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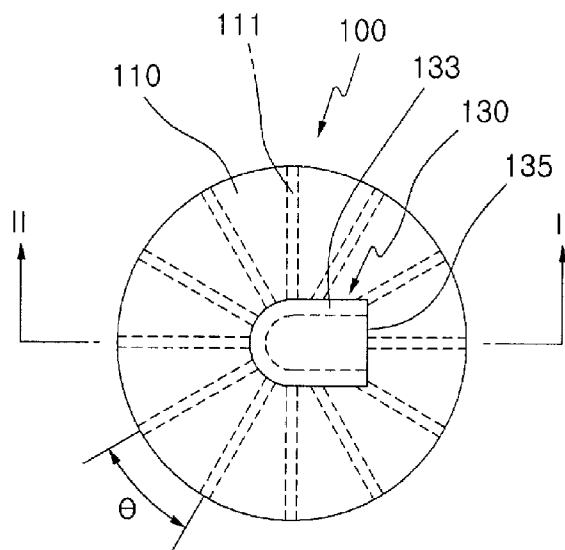
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[Continued on next page]

(54) Title: MEDICAL SUCTION HEAD

[Fig. 1]



(57) Abstract: The present invention relates to a suction head, and particularly a medical suction head which can easily drain exudations from a patient's skin wound. The present invention is a medical suction head for draining exudations of a wound sealed by a surgical drape to a drain tube using negative pressure, the exudations being absorbed in a porous pad, which is attached to the wound, and guided to the drain tube by the medical suction head placed in contact with the porous pad, the medical suction head comprising: a flange part placed in contact with the porous pad, comprising a center hole disposed in the center of the flange part and a plurality of guiding channels arranged on a porous pad-contacting surface of the flange part and separated from each other without intersection; and a coupling pipe, a first end of the coupling pipe communicating with the center hole of the flange part, and a second end of the coupling pipe coupled to the drain tube, wherein the exudations absorbed in the porous pad are guided to the center hole through the plurality of guiding channels.



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Description

MEDICAL SUCTION HEAD

[1] **BACKGROUND OF THE INVENTION**

[2]

[3] **Field of the Invention**

[4]

[5] The present invention relates to a suction head, and particularly a medical suction head which can easily drain exudations from the skin wound of a patient.

[6]

[7] **Description of the Related Art**

[8]

[9] In a surgical field, a negative pressure wound therapy has been performed in order to promote wound healing. Usually, the negative pressure wound therapy is performed by using a porous pad which consists of open cell polymers, and a surgical drape which reduces an infection and allows the skin around an incision to be easily treated.

[10] A vacuum-induced therapy using negative pressure has recently been popularized by V.A.C. (Vacuum-Assisted Closure) product lines commercially available from Kinetic Concepts, Inc. located in San Antonio , Texas . Processes of the vacuum-induced therapy are disclosed in US Patent Nos. 4,969,880, 5,100,396, 5,261,893 and 5,527,293. The advanced or modified processes of the vacuum-induced therapy are disclosed in US Patent Nos. 5,636,643, 5,645,081 and 6,142,982.

[11] A process of the negative pressure wound therapy is explained as follows. First, a porous pad is attached to a wound. Then, both the wound and the porous pad are covered and sealed by a surgical drape by attaching the surgical drape to the porous pad and the skin around the porous pad. After the wound is sealed by the surgical drape, one end of a drain tube is directly inserted into the porous pad, and another end of the drain tube is coupled to a vacuum pressure generator. The vacuum pressure generator is operated to generate negative pressure inside of the surgical drape. Due to this negative pressure, exudations are drained from the wound, absorbed into the porous pad and guided to the drain tube, which results in healing of the wound. The porous pad helps the exudations to be easily drained to the drain tube by maintaining a certain space between the surface of the wound and the surgical drape, and continuously maintaining the negative pressure inside of the surgical drape.

[12] However, when the end of the drain tube is inserted into the porous pad to drain the exudations, those drained from the wound site close to the end of the drain tube are absorbed in the porous pad well, whereas those drained from the wound site far from the end of the drain tube are not absorbed well. Because of this lack of uniformity, the

negative pressure wound therapy cannot be performed efficiently.

- [13] In order to resolve this problem, a suction head for enhancing the suction of exudations from a wound is disclosed in Korean Patent No. 516,288. This suction head has a flange part which is attached to the top surface of a porous pad and a coupling pipe which is disposed on the flange part and coupled to a drain tube. On the bottom surface of the flange part, many hemisphere-shaped protrusions, which define fluid channels to enhance the flow of the exudation, are arranged spaced apart from each other to easily guide the exudations absorbed in the porous pad to the coupling pipe. The suction head is used with a surgical drape which includes a thin flexible plastic film, which is adhesive coated, for attaching an assembly to a patient's skin and the open face of the porous pad.
- [14] However, because the hemisphere-shaped protrusions are randomly arranged on the center area of the suction head on which the negative pressure is concentrated, the lengths of fluid paths through which the exudations are guided from various points of the porous pad to the coupling pipe are not the same, and sometimes the fluid paths tend to be concentrated on one point as approaching the coupling pipe. Therefore, since these randomly arranged protrusions prohibit the exudations from being guided to the coupling pipe, the exudations cannot be easily drained to the drain tube, and thus the negative pressure wound therapy cannot be performed efficiently.
- [15] A conventional suction head also has a problem in that the coupling pipe can be easily separated from the drain tube by the patient's motion. In this case, because the wound is exposed to the air in the room, it is infected by the bacteria in the air. Whenever this separation happens, medical personnel have to immediately replace the separated suction head with a new suction head.
- [16] In order to resolve this problem, the suction head has been completely fixed to the drain tube by using an adhesive. However, when the suction head is attached to a wound by a surgical drape, the fixed drain tube prohibits the surgical drape from being perfectly attached to the suction head. Therefore, a desired negative pressure cannot be generated inside of the surgical drape, and the exudations cannot be easily drained. This results in delaying the period of wound healing.
- [17]
- [18] **SUMMARY OF THE INVENTION**
- [19]
- [20] The purpose of the present invention is to provide a medical suction head for easily draining the exudations which are absorbed in a porous pad to a drain tube and firmly connecting a coupling pipe of the suction head to the drain tube.
- [21]
- [22] In order to achieve the above purpose, an embodiment of the present invention is a

- medical suction head for draining exudations of a wound sealed by a surgical drape to a drain tube using negative pressure, the exudations absorbed in a porous pad, which is attached to the wound, and guided to the drain tube by the medical suction head placed in contact with the porous pad, the medical suction head comprising: a flange part placed in contact with the porous pad, comprising a center hole disposed in a center of the flange part and a plurality of guiding channels arranged on a porous pad-contacting surface of the flange part and separated from each other without intersection; and a coupling pipe, a first end of the coupling pipe communicating with the center hole of the flange part, a second end of the coupling pipe coupled to the drain tube, wherein the exudations absorbed in the porous pad are guided to the center hole through the plurality of guiding channels.
- [23] The plurality of guiding channels are arranged in a radial direction from the center hole, straightly extended from the center hole and penetrating an outer surface of the flange part. The plurality of guiding channels comprise grooves.
- [24] Preferably, the edge of the flange part is rounded to prevent the surgical drape covering the flange part from being torn.
- [25] The coupling pipe comprises a depression, which is engaged with a prominence on an outer surface of the drain tube, on an inner surface of the coupling pipe, and an engagement between the depression and the prominence is released only in a direction in which the drain tube is inserted into the coupling pipe.
- [26] The coupling pipe is bent to support the drain tube close to a patient's skin and bent to be parallel with the flange part.
- [27] The medical suction head further comprises a joint pipe inserted in the drain tube and coupled to the coupling pipe to couple the coupling pipe to the drain tube.
- [28] The coupling pipe comprises a depression on an inner surface of the coupling pipe, and the joint pipe comprises a prominence on an outer surface of the joint pipe, and an engagement between the depression and the prominence is released only in a direction in which the joint pipe is inserted into the coupling pipe.
- [29] The medical suction head further comprises a tightening ring surrounding an outer surface of the coupling pipe to tighten the joint pipe through the coupling pipe.
- [30] Another embodiment of the present invention is a medical suction head for draining exudations of a wound sealed by a surgical drape to a drain tube using negative pressure, the exudations being absorbed in a porous pad, which is attached to the wound, and guided to the drain tube by the medical suction head placed in contact with the porous pad, the medical suction head comprising: a first surface having a coupling pipe on the center of the first surface, the coupling pipe coupled to the drain tube; a center hole disposed on the center of the first surface and communicating with the coupling pipe; and a second surface placed in contact with the porous pad and having a

plurality of guiding channels separated from each other without intersection and guiding the exudations absorbed in the porous pad to the center hole.

[31]

[32] The effect of the medical suction head according to the present invention is that when a negative pressure wound therapy is performed on a wound, the exudations which are absorbed in a porous pad are guided to a center hole through a plurality of guiding channels which are the shortest path to the center hole, and are not mixed with each other because the guiding channels are separated from each other without intersection, whereby the exudations can be smoothly drained and the negative pressure wound therapy can be performed efficiently.

[33] Also, in the medical suction head according to the present invention, a coupling pipe is not separated from a drain tube during the negative pressure wound therapy because they are coupled to each other by depressions and prominences, whereby the bacteria in the air cannot infect the wound through the separated coupling pipe.

[34]

[35] **BRIEF DESCRIPTION OF THE DRAWING**

[36]

[37] Fig. 1 is a plan view of a suction head according to the first embodiment of the present invention.

[38] Fig. 2 is a cross-sectional view taken along the line II-II of Fig. 1.

[39] Fig. 3 is a bottom view of the suction head according to the first embodiment of the present invention.

[40] Fig. 4 is a schematic view showing a drain tube for the suction head according to the first embodiment of the present invention.

[41] Fig. 5 shows that a porous pad is attached to a patient's wound.

[42] Fig. 6 is a cross-sectional view showing that the suction head according to the first embodiment of the present invention is attached to the top surface of the porous pad and is covered by a surgical drape for sealing.

[43] Fig. 7 is a cross-sectional view showing that the drain tube is coupled to the suction head according to the first embodiment of the present invention.

[44] Fig. 8 is a perspective view showing that the drain tube is coupled to the suction head according to the first embodiment of the present invention.

[45] Fig. 9 is a cross-sectional view of a suction head according to the second embodiment of the present invention.

[46] Fig. 10 is a cross-sectional view showing that the drain tube is coupled to the suction head according to the second embodiment of the present invention through a joint pipe.

[47] Fig. 11 is a side view showing that a tightening ring is coupled to the suction head according to the second embodiment of the present invention to prevent the joint pipe

from being separated from the suction head.

[48]

<Part List>

20	porous pad	30	surgical drape
31	opening	100, 300	suction head
110, 310	flange part	111, 311	guiding channel
113, 313	center hole	130, 330	coupling pipe
131, 331	first pipe	133, 333	second pipe
135, 335	assembling opening	137, 337	depression
200, 400	drain tube	210, 351	prominence
350	joint pipe	370	tightening ring

[49]

[50] **DETAILED DESCRIPTION OF THE INVENTION**

[51]

[52] Hereinafter, a medical suction head according to a first embodiment of the present invention will be explained in more detail with reference to the accompanying drawings.

[53] Fig. 1 is a plan view of the suction head according to the first embodiment. Fig. 2 is a cross-sectional view taken along the line II-II of Fig. 1. Fig. 3 is a bottom view of the suction head according to the first embodiment. Fig. 4 is a schematic view showing a drain tube for the suction head according to the first embodiment of the present invention.

[54] Referring to Figs. 1-3 and 7, the suction head 100 according to the first embodiment of the present invention comprises a first surface (i.e., a top surface), a center hole 113 and a second surface (i.e., a bottom surface). The first surface is a flat surface and has a coupling pipe 130, which can be coupled to a drain tube 200, in the center of the first surface. The center hole 113 is disposed in the center of the first surface and communicates with coupling pipe 130. The second surface is placed partly in contact with a porous pad 20 because it has a plurality of guiding channels 111 which are separated from each other without intersection, whereby the exudations which are guided in one guiding channel 111 are not mixed with the exudations which are guided in another guiding channel 111 until they approach the center hole 113 though each of the guiding channels 111.

[55] The suction head 100 also comprises a flange part 110 and a coupling pipe 130. Here, the top surface of the flange part 110 corresponds to the first surface, and the

- bottom surface of the flange part 110 corresponds to the second surface. Therefore, the guiding channels 111 are disposed on the bottom surface of the flange part 110, and the center hole 113 is disposed in the center of the flange part 110.
- [56] The flange part 110 is placed in contact with the top surface of the porous pad 20 (see Figs. 6 and 7) which is attached to a wound 11 of the skin 10, and then the exudations which are absorbed into the porous pad 20 are guided to the center hole 113 through the guiding channels 111 which are placed in contact with the porous pad 20. The coupling pipe 130 is disposed in the center of the flange part 110 and communicates with the center hole 113. The exudations are gathered to the center hole 113 through the guiding channels 111.
- [57] The guiding channels 111 are arranged in a radial direction from the center hole 113 to be spaced apart from each other. Preferably, the guiding channel 111 may be a groove, and the cross-section of the groove may be a trench shape, semicircular shape or triangular shape. The angle θ between the guiding channels 111 can be determined to be 30° for a smooth flow of the exudation. The angle θ between the guiding channels 111 can vary according to the size of the wound 11 (i.e., the diameter of the flange part 110) or the quantity of the exudations.
- [58] Because the flange part 110 is usually smaller than the porous pad 20, the guiding channels may be arranged to extend from the outer surface of the flange part 110 to the center hole 113 and penetrate the outer surface of the flange part 110 to efficiently guide the exudations from the peripheral area of the porous pad 20. Additionally, in order to shorten the length between the outer surface of the flange part 110 and the center hole 113, guiding channels 111 may straightly extend from the outer surface of the flange part 110 to the center hole 113.
- [59] In the first embodiment, the guiding channel 111 is exemplified to be extended straightly but is not limited thereto. The guiding channel 111 may be curved on the flange part 110. In this case, it is preferable that they do not intersect with each other to prevent the exudation from being mixed with the exudation guided in other guiding channels 111 until each of the exudations are guided to the center hole 113.
- [60] If the surgical drape 30 is torn, the negative pressure generated between the skin 10 and the surgical drape 30 disappears. Therefore, the edge of the flange part 110 should preferably be rounded, thereby preventing the edge of the flange part 110 from tearing the surgical drape 30 while the flange part 110 to which the surgical drape 30 is attached is attached to the porous pad 20.
- [61] The flange part 110 may be formed in a circular or oval shape. Also, the flange part 110 may be manufactured in various sizes according to the wound size.
- [62] The coupling pipe 130 comprises a first pipe 131 and a second pipe 133, which form a single body. The first pipe 131 communicates with the center hole 113, and the

second pipe 133 communicates with the drain tube 200.

