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(11) **EP 0 969 244 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.01.2000 Bulletin 2000/01

(51) Int. Cl.⁷: **F21P 1/00**

(21) Application number: **99202086.7**

(22) Date of filing: **29.06.1999**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **01.07.1998 NL 1009535**

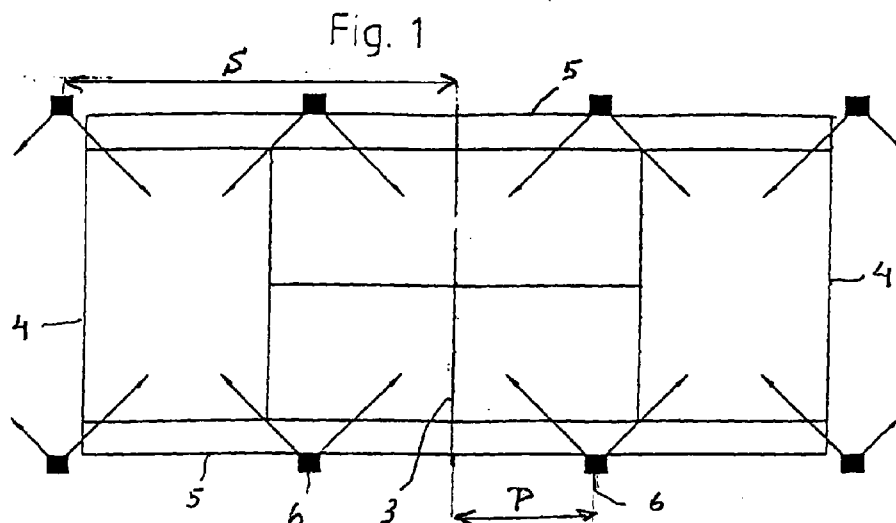
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(54) **Lighting system in particular for use in a tennis hall**

(57) Lighting system, in particular for use in a tennis hall (1), employing at least eight lighting armatures (6, 7) being arranged alongside the court (2) in two rows spaced apart and each comprising at least four armatures in such a way, that at least four primary lighting armatures (6) are situated at a horizontally measured distance (P) between 3.75 m and 4.75 m from the net (3) and at a height (HP) between 6 m and 8 m above the court (2) and that at least four secondary lighting arma-

tures (7) are situated at a distance (S) between 12 m and 13.5 m from the net (3) and at a height (HS) between 5 m and 6 m, said lighting armatures (6, 7) being provided with high-pressure discharge lamps (10). The primary lighting armatures (6) can diffuse almost twice as much light as the secondary lighting armatures (7).



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Description

[0001] The invention relates to a lighting system, in particular for use in a tennis hall, employing lighting armatures each comprising at least one lamp mounted within a reflector, said lighting armatures being arranged in two parallel rows in longitudinal direction of a court.

[0002] Such a lighting system is known from DE-A-2242309. There, the lighting armatures are directed to the inner wall of the hall so that the rays of light emitted by the lighting armatures are reflected towards the court by the wall.

[0003] By applying such an indirect lighting system, the energy absorbed by it will not be used efficiently. Furthermore, it is still possible to look in the reflectors, so that it is desirable to cover them by means of a grid. This further reduces the efficiency of the system.

[0004] It will be obvious that when playing tennis it is not only desirable to obtain a proper illumination of the court, but it should also be possible to follow the path of the ball during the game. The movements of the opponents should also be clearly visible. All this requires a certain light intensity and in particular a uniform lighting across the entire space above the court.

[0005] The object of the invention is to design the lighting system in such a way, that an optimum efficiency is achieved and that a suitable light distribution across the entire space above the court is obtained.

[0006] According to the invention, this is achieved in that at least eight lighting armatures are employed, being arranged alongside the court in two rows spaced apart and each comprising at least four armatures in such a way, that at least four primary lighting armatures are situated at a horizontally measured distance between 3.75 m and 4.75 m from the net and at a height between 6 m and 8 m above the court and that at least four secondary lighting armatures are situated at a distance between 12 m and 13.5 m from the net and at a height between 5 m and 6 m, said lighting armatures being provided with high-pressure discharge lamps.

