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(54) Title: FOOTBALL SHOOTING TRAINING SYSTEM

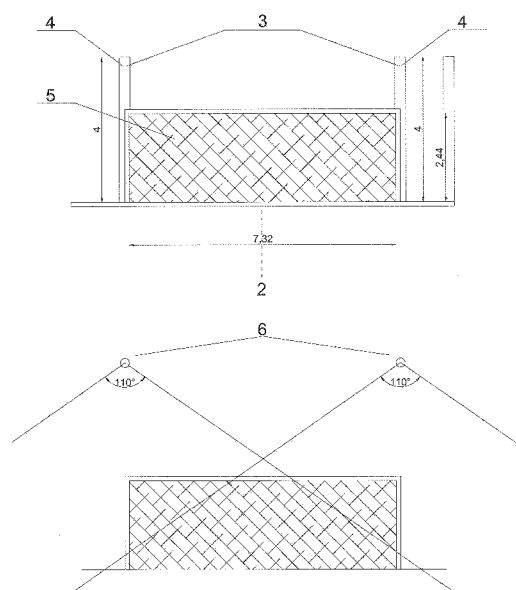


Figure 3

(57) Abstract: The football shooting training system is basically aimed to instantly identify the shooter, detect with which foot the shot is taken, measure the speed of the shot and the distance of the shot to the goal post (5), visually indicate the hit in the goal post (5) with LED lighting and score inside of the goal as well as determine the total score achieved by establishing a correlation based on the distance, speed and hit within the goal post (5) without the existence of support personnel. The invention especially allows young football players, who are trained in the youth setups of football clubs, to contribute to their shooting training, to monitor their development instantly without the existence of support personnel as all the elements of the shot become measurable, and to determine the areas they need individually and make shoot training accordingly.



## FOOTBALL SHOOTING TRAINING SYSTEM

Technical Field

5 The invention refers to whom the shot was taken, whether the ball is standing or moving, by which foot shot was taken, from how many meters and how fast the ball was shot and where it hit the goal area. The evaluation score of the shot, where the ball hit the goal, by using LED lighting in the determined color and also it is indicated with the visual indication of the hit location.

10 Known Areas of the Technique

Currently, there are many methods and methodologies in football that measure team and individual performances, such as;

Voice Oriented Observation Method

Pen and Paper Method

15 Video Analysis Method

Computer Controlled Video Analysis Method

Video Editing

Video Tracking Technique

Sensor Technology

20 There are also many programs that use these methods. Such as;

FSTATS Analysis Program

MUNA Football Analysis Program

SIMI Scout Football Analysis Program

Liverpool Polytechnic Analysis Program

25 Castrol and Football

Sportvas Football Video Program

Sport Universal (AMISCO)

E – Analysis Program

Prozone Match Analysis Program

- 5 These programs' common feature is to measure team performance and, accordingly, individual performance in team training and matches.

While measuring individual performance, these programs evaluate different criteria. These include tactical knowledge and discipline, control of area and environment, physical endurance, running distance, double fight win rate, accurate pass rate,  
10 target shooting rate, entering the position, and conversion rate.

While some of these criteria are taken automatically through the program, the distance, speed, and quality of the shot are taken by the technical director's support staff, just like shooting.

Likewise, with which foot the shot was shot by the player, whether it is standing or  
15 moving ball, it is also made by the support staff by the method of observation.

While every shot that hits the goal is considered successful, one of the critical evaluation points of shooting, where the shot hits the goal area, is determined only by the support staff using the observation method.

#### Purpose of the Invention

20 The invention determines the speed and distance of the shot instantly, with which foot it shot, whether it is standing or moving ball, without the need for any support personnel. Also, it allows scoring the hit of the shot inside the goal, which is not available in other known methods, and the visual indication of the location where the hit was achieved with different LED lights, evaluating all elements of the shot, and  
25 taking statistical values. The data obtained from previous actions allows it allows the daily, weekly, and monthly shooting tasks are assigning to the individual needs of the players.

Explanation of Figures

Figure 1: Modular block site view

Figure 2: The scoring chart on modular block

Figure 3: Integrated camera placement and angles

5 Explanation of reference numbers used in the figures

1. Modular blocks

2. Field middle axle

3. Camera

4. Camera Pole

10 5. Goal Post

6. Camera Angles

Explanation of the Invention

Main Parts of the System;

15 Modular Blocks: A modular block (Figure 1) is placed 20 cm behind the goal line and covers the entire goal. The modular block consists of 7 pieces of 20 mm tempered glass. Flexible pressure plates are placed on the front face of the modular block facing the field. Led lighting in different colors is placed on the back of the modular block.

