

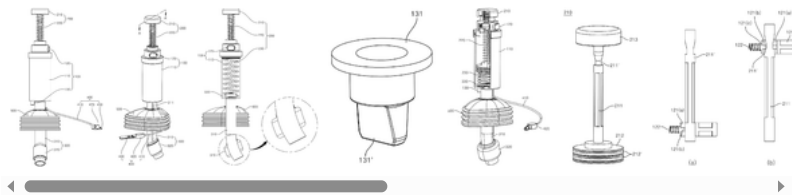
Removal Apparatus For Esophageal Foreign Substances

Abstract

translated from Korean

The present invention relates to an apparatus for removing foreign substances from the esophagus, and more particularly, a negative pressure generating unit 100 for generating a vacuum pressure by exhausting or entering air; A pressurizing unit 200 connected to one side of the negative pressure generating unit 100; An insertion tube 300 connected to the other side of the negative pressure generating unit 100 and inserted into an oral cavity of a person with a blocked esophagus; And a contact mask 500 that is fastened in a structure through which the insertion tube 300 passes, and is in close contact with an oral cavity of a person having an esophageal obstruction.

Images (12)



Classifications

 **A61B17/50** Instruments, other than pincettes or toothpicks, for removing foreign bodies from the human body

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Claims (10)

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translated from Korean

A negative pressure generating unit 100 for generating a vacuum pressure as air is discharged or introduced;
A pressurizing unit 200 connected to one side of the negative pressure generating unit 100 to discharge or introduce air in the negative pressure generating unit 100;
An insertion tube 300 connected to the other side of the negative pressure generating unit 100 and inserted into an oral cavity of a person with a blocked esophagus; And
It is fastened in a structure through which the insertion tube 300 passes, and includes a close contact mask 500 that is in close contact with the mouth of a person whose esophagus is blocked,
The insertion tube 300 blocks the main tube 310 having a predetermined inner diameter and length, the volume deformable part 320, and the air inside the case 110 from moving to the main tube 310, and from the esophagus. Includes a check valve 330 positioned at an opening of one side of the main tube 310 to allow the inhaled air to pass, and the volumetric deformation part 320 includes the insertion tube 300 so as to be in close contact with the esophagus. It is provided outside the other end of the main tube 310, Including an air control unit 400 for supplying or discharging air to the volumetric deformation unit 320, the air control unit 400, an air moving pipe 410 connected to the volumetric deformation unit 320, An air opening/closing unit 420 connected to the other side of the air movement pipe 410 and having a moving member 424 for opening and closing the passage of air therein, and a stopper for controlling air access to the air opening/closing unit 420 Including (430),
The air opening/closing part 420 has a volume of a predetermined size and is provided on one side of the opening/closing body 421 and the opening/closing body 421, and the first protrusion 422(a) is formed on the outer surface thereof. A first port 422 in a cylindrical shape having a second protrusion 422 (b) formed on the inner surface thereof, and a second port 423 provided on the other side of the opening/closing body 421 and connected to the air moving pipe 410), a moving member 424 that is accommodated in the first port 422 to open and close the air passage inside the first port 422, and a fifth elastic body for inducing a linear motion of the moving member 424 (425),
The stopper 430 has a flat plate structure having a cutout 431 ' that is cut in a predetermined shape from one edge to the inside, and a first protrusion of the first port 422 (422 (a)), the cut-out part 431 ' so as to be in close contact with one side of the movable member 424 of the first port 422 and the locking protrusion 432 provided at a predetermined position of the cut-out part 431 ' .) Device for removing foreign substances from the esophagus, characterized in that it comprises an extension protrusion (433) provided in a predetermined position.
delete delete delete The method of claim 1,
The sound pressure generating unit 100 includes a cylindrical case 110 with an empty inside, a button 120 positioned in a state protruding a predetermined height outside one side of of the case 110, and an outer side of the other side of the case 110 An apparatus for removing foreign substances from the esophagus, characterized in that it comprises an air

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outlet (130) provided.

The method of claim 5,

The button 120 includes a through hole 121 (a) having a predetermined inner diameter, a first protrusion 121 (b) positioned to protrude a predetermined length from an inner surface of the through hole 121 (a), and a button body 121 including a second protrusion 121 (c) positioned to protrude a predetermined length outward from one side surface; And a first elastic body 122 positioned in a shape surrounding the outer surface of the second protrusion 121(c).

The method of claim 5,

An apparatus for removing foreign matter from the esophagus, characterized in that the air outlet 130 accommodates an air discharge member 131 capable of discharging the air inside the case 110 and blocking the inflow of external air.

The method of claim 6,

The pressurizing part 200 is a pressurizing member 210 capable of a piston movement inside the case 110 so as to discharge the air inside the case 110 to the outside or generate a suction force in the insertion tube 300, the A device for removing foreign matter from the esophagus, comprising: a second elastic body 220 mounted on one side of the pressing member 210, and a third elastic body 230 located on the other side of the pressing member 210.

The method of claim 8,

The pressing member 210 is a support shaft 211 having a locking protrusion 211 ' in a predetermined position on one side in a cylindrical shape having a predetermined diameter, and a support shaft 211 while being positioned at one end of the support shaft 211), and a handle 213 having a diameter relatively larger than the diameter of the support shaft 211 while being located at the other end of the support shaft 211. Including,

The second elastic body 220 is located between the contact plate 212 and the handle 213, and the third elastic body 230 is in close contact with the outer surface of the contact plate 212. Device to remove.

The method of claim 9,

The first protrusion 121 (b) of the button body 121 is seated or detached from the locking projection 211 ' of the pressing member 210, thereby controlling the vertical movement of the pressing member 210 A device that removes foreign substances from the esophagus.

Description

translated from Korean

Device to remove foreign substances from the esophagus(Removal Apparatus For Esophageal Foreign Substances)

The present invention relates to a device for removing foreign substances from the esophagus, and more particularly, when food or foreign substances are caught in the human esophagus and breathing is difficult, foreign substances from the esophagus capable of removing substances trapped in the esophagus using suction power. It relates to a device to remove.

Esophageal food impaction is one of the most common and very dangerous emergencies in gastroenterology. These esophageal food blockages may occur acutely in some cases, and the patient may experience chest pain or compression, inability to swallow, painful swallowing, sensation of choking, and neck pain. It may also complain of neck pain or throat pain.

As a prior art that can urgently cope with food clogging in the esophagus, a device for removing foreign matter from the esophagus is disclosed in Korean Patent Publication No. 2020-0102780.

The apparatus for removing foreign matter from the esophagus according to the prior literature comprises: a pressurized body configured to form a vacuum pressure through the inflow and outflow of air; An air outlet member configured on one surface of the pressurizing body and configured to discharge internal air to the outside according to the operation of the pressurizing body or block the inflow of external air to form a vacuum pressure; It is detachably coupled to the air inflow and outflow member, and includes a compression mask that is in close contact with the mouth of a person whose esophagus is blocked to remove foreign substances clogged in the esophagus by vacuum pressure.

However, in the case of the prior art, there is a problem that it is difficult to sufficiently respond according to the type of foreign matter or the degree of clogging because the pressure mask is located only around the mouth, and the vacuum pressure is formed only by relying on the shape restoring force of the pressurized body.

Korean Patent Application Publication No. 2020-0102780

The present invention has been conceived to solve the above-described problems, and an object of the present invention is to provide an apparatus for removing foreign substances in the esophagus capable of generating sufficient negative pressure so that foreign substances clogged in the esophagus can be reliably and quickly discharged.

In addition, an object of the present invention is to provide an apparatus for removing foreign substances that are easy to operate and use.

An apparatus for removing foreign substances from the esophagus according to the present invention for solving the above problem includes: a negative pressure generator 100 for generating a vacuum pressure when air is discharged or introduced; A pressurizing unit 200 connected to one side of the negative pressure generating unit 100 to discharge or introduce air in the negative pressure generating unit 100; An insertion tube 300 connected to the other side of the negative pressure generating unit 100 and inserted into an oral cavity of a person with a blocked esophagus; And it is fastened in a structure through which the insertion tube 300 passes, and characterized in that it comprises a close contact mask 500 in close contact with the mouth of a person with an esophageal obstruction.

In addition, in the apparatus for removing foreign matter from the esophagus of the present invention, the insertion tube 300 includes a main tube 310 having a predetermined inner diameter and length, a volumetric deformation unit 320, and the air inside the case 110. Includes a check valve 330 located at one opening of the main tube 310 so that air sucked from the esophagus can pass while blocking movement to the main tube 310, wherein the insertion tube 300 is The volumetric deformation part 320 is provided outside the other end of the main tube 310 so as to be in close contact with the main tube 310.

In addition, in the apparatus for removing foreign matter from the esophagus of the present invention, further comprising an air control unit 400 for supplying or discharging air to the volumetric deformation unit 320, wherein one end of the air control unit 400 is An air moving pipe 410 connected to the volumetric deformation part 320, an air opening/closing part 420 connected to the other side of the air moving pipe 410 and having a moving member 424 for opening and closing the passage of air therein, and the It characterized in that it comprises a stopper portion 430 for controlling the entry of air into the air opening and closing portion 420.

In addition, in the apparatus for removing foreign substances from the esophagus of the present invention, the air opening/closing part 420 has a volume of a predetermined size and is provided on one side of the opening/closing body 421 and the opening/closing body 421 capable of changing the volume. (422(a)) is formed on the outer surface while the second protrusion 422(b) is formed on the inner surface of the cylindrical first port 422, and is provided on the other side of the opening/closing body 421. A second port 423 connected to the air moving pipe 410, a moving member 424 accommodated in the first port 422 to open and close the air passage inside the first port 422, and the moving member (A flat plate structure including a fifth elastic body 425 for inducing a linear motion of 424, and the stopper 430 is provided with a cutout 431' cut in a predetermined shape from one edge to the inside The stopper body 431 of the, the first protrusion 422 (a) of the first port 422,

the incision 431', a locking protrusion 432 provided at a predetermined position so as to be fastened, and the first port It is characterized in that it comprises an extension protrusion 433 provided at a predetermined position of the cutout portion 431' so as to be in close contact with one side of the moving member 424 of 422.

In addition, in the apparatus for removing foreign matter from the esophagus of the present invention, the negative pressure generating unit 100 includes a cylindrical case 110 with an empty inside, a button protruding at a predetermined height outside one side of the case 110 It is characterized in that it comprises a 120, and an air outlet 130 provided outside the other side of the case 110.

In addition, in the device for removing foreign matter from the esophagus of the present invention, the button 120 is a through hole 121 (a) having a predetermined inner diameter and a predetermined length protruding from the inner surface of the through hole 121 (a). A button body 121 comprising a first protrusion 121 (b) positioned and a second protrusion 121 (c) positioned to protrude a predetermined length outward of one side; And a first elastic body 122 positioned in a shape surrounding an outer surface of the second protrusion 121(c).

In addition, in the apparatus for removing foreign substances from the esophagus of the present invention, the air outlet 130 contains an air discharge member 131 capable of discharging the air inside the case 110 and blocking the inflow of external air. It is characterized.

In addition, in the apparatus for removing foreign substances from the esophagus of the present invention, the pressurizing unit 200 may discharge the air inside the case 110 to the outside or generate a suction force in the insertion tube 300. Including a pressing member 210 capable of a piston movement inside, a second elastic body 220 mounted on one side of the pressing member 210, and a third elastic body 230 located on the other side of the pressing member 210 It is characterized.

In addition, in the apparatus for removing foreign substances from the esophagus of the present invention, the pressing member 210 has a cylindrical shape having a predetermined diameter, and a support shaft 211 having a locking projection 211' at one predetermined position on one side, and the support A disk-shaped contact plate 212 having a diameter relatively larger than the diameter of the support shaft 211 while being positioned at one end of the shaft 211, and the support shaft 211 while being positioned at the other end of the support shaft 211 Includes a handle 213 having a diameter relatively larger than the diameter, the second elastic body 220 is located between the contact plate 212 and the handle 213, the third elastic body 230 is the contact plate (212) characterized in that it is in close contact with the outer surface.

In addition, in the device for removing foreign substances from the esophagus of the present invention, the first protrusion 121 (b) of the button body 121 is seated or separated from the locking jaw 211' of the pressing member 210, thereby pressing Characterized in that it controls the vertical movement of the member 210.

According to the apparatus for removing foreign substances from the esophagus according to the present invention, there is an advantage in that a button is provided outside the negative pressure generating unit where the negative pressure is generated, so that the operation of the apparatus for removing the clogged foreign substances from the esophagus is easy.

In addition, according to the device for removing foreign substances from the esophagus according to the present invention, a volumetric deformation part is provided at one end of the insertion tube inserted into the oral cavity, so that adhesion between the insertion tube and the esophagus can be increased, thereby improving the efficiency of removing foreign substances. There is an advantage.

In addition, according to the apparatus for removing foreign substances from the esophagus according to the present invention, there is an advantage in that the reliability of the apparatus can be increased because the structure for forming a negative pressure required for removing foreign substances is implemented by an elastic body using a spring.

1 is a perspective view as viewed from one side of an esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention.

2 is a perspective view of an esophageal foreign matter removal device according to a preferred embodiment of the present invention as viewed from the other side.

3 is a cross-sectional view taken along line AA' of FIG. 2.

Figure 4 is a perspective view of an air discharge member in the esophageal foreign matter removal device according to a preferred embodiment of the present invention.

5 is a perspective view showing a state in which the pressing member is compressed in the esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention.

6 is an enlarged perspective view of a pressing member in an esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention.

7 is a cross-sectional view illustrating a coupling structure between a pressing member and a button in an esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention.

8 is a perspective view showing a lower end of the esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention, showing a state before the volume deformable portion is expanded.

9 is a perspective view showing a lower end of the esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention, and showing a state after the volume deformable portion is expanded.

10 is a perspective view for explaining the operation of the check valve in the esophageal foreign matter removal device according to a preferred embodiment of the present invention.

11 is a perspective view for explaining the detachable structure of the air opening and closing part and the stopper in the esophageal foreign matter removal apparatus according to a preferred embodiment of the present invention.

12 is a cross-sectional view for explaining the flow of air in the air opening and closing portion according to the attachment and detachment of the stopper in the esophageal foreign matter removal apparatus according to a preferred embodiment of the present invention.

In the present application, terms such as "include", "have" or "have" are intended to designate the existence of features, numbers, steps, components, parts, or combinations thereof described in the specification. It is to be understood that it does not preclude the presence or addition of features, numbers, steps, actions, components, parts, or combinations thereof.

When a component is referred to as being "connected" or "connected" to another component, it is understood that it may be directly connected or connected to the other component, but other components may exist in the middle. It should be. On the other hand, when a component is referred to as being "directly connected" or "directly connected" to another component, it should be understood that there is no other component in the middle. Other expressions describing the relationship between components, such as "between" and "directly between" or "adjacent to" and "directly adjacent to" should be interpreted as well.

Hereinafter, an apparatus for removing foreign substances from the esophagus according to the present invention will be described with reference to the accompanying drawings.

1 is a perspective view of an esophageal foreign material removal device according to a preferred embodiment of the present invention as viewed from one side, FIG. 2 is a perspective view of an esophageal foreign material removal device according to a preferred embodiment of the present invention as viewed from the other side, and FIG. A cross-sectional view taken along line AA' and FIG. 4 is a perspective view of an air discharge member in the esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention.

As shown in Figs. 1 to 3, the esophageal foreign matter removal apparatus according to the present invention discharges or introduces the air inside the negative pressure generating unit 100 and the negative pressure generating unit 100 in which vacuum pressure is generated by the discharge or inflow of air. It is configured to include a pressurizing unit 200 for, an insertion tube 300 inserted into the oral cavity of a person whose esophagus is blocked, an air control unit 400, and a close contact mask 500 that is in close contact with the oral cavity.

To describe the above configurations in detail, first, the sound pressure generating unit 100 includes a case 110 formed in a cylindrical shape with an empty inside, a button 120 positioned in a state protruding a predetermined height toward an outer side of one side of the case 110, and The case 110 is configured to include an air outlet 130 provided outside the other side.

Here, the button 120 is a configuration for maintaining the pressing unit 200 in a compressed state or returning the pressing unit 200 to its original position, and when the pressing unit 200 is compressed and released, the case 110) Inside, negative pressure is instantaneously formed, and by this negative pressure, foreign substances are sucked and removed by the insertion tube 300 that has been inserted into the vicinity of the airways of the oral cavity, and the detailed configuration related to the button 120 for performing the above function is It will be described later.

In addition, an air discharge member 131 as shown in FIG. 4 is accommodated in an air discharge port 130 corresponding to a passage through which air inside the case 110 is discharged. When the pressurizing part 200 is compressed, the air inside the case 110 must be quickly discharged to the outside while the movement to the insertion tube 300 is restricted, and for this purpose, the air discharge member 131 is partially penetrated. It has a cylindrical shape of the shape, and the lower part has a nip shape whose cross-sectional area decreases as it goes downward, and discharge portions 131 ' are provided in close contact with each other while being cut in a straight shape at the end portion.

Here, the air discharging member 131 is preferably made of an elastic material such as silicone or rubber. This is when the air in the case 110 is discharged, the discharging part 131 ' is easily opened, and the inside of the case 110 is This is because it is advantageous in preventing external air from flowing into the discharge part 131 ' in the negative pressure state.

On the other hand, when the pressurizing unit 200 is compressed, a configuration that restricts movement of the air inside the case 110 to the insertion tube 300 will be described later.

5 is a perspective view showing a state in which the pressing member is compressed in the esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention, and FIG. 6 is an enlarged perspective view of the pressing member in the esophageal foreign substance removing apparatus according to a preferred embodiment of the present invention.

The pressurization unit 200 for discharging or introducing the air inside the negative pressure generating unit 100 is exposed to the outside of the negative pressure generating unit 100 except for one side of the negative pressure generating unit 100, and more specifically, a part of the lower side in general However, when compressed, the remaining parts except for the upper part are connected in a form accommodated in the sound pressure generating unit 100.

This pressurizing unit 200 is a pressurizing member 210 capable of a piston movement inside the case 110 so as to discharge the air inside the case 110 to the outside or generate a suction force in the insertion tube 300, pressurization The member 210 includes a second elastic body 220 such as a coil spring mounted on one side, and a third elastic body 230 such as a coil spring disposed on the other side of the pressing member 210.

When explaining in more detail with respect to the pressing member 210, a support shaft 211 having a cylindrical shape having a predetermined diameter and length and a slightly recessed locking protrusion 211 ' at a predetermined position on one side, and a support shaft (211) A contact plate 212 in the shape of a disk having a diameter that is relatively larger than the diameter of the support shaft 211 while being located at one end, and is located at the other end of the support shaft 211 and is relative to the diameter of the support shaft 211 It includes a handle 213 having a large diameter (see Fig. 6).

And the above-described second elastic body 220 is located between the contact plate 212 and the handle 213, the third elastic body 230 is in close contact with the outer surface of the contact plate 212 on one side, while the other side is the case 110) It is located in close contact with the lower inner surface.

Meanwhile, it is preferable that a packing 212 ' is additionally provided around the disc-shaped contact plate 212 so as to reliably maintain airtightness between the inner surface of the case 110 and the contact plate 212.

7 is a cross-sectional view illustrating a coupling structure between a pressing member and a button in an esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention.

The button 120 positioned in a state slightly protruding from the upper outer surface of the case 110 includes a button body 121 and a first elastic body 122 such as a coil spring. Specifically, the button body 121 has a through hole 121 (a) having a predetermined inner diameter, a first protrusion 121 (b)) positioned to protrude a predetermined length from the inner surface of the through hole 121 (a), and one It is configured to include a second protrusion 121 (c) positioned to protrude a predetermined length outward from the side, and the first elastic body 122 is positioned to surround the outer surface of the second protrusion 121 (c).

Briefly explaining the principle of controlling the movement of the pressing member 210 by the button 120 having the above configuration, when the pressing member 210 is not compressed, the first protrusion 121 (b) of the button body 121 (b)) is located under the support shaft 211 (Fig. 7(a)), and when the support shaft 211 moves into the case 110 and is compressed, the first protrusion 121 (b) of the button body 121) is seated on the locking projection 211 ' of the pressing member 210 to prevent the pressing member 210 from returning to its original position (FIG. 7(b)).

When the button 120 is pressed while the pressing member 210 is compressed, the first protrusion 121 (b) moves to the left in the drawing, so the pressing member 210 is in its original position by the third elastic body 230. Is restored, and at this time, negative pressure is temporarily generated inside the case 110.

8 is a perspective view showing the lower end of the esophageal foreign matter removing device according to a preferred embodiment of the present invention, showing a state before the volume deforming part expands, and FIG. 9 is a lower end of the esophageal foreign matter removing device according to a preferred embodiment of the present invention. A perspective view showing a state after the additional expansion is inflated, and FIG. 10 is a perspective view illustrating an operation state of a check valve in the esophageal foreign matter removing apparatus according to a preferred embodiment of the present invention.

With reference to FIGS. 3 and 8 to 10 together, the insertion tube 300, the air control unit 400, and a close contact mask 500 that is in close contact with the oral cavity will be described.

Insertion tube 300, the main tube 310 having a predetermined inner diameter and length, the volume deformation portion 320, and the case 110 blocks the movement of the air inside the main tube 310 while being sucked from the esophagus The air is configured to include a check valve 330 to allow passage.

The length and outer diameter of the main tube 310 are not particularly limited as long as it can be inserted into a part of a person's oral cavity and esophagus, and shape deformation (contraction due to negative pressure) does not occur when the inside of the case 110 is in a negative pressure state. A somewhat flexible material is good.

The volumetric deformation part 320 is for inducing airtightness between the esophagus and the insertion tube 300, and is provided outside the other end of the main tube 310.

And unlike the main tube 310, it is preferable to be made of an elastic material so that the volume can be deformed by the inflow and outflow of air, and it is more preferable that the original volume (outer shape) can be restored when exposed to atmospheric pressure in a contracted state.

That is, as shown in FIG. 8, before inserting the main tube 310 into the oral cavity, the volumetric deformation part 320 is in a contracted state, but when the end of the main tube 310 is located in the esophagus, the volumetric deformation part 320 By supplying and expanding the volumetric deformation unit 320, the outer surface and the esophagus are kept in close contact.

On the other hand, the check valve 330 for controlling air to move in only one direction is located in a state accommodated in the case 110 opposite the main tube 310, specifically the volumetric deformation part 320, and the case (When the air of 110) is discharged, the movement of air to the main tube 310 is blocked, and when the inside of the case 110 is in a negative pressure state, the main tube 310 is operated to open.

As shown in FIG. 10, the check valve 330 is positioned inside the valve body 331 and the valve body 331 having a cylindrical shape similar to the outer diameter or inner diameter of the main tube 310 to open and close the flow of air. A pair of semicircular valves 332 positioned facing each other, a pair of first supporting rods 333 for limiting the moving radius of the semicircular valve 332, and a pair of semicircular valves 332 are placed in a predetermined portion of the valve body (Consisting of including a second support rod 334 for connecting 331) with a hinge structure, and a fourth elastic body 335 for controlling the valve 332 to be opened only when negative pressure is formed inside the case 110 do.

Here, a part of the fourth elastic body 335 has a coil shape surrounding the second support rod 334, and both ends are in close contact with a pair of semicircular valves 332, respectively, and FIG. 10(a) shows a pair of The air flow is blocked by the semicircular valve 332, and FIG. 10(b) is an open state in which air flow is allowed.

The contact mask 500 is to be closely attached to the periphery of an oral cavity of a person whose esophagus is obstructed to maintain airtightness as much as possible, and is fastened in a structure through which the insertion tube 300 passes through the middle part. Here, the material of the adhesion mask 500 is not particularly limited, but it is preferably a silicone or rubber material having a predetermined elasticity so as to have excellent adhesion with the oral cavity.

On the other hand, reference numeral 311 is formed as a seating groove in the form of a predetermined depth recessed outside the main tube 310, which is a configuration for allowing the air moving pipe 410 to be described later to be seated along the longitudinal direction of the main tube 310.

Next, the air control unit 400 for supplying or discharging air to the volumetric deformation unit 320 will be described.

