Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

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This invention relates to a spring clip construction adapted to be employed for pinning diapers, for pinning patterns to pieces of cloth, and for other purposes.

Another object of the invention is to provide a spring clip which is highly simple to use yet is extremely effective in its fastening operation.

Another object of the invention is to provide a spring clip which may be swallowed without substantial danger that the sharp points thereof will penetrate the tissues of the infant.

Another object of the invention is to provide a spring clip having lock means adapted to insure against accidental opening of the clip, and also adapted to facilitate insertion of the pointed portions of the clip into a diaper.

A further object is to provide a highly economical clip which may be readily employed to pin patterns to sheets of cloth, etc.

These and other objects and advantages of the invention will be more fully set forth in the following specification and claims, considered in connection with the attached drawing to which they relate.

In the drawing:

FIGURE 1 is a bottom plan view, on an enlarged scale, of a diaper clip constructed in accordance with the present invention, the lock portion of the clip being illustrated as rotated to unlocking position;

FIGURE 2 is a side elevation of the clip when in the position shown in FIGURE 1;

FIGURE 3 is a side elevation corresponding to FIGURE 2 but illustrating the positions of the elements when disposed for insertion into a diaper;

FIGURE 4 illustrates the clip in closed position and with the lock portion rotated to locking position;

FIGURE 5 is a perspective view of a second embodiment of the invention, wherein the locking means is omitted;

FIGURE 6 is a perspective view, on a much enlarged scale, showing a pattern clip in closed and inverted position;

FIGURE 7 is a side elevation of the pattern clip illustrated in FIGURE 6; and

FIGURE 8 is a view corresponding to FIGURE 7 but showing the pattern clip in position for insertion into a pattern or the like.

Referring first to the embodiment shown in FIGURES 1-4 of the drawing, the spring clip is illustrated to comprise a strip 10 of spring material, a pair of arms 11 connected to spring 10 at the end portions thereof, point elements 12 mounted on the arms 11 adjacent the mid-portions of the spring 10, and means 13 to lock the spring 10 in a bowed condition and to aid in the insertion of point elements 12 into a diaper or the like.

The illustrated strip 10 is shown as being somewhat wider at its center portion than at its ends, the over-all shape being that of a double trapezoid having a common base. The normal or free position of the strip 10 is shown in FIGURE 2, such strip then lying generally in a single plane.

The arms 11 are disposed longitudinally of strip 10 on only one side thereof, which for convenience of reference may be called the underside. Each is illustrated to comprise a single strip of metal bent into the shape of an acute triangle having a maximum altitude substantially less than half the length of spring strip 10. The apex (minimum angle) portion of each arm 11 is secured to an end of the spring strip, as by soldering indicated at 15. When the spring strip is in the free position illustrated in FIGURE 2, one side wall of each arm 11 is disposed adjacent one surface of the spring strip. It is within the scope of the invention to form each arm 11 as a block of injection-molded plastic having one end of spring strip 10 embedded therein, the necessity for the soldered joint 15 then being eliminated. Furthermore, the point elements 12, to be described below, may be embedded in such plastic blocks.

Each point element 12 comprises an extremely sharp elongated metal point or tapered pin which is secured to the inner end of an arm 11 by soldering or the like, or by embedding as stated above. When the clip is in the free position illustrated in FIGURE 2, the points 12 are generally parallel to spring strip 10 and are lapped substantially (FIGURE 1). It is emphasized that, even prior to operation of the means 13 to be described hereinafter, the point elements 12 are nested or indented above the level of the wide inner ends (bases) of arms 11. Accordingly, should the clip become dislodged or be swallowed, the points would be substantially shielded by the arms and would effect little or no injury to the infant.

The point elements are spaced from spring 10, to provide room for a number of layers of diaper fabric therebetween.

The means 13, which is a cam locking element, comprises a relatively rigid elongated member disposed on the opposite side of strip 10 from arms 11, and preferably having a length substantially less than that of the spring strip 10. In the illustrated embodiment, the cam locking element 13 is a rigid channel-shaped metal element the web or underside portion of which is longitudinally arcuate or concave as illustrated in FIGURE 4. The flanges 16 of the channel extend upwardly, or away from the spring strip 10 against which the channel web is engaged, and are associated with the web of the channel through a smooth curve (FIGURE 2).

The cam locking element 13 is rotatably mounted at the center portion of spring strip 10 as by a rivet 17 inserted through the centers of these elements. When the means 13 is disposed longitudinally of the spring strip, as shown in FIGURE 4, such strip is necessarily bowed to conform to the arcuate or concave shape of the means 13. Stated otherwise, rotation of the means 13 through a 90 degree angle from the position shown in FIGURES 1-3 to that shown in FIGURE 4 creates a cam action whereby the spring strip 10 is gradually bowed downwardly from its flat condition (FIGURE 2) to its bowed condition (FIGURE 4).

It is pointed out that the means 13 may be a solid element instead of a channel element. It may be formed of plastic, and highly decorated.

In the operation of the embodiment of FIGURES 1-4, it is to be assumed that the clip is initially in the unlocked free condition shown in FIGURES 1 and 2. The user may then hold several layers of diaper cloth in his left hand, to protect the infant from injury, and may grasp the spring clip 10 in his right hand. More specifically, the ends of the spring strip 10 are held between the thumb and middle finger of the user, and the index finger is pressed downwardly against the rivet 17 to effect bowing of the strip 10 to the FIGURE 3 position, or to
a more extreme bowed condition. Because of the fact that the arms 11 are connected to the end portions of spring 10, such bowing of the spring causes the point elements 12 to move away from the spring and from each other, and to incline downwardly until in position for insertion through the layers of cloth held by the left hand of the user. It is then merely necessary to move the spring clip downwardly until the sharp points 12 penetrate the cloth, and then release the clip to permit the spring 10 to resume its substantially flat condition shown in FIGURE 2.

Thereafter, the means or element 13 is rotated 90 degrees to effect bowing of the spring 10 to the FIGURE 4 position. Such bowing of strip 10 has the beneficial effect of causing the point elements 12 to incline upwardly and become crossed, in the manner of crossed swords, which increases the grip on the cloth being held thereby. Several layers of cloth are then humped upwardly between the ends of arms 11, adjacent rivet 17. The element 13 insures that the spring strip 10 will be maintained in closed condition, so that the point elements 12 are not only effectively locked in the fabric but are so directed that they cannot possibly harm the infant. The resilience of the spring 10 tends to maintain the means 13, by friction, in its locking position longitudinally of the spring strip. Suitable detent protuberances, not shown, may be provided to insure against accidental rotation of the means 33 from the locking position (FIGURE 4) to unlocking position (FIGURES 1-3).

The embodiment of FIGURE 5 is identical to that of FIGURES 1-4 except that the means 13 is omitted.

Embodiment of Figures 6-8

FIGURES 6-8 illustrate a spring clip adapted to be employed for purposes including the pinning of a pattern to a sheet of cloth. The sewor conventionally performs such operation by means of straight pins, with considerable difficulty.

The illustrated spring clip comprises a spring strip 18, a pair of flat arms 19 disposed parallel to the strip 18 and connected thereto adjacent the ends thereof, point elements 20 provided at the inner ends of the arms 19, and finger-grip elements 21 provided at the outer ends of the arms.

Stated more specifically, each arm 19 and an associated finger-grip element 21 may be integral and may comprise a strip of metal bent at right angles adjacent an extreme end of the strip. Each right-angle element may be secured to the spring strip as by a spot weld indicated at 22.

The point elements 20 are illustrated to comprise three sharp and tapered pins two of which are connected to the inner end of one of the arms 19, and the other of which is connected to the inner end of the remaining arm. The point elements incline away from the spring strip, and are normally crossed as best shown in FIGURE 7. The position shown in FIGURES 6 and 7 is the normal one assumed when the spring strip is in its free position.

To use the pattern clip, the user merely squeezes the finger-grip elements 21 between her thumb and index finger, thereby effecting bowing of the strip 18 to the position shown in FIGURE 8. The point elements 20 are then generally parallel and may be readily inserted downwardly through the pattern and the fabric disposed therebeneath. The finger grip elements 21 are then released, permitting the clip to return to the position shown in FIGURES 6 and 7. The consequent re-crossing of the point elements 20 has the effect of maintaining the pattern strip against the cloth. It is to be emphasized that there is no tension on the spring strip 18 at this time, the spring being in its free position.

During the above-described fastener operation, the sheet of cloth is supported on a hard surface, or on a pile rug, so that there will be no fastening of undesired elements to the cloth.

To remove the spring clip, in any embodiment, the procedure required for mounting the same is merely reversed. Variations of the elements of the present invention, in addition to what has been illustrated and described in detail, may be employed without departing from the scope of the accompanying claims.

We claim:

1. A diaper clip, comprising an elongated spring element, first and second arms means and fastening means rigidly associated with said spring element at opposite end portions thereof, said arm means extending generally longitudinally of said spring element from said outer end portions thereof to adjacent the mid-portion thereof, said arm means both being disposed on one side of said spring element, first and second point elements respectively associated with said arm means and disposed adjacent said mid-portion of said spring element, said point elements being sufficiently long and sharp to penetrate readily a substantial number of layers of diaper fabric, said point elements and said arm means being so related to each other and to said spring element that the pointed ends of said point elements are shielded when said spring element is in free condition, and means to aid in insertion of said point elements through said layers of fabric and also to insure against accidental unfastening of said clip, said means comprising an elongated element pivotally mounted at said mid-portion of said spring element and having an arcuate or concave surface adjacent said spring element, the relationship being such that turning of said elongated element through an angle from a position transverse to said spring element to a position longitudinal to said spring element effects arching of said spring element to conform to said arcuate or concave surface of said elongated element.

2. A diaper clip, comprising a continuous elongated spring element capable of being flexed between normal and biased positions, first and second arm means respectively rigidly connected with said spring element at the opposite free end portions thereof only, said arm means extending generally longitudinally of the spring element inwardly from said free end portions thereof to adjacent the mid-portion thereof on one side only of said spring element, said arm means having substantial thickness at their inner end portions, said inner end portions when the spring element is in biased position being spaced from the spring element, and first and second point elements respectively projecting inwardly from said thickened inner end portions of said arm means, said point elements being sufficiently long and sharp to penetrate readily a substantial number of layers of diaper fabric, said point elements and said arm means being so related to each other and to said spring element that the pointed ends of said point elements are shielded when said spring element is in the normal position.

3. The invention as claimed in claim 2, in which said point elements are relatively straight and are generally parallel to said spring element when the latter is in normal position.

4. The invention as claimed in claim 3, in which said point elements overlap each other when said spring element is in normal position.

5. A spring clip, comprising a continuous flat elongated spring strip element capable of being flexed from normal or free position to biased position and means rigidly associated with the outer end portions only of said spring strip element and extending on one side only and generally longitudinally of said spring strip element inwardly toward the central portion thereof, said arm means having inner end portions spaced from said spring strip element when the same is in normal position, and point means associated with said arm means and disposed at said inner end portions thereof and shielded thereby when said strip is in normal position, said point
means being sufficiently sharp to penetrate readily a plurality of layers of material, said point means being relatively straight and being rigidly connected to said inner end portions of said arm means, said point means extending generally parallel to said spring strip element when the same is in said normal position, the point means connected to one of said inner end portions extending in opposite direction to the point means connected to the other of said inner end portions.

6. A spring clip, comprising a continuous flat elongated spring strip element capable of being flexed from normal or free position to a biased position, arm means rigidly associated with the outer end portions only of said spring strip element and extending on one side only and generally longitudinally of said spring strip element inwardly toward the central portion thereof, said arm means having inner end portions spaced from said spring strip element when the same is in said normal position, said arm means being relatively thick at least at said inner end portions thereof, and point means associated with said arm means and disposed at said inner end portions thereof and shielded thereby when said strip is in normal position, said point means being sufficiently sharp to penetrate readily a plurality of layers of material, said point means being relatively straight and being recessed beneath said inner end portions of said arm means when said spring strip element is in said normal position, whereby said point means are shielded by said inner end portions of said arm means when said spring strip element is in said normal position.

7. A spring clip, comprising a continuous flat elongated spring strip element capable of being flexed from normal or free position to a biased position, arm means rigidly associated with the outer end portions only of said spring strip element and extending on one side only and generally longitudinally of said spring strip element inwardly toward the central portion thereof, said arm means having inner end portions spaced from said spring strip element when the same is in said biased position, point means associated with said arm means and disposed at said inner end portions thereof, said point means being sufficiently long and sharp to penetrate readily a plurality of layers of material, and lock means to prevent flexing of said spring strip element to said biased position, thereby causing said inner end portions of said arm means to remain relatively adjacent said spring strip element, said lock means being movable to a position permitting flexing of said spring strip element to said biased position.

8. The invention as claimed in claim 7, in which said lock means comprises a cam element pivotally mounted on said spring strip element on the side thereof opposite said arm means, said cam element being adapted to rotate thereof to a position parallel to said arm means to effect flexing of said spring strip element in a direction opposite to the direction of flexing thereof to said biased position.