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[21]	Appl. No.	841,202
[22]	Filed	July 14, 1969
[45]	Patented	Jan. 4, 1972

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[54] SEVER CORD
9 Claims, 6 Drawing Figs.

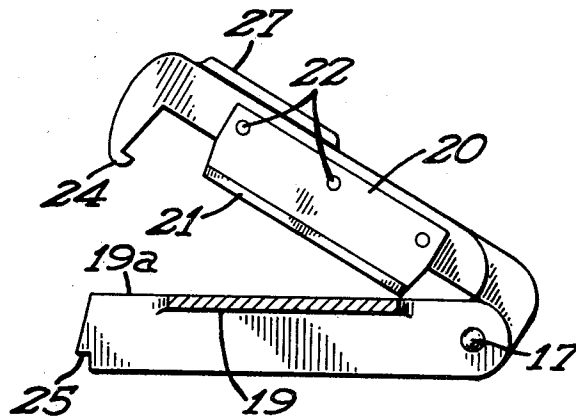
[52] **U.S. Cl.**..... 128/318,
128/346, 30/124
[51] **Int. Cl.**..... **A61b 17/08**,
A61b 17/32, B26b 17/00
[50] **Field of Search**..... 128/318,
346; 30/124, 134, 135

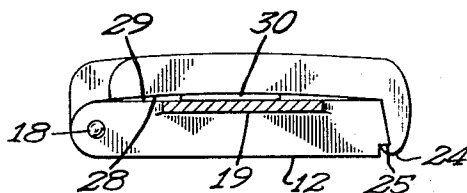
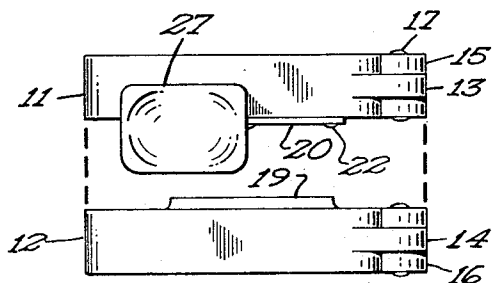
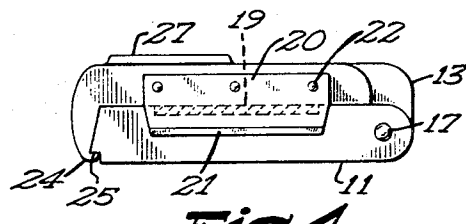
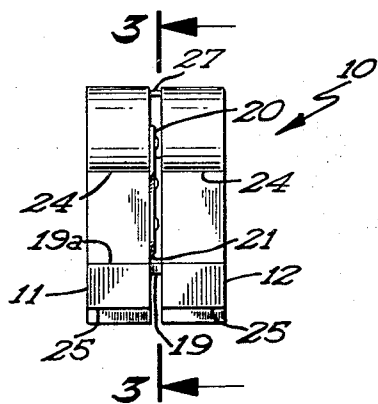
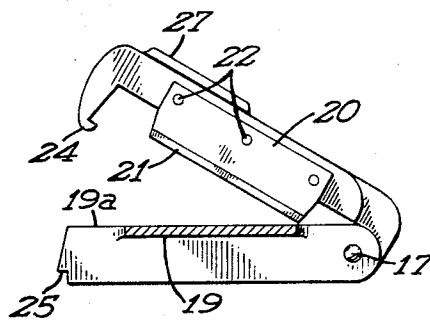
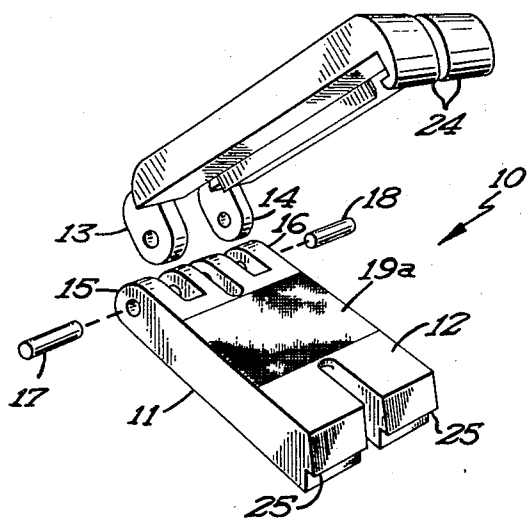
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ABSTRACT: Means for simultaneously clamping and severing the umbilical cord of a newly born infant and comprising generally elongated clamping jaw and cutting jaw members held in substantially side-by-side relationship with each jaw member having hinge means at one end thereof to accommodate substantially simultaneous pivotal closing of said jaw members, and latch means at the other end thereof for retention of said jaw members in closed disposition upon completion of the closure stroke. A severable web means is secured laterally to each of said jaw members for the severable retention of the jaw members in their side-by-side relationship. Cutting blade means are secured to the cutting jaw and project into the bite zone of the cutting jaw, the cutting blade means being arranged to sever an umbilical cord disposed within said jaw upon the initial portion of the closure stroke, and to sever the web means upon continuation of the closure stroke. The clamping jaw is provided with clamping face means along the inwardly directed faces of the clamping jaw for the secure clamping of the umbilical cord upon closure and latching of the clamping jaw.





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SEVER CORD

The present invention relates generally to an improved means for simultaneously clamping and severing the umbilical cords of newly born infants, and more particularly to a means for clamping and severing such cords upon a single closure stroke of combined clamping and cutting jaws. More specifically, the present invention relates to an improved means for the simultaneous clamping and severing of the umbilical cords of newly born infants wherein the means includes a clamping jaw and a cutting jaw arranged in side-by-side relationship, and wherein a severable web means is provided which functions as an anvil for the umbilical cord during the initial portion of the closure stroke, the web means being severed by the cutting blade upon continuation and completion of the closure stroke.

In the severing and clamping of umbilical cords of newly born infants, it is deemed desirable to be able to accomplish this with the use of only one hand. In the past, various devices have been proposed and utilized wherein a device is employed which requires either two individual stages of operation, or a single operation requiring the use of two hands. The present arrangement permits the simultaneous clamping and severing of the umbilical cord with a single operation requiring only one hand.

Briefly, the apparatus of the present invention includes a clamping and severing means which comprises a pair of generally elongated clamping jaws arranged in side-by-side relationship, each jaw being hinged at one end, and having latch means or locking means at the other end for retention of the jaws in closed disposition. A severable web means, secured to the lateral edges of each of the individual jaw members is employed for the severable retention of the jaw members in their side-by-side relationship. A cutting blade is secured to the cutting jaw portion and it is arranged to sever the umbilical cord within the jaw upon the initial closure portion of the closing stroke, the severable web means functioning as an anvil during this portion of the closure. Upon continuation of the closure stroke, the cutting blade is adapted to sever the web into two sections, thereby separating the clamping jaw from the cutting jaw, with the clamping jaw being securely clamped upon the severed end of the umbilical cord. As indicated, this is accomplished by a simple closure operation of the device, the closure being carried out on the cord member.

Therefore, it is an object of the present invention to provide an improved clamping and severing device for use on the umbilical cords of newly born infants, the device including a clamping jaw member and a cutting jaw member arranged in generally side-by-side relationship, the jaw members being secured together by a severable web means which is severed upon closing of the cutting jaw member.

It is yet a further object of the present invention to provide an improved clamping and severing device for the umbilical cords of newly born infants, which device is operable by a single closure stroke, this stroke accomplishing both clamping and severing of the umbilical cord, together with a removal of the severing portion of the device from the clamping portion of the device.

It is yet a further object of the present invention to provide an improved clamping and severing device for the umbilical cords of newly born infants wherein the cord may be simultaneously clamped and severed, and wherein upon completion of the closure stroke, the clamping portion will be securely locked and bound to the severed cord.

Other and further objects of the present invention will become apparent to those skilled in the art upon a study of the following specification, appended claims, and accompanying drawing wherein:

FIG. 1 is a perspective view, partially exploded, showing the apparatus in open disposition;

FIG. 2 is a front elevational view of the apparatus of the present invention with the device being illustrated in open disposition;

FIG. 3 is a side elevational view of the cutting jaw portion of the apparatus shown in open disposition;

FIG. 4 is a side elevational view of the cutting jaw portion of the apparatus shown in close disposition;

FIG. 5 is a side elevational view of the cord clamping portion of the device shown after the cord has been severed; and

FIG. 6 is a top elevational view, partially exploded so as to show the disposition of the individual portions of the apparatus after severance of the interconnecting web.

