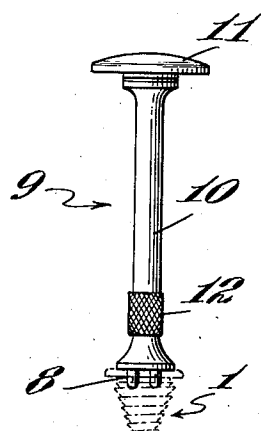
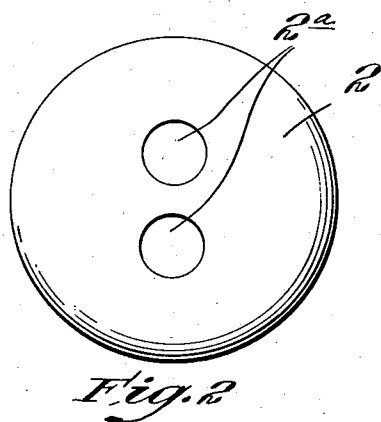
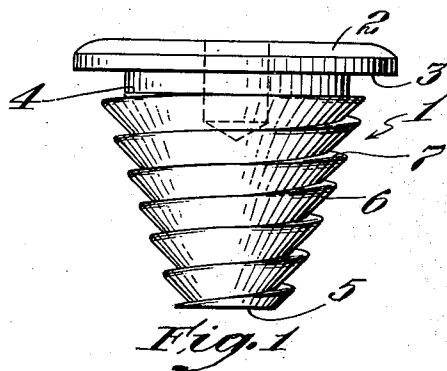


March 9, 1948.

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EMBALMING APPLIANCE
Filed Jan. 12, 1945

2,437,381



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UNITED STATES PATENT OFFICE

2,437,381

EMBALMING APPLIANCE

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Application January 12, 1945, Serial No. 572,533

5 Claims. (Cl. 27—1)

1

This invention pertains to embalming, and more particularly to a novel appliance or trocar button for use in closing an aperture made in the body for the purpose of aspirating body fluids and/or for the introduction of embalming fluid.

It is customary in embalming the human body to make an aperture in the abdominal wall by the use of a trocar or hollow needle. This trocar is usually inserted at a point about an inch above the navel, and through this trocar or hollow needle liquids and gases are aspirated from the thoracic and abdominal cavities and embalming fluid is injected. After the embalming fluid has been introduced, the aperture left by the trocar must be closed substantially leak-tight. Good embalming practice requires that some time after the first injection of fluid, for instance twenty-four hours later, the aperture must be opened for release of accumulated gases and/or for the introduction of more embalming fluid.

Heretofore the aperture resulting from the introduction of the trocar has been closed by a suture, the operator making three or four one-half inch stitches, using a suture needle and ordinarily employing a cotton thread, the stitches being spaced evenly about the aperture, and after the stitches have been taken, the ends of the suture thread are drawn up so as to purse the skin about the aperture and thus close the latter. This mode of closure produces an unsightly effect not at all in keeping with the aesthetics of good embalming.

Not only is the appearance resultant from this mode of closure unsightly, but the method employed is difficult, disagreeable and highly dangerous to the operator.

Certain types of embalming fluid commonly used have a very disagreeable and in many cases nauseating odor, and some types are extremely irritating to the eyes. Exposed to these conditions, the operator must insert the suture needle several times through the tough and slippery skin, which is not easily pierced by the needle, especially at the time the second closure is performed, since at this time the skin has been tanned and become hard and leathery by exposure to the embalming fluid. This difficulty in inserting the needle is attended with the grave possibility that the operator will prick his finger or hand with the needle and thus become infected; frequently the needle is broken during the operation, requiring substitution of a new needle and rethreading; the thread must be drawn up very tightly to close the aperture, the tension necessary sometimes being sufficient to cut through the

2

rubber gloves worn by the operator and even to cut his skin with further danger of infection and resultant blood poisoning; drawing the thread as tightly as possible does not always stop leakage; and the thread which passes through the skin acts as a wick along which the fluid may leak from the interior to the exterior, moistening and staining of the burial garments and producing a disagreeable odor.

The present invention has for its object the provision of novel closure button for stopping the trocar opening, this closure means being of such a character that by its use the above difficulties and danger attendant upon prior modes of closure are completely eliminated, and whereby the aperture may be closed quickly and without requiring especial skill; whereby the aperture is made leak-tight, and whereby the aperture may be reopened at any time without difficulty or danger to the operator.

Other and further objects of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings wherein:

Fig. 1 is a side elevation, to large scale, illustrating the improved closure button;

Fig. 2 is a plan view of the device shown in Fig. 3; and

Fig. 3 is a side elevation, to smaller scale, illustrating a tool useful, but not essential, in introducing the closure appliance, the latter being indicated in broken lines.

