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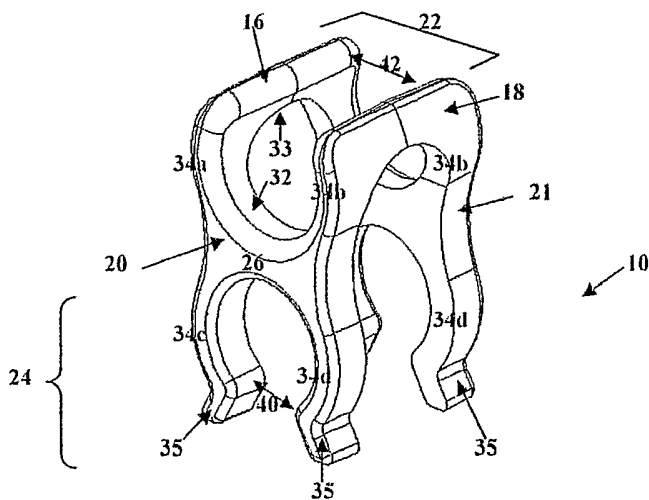
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(54) Title: BAR CLIP WITH FLARED LEGS



(57) Abstract: A color coded molded plastic clip (10) comprising a pair of opposing clasp assemblies (20, 21) provides a means of holding a pair of reinforcement bars in a parallel orientation. Each clasp assembly comprises an upper clasp (22) and a lower clasp (24). Each upper clasp includes a pair opposing, convexly curved fingers (34a, 34b) extending upward from a transverse support (26) toward and attached to a pair of parallel longitudinal supports (16, 18). Each clasp assembly further includes a second pair of opposing, convexly curved fingers (34c, 34d) extending downward from either end of the transverse support so as to form a lower clasp. Flared guides (35) are attached to the lower ends of the opposing fingers of each lower clasp.

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DESCRIPTION
BAR CLIP WITH FLARED LEGS

TECHNICAL FIELD

[0001] The present invention relates generally to an apparatus and method of attaching and aligning reinforcing bars in a framework for supporting a concrete matrix. More particularly, this invention pertains to clips for joining reinforcing bars in a framework. Even more particularly, this invention pertains to a clip with flared legs for joining pairs of reinforcing bars in a parallel orientation.

BACKGROUND ART

[0002] It has been long known in the art of reinforced concrete structures to provide fastening means for aligning and attaching reinforcing bars in a framework prior to encasing such bars in a concrete matrix. One well known fastening means used in forming a framework of reinforcing bars is to wrap adjacent bars with wire ties, or other similar binding materials. Another well known fastening means is to attach such reinforcing bars by welding instead of wrapping. Both of these fastening means provide for attaching bars arranged in either transverse or parallel orientations. However, both means are labor intensive and, thus, more expensive when compared to the use of more recently developed reinforcing bar clips.

[0003] Plastic clips have been developed to provide a means of rapidly attaching adjacent reinforcing bars that are arranged in transverse orientations. For example, Padrum, in U.S. Patent No. 4,110,951, teaches a plastic U-shaped clip formed by two opposing flanges extending from a base. Each of the flanges is split to form opposing and aligned openings within each flange. The clip is positioned and aligned above two reinforcement bars that are in a transverse orientation to each other. Pressure applied to the base causes the first reinforcing bar to be forced between the flanges and held in an upper position. Continued application of pressure upon the base causes the second reinforcing bar to be forced between the opposing split opening in the

flanges and held in a lower position independent of the first bar.

[0004] A second example of prior art plastic clips is shown in U.S. Patent No. 5,626,436 to Dragone. The Dragone clip is a U-shaped assembly comprising two parallel longitudinal members connecting two opposed hook assemblies. Each hook assembly comprises two connecting members, each extending from one of the longitudinal members, and a fulcrum section. A hook is formed by two opposing fingers, each attached at an opposite end of the fulcrum section and extending from the fulcrum section in a direction away from the longitudinal members. A gap is formed between each pair of opposing fingers. To install the Dragone clip, a first reinforcing bar is forced between the two opposed hook assemblies and held in an upper position against the parallel longitudinal members. The parallel longitudinal members are squeezed together by the user, causing each pair of opposing fingers to spread apart. The user slips the spread fingers of the opposing hooks over a second reinforcing bar that is positioned transverse to the first bar. The user then releases the parallel longitudinal members. As the parallel longitudinal members separate, each pair of opposing fingers close around the second bar and hold it in a lower position. The Dragone clip is sized so as to hold the second bar against the first bar.

[0005] One shortcoming of these two plastic clips is the limited orientations in which they can be used. These clips can only be used with transversely oriented reinforcement bars. However, frameworks of reinforcement bars frequently require attachment of bars in parallel orientations as well as transverse orientations. Previously, no clips exist to attach reinforcement bars in parallel orientations. Where frameworks are constructed using either of the prior art clips, the user can only use such clips to attach transversely oriented bars. All other attachment orientations require the user to employ more labor intensive methods of attaching the bars, such as wire wrap. What is needed, then, is a reinforcement bar clip that can be used to attach adjacent reinforcing bars arranged in a parallel orientation.

[0006] To make the task of attaching reinforcement bars in a framework

as simple as possible, it would be advantageous if only one type of clip were necessary to join reinforcement bars in either a transverse orientation or in a parallel orientation. Therefore, what is additionally needed is a reinforcement bar clip that can be used to attach adjacent reinforcing bars arranged in either a transverse orientation or in a parallel orientation.

DISCLOSURE OF THE INVENTION

[0007] In the preferred embodiment, the present invention includes a color coded molded plastic clip including a pair of opposing clasp assemblies. Each clasp assembly has an upper clasp and a lower clasp for holding, respectively, first and second reinforcement bars in a parallel orientation. Each upper clasp includes a pair of opposing, convexly curved fingers that extend upwards from a transverse support and are attached to a pair of parallel longitudinal supports. Each clasp assembly further includes a second pair of opposing, convexly curved fingers extending downward from either end of the transverse support so as to form a lower clasp.

[0008] One novel aspect of the preferred embodiment of present invention is a pair of flared guides attached to the lower ends of the opposing fingers of each lower clasp. During installation of the clip's lower clasps upon a reinforcement bar, each pair of flared guides engages the bar and guides it to the lower clasp gaps for insertion into the lower clasps.

[0009] An alternative embodiment of the present invention additionally includes two alternative upper clasps formed from the longitudinal supports cooperating with the opposed clamp assemblies. Each alternative upper clasp includes an alternative upper seat and an alternative upper clasp gap for receiving and holding a reinforcement bar in an orientation transverse to a reinforcement bar received and held by the lower clasp. Advantageously, the clip of this alternative preferred embodiment can be selectively used to attach and hold two reinforcement bars arranged in either a parallel orientation or in a transverse orientation.

[0010] Accordingly it is an object of the present invention to provide a reinforcement bar clip that can be used to attach adjacent reinforcing bars

arranged in a parallel orientation.

[0011] It is an additional object of the present invention to provide a reinforcement bar clip that can be used to attach adjacent reinforcing bars arranged in either a transverse orientation or in a parallel orientation.

[0012] Finally, it is an object of the present invention to provide a means of guiding a reinforcement bar into a clasp during installation of the clip.

[0013] Fig. 1 is an oblique view of a preferred embodiment of the reinforcement bar clip of the present invention.

[0014] Fig. 2 is an end view of the clip of Fig. 1 along the longitudinal axis.

[0015] Fig. 3 is a side view of the clip of Fig. 1 along the transverse axis.

[0016] Fig. 4 is oblique view of the clip of Fig. 1.

[0017] Fig. 5 is an oblique view of the clip of Fig. 1 shown holding two reinforcement bars in a transverse orientation.

BEST MODE FOR CARRYING OUT THE INVENTION

[0018] One preferred embodiment of the reinforcement bar clip 10 of the present invention is shown in Figure 1, wherein orientation of the clip 10 is shown with reference to the vertical direction arrow 15, the longitudinal direction arrow 12 and the transverse direction arrow 14. The embodiment shown in Figure 1 is a molded plastic clip 10 made of a resilient plastic material having a color selected to indicate the appropriate gauge of reinforcement bars upon which it may be installed. The clip 10 comprises a plurality of clasp assemblies. The embodiment shown in Figure 1 comprises a pair of opposing first and second clasp assemblies 20, 21. Each first and second clasp assembly 20, 21 is attached to parallel first and second longitudinal supports 16, 18 and extends downward from the longitudinal supports 16, 18. The opposing first and second clasp assemblies 20, 21, together with the first and second longitudinal supports 16, 18, form a U-shaped profile, as is shown in Figure 3.

[0019] Referring again to Figure 1, the first and second clasp assemblies 20, 21 each comprise an upper clasp 22 for holding a first reinforcement bar and a lower clasp 24 for holding a second reinforcement bars in a parallel

orientation to the first reinforcement bar. For each first and second clasp assembly 20, 21, opposing, convexly curved fingers 34 extend upward from either end of a transverse support 26 so as to form the upper clasp 22. One finger 34a is shown attached to the first longitudinal support 16 and the opposing finger 34b is shown attached to the second longitudinal support 18. Together with the transverse support 26, the opposing fingers 34a, 34b form an upper seat 32. Referring now to Figures 1, 2 and 4, an upper clasp gap 42 is disposed between the first and second longitudinal supports 16, 18 so as to provide a means of inserting the first reinforcement bar into the upper clasp 22. The upper clasp gap 42 is selected so as to be narrower than the diameter of the first reinforcement bar, while the upper seat 32 is adapted in size and shape to compressively engage the first reinforcement bar when such bar is placed within the upper clasp 22.

[0020] Referring again to Figure 1, for each first and second clasp assembly 20, 21, opposing, convexly curved fingers 34c, 34d extend downward from either end of the transverse support 26 so as to form the lower clasp 24. Together with the transverse support 26, the pair of opposing fingers 34c, 34d form a lower seat 30. Referring now to Figures 1, 2 and 4, a lower clasp gap 40 is disposed between the opposing fingers 34c, 34d so as to provide a means of inserting a reinforcement bar into the lower clasp 24. The lower clasp gap 40 is selected so as to be narrower than the diameter of the second reinforcement bar, while the lower seat 30 is adapted in size and shape to compressively engage the second reinforcement bar when such bar is placed within the lower clasp 24.

[0021] The term 'gauge of a clip' is used herein to indicate the size of bar that the clip can attach and hold. In the preferred embodiment of the present invention, the gauge of the clip 10 is indicated by the color of the material used to fabricate the clip 10. For example, a clip 10 having a red color may have a gauge of 0.425 inches and a clip 10 having a white color may have a gauge of 0.525 inches. Other color coding schemes would be obvious to one skilled in the art. Optionally, the gauge of the clip is cast, printed or otherwise

numerically indicated on the surface of the clip 10. Preferably, the gauge of the clip is indicated by both color of the clip 10 and by the color of the material used to fabricate the clip 10.

[0022] A preferred method of installing the clip 10 upon parallel oriented reinforcement bars is described. The gauge of the reinforcement bars is determined and the appropriate size of clip 10 is selected as indicated above. The receiver tip 110, in the preferred embodiment of the application tool 100, is interchangeable and is selected by the gauge appropriate for installation into the upper clasp gap 42. The clip 10 is removably installed upon the application tool 100 by sliding the receiver tip 110 into the upper clasp gap 42 so as to form a rigid assembly held together by a friction fit between the receiver tip 110 and the first and second longitudinal supports 16, 18.

[0023] One novel aspect of the present invention is the flared guide 35 attached to the lower ends of each opposing finger 34c, 34d of the lower clasp 24. During installation of the lower clasp 24 of the clip 10 upon a reinforcement bar 52, each pair of flared guides 35 engage the bar 52 and guide it to the lower clasp gap 40 for insertion into the lower clasp 24 of each clasp assembly 20, 21. As the lower clasp 24 is pressed against the reinforcement bar 52, the flaring of guides 35 cause the opposing fingers 34c, 34d to spread open so as to enlarge the lower clasp gap 40 sufficiently for the insertion of the bar 52. After the bar 52 is inserted into the lower clasp 24, the opposing fingers 34c, 34d close so as to hold the bar in the lower seat 30.

[0024] Once the reinforcing bar 52, is inserted into the lower clasp 24, the receiver tip 110 of the application tool 100 is removed from the upper clasp gap 42. With the upper clasp gap 42 clear, another reinforcement bar 50, is positioned above the upper clasp gap 42 and in a parallel orientation to the reinforcement bar 52 held in the lower clasp 24. The bar 50 and the clip 10 are forced together so as to cause the opposing fingers 34a, 34b to spread open so as to enlarge the upper clasp gap 42 sufficiently for the insertion of the bar 50. After the bar 50 is inserted into the upper clasp 22, the opposing fingers 34a, 34b close so as to hold the bar in the upper seat 32. In this configuration, the

preferred embodiment of the clip 10 of the present invention holds the two reinforcement bars 50, 52 independent of the other bar and a parallel orientation with the other bar.

[0025] In an alternative preferred embodiment (not shown), flared guide 35 are attached to the upper ends of each opposing finger 34a, 34b and longitudinal supports 16, 18 of the upper clasp 22. During installation of the upper clasp 22 of the clip 10 upon a reinforcement bar 50, each pair of flared guides 35 engage the bar 50 and guide it to the upper clasp gap 42 for insertion into the upper clasp 22 of each clasp assembly 20, 21 in the same manner described above for the lower clasp 24.

[0026] Referring to Figures 3 and 5, an additional preferred embodiment is shown. In the embodiment shown, longitudinal supports 16, 18 each cooperate with the opposed clamp assemblies 20, 21 to form two aligned and opposing alternative upper clasps 23. Each alternative upper clasp 23 includes an alternative upper seat 33 and an alternative upper clasp gap 44. This additional preferred embodiment also includes upper and lower clasps 22, 24 as previously described. In one application of this additional preferred embodiment, a first reinforcement bar is placed into the alternate upper clasps 23 by forcing the bar 50 into the alternate upper clasp gaps 44 and against the alternative upper seats 33. A second reinforcement bar 52 is oriented in a position transverse to the first bar. The second bar 52 is then forced into the lower clasps 24 so as to contact the first bar 50 and to hold it against the alternative upper seats 33. In the configuration shown in Figure 5, the clip 10 of this additional preferred embodiment attaches and holds two reinforcement bars 50, 52 in a transverse orientation.

[0027] Advantageously, the clip 10 of this alternative preferred embodiment can selectively attach and hold two reinforcement bars 50, 52 in either a parallel orientation, as described above, or in a transverse orientation as shown in Figure 5. This aspect of the invention allows a single type of clip to be used to attach adjacent reinforcing bars arranged in either a transverse orientation or in a parallel orientation.

[0028] Thus, although there have been described particular embodiments of the present invention of a new and useful Bar Clip with Flared Legs, it is not intended that such references be construed as limitations upon the scope of this invention except as set forth in the following claims.

CLAIMS

What is claimed is:

1. A clasp assembly for attaching and holding reinforcement bars, the clasp assembly comprising:

a support rod;

a first and a second pair of opposing fingers, each pair of opposing fingers attached to the support rod and extending away in opposition, the support rod and the first pair of opposing fingers cooperating to form a first clasp, the support rod and the second pair of opposing fingers cooperating to form a second clasp, each clasp having a gap disposed between the pair of opposing fingers of the clasp, each clasp adapted to receive a reinforcement bar; and

a plurality of guide legs,

wherein, for each finger of at least one pair of opposing fingers, a guide leg is disposed upon the end of such finger distal to the support rod so as to extend outward in a flared manner.

2. The apparatus of claim 1, wherein guide legs are disposed on opposite sides of the gap of at least one clasp so as to form a flared guide, and

wherein, each such flared guide is adapted to direct a reinforcement bar into the clasp gap.

3. The apparatus of claim 2, wherein each such flared guide is further adapted cooperate with a reinforcement bar so as to cause the pair of opposing fingers to which such guide is attached to spread apart so as to enlarge the gap of the clasp.

4. The apparatus of claim 1, wherein the first and second clasps are each adapted to receive and hold a first and second reinforcement bar, respectively, in a parallel orientation.

5. The apparatus of claim 1, the clasp assembly further comprising a pair of longitudinal supports disposed in parallel orientation,

wherein, each longitudinal support is attached to an opposing finger of the first clasp such that the longitudinal supports extend from the gap of the first clasp in a direction generally orthogonal to the first clasp.

6. A clip for attaching and holding reinforcement bars, the clip comprising opposing first and second clasp assemblies as recited in claim 1,

wherein, the clip further comprises opposing first and second longitudinal supports disposed in parallel with each other, such supports each having a first and a second end,

wherein, the first clasp assembly is attached to the first ends of the longitudinal supports and the second clasp assembly is attached to the second ends of the longitudinal supports such that, for each clasp assembly, the longitudinal supports are attached to opposing fingers of the first clasp.

7. The apparatus of claim 6, wherein, the first clasps of the opposing clasp assemblies are aligned so as to cooperatively receive and hold a first reinforcement bar, and

wherein, the second clasps of the opposing clasp assemblies are aligned so as to cooperatively receive and hold a second reinforcement bar.

8. The apparatus of claim 7, wherein, with the first reinforcement bar held in the first clasps, the second clasps holds the second reinforcement bar in an orientation parallel to the first reinforcement bar.

9. The apparatus of claim 8, wherein, the opposing clasp assemblies extend orthogonally from the longitudinal supports so as to form a U-shaped assembly adapted to receive and hold the first reinforcement bar.

10. The apparatus of claim 9, wherein, with the first reinforcement bar held in the U-shaped assembly, the second clasps holds the second reinforcement bar in an orientation transverse to the first reinforcement bar.

11. A clip for attaching and holding reinforcement bars, the clip comprising:

a first and a second upper clasp, each upper clasp disposed in aligned opposition with the other, each upper clasp including a transverse support connected to proximate ends of a first and a second longitudinal support by means of opposing first and second upper fingers, each first and second upper fingers attached, respectively, to opposing ends of the transverse support by a first end of each upper finger, each first and second finger extending toward and attached to an end of each first and second respective longitudinal support that is proximate

to the transverse support, the first and a second longitudinal supports extending in parallel opposition between the first and a second upper clasps, an upper clasp gap being defined between the first and second longitudinal supports;

a first and a second lower clasp, each lower clasp disposed in aligned opposition with the other, each lower clasp including the transverse support and opposing first and second upper fingers, each first and second lower fingers attached, respectively, to opposing ends of the transverse support by a first end of each lower finger, each first and second lower finger extending away from the first and second longitudinal support, each lower finger having a second end opposite the transverse support, a lower clasp gap disposed between the second ends of each pair of opposing lower fingers, each lower clasp gap further disposed opposite the transverse support; and

a first and a second guide leg,

wherein, for each lower finger, a guide leg is disposed upon the second end of such finger so as to extend outward from both the transverse support and the direction such finger generally extends.

12. The apparatus of claim 11, wherein the first and second guide legs are disposed on opposite sides of the lower clasp gap so as to form a flared guide, and

wherein, with the lower clasp pressed against a reinforcement bar, the flared guide is adapted to direct such reinforcement bar into the lower clasp gap.

13. The apparatus of claim 12, wherein the flared guide is further adapted to cause the opposing lower fingers to spread open so as to enlarge the lower clasp gap sufficiently for the insertion of the bar into the lower clasp.

14. The apparatus of claim 11, wherein the first and second upper clasps are cooperatively adapted to receive and hold a first reinforcement bar, and

wherein, the first and second lower clasps are cooperatively adapted to receive and hold a second reinforcement bar, so that such first and second reinforcement bars are held in a parallel orientation.

15. The apparatus of claim 11, wherein the clip comprises a plastic material

having a color, the color being selectable prior to the manufacture of the clip,

wherein, the clip has a gauge corresponding to the gauge of the reinforcing bar receivable by the upper or lower clasp, the clip gauge selectable prior to the manufacture of the clip, and

wherein, the color of the plastic material is selected so as to correspond to and indicate the selected gauge of the clip.

16. A clip for holding together two transversely positioned bars comprising two bodies, each body having two curved legs to define two semi-hooks, said bodies being joined together at two points to define a fulcrum, each body between said curved legs defining an area to receive one bar, said semi-hooks of each body when said bodies are joined defining two hooks to hold the other of said bars,

the improvement comprising a flared guide disposed upon each semi-hook wherein, with both semi-hook pressed against the other of said bars, the flared guide is adapted to direct such bar into the area between said curved legs of each semi-hook.

17. The apparatus of claim 16, wherein the flared guide comprises a plurality of guide legs disposed one upon each of the two curved legs of each semi-hook so as to extend outward from both the transverse support and the direction such curved legs generally extends.

18. The apparatus of claim 17, wherein the flared guide is further adapted to cause the two curved legs of each semi-hook to spread open sufficiently for the other of said bars to be inserted into the open semi-hook.

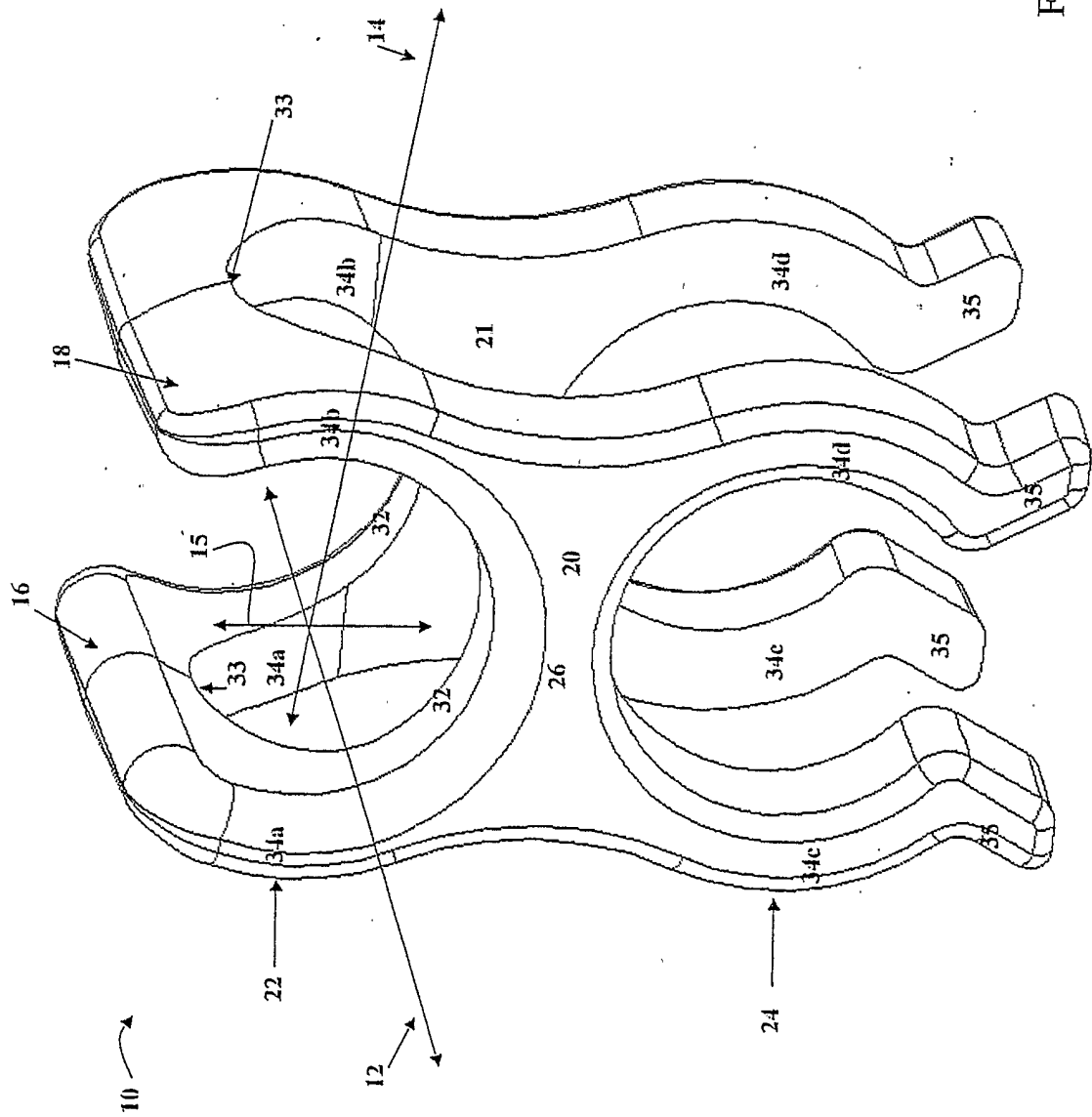


Figure 1

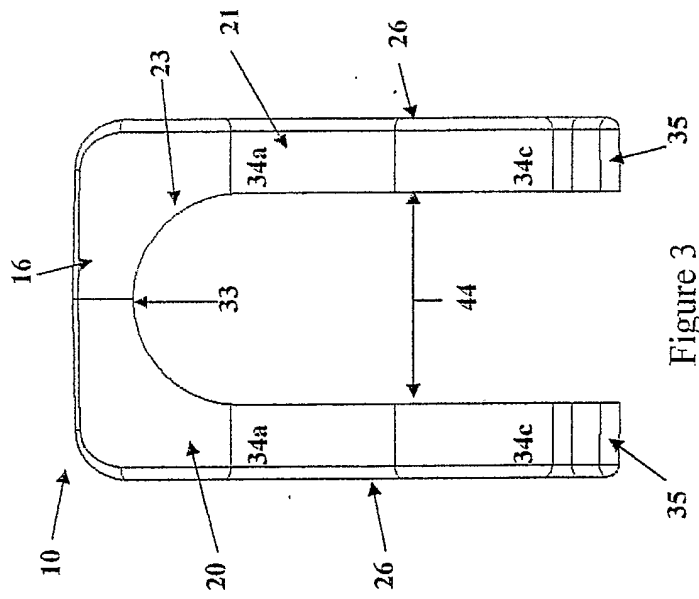


Figure 3

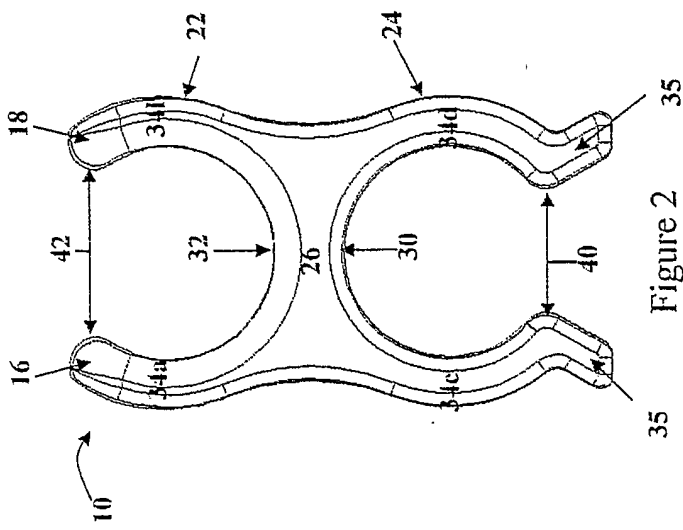


Figure 2

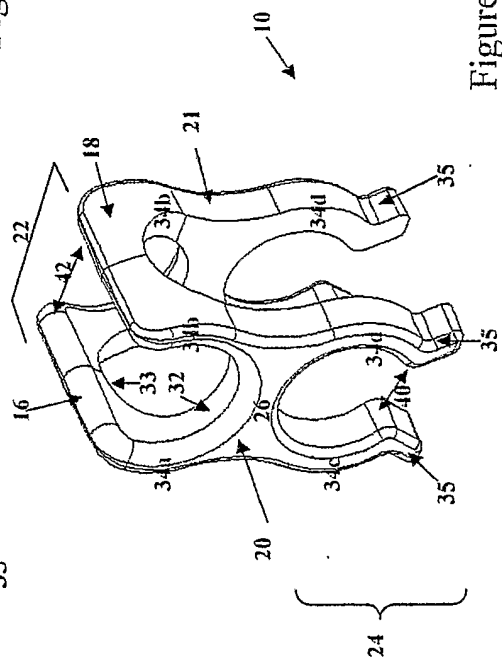


Figure 4

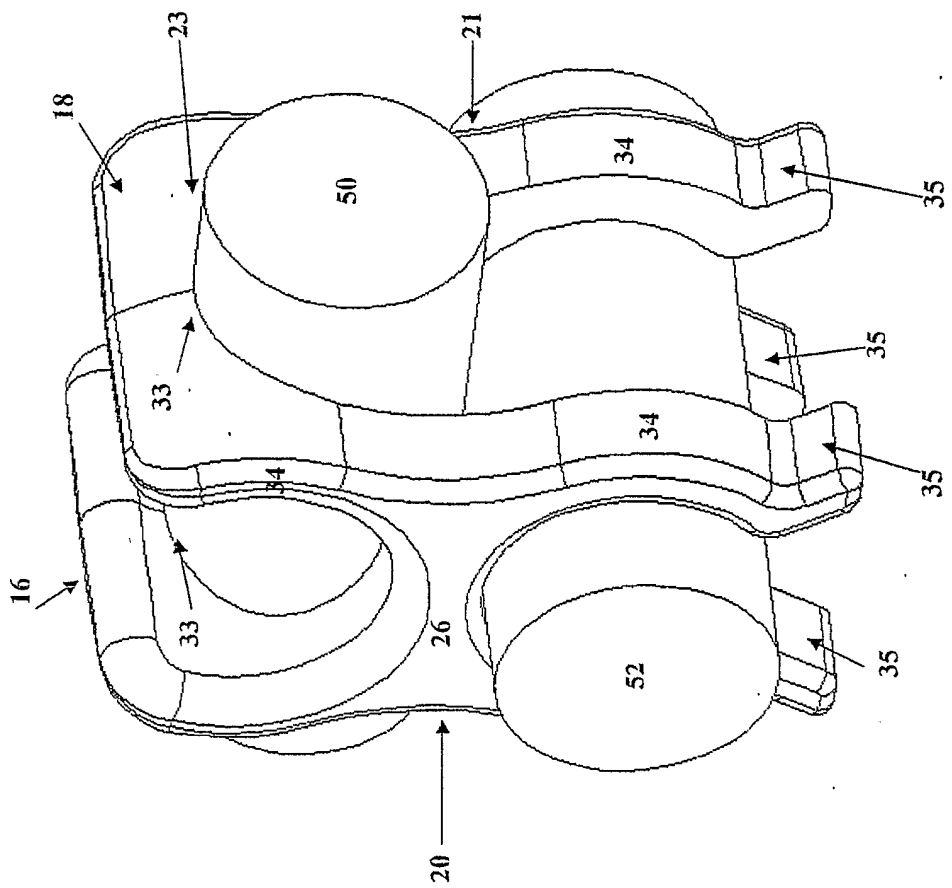


Figure 5