

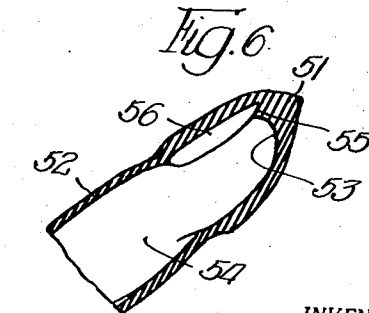
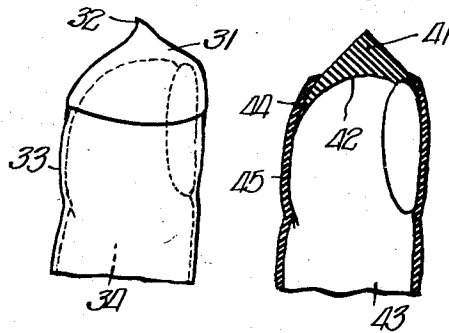
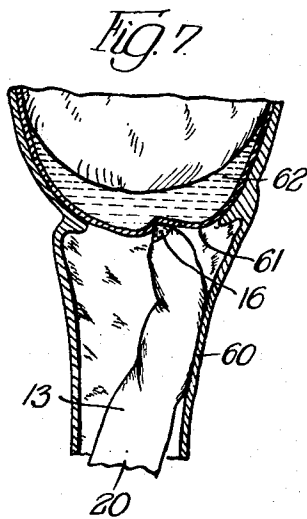
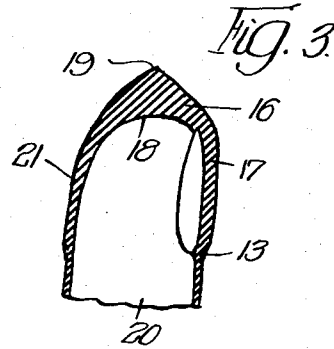
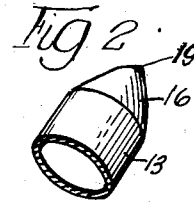
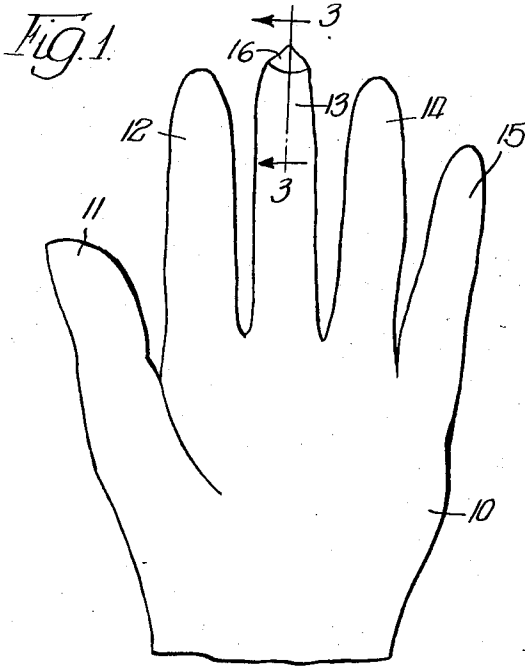
Aug. 12, 1958

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2,847,012

DEVICE FOR RUPTURING THE AMNIOTIC MEMBRANES

Filed Oct. 13, 1954



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2,847,012

Patented Aug. 12, 1958

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2,847,012

DEVICE FOR RUPTURING THE AMNIOTIC MEMBRANES

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Application October 13, 1954, Serial No. 462,026

4 Claims. (Cl. 128—303)

This invention relates to surgery and is more particularly concerned with a device which is adapted for use in an obstetrical operation in which the membrane covering the opening at the cervix is artificially punctured to release the amniotic fluid.

During the pregnancy period amniotic fluid is introduced into the uterus with the result that when labor begins and the muscles are contracting in an effort to expel the baby from the uterus the action of the muscles may be ineffective to expel the baby because of the amount of fluid present, and the baby may be merely moved from one area to another within the uterus. When the obstetrician recognizes this condition it is the usual practice for him to artificially rupture the membrane covering the opening at the cervix which confines the fluid to the uterus and permit some of the fluid to be drained from the uterus so that the muscle activity during labor will be directed solely toward the expulsion of the baby without interference from the fluid. It is the common practice for the obstetrician to rupture the membrane by a procedure in which a small plier-like instrument, such as an "Allis" forceps, is placed in the palm of the hand which is then inserted in the vaginal canal with the fingers extended and the ends of the plier-like tool manipulated to engage and rupture the membrane. During such an operation there is great danger, especially for doctors with large hands or those not particularly adept in respect to such an operation, that the instrument will injure the vaginal walls or the cervix, or even penetrate into the uterus too far, to the extent that the end of the instrument might well strike the head of the unborn baby. Obviously, use of the forceps or a similar instrument in this operation involves considerable hazard to the patient. Other procedures for performing this operation have been suggested but they have not been successful, principally because they have involved the use of a tool or instrument of such a character that injury to the patient or the baby is difficult to avoid.

It is a general object of the present invention to provide a device for use in connection with the artificial rupturing of the membrane during childbirth which reduces to a minimum the possibility of injury to the mother or the child and the use of which requires no more than a normal amount of skill on the part of the doctor.

It is a more specific object of the invention to provide a surgical device which comprises a glove-like cover for a portion of the hand having a hardened extension affixed to the end thereof which may be manipulated to engage with and rupture the membrane at the cervix in an obstetrical operation.

It is a more specific object of the invention to provide a glove of relatively thin pliant sheet-like material which is adapted to conform to the shape of the hand and which has incorporated on the end of a finger thereof a membrane rupturing member having a relatively hard non-metallic point which does not interfere with the use of the hand and which does not reduce the degree of sensitivity in the finger or the hand whereby the device may be ma-

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nipulated by the user for engaging the point with the membrane to rupture the same without danger of injury to the vaginal walls, the cervix, and/or the baby.

- It is another object of the invention to provide a device for use in obstetrical examinations which comprises a rubber-like glove for the hand of the physician which has a hardened tip on the end of the middle finger and which may be manipulated by the physician to engage the tip in contact with the membrane across the opening at the cervix.

These and other objects and advantages of the invention will be apparent from a consideration of the device which is shown by way of illustration in the accompanying drawings, wherein:

- Fig. 1 is a plan view of a glove having incorporated therein the principal features of the invention;

- Fig. 2 is a perspective view to an enlarged scale of a portion of the end of the middle finger of the glove showing the membrane rupturing element thereon;

- Fig. 3 is a section taken on the line 3—3 of Fig. 1, to an enlarged scale;

- Fig. 4 is a side elevation of a portion of the end of the middle finger of the glove showing a modified form of the membrane rupturing member;

- Fig. 5 is a section similar to Fig. 3 illustrating a further modification of the device;

- Fig. 6 is a sectional view of a portion of the end of the middle finger of the glove illustrating a further modified form of the device; and

- Fig. 7 is a sectional view through the body illustrating the use of the device.

In all operations and examinations where there is danger of infection it is the universal practice for the operating or examining physician to cover his hand with a glove which is generally made of rubber latex film and which closely conforms to the shape of the hand. The device of the present invention is preferably incorporated in a glove of this general character as illustrated in the drawings.

- The glove 10 may be in the usual form with a thumb 11 and finger forming portions 12, 13, 14 and 15 which leave the fingers free for movement and which does not materially decrease the degree of sensitivity in the fingers while the glove is worn. One of the fingers, preferably the middle finger 13, has incorporated in the end thereof a tip forming element 16 which is preferably of a generally conical shape with the marginal edges of the base integrally connected or joined at 17 to the finger forming portion 13 of the glove. The inner portions of the base of the element 16 (Fig. 3) may be recessed as at 18 to conform to the shape of the end of the finger 20 while the apex thereof is in the form of a somewhat pointed end 19. The specific shape of the end member 16 is not critical so long as it forms a projecting membrane engaging peak or tip formation 19 at the outer terminus thereof and has sufficient rigidity to permit it to be manipulated by movement of the finger 20. In the form illustrated (Fig. 1) the tip 16 may be integrally molded or formed with the glove, from the same material, as an extension on the finger portion with the edge of the base and adjacent portions of the walls of the finger thickened at 21 to give it greater rigidity. It is preferably provided on the middle finger for reasons which will be explained.

- In the form of the device as illustrated in Figs. 1 to 3 the tip forming member 16 is generally conical in shape with a plain and somewhat blunt outer end or point. In the device as illustrated in Fig. 4 the tip element 31 is similar to the tip element 16 but it is provided on its outer free end with a hook-shaped formation or point 32 which is arranged on the glove finger 33 preferably so that it curves or faces in the direction of the inside surface of the finger 34 of the user.

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A modification is illustrated in Fig. 5 in which the tip 41 is of the same generally conical form as the tip 16 with the base thereof recessed at 42 to receive the end of the finger 43 and with the marginal edges 44 joined to the inside and adjacent the end margins of the finger forming portions 45 of the glove, the latter being apertured at the end and the element 41 being secured therein in the form of an insert. In this form the element 41 may, of course, be preformed of a different material than the rubber glove.

In the form of the device illustrated in Fig. 6 the tip 51 may take any of the shapes illustrated in Figs. 3 to 5, and it may be integrally cast with the finger portion 52 of the glove itself or attached thereto in any manner. The base portion of the conical shaped peak or tip 51 is recessed at 53 to receive the end of the finger 54 and on the inside wall defining the recess 53 there is provided a small protuberance 55 which is adapted to be engaged by the end of the fingernail 56 to permit the tip 51 to be more readily manipulated by movement of the finger 54.

All forms of the glove structure which are described herewith are employed in the same manner in the surgical operation which is illustrated in Fig. 7. The glove 10 is placed on the hand of the physician and the fingers are introduced into the vagina 60 with the point or tip formation 16 extending from the finger 13 so that it will be engaged with the membrane 61. The rupturing of the membrane 61 is accomplished by pulling the tip 16 across the surface of the same by crooking or manipulating the finger 20, to puncture or tear the membrane and permit the fluid 62 to escape through the aperture made in the membrane 61. Draining the fluid from the uterus in this manner not only hastens labor but also facilitates the dilation of the cervix by the the baby's head and contributes to an easier birth.

Generally the tip or point formation will be non-metallic and formed of the same material as the glove with the material comprising the tip having somewhat greater hardness than the membrane so that it will be capable of tearing or rupturing the membrane and will still not be so sharp or hard as to make it dangerous to the walls of the cervix or the baby if it is accidentally brought in contact with the same during the operation.

While specific details of the device and particular materials have been referred to in describing the several forms illustrated it will be understood that other details of construction and other materials may be resorted to within the spirit of the invention.

I claim:

1. A surgical glove adapted for use in an obstetrical operation which involves rupturing the amniotic membrane to release the amniotic fluid and facilitate childbirth, said glove being formed of a relatively thin pliable and contractible rubber-like sheet material whereby it fits over the hand of the user and closely conforms to the contour thereof, said glove having finger enclosing portions and an integral membrane rupturing member at the end of one of said finger enclosing portions, said membrane rupturing member comprising a relatively hard generally cone-shaped non-metallic element integrally attached at its base to the glove, which cone-shaped element

is formed to provide a relatively hard pointed end projecting from said finger enclosing portion for engaging the membrane by manipulation of the finger whereby the same may be readily ruptured.

2. An obstetrical glove for use in rupturing the amniotic membrane to release the amniotic fluid and hasten childbirth, said glove being formed of a relatively thin pliable rubber-like material which fits over the hand of the user and which closely conforms to the contour thereof so that it is frictionally retained thereon, said glove having a finger forming portion and a membrane rupturing member adjacent the end thereof, said membrane rupturing member comprising a projecting element which is integrally attached adjacent its base to the finger forming portion of the glove and which is formed with a relatively hard pointed and somewhat blunt end for engaging the membrane by manipulation of the finger whereby the same may be ruptured by said element.

3. A glove for surgical use, said glove being formed of a relatively thin pliable and contractible material which fits over the hand of the user and closely conforms to the contour thereof so that it is frictionally retained thereon, said glove having an end portion covering the fingers of the user and a membrane rupturing member on said end portion comprising an element having a base portion integrally joined with said end portion of the glove, said element having a relatively stiff non-metallic pointed end projecting in the direction of the axis of the finger whereby said projecting end may be engaged with an amniotic membrane by manipulation of the fingers of the user to rupture said membrane.

4. A surgical device which is adapted to be placed on a finger for use in rupturing the amniotic membrane in an obstetrical operation, said device comprising a finger carried member of relatively thin pliable rubber-like material which closely conforms to the contour of the finger and which encompasses a substantial end portion of the finger sufficient to grip the finger and to be frictionally retained thereon, a pointed membrane rupturing element of relatively hard non-metallic material integrally secured at the end of said member, said element having a pointed end which is somewhat blunted and which is directed outwardly of the end of the finger in the direction of the long axis thereof whereby when said pointed end is drawn across the surface of the membrane by manipulation of the finger the membrane will be ruptured.

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