Nov. 25, 1969 D. D. DURLAND 3,479,691

DEVICE FOR MAKING SCULPTURE

Filed July 17, 1967

FIG. 1

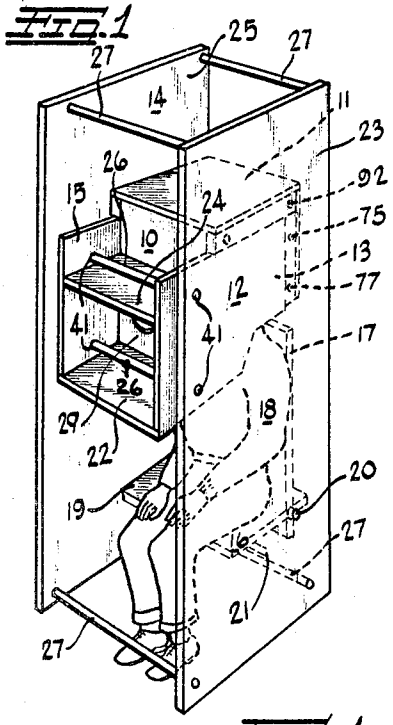


FIG. 2

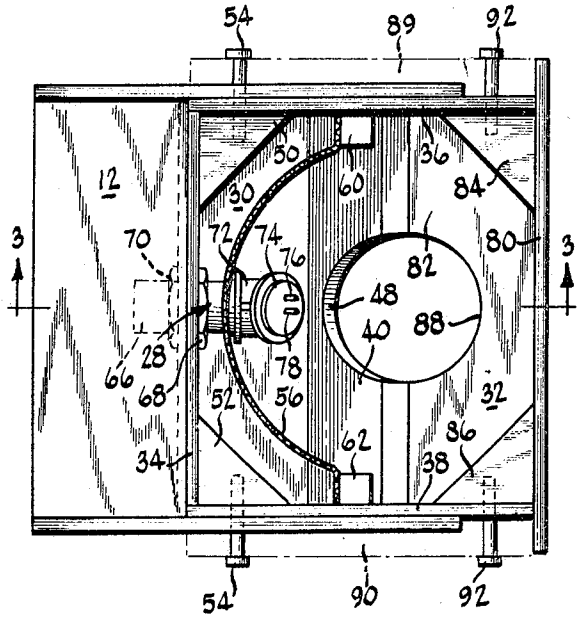


FIG. 4

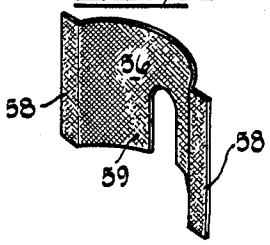


FIG. 3

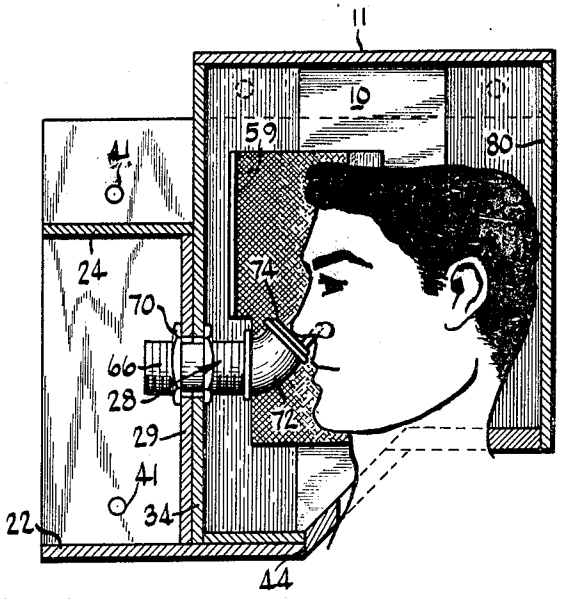
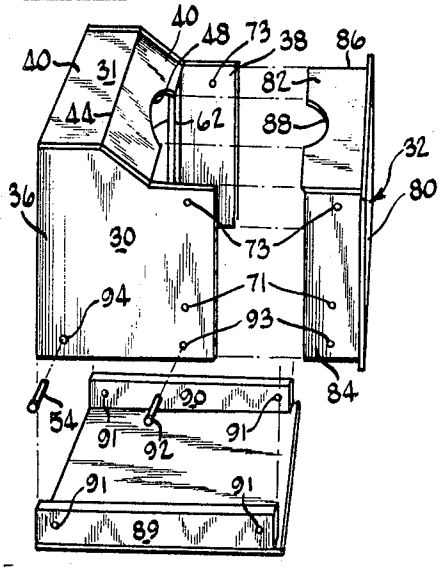


FIG. 5



INVENTOR

Donovan D. Durland

R. F. Bojanowski

ATTY.