20 Scoring Table; The scoring table is created according to where the ball hit the modular block. (Figure 2)

Hit Point: An average goalkeeper covers an area of 2 meters wide when he opens his hands sideways in the Castle (5) and 2.20 meters when he opens it upwards. This area up to the upper goal (5) pillar is scored as 1 point. Other areas inside the goal field (5) are scored according to their distance from the goalkeeper.

25 Total Point: TOTAL POINTS are calculated for a shot taken by establishing a relationship between the distance, velocity, and accuracy of the shot

Total Points = (Distance x 1/10 ) x (velocity x 1/10 ) x Accuracy of the Shot

For Example; Shoot's;

Distance: 30 meters ( Coefficient: 3 )

5 Velocity: 60 km/hour (Coefficient: 6 )

Accuracy Point: 5 ( Coefficient: 5 )

Total Point =  $3 \times 6 \times 5 = 90$

So if there is no hit, the total score will be zero.

10 Integrated camera (3) layout and angles: Two camera poles (4), 4 m behind the goal area (5) poles and 4 m high, were mounted, and two digital cameras (3) are placed at different angles (Figure 3).

System Operations;

1. When a shot is taken by the player who is introduced to the system, the integrated camera (3) system (Figure 3) will detect who took the shot with the help of the  
15 identification system. System will also provide information such as with which foot the shot was taken, and whether it is a standing / moving ball and its distance with the artificial vision technique

2. When the ball touches the modular block (Figure 1) inside the goal area (5), the speed and hit point of the ball will be determined by the flexible pressure plate placed  
20 on the side of the modular block facing the field side. Total points will be obtained in this phase due to the correlation between the speed, distance and hit points of the ball.

3. The colored LED lighting will illuminate where the hit is made within the goal area (5).

25 For Example; If the ball touches "6 hit points", the red led will light, and when it touches "1 hit point", the purple led will light.

4. The flexible pressure plates placed on the front face of the modular block (Figure 1) facing the field are controlled by a tablet or computer. The minimum shot speed is determined if requested by the user,

5 For Example; If the minimum speed of the ball touching the goal area (5) is determined by the user as 60 km/h when the ball touches the goal area (5) below 60 km/h, it will not be considered as an accurate shot, and therefore the LED at the point of contact will not light.

10 5. The control of the LED lights placed on the back of the modular block (Figure 1) performs via a tablet or computer. When requested by the user, all or some parts of the LED lighting can be left open, and LED lighting will close when the ball hits the desired area. Similarly, LED lighting, which is turned off, will be turned on when the ball hits the desired area.

15 For Example; If the player wants to work on 4,5,6 hit points, the LED lights corresponding to these points left on, and if the minimum shot speed is detected, the LED lighting in the area where the contact is made and fired above this speed will turn off.

6. The user can set a time limit on the flexible pressure plates on the front of the modular block (figure 1), by a tablet or computer, may impose a time limit over just a part or all of the point table.

20 For example; If the user wants to work on 4,5,6 hit points and wants to do this within a limited time, the user can select 4,5,6 points from a tablet or computer and set a time limit. If the user has chosen the time limit of 30 seconds, the shoot must be completed within this period. If the shot is fired after the determined period, it will be considered unsuccessful even if the shot was hit. Therefore, even if there is a hit, 25 LED lighting will not be turn off if it is on and vice versa.

7. Football shoot training system, in principle, aims to detect identification of the player who takes the shot, which foot used for the shot, velocity of the shot, and to measure the distance between the shooting area and goal area without requiring any support staff by visually indicating the hit area with LED lighting and determining the 30 total score based on establishing a formulation based on distance, velocity and hit area of the goal.

The data obtained at this phase will be shown on a led panel which is mounted at the appropriate place outside the field as;

PLAYER NAME – DISTANCE - SPEED - TOTAL SCORE

5 The 3 players' names with the highest total points are displayed on the led panel every time the system is turned on and once an hour. The shot with the highest total score will also show on the led panel with the player's name as a record. This issue aims to increase competition and motivation.

### Industrial Application of the Invention

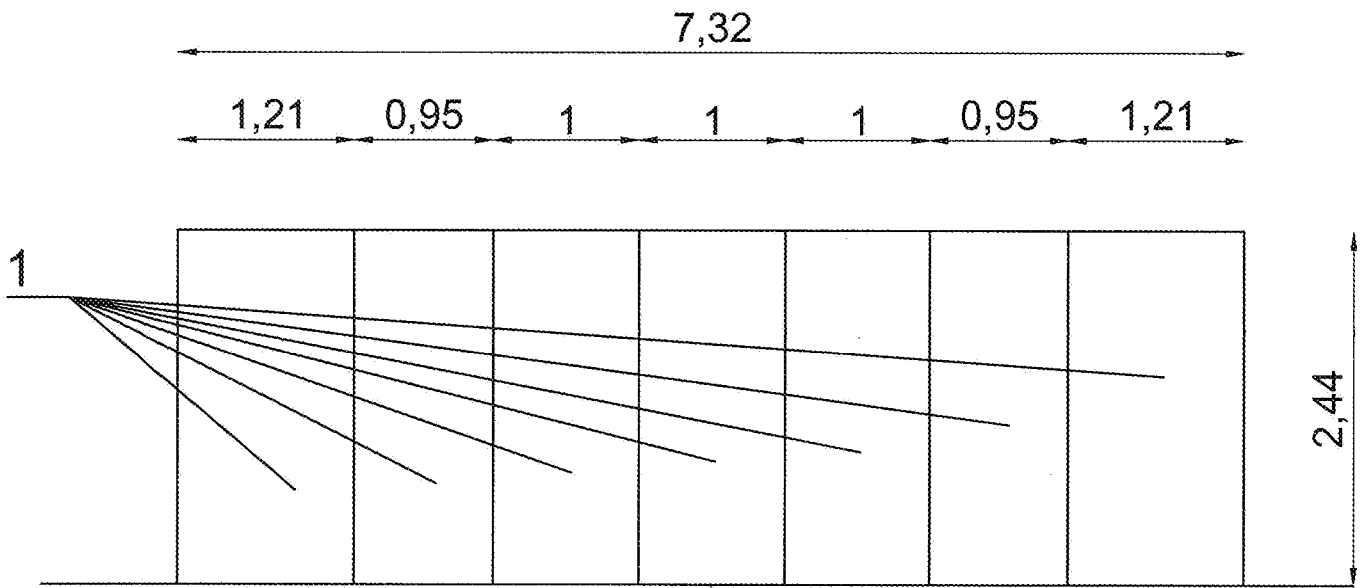
10 The invention mainly contributes to the shooting training of young footballers trained in the infrastructure of football clubs, and the players' developments can be followed by the players and their coaches instantly since all the elements of the shot become measurable. Also, players can compete with themselves and their teammates, and the development areas can be detected, and shooting practice can  
15 be formed based on those improvement areas. The invention can be produced and used in the industry.

20

CLAIMS  
FOOTBALL SHOOTING TRAINING SYSTEM

1. Invention is regarding the increase of shoot quality and its features includes;
- 5 - Integrated camera (3) system that detects the distance of the shot, with which foot the shot was taken, whether the ball is moving or standing and the identity of the shooter,
- Modular blocks installed 20 cm behind the goal area line, (1)
- Flexible pressure plates placed on the front face of the modular block  
10 indicating where the shot hit the goal post (5) and determining the speed of the shot,
- Scoring the hit location when the shot hits inside the goal post (5),
- Detecting the total score by establishing a correlation between the distance, speed and hit points of the shot,
- 15 - LED lighting system lit in the previously determined color according to the place where the shot touches inside the goal post (5),
- Limitations of the minimum shot speed of the flexible pressure plates on the modular block via a tablet or computer,
- Controlling the LED lights on the backside of the modular block via tablet or  
20 computer,
- Limitation on the selected or all scoreboard from a tablet or computer.
2. Increasing the shot quality according to claim 1, and its feature includes;
- The integrated camera (3) system which detects the distance of the shot, with  
25 which foot the shot was taken, whether the ball is moving or standing and the identity of the shooter, which consists of two cameras (3) placed on the two camera poles (4) mounted 4 meters behind the goal posts (5) at an angle of 110 degrees.
3. Increasing the shot quality according to claim 1, and its feature includes;
- Modular blocks (1) installed 20 cm behind the goal area line (5) consisting of  
30 20mm thick tempered glass.
4. Increasing the shot quality according to claim 1, and its feature includes;

- The scoring of the hit location and scoring system from 1 to 6 points from the center of the goal post (5) to sideways when the shot hits inside the goal post (5).
- 5 5. Increasing the shot quality according to claim 1, and its feature includes;
- Establishment of a correlation between the distance, speed and hit points of the shot, and detecting the total score by the equation of  $(\text{Distance} \times 1/10) \times (\text{speed of the shot} \times 1 / 10) \times \text{Hit points}$
- 10 6. Increasing the shot quality according to claim 1, and its feature includes;
- Determination of the flexible pressure plates on the modular block and the limitations of minimum shot speed, according to the user's request via a tablet or computer.
- 15 7. Increasing the shot quality according to claim 1 and claim 3, and its feature includes;
- The LED lighting system placed behind the modular block at the point where the shot touches inside the goal post (5) and lit in a predetermined color.
- 20 8. Increasing the shot quality according to claim 1, and its feature includes;
- Controlling of the desired score to turn on when the shot is on contact or turn off if it is lit by determining the LED lightings on the backside of the modular block according to the user's request via a tablet or computer, and in accordance with the scoring system specified in claim 4.
- 25 9. Increasing the shot quality according to claim 1, and its feature includes;
- Time limitation of flexible pressure plates on the front face of the modular block via a tablet or computer, over the selected or the entire scoreboard.



2  
Figure 1

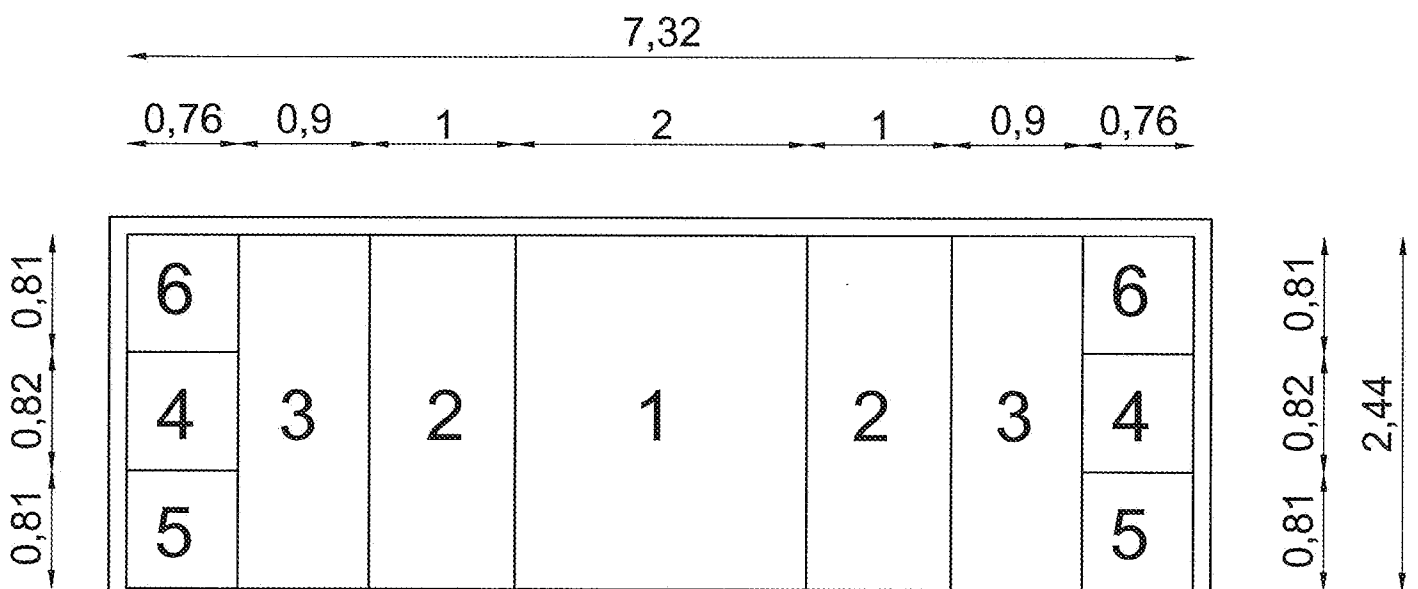


Figure 2

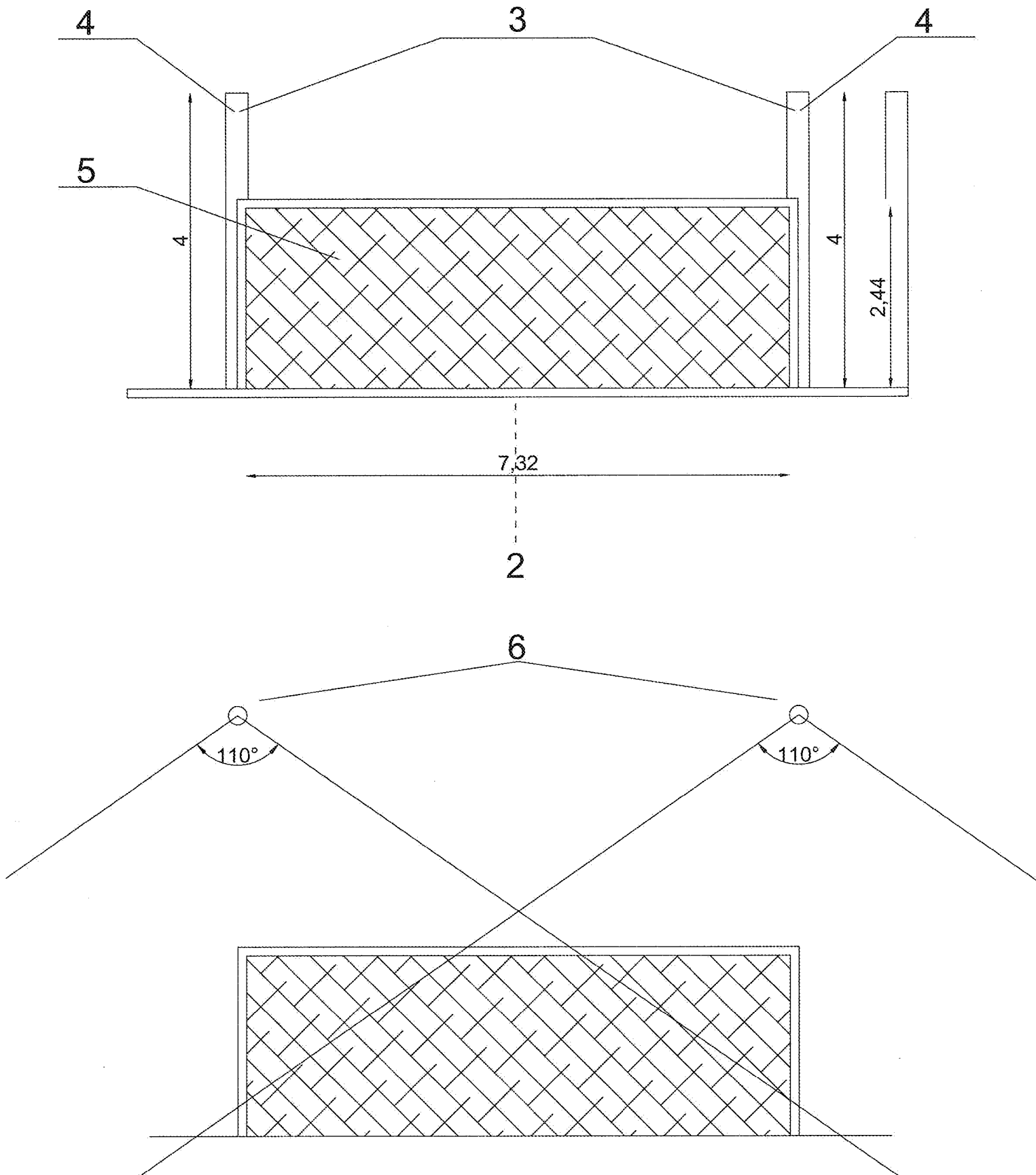


Figure 3

## INTERNATIONAL SEARCH REPORT

International application No.

**PCT/TR2021/050114**

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> A63B 69/00 (2006.01)i; A63B 71/06 (2006.01)i  According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) A63B 69/00; A63B 71/06  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 109173210 A (HUNAN XDKW CO LTD) 11 January 2019 (2019-01-11) All document	1-9
A	CN 106512361 B (STATE GRID CORP OF CHINA SGCC, JINAN POWER SUPPLY CO OF STATE GRID, SHANDONG ELECTRIC POWER CO) 07 August 2018 (2018-08-07) All document	1-9
A	CN 105080111 A (ADIDAS AG) 25 November 2015 (2015-11-25) All document	1-9
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search <b>23 May 2021</b>		Date of mailing of the international search report <b>23 May 2021</b>
Name and mailing address of the ISA/TR <b>Turkish Patent and Trademark Office (Turkpatent) Hipodrom Caddesi No. 13 06560 Yenimahalle Ankara Turkey</b> Telephone No. (90-312) 303 11 82 Facsimile No. +903123031220		Authorized officer  <b>Nurgül SIKI</b>  Telephone No.

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No. <b>PCT/TR2021/050114</b>
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Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	109173210	A	11 January 2019	NONE	
CN	106512361	B	07 August 2018	NONE	
CN	105080111	A	25 November 2015	EP 2945143 A1	18 November 2015
				US 10765925 B2	08 September 2020
				US 2015328516 A1	19 November 2015
				US 2018117436 A1	03 May 2018
				US 2020398132 A1	24 December 2020
				US 9849361 B2	26 December 2017