIG. 2 is a view for showing a movable display apparatus using optical fibers according to a second embodiment of the present invention.

As shown in FIG. 2, the movable display apparatus using optical fibers according to the second embodiment has the electric power supply unit 10 which is portable and supplies a small electric power, the luminosity unit driver 20 for supplying the small electric power of the electric power supply unit 10 to plural luminosity units 30 to light the plural luminosity units 30 according to a control signal inputted from a control unit 50, optical fibers 40 disposed in front of the plural luminosity units 30 and luminesced by light emitted from the plural luminosity units 30 in case that the plural luminosity units 30 are lit, and the control unit 50 for outputting the control signal to the luminosity unit driver 20 to control turning-on or turning-off of the luminosity units 30 according to luminosity control patterns stored in an internal memory.

The movable display apparatus using optical fibers according to the second embodiment of the present invention, having the above-mentioned structure, has the same application field, electric power supply unit 10, and plural luminosity units 30 as in the first embodiment, of which a detailed description will be omitted.

Further, applications to products is also the same as in the first embodiment, as shown in FIG. 5, of which a detailed description will be omitted.

The movable display apparatus using optical fibers according to the second embodiment, differently from the first embodiment, has the control unit 50 to selectively turn on and off the luminosity units 30 according to the luminosity control patterns stored in the internal memory.

That is, the control unit 50 reads a luminosity control pattern stored in the internal memory and outputs a control signal to the luminosity unit driver 20 according to the luminosity control pattern.

Accordingly, the luminosity unit driver 20 selectively supplies an electrical power

of the electric power supply unit 10 to the luminosity units 30 according to the control signal, so that some of luminosity units 30 to which the electric power is supplied are turned on and the remaining luminosity units 30 are turned off. According to this, since the optical fibers 40 are selectively lit, the optical fibers 40 is turned on and off in appearance.

5           At this time, since various luminosity control patterns may be designed and stored in the internal memory of the control unit 50, various displays of letters and figures designed on products can be performed.

          Therefore, a decorative effect may be more enhanced according to the luminosity control patterns, and more diverse decorative designs become available than in the first  
10   embodiment.

          FIG. 3 is a view for showing a movable display apparatus using optical fibers according to a third embodiment of the present invention.

          As shown in FIG. 3, the movable display apparatus using optical fibers according to the third embodiment of the present invention has the electric power supply unit 10  
15   which is portable and supplies a small electric power, the luminosity unit driver 20 for supplying the small electric power of the electric power supply unit 10 to plural luminosity units 30 to light the plural luminosity units 30 according to a control signal inputted from the control unit 50, optical fibers 40 disposed in front of the plural luminosity units 30 and luminesced by light emitted from the plural luminosity units 30  
20   in case that the plural luminosity units 30 are lit, and the control unit 50 for outputting the control signal to the luminosity unit driver 20 to control turning-on or turning-off of the luminosity units 30 according to luminosity control patterns stored in an internal memory in response to a lamp driving signal inputted from a luminosity detection unit 60, and the luminosity detection unit 60 for detecting a level of an ambient luminosity and outputting  
25   the lamp driving signal to the control unit 50 in case that the detected level of an



ambient luminosity is lower than a level of a predetermined luminosity.

The movable display apparatus using optical fibers according to the third embodiment of the present invention, having the above-mentioned structure, has the same application field, electric power supply unit 10, and plural luminosity units 30 as in the first embodiment, of which a detailed description will be omitted.

5 Further, applications to products is also the same as in the first and second embodiments, as shown in FIG. 5, of which a detailed description will be omitted.

In the meantime, the movable display apparatus using optical fibers according to the third embodiment of the present invention, as in the second embodiment, uses the control unit 50 to turn on and off designed optical fibers 40, and, differently from the  
10 second embodiment, is further equipped with the luminosity detection unit 60 which outputs a lamp driving signal to the control unit 50 in case that a darkness level as it gets dark is lowered than a level predetermined in the luminosity detection unit 60.

The control unit 50 which inputs the lamp driving signal, as described in the second embodiment, controls the luminosity unit driver 20 according to the luminosity  
15 control pattern stored in the internal memory, an electric power is supplied to the luminosity units 30 from the luminosity unit driver 20 to light the luminosity units 30.

Accordingly, the optical fibers 40 disposed in front of the luminosity units 30 start to be lit, but a detailed description of which will be omitted since the description will be the same as in the first embodiment.

20 As stated above, in cases of the first and the second embodiment, plural letters or figures are designed on a product to be selectively turned on and off, so that diverse decorations or advertisements are more effectively expressed than in the first embodiment.

Accordingly, a great effectiveness are expected in case that the second and the  
25 third embodiment is applied to mobile electric signs or signboards.

FIG. 4 is a view for showing a movable display apparatus using optical fibers according to a fourth embodiment of the present invention.

As shown in FIG. 4, the movable display apparatus using optical fibers according to the fourth embodiment of the present invention has the electric power supply unit 10 which is portable and supplies a small electric power, and the luminosity unit driver 20  
5 for supplying the small electric power of the electric power supply unit 10 to the plural luminosity units 30 to light the plural luminosity units 30.

The movable display apparatus using optical fibers according to the fourth embodiment of the present invention, having the above-mentioned structure, has the same application field, electric power supply unit 10, and plural luminosity units 30 as  
10 in the first embodiment, of which a detailed description will be omitted.

The optical fibers shown in the first to third embodiments are eliminated in the fourth embodiment, as shown in FIG. 7, the luminosity units 30 are attached on a bag, for example, to express or design letters or figures, and an electric power of the electric power supply unit 10 is supplied to the luminosity units 30 through the luminosity unit  
15 driver 20 to light the luminosity units 30.

Accordingly, since light is emitted from only the designed letters or the figures when viewed in appearance of a product on which the letters and figures are designed, gaudy decorative effects are expected.

The term of miscellaneous goods means goods such as clothes, shoes, and so  
20 on, in addition to the above-mentioned bag.

Accordingly, since the present invention uses a portable and small-sized electric power supply unit to light optical fibers, the present invention may be applied to goods such as fancy goods, stationery, toys, ornamental goods, miscellaneous goods, and so on which everyone can bear. Further, since optical fibers are used in the present  
25 invention, a gaudy decorative effect is expected.

Furthermore, as stated above, the present invention may be applied to mobile electric signs and signboards in addition to general goods and turn on and off letters or figures designed as desired by using a small electric power in a state mounted in a desired place, doubling the advertisement effect.

Although the preferred embodiment of the present invention has been described,  
5 it will be understood by those skilled in the art that the present invention should not be limited to the described preferred embodiment, but various changes and modifications can be made within the spirit and scope of the present invention as defined by the appended claims.

**CLAMS**

1. the movable display apparatus using optical fibers, comprising:

an electric power supply unit which is portable and supplies a small electric power;  
a luminosity unit driver for supplying the small electric power of the electric power supply unit to plural luminosity units to light the plural luminosity units; and optical fibers disposed in front of the plural luminosity units and luminesced by light emitted from the plural luminosity units in case that the plural luminosity units are lit.

2. the movable display apparatus using optical fibers, comprising:

an electric power supply unit which is portable and supplies a small electric power;  
a luminosity unit driver for supplying the small electric power of the electric power supply unit to plural luminosity units to light the plural luminosity units in response to a control signal inputted from external;

optical fibers disposed in front of the plural luminosity units and luminesced by light emitted from the plural luminosity units in case that the plural luminosity units are lit; and

a control unit for outputting a control signal to the luminosity unit driver to control turning-on or turning-off of the luminosity units according to luminosity control patterns stored in an internal memory.

3. The movable display apparatus using optical fibers, comprising:

an electric power supply unit which is portable and supplies a small electric power;  
a luminosity unit driver for supplying the small electric power of the electric power supply unit to plural luminosity units to light the plural luminosity units in response to a control signal inputted from external;

optical fibers disposed in front of the plural luminosity units and luminesced by light emitted from the plural luminosity units in case that the plural luminosity units are lit;

a control unit for outputting a control signal to the luminosity unit driver to control turning-on or turning-off of the luminosity units according to luminosity control patterns stored in an internal memory in response to a lamp driving signal inputted from external; and

5 a luminosity detection unit for detecting a level of an ambient luminosity and outputting the lamp driving signal to the control unit in case that the detected level of an ambient luminosity is lower than a level of a predetermined luminosity.

4. The mobile display apparatus as claimed in any of claims 1 to 3, wherein the electric power supply unit is any of a dry cell, a rechargeable battery, a storage battery, and a solar battery.

10 5. The mobile display apparatus as claimed in any of claims 1 to 3, wherein the luminosity units are any of light emitting devices(LEDs), lighting LEDs, and light bulbs.

6. The mobile display apparatus as claimed in any of claims 1 to 3, mounted in one body to an object which is any of fancy goods, accessories, stationery, toys, and miscellaneous goods.

15 7. The mobile display apparatus as claimed in any of claims 1 to 3, wherein the optical fibers has grooves in a certain depth on outer circumferences thereof to emit light from the outer circumferences.

20 8. The mobile display apparatus as claimed in any of claims 1 to 3, wherein the optical fibers are made up with transparent materials to emit light from the entire optical fibers.

9. The mobile display apparatus as claimed in claim 1 or claim 2, being an electric sign or a signboard.

25 10. The mobile display apparatus using optical fibers, comprising:  
an electric power supply unit which is portable and supplies a small electric power;  
and

a luminosity unit driver for supplying the small electric power of the electric power supply unit to plural luminosity units to light the plural luminosity units.

11. The mobile display apparatus as claimed in claim 7, wherein the electric power supply unit is any of a dry cell, a rechargeable battery, a storage battery, and a solar battery.

5           12. The mobile display apparatus as claimed in claims 7, wherein the luminosity units are any of light emitting devices(LEDs), lighting LEDs, and light bulbs.

13. The mobile display apparatus as claimed in claims 1 to 3, mounted in one body to an object which is any of fancy goods, accessories, stationery, toys, and miscellaneous goods.

FIG. 1

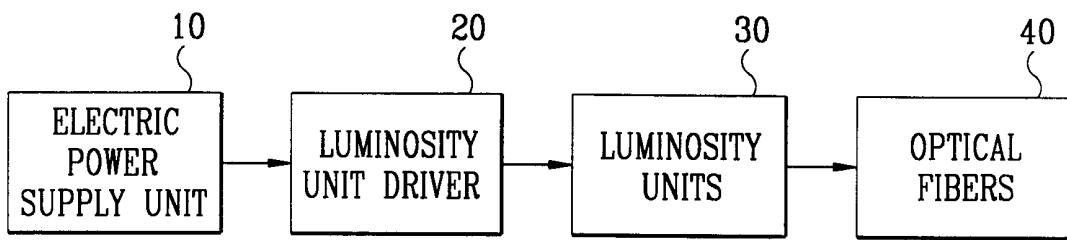


FIG. 2

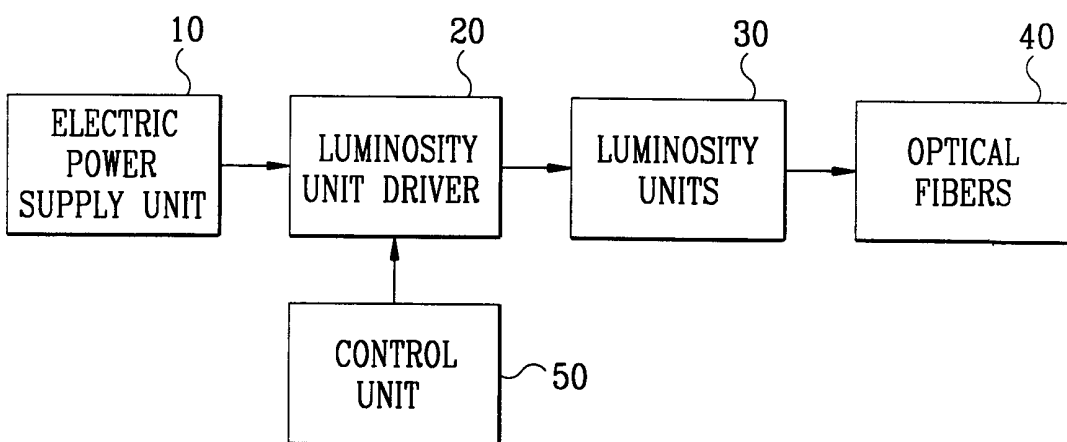


FIG. 3

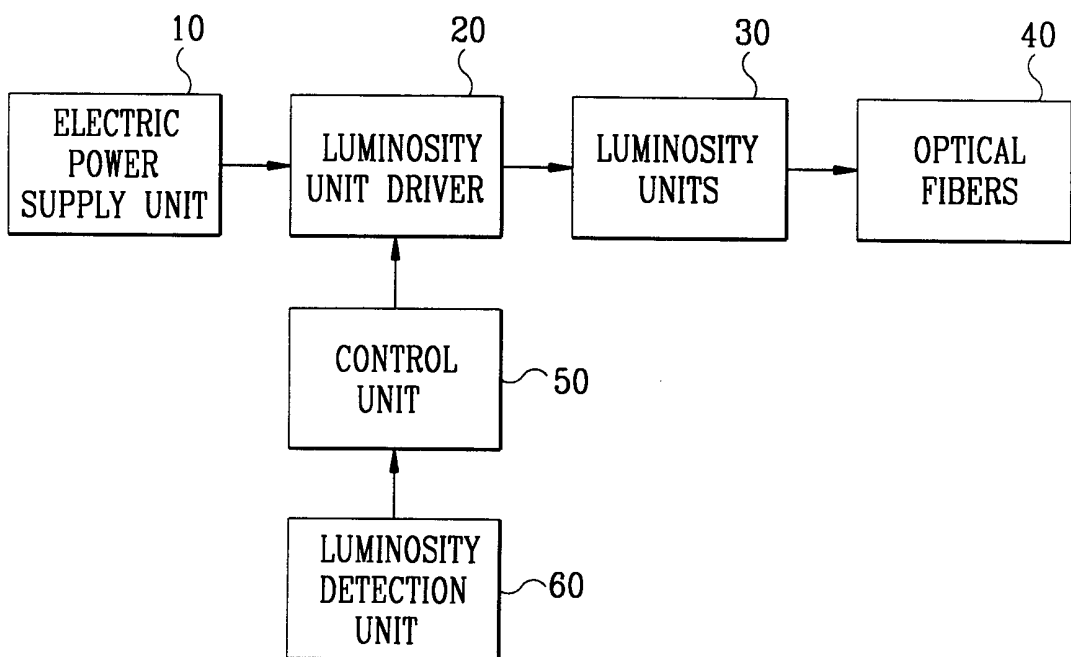


FIG. 4

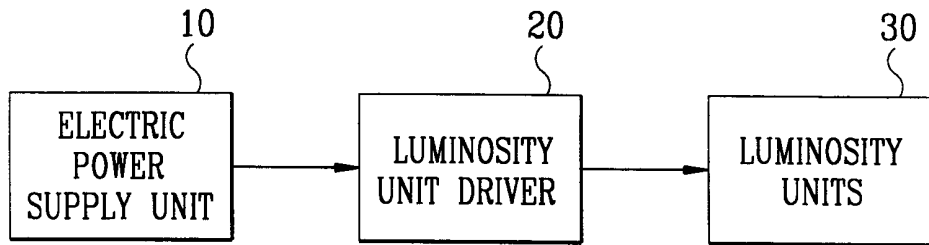


FIG. 5

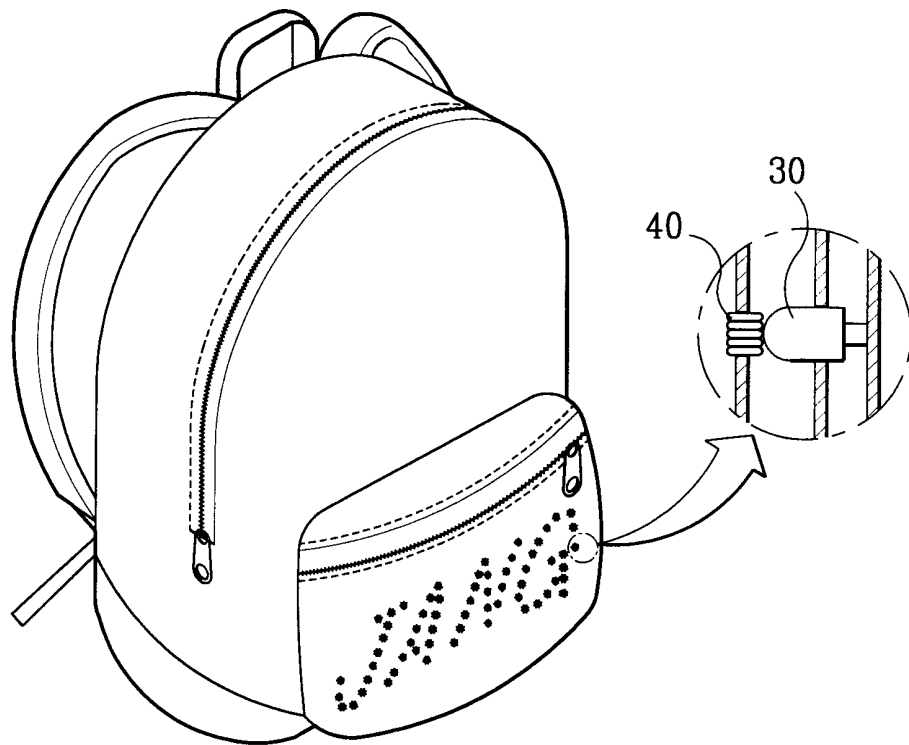




FIG. 6

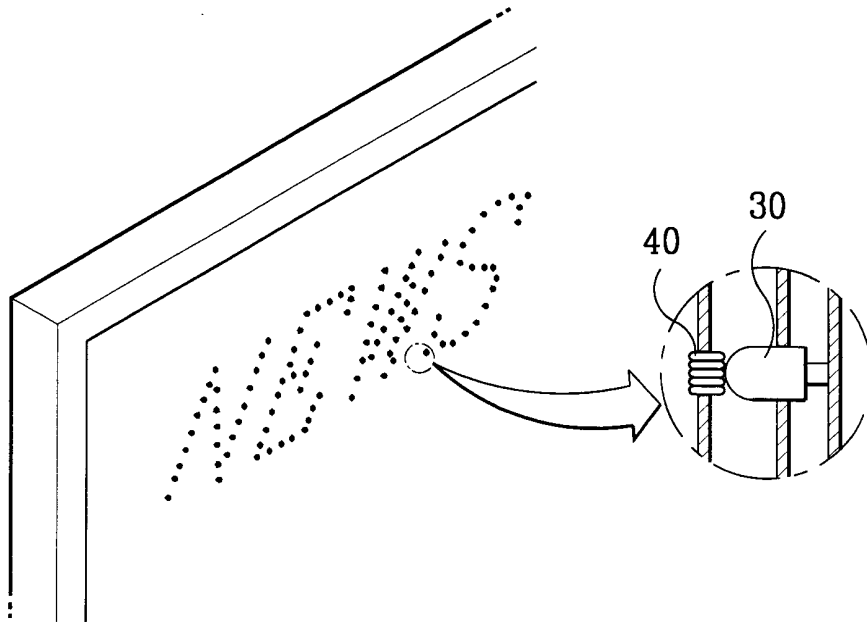
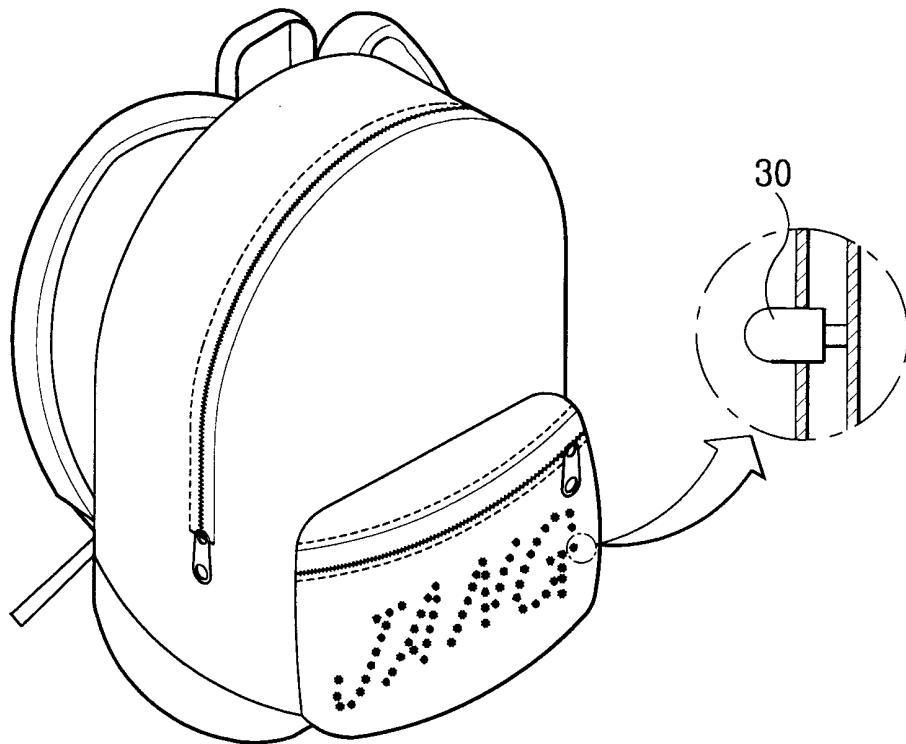


FIG. 7



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR00/00141

**A. CLASSIFICATION OF SUBJECT MATTER****IPC7 G09F 9/30**

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)

IPC7 G09F 9/30, G09F 9/00, G09F 13/00, G09F 13/20, A42B 1/24

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

Korean Patents and Applications for Inventions since 1975

Korean Utility Models and Applications for Utility Models since 1975

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

NPS, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 09 - 197987 A (SANYO ELECTRIC CO LTD) 31 JULY 1997 See Claim 1-3, Fig.1-2	1-13
Y	KR 96 - 30137 U (YOUNGAN HAT CO LTD) 22 OCTOBER 1996 See Abstract, Claim 1,3 , Fig.1A-2B	1-13
A	KR 96 - 16098 U (SONG KI-YOUNG) 17 JUNE 1996 Whole Document	1, 2, 3, 10
A	KR 98 - 25333 A (CHUN SI-WOO) 6 JULY 1998 See Abstract, Claim 1	1, 2, 3, 10
A	KR 95 - 10693 U (KIM JAE-DUCK) 15 MAY 1995 Whole Document	3, 10

 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

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"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

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"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

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Date of the actual completion of the international search

09 AUGUST 2000 (09.08.2000)

Date of mailing of the international search report

14 AUGUST 2000 (14.08.2000)

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

PCT/KR00/00141

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 09 - 197987	31.07.97	AU 1229297 A1 CA 2195736 A	31.07.97 25.07.97
KR 96 - 30137	22.10.96	None	
KR 96 - 16098	17.06.96	None	
KR 98 - 25333	06.07.98	None	
KR 95 - 10693	15.05.95	None	