[0007] The primary lighting armatures will be positioned in particular at a distance of 4.25 m from the net and at a height of 7 m, whereas the secondary lighting armatures will be positioned at a distance of 12.75 m from the net and at a height of 5.5 m.

[0008] The two rows each comprising at least four lighting armatures will be preferably be mounted almost above the sidelines of a court. There, the rays of light from the armatures are aimed directly at the tennis court.

[0009] Since the secondary lighting armatures are required to cover a less large part of the space above the court, it will be provided for, that the primary lighting armatures can diffuse almost twice as much light as the secondary lighting armatures.

[0010] In order to achieve this in a simple way, it can be provided for, that the primary lighting armatures hold

two high-pressure discharge lamps of almost 400 Watt each and the secondary lighting armatures hold one such lamp.

[0011] Switching means can be provided, by means of which one of the two lamps present in the primary lighting armatures can be switched off. This can be done when playing for leisure. Thus, energy can be saved.

[0012] In particular, the lighting armatures will be designed in such a way, that they have a diffuse, flat, asymmetrical light distribution both in longitudinal direction and transverse direction. Thus, there is no need for using so-called grids for covering the reflector against looking in.

[0013] It has turned out that the lighting system according to the invention, at a relatively low power consumption, comes up to the standards and guidelines valid in Europe for the illumination of tennis halls.

[0014] It has also been found that the nuisance which players might experience from the lighting system is within highly acceptable limits.

[0015] The lighting level across 45° at 1.5 m above the court was measured. With a uniformity of approximately 0.6 between the minimum and the average lighting level, the lighting level at a height of 1.5 m proved to be approximately 85 % of the level on the court.

[0016] The invention is further explained by way of an embodiment, shown in the drawing, in which:

Fig. 1 shows schematically a plan view of a lighting system according to the invention above a court;

Fig. 2 shows schematically a cross-section across a tennis hall containing the lighting system according to Fig. 1 on a smaller scale;

Fig. 3 shows schematically a plan view of the hall according to Fig. 2 in which two courts have been provided;

Fig. 4 shows schematically a side view of a lighting armature applied with the lighting system according to the Figs. 1, 2 and 3;

Fig. 5 shows schematically a rear view of the lighting armature of Fig. 4; and

Fig. 6 shows schematically a cross-section across the lighting armature according to the line VI - VI of Fig. 4.

[0017] Figures 1 and 2 show a tennis hall 1 containing the court 2. The position of the net is indicated by 3, the position of the baselines by 4, and the position of the longitudinal lines by 5. As shown in Fig. 3, it is also possible that two courts 2 have been provided in one single hall.

[0018] Four primary lighting armatures 6 have been mounted at a distance P from the net 3, with P equalling 4.25 m in particular. The height HP above the court 2 is 7 m in particular.

[0019] Four secondary lighting armatures 7 have been mounted at a distance S from the net 3, with S equalling 12.75 m in particular. The height HS above the court 2

is 5,5 m in particular.

[0020] The lighting armatures 6 and 7 will be situated almost above the longitudinal lines 5.

[0021] Figures 4, 5 and 6 show the lighting armatures 6 and 7 in more detail, each consisting of a reflector 8 having fittings 9 mounted thereon for receiving high-pressure discharge lamps 10. The secondary lighting armatures 7 need only contain one single lamp 10. Said lamp will then preferably be situated at the largest distance to the net.

[0022] The lighting armatures 6 and 7 can be suspended on chains 11 from the roof 12 of the hall or be fastened in another way.

