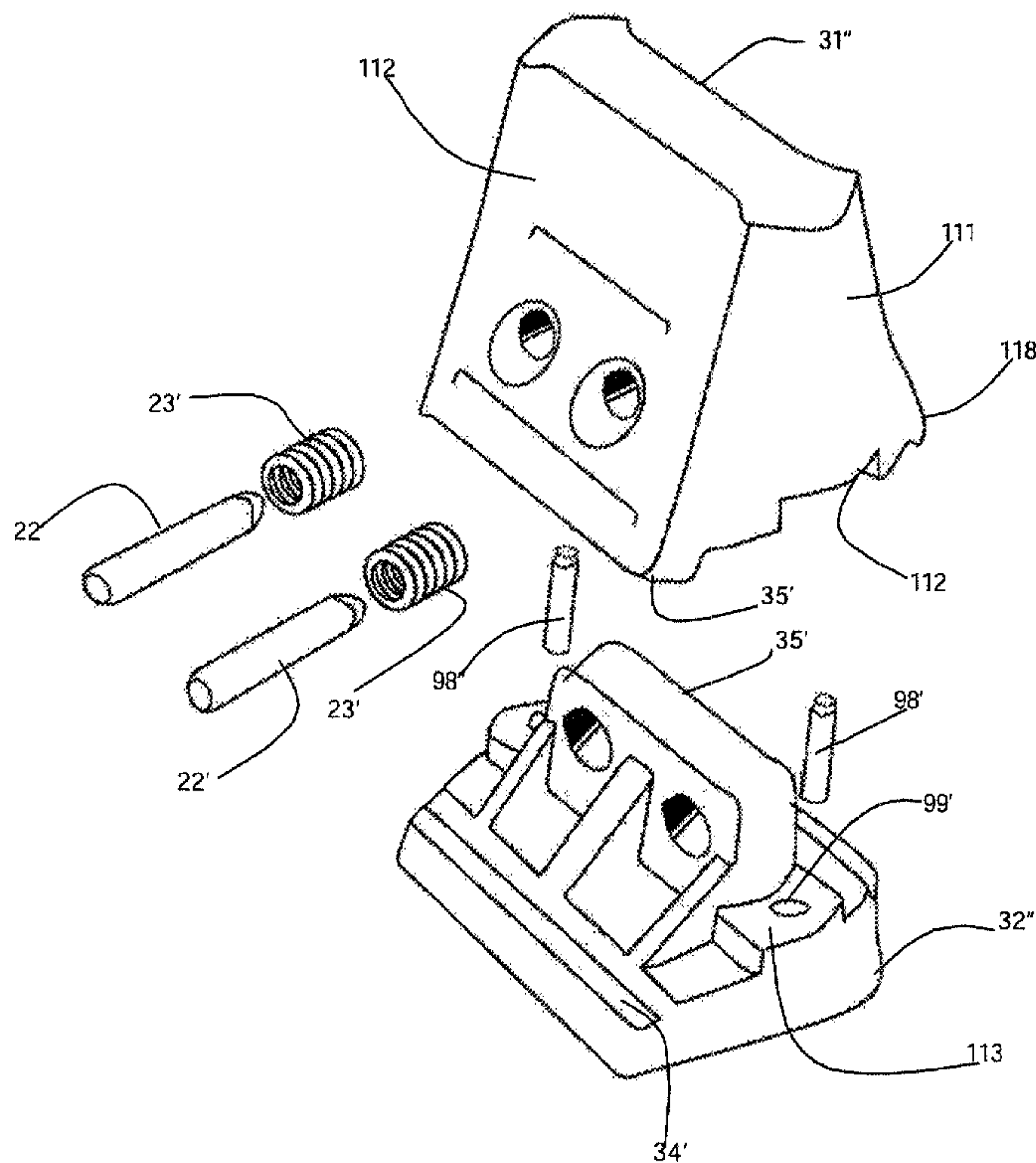




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(54) Titre : ROULEAU COMPACTEUR UTILISANT DES CRAMPONS REMPLACABLES A DUREE DE VIE UTILE
PROLONGEE
(54) Title: FILL AND COMPACTION ROLLER USING REPLACEABLE CLEAT ASSEMBLIES WITH EXTENDED
SERVICE LIFE



(57) **Abrégé/Abstract:**

A compaction roller for mounting on a driven compaction vehicle is equipped with both destructive and tractive, highly wear resistant cleat assemblies. The later includes readily removable wear caps with bulbous full height corner portions and broad wear faces. Anti twist projections and complementary recesses including mortise and tenon type locks at the interface of the wear cap and support bases reduce relative movements between the parts under sever working forces.

1

Abstract

2 A compaction roller for mounting on a driven compaction vehicle is equipped with
3 both destructive and tractive, highly wear resistant cleat assemblies. The later
4 includes readily removable wear caps with bulbous full height corner portions and
5 broad wear faces. Anti twist projections and complementary recesses including
6 mortise and tenon type locks at the interface of the wear cap and support bases
7 reduce relative movements between the parts under sever working forces.

