

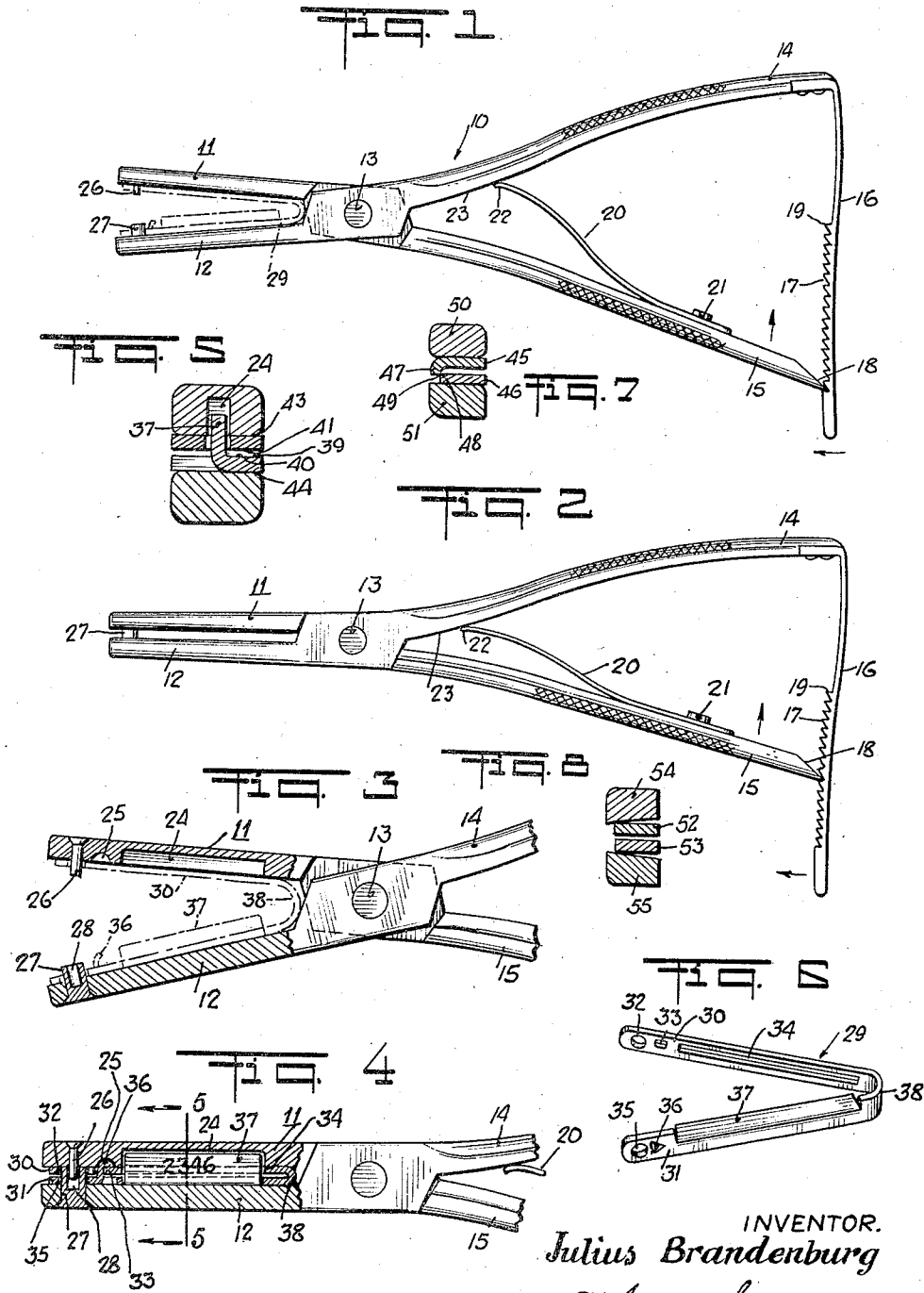
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J. BRANDENBURG

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UMBILICAL CLIP AND HOLDER FOR SAME

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INVENTOR.
Julius Brandenburg

BY *Spring Seidman*

ATTORNEY

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UMBILICAL CLIP AND HOLDER FOR SAME

Julius Brandenburg, New York, N. Y.

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This invention relates to umbilical clips and to forceps for applying such clips to umbilical cord.

