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(54) Parking garage

(57) Parking garage having at least two parking areas inside said parking garage,
each parking area comprising a plurality of parking spaces adjacent to a wall, a wall segment of said wall extending along said plurality of parking spaces, said wall segment having a color pattern comprising at least two contrasting colors, whereby the color patterns of wall segments of different parking areas differ in color and in the pattern of the color patterns.

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Description

[0001] The present invention relates to a parking garage having an improved throughput of parking garage users.

[0002] Parking garages are widely used in urban settlements for allowing transient storage of cars. Parking garages are frequently very big in that they may have several hundred parking spaces that may be located on different floors. When a user of a parking garage drives into a parking garage, he/she usually drives through a parking floor and, if necessary, through several parking floors until an empty parking space is found and used for parking a car. When the user later returns to the parking garage to find his car, users frequently have problems to recall the particular parking area or parking floor where they have left their car. Generally used numbering systems like an assignment of letters to the parking floors is of no help, since users tend to forget the letter or number designating the parking area in which they have left their car. Users therefore frequently have to search several parking areas or several parking floors of a parking garage to find their car, which wastes valuable time of the user. Further, this wastes valuable time for the owner of the parking garage and for other people in need of a free parking space, since parking spaces remain occupied longer than necessary. Therefore, the overall efficiency of using conventional parking garages is low. Moreover, parking garages are generally all but attractive places, which makes lengthy searches for a parked car, notably late in the evening or for women, very unpleasant.

[0003] It is therefore an object of the invention to provide a parking garage which allows a higher throughput of users by shortening the time required for finding a parked car. It is another object of the invention to provide a parking garage of improved commercial efficiency. It is another object of the invention to provide a parking garage which is more attractive for a user.

[0004] The invention provides a parking garage having at least two parking areas inside said parking garage, each parking area comprising a plurality of parking spaces adjacent to a wall, a wall segment of said wall extending along said plurality of parking spaces, said wall segment having a color pattern comprising at least two contrasting colors, whereby the color patterns of wall segments of different parking areas are different and preferably differ in color and in the pattern of the color patterns.

[0005] The invention also provides a use of a color pattern in a parking garage as defined herein for providing guidance to a user of said parking garage to a vehicle parked by said user. The invention further provides a system for memorizing the location of a parking space in a parking garage, said system comprising a parking garage and a color pattern as defined herein.

[0006] It has been found that the use of specific color patterns designating the parking areas of a parking garage enable the user of a parking garage to easily memorize and recall the parking area where the car was parked. In the invention, the color pattern is chosen and arranged such that it affects the memory of a user without the user having to actively memorize the parking area. If a user leaves his car in a particular area, the user is exposed to the color pattern of the wall segment corresponding to the chosen parking area. The color pattern is memorized unconsciously by the user. When the user later returns to the parking garage to find his car, parking areas having on wall segments color patterns different from that memorized by the user are immediately recognized as false, and the parking area having the memorized color pattern is recognized as right. This system provides guidance for the user to the parked car. This system is based on the surprising finding that the color patterns of the invention can be memorized easily by users of a parking garage. Compared to an otherwise comparable parking garage of the prior art, users of the parking garage of the invention need, on average, less time to find their cars. Thus, the parking process is more efficient. On average, more users can use the parking garage of the invention during a predetermined period of time of e.g. one day. Further, the parking garage of the invention is more attractive and appealing to users, thus improving the turnover of the parking garage.

[0007] An important advantage of the invention is obtained if corporate identity colors or logos of well-known companies are used in or as said color patterns. Use of such color patterns in this invention leads to an intense memory effect and to an intense impression/perception of the color pattern by a user and vice versa. These two effects can amplify each other.

[0008] The parking garage of the invention is divided into at least two parking areas inside the parking garage. Each parking area comprises a plurality of parking spaces adjacent to a wall, whereby a segment of said wall extends, in horizontal direction, along said plurality of parking spaces. Said plurality of parking spaces comprises at least two parking spaces, preferably at least three parking spaces, more preferably at least four parking spaces. There is no strict upper limit for the number of parking spaces of said plurality of parking spaces that are located adjacent to said wall. This upper limit is generally determined by the length of said wall segment and may be more than 100. Preferably, the upper limit is 50 parking spaces. Herein, a parking space is considered to be located adjacent to a wall, if the boundaries of said parking space are within 2 meters, preferably within 1 meter from said wall. The number of parking spaces in a plurality of parking spaces of different parking areas may be the same or may be different.

[0009] Not all parking spaces of a parking area have to be located adjacent to a wall, provided that a plurality of parking spaces is located adjacent to a wall. Preferably, said wall segment carrying the color pattern should be viewable essentially from all parking spaces of the corresponding parking area. The minimum number of parking spaces per parking area is 2. The maximum number of parking spaces per parking area is not limited.

However, the maximum number of parking spaces in a parking area should be such to provide effective guidance for a user to his car. Therefore, the maximum number of parking spaces in a parking area should be at most 200, preferably at most 100, more preferably at most 50 parking spaces.

[0010] Said wall may be an outside wall of said parking garage or an inside wall of said parking garage. Said wall serves at least the purpose of carrying said color pattern. Said wall may be made of concrete, of brickwork, of gypsum panels or any other material providing a solid support for said colar pattern. Said wall typically extends from the bottom of a parking floor up to the ceiling. Supporting walls are typically made of reinforced concrete or brickwork, whereby non-supporting walls may be made of less stable materials like gypsum panels.

[0011] The segment of a wall extends along said plurality of parking spaces. Extending along said plurality of parking spaces forces a user of a parking space of said plurality of parking spaces to get in close proximity to said color pattern on said wall. A segment of said wall is defined as having one type of color pattern thereon. A segment of a wall may have the same color pattern repeatedly several times next to each other. A wall of said parking garage may comprise more than one wall segment, whereby the color patterns of said wall segments will be different. It is not necessary, that all parking spaces of a particular parking area are located adjacent to the wall, provided that a plurality of parking spaces of a parking area are located adjacent to a wall. It is the plurality of parking spaces that is located adjacent to a wall, which defines said parking area. Thus, each of said at least two parking area has one wall segment. Different wall segments carry different color patterns and can thus easily be assigned by a user of the parking garage to the parking area where he has left his car. Herein, a parking space is considered to be adjacent to a wall if it is within 2 m from said wall.

[0012] The color pattern of each wall segment comprises at least two contrasting colors. In order to give an easily memorizable color pattern, at least 40, preferably at least 50, more preferably at least 60, and most preferably at least 70 % of the surface of a selected wall segment should be covered by a chromatic color. "Chromatic" means a color not lying on the vertical lightness axis in the color solid, i.e. not an achromatic color. Preferably, a chromatic color is one having a chroma in the CIELab system of at least 20. In calculating the surface area of a wall segment, the total height of said wall from top to bottom is used in vertical direction, i.e. the height from the ground to the ceiling of a floor (story) of the parking garage. In horizontal direction, the length of the wall segment along a plurality of parking spaces is used. This length is at least the sum of the breadth of two parking spaces, i.e. about 3.5 m. Said chromatic color has a chroma in the CIELab system of at least 20, preferably at least 30, more preferably at least 40. Preferably, the lightness of the chromatic color covering at least 40 (preferably at least 50, 60, or 70) % of the surface of said wall segment is between 20 and 90, preferably between 30 and 85, more preferably between 40 and 85, and most preferably between 50 and 80 in the CIELab system. The CIELab system used herein is the CIE 1976 system. See also: CIE: Colorimetry, 2nd ed., CIE, Vienna, 1986. Further, chapters 3.3, 3.4, and 3.5 of volume 11 of Ullman's Encyclopedia of Industrial Chemistry, 6th edition, Wiley-VCH, 2003, are incorporated herein by reference.