11 is a perspective view for explaining the detachable structure of the air opening and closing part and the stopper in the esophageal foreign matter removal apparatus according to a preferred embodiment of the present invention, and FIG. 12 is a view showing the detachment and detachment of the stopper in the esophageal foreign matter removal apparatus according to a preferred embodiment of the present invention. It is a cross-sectional view for explaining the air flow in the air opening and closing part according to.

Referring to FIGS. 9, 10, 11 and 12 together, the air control unit 400 includes an air moving pipe 410, an air opening/closing unit 420, and a stopper 430.

First, the air moving pipe 410 will be described. One side is connected to the air opening/closing unit 420 while the other side is connected to the volumetric deformation unit 320, thereby acting as a passage for air.

The air opening/closing part 420 connected to one side of the air moving pipe 410 is for blocking or allowing the flow of air, and the opening/closing body 421 and the opening/closing body (421) A cylindrical first port 422 provided on one side and having a first protrusion 422(a) formed on the outer surface while a second protrusion 422(b) is formed on the inner surface, opening/closing body (421) A second port 423 provided on the other side and connected to the air moving pipe 410, a moving member 424 accommodated in the first port 422 to open and close the air passage inside the first port 422 And a fifth elastic body 425 such as a coil spring for inducing a linear motion of the moving member 424.

Here, the moving member 424 includes a center pin 424 (a) having a predetermined inner diameter and length and a pair of blocking pins 424 (b) provided at both ends of the center pin 424 (a). I can.

The stopper part 430 for controlling the entry of air into the air opening/closing part 420 is a stopper body 431 having a flat plate structure in which a cutout part 431 ' is cut in a predetermined shape from one edge to the inside, 1 A locking protrusion 432 provided at a predetermined position of the cutout 431 ' to be fastened with the first protrusion 422(a) of the port 422, and one side of the moving member 424 of the first port 422 It is configured to include an extension protrusion 433 provided at a predetermined position of the cutout portion 431 ' so as to be in close contact.

Briefly explaining the operating principle of the air control unit 400 having the structure as described above, the volumetric deformation unit 320 is in a contracted state, that is, as shown in Fig. 12(a), the closure unit 430 is in the air opening/closing unit 420 In the coupled state, after inserting the main tube 310 into the oral cavity, the stopper 430 is separated from the air opening/closing part 420 (FIG. 12(b)).

Then, the moving member 424 is moved by the fifth elastic body 425, and thus the blocking pin 424(b) that was blocking the air passage of the opening/closing body 421 is also moved. The inflow and outflow of air is free through the opening (Fig. 12(b)).

Hereinafter, a method of using the apparatus for removing foreign substances from the esophagus of the present invention having the above configuration will be briefly described.

First, by pressing the pressing member, the first protruding portion of the button body is operated so that it is caught on the locking jaw of the pressing member, and the cap is coupled to the air opening and closing portion in a state in which the volume deformable portion is contracted.

The insertion tube is pushed into the oral cavity of an emergency patient with a foreign substance caught in the esophagus, and when the volumetric deformation part of the insertion tube is located near the esophagus, the cap which was fastened to the air opening and closing part is removed to inflate the volumetric deformation part.

Next, when the button body is pressed, the first protrusion is separated from the locking jaw of the pressing member and the pressing member is restored to its original position. At this time, the foreign matter blocking the esophagus is discharged through the insertion tube by the negative pressure generated instantaneously.

Specific parts of the present invention have been described in detail above. For those of ordinary skill in the art, these specific descriptions are only preferred embodiments, and the scope of the present invention is not limited thereby, and the scope of the present invention is not limited thereto. It is obvious to those skilled in the art that various changes and modifications are possible within the scope and scope of the technical idea, and it is natural that such modifications and modifications fall within the appended claims.

100: sound pressure generating unit
110: case
120: button
121: button body
121(a): through hole 121(b): first protrusion
121(c): second protrusion
122: first elastic body
130: air outlet
131: air exhaust member 131': discharge part
200: pressurization part
210: pressure member
211: support shaft 211': locking jaw
212: contact plate 212': packing
213: handle
220: second elastic body
230: third elastic body
300: insertion tube
310: main tube
311: seating groove
320: volume deformation part
330: check valve
331: valve body 332: valve
333: first support rod 334: second support rod
335: fourth elastic body
400: air control unit
410: air moving pipe
420: air opening and closing part
421: opening and closing body
422: first port
422(a): first protrusion 422(b): second protrusion
423: second port
424: moving member
424(a): center pin 424(b): blocking pin
425: fifth elastic body
430: stopper
431: closure body 431': incision
432: stumbling block
433: extension protrusion
500: close contact mask

Patent Citations (4)

Publication number	Priority date	Publication date	Assignee	Title
US4971053A *	1988-07-19	1990-11-20	Edward Tarrats	Suction mask to relieve choking
JP2004016460A *	2002-06-17	2004-01-22	Nippon Sherwood Medical Industries Ltd	Endotracheal tube with cuff internal pressure monitor balloon
KR20190088668A *	2018-01-19	2019-07-29	재단법인 아산사회복지재단	Endotracheal tube
KR20200102780A	2019-02-22	2020-09-01	배정환	Esophageal foreign substances removal device
Family To Family Citations				

* Cited by examiner, † Cited by third party

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Publication number	Priority date	Publication date	Assignee	Title
CN116138845A *	2023-04-07	2023-05-23	樊文静	Digestive tract foreign matter extraction device
KR102612022B1 *	2023-08-09	2023-12-08	주식회사 장전	Airway expansion device including safety fit structure
Family To Family Citations				

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
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KR102229619B1	2021-03-18	Removal Apparatus For Esophageal Foreign Substances
JP2922546B2	1999-07-26	Disposable resuscitator
KR100360605B1	2002-11-18	Medical instruments
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US20070060873A1	2007-03-15	Milking apparatus
US20220175532A1	2022-06-09	Inflatable penile prosthesis with valves for increasing flow efficiency
US8617052B2	2013-12-31	Penile prosthetic system and pump having inlet valve with high velocity closure mechanism
US20200316327A1	2020-10-08	Device for ventilating a patient
AU2016370708B2	2022-03-10	Device allowing an alimentary bolus flow between two stomas
EP2696808A1	2014-02-19	Penile prosthetic system and pump having inlet valve with high velocity closure mechanism
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WO2024116088A1	2024-06-06	Shunt flushing systems and methods
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CN115530947A	2022-12-30	Dredging device and connecting piece for respiratory tract blockage
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CN107432783B	2023-05-05	Pressure-adjustable pessary
JP2006512967A	2006-04-20	Urine flow control valve
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JP2017213362A	2017-12-07	Airway treatment device
JP2012232038A	2012-11-29	Hand pump for rubber balloon
WO2025060165A1	2025-03-27	Built-in inflation mechanism and built-in inflation method for adult product prosthesis
KR20020014335A	2002-02-25	Device for preventing a liquid inflow of inhaler of snivel

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
KR1020210004323A	2021-01-13	2021-01-13	Removal Apparatus For Esophageal Foreign Substances

Applications Claiming Priority (1)

Application	Filing date	Title
KR1020210004323A	2021-01-13	Removal Apparatus For Esophageal Foreign Substances

Legal Events

Date	Code	Title	Description
2021-01-13	PA0109	Patent application	Patent event code: PA01091R01D Comment text: Patent Application Patent event date: 20210113
2021-01-13	PA0201	Request for examination	

2021-01-13	PA0302	Request for accelerated examination	Patent event date: 20210113 Patent event code: PA03022R01D Comment text: Request for Accelerated Examination
2021-03-11	E701	Decision to grant or registration of patent right	
2021-03-11	PE0701	Decision of registration	Patent event code: PE07011S01D Comment text: Decision to Grant Registration Patent event date: 20210311
2021-03-12	GRNT	Written decision to grant	
2021-03-12	PR0701	Registration of establishment	Comment text: Registration of Establishment Patent event date: 20210312 Patent event code: PR07011E01D
2021-03-12	PR1002	Payment of registration fee	Payment date: 20210315 End annual number: 3 Start annual number: 1
2021-03-18	PG1601	Publication of registration	
2024-01-29	PR1001	Payment of annual fee	Payment date: 20240129 Start annual number: 4 End annual number: 4

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