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(54) A device for culturing animal muscle cells.

(57) A device for culturing animal muscle cells, characterized by comprising a culture dish body and a dish cover, wherein a sealed cavity is arranged at the lower part of the culture dish body, a liquid inlet pipe communicated with the cavity is arranged in the culture dish body, and a liquid outlet of the liquid inlet pipe is higher than the liquid level in the culture dish body and cavity. It also comprises a container which can be adjusted by a liquid storage space communicated with the cavity through a one-way valve, and the liquid in the container can enter the culture dish body through the sealed cavity and the liquid inlet pipe when the liquid storage space of the container is reduced. The invention has the beneficial effects that the culture solution can be added into the culture dish manually without moving the culture dish and opening the cover.

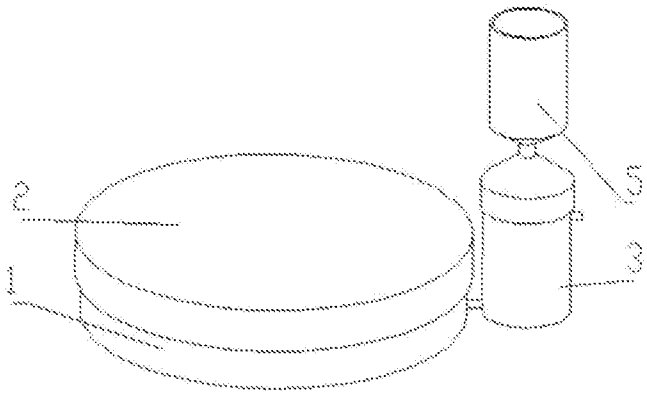

Fig. 1.

DESCRIPTION

A device for culturing animal muscle cells

TECHNICAL FIELD

The invention relates to the technical field of cell culture, in particular to a device for culturing animal muscle cells.

BACKGROUND

Culture bottles or culture dishes are usually used for cell culture. Because of the small diameter of the bottle mouth, it is not easy to operate when inoculating tissue particles in primary culture. At present, the most commonly used culture dish has the following shortcomings: first, the cover is loosely covered on the culture dish, and the cover will be moved carelessly when taking the culture dish, resulting in the growth of bacteria in the culture solution. Second, the side wall of the culture dish is not high, and the slight movement amplitude when taking it will shake the culture solution to the cover, which will also cause the culture solution to grow bacteria, which is not conducive to microscopic observation.

In primary culture, after the tissue particles to be inoculated adhere to the wall, the culture dish needs to be taken out of the incubator and put into the clean bench, and then put back into the incubator after adding the culture medium. In the whole moving process, in order to avoid the growth of bacteria in the culture medium, the operators will be very careful and meticulous, which is time-consuming and laborious.

SUMMARY

The purpose of the present invention is to provide a device for culturing animal muscle cells, which can assist in manually adding culture medium to a culture dish without moving the culture dish and opening the cover during primary culture.

The device for culturing animal muscle cells is characterized by comprising a culture dish body and a dish cover, wherein a sealed cavity is arranged at the lower part of the culture dish body, a liquid inlet pipe communicated with the cavity is arranged in the culture dish body, and a liquid outlet of the liquid inlet pipe is higher than the liquid level in the culture dish body and the cavity.

It also comprises a container which can be adjusted by a liquid storage space communicated with the cavity through a one-way valve, and the liquid in the container can enter the culture dish body through the sealed cavity and the liquid inlet pipe when the liquid storage space of the container is reduced.

It also comprises an extrusion mechanism for controlling the reduction of the liquid storage space inside the container.

The extrusion mechanism comprises an extrusion barrel and a sealing piston I arranged in the extrusion barrel, and the container is arranged in the extrusion barrel below sealing piston I.

It also comprises a driving mechanism for controlling sealing piston I, wherein the driving mechanism comprises a liquid storage barrel connected with the extrusion barrel, fluid is arranged in the liquid storage barrel, the liquid storage barrel is communicated with the extrusion barrel through a fluid flow restriction structure, and an exhaust pipe for exhausting air to the outside of the extrusion barrel is arranged on the extrusion barrel above sealing piston I, and a one-way valve II is arranged on the exhaust pipe. The fluid

gradually enters the extrusion barrel, and the sealing piston I moves downwards under the action of gravity of the fluid.