Broadly, it is an object of my invention to provide a clip which will, upon pressure, cut the umbilical cord and automatically apply the clip to the umbilical cord so that it firmly adheres to the cord and seals the same.

More specifically, it is an object of my invention to provide an umbilical clip to be used with forceps so that the clip can be quickly applied to the umbilical cord effectively compressing the umbilical cord without closing the blood vessels passing through the center of the cord at the same time severing the cord simultaneously during the same operation.

Heretofore, a number of mechanical methods had been tried but apparently without satisfactory success. The previous method used is to tie the umbilical cord with gut. However, this method is slow and is not entirely reliable. Later methods employed other means, such as compressed clips which are generally attached to the umbilical cord and the cord then has to be severed after the clips have been applied. This method involves expensive instruments and the mother and infant run the danger of developing umbilical hernia due, sometimes, to the delay in severing the cord after the clips have been applied. With my clip, the possibility of a secondary hemorrhage will be eliminated and the application of the clip simultaneously severs the cord, the clip being quickly applied, thus eliminating all moisture from the clamped tissue, so that the blood supply is entirely cut off from this tissue, which eventually atrophies and the dead tissue drops off with the clip. During the compression of the clip upon the umbilical cord, the possibility of infection is minimized since the moisture is eliminated, thus retarding the possibility of bacterial growth.

My clips may be numbered or lettered to identify the infant and the mother, so that the possibility of error is avoided.

A further object of my invention is to provide holding means for the clip within the jaws of the forceps so that the possibility of the clips springing from the jaws of the forceps is entirely eliminated, and the clip is positively positioned within the forceps jaws.

A further object is to provide an identical light clip which may be easily sterilized so that, after it is applied to the infant, infection will not set in, nor will the clip irritate the body of the infant.

Still a further object of my invention is to provide an umbilical clip which will produce complete hemostasis by flattening the blood vessels of the

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umbilical cord without the danger of folding or creasing the cord to obtain a perfect closure in order to preclude any leakage or bleeding.

Still another object of the invention is to provide a perfected clip having the advantages of umbilical hemostat, so that all danger of its becoming unintentionally unfastened is eliminated.

Still another object is to provide a pair of forceps for rapid and easy application of the clip with ratchet means so that the clip can be speedily and safely applied by the forceps, simultaneously severing the cord and preventing the handles of the forceps from separating to relieve the pressure at the jaws.

A further object of the invention is to provide rounded edges at the sides of the forcep jaws to take up any pressure upon the umbilical cord in order to prevent the cord being severed where not intended.

For a fuller understanding of the nature and objects of my invention, reference is had to the following detailed description in connection with the accompanying drawings in which:

Fig. 1 is a side elevation of the forceps used for the application of the umbilical clip, the clip being shown in dot and dash lines.

Fig. 2 is a side elevation of the forceps shown in Fig. 1 in partially closed position.

Fig. 3 is a fragmentary side elevation enlarged showing the jaws of the forceps in longitudinal section.

Fig. 4 is a fragmentary section of the jaws of the forceps in closed position with a clip between the jaws of the forceps in closed or applied position.

Fig. 5 is an enlarged section taken through line 5—5 of Fig. 4.

Fig. 6 is a perspective view of the clip in open position.

Fig. 7 is a transverse section of a modified umbilical clip under compression.

Fig. 8 is a transverse section of another modified umbilical clip under compression.

Referring to the drawings, numeral 10 represents a forceps comprising an upper jaw 11 and a lower jaw 12, jaws 11 and 12 pivoting about a pivot member 13 and continuing beyond pivot 13, terminating in projecting handles 14 and 15, handle 14 being the upper handle to the end of which is attached a flexible ratchet 16 having teeth 17 and which is adapted to receive the end 18 of the lower handle 15. When the jaws 11 and 12 are in separated position, the handles 14 and 15 are spread apart as shown in Fig. 1 and as the handles are compressed, the end 18 of the lower handle rides upward along the ratchet teeth 17

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until it reaches the uppermost tooth 19 when the jaws 11 and 12 are in closed position. The spring 20 is attached to handle 15 by screw 21, the flexible end 22 of spring 20 rides along the inside edge 23 of handle 14, exerting pressure between the

The upper jaw 11 has a longitudinal channel 24, an anvil 25 and a depending pin 26. The lower jaw has a pin 27 having a hollow central portion 28 to receive the projecting portion of pin 26 therein as shown in Fig. 4. Pins 26 and 27 are firmly attached in the ends of jaws 11 and 12, respectively.

Referring to Fig. 6, I have provided a clip 29 comprised of opposed legs 30 and 31, the leg 30 having a hole 32 at its end and opening 33 adjacent the hole 32 and a longitudinal slot 34. The lower leg 31 has a hole 35 at its end in alignment with hole 32 when the clip is compressed, a projection 36 bent inwardly from the material of the clip and in alignment with hole 33 is placed adjacent hole 35. A blade 37 is bent inwardly at right angles to the inner face of leg 31 in alignment with slot 34, so that when the clip 29 is compressed, the end of the blade 37 will enter the slot 34, shearing the umbilical cord passing between the legs 30 and 31 and simultaneously compressing the umbilical cord between the inner surfaces of legs 30 and 31, so that the clip 29 is firmly clamped upon the end of the sheared umbilical cord. Legs 30 and 31 are retained under slight tension by the curved central portion 38.

In order to use and apply the umbilical clip 29 to the umbilical cord during childbirth, the clip is placed between the jaws 11 and 12 of the forceps, pin 27 passing through hole 35 and pin 26 passing through hole 32 of the clip. The handles 14 and 15 of the forceps are slightly compressed until the end 18 of the handle 15 rests in the lowermost ratchet tooth 17 as shown in Fig. 1. In this position, the clip 29 rests firmly in position between jaws 11 and 12 of the forceps, so that it cannot be dislodged. The surgeon is now ready to sever the umbilical cord and apply the clip to the infant.

Upon further compression of the handles 14 and 15, the handle 15 rides upward along the ratchet teeth 17, the spring tension of the flexible ratchet 16 preventing the return of handle 15. As the jaws 11 and 12 of the forceps move together, blade 37 enters the slot 34 and the channel 24 of the upper jaw 11, severing the umbilical cord while simultaneously the projection 36 passes through the hole 33 entering the anvil 25 and is simultaneously bent over as shown in Fig. 4, to permanently lock the legs 30 and 31 of the clip 29. During the closing of jaws 11 and 12, the upper pin 26 enters the hollow 28 of the pin 27 as shown in Fig. 4. The end of the umbilical cord is firmly compressed between the inner surfaces 39 and 40 of the legs 30 and 31 respectively of the clip and to prevent edges 41 and 42 of the clip from again severing the umbilical cord, I have rounded the opposed longitudinal edges 43 and 44, so as to provide a slight give or resiliency at the edges 41 and 42, thus preventing injury to the umbilical cord at this point.

Numbers, letters or characters may be placed along any portion of the clip 29 to provide positive identification of the infant and the mother.

I prefer to make my clip of very thin stainless metal which can be easily sterilized and which will not cause injury, weight or irritation to the infant. After the clip is applied, it remains upon

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the umbilical cord of the infant until it falls off of its own accord after healing.

In Fig. 7, I have shown a modified clip having opposed legs 45 and 46; the upper leg 45 has one edge 47 bent and overlaps the lower leg 46 which has a sharp upper edge 48. When the clip is compressed by the jaws 50 and 51, the umbilical cord (not shown) is severed by the sharp edge 48 and the sharp inside overlapping edge 49. The umbilical cord is sealed and compressed between the inside faces of the upper and lower legs 45 and 46.

In Fig. 8, I have shown another modified clip comprising like upper and lower legs 52 and 53. The inner surfaces of the jaws 54 and 55, however, are tapered in opposite directions, as shown so that upon compression, greater pressure is placed upon one side of legs 52 and 53 which will cause the umbilical cord to be severed on the inside sharp edges of the opposed legs of the clip and the umbilical cord will be compressed between the inside faces of legs 52 and 53.

It is obvious that various changes and modifications may be made in the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. An umbilical clip comprising a pair of opposed legs, opposed openings in alignment adjacent the ends of said legs, a projection bent inwardly from one of said legs adjacent one of said openings, a longitudinal blade bent inwardly from one of said legs and at right angles thereto, an opening opposite and in alignment with said projection adapted to receive said projection, a longitudinal slot slightly wider than the thickness of said blade permitting said blade to pass into said slot, whereby when said opposed legs are compressed said blade will enter said slot and said projection will pass through said opposed opening and when bent will hold the legs of said clip firmly together.

2. An umbilical clip comprised of a single piece of material bent at its center forming two legs, a longitudinal blade bent inwardly and at right angles to one of said legs, a longitudinal slot in the opposite leg to receive said blade, a projection bent inwardly from one of said legs adjacent the end thereof, and an opening in alignment with said projection to permit said projection to pass through said opening, whereby when the legs of said clip are compressed and said projection is bent after passing through said opposed opening and said blade is within said slot, the legs of said clip will be held firmly together.

3. An umbilical clip comprised of a single piece of material bent at its center forming two opposed legs, a longitudinal blade bent inwardly from the material of one of said legs, a longitudinal slot in alignment with said blade in the opposite leg for permitting said blade to pass therethrough, a projection bent inwardly from one of said legs and a hole in alignment with said projection, said hole permitting said projection to pass therethrough and be bent inwardly for maintaining said legs in closed and compressed position.

4. An umbilical clip formed from one piece of metal bent at its center forming opposed legs of equal length, a blade bent inwardly and at right angles to one of said legs, a slot in the opposite leg permitting said blade to pass therethrough, a projection bent inwardly adjacent the end of one of said legs, and an opening opposite said projection in said opposite leg permitting said projection to pass therethrough to lock said legs

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together in compressed position, whereby when said clip is applied to an umbilical cord, said cord will be severed by said blade passing through said slot and will be simultaneously sealed and compressed between the inner portions of said legs to maintain said clip upon the end of the umbilical cord of an infant.

5. Umbilical forceps of the character described comprising a pair of opposed jaws and opposed handles pivoted between said jaws and said handles, ratchet means to prevent said handles from separating during compression, spring means for applying tension between said handles and normally separating the same, means for retaining an umbilical clip between said jaws, a longitudinal slot in one of said jaws, and an anvil in one of said jaws for bending a projection upon a clip placed between said jaws to hold said clip together.

6. Umbilical forceps of the character described comprising a pair of pivoted handles and jaws, spring means for normally separating said handles, ratchet means to prevent said handles from separating during compression, means for retaining a clip between said jaws, a longitudinal slot in one of said jaws to permit a blade on said clip to enter said slot, a curved anvil in one of said jaws to permit a projection to enter therein and be bent, whereby upon compression of said handles, a clip between the jaws of said forceps will be firmly compressed and locked.

7. In combination, umbilical forceps with an umbilical clip, said forceps having opposed pivoted jaws, one of said jaws having a longitudinal channel, an anvil in one of said jaws, means for retaining said umbilical clip within said jaws, a pair of opposed handles, spring means for normally separating said handles, ratchet means to prevent said handles from separating during compression, said clip made of one piece

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of material bent at its center forming two opposed legs, opposed and aligned openings adjacent the ends of said legs to cooperate with said means for retaining said clip between said jaws, a projection bent inwardly from one of said legs adjacent one of said openings, an opposed opening in said opposite leg in alignment with said projection permitting said projection to enter therethrough, a longitudinal blade bent inwardly at right angles to one of said legs, a longitudinal slot in said opposite leg to permit said blade to enter said slot and to sever the umbilical cord passing between said legs, whereby when said clip is placed within said jaws and said handles compressed said blade of said clip will enter said opposed slot severing the umbilical cord and said projection will enter said opposed hole and be bent by said anvil to firmly lock said clip while said legs simultaneously compress the end of said umbilical cord.

8. An umbilical clip comprising opposed legs, one of said legs having a longitudinal inwardly bent edge with a sharp inner edge, the opposite leg having a sharp upper edge, said inner bent edge just overlapping said upper edge of said opposite leg for severing an umbilical cord placed between said legs upon compression of said legs and for holding said umbilical cord between said legs under compression.

9. An umbilical clip comprising two opposed legs having sharp inner edges in combination with forceps having jaws, said jaws having inner surfaces tapered in opposite directions whereby when said jaws are compressed upon said clip an umbilical cord will be severed by the opposed inner sharp edges of said clip and be held firmly compressed between the inner faces of said legs.

JULIUS BRANDENBURG.