In accordance with the preferred modification of the present invention, and with particular reference to the drawings, it will be seen that the simultaneous clamping and severing means generally designated 10 includes a generally elongated cutting jaw member 11 and a similarly formed clamping jaw 12, these jaws being hingedly secured by means of the hinge lugs 13 and 14 secured to the upper portions of the jaws 11 and 12, along with mating lug members 15 and 16 on the lower portion of the jaws 11 and 12 respectively. These hinge lugs are provided with independent pin members 17 and 18, pin 17 joining the cutting jaw member segments together, pin 18 joining the clamping jaw segments.

The individual jaw members 11 and 12 are maintained in their side-by-side relationship by means of the severable web means 19, the web means 19 being shown in detail in FIGS. 2 and 3. Web 19 has other functions and these will be made manifest in greater detail hereinafter.

The severing feature is performed by the cutting jaw portion 11, this jaw portion being provided with a cutting blade means such as the blade 20, this blade having a sharpened edge as at 21. Mounting means such as the rivets 22 are utilized to secure the blade 20 to the upper portion of the cutting jaw 11. As is illustrated in detail in FIG. 3, the blade 20 makes contact with the web 19, and while on its downward closure stroke, web 19 functions as an anvil prior to its being severed by the cutting blade as it moves through its closure stroke. In other words, the arcuate path of travel of the blade 20 carries it entirely through the cross-sectional thickness of the web means 19.

Attention is now directed to FIGS. 1 and 3 wherein the latch means for retaining the individual jaws in closed relationship are illustrated in detail. In this connection, the devices are provided with positive latch means which will retain the individual jaws in closed relationship once the closure stroke has been completed. To accomplish this, latching jaws 24, together with complimentary latching surfaces 25 are provided, this arrangement providing the extent of the latch mechanism necessary. It will, of course, be understood and realized that other positive latching techniques and systems may be utilized with an equal degree of success.

In the operation of the device, it is desirable that both jaws be closed simultaneously. In order to accomplish this feature, an overlapping flap or the like is utilized as at 27 which overlies both top surfaces of the individual jaw members. In other words, therefore, upon exerting a force on the overlying member 27, both jaws will be closed simultaneously and the clamping, severing, and latching steps will occur.

In certain instances, it is desirable that the clamping face have a surface which is somewhat roughened in order to avoid the inadvertent slippage of the umbilical cord retained between the jaws. For this purpose, therefore, the surface 19a of the area existing between the jaws is preferably roughened, textured, or otherwise treated with protrusions or the like in order to establish the roughened surface which will be reasonably resistant to slippage of the confined cord.

In operation, the umbilical cord is placed within the confines of the side-by-side jaws, with the clamping jaw being arranged adjacent the newly born infant, and correspondingly, the cutting jaw arranged remote from the newly born infant. The cord may then be clamped and severed in one simple operation, merely by applying pressure across the faces of the jaw, the initial portion of the closure stroke being utilized to sever the umbilical cord retained therebetween, with the final portion of the stroke being utilized to sever the web means 19 which is utilized to interconnect the clamping jaw and cutting jaw. During the closure operation, the web functions as an anvil for the cutting operation, and thereafter is actually

severed by the sharpened edge 21 of the blade 20. As is indicated in FIG. 6, after the web 19 becomes severed, the individual jaws 11 and 12 are latched or locked in closed disposition, and the jaws are no longer attached to one another. Thus, the clamping jaw 12 will remain in place on the infant, clamping the maternal stump as shown at 30 in FIG. 5, while the cutting jaw 11 is separated therefrom. The device therefore provides a simple technique for providing a clean positive cut of the cord as is desirable.

As materials of construction, the individual jaws are fabricated from a reasonably rigid material such as molded thermosetting compositions of poly-carbonates, polyesters, or any rigid substance acceptable for this procedure. The severable web is preferably fabricated from Teflon or other reasonably soft material acceptable for this purpose. Other materials such as polyolefins, or the like may be utilized, the general requirement being that the material is capable of being sheared relatively easily for purposes of separation.

As a further modification of this device, it is possible to fabricate the severable web from separate and distinct interconnecting elements, such as, for example, rods or the like which may be cut and separated by the blade.

In certain instances, it may be desirable to provide a spring bias for retaining the severing and cutting means in a normally closed disposition, such a provision also requiring, of course, means for restraining closure until such time as closure is desired. In this connection, a wedge of fracturable, or severable material may be lodged near the pivot point in order to restrain the device against closure until desired. Upon removal of the restraining means, the unit may be positively closed and latched by the available spring bias.