- [63] The first pipe 131 protrudes from the first surface of the flange part 110, communicating with the center hole 113. The first pipe 131 is perpendicular to the flange part 110 with a certain height.
- [64] The second pipe 133 is disposed to be bent perpendicularly to the first pipe 131 and extended parallel to the flange part 110, whereby the drain tube 200 which is coupled to the second pipe 133 can be arranged close to the patient's body. Since the second pipe 133 is bent perpendicularly to the first pipe 131, the therapy is not interrupted by the location of the drain tube 200.
- [65] The second pipe 133 is coupled to the drain tube 200 through an assembling opening 135 into which an end of the drain tube 200 is inserted. Depressions 137 are disposed on an inner surface close to the assembling opening 135 of the second pipe 133. Prominences 210, which are inserted into the assembling opening 135 and engaged with the depressions 137, are disposed on an outer surface of an end of the drain tube 200. Here, the depressions 137 and the prominences 210 have corresponding surfaces that are declined to allow the drain tube 200 to move forward (i.e., to be inserted into the second pipe 133) but to block the drain tube 200 from moving backward, as illustrated in Fig. 7. Therefore, only when the drain tube 200 is inserted further into the second pipe 133, the engagement between the depressions 137 and the prominences 210 is released.
- [66] It is desirable to determine an appropriate tolerance which can maintain the negative pressure, which a vacuum pressure generator generates, inside of the surgical drape 30 after the prominences 210 are engaged with the depressions 137.
- [67] The engagement between the second pipe 133 and the drain tube 200 may be a screw-type engagement in addition to the above prominences/depressions engagement. If necessary, a packing for sealing can be added.
- [68] The suction head 100 may be packed along with the porous pad 20, the surgical drape 30 and the drain tube 200 in a polymer pouch. Each of the suction head 100, the porous pad 20, the surgical drape 30 and the drain tube 200 may be packed separately. They may also be sterilized by a gamma ray. Preferably, the material of the suction head 100 may be a transparent material that is not degenerated by a gamma ray or if degenerated, its strength is not decreased much and its elasticity is maintained. For example, the preferable material of the suction head 100 may be silicon rubbers or PVC.
- [69] Hereinafter, a process of attaching the suction head 100 according to the first embodiment to the wound 11 will be explained with reference to Figs. 5-8.
- [70] Referring to Fig. 5, the porous pad 20 which is made from open cell polymers is attached to the wound 11 of the skin 10 to absorb the exudations efficiently. Then, the

- flange part 110 of the suction head 100 is placed in the center of the porous pad 20.
- [71] After the coupling pipe 130 passes through the opening 31 of the surgical drape 30, a protective film (not shown) of the surgical drape 30 is removed. As shown in Fig. 6, after the second surface of the flange part 110 is placed completely in contact with the surgical drape 30, the peripheral area of the surgical drape 30 is completely attached to the area around the wound 11 of the skin 10, and the wound 11 is sealed by the surgical drape 30, whereby vacuum pressure does not leak between the surgical drape 30 and the skin 10, and thus negative pressure can be generated inside of the surgical drape 30.
- [72] As shown in Figs. 7 and 8, the prominences 210 of the drain tube 200 are inserted into the assembling opening 135 of the second pipe 133 and engaged with the depressions 137, whereby the drain tube 200 cannot be separated from the coupling pipe 130.
- [73] After the wound 11 is sealed by the surgical drape 30, the vacuum pressure generator (for example, a vacuum pressure pump), which is coupled to the drain tube 200 is operated, and then negative pressure is generated between the surgical drape 30 and the skin 10. After the exudations of the wound 11 are absorbed into the porous pad 20 under negative pressure, the exudations are guided to the center hole 113 through the guiding channels 111 which are disposed on the flange part 110.
- [74] The exudations are guided from the center hole 113 through the coupling pipe 130 and the drain tube 200 to an exudation-gathering box.
- [75] In the negative pressure wound therapy using the medical suction head 100 according to the first embodiment of the present invention, the exudations which are absorbed in the porous pad are guided to the center hole 113 through the guiding channels 111 which are individually separated from each other and are the shortest paths to the center hole 113, thereby smoothly extracting the exudation.
- [76] Furthermore, once the coupling pipe 130 is engaged with the drain tube 200 through the prominences/depressions engagement, the coupling pipe 130 cannot be separated from the drain tube 200, thereby preventing the air in the room from flowing into the separated coupling pipe 130 during the therapy, and preventing the wound from being exposed to the bacteria in the air.
- [77] Fig. 9 is a cross-sectional view of the suction head according to the second embodiment of the present invention. Fig. 10 is a cross-sectional view showing that the drain tube is coupled to the suction head according to the second embodiment of the present invention through a joint pipe. Fig. 11 is a side view showing that a tightening ring is coupled to the suction head according to the second embodiment of the present invention to prevent the joint pipe shown in Fig. 10 from being separated from the suction head.

- [78] As shown in Fig. 9, the medical suction head 300 according to the second embodiment of the present invention comprises a flange part 310 and a coupling pipe 330. The flange part 310 is placed in contact with the top surface of the porous pad 20 (see Fig. 6), which is attached to the wound 11 of the skin 10, like the first embodiment. A plurality of guiding channels 311 are disposed on the bottom surface, which is placed in contact with the porous pad 20, to guide the exudations, which are absorbed in the porous pad 20 to a center hole 313, which is disposed in the center of the flange part 310 to communicate with the coupling pipe 330.
- [79] The coupling pipe 330 comprises a first pipe 331 and a second pipe 333. The coupling of the second embodiment between the coupling pipe 330 and the drain tube 400 is different from the first embodiment. A depression 337 is disposed on the inner surface of the second pipe 333. A joint pipe 350, which is made of plastic or metal and has a smooth surface, is inserted into an assembling opening 335 of the second pipe 333.
- [80] As shown in Fig. 10, a prominence 351 which is disposed on the outer surface of the joint pipe 350 is coupled with a snap to the depression 337. The depression 337 and the prominence 351 have corresponding surfaces which are declined to allow the joint pipe 350 to move forward (i.e., to be inserted into the second pipe 333) but to block the joint pipe 350 from moving backward, as illustrated in Fig. 10. Therefore, only when the joint pipe 350 is inserted further into the second pipe 333 the engagement between the depression 337 and the prominence 351 is released. As the joint pipe 350 engaged with the second pipe 333 is inserted into the drain tube 400, the drain tube 400 is coupled to the coupling pipe 330 through the joint pipe 350.
- [81] After the drain tube 400 is coupled to the coupling pipe 330 through the joint pipe 350, as shown in Fig. 11, a tightening ring 370 is set to surround the coupling pipe 330 to more firmly maintain the coupling between the joint pipe 350 and the coupling pipe 330. It is preferable that the tightening ring 370 be disposed close to the end of the joint pipe 350 on the second pipe 333 to tighten the joint pipe 350 through the second pipe 333.
- [82] A process of attaching the suction head 300 according to the second embodiment to the wound is the same as that of the first embodiment, and thus will not be explained again.
- [83] In the negative pressure wound therapy using the medical suction head 300 according to the second embodiment of the present invention, the exudations can be efficiently guided through the separated guiding channels 111 which keep the exudations in one guiding channel 111 from being mixed with the exudations in another guiding channel 111. The coupling pipe 330 is elastically snap-coupled to the joint pipe 350 through the depression 337 and the prominence 351 so that the joint pipe 350 cannot be separated

from the coupling pipe 330. The tightening ring then firmly tightens the coupling pipe 330 and the joint pipe 350, thereby preventing the air from flowing into the separated coupling pipe 330 during the therapy, and preventing the wound from being exposed to the bacteria in the air.

- [84] From the above preferred embodiments for the present invention, it is noted that modifications and variations could be made by a person skilled in the art in light of the above teachings. Therefore, it should be understood that changes may be made for a particular embodiment of the present invention within the scope and spirit of the present invention outlined by the appended claims.

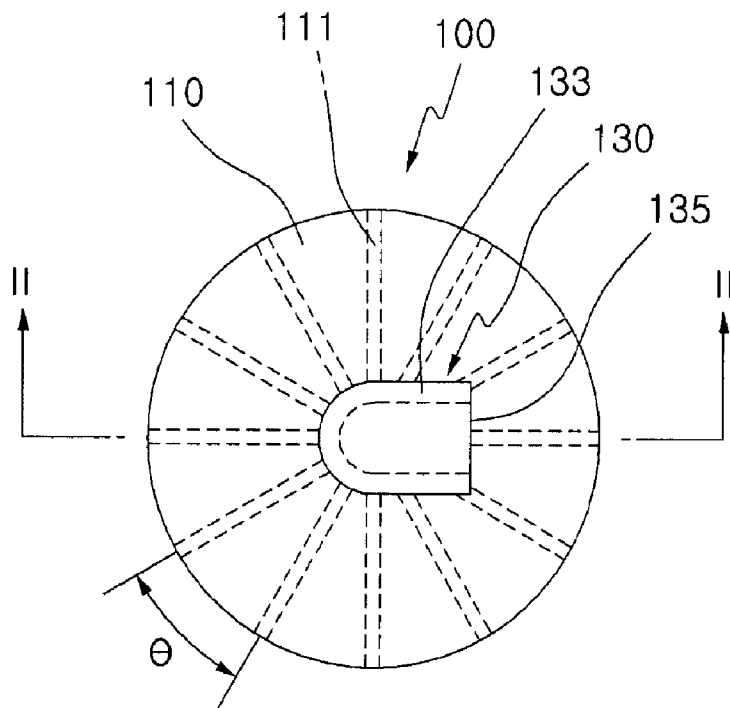
Claims

- [1] 1. A medical suction head for draining exudations of a wound sealed by a surgical drape to a drain tube using negative pressure, the exudations absorbed in a porous pad, which is attached to the wound, and guided to the drain tube by the medical suction head placed in contact with the porous pad, the medical suction head comprising:
- a flange part placed in contact with the porous pad, comprising:
- a center hole disposed in a center of the flange part; and
- a plurality of guiding channels arranged on a porous pad-contacting surface of the flange part and separated from each other without intersection; and
- a coupling pipe, a first end of the coupling pipe communicating with the center hole of the flange part, a second end of the coupling pipe coupled to the drain tube,
- wherein the exudations absorbed in the porous pad are guided to the center hole through the plurality of guiding channels.
- [2] 2. The medical suction head of Claim 1, wherein
- the plurality of guiding channels are arranged in a radial direction from the center hole.
- [3] 3. The medical suction head of Claim 1 or 2, wherein
- the plurality of guiding channels are extended from the center hole and penetrate an outer surface of the flange part.
- [4] 4. The medical suction head of Claim 3, wherein
- the plurality of guiding channels are straightly extended.
- [5] 5. The medical suction head of Claim 4, wherein
- the plurality of guiding channels comprise grooves.
- [6] 6. The medical suction head of Claim 1, wherein
- an edge of the flange part is rounded to prevent the surgical drape covering the flange part from being torn.
- [7] 7. The medical suction head of Claim 1, wherein
- the coupling pipe comprises a depression, which is engaged with a prominence on an outer surface of the drain tube, on an inner surface of the coupling pipe, and
- wherein an engagement between the depression and the prominence is released only in a direction in which the drain tube is inserted into the coupling pipe.
- [8] 8. The medical suction head of Claim 1, wherein
- the coupling pipe is bent to support the drain tube close to a patient's skin.
- [9] 9. The medical suction head of Claim 8, wherein

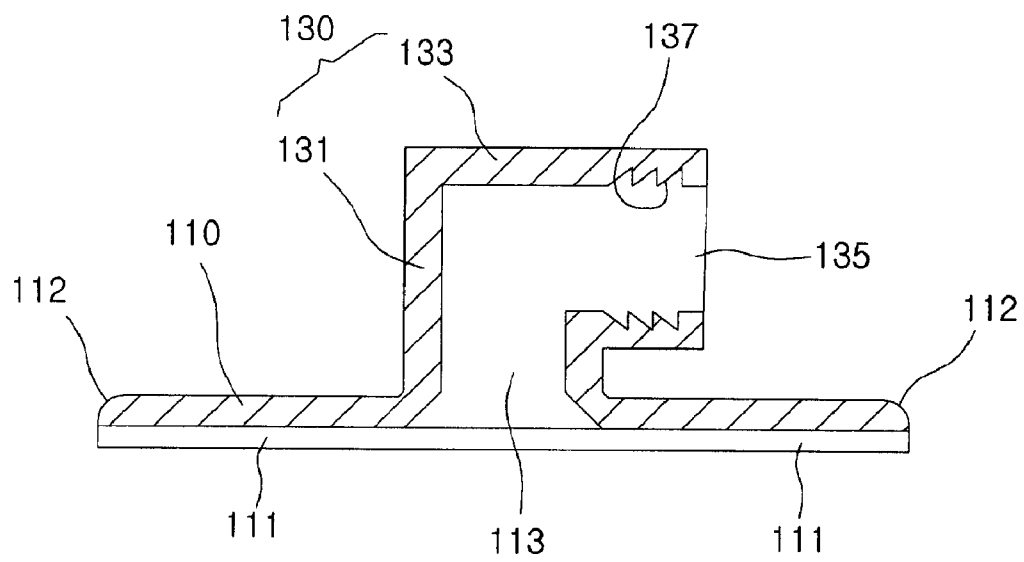
- the coupling pipe is bent to be parallel with the flange part.
- [10] 10. The medical suction head of Claim 1, further comprising:
a joint pipe inserted in the drain tube and coupled to the coupling pipe to couple the coupling pipe to the drain tube.
- [11] 11. The medical suction head of Claim 10, wherein
the coupling pipe comprises a depression on an inner surface of the coupling pipe, and the joint pipe comprises a prominence on an outer surface of the joint pipe, and
wherein an engagement between the depression and the prominence is released only in a direction in which the joint pipe is inserted into the coupling pipe.
- [12] 12. The medical suction head of Claim 10 or 11, further comprising:
a tightening ring surrounding an outer surface of the coupling pipe to tighten the joint pipe through the coupling pipe.
- [13] 13. A medical suction head for draining exudations of a wound sealed by a surgical drape to a drain tube using negative pressure, the exudations absorbed in a porous pad, which is attached to the wound, and guided to the drain tube by the medical suction head placed in contact with the porous pad, the medical suction head comprising:
a first surface having a coupling pipe on a center of the first surface, the coupling pipe coupled to the drain tube;
a center hole disposed on the center of the first surface and communicating with the coupling pipe; and
a second surface placed in contact with the porous pad and having a plurality of guiding channels separated from each other without intersection and guiding the exudations absorbed in the porous pad to the center hole.
- [14] 14. The medical suction head of Claim 13, wherein
the plurality of guiding channels are arranged in a radial direction from the center hole.
- [15] 15. The medical suction head of Claim 13 or 14, wherein
the plurality of guiding channels are extended from the center hole and penetrate an outer surface of the medical suction head.
- [16] 16. The medical suction head of Claim 15, wherein
the plurality of guiding channels are straightly extended.
- [17] 17. The medical suction head of Claim 16, wherein
the plurality of guiding channels comprise grooves.
- [18] 18. The medical suction head of Claim 13, wherein
an edge of the first surface is rounded to prevent the surgical drape covering the medical suction head from being torn.

- [19] 19. The medical suction head of Claim 13, wherein the coupling pipe comprises a depression, which is engaged with a prominence on an outer surface of the drain tube, on an inner surface of the coupling pipe, and wherein an engagement between the depression and the prominence is released only in a direction in which the drain tube is inserted into the coupling pipe.
- [20] 20. The medical suction head of Claim 13, wherein the coupling pipe is bent to support the drain tube close to a patient's skin.
- [21] 21. The medical suction head of Claim 20, wherein the coupling pipe is bent to be parallel with the first surface.
- [22] 22. The medical suction head of Claim 13, further comprising: a joint pipe inserted in the drain tube and coupled to the coupling pipe to couple the coupling pipe to the drain tube.
- [23] 23. The medical suction head of Claim 22, wherein the coupling pipe comprises a depression on an inner surface of the coupling pipe, and the joint pipe comprises a prominence on an outer surface of the joint pipe, and wherein an engagement between the depression and the prominence is released only in a direction in which the joint pipe is inserted into the coupling pipe.
- [24] 24. The medical suction head of Claim 22 or 23, further comprising: a tightening ring surrounding an outer surface of the coupling pipe to tighten the joint pipe through the coupling pipe.

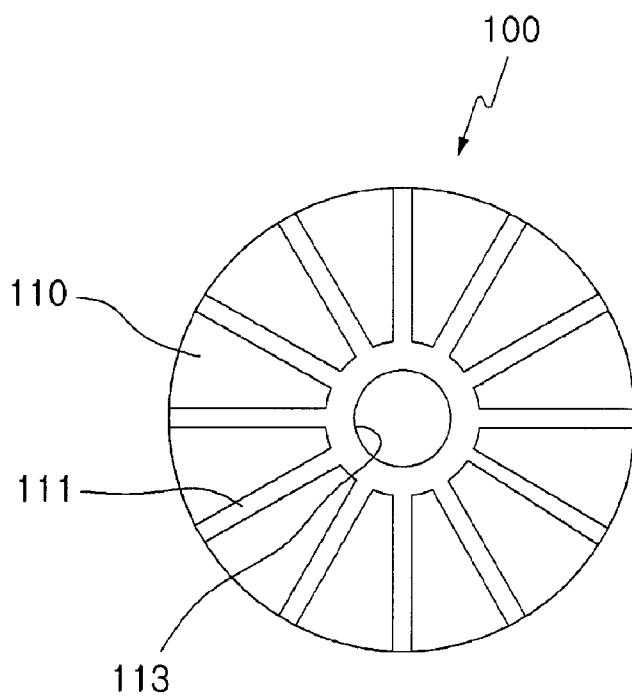
[Fig. 1]



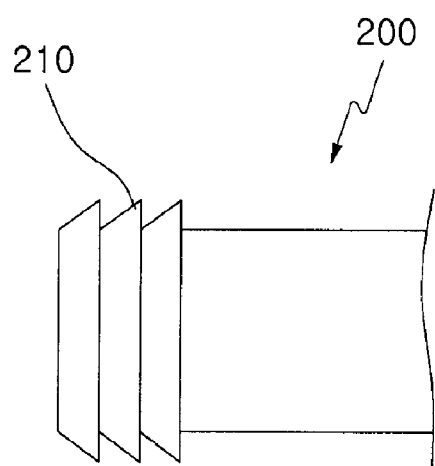
[Fig. 2]



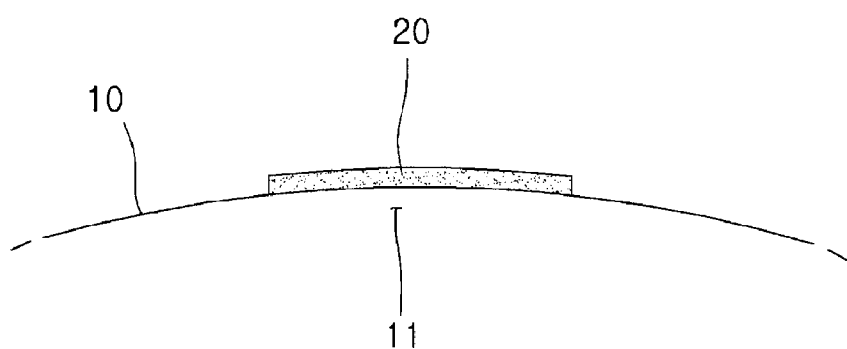
[Fig. 3]



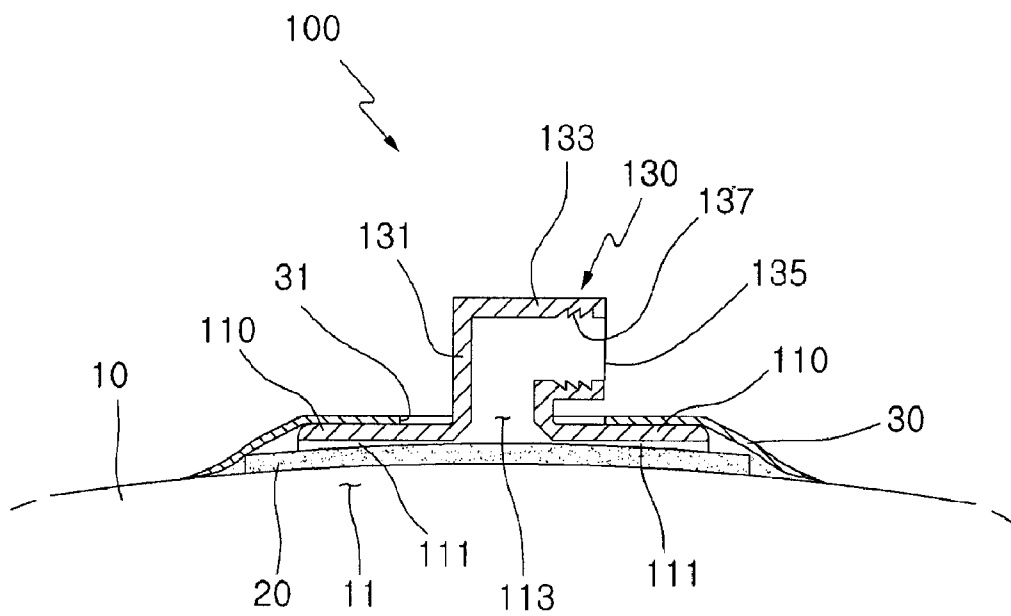
[Fig. 4]



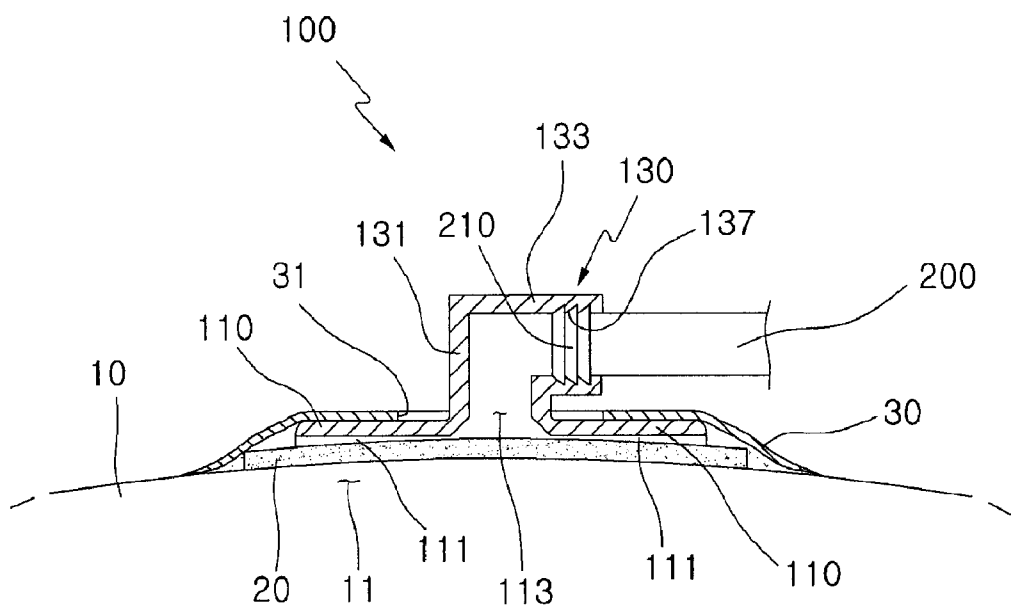
[Fig. 5]



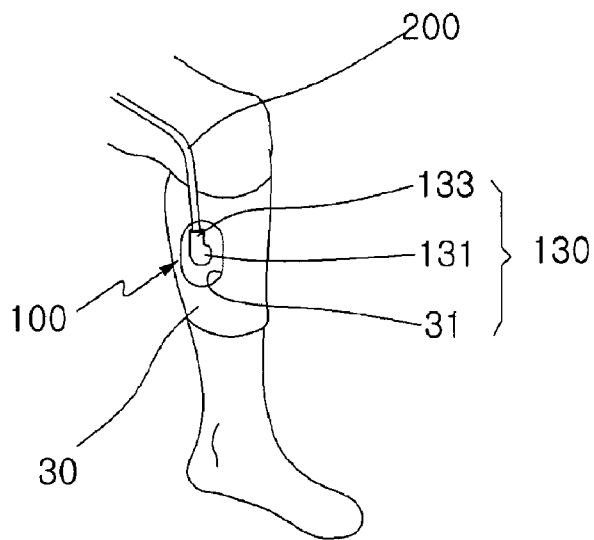
[Fig. 6]



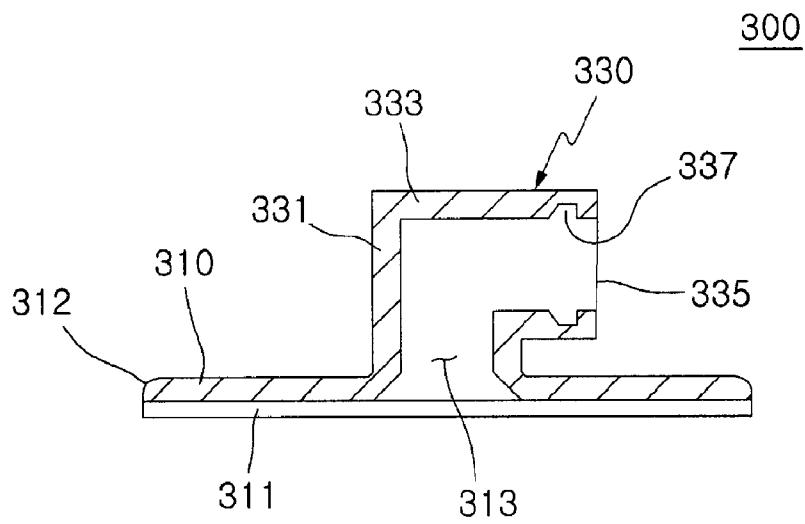
[Fig. 7]



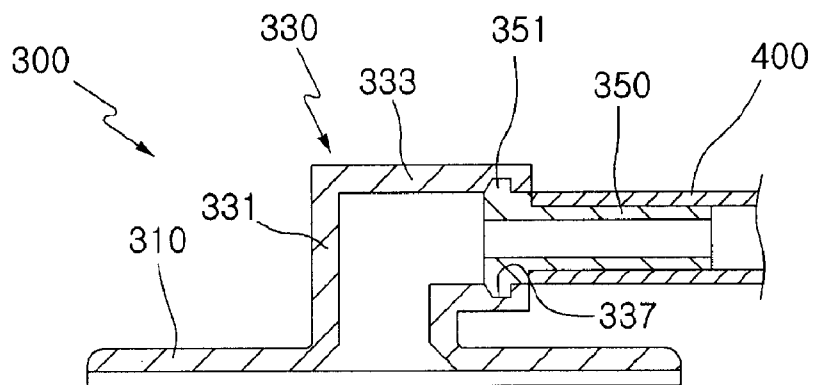
[Fig. 8]



[Fig. 9]



[Fig. 10]



[Fig. 11]