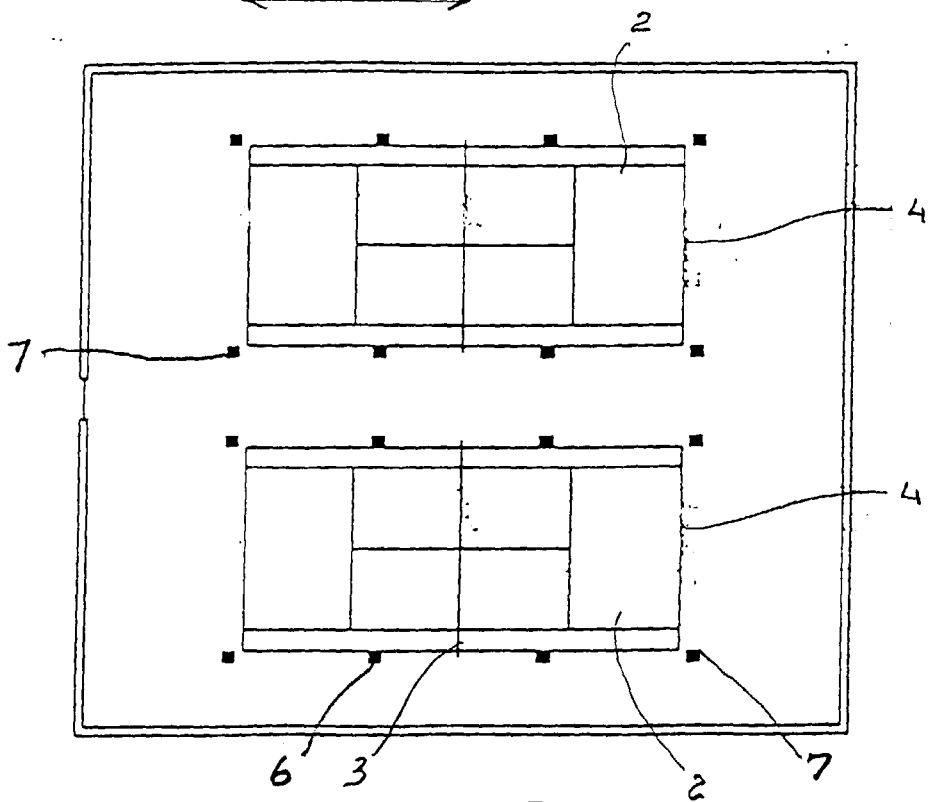
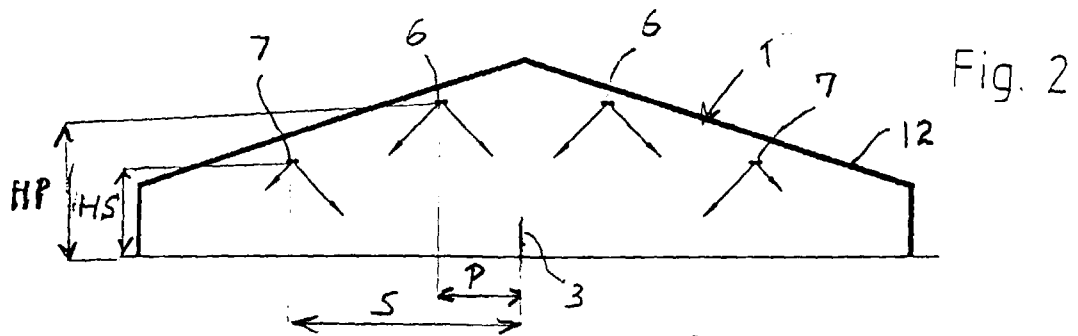
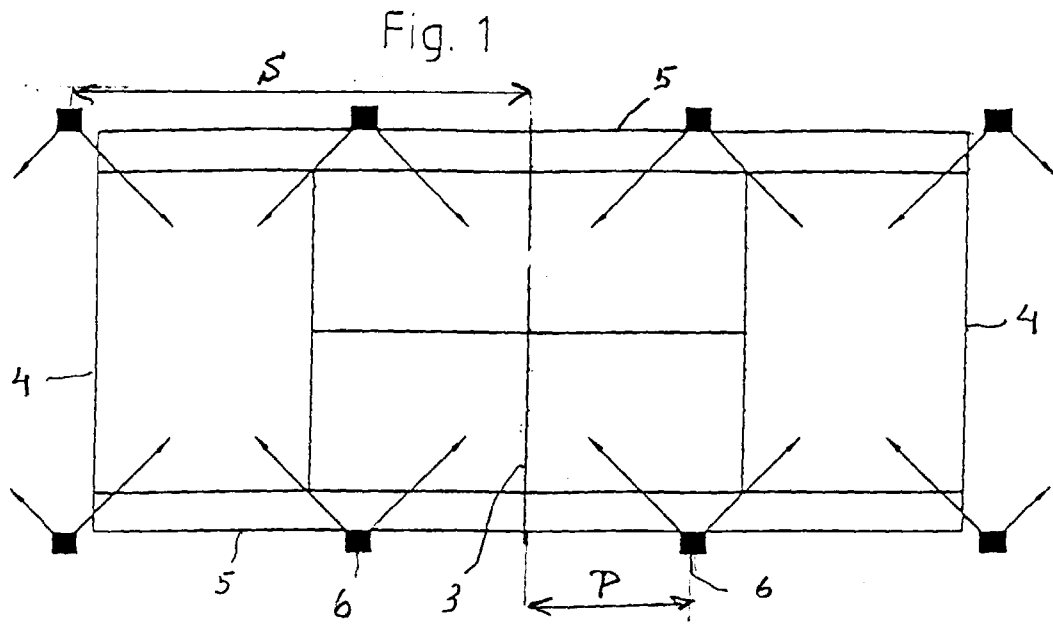
[0023] When playing for leisure, one of the two lamps 10 in the primary armatures 6 can be switched off. To that end, switching means not further indicated can be provided.

[0024] It will be obvious, that only one possible embodiment of a lighting system according to the invention has been illustrated in the drawing and described above and that many changes can be made without leaving the inventive idea, as it is indicated in the claims.

Claims

1. Lighting system, in particular for use in a tennis hall (1), employing lighting armatures (6, 7) each comprising at least one lamp (10) mounted within a reflector (8), said lighting armatures being arranged in two parallel rows in longitudinal direction of a court (2), characterized in that at least eight lighting armatures (6, 7) are employed, being arranged alongside the court (2) in two rows spaced apart and each comprising at least four armatures in such a way, that at least four primary lighting armatures (6) are situated at a horizontally measured distance (P) between 3.75 m and 4.75 m from the net (3) and at a height (HP) between 6 m and 8 m above the court (2) and that at least four secondary lighting armatures (7) are situated at a distance (S) between 12 m and 13.5 m from the net (3) and at a height (HS) between 5 m and 6 m, said lighting armatures (6, 7) being provided with high-pressure discharge lamps (10).
2. Lighting system according to claim 1, characterized in that the primary lighting armatures (6) are positioned at a distance (P) of 4.25 m from the net (3) and at a height (HP) of 7 m, whereas the secondary lighting armatures (7) are positioned at a distance (S) of 12.75 m from the net (3) and at a height (HS) of 5.5 m.
3. Lighting system according to claim 1 or 2, characterized in that the two rows, each comprising at least four lighting armatures (6, 7), are mounted almost above the sidelines (5) of a court (2).

4. Lighting system according to one of the preceding claims, characterized in that the primary lighting armatures (6) can diffuse almost twice as much light as the secondary lighting armatures (7).
5. Lighting system according to claim 4, characterized in that the primary lighting armatures (6) hold two high-pressure discharge lamps (10) of almost 400 Watt each and the secondary lighting armatures (7) hold one such lamp (10).
6. Lighting system according to claim 5, characterized in that switching means are provided, by means of which one of the two lamps (10) present in the primary lighting armatures (6) can be switched off.
7. Lighting system according one of the preceding claims, characterized in that the lighting armatures (6, 7) are designed in such a way, that they have a diffuse, flat, asymmetrical light distribution both in longitudinal direction and transverse direction.



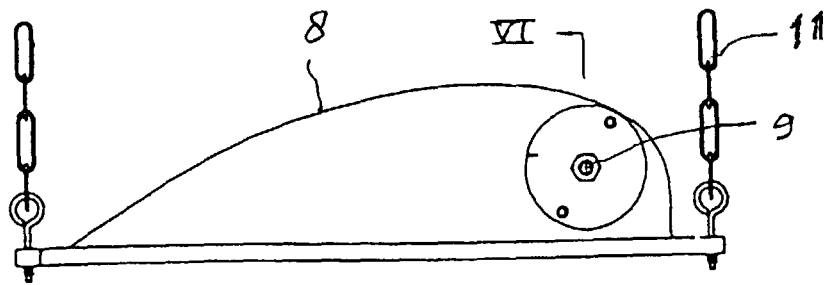


Fig. 4 VI ↙

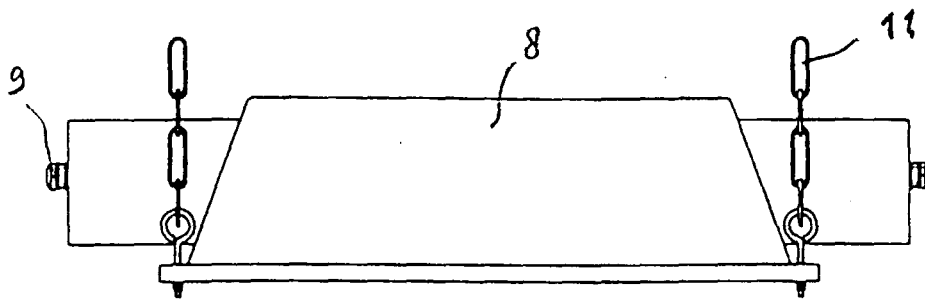


Fig. 5

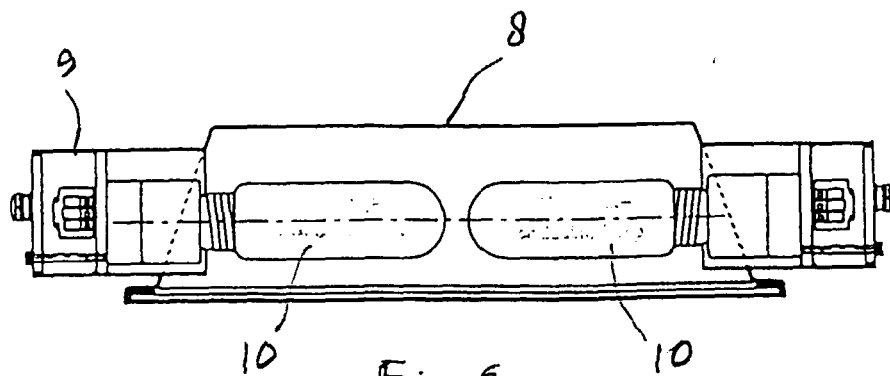


Fig. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 99 20 2086

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 22 42 309 A (KNITTAX STEINHOF VERTRIEBSGESELLSCHAFT KG) 14 March 1974 (1974-03-14) * the whole document *	1-4	F21P1/00
X	DE 44 10 898 A (ZUMTOBEL LICHT GMBH) 24 November 1994 (1994-11-24) * column 1, line 3 - line 5 * * column 2, line 41 - line 44 * * claims 10-12 *	1,2,4	
A	DE 30 08 339 A (EWALD) 17 September 1981 (1981-09-17) * the whole document *	3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F21P
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		4 October 1999	De Mas, A
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 20 2086

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The members are as contained in the European Patent Office EDP file on
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04-10-1999

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