[0013] In said color pattern, said at least two contrasting colors alternate to produce a pattern of said contrasting colors. "Alternate" means that said at least two different colors cover different parts of the surface of said wall segment, i.e. are not (exclusively) mixed and not (exclusively) used on top of each other to give a single color impression. The arrangement of wall surface areas covered by different contrasting colors relative to each other defines the pattern of the color pattern. The colors of said color pattern may be arranged in any way. Said pattern may comprise any combination of straight and curved dividing lines between surface areas of different contrasting colors. Thus, a color pattern is defined herein by the contrasting colors used and by the patterns formed by said contrasting colors. Examples of color patterns according to the invention are numbers, letters, words, symbols or any combination of these in a first color on a background having a second color, whereby the first and the second color are contrasting colors.

[0014] In a preferred embodiment, the color pattern of the invention is the logo of a company on the background of a corporate identity color of said company. Most preferably, the color pattern is the logo of a company well-known at the location of the parking garage. In this event, the best effect on the memory of the parking garage user can be obtained, since this produces an association in the user's memory of a famous name or company with the parking area where the user has left his car. Such an association enables the user to easily recall the color pattern of the used parking area.

In order to be contrasting, said contrasting colors differ in at least one property selected from lightness, hue and chroma. More preferably, said contrasting colors of a color pattern differ in hue and in chroma. Most preferably, said at least two different colors differ in lightness, hue and in chroma. Differences in hue should be at least 30°, preferably at least 50°, more preferably at least 70°, and most preferably at least 90° in the a-b-plane of the CIELab color space. Differences in chroma should be at least 20, preferably at least 30, more preferably at least 40, and most preferably at least 50.

[0015] In an important embodiment, both said different contrasting colors of a selected color pattern are chromatic colors. In another embodiment, said color pattern comprises three, four or more contrasting colors.

[0016] Further preferred are embodiments wherein:

said two contrasting colors differ in hue by at least 50° and in chroma by at least 20;

said two contrasting colors differ in hue by at least 70° and in chroma by at least 20;
said two contrasting colors differ in hue by at least 70° and in chroma by at least 30;
said two contrasting colors differ in hue by at least 50°, in chroma by at least 30, and in lightness by at least 30. These embodiments may apply to one, to two or to more different color patterns.

[0017] Since the parking garage of the invention comprises at least two parking areas each having a wall segment having a color pattern, the parking garage has at least two color pattern that are different. The parking garage may have three, four, or more parking areas, each having a wall segment with a color pattern, whereby all color patterns are different.

[0018] The difference between said color patterns is preferably in color and in the pattern formed by said at least two contrasting colors. Difference in color means that a first color pattern has at a selected point a color different from the color at a corresponding point of a second color pattern. Difference in pattern means that the arrangement of colors of different color patterns is different. In general, two color patterns may differ either in color or in pattern, or in color and in pattern. In the present invention, two color patterns differ most preferably in color and in pattern.

[0019] Herein, a first color pattern differing in color from a second color pattern preferably has at least one color essentially absent in the second color pattern. A color not present in another color pattern preferably covers at least 10, preferably at least 20, more preferably at least 30, and most preferably at least 40 % of the surface area of the wall segment carrying said color pattern. "Essentially absent" means that the essentially absent color covers at most 5% of the surface area of wall segment.

[0020] Preferred embodiments of different color patterns are the following: a color of a first color pattern covers at least 40% of the surface area of a first wall segment and a different color of a second color pattern covers at least 40% of the surface area of a second wall segment, whereby said color of said first color pattern and said color of said second color pattern differ in hue by at least by 50° or in chroma by at least 30; more preferably, said colors differ in hue by at least 70° or in chroma by at least 40; even more preferably, said colors differ in hue by at least 50° and in chroma by at least 20; even more preferably, said colors differ in hue by at least 70° and in chroma by at least 20; even more preferably, said colors differ in hue by at least 70° and in chroma by at least 30; most preferably, the colors of the previous embodiments each covers more than 50% of the surface area of the respective wall segments.

[0021] The ratio of the repetition period of a color pattern according to the invention on its wall segment to the repetition period of the parking spaces adjacent to said wall are preferably between 0.25 to 10, preferably 0.5 to 5. A ratio of 0.25 corresponds to a situation where a color patterns is repeated four times on a length of said wall (in horizontal direction) corresponding to the breadth of one parking space (measured parallel to said wall). A ratio of ten corresponds to the situation of one color pattern that extends over a length corresponding to ten parking spaces without repeating said color pattern over this length. Thus, said ratio is a measure of the number of a repetitions of a color pattern on said wall segment per parking space adjacent to said wall. For the purpose of calculating said ratio on an absolute scale, the size of a parking space may be assumed to be 1.75 m for parking spaces arranged orthogonal to the adjacent wall. For parking spaces arranged parallel to the adjacent wall, the size of a parking space may be assumed to be 4 m. The orientation of a parking space relative to said wall may be such that the longer extension of the parking space may be parallel or orthogonal to the direction of said wall. In any case, the size of a parking space is always measured in parallel to said wall.

[0022] A selected color pattern is present at least once over a length of the corresponding wall segment, which gives a ratio of 2 if said plurality of parking spaces consists of 2 parking spaces and a ratio of 10 if said plurality of parking spaces consists of 10 parking spaces. A selected color pattern may be repeated once, twice, thrice or more times over the length of the corresponding wall segment, i.e. be present two times, three times, four or more times, respectively, over a length of the corresponding wall segment. If a color pattern is repeated once over the length of the corresponding wall segment, said ratio is 1 if said plurality of parking spaces consists of 2 parking spaces and said ratio is 5 if said plurality of parking spaces consists of 10 parking spaces. Preferably, said ratio of the repetition period of said color pattern to the repetition period of the parking spaces adjacent to said wall is 0.5 to 5, more preferably 1 to 5, most preferably 2 to 5. The ratio of wall segments in different parking areas may be the same or may be different.

[0023] There are no limitations regarding the mode of application of the colors forming said color patterns on said wall segments. In one embodiment, said color patterns are painted on panels, e.g. gypsum panels, and the painted panels are mounted on said wall segment. In another embodiment, said color patterns are applied or printed on a sheet (e.g. of paper or plastic) and said sheet are then applied (e.g. glued) on said wall segments.

[0024] The paint used for painting or printing said color pattern may contain fluorescent dyes or may contain reflecting particles for providing the color pattern with an appealing look. These embodiment should be combined with an illuminating system illuminating said color patterns.

[0025] Said parking garage may have said color patterns not only on a wall but also on the floor and/or on the ceiling adjacent to the wall carrying said color pattern for improving the effect of the color pattern on the user of the parking garage. For the same purpose, the parking garage should comprise a lighting installation capable of

illuminating the at least two color patterns.

Brief description of the drawings

[0026]

Fig. 1 shows a view on a sidewall in a parking garage. Fig. 1 indicates 3 parking areas, each parking area having a plurality of parking spaces (shown partially). The parking area in the middle of the figure consists of two parking spaces numbered as 110 and 111. The plurality of parking spaces 110 and 111 are located adjacent to a sidewall. The wall segment belonging to the parking area in the middle of the figure extends along parking spaces 110 and 111. The wall segment extending along parking spaces 110 and 111 has a color pattern having at least three contrasting colors, namely green for the lawn in the foreground, blue for the sky and white for the clouds. The blue color of the sky covers at least 40% of the surface of said wall segment and has a lightness of at least 50 and a chroma of at least 30 in the CIELab system. The color pattern further comprises a symbol in the form of an upwardly directed arrow and the words "CAR SPACE". The parking garage further has a light installation comprising four lights above the central wall segment, said light installation illuminating the color pattern under said light, whereby the color pattern can easily be seen by users of the parking area. Fig. 1 further shows two further parking areas flanking the central parking area on the left and on the right. These further parking areas have, on the same wall, wall segments extending along the respective parking spaces (partially shown) and color patterns (partially shown) on the respective wall segments. The color patterns of the three color patterns shown in Fig. 1 are different.