While the unit illustrated in the drawings has been shown with individual hinge lugs, it will, of course, be appreciated that individual flexible webs may be utilized for purposes of accommodating pivotal motion. Other hinge means may be utilized as well, provided, however, that it is recognized that a generally coaxial pivot arrangement is normally desired for the cutting jaw and the clamping jaw.

What is claimed is:

1. Means for simultaneously clamping and severing the umbilical cords of newly born infants comprising:

- a. generally elongated clamping jaw and cutting jaw members held in substantially side-by-side relationship with each jaw member having hinge means at one end thereof to accommodate pivotal closing of the members into a bite zone therebetween, and latch means at the other end thereof for retention of said jaw members in closed disposition upon substantial completion of the closure stroke;
- b. coupling web means secured to each of said jaw members for the retention of said jaw members in their side-by-side relationship;
- c. cutting blade means secured to one of said cutting jaw members and projecting into the bite zone of said cutting jaw members upon closure of said members to sever an umbilical cord disposed within said jaw upon the initial portion of the closure stroke thereof and to sever said coupling web means upon continuation and completion of said closure stroke; and
- d. clamping face means along the inwardly directed surfaces of said clamping jaw members for the secure clamping of said umbilical cord upon closure and latching of said clamping jaw members.

2. Means for simultaneously clamping and severing the umbilical cords of newly born infants comprising:

- a. generally elongated clamping jaw and cutting jaw members held in substantially side-by-side relationship with each jaw member having hinge means at one end thereof to accommodate pivotal closing of the members into a bite zone therebetween, and latch means at the other end

thereof for retention of said jaw members in closed disposition upon substantial completion of the closure stroke;

- b. coupling web means secured to each of said jaw members for the retention of said jaw members in their side-by-side relationship, said coupling web means being secured along the lateral edge surfaces of each of said jaw members;

- c. cutting blade means secured to one of said cutting jaw and projecting into the bite zone of said cutting jaw upon closure thereof to sever an umbilical cord disposed within said members upon the initial portion of the closure stroke of said jaw members and to sever said coupling web means upon continuation and completion of said closure stroke; and

- d. clamping face means along the inwardly directed surfaces of said clamping jaw members for the secure clamping of said umbilical cord upon closure and latching of said clamping jaw members.

3. The clamping and severing means as defined in claim 10 being particularly characterized in that closure means are secured to one of said cutting jaw members for the simultaneous closure of each of said jaw means.

4. The clamping and severing means as defined in Claim 3 being particularly characterized in that said closure means is normally in contact with said clamping jaw and permits closure of said cutting jaw only upon simultaneous closure of said clamping jaw.

5. The clamping and severing means as defined in claim 2 being particularly characterized in that said cutting blade means comprises a blade having a cutting edge projecting inwardly of the bite zone of said cutting jaw members and in oppositely disposed relationship to said severable web means.

6. The clamping and severing means as defined in claim 1 being particularly characterized in that said hinge means provide coaxial pivotal rotation for each of said clamping jaw and cutting jaw members.

7. The clamping and severing means as defined in claim 2 being particularly characterized in that said latch means provide positive locking of each of said clamping jaw and cutting jaw members.

8. The clamping and severing means as defined in claim 1 being particularly characterized in that resilient bias means are provided for urging the jaw members to a normally closed disposition.

9. Means for simultaneously clamping and severing the umbilical cords of newly born infants comprising:

- a. generally elongated clamping jaw and cutting jaw members held in substantially side-by-side relationship with each jaw member having hinge means at one end thereof to accommodate pivotal closing of the members, a bite zone disposed between said members, and latch means at the other end thereof for retention of said jaw members in closed disposition upon substantial completion of the closure stroke;

- b. cutting blade means secured to one of said cutting jaw members and projecting into the bite zone of said cutting jaw members and arranged to sever an umbilical cord disposed within said members upon closure of said members;

- c. means retaining said clamping jaw and cutting jaw members in substantially side-by-side relationship, said cutting blade means being adapted to sever said retaining means upon closure of said jaw members to release the retention of said clamping jaw and cutting jaw members upon the closure of said clamping and cutting jaw members; and

- d. clamping face means along the inwardly directed surfaces of said clamping jaw members for the secure clamping of said umbilical cord upon closure and latching of said members.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,631,858 Dated January 4, 1972

Inventor(s) Robert A. Ersek

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 57, "jaw" should read -- members --.

Column 4, lines 9 and 10, after each occurrence of "jaw" insert -- members --. Line 20, Claim 3, "10" should read -- 2 --.

Signed and sealed this 6th day of June 1972.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents