

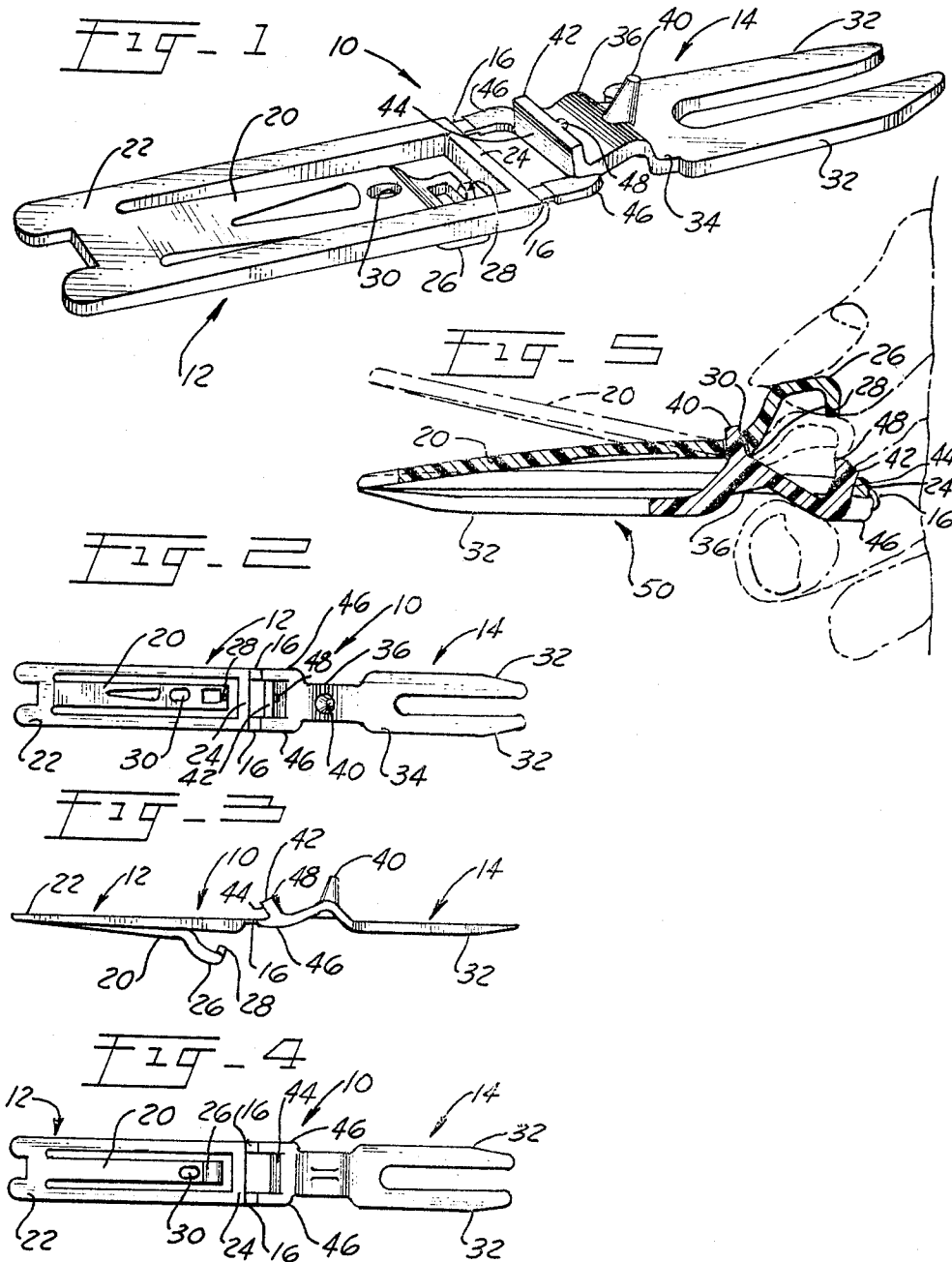
Oct. 11, 1966

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3,277,899

ONE PIECE CURL CLIP WITH HINGE LINE INTERLOCK

Filed April 14, 1964



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3,277,899

**ONE PIECE CURL CLIP WITH HINGE  
LINE INTERLOCK**

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Filed Apr. 14, 1964, Ser. No. 359,669  
4 Claims. (Cl. 132-46)

This invention relates to an improved clip having as one of its more important uses the holding of pin curls in place while the curls are setting.

There has been recently developed a clip construction made from a single piece molded blank of synthetic plastic material. This clip is disclosed and claimed in U.S. Patent No. 3,111,130 granted November 19, 1963. This clip has two sections molded in substantially the same place with work engaging portions or jaws at the outer ends thereof and handle forming portions at adjacent inner ends thereof. The clip sections are connected through hinge forming connecting webs of plastic material at the adjacent handle forming ends thereof which permit the two sections to be folded readily into confronting relation where the jaws or work engaging ends are opposite one another. The folded sections of the blank are held together by interlocking portions of the blank section which engage when a spring forming arm on one of the blank sections is placed under compression. The clip holds together as long as the hinge forming webs remain intact. However, repeated operation of the clip may break the hinge forming web and render the clip inoperative.

It is an object of the present invention to provide a one piece molded clip construction as described which will not readily break apart with prolonged repeated use. A related object of the invention is to provide a one piece clip construction as described which will not be rendered inoperative by breakage of the hinge forming connecting webs of the clip.

In accordance with the present invention, one of the sections of the clip is most advantageously provided with a transverse crossbar or locking bar at the handle forming end thereof. The hinge forming webs referred to above extend between the crossbar and the other section of the clip. The other section of the clip is most advantageously provided with a transverse lock forming projection extending from the handle forming ends thereof. The lock forming projection resiliently and lockingly engages the aforementioned crossbar when the two sections of the clip blank are folded over and interlocked in the manner explained above. The force resulting from the compression of the spring forming arm maintains the locking projection in locking engagement with the crossbar independently of the connecting webs so that breakage of the webs will not affect the operation of the clip.

These and other objects, advantages and features of the invention will become apparent upon making reference to the specification to follow, the claims and the accompanying drawing, in which:

FIG. 1 is an enlarged view in perspective of a one piece molded clip blank incorporating features of the present invention in an unfolded or inoperative condition;

FIG. 2 is a top plan view of the clip blank;

FIG. 3 is a side view in elevation of the clip blank;

FIG. 4 is a plan view of the reverse side of the clip blank; and

FIG. 5 is an enlarged longitudinal sectional view of the clip formed by folding the two sections of the clip blank of FIGS. 1-4 in half and interlocking the projecting parts thereof.

Referring now in greater detail to the drawings, the embodiment of the clip of the present invention therein illustrated advantageously is formed from a single piece molded blank of a resilient synthetic plastic material.

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While a wide variety of such materials may be utilized in fabricating the clip, excellent results can be obtained with such synthetic plastics as polyethylene, polypropylene, Teflon, nylon and the like. The exemplary blank, designated generally by reference numeral 10, comprises a substantially rectangularly shaped jaw forming section 12 and a fork shaped jaw forming section 14. The sections 12 and 14 are connected by thin, spaced hinge forming webs 16-16 which have sufficient flexibility to enable the sections 12 and 14 to be folded into confronting relation as illustrated in FIG. 5. It is to be understood that while the jaw forming sections of the clip are illustrated as having a distinctive configuration, it should be obvious that the configuration of the jaw forming sections is variable and that, therefore, this aspect of the description of the clip of the invention is to be considered as merely illustrative and not limitative thereof.

The substantially rectangularly shaped jaw forming section 12 of the blank 10 advantageously has a jaw urging spring arm 20 struck therefrom. The spring arm 20 extends from the work engaging end 22 of the section 12 to a point adjacent a hinge-joint connected transverse crossbar or locking bar 24 and, except for its jointer to the work engaging end 22, is unconnected to the section 12. The spring arm 20 is formed at its free end into an outwardly extending finger-engaging portion 26 which is provided with a stop projection 28. The spring arm 20 further has an opening or slot 30 therethrough adjacent to the inner end of the portion 26. The function of the stop projection 28 and the opening 30 will become clear as the description proceeds.

The fork shaped jaw-forming section 14 of the blank 10 has a pair of work engaging prongs or fingers 32-32 which, when the sections 12 and 14 are folded at the spaced hinge-joints 16-16, are placed in confronting relation with respect to the work engaging end 22 of the section 12. The fingers 32-32 terminate in a common work engaging-finger support portion 34 which is joined to an outwardly extending, substantially V-shaped, fulcrum forming portion 36. The portion 36, substantially at its outermost point of extension, carries connecting means in the form of a projection or pin 40 which is received by the opening 30 in the spring arm 20. The V-shaped portion 36 is joined at its innermost end to an inclined, outwardly extending transverse locking projection 42 having a crossbar engaging surface 44. In the embodiment of the clip illustrated, the projection 42 forms an obtuse angle with the innermost end of the portion 36 and an acute angle with a pair of spaced, hinge-joint connected extensions or arms 46-46. The surface 44 of the locking projection 42, as seen in FIG. 5, advantageously is curved inwardly slightly so that the outermost portion thereof will overlie the crossbar 24. The locking projection 42 desirably is provided with a stop means engaging portion or boss 48 against which the projection 28 abuts when the working engaging portions of the sections 12 and 14 are separated to receive work, for example, a pin curl.

In the embodiment of the invention hereinabove described, and as disclosed in the aforementioned U.S. Patent 3,111,130, the jaw urging spring arm 20 advantageously is dimensioned in a manner such that the distance between the work engaging end 22 of the blank section 12 and the opening 30 of the spring arm 20 is greater than the distance between the end 22 and the pin 40 when the sections 12 and 14 have been folded along a fold line at the thin easily foldable webs 16-16 into confronting relation prior to engagement of the pin 40 in the opening or slot 30. Therefore, in forming a clip (designated generally at 50 in FIG. 5) the spring arm 20 must be shortened by compressing or bowing the same to enable insertion of the pin 40 in the opening 30. When the pin 40 is thus engaged in the opening 30, the jaw urging spring

arm 20 is placed under compression which applies a jaw closing force along the now bowed jaw urging spring arm 20 in the direction of the work engaging end 22 of the section 12 whereby the end 22 is urged toward the fingers 32—32 of the clip section 14.

During the folding and interlocking of the sections 12 and 14 into confronting relation as described, the surface 44 of the locking projection 42 is brought into engagement with and overlaps and thus interlocks with the crossbar 24. The force applied by the jaw urging spring arm 20 when the opening 30 thereof is engaged with the pin 40 keeps the surface 44 of the shoulder 42 snugly against the crossbar 24. Breakage of the thin webs 16—16 will not result in separation of the handle forming ends of the sections 12 and 14 of the clip.

When the clip 50 is gripped between the fingers of a user as in FIG. 5, and finger pressure is applied to the finger engaging portion 26 of the jaw urging spring arm 20, the jaw forming section 12 pivots on the fulcrum forming portion 36 of the section 14, and the work engaging jaws of the clip separate as shown by the dotted lines. The distance traversed by the portion 26 as a result of the pressure applied to it by the fingers of a user, while being sufficient to separate the jaws of the clip to enable an object such as a pin curl to be easily inserted therebetween, is limited by contact of the stop projection 28 of the finger engaging portion 26 of the spring arm 20 with the boss 48 on the locking projection 42. By limiting the movement of the finger engaging portion 26 of the spring arm 20, an area of the surface 44 of the locking projection 42 is always maintained in overlying locking engagement with the locking bar 24 and the jaw forming sections 12 and 14 are thereby prevented from becoming disengaged even in the event of a failure of the webs 16—16. This unique locking arrangement of the clip of the present invention is foolproof in operation and greatly prolongs the useful life of the clip.

It should be understood that numerous modifications may be made in the preferred form of the invention hereinabove described without deviating from the broader aspects of the invention.

What is claimed is:

1. In a clip comprising a single-piece blank of molded synthetic plastic material having two folded over confronting sections connected by hinge forming web means at the inner ends thereof and forming work engaging jaws

at the outer ends thereof and handle forming portions at the inner ends thereof, said clip sections having a fulcrum between the ends thereof for pivoting the sections relative to one another to enable the work engaging jaws to be separated by force applied to the handle forming portions thereat, one of said sections having a resilient jaw urging arm extending from a point adjacent the work engaging end thereof toward the opposite end thereof and being unconnected with said one jaw for the remainder of the length thereof, and the other section having a connecting means for said jaw urging arm, said jaw urging arm engaging with said connecting means to place the jaw urging arm under initial compression which applies a jaw closing force along the jaw urging arm toward the base end thereof to urge the work engaging end of said one clip section toward the work engaging end of the other clip section, the improvement comprising a crossbar at the handle forming end of one of the clip sections, and a locking projection at the handle forming end of the other clip section, said locking projection partially overlying and interlocking with said crossbar to prevent the separation of the web connected ends of said clip sections in the event of breakage of said web means.

2. The clip of claim 1 wherein the locking projection has a slightly inwardly curved surface for engaging and overlying said crossbar.

3. The clip of claim 1 wherein said crossbar is on the handle forming end of the clip section on which the spring arm is formed.

4. The clip of claim 1 wherein the outer end of said spring arm forms a finger compressible handle forming portion of the clip, said end having stop means which engages a portion of said locking projection after a predetermined compression of the handle forming portion thereof for limiting the distance said clip section can be pivoted on said fulcrum.

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