The liquid storage barrel comprises a lower conical connecting cylinder, an upper cylindrical cylinder, and a connecting pipe which connects the conical connecting cylinder and the cylindrical cylinder and shrinks toward the axial center, and the fluid flow restriction structure is arranged on the connecting pipe.

The fluid flow limiting structure is a flow restriction valve or a plurality of plugs I each provided with water outlet holes, and the inner diameters of the water outlet holes on different plugs I are different.

The sealing piston I is fixed on the upper part of the side wall of the extrusion barrel through an elastic part.

The container is a water bag made of flexible material.

The container is integrally arranged with the extrusion barrel, the bottom of the extrusion barrel is sealed by a bottom plate, and the container is arranged between the bottom plate of the extrusion barrel and sealing piston I.

The fluid is oil or water.

A plurality of liquid inlet pipes are uniformly distributed along the inner wall of the culture dish body, and the liquid inlet pipes are all communicated with the cavity.

The utility model also comprises a discharge mechanism arranged under the culture dish body, the discharge mechanism comprises a liquid discharging barrel, the liquid discharging barrel is arranged under the culture dish body, the culture dish body is provided with a plurality of liquid Drain holes, the lower part of the culture dish body and the periphery of the liquid Drain hole is provided with an annular baffle, and the annular

baffle is provided with an inlet hole for the liquid Drain hole. The plug II is arranged under the culture dish body through a spring.

The upper part of the side wall of the liquid discharging barrel is externally connected with a U-shaped pipe, the upper and lower outlets of the U-shaped pipe are communicated with the inside of the liquid discharging barrel, a drain port is arranged on the side wall of the liquid discharging barrel and below the U-shaped pipe, and the thickness of the sealing piston II is less than the minimum distance between the two outlets.

The lower end of the liquid discharging barrel is sealed, a piston rod is concentrically arranged on the sealing piston II, and the piston rod is arranged on the liquid discharging barrel through threaded connection.

It also comprises a placing rack which comprises a base, and the culture dish body is placed on the base.

It also comprises a fixing ring for fixing the liquid storage barrel, wherein the fixing ring is sleeved outside the conical connecting cylinder. A connecting plate is arranged outside the fixing ring. A screw rod is arranged below the connecting plate, and the lower end of the screw rod extends out of the base and is fixed by a nut.

Compared with the prior art, the invention has the beneficial effects that the culture solution can be added into the culture dish manually without moving the culture dish and opening the cover.

DESCRIPTION OF THE FIGURES

Fig. 1 is a schematic diagram of the overall structure of Embodiment 1.

Fig. 2 is a schematic diagram of the internal structure of Embodiment 1.

Fig. 3 is a schematic diagram of the internal structure of the extrusion barrel of Embodiment 1.

Fig. 4 is a schematic diagram of the overall structure of Embodiment 2 to Embodiment 6.

Fig. 5 is a schematic diagram of the internal structure of the extrusion barrel of Embodiment 2 to Embodiment 6.

Fig. 6 is a schematic diagram of the internal structure of Embodiment 2 to Embodiment 6.

Fig. 7 is a partial enlarged view at B in Fig. 6.

Fig. 8 is a schematic diagram of the structure of the liquid discharging barrel.

Among them, the reference numerals are: 1. The culture dish body. 2. The dish cover. 3. Extrusion barrel. 4. Sealing piston I. 5. Liquid storage barrel. 6. Containers. 7. Exhaust pipe. 8. Discharging mechanism. 10. Pipeline. 11. Placing rack. 12. Fixing ring. 101. Cavity. 102. Liquid inlet pipe. 103. Drain hole. 401. Elastic part. 402. Supporting rod. 501. Conical connecting cylinder. 502. Cylindrical cylinder. 503. Connecting pipe. 504. Plug I. 505. water outlet holes. 801. Discharging barrel. 802. Sealing piston II. 803. Piston rod. 804. Plug II. 805. Spring. 806. U-shaped pipe. 807. Drain port. 1201. Connecting plate. 1202. Screw.

DESCRIPTION OF THE INVENTION

In order to clearly explain the technical characteristics of the scheme, the scheme will be described by specific implementation mode below.

It should be noted that the embodiments in the invention and the features in the embodiments can be combined with each other without conflict.

Embodiment 1:

Referring to Figs. 1- 3, the device for culturing animal muscle cells comprises a culture dish body 1 and a dish cover 2, wherein a sealed cavity 101 is arranged at the lower part of the culture dish body 1, a liquid inlet pipe 102 communicated with the cavity 101 is arranged in the culture dish body 1, and a liquid outlet of the liquid inlet pipe is higher than the liquid level in the culture dish body 1 and the cavity 101.

It also includes a container 6 whose liquid storage space communicated with the cavity 101 can be adjusted through one-way valve I. As the liquid storage space of the container 6 becomes smaller, the liquid in the container 6 can enter the culture dish body 1 through the sealed cavity 101 and the liquid inlet pipe 102.

It also comprises a extrusion mechanism for controlling the reduction of the liquid storage space inside the container 6.

The extrusion mechanism comprises an extrusion barrel 3 and a sealing piston I 4 arranged in the extrusion barrel 3, and a container 6 is arranged in the extrusion barrel 3 below sealing piston I 4.

It also includes a driving mechanism for controlling sealing piston I 4, wherein the driving mechanism comprises a liquid storage barrel 5 connected with the extrusion barre 3l, fluid is arranged in the liquid storage barrel 5, the liquid storage barrel 5 is communicated with the extrusion barrel 3 through a fluid flow restriction structure, and an exhaust pipe 7 for exhausting air to the outside of the extrusion barrel 3 is arranged on the extrusion barrel 3 above sealing piston I 4, and a one-way valve II is arranged on the exhaust pipe 7. The fluid gradually enters the extrusion barrel 3, and the sealing piston I 4 moves downwards under the action of gravity of the fluid.

The liquid storage barrel 5 comprises a lower conical connecting cylinder 501, an upper cylindrical cylinder 502, and a connecting pipe 503 which connects the conical connecting cylinder 501 and the cylindrical cylinder 502 and shrinks toward the axial center, and the fluid flow restriction structure is arranged on the connecting pipe 503.

The fluid flow restriction structure is a flow restriction valve or a plurality of plugs I 504 each provided with water outlet holes 505, and the inner diameters of the water outlet holes 505 on different plugs I 504 are different.

Sealing piston I 4 is fixed on the upper side wall of the extrusion barrel 3 through an elastic part 401. The elastic part 401 can be a spring or a rubber band.

The container 6 is integrally arranged with the extrusion barrel 3, the bottom of the extrusion barrel 3 is sealed by a bottom plate, and the container is arranged between the bottom plate of the extrusion barrel 3 and sealing piston I 4.

A plurality of liquid inlet pipes 102 are uniformly distributed along the inner wall of the culture dish body 1, and the liquid inlet pipes 102 are all communicated with the cavity 101.

Usage: according to the amount of culture solution injected into the culture dish body 1, select a container 6 with appropriate volume, and inject appropriate fluid into the liquid storage barrel 5. The fluid will drip above the sealing piston I 4 through the water outlet hole 505 on the plug I 504. With the passage of time, more and more fluid will accumulate on the sealing piston I 4, and the air in the upper part of the extrusion barrel 3 will be squeezed out through the exhaust valve during the fluid entering. When the weight of the fluid can overcome the friction of sealing piston I 4 and the pulling force of the elastic part 401, sealing piston I 4 will move down, and the space of the container 6

will become smaller in the process of moving down, and the nutrient solution in the container 6 will be squeezed into the cavity 101. With the continuous descent of sealing piston I 4, the culture solution will enter the inside of the culture dish body 1 through the cavity 101 and the liquid inlet pipe 102. The capacity in the container 6 only needs to ensure the amount of adding once. In addition, the size of the water outlet hole 505 can control the time for adding the nutrient solution into the culture dish body 1. The smaller, the longer the waiting time for adding the nutrient solution.

Embodiment 2:

Referring to Figs. 4- 8, the device for culturing animal muscle cells comprises a culture dish body 1 and a dish cover 2, wherein a sealed cavity 101 is arranged at the lower part of the culture dish body 1, a liquid inlet pipe 102 communicated with the cavity 101 is arranged in the culture dish body 1, and a liquid outlet of the liquid inlet pipe is higher than the liquid level in the culture dish body 1 and the cavity 101.

It also includes a container 6 whose liquid storage space communicated with the cavity 101 can be adjusted through one-way valve I. As the liquid storage space of the container 6 becomes smaller, the liquid in the container 6 can enter the culture dish body 1 through the sealed cavity 101 and the liquid inlet pipe 102.

It also comprises a extrusion mechanism for controlling the reduction of the liquid storage space inside the container 6.

The extrusion mechanism comprises an extrusion barrel 3 and a sealing piston I 4 arranged in the extrusion barrel 3, and a container 6 is arranged in the extrusion barrel 3 below sealing piston I 4.

It also includes a driving mechanism for controlling sealing piston I 4, wherein the driving mechanism comprises a liquid storage barrel 5 connected with the extrusion barre 3l, fluid is arranged in the liquid storage barrel 5, the liquid storage barrel 5 is communicated with the extrusion barrel 3 through a fluid flow restriction structure, and an exhaust pipe 7 for exhausting air to the outside of the extrusion barrel 3 is arranged on the extrusion barrel 3 above sealing piston I 4, and a one-way valve II is arranged on the exhaust pipe 7. The fluid gradually enters the extrusion barrel 3, and the sealing piston I 4 moves downwards under the action of gravity of the fluid.

The liquid storage barrel 5 comprises a lower conical connecting cylinder 501, an upper cylindrical cylinder 502, and a connecting pipe 503 which connects the conical connecting cylinder 501 and the cylindrical cylinder 502 and shrinks toward the axial center, and the fluid flow restriction structure is arranged on the connecting pipe 503.

The fluid flow restriction structure is a flow restriction valve or a plurality of plugs I 504 each provided with water outlet holes 505, and the inner diameters of the water outlet holes 505 on different plugs I 504 are different.

Sealing piston I 4 is fixed on the upper side wall of the extrusion barrel 3 through an elastic part 401. The elastic part 401 is fixed by a supporting rod 402 fixed on the inner wall of the extrusion barrel 3, the elastic part 401 can be a spring or a rubber band.

The container 6 is integrally arranged with the extrusion barrel 3, the bottom of the extrusion barrel 3 is sealed by a bottom plate, and the container is arranged between the bottom plate of the extrusion barrel 3 and sealing piston I 4.

A plurality of liquid inlet pipes 102 are uniformly distributed along the inner wall of the culture dish body 1, and the liquid inlet pipes 102 are all communicated with the cavity 101.

It also includes a discharging mechanism 8 arranged below the culture dish body 1, which comprises a liquid discharging barrel 801 which is arranged below the culture dish body 1 and provided with a plurality of drain hole 103. An annular baffle 104 is arranged below the culture dish body 1 at the periphery of the drain hole 103, and a plug II 804 for blocking the drain hole 103 is arranged on the annular baffle 104. Plug II 804 is arranged below the culture dish body 1 through a spring 805.

A sealing piston II 802 is arranged in the liquid discharging barrel 801, and a U-shaped pipe 806 is externally connected to the upper side wall of the liquid discharging barrel 801. The upper and lower outlets of the U-shaped pipe 806 are both communicated with the inside of the liquid discharging barrel 801. A drain port 807 is arranged on the side wall of the liquid discharging barrel 801 below the U-shaped pipe 806, and the thickness of sealing piston II 802 is less than the minimum distance between the two outlets.

The lower end of the liquid discharging barrel 801 is sealed, and a piston rod 803 is concentrically arranged on sealing piston II 802, and the piston rod 803 is arranged on the liquid discharging barrel 801 through threaded connection.

Usage: the discharging mechanism 8 is adjusted in advance so that the sealing piston 802 is located between the two outlets, due to the existence of the u-shaped pipe 806 and the drain port 807, the discharging barrel 801 is communicated with the outside air, at this time, the drain hole 103 is completely blocked by the plug II 804 under the action of the spring 805.

Then, according to the amount of culture solution injected into the culture dish body 1, a container 6 with appropriate volume is selected, and an appropriate fluid is injected into the liquid storage barrel 5. The fluid will drip above the sealing piston I 4 through the water outlet hole 505 on the sealing plug I 504. With the passage of time, more and more fluid will accumulate on the sealing piston I 4, and the air in the upper part of the extrusion barrel 3 will be squeezed out through the exhaust valve during the fluid entering. When the weight of the fluid can overcome the friction of sealing piston I 4 and the pulling force of the elastic part 401, sealing piston I 4 will move down, and the space of the container 6 will become smaller in the process of moving down, and the nutrient solution in the container 6 will be squeezed into the cavity 101. With the continuous descent of sealing piston I 4, the culture solution will enter the inside of the culture dish body 1 through the cavity 101 and the liquid inlet pipe 102. The capacity in the container 6 only needs to ensure the amount of adding once. In addition, the size of the water outlet hole 505 can control the time for adding the nutrient solution into the culture dish body 1. The smaller, the longer the waiting time for adding the nutrient solution.

When it is necessary to replace the culture solution or discharge the waste culture solution, the screw 803 can be rotated to make sealing piston II 802 move down. When the outlet below the U-shaped pipe 806 is blocked, there is no air inlet above the liquid discharging barrel 801. If the screw 803 is continuously rotated, sealing piston II 802 moves down continuously, and the upper space of the liquid discharging barrel 801 gradually increases, while the air mass remains unchanged and the air pressure decreases. When the air pressure at the upper part of the culture dish body 1 can overcome the pulling force of the spring 805, the plug II 804 is pushed open, and the waste liquid flows

to the top of the sealing piston 802 through the drain hole 103. Because the inner diameter of the drain hole 103 is small, the tissue particles will not flow out and stick to the inner wall of the culture dish body 1, which also increases the difficulty of flowing out. Sealing piston II 802 continues to descend. When the drain port 807 is higher than sealing piston II 802, the waste liquid flows out through the drain port 807, and the spring 805 drives the plug II 804 to reset.

Embodiment 3:

On the basis of the Embodiment 1 or 2, the conical connecting cylinder 501 is detachably connected with the extrusion barrel 3, preferably in a threaded connection, and the container 6 is detachably connected with the culture dish body 1 through the existing pipeline 10, and the first check valve is arranged on the pipeline 10. This is convenient for later cleaning and disinfection.

Embodiment 4:

On the basis of Embodiment 1 or 2 or 3, it further comprises a placing rack 11 which comprises a base on which the culture dish body 1 is placed.

It also includes a fixing ring 12 for fixing the liquid storage barrel 5, which is sleeved on the outer side of the conical connecting cylinder 501. A connecting plate 1201 is arranged on the outer side of the fixing ring 12, and a screw 1202 is arranged below the connecting plate 1201. The lower end of the screw 1202 extends out of the base and is fixed by a nut.

Embodiment 5:

On the basis of Embodiment 1 or 2 or 3 or 4, the container 6 is provided with a inlet port controlled by a valve, which is convenient for adding culture solution.

Embodiment 6:

On the basis of Embodiment 1 or 2 or 3 or 4 or 5, the culture dish body 1 is round, and an annular boss is arranged at the lower edge of the culture dish body 1, and the cavity 101 is arranged on the annular boss and is in an annular groove shape.

Embodiment 7:

On the basis of Embodiment 1 or 2 or 3 or 4 or 5 or 6, the container is a water bag made of flexible material, preferably rubber.

In the description of the invention, it should be understood that the orientation or position relationship indicated by the terms "center", "longitudinal", "transversal", "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom" and "inner" and others is based on the orientation or position relationship shown in the figure, which is only for the convenience of describing the invention creation and simplifying the description, rather than indicating or implying that the device or element referred to must have a specific orientation and be constructed and operated in a specific orientation. Therefore, it cannot be understood as a limitation of the invention creation. In addition, the terms "first", "second" and the like are only used for descriptive purposes, and cannot be understood as indicating or implying relative importance or implicitly indicating the number of indicated technical features. Thus, the features defined by "first", "second", etc., may explicitly or implicitly include one or more of the features. In the description of the invention, unless otherwise specified, "multiple" means two or more.

In the description of the invention, it should be noted that unless otherwise specified and limited, the terms "installation", "connection", "communication" and "setting" should be understood in a broad sense, for example, they can be fixed connection, detachable connection or integrated connection. It can be connected mechanically or electrically. It

can be directly connected, indirectly connected through an intermediate medium, or communicated inside two elements. For ordinary technicians in the field, the specific meanings of the above terms in the invention can be understood through specific situations.

Undescribed technical features of the present invention can be realized by or by using the existing technology, so they will not be repeated here. Of course, the above description is not a limitation of the present invention, and the present invention is not limited to the above embodiments. Changes, modifications, additions or substitutions made by ordinary technicians in the technical field within the substantive scope of the present invention should also belong to the protection scope of the present invention.

CLAIMS :

1. A device for culturing animal muscle cells, characterized by comprising a culture dish body and a dish cover, wherein a sealed cavity is arranged at the lower part of the culture dish body, and a liquid inlet pipe communicated with the cavity is arranged in the culture dish body, and a liquid outlet of the liquid inlet pipe is higher than the liquid level in the culture dish body and the cavity;

it also comprises a container which can be adjusted by a liquid storage space communicated with the cavity through a one-way valve I, and the liquid in the container can enter the culture dish body through the sealed cavity and the liquid inlet pipe when the liquid storage space of the container is reduced.

2. The device for culturing animal muscle cells according to claim 1, characterized by further comprising a extrusion mechanism for controlling the reduction of the liquid storage space inside the container;

the extrusion mechanism comprises an extrusion barrel and a sealing piston I arranged in the extrusion barrel, and the container is arranged in the extrusion barrel below sealing piston I.

3. The device for culturing animal muscle cells according to claim 2, characterized by further comprising a driving mechanism for controlling sealing piston I, wherein the driving mechanism comprises a liquid storage barrel connected with the extrusion barrel, fluid is arranged in the liquid storage barrel, the liquid storage barrel is communicated with the extrusion barrel through a fluid flow restriction structure, and an exhaust pipe for exhausting air to the outside of the extrusion barrel is arranged on the extrusion barrel above sealing piston I, and a one-way valve II is arranged on the exhaust pipe; the fluid

gradually enters the extrusion barrel, and the sealing piston I moves downwards under the action of gravity of the fluid.

4. The device for culturing animal muscle cells according to claim 3, characterized in that the liquid storage barrel comprises a lower conical connecting cylinder, an upper cylindrical cylinder, and a connecting pipe which connects the conical connecting cylinder and the cylindrical cylinder and shrinks toward the axial center, and the fluid flow restriction structure is arranged on the connecting pipe.

5. The device for culturing animal muscle cells according to claim 4, characterized in that the fluid flow restriction structure is a flow restriction valve or a plurality of plugs I each provided with water outlet holes, and the inner diameters of the water outlet holes on different plugs I are different.

6. The device for culturing animal muscle cells according to claim 5, characterized in that sealing piston I is fixed on the upper part of the side wall of the extrusion barrel through an elastic part.

7. The device for culturing animal muscle cells according to claim 1, characterized in that the container is a water bag made of flexible material.

8. The device for culturing animal muscle cells according to claim 2, characterized in that the container is integrated with the extrusion barrel, the bottom of the extrusion barrel is sealed by a bottom plate, and the container is located between the bottom plate of the extrusion barrel and sealing piston I.

9. The device for culturing animal muscle cells according to claim 3, characterized in that the fluid is oil or water.

10. The device for culturing animal muscle cells according to claim 1, characterized in that a plurality of liquid inlet pipes are uniformly distributed along the inner wall of the culture dish body, and the liquid inlet pipes are all communicated with the cavity.

PATENTANSPRÜCHE

1. Eine Vorrichtung zur Kultivierung von tierischen Muskelzellen ist dadurch gekennzeichnet, dass sie einen Petirschalenkörper und einen Schalendeckel umfasst, wobei ein abgedichteter Hohlraum am unteren Teil des Petirschalenkörpers angeordnet ist und ein mit dem Hohlraum verbundenes Flüssigkeitseinlassrohr im Petirschalenkörper angeordnet ist und der Flüssigkeitsauslass des Flüssigkeitseinlassrohrs höher als der Flüssigkeitsstand im Petirschalenkörper und im Hohlraum liegt;

es umfasst auch einen Behälter, der durch einen Flüssigkeitsspeicherraum eingestellt werden kann, der mit dem Hohlraum durch ein Einwegventil I verbunden ist, und die Flüssigkeit in dem Behälter kann durch den abgedichteten Hohlraum und das Flüssigkeitseinlassrohr in den Petirschalenkörper eintreten, wenn sich der Flüssigkeitsspeicherraum des Behälters verkleinert.

2. Nach Anspruch 1 ist die Vorrichtung zur Kultivierung von tierischen Muskelzellen dadurch gekennzeichnet, dass die ferner einen Extrusionsmechanismus zur Steuerung der Verringerung des Flüssigkeitsspeicherraums im Inneren des Behälters umfasst;

der Extrusionsmechanismus umfasst einen Extrusionszylinder und einen im Extrusionszylinder angeordneten Dichtungskolben I, und der Behälter ist im Extrusionszylinder und unterhalb des Verschlusskolbens I angeordnet.

3. Nach Anspruch 2 ist die Vorrichtung zu der Kultivierung von tierischen Muskelzellen dadurch gekennzeichnet, dass die ferner einen Antriebsmechanismus zu der Steuerung des Dichtungskolbens I umfasst, wobei der Antriebsmechanismus ein mit dem Extrusionszylinder verbundenes Flüssigkeitsvorratsfass umfasst und in dem Flüssigkeitsvorratsfass ein Fluid angeordnet ist und das Flüssigkeitsvorratsfass mit dem Extrusionszylinder durch Flüssigkeitsströmungsbegrenzungsstruktur in Verbindung steht; ein Auspuffrohr zum Ablassen von Luft zur Außenseite des Extrusionszylinders am Extrusionszylinder und oberhalb des Dichtungskolbens I angeordnet ist und ein Einwegventil II an dem Auspuffrohr angeordnet ist;

das Fluid tritt allmählich in den Extrusionszylinder ein, und der Dichtungskolben I bewegt sich unter der Wirkung der Schwerkraft des Fluids nach unten.

4. Nach Anspruch 3 ist die Vorrichtung zur Kultivierung von tierischen Muskelzellen dadurch gekennzeichnet, dass das Flüssigkeitsvorratsfass einen unteren konischen Anschlusszylinder, einen oberen zylindrischen Zylinder und ein Verbindungsrohr umfasst, das den konischen Anschlusszylinder und den zylindrischen Zylinder verbindet und sich zur axialen Mitte hin schrumpft; die Flüssigkeitsströmungsbegrenzungsstruktur ist am Verbindungsrohr angeordnet.

5. Nach Anspruch 4 ist die Vorrichtung zur Kultivierung von tierischen Muskelzellen dadurch gekennzeichnet, dass die Flüssigkeitsströmungsbegrenzungsstruktur ein Drosselventil oder einige Stopfen I ist, die jeweils mit Wasserauslasslöchern versehen sind, und die Innendurchmesser der Wasserauslasslöcher an verschiedenen Stopfen I unterschiedlich sind.

6. Nach Anspruch 5 ist die Vorrichtung zur Kultivierung von tierischen Muskelzellen dadurch gekennzeichnet, dass der Dichtungskolben I durch ein elastisches Teil am oberen Teil der Seitenwand des Extrusionszylinders befestigt ist.

7. Nach Anspruch 1 ist die Vorrichtung zur Kultivierung tierischer Muskelzellen dadurch gekennzeichnet, dass der Behälter ein Wasserbeutel aus flexiblem Material ist.

8. Nach Anspruch 2 ist die Vorrichtung zur Kultivierung tierischer Muskelzellen dadurch gekennzeichnet, dass der Behälter in den Extrusionszylinder integriert ist, der Boden des Extrusionszylinders durch eine Bodenplatte abgedichtet ist und sich der Behälter zwischen der Bodenplatte des Extrusionszylinders und dem Dichtungskolben I befindet.

9. Nach Anspruch 3 ist die Vorrichtung zur Kultivierung tierischer Muskelzellen dadurch gekennzeichnet, dass das Fluid Öl oder Wasser ist.

10. Nach Anspruch 1 ist die Vorrichtung zur Kultivierung tierischer Muskelzellen dadurch gekennzeichnet, dass eine Vielzahl von Flüssigkeitseinlassrohren gleichmäßig entlang der

Innenwand des Petirschalenkörpers verteilt sind und die Flüssigkeitseinlassrohre alle mit dem Hohlraum verbunden sind.