Fig. 2 shows a plan view on a parking floor of a parking garage according to the invention. Filled arrows indicate entrance and exit, respectively, to the parking floor. The checky area indicates the driving route for cars entering or leaving the parking floor, whereby the driving direction is indicated by arrows. Rectangular fields stand for parking spaces. 10 indicates a supporting sidewall of the parking garage. 12 indicates a first wall segment of said side wall, said wall segment extending along 20 parking spaces. 14 indicates a second wall segment of said sidewall, said wall segment extending along 20 parking spaces. 16 indicates a non-supporting sidewall extending in vertical direction from top to bottom of the parking floor. The parking floor shown in Fig. 2 is divided into two parking areas by sidewall 16. Sidewall 16 serves as a wall segment for the first parking area with its surface directed towards wall segment 12. Sidewall 16 also serves as a wall segment for the second parking area with its surface directed towards wall segment 14. The surfaces of wall segment 12 and the surface of sidewall 16 directed towards wall segment 12 carry a first color pattern (not shown). The surfaces of wall segment 14 and the surface of sidewall 16 directed towards wall segment 14 carry a second color pattern (not shown). In each parking area, the respective color pattern may be repeated several times. A color pattern may extend along 4 parking spaces and will be present 4 times on sidewall 16 and 5 times on wall segments 12 and 14.

Fig. 3 is a perspective view into the parking floor shown in Fig. 2.

Preferred embodiments

[0027] Parking garage having at least two parking areas inside said parking garage,
each parking area comprising a plurality of parking spaces adjacent to a wall, a wall segment of said wall extending along said plurality of parking spaces, said wall segment having a color pattern comprising at least two contrasting colors, whereby the color patterns of wall segments of different parking areas differ in color and in the pattern of the color patterns and wherein at least 40% of the surface of a wall segment is covered by color having a chroma of at least 20, preferably at least 30 in the CIELab system.

[0028] Parking garage having at least two parking areas inside said parking garage,
each parking area comprising a plurality of parking spaces adjacent to a wall, a wall segment of said wall extending along said plurality of parking spaces, said wall segment having a color pattern comprising at least two contrasting colors, the ratio of the repetition period of said color pattern to the repetition period of the parking spaces adjacent to said wall being 0.25 to 10, whereby the color patterns of wall segments of different parking areas are different.

Claims

1. Parking garage having at least two parking areas inside said parking garage,
each parking area comprising a plurality of parking spaces adjacent to a wall, a wall segment of said wall extending along said plurality of parking spaces, said wall segment having a color pattern comprising at least two contrasting colors,
whereby the color patterns of wall segments of different parking areas differ in color and in the pattern of the color patterns.

2. The parking garage according to claim 1, wherein said two contrasting colors of a selected wall segment differ at least in hue and in chroma.

3. The parking garage according to any of claims 1 or 2, wherein at least 40% of the surface of a wall segment is covered by color having a chroma of at least 20, preferably at least 30, in the CIELab system.

4. The parking garage according to one of claims 1 to 3, comprising a lighting installation capable of illuminating said color patterns.

5. The parking garage according to any of claims 1 to 4, wherein the ceiling above the parking spaces of a selected wall segment has a color pattern corresponding to the color pattern of said selected wall segment.

6. The parking garage according to any of claims 1 to 5, wherein said color pattern comprises letters or words.

7. The parking garage according to any of claims 1 to 6, wherein said color pattern comprises the logo of a company.

8. The parking garage according to any of claims 1 to 6, wherein a first color pattern of a first parking area comprises at least one chromatic color that is essentially absent in a second color pattern of a second parking area, said chromatic color covering at least 10 %, preferably at least 20 % of the surface area of the wall segment carrying said first color pattern.

8. The parking garage according to any of claims 1 to 7, said parking garage having at least two floors, each floor constituting one parking area.

9. The parking garage according to any of claims 1 to 9, wherein said at least two parking areas are present within one floor of said parking garage.

10. The parking garage according to any of claims 1 to 10, wherein said wall segment having a color pattern comprising at least two contrasting colors, the ratio of the repetition period of said color pattern to the repetition period of the parking spaces adjacent to said wall being 0.25 to 10.

11. Use of a color pattern in a parking garage as defined in any one of claims 1 to 10 for providing guidance to a user of said parking garage to a vehicle parked by said user.

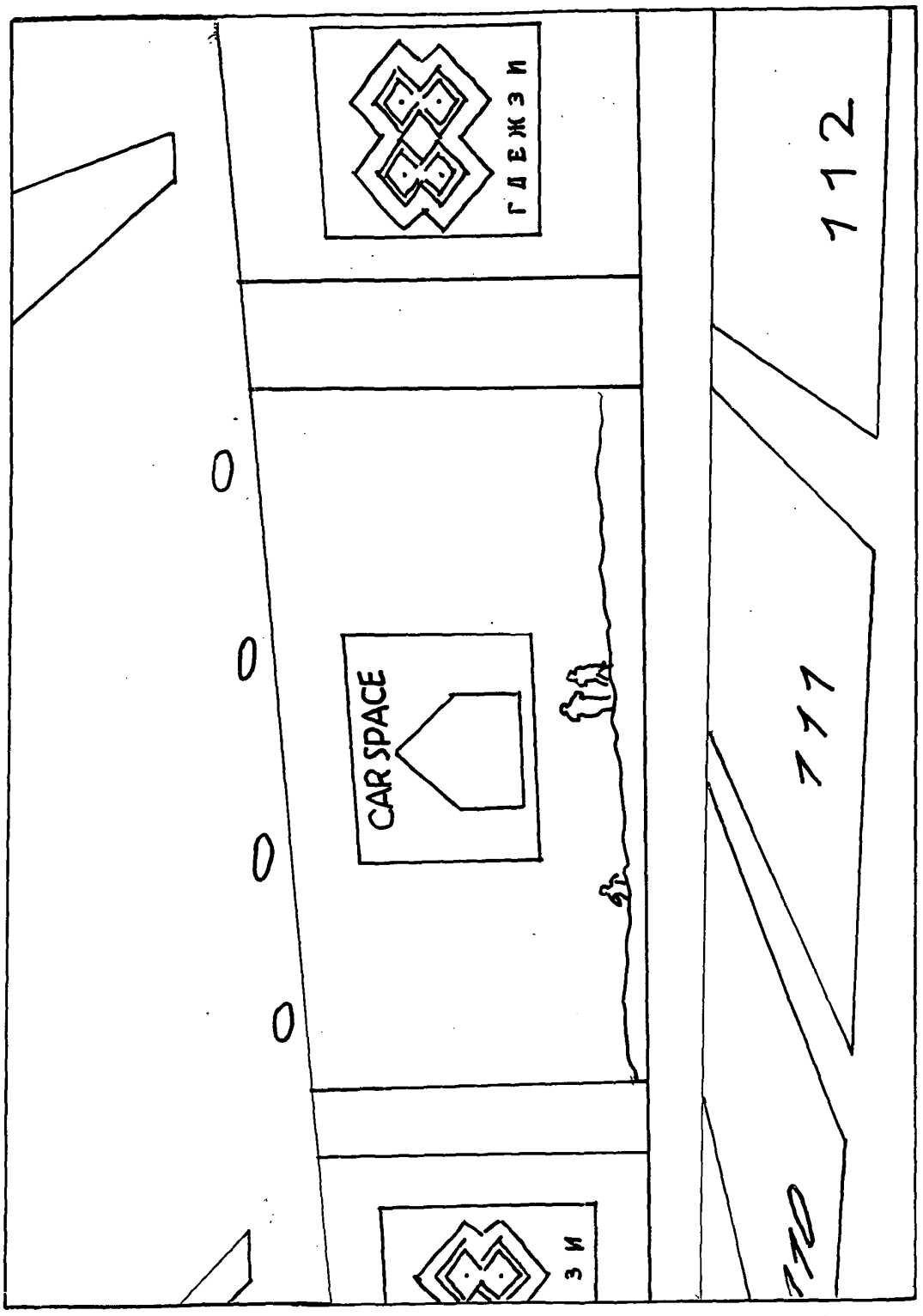

Fig. 1

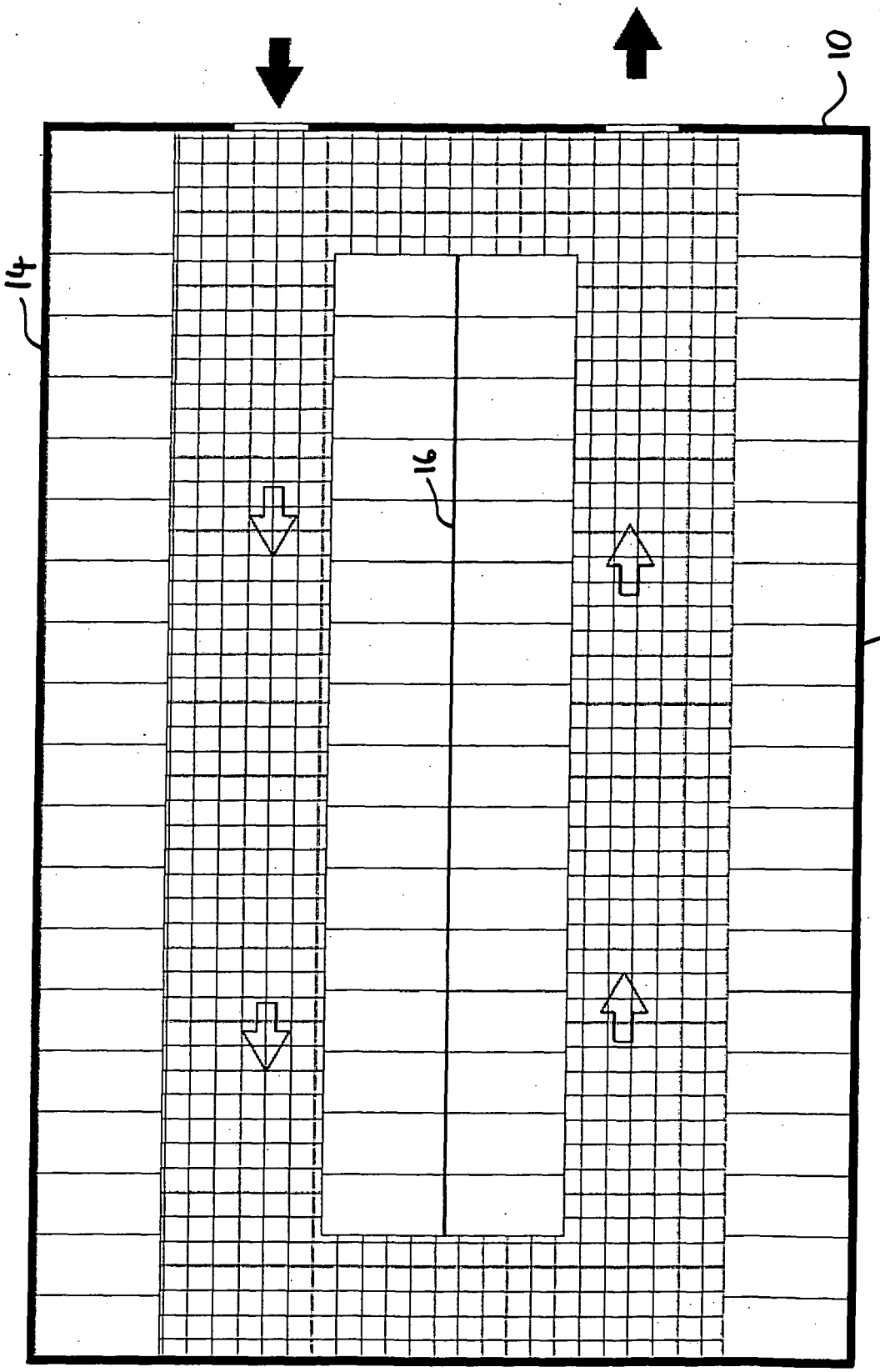

Fig. 2

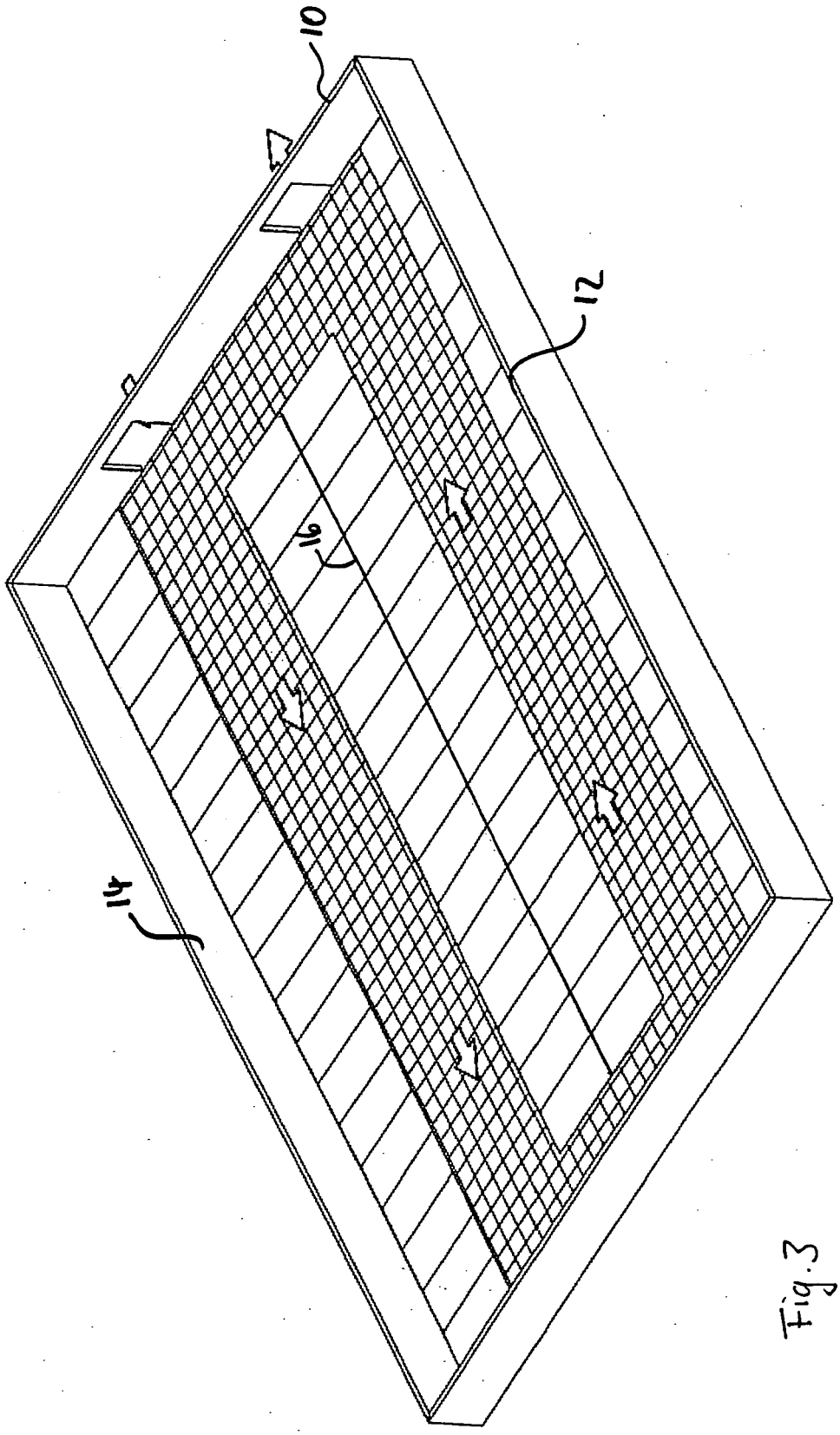

Fig. 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 02 2953

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	US 4 674 937 A (WARSHAUER ET AL) 23 June 1987 (1987-06-23) * the whole document * -----	1,4,6,8, 11	INV. E04H6/42

TECHNICAL FIELDS SEARCHED (IPC)
E04H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	27 November 2006	Delzor, François

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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3

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 02 2953

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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27-11-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4674937 A	23-06-1987	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Non-patent literature cited in the description

- CIE: Colorimetry. 1986 **[0012]**
- Ullman's Encyclopedia of Industrial Chemistry. Wiley-VCH, 2003, vol. 11 **[0012]**