Referring to the drawings, the numeral 1 designates the improved appliance shown to large scale. This appliance, in a preferred form, consists of a unitary piece of material, for example metal, a ceramic, or a plastic, for example, one of the synthetic resins, and may be made by any suitable method appropriate to the material chosen. While for ease and cheapness in construction it is preferred to make the device of a single piece of material, it is contemplated as within the scope of the invention to make it of two or more pieces of material, for instance the head and body may be made separately of the same or different materials and appropriately united. Furthermore, if desired, the exposed or upper surface of the head may be colored, for example by the application of enamel (if the head be of metal) or by the incorporation of suitable coloring material in the substance of the head (if the latter be of ceramic or plastic material), such coloring being chosen to simulate that of the human skin.

As illustrated, the appliance comprises a head

3

2 of generally disk-like shape, preferably having a substantial flat upper surface with smoothly rounded edges and having a flat lower surface 3, this latter surface being annular. The appliance also comprises the body portion 4 coaxial with the head 2 and usually integrally united with the latter, the upper end of the body portion being of somewhat less diameter than the diameter of the head, thus providing the aforesaid annular surface 3.

The body 4 is of truncated conical contour tapering downwardly from its junction with the head to the free end or tip 5.

The slope of the conical peripheral surface of the body is approximately 20° with reference to the axis of the body portion and the body portion is provided with one or more anchoring elements, here shown as a single helical shoulder or thread 6. As illustrated, this thread or helix is so formed that any radial element of its upper surface 7 is approximately perpendicular to the axis of the body portion, while the lower surface of the helix inclines downwardly and inwardly, the outer edge of the helix being dulled or rounded. However, an ordinary screw thread, preferably a square or round thread, may be employed if desired. Instead of a continuous helix such as that specifically illustrated, the helix may be broken at intervals, for example to form a partial thread, or in place of a helix, one or more radial ribs may be employed.

Trocars used in embalming are customarily made in three sizes and if desired the button herein described may be made in corresponding sizes. However it is believed that the present appliance by reason of its wide adaptability, need be made in no more than two sizes, one for adult use and the other for children. Merely as suggestive of proper proportions, the diameter of the head may be approximately $\frac{5}{8}$ of an inch; the diameter of the body 4 where it joins the head $\frac{3}{8}$ of an inch; the diameter of the body at the tip end 5 may be $\frac{1}{8}$ of an inch; the total axial length of the device may be $\frac{1}{2}$ inch; the thickness of the head may be $\frac{1}{8}$ of an inch, and the diameter of the uppermost turn of the helix approximately $\frac{1}{8}$ of an inch. These dimensions are instanced as indicative of good proportions, it being contemplated that devices of this sort may be useful and practical within a range of a head diameter of from $\frac{1}{8}$ to $\frac{5}{8}$ of an inch, for example.

To assist in the insertion and removal of this device, it is preferred to provide the head with a pair of socket openings 2^a for the reception of a tool for use in rotating the appliance. A convenient form of tool is illustrated at 9 in Fig. 3. This tool comprises an end portion from which project fixed spaced parallel pins 8 designed to enter the opening 2^a in the head 2 of the appliance. This head is at the lower end of a stem 10 to whose upper end there is secured a rotatable palm-engaging disk 11. Preferably the lower end of the stem is provided with a knurled portion 12 for engagement between the thumb and fingers of the user. As an alternative construction, the stem of the tool may be made hollow and of a diameter to provide a storage chamber for a supply of the buttons, the upper end of the device being removable to give access to the storage chamber.

After removal of the trocar, the small end 5 of the appliance is inserted in the opening left by the trocar. By rotating the device, the helical rib, which forms a channel for the reception of

4

the edge of the skin, acts to draw the appliance into operative position. The tool of Fig. 3 is useful in rotating the appliance, thereby to screw it into the aperture in the skin, the tapering shape of the body of the appliance gradually distending the walls of the aperture until a leak-tight closure is formed. In thus introducing the appliance, it is not necessary for the operator's hands to contact the corpse. The skin tissue is firmly held within the channel defined by the rib so that the appliance is retained in place and will not be forced out by accumulation of gas in the body cavity. On the other hand, even though the skin surrounding the aperture may become hardened by the action of the embalming fluid, it is possible to remove the appliance by rotating it in the reverse direction thus permitting its ready withdrawal from the aperture in the skin for the secondary embalming operation.

Since, when the appliance is in place, its upper surface is raised but little above the skin surface, it is not objectionable in appearance, and its insertion does not cause any puckering or other substantial distortion of the skin adjacent to the aperture. The insertion and removal of this appliance may be accomplished without any danger to the operator, without disfiguring the corpse, and by anyone whether or not skilled in the embalming operation.

While one desirable embodiment of the invention is hereby illustrated by way of example, it is to be understood that the invention is broadly inclusive of any and all equivalent constructions falling within the terms of the appended claims.

I claim:

1. An embalming appliance for use in closing the aperture in the skin of a corpse which results from the introduction of a trocar, said appliance being designed to distend the skin bordering said aperture to provide a leak-tight closure for the aperture, said appliance comprising a disk-like head and a screw-threaded, truncated conical body, that surface of the thread facing toward the head being more nearly perpendicular to the axis of the body than is the opposite surface of the thread, the larger end of the body being joined to the under side of the head and being coaxial with the latter, the body tapering to a diameter such as to facilitate the introduction of its small end into the undistended aperture formed by the trocar and the taper of the body being such as gradually to distend the skin bordering the aperture as the appliance is screwed into the aperture, the outer edge of the screw thread on the body being dull, and the head having a substantially flat upper surface and having a socket for engagement by a tool employed in screwing the appliance into the aperture in the skin.

2. An embalming appliance for use in closing the aperture in the skin of a corpse which results from the introduction of an embalming trocar, said appliance being designed to distend the skin bordering said aperture to provide a leak-tight closure for the aperture, said appliance consisting of a unitary mass of non-metallic material and comprising a disk-like head of a diameter of from $\frac{1}{8}$ to $\frac{5}{8}$ of an inch, and a screw-threaded, tapering body, both head and body being of circular section in planes perpendicular to the axis of the body, the head having therein a socket for engagement by an actuating instrument, the body being of truncated conical diametrical section, the larger end of the body being joined to

5

the head, the body and head being coaxial and the axial length of the appliance approximating four-fifths of the diameter of the head, the tip of the body being of a diameter to enter the aperture formed by the trocar, the screw-thread having a non-cutting edge and defining a helical channel for the reception of the edge of the skin bordering the aperture.

3. An appliance for use in closing the aperture left in the skin of a corpse by the insertion and withdrawal of a trocar, said appliance consisting of a unitary mass of synthetic resin forming a truncated, conical screw-threaded body portion and an axially thin, disk-like head to which the larger end of the body portion is joined, both head and body portion being of circular section in planes perpendicular to the axis of the body portion, the maximum diameter of the screw-threaded body portion being so much greater than the normal diameter of the aperture formed by the trocar, that, when screwed into the aperture, the skin bordering the aperture is gradually distended and a leak-tight closure of the aperture assured, the total axial length of the appliance being approximately one-half inch and the diameter of the head being greater than the maximum diameter of the body portion, the included angle between diametrically opposite longitudinal elements of the threaded conical surface of the body portion being approximately 40° and the axial length of the body portion being of the order of seven-sixteenths of an inch, the edge of the screw thread being dull, the screw thread defining a channel for the reception of the edge of the skin, and the head being shaped for engagement with a tool for rotating the appliance thereby to screw it into the aperture in the skin.

4. An appliance for use in closing the aperture left in the skin of a corpse by the introduction and withdrawal of a trocar, said appliance consisting of a unitary mass of material forming a truncated conical screw-threaded body portion and an axially thin disk-like head to which the larger end of the body portion is joined, both head and body portion being of circular section in planes perpendicular to the axis of the body portion,

6

tion, the maximum diameter of the screw-threaded body portion being greater than the normal diameter of the aperture formed by the trocar whereby when the appliance is screwed into the aperture, the skin bordering the aperture is gradually distended and a leak-tight closure of the aperture is produced.

5. An embalming appliance for use in closing the aperture in the skin of a corpse which results from the introduction of a trocar, said appliance being designed to distend the skin bordering said aperture and by reason of the elasticity of the skin to provide a leak-tight closure for the aperture, said appliance comprising a disk-like head and a screw-threaded, truncated conical body, the surface of the thread facing toward the head being approximately perpendicular to the axis of the body, the larger end of the body being joined to the under side of the head and being coaxial with the latter, the body tapering to a diameter such as to facilitate the introduction of its small end into the undistended aperture formed by the trocar and the taper of the body being such as gradually to distend the skin bordering the aperture as the appliance is screwed into the aperture and the outer edge of the screw thread on the body being rounded.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

35	Number	Name	Date
	42,473	Hartman	Apr. 26, 1864
	846,981	Claiborne	Mar. 12, 1907
	874,543	Scheuer	Dec. 24, 1907
	951,437	Gehrke	Mar. 8, 1910
40	1,260,154	Day	Mar. 19, 1918
	2,053,918	Peretzman	Sept. 8, 1936
	2,172,258	Place	Sept. 5, 1939

FOREIGN PATENTS

45	Number	Country	Date
	176,795	Germany	Nov. 6, 1906