

[54] TABLE FOOTBALL APPARATUS
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 273/58 B, 58 D, 119 B; 124/1, 11 R

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[57] **ABSTRACT**
 A table football apparatus comprises a playing surface over which the ball is moved by blasts of compressed air from nozzles arranged at the edges of the playing surface. Each nozzle can be in the form of a pistol-grip with a trigger, and is pivotable so as to sweep over the playing surface. Each trigger can be part of an electrical circuit for controlling the supply of compressed air to move the ball. The table football is a hollow sphere with apertured shell.

2 Claims, 3 Drawing Figures

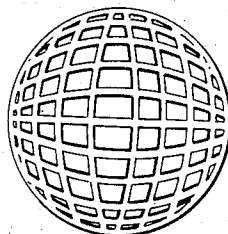
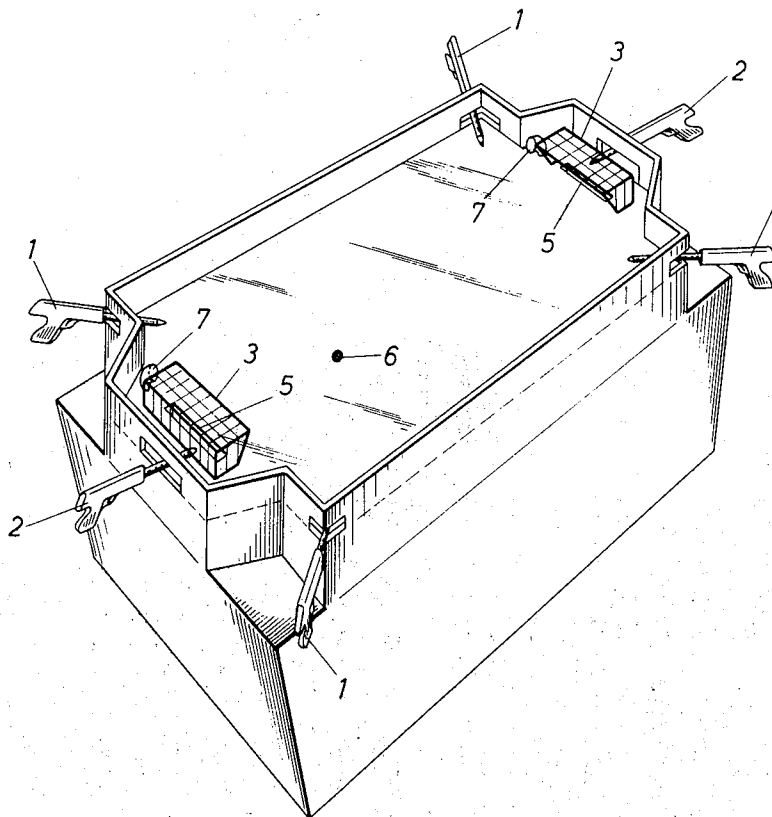


FIG. 1

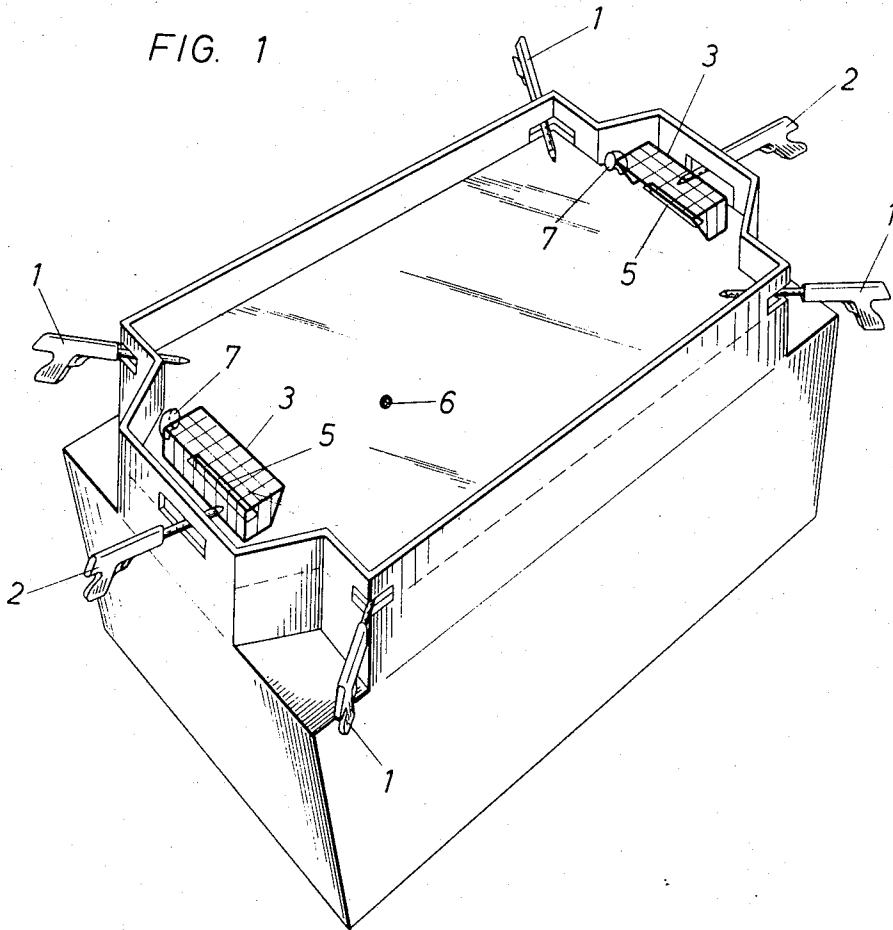
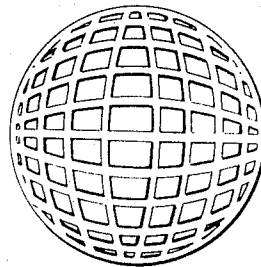


FIG. 3



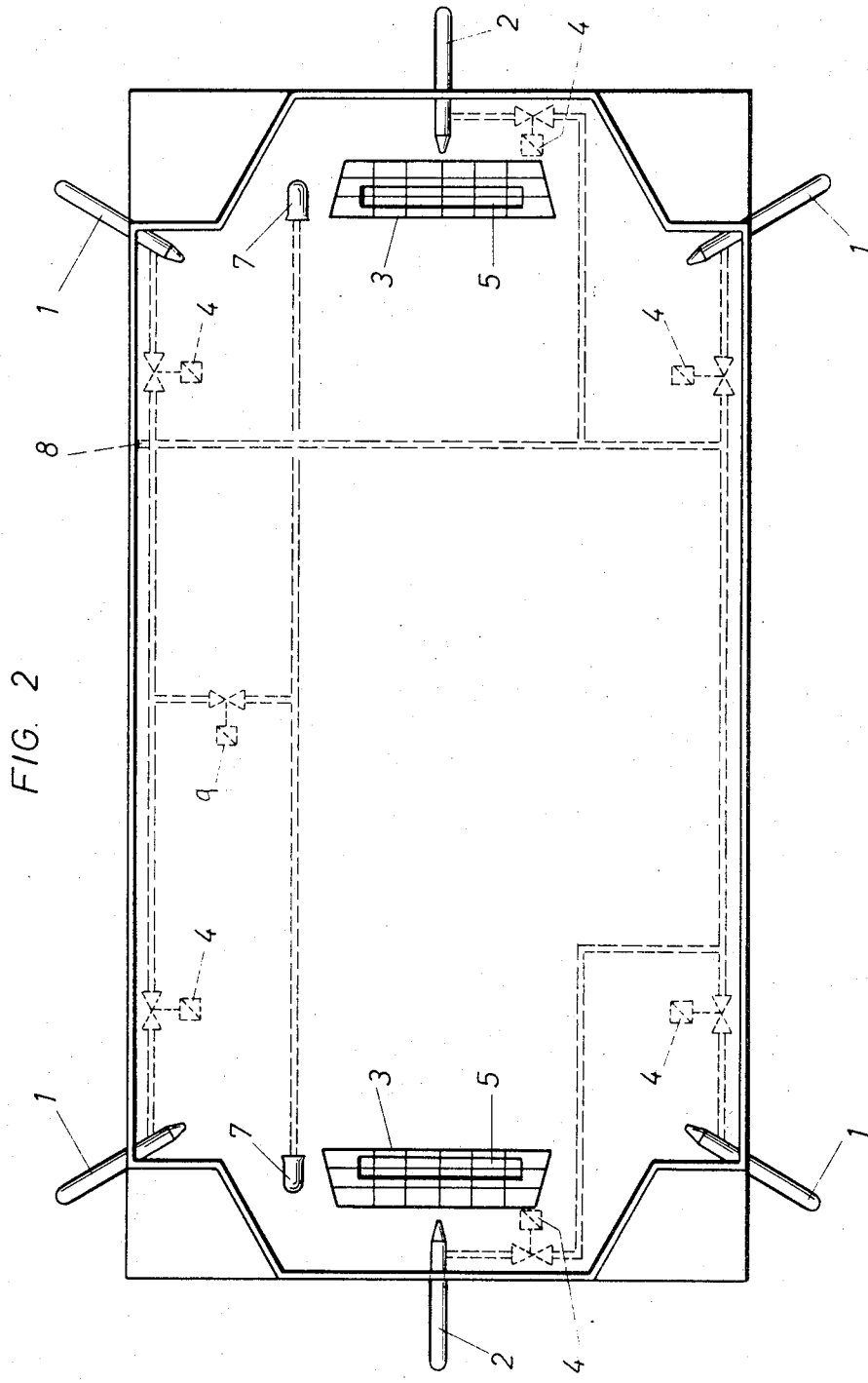


TABLE FOOTBALL APPARATUS

BACKGROUND OF THE INVENTION

Table football apparatuses are already known for example from German patent specifications, Belgian patent specification and French patent specifications. However these specifications all relate to table football games in which figures representing the players are distributed over a playing surface in a given arrangement and are usually movable. A compressed air nozzle terminates at or in the base of each of the figures, the blast of air therefrom being used to move the ball. These inventions are primarily concerned with the problems of running conduit under the plane of the playing area, producing and triggering the compressed air thrust, and directing the compressed air nozzle, and thus the player figures, relative to the axes of the playing area; such directing is effected mechanically or pneumatically and at the same time as triggering of the compressed air thrust. The known solutions to these problems involve expensive devices which are generally of combined mechanical and pneumatic operation, for example with cable guide rollers, levers, hoses and bellows, which are not only liable to trouble but are also complicated to operate. This can make it difficult if not impossible to achieve a fluid succession of individual playing movements.

SUMMARY OF THE INVENTION

An object of the invention is to provide table football apparatus with a ball which is movable by compressed air thrust. A further object of the invention is to provide such an apparatus which is of simple construction and easy to operate, while permitting accuracy in moving the ball and a rapid succession of individual playing movements.

According to the invention, table football apparatus comprises a playing surface and compressed air nozzles arranged at the edge of the playing surface, the nozzles being pivotally directable over a substantial part of the playing surface.

An advantage of this construction is that the nozzles can be directed onto the ball by hand, and thus very rapidly and precisely without mechanical complication.

In a table football game, the aim of each player or the players of each team is to convey the ball to a given point or into a given space, for example a goal structure, while at the same time protecting their own goal. So that the ball can be moved with a compressed air thrust substantially in the longitudinal direction of the playing area, while at the same time the player's own goal area can be well protected, in a further aspect of the invention, the nozzles are arranged in the four corners of the playing area and behind net-like or grid-like goals which are located at each end of the playing area. For the sake of simplicity of operation, it is desirable that the nozzles should be pivotable only about a vertical axis which substantially intersects the edge of the playing area, the axis of each nozzle extending horizontally.

In a further advantageous embodiment, to avoid the need for complicated and probably less effective individual bellows, the apparatus has a compressor to produce the compressed air at a constant pressure.

In another advantageous aspect, the nozzles are carried on pistol-shaped handles each provided with a trigger for releasing the compressed air thrust. The trigger

can be formed as an electrical contact which, upon actuation, closes the control circuit of a magnetic valve located in the compressed air supply pipe to the nozzle in question. In a development of this aspect, in order to prevent the progress of a game possibly being stopped by the continuous actuation of the trigger of a nozzle, the invention provides that the closing of one of the electrical contacts triggers a delay circuit which is located in the control circuit of the magnetic valve in question. The delay circuit in turn releases the magnetic valve for a time corresponding to the set delay time of the delay circuit.

Another aspect of the invention provides that the surface of the playing area within each goal structure forms an opening into which the ball passes when a goal is scored. This establishes beyond doubt whether a goal has been scored or not. So that the ball which has disappeared into the opening can be brought back into play, each opening can be slot-shaped and extended downwardly into a suitable trough, at the lowest point of the bottom of which there is a vertically upwardly directed compressed air nozzle. Actuation of this nozzle will move the ball back onto the playing surface, by way of an upwardly extending pipe which has a curved portion so that it opens horizontally on to the playing area.

In a further aspect of the invention, the table football comprises an apertured spherical shell, in order to prevent the ball lifting from the playing surface owing to an irregular flow of compressed air thereagainst, as a result of Bernoulli's law, or carrying out other uncontrollable movements which are not in line with the axis of the nozzle. The ball is thus in the form of a lattice-like hollow sphere. This prevents the flow of compressed air sliding off the ball as would be the case with a solid smooth-surface ball, a swirling action being produced instead in the region of the ball.

BRIEF DESCRIPTION OF THE DRAWINGS

Table football apparatus according to the invention will now be described by way of example with reference to the accompanying drawings, in which:

FIG. 1 shows a perspective view of the table football apparatus with ball,

FIG. 2 shows a plan view onto the apparatus shown in FIG. 1, with the path of the compressed air conduits under the playing surface being indicated in broken lines,

FIG. 3 shows an embodiment of the ball for the table football apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring firstly to FIG. 1, the table football apparatus according to the invention has a substantially rectangular playing surface which is formed by the top side, which is substantially at table height, of a closed box. Disposed in the interior of the box is a compressor with its auxiliary devices, and control means. For example, the compressor is driven by an electric motor and is connected to an air chamber to which an air pressure monitoring means is also connected, to cut out the drive motor when the adjusted pressure is reached. The playing surface is surrounded by an upstanding peripheral edge wall which projects as shown at the ends of the playing surface, to provide space for the provision of goal structures 3 in the form of metal grids or nets.

Arranged at each of the four corners of the playing area is a jet or nozzle 1 which is pivotable about a vertical axis so that its blast of air can be directed to at least substantially any part of the playing surface. Each nozzle 1 is secured to a pistol-shaped handle, for easier handling. The nozzle 1 project into the playing area through slots in the edge wall and are suitably connected to the compressor. Arranged behind each of the goal structures 3 is a further jet of nozzle 2. Each nozzle 2 is also fitted to a pistol grip and is also pivotable about a vertical axis, while the axis of each of the nozzles 1 and 2 extends substantially horizontally. A ball 6 is shown on the playing surface.

When the game is played, suitably controlled and directed compressed air blast or thrust from the nozzles 1 at one end of the playing area is used to move the ball 6 towards and into the opposite goal structure 3 at the other end of the playing area. If the ball 6 enters a goal structure 3, the ball 6 disappears into an opening formed by a slot 5 which is provided within the goal 3 in the surface of the playing area. The blast of compressed air used to propel the ball 6 into the goal structure 3 can of course pass through the goal grid or net. Each slot 5 has a guide which extends downwardly into a trough within the box, for collecting the ball. The bottom of each trough is slightly inclined towards one end so that the ball 6 will roll down to the lowest point. Provided at the lowest point is a compressed air nozzle, the aperture of which faces vertically upwardly. Arranged above each upward compressed air nozzle is a respective upwardly extending tube 7, the inside diameter of which substantially corresponds to, that is, is not substantially greater than, the outside diameter of the ball 6. The tubes 7 pass upwardly through the playing surface, the top part of the tubes 7 which lies above the playing surface being curved substantially into a quarter circle configuration, such that the mouth of each tube 7 is directed horizontally towards the transverse centre line of the playing surface. Thus a short blast of compressed air from the upwardly facing nozzles can bring the ball 6 back into play after a goal has been scored.

The apparatus can also have an electrical contact which is actuated by the ball when a goal is scored, the contact being connected to an indicator device for indicating the score.

In the plan view shown in FIG. 2, the four compressed air nozzles 1 at the corners of the playing area and the two compressed air nozzles 2 behind the goal structures 3 are clearly visible, although their pivot points which intersect the edge of the playing surface are not illustrated. Also visible are the top parts of the two tubes 7 which each pass upwardly through the playing surface beside the goals 3. Shown in broken lines are compressed air conduits which extend under the playing surface to the individual nozzles 1, 2 and 7. The compressor or its air tank is connected to a compressed air circuit connection point 8.

Fitted into the supply conduit to each compressed air nozzle 1 and 2 is an electromagnetic valve 4, while an electromagnetic valve 9 is also provided in the supply conduit which is common for the two upwardly facing nozzles below the tubes 7. The electrical control leads for the valves 4 and 9 are not shown. The supply of current for actuating an electromagnetic valve 4 or 9 and thus for triggering a blast of compressed air from the particular nozzle 1, 2 or 7 in question is advantageously

produced by the actuation of an electrical quick-action contact forming a trigger, which is incorporated into each pistol grip, or, in the case of the throw-in nozzles, that is to say the nozzles below the tubes 7, by one or more quick-action contacts which are actuated separately and which are incorporated for example behind the goal structures 3 in the walls of the box.

To prevent a continuous stream of compressed air being delivered by a particular nozzle by continuous actuation of the trigger contact of that nozzle, which could result in the game coming to a halt, the circuit for actuating the valves 4 and 9 is not closed directly by way of the quick-action contacts. Instead, the closing of a contact triggers a delay circuit with a set delay time, for example a monostable switching circuit, which in turn closes the actuation circuit of the valve 4 or 9 until its delay time has expired, that is to say, until it tips back into its stable condition. The delay circuit can also be so designed that it can only be triggered again after a given recuperation time has expired.

FIG. 3 shows in greater detail the ball 6 which is used for the table football game. It comprises a spherical shell which is regularly or irregularly pierced or lattice-like apertured. This prevents a laminar flow of compressed air being formed at the outside surface of the ball, as would be the case if that surface of the ball were smooth. The formation of a laminar flow of this nature is undesirable insofar as the flow of compressed air against the ball 6, which flow is never symmetrical because of the area on which the ball is standing but which can become predominantly extremely asymmetrical owing to a nozzle being imprecisely directed against the ball, can result in uplift forces on the ball (such forces are not necessarily directed only upwardly but can also have a lateral or other angular component). Owing to the light weight of the ball, such uplift forces could have a strong influence on the directing of the ball, resulting in movement in an unforeseeable and controllable manner.

Various modifications can of course be made without departing from the scope of the invention as defined by the appended claims, for example the apparatus could comprise more than the six nozzles as described and illustrated. The apparatus can also include time relay means for limiting the duration of a game.

I claim:

1. Apparatus for playing table football, comprising: a playing surface; two net-like or grid-like goal structures at respective ends of the playing surface; the surface of the playing area being provided with an opening at each said goal structure, with the ball passing through the opening when a goal is scored in the associated goal structure, each of said opening being slot-shaped, and guide means extending downwardly from each opening into a ball collector trough; a vertically upwardly directed compressed air nozzle at the lowest point of the bottom of said trough, which nozzle when actuated can move the ball back onto the playing surface; a pipe having one of its orifices aligned with said upwardly directed nozzle and its other orifice opening substantially horizontally on to said playing surface, whereby said ball can be returned to said playing surface from said trough by way of said pipe; compressed air nozzles arranged at the edge of the playing surface at least at the four corners of said playing surface and behind said goal structures, the nozzles being pivotally directable over a substantial part of the playing surface

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and each said nozzle being pivotable about a respective vertical axis which substantially intersects the edge of the playing surface, the axis of each nozzle extending substantially horizontally and each nozzle comprising a piston-shaped handle on which it is carried and a trigger on each handle for triggering a compressed air thrust; a compressor for producing compressed air for the nozzles at a substantially constant pressure; a conduit connecting each said nozzle to said compressor; and electromagnetic valve in each said conduit, each valve including a control circuit and each said trigger being in the form of an electrical contact operative to close the respective control circuit to trigger a compressed air thrust; and a table football which comprises

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a grid-like apertured spherical shell shaped to prevent laminar flow of the compressed air at the outside surface of the shell which causes undesirable lateral or uplifting forces on the sphere thereby resulting in uncontrolled movement of the sphere on the playing surface.

2. Apparatus according to claim 1 wherein a respective delay circuit with a set delay time is provided in the control circuit of each said valve, each delay circuit being in operation triggered by the closing of the associated electrical contact and each delay circuit in turn releasing the associated valve after a time corresponding to said delay time.

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