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DEVICE FOR MAKING SCULPTURE

Donovan D. Durland, 1183 W. Main St.,
Decatur, Ill. 62522

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ABSTRACT OF THE DISCLOSURE

A device for producing a sculpture of a human head comprising a head enclosure having a removable cover and back section. The head enclosure also contains a means for supplying air to the subject during the making of a mold and a means for retaining the mold within the head enclosure while the subject's head is removed. The mold in the head enclosure is then cast with a solid forming liquid.

This invention relates to a device for producing sculpture and particularly relates to a method and device for producing a life-like impression mold of a person's head and for casting this impression.

Sculpturing, which is broadly defined as the art of producing a representation of a person in the round, is one of the oldest arts known to man. One particular type of sculpture which is easily recognizable is the bust. This type of sculpture is a representation of only the person's head, although in many instances it will also include the person's shoulders and chest. However, this latter inclusion has limited significance in the art and generally serves only as a base or pedestal for the sculptured head. Although sculpturing is normally identified with a highly skilled artist working with a hammer and chisel, sculpturing is much broader and includes any representation in the round that is carved, molded, or cast from a material such as stone, clay, plaster, metal, wood, ice, and the like. This invention is concerned with the latter two, namely, molding and casting and specifically with the molding and casting of a person's head.

Over the years many techniques have been proposed for molding and casting a bust or life-like representation of a person's head. One of the earliest methods reported is for a sculptor to sculpt a clay reproduction of a head from which a mold is produced. The mold is then cast with a liquid or molten material, solidified and the mold chipped away. Although a durable reproduction can be obtained by this method, only one casting is possible per mold and further, a gifted sculptor is required to produce the clay reproduction particularly, if a true and accurate representation of the person's head is desired. Also, this method is time-consuming and under present economic conditions is too costly for the average individual.

More recently a method has been proposed in U.S. Patent 996,783, for example, for making reproductions from life. According to this patent, a number of thin, light layers of wax are applied directly to a pesron's face and head until the desired thickness is obtained. The wax is then removed in pieces and reassembled to produce a mold from which a casting can be made. One of the disadvantages of such a technique is that the wax must be removed carefully and, if accurate reproductions of appendages such as ears and nose are to be obtained, the wax must be removed in many small pieces and later carefully reassembled. Further, this process requires that many thin layers of wax be applied in order to avoid distorting the facial features by applying too much of the wax too quickly. Considerable discomfort and danger to the subject is also encountered by this technique.

Another method for producing a life-like mold is to apply a quick drying, solid forming material such as plaster of Paris over the subject's face which, after cooling, is removed in pieces and reassembled. The disadvantages of this process are similar to those encountered in the above "wax" process. However, with this process there is the additional disadvantage that the softer flesh parts of the subject's face are depressed on application of the heavy plaster causing distortions and inaccuracies in the mold. These distortions must then be corrected by casting the mold and making another mold from the original casting.

It is therefore a primary object of this invention to provide a device which overcomes the disadvantages heretofore encountered in producing a life-like reproduction of a human head.

Another object of this invention is to provide a device for producing a reusable, one piece impression of a person's head quickly, safely and economically.

Still another object of this invention is to provide a device which can be used in both molding and casting a bust.

Another object of this invention is to provide an impression forming device which can be quickly and easily disassembled to insure maximum safety of the subject while an impression of the subject's head is being made.

Other objects of this invention will be apparent from the disclosure and accompanying drawings in which like numbers represent like parts in the various views and in which:

FIGURE 1 is a perspective view showing generally one embodiment of this invention and its proposed use.

FIGURE 2 is a top cross-sectional view of the head enclosure and enclosure holder immediately below the enclosure cover.

FIGURE 3 is a view taken along line 3—3 of FIGURE 2 showing a head in position for the taking of an impression.

FIGURE 4 is a magnified perspective view of a retaining means.

FIGURE 5 is a perspective overturned view showing how the main parts of the head enclosure are slidably united.

Referring now to the drawings and particularly to FIGURE 1 which shows the use of one embodiment of a device constructed in accordance with this invention wherein a head enclosure designated generally by numeral **10** with cover **11** is slidably engaged and held by an enclosure holder designated generally by numeral **12**. The enclosure holder is mounted to vertical walls **23** and **25** of enclosure support shown generally by numeral **14** by rods **26** passing through holes **41** located in matching opposed relation in side walls **13** and **15** of the enclosure holder and vertical walls **23** and **25**. Seat **16** having a back support **17** passing through its horizontal seat section **19** at substantially a right angle is pivotally mounted to vertical walls **23** and **25** by rod **20** passing through a hole bored laterally through back support **17**. Forward pivotal movement of the seat is prevented by rod **21** running horizontally under the seat section and mounted to the two vertical walls of the enclosure support. With this arrangement only a backward tilting movement of the seat is possible. Subject **18** is shown in a seated position with his head in head enclosure **10**. As the seat is tilted backward by the downward pushing action of the subject's feet, the subject's head is lifted slightly up and out of the rear portion of the head enclosure. This allows the subject to withdraw his head easily and quickly from the area of the head enclosure.

Side walls **13** and **15** of enclosure holder **12** are held in vertical upright position by lower horizontal tray **22** and

upper horizontal tray **24** separated by front wall **29** of the enclosure holder. The enclosure holder, as previously indicated, is mounted to the enclosure support by rods **26** passing through holes **41** of side walls **13** and **15** and vertical walls **23** and **25**.

Vertical side walls **23** and **25** of the enclosure support are held in vertical upright position by four horizontal connecting rods **27** of substantially equal length extending between and mounted to each of the side walls.

Referring now to FIGURES 2 and 3 which show a top and side cross-sectional view of head enclosure **10** slidably engaged and held by enclosure holder **12** and FIGURE 5 which shows an overturned perspective of the three main parts of the head enclosure.

Broadly, the head enclosure **10** performs a number of important functions during the taking of an elastic impression, the subsequent casting of the impression to produce a bust-like representation. The head enclosure's primary function is to enclose a subject's head and neck and to supply the subject enclosed therein with a breathing atmosphere through a breathing means shown generally by numeral **28**. The head enclosure also receives and holds an impression forming material which is introduced therein and which encompasses the subject's head and neck. Also, the head enclosure is adapted to retain the impression forming material after it has set and the subject's head has been removed. Finally, the head enclosure holds the impression or mold in its set position while the impression is being cast.

The head enclosure comprises broadly a front section indicated generally by numeral **30**, a detachable rear section indicated generally by numeral **32**, and a breathing means shown generally by numeral **28**. The front and rear sections in slidable engagement provides an enclosure having an opening at the top through which an impression forming material can be added. The top opening is adapted to receive cover **11** which is normally in place during the casting operation which will be described in greater detail later in this disclosure. Another opening at the bottom is provided for encircling the subject's neck and through which the casting material can be introduced during the aforementioned casting operation.

Considering first in greater detail the front section which can be generally described as being scoop shaped and having a front wall **34**, two identical side walls **36** and **38**, and a partial or incomplete bottom wall **40**. Bottom wall **40** follows angularly the cut of the bottom portion of side walls **36** and **38** of the head enclosure forming a pan-like section shown generally in FIGURE 5 by numeral **31**. The front section is designed to enclose the front and two sides of a subject's head. The pan section is specifically designed to pass under a subject's chin and to surround the front half of the subject's neck.

Side walls **36** and **38** of front section **30** proceed rearwardly from front wall **34** in substantially right angle relations to the front wall. The top edges of the side walls are essentially straight and in a substantially parallel relation to the bottom edges of the side walls with the exception of the middle third portion of the bottom edge which is cut on an angle upward and away from the front wall. This angular cut results in a side wall having a front vertical edge longer than its back vertical edge. Bottom wall **40**, as stated above, follows the cut of the side walls forming a pan-like section extending between the two side walls. The angular portion of the bottom wall extends slightly beyond the horizontal portion of the bottom wall forming a ledge **44** extending horizontally between the two side walls. This ledge is of such size and shape that it meets flush with the back edge of lower horizontal tray **22** when both edges are in abutting relation making a continuous outer surface between the head enclosure and the enclosure holder when the head enclosure and the enclosure holder are telescopically engaged.

Referring to FIGURE 5 which shows an overturned perspective view of the head enclosure wherein approximately midway between the two side walls **36** and **38**, a recession **48** approximating a half circle is cut into the slanted portion of the bottom wall **40** to accommodate the lower front portion of a person's neck.

Referring now to FIGURE 2, triangular braces **50** and **52** are vertically mounted one in each of the two corners formed by the junction of front wall **34** and side walls **36** and **38** to reinforce the front section of the head enclosure. The triangular braces also house pins **54** (one on each side) in holes **94** which position and hold the front section of cover **11** on the head enclosure. Pins **54** may be removed quickly from their respective housings by merely pulling the pins outwardly and away from the holes in the head enclosure. This releases the front section of the cover from the enclosure holder. The triangular braces also serve to reduce the volume within the head enclosure and thereby reduces the quantity of impression forming material required for obtaining a mold or impression.

A critical feature of this invention is that the inner surface of front section **30** of enclosure holder **10** be adapted with a retaining means **56** to retain and hold fast the impression forming material after the impression forming material has set during removal of the subject's head. The impression or mold thereby produced is retained in the enclosure holder by the retaining means. The head enclosure, with the impression or mold firmly retained within the enclosure and in the exact same position it was in when the mold was formed, may then be inverted and the impression cast. By not having to remove the mold or impression from the head enclosure during the casting operation, distortion of the impression is minimized, if not completely avoided.

In one embodiment of this invention, the retaining means **58** is shown generally as a slitted omega shaped element with perforations **59**. A magnification of such element is shown in FIGURE 4. However, this retaining means can take on almost any size and shape and can be part of or separate from the inner surface of the front section. Preferably, the retaining means is an element which can be easily removed from the head enclosure. This facilitates cleaning of the retaining means after the mold or impression has been cast and separated therefrom.

More specifically, the retaining means **56** follows generally the inside contour of the inner wall of the front section and is held vertically by wings **58** to ribs **60** and **62** mounted to side walls **36** and **38** respectively. As previously noted, the retaining means **56** contains a plurality of perforations **59** through which a small portion of the impression forming material can pass. After the impression forming material has set, the impression forming material is held firmly to the retaining means by the perforations and thereby permits the subject's head to be separated from the impression forming material without disrupting the position and shape of the subject's impression produced therein.

Referring again to FIGURES 2 and 3 which show a breathing means designated generally by number **28** and which comprises a threaded pipe **66** which passes through apertures in front wall **34** and transverse wall **29**. Retaining means **56** has a vertical slit which slides around and over the threaded pipe **66**. Pipe **66** is adjustably held in position by an inner lock nut **68** and outer lock nut **70** which, when tightened toward the center of the pipe, tightly sandwiches the front wall **34** and the transverse wall **29** between them locking the front section of the head enclosure to the enclosure holder. This retains the pipe in a firm, substantially perpendicular relation to the front and vertical walls. With the above arrangement, the adjustable breathing means may be slidably positioned in the head enclosure to any desirable depth for supplying a breathing atmosphere to a subject within the enclosure. This permits a subject to breath comfortably while an impression of the subject's head is being made.

A female threaded elbow **72** is screwed onto that portion of the threaded pipe which extends into the head enclosure giving an upward curvature to a point just below the subject's nostrils. The other end of the elbow is covered with a threaded cap **74** having two small threaded tubular members **76** and **78** protruding through the cap and extending outward toward the nostrils of the subject. The tubular members are of such size and shape that they can fit snugly into the nostrils of the subject and thereby make breathing easy for the subject during the time when the impression is being made. Although the breathing means is shown in FIGURE 3 as supplying air to the subject through the subject's nostrils, such breathing means can be adapted with a breathing piece, if desired, for supplying air through the subject's mouth. Since all members of the breathing means are threaded, the position and length of these members can be readily varied to permit the breathing means to be easily and quickly adjusted to the breathing needs of most all subjects.

The rear section **32** of head enclosure **10** comprises a vertical back wall **80** and bottom wall **82** mounted in perpendicular relation. The back wall and bottom wall being supported by triangular shaped vertical braces **84** and **86** mounted vertically thereto. The mounted triangular braces also serve as the side walls forming the complete rear section. Approximately midway along the leading edge of the bottom wall, a half circle-like recession **88** is cut into the bottom wall. Recession **88** is directly opposite to and is approximately of the same diameter as recession **48**. When the front and rear sections are telescopically engaged, a circle bent along its diameter is formed (shown in FIGURES 2 and 5) for encircling the subject's neck. The leading edge of the bottom wall of the rear section is reciprocally cut to receive the back edge of the bottom wall of the front section to form a continuous appearing bottom wall with a circular portion removed from the center thereof.

Referring now particularly to FIGURE 5, it can be seen that the width of rear section **32** is slightly less than the width of front section **30** thus permitting the rear section to telescopically engage the front section to form a box-like enclosure open at the top and having a hole in the bottom, said bottom hole being of such diameter that a subject's neck can be encircled thereby. An enclosure cover **11** is provided to cover the opening at the top of the head enclosure. The enclosure cover **11** has two rib sides **89** and **90** mounted to the bottom portion near the side edges of the enclosure cover. When the cover **11** is in proper position on the head enclosure, the side ribs override and closely engage the side walls **36** and **38** of the front section forming a tight cover fitting for the head enclosure. At each end of the rib sides, holes **91** are provided which coincide with holes **93** and **94** located along the walls of the front and rear section for receiving a pair of slidably insertable pins **54** and **92** which hold cover **11** in locked position. Pins **92** also lock and hold front section **30** to rear section **32**. An additional set of pins **75** and **77** (shown in FIGURE 1) pass through matched holes **71** and **73** (shown in FIGURE 5) located at or near the ends of the front and rear sections of the head enclosure. It should be noted that these pins **92**, **75** and **77** are located on both sides of the head enclosure and are preferably only slidably engaged. Thus these pins can be removed quickly enabling the rear section of head enclosure to be separated in a matter of seconds from the front section still retained in the enclosure holder. This assembly thereby insures maximum safety at all times for the subject whose head is enclosed by the head enclosure.

The enclosure holder is designed to telescopically hold and position the head enclosure in the position desired for taking of an impression. The enclosure holder is mounted to the vertical walls **23** and **25** of enclosure

support **14** by rods **26** which pass through holes **41** located in the side walls **13** and **15** of the enclosure holder. Lower horizontal tray **22** and upper horizontal tray **24** and transverse wall **29** are mounted to side walls **13** and **15**. The lower horizontal tray **22** extends rearwardly beyond the head enclosure permitting the bottom wall of the head enclosure to rest on the rearward portion. The transverse wall **29** is parallel to and fits flush against the front wall **34** of the front section when in telescopic engagement. The length and width of the side walls of the enclosure holder are such that the head enclosure can be telescopically engaged into the enclosure holder and thereby gives the head enclosure the necessary position and support needed while the impression is being taken. As previously mentioned, the transverse wall also possesses an opening through which the breathing means extends outward to the atmosphere.

In the making of a sculpture or bust, the enclosure holder **12** is mounted to the enclosure support **14** by placing rods **26** through matching holes **41** located in both the enclosure holder and the enclosure support. The front section **30** of head enclosure **14** is then telescopically inserted into the enclosure holder **12**. The subject **18** is seated in seat **16** and his head placed into the front section of the head enclosure. After the subject has been comfortably seated and his head is properly aligned in the front section of the head enclosure, cotton is inserted into the ears of the subject and the subject's hair is greased or covered with a close fitting net or cap.

The breathing means **28** is adjusted and tubular members **76** and **78** of the breathing means are inserted into the subject's nostrils. Once it has been determined that the subject is breathing comfortably through the breathing means, the rear section **32** of the head enclosure is telescopically engaged into the front section **30**. The space between the subject's neck as well as other major void areas in the head enclosure are packed with a filler material such as cloth, paper, sponge rubber, and the like to minimize loss and to reduce the amount of impression forming material added to the head enclosure.

An elastic impression forming material such as alginate, rubber base, silicone, resins, gums or any other elastic or flexible setting creme, paste or highly viscous liquid material is mixed and after the subject's eyes are closed, is poured into the head enclosure and around the subject's neck and head. After the head enclosure is completely filled with the impression forming material enclosure cover **11** is slid into position from the back to the front. Any excess material will be skimmed off the top and collected on upper horizontal tray **24**.

After the impression forming material has "set," the enclosure cover and the rear section of the head enclosure are removed, a dull spatula is gently inserted into the impression forming material at the base of the subject's neck and in slitting motion is moved upward along the back of the neck to a point about two or three inches from the subject's forehead or hair line. The impression forming material is then separated from the subject's head by pulling apart the slitted portions. The impression forming material is loosened from around the subject's ears by placing one's hands in between the subject's head and the impression forming material and separating the impression forming material by movement of the fingers. The elastic impression forming material can be stretched slightly whenever and wherever necessary to assist in separating stubborn areas from the subject's head. On a prearranged signal the subject pushes backward with his feet forcing the pivotally mounted seat to tilt backward. This backward tilting action forces the subject's head slightly up and out of the impression forming material. The upward action also separates the subject from the breathing means. The impression forming material is retained in the front section of the head by the retaining means **56**.

After the subject has been removed from the head enclosure, the rear section and enclosure cover of the head

enclosure are replaced. Pins **54**, **92**, **75** and **77** are placed in their respective holes in the head enclosure and lock nut **70** removed. The entire head enclosure is then pulled out from the enclosure holder and inverted on a flat surface (inverted position shown in FIGURE 5). The impression or mold may now be inspected through the neck opening with a light and mirror to determine if the slitted section of the impression or mold are properly joined. If desired, the slitted portions may be glued together, however, this is not generally necessary.

An artificial stone, cold cure resin, liquid metal or other solidifying material is poured into the mold through the neck opening and allowed to harden. After the mold has been cast and the material hardened, the cover and rear section of the head enclosure are removed and the impression or mold separated from the sculpture by the same method employed in removing the subject's head from the head enclosure.

With the apparatus and process of this invention more than one bust may be prepared from the same cast as the elastic impression or mold can be separated from the subject or casting without breaking or otherwise damaging the mold.

While but one embodiment of the invention has been shown and described, it will be apparent that certain other changes and modifications may be made therein. It is therefore to be understood that it is not intended to limit the invention to the embodiment shown, but only by the scope of the claims which follow.

I claim:

1. A device for producing an elastic impression of a human head comprising in combination

(1) a head enclosure for enclosing a subject's head and holding an elastic impression forming material, said head enclosure having

(a) an opening in the bottom of said head enclosure for encircling the neck of the subject and

(b) an opening in the top of said enclosure through which the elastic impression forming material can be added to encompass the subject's head enclosed therein,

(c) a removable back section to permit easy removal of the subject's head and

(d) a front section having

(1) a retaining means along its inner surface for retaining and holding fast the impression forming material after said material has gelled and permitting removal of the subject's head,

(2) a means mounted through said front section for supplying a breathing atmosphere to a subject within said enclosure and

(3) a means for holding said front section to said back section.

2. Device of claim **1**, wherein said retaining means is removable.

3. Device of claim **1**, wherein said retaining means comprises an omega shaped member having a plurality of perforations, said perforated member being vertically mounted between said inner surface of the front section and the subject's face.

4. Device of claim **3**, wherein said breathing means comprises a hollow member passing through said front section, said hollow member having a means at one end for directing and carrying a breathing atmosphere to a subject enclosed within said head enclosure.

5. Device of claim **4**, wherein said hollow member is adjustable and wherein one end of said hollow member is adapted with a means for fitting into the subject's nose or mouth and thereby permitting the subject to breathe normally while an impression of the subject's head is being produced.

6. Device of claim **3**, wherein said breathing means is an adjustable pipe slidably inserted through said front section with one end of said pipe leading to the atmosphere and the other end leading to the subject's nose, said latter end having a capped member and two smaller tubular members extending through said cap member for tight placement in each of the subject's nostrils.

7. Device of claim **1**, wherein said head enclosure is held by a head enclosure holding means.

8. Device of claim **7**, wherein said head enclosure is telescopically positioned in and held by said head enclosure holding means.

9. Device of claim **7**, wherein said head enclosure holding means is mounted to an enclosure support.

10. Device of claim **9**, wherein a seating means is pivotally mounted to said enclosure holder directly below the enclosure holding means, to permit the subject to sit comfortably while his head is enclosed by said head enclosure.

11. Device of claim **10**, wherein said seating means is pivotally mounted to prevent a forward pivotal movement and to permit a subject seated in said seating means to be raised slightly as the subject's head is drawn backward away from the head enclosure by the backward pivotal action of the seating means.

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WILBUR L. McBAY, Primary Examiner

U.S. Cl. X.R.

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