8

1 **FILL AND COMPACTION ROLLER USING REPLACEABLE CLEAT**
2 **ASSEMBLIES WITH EXTENDED SERVICE LIFE**

3
4 ***Description***
5

6
7
8 [0001] This application is a continuation-in-part of application Serial No.
9 09/846,082, filed Apr. 30, 2001, which is a continuation-in-part of application
10 Serial No. 09/565,824, filed May 5, 2000, abandoned.

11
12 **FIELD OF THE INVENTION**

13
14 [0002] This invention generally concerns compaction machinery such as a roller
15 or wheel for mounting upon a driven compactor vehicle or tractor, the roller
16 having both destructive and tractive characteristics adapted to break up, crush,
17 grind and compact throwaway materials commonly delivered to a sanitary land fill
18 operations. More particularly this invention is characterized by cleat assemblies
19 including removable wear caps configured for a long service life.

20
21 **BACKGROUND OF THE INVENTION**

22
23 [0003] Compaction rollers and wheels used on landfill operations and particularly
24 sanitary landfill operations are equipped generally with cleats or feet of the type
25 for grinding and crushing materials to reduce the size and bulk of the material. As
26 shown in the assignee's prior patents, U.S. Pat. No. 3,922,106 and 4,919,566, an
27 earth and sanitary fill compaction roller has been shown employing two different
28 types of feet having a replaceable wear cap as a part of the cleat assemblies.
29 The wear caps are welded to a base portion of the assembly, which in turn is

1 welded to the roller as shown in U.S. Pat. No. 3,922,106. The wear caps in U.S.
2 Pat. No. 4,919,566 are readily removable from the base portion of the assembly
3 using common tools available at the job site. It has been observed that due in
4 large degree to manufacturing tolerances that the use of removable wear caps
5 coupled to a fixed base, in severe service exposes the assembly to twisting
6 forces which in time materially reduce the service life of the wear cap and cleat
7 assembly. In the '566 patent, a cleat assembly was disclosed including means for
8 restraining twisting of the wear cap relative to the base, which function entirely
9 satisfactory with compaction equipment then operating in the 70,000 lbs. gross
10 weight class. Improvements in the cleat assembly are desired for use on
11 compaction rollers mounted on compaction machines now furnished in the
12 100,000 to 120,000 lbs gross vehicular weight class.

13
14 [0004] More particularly, the compaction vehicles of the higher operating weights
15 now coming into service apply substantially more torque to the compaction rollers
16 via their larger engines and transmissions than was the case with compactors
17 that were 30,000 to 50,000 lbs. lighter in gross vehicle weight. Moreover, landfill
18 operators expect very long service life of the compaction rollers and cleat
19 assemblies, some required assurances that these components will render a
20 service life on the order of 20,000 hours. Thus, it is highly desirable to
21 accommodate in the cleat assemblies on the compaction rollers the higher torque
22 than tractive forces applied by the extra heavy duty compaction machinery now
23 entering into service.

24
25 **SUMMARY OF THE INVENTION AND OBJECTS**

26
27 [0005] In general, an improved compaction roller carries cleat assemblies
28 comprising a rigid mounting pad assembly to be welded to a rigid cylindrical body
29 and a bracket integral to the base portion protruding generally outwardly
30 therefrom. At least one coupling opening extends transversely through the

1 bracket. A detachable wear cap unit is releaseably coupled to the base, the cap
2 having a generally hollow body, including radially outwardly converging outer
3 sidewalls and having broad tractive faces with enlarged end portions. At least
4 one pair of aligned openings is formed through the sidewalls and align able with
5 the coupling openings for receiving coupling means there through. Coupling
6 means are disposed acting between the bracket and the wear cap unit. The cleat
7 assembly being characterized by means restraining twisting of the wear cap unit
8 with respect to said base portion, and including a plurality of apertures and
9 complementary projections such as mortise and tenon-like elements arranged on
10 said base portion and said wear cap unit and positioned outwardly on said base
11 portion on said bracket. The wear cap including transverse end walls extending
12 between the end portions of said side walls and merging therewith into enlarged
13 corner portions protruding outwardly for substantially their full height from the
14 general plane of the sidewalls thereby defining a broad tractive working face.

15

16 [0006] In general it is an object of the present invention to provide an improved
17 fill and compaction roller having readily replaceable cleat assemblies compatible
18 with extra heavy duty compaction equipment utilizing high horsepower and
19 torque forces.

20

21 [0007] It is another object of the present invention to provide an improved cleat
22 assembly in which the wear cap can be readily replaced so as to avoid the
23 wearing away the mounting base carrying such wear cap.

24

25 [0008] Another object of the invention is to provide a cleat assembly of the type
26 described having broad tractive working faces.

27

28 [0009] It is a further object of the invention to provide an improved cleat assembly
29 for fill and compaction roller characterized by means restraining twisting between
30 the wear cap and base.

1 [0010] It is yet an additional object of the invention to provide a cleat assembly
2 for a fill and compaction roller including readily removable cap units or shoes
3 serving to provide to the roller traction and demolition functions.

4

5 [0011] An additional object of the invention is to provide a cleat assembly having
6 a readily removable cap unit serving to engage upon a base in secure mortise
7 and tenon joints thereby inhibiting twisting of the cap unit with respect to the
8 base.

9

10 [0012] The foregoing and other objects of the invention will become more readily
11 evident from the following detailed description of preferred embodiments when
12 considered in conjunction with the drawings.

13

14 BRIEF DESCRIPTION OF THE DRAWINGS

15

16 [0013] FIG. 1 is a perspective view of the rear of a sanitary landfill trash
17 compactor equipped with compaction rollers having mounted thereon the cleat
18 assemblies, all made in accordance with the principles of the present invention;

19

20 [0014] FIG. 2 is a perspective view on an enlarged scale of a contour type wear
21 cap having broad tractive working end faces;

22

23 [0015] FIG. 3 is a view on the scale of FIG. 2 showing the contour cleat base;

24

25 [0016] FIG. 4 is a plan view from above of the contour cleat shown in FIGS. 2
26 and 3;

27

28 [0017] FIG. 5 is an enlarged perspective view, like FIG. 2, showing the wear cap
29 of a traction foot of the present invention having broad tractive working faces;

30

1 [0018] FIG. 6 is a perspective view of the adapter base accommodating the wear
2 cap of FIG. 5;

3

4 [0019] FIG. 7 is a plan view from above of the traction cleat shown in FIGS. 5
5 and 6;

6

7 [0020] FIG. 8 is a perspective exploded view of the contour cap base assembly
8 equipped with anti-twist pintles;

9

10 [0021] FIG. 9 is a perspective view from above of the adaptor base as shown in
11 FIG. 8;

12

13 [0022] FIG. 10 is an exploded perspective view of the traction foot of the present
14 invention equipped with the pintle anti-twist elements;

15

16 [0023] FIG. 11 is an enlarged perspective view from above of the adaptor base
17 for the traction foot as shown in FIG. 10;

18

19 [0024] FIGS. 12 and 13 are perspective views of still another embodiment of the
20 invention showing dowels and recesses on the base adaptor and wear cap,
21 respectively, for anti-twist purposes;

22

23 [0025] FIGS. 14 and 15 show yet another embodiment of the invention with
24 recesses on the base adaptor and protruding elements on the wear cap for anti-
25 twist purposes;

26

27 [0026] FIG. 16 is an exploded perspective view of the wear cap and adaptor for
28 the contour foot showing another preferred embodiment of the anti-twist
29 provisions;

30

1 [0027] FIG. 17 is an enlarged perspective view from above of the adaptor base
2 shown in FIG. 16;

3

4 [0028] FIG. 18 is a perspective exploded view of the traction foot assembly
5 showing another preferred embodiment of the anti-twist means in the
6 environment of a traction foot;

7

8 [0029] FIG. 19 is an enlarged perspective view from above of the adaptor base of
9 the embodiment shown in FIG. 18;

10

11 [0030] FIG. 20 is an exploded isometric view of a contour foot showing insertable
12 pins or dowels serving as anti-twist means;

13

14 [0031] FIG. 21 is a view like FIG. 20 but showing still another form of traction
15 cleat of the present invention;

16

17 [0032] FIG. 22 is a view like FIG. 10 but rotated to view from below, an exploded
18 perspective view, of the traction foot of the present invention equipped with the
19 mortise and tenon lock, each lock being equipped with a pintle;

20

21 [0033] FIG. 23 is an exploded perspective view of the contour foot equipped with
22 the mortise and tenon lock and with pintle anti-twist elements;

23

24 [0034] FIG. 24 is a view like FIG. 23 showing a wear cap configuration employed
25 in bio-mass landfill applications.

26

27 DESCRIPTION OF THE PREFERRED FORMS OF THE INVENTION

28

29 [0035] A compaction roller 10 constructed according to the present invention is
30 illustrated in FIG. 1 mounted upon a power-driven trash compaction vehicle 11 of

1 high gross vehicular weight, the roller 10 normally being deployed in sets of four
2 as shown. The compaction roller 10 includes a rigid cylindrical body or rim 12
3 connected to a centrally disposed conical web 13 which in turn is rigidly secured
4 to central wheels structure 14 shown diagrammatically but may be constructed
5 according to U.S. Pat. No. 3,724,342 assigned to Caron Compactor Company to
6 incorporate cushioning elements and the like.

7

8 [0036] The wheel or roller 10 is shown mounted upon a very heavy duty
9 compactor. vehicle, one in the gross vehicle weