

United States Patent

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[54] OBSTETRICAL FORCEPS

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[58] Field of Search **73/141 AB; 128/323, 324, 346,
128/352, 353, 361; 214/2; 294/16**

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[57]

ABSTRACT

An obstetrical forceps wherein the gripping portions or blades are provided with an externally threaded shank or base portion over which is adapted to be threaded a combined tensiometer and hand grip portion to indicate the amount of compressive force and tension applied to the head of a baby during delivery.

19 Claims, 3 Drawing Figures

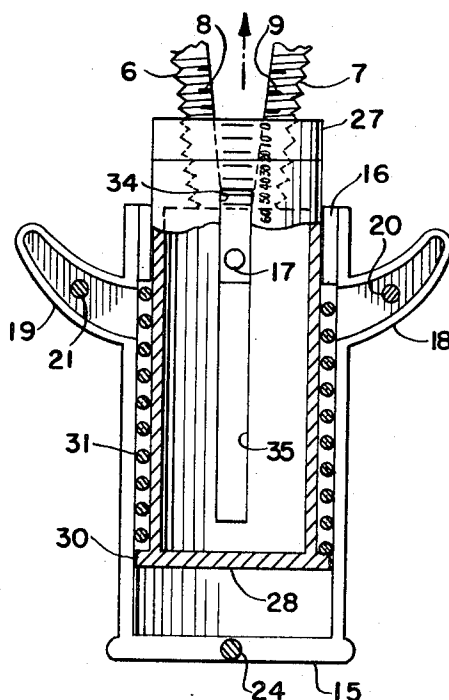


FIG. 1.

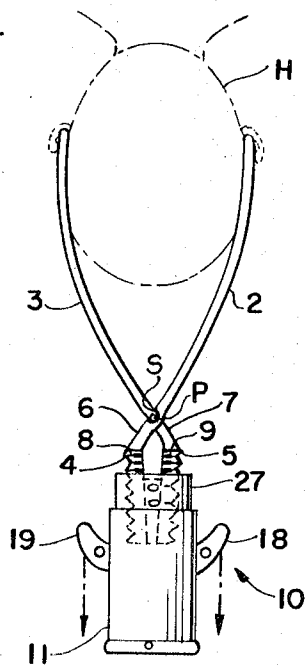


FIG. 3.

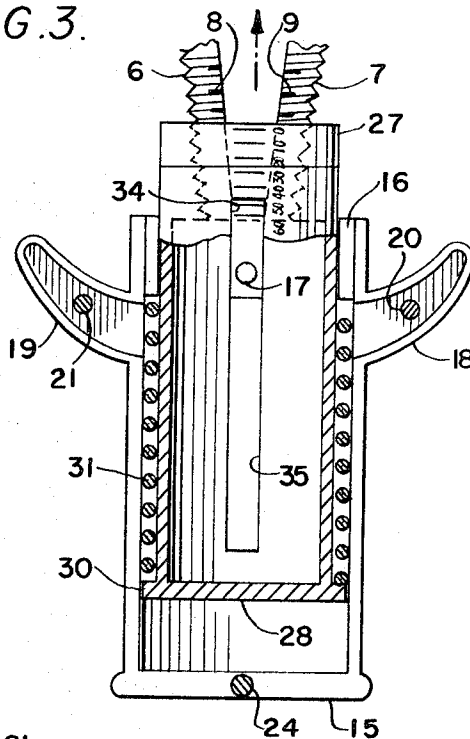
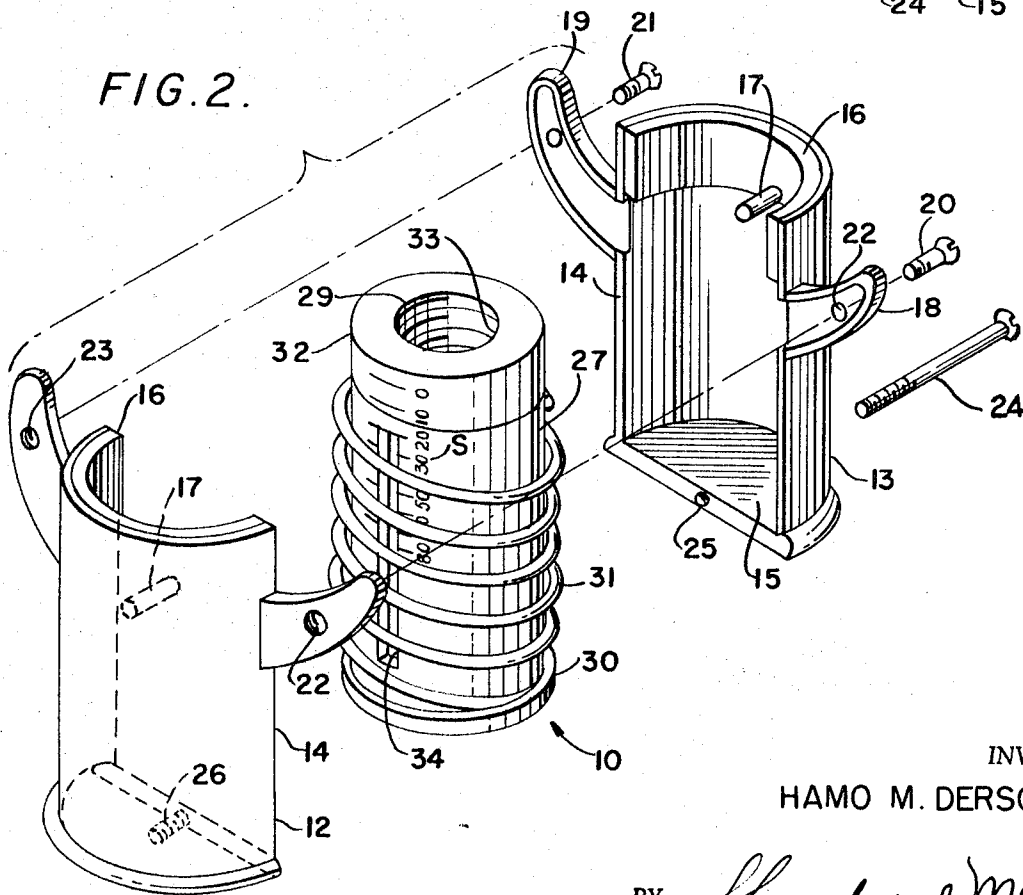


FIG. 2.



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OBSTETRICAL FORCEPS

BACKGROUND OF THE INVENTION

This invention relates generally to obstetrical forceps and is particularly directed to an obstetrical forceps having means for indicating both the compressive and tensile forces applied to a baby during delivery.

In the past, when it became necessary to use forceps to aid in the delivery of a baby, extreme care had to be exercised by the doctor making the delivery not to exert too much force on the baby during delivery so that the baby would not be damaged by the forceps. Generally, up to 80 pounds of pull may be exerted on the baby without danger of causing damage to the baby, but it is extremely difficult for the doctor making the delivery to judge accurately the amount of pull he is exerting; and accordingly, damage to the bone structure of the baby's head occasionally resulted. For example, the strength of the doctor would vary from individual to individual, and a large or strong doctor may exert more than the 80 pounds of pull generally regarded as safe.

Some obstetrical forceps are known in the prior art which provide means for indicating the amount of pull being exerted on the forceps, but these prior art devices are quite complicated and difficult to use and are cumbersome and hard to sterilize and the like.

The present invention obviates these problems existing in the prior art by providing an obstetrical forceps which is extremely simple in construction and which provides a simple and accurate means for indicating both the compressive force exerted on the baby's head by the forceps and the tensile force or amount of pull exerted by the doctor during delivery, whereby the doctor is enabled accurately and safely to gauge the amount of pull he is exerting thereby to prevent damage to the baby. Moreover, the present invention is simple and easy to sterilize, and in one form of the invention, the blades are disposable thus completely eliminating any need for sterilization.

OBJECTS OF THE INVENTION

It is an object of this invention to provide an obstetrical forceps having means for indicating the amount of pull exerted on a baby during delivery.

It is another object of this invention to provide an obstetrical forceps having means for indicating both the amount of compressive force applied to the head of the baby and the amount of pull or tensile force applied to the head of the baby during delivery.

It is a still further object of this invention to provide an obstetrical forceps as aforesaid which is extremely simple in construction and easy and economical to sterilize, or which may be made disposable after a single use so as to eliminate entirely the need for sterilization.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a somewhat diagrammatic view in elevation of the forceps according to the present invention positioned about the head of the baby, showing the scale means for indicating the compressive force and the tensile force applied to the baby's head during a delivery.

FIG. 2 is an exploded perspective view of the handle and scale means of the present invention illustrating the manner in which various components are assembled.

FIG. 3 is a side view in elevation partly in section illustrating the manner in which the scale means is applied to the base of the forceps and showing the scale extended to approximately 60 pounds.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings wherein like reference numerals refer to like parts throughout the several views, the obstetrical forceps according to the present invention is indicated generally at 1 in FIG. 1 and comprises a pair of

gripping prongs or blades 2 and 3 disposed in operative position about the head H of a baby. The blades 2 and 3 are releasably connected together at a pivot point by means of a pin P on one blade 3 received in a slot S in the other blade 2, for example, and a combined tensiometer and handle 10 is attached to the blades.

The base portions 4 and 5 of each of the blades 2 and 3 are externally threaded at 6 and 7, and each has indicia or scale means 8 and 9 inscribed thereon calibrated to indicate the amount of compressive force applied to the head of a baby. The blades of the forceps and their pivot are constructed such as to have a predetermined spacing between the ends thereof as determined or based on a standard head size. The base portions 4 and 5 are slightly tapered toward the ends thereof so that when the handle 10 is threaded upon the base portions 4 and 5, the blades 2 and 3 will be caused to move toward one another to exert a desired amount of compression on the head H of the baby. The scales 8 and 9 indicate the amount of compression being exerted so that the doctor is enabled to accurately gauge the force he is applying to the head of the baby.

As seen most clearly in FIGS. 2 and 3, the combination tensiometer and handle 10 for application to the blades of the obstetrical forceps includes a first member comprising an outer shell or casing 11 formed in two substantially identical halves 12 and 13 to facilitate assembly of the tensiometer and handle and also to enable disassembly of the tensiometer for cleaning or replacement of parts or the like if desired. Each half 12 and 13 comprises a substantially semi-cylindrical wall 14 closed at one end by a substantially semi-circular wall 15 which may be formed integrally with the sidewall 14 or made separately as desired. The opposite end of sidewall 14 is open and has a substantially semicylindrical spring retaining ring or shoulder 16 secured within the upper marginal edge portion of the sidewall. This spring retaining ring 16 can either be made integrally with the sidewall 14 or formed separately and then secured therewithin as desired. A relatively short radially extending pin 17 is formed on each semi-circular ring 16 adjacent the lower edge thereof, and a pair of outwardly directed wings 18 and 19 are formed on diametrically opposite edges of the sidewall 14, so that the handle portion may be securely grasped by the doctor for exerting a strong and steady pull on the forceps during delivery. A pair of relatively short screws 20 and 21 or other suitable fastening means are provided for extending through aligned holes 22 and 23 in the wing portions 18 and 19, and a relatively long screw 24 or other suitable fastening means is provided for extending through aligned holes 25 and 26 in the base portion 15 for rigidifying and securing the halves 12 and 13 in assembled relationship.

A second member comprising an attaching and indicating cylinder 27 is telescopically received within the casing or first member 11 and has a closed end 28 and an open end 29. A radially outwardly extending shoulder or flange 30 is formed on the closed end of the cylinder and provides a spring seat for a coil spring 31 disposed in surrounding relationship to the cylinder 27. The spring 31 is engaged at its other end with the ring 16 secured within the casing 11. An attaching collar 32 is fixed to the open end of the cylinder 27 and is internally threaded at 33 for mating cooperation with the threads 6 and 7 on the bases 4 and 5 of the blades 2 and 3. A pair of diametrically opposite slots 34 and 35 are formed in the cylinder 27 extending through the wall thereof longitudinally from adjacent the closed end to adjacent the collar 32.

In operation, with the parts assembled as indicated in FIGS. 1 and 3, the pins 17 extend into a respective slot 34 or 35 disposed at opposite sides of the cylinder 27 in order to prevent relative rotation between the cylinder 27 and the casing 11 while permitting relative axial movement therebetween. The blades 2 and 3 are inserted in operative position about the head of the baby and the base portions 4 and 5 are brought together with the pivot P assembled, and the combination tensiometer and handle 10 is threadably adjusted on the threads 6 and 7 on the base portions to a predetermined adjusted position, depending on the size of the head H of the

baby. A pull is then exerted on the casing 11 in order to aid in the delivery of the baby. As pull is exerted on casing 11, the cylinder 27 will telescope relative to the casing 11, collapsing spring 31 and the doctor may observe the amount of pull being exerted on the baby by looking at the scale S inscribed on the cylinder 27 as the cylinder 27 is pulled outwardly relative to casing 11. In this manner, an accurate and known amount of pressure is exerted on the baby's head and an accurate and known amount of pulling force is exerted thereon during delivery, thus avoiding the danger of damage to the head of the baby.

The various components comprising the invention may be simply and economically manufactured by investment casting or injection molding or the like from stainless steel or plastic or any other suitable material. It is contemplated as within the scope of this invention that the parts may be disposable if manufactured from plastic or some other suitable inexpensive material. In such case, sterilization of the obstetrical forceps is not necessary, and the expense and time involved in sterilizing the components may thereby be eliminated. Also, the pivot connection P between the blades 2 and 3 may be a pinned connection if desired rather than the connection shown or any other suitable pivoted connection may be utilized which will permit ready assembly and disassembly of the blades 2 and 3.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive and since the scope of the invention is defined by the appended claims, all changes that form their functional as well as conjointly cooperative equivalents are therefore intended to be embraced by those claims.

I claim:

1. A forceps for aiding in the delivery of a fetus, comprising a pair of forceps blades, means for pivotally interconnecting said blades about an axis transverse to the longitudinal axis of the forceps, and combination handle and tension indicating means having means for removably connecting said handle and tension indicating means to said blades, said handle being movable relative to said forceps blades in a direction parallel to the longitudinal axis of the blades to actuate the indicator for indicating the amount of pull exerted on the forceps and on a fetus during delivery with the forceps.

2. A forceps as in claim 1, wherein additional means are connected with said handle and said forceps blades for indicating the pivoted adjustment of said blades.

3. A forceps as in claim 2, wherein said combination handle and tension indicating means comprises a second member telescopically received in a first member, and means resiliently biasing said members in a first direction relative to one another.

4. A forceps as in claim 3, wherein said members are mova-

ble in a second direction against said resilient biasing means when a pulling force is exerted on one of said members

5. A forceps as in claim 4, wherein said tension indicating means comprises indicia on said second member.

6. A forceps as in claim 5, wherein said forceps is an obstetrical forceps and said additional means for indicating the pivoted adjustment of said blades and said tension indicating means indicate the amount of compressive force and the amount of tension applied, respectively, to the head of a baby during delivery of the baby.

7. A forceps as in claim 6, wherein each of said blades has an externally threaded base or shank portion and wherein said second member is internally threaded for mating cooperation with the external threads on said base portions of said blades.

8. A forceps as in claim 7, wherein said base or shank portions of said blades are tapered toward the ends thereof so that when said handle is threaded thereon, the distance between the other ends of said blades is adjusted.

9. A forceps as in claim 8, wherein said first and second members comprising said handle are cylindrical.

10. A forceps as in claim 9, wherein said means for indicating the pivoted adjustment of said blades comprises indicia on the base or shank portions of said blades.

11. A forceps as in claim 10, wherein said resilient biasing means comprises a coil spring disposed between said first and second members.

12. A forceps as in claim 11, wherein a flange is formed on one end of said second member and a shoulder is formed in the opposite end of said first member, said coil spring being disposed between said flange and said shoulder in engagement therewith.

13. A forceps as in claim 12, wherein said first member is formed in two substantially identical halves, said halves being secured together in assembled relationship around said second member.

14. A forceps as in claim 13, wherein said second member has a pair of diametrically opposite longitudinally extending slots in the wall thereof, and a pin is formed on each half of said first member in alignment with and extended into said slots for preventing relative rotation between said first and second members.

15. A forceps as in claim 14, wherein said blades are made of plastic.

16. A forceps as in claim 14, wherein said blades are made of metal.

17. A forceps as in claim 15, wherein said combination handle and indicating means is made of plastic.

18. A forceps as in claim 16, wherein said combination handle and indicating means is made of metal.

19. A forceps as in claim 1, wherein said blades are disposable and may be used only once and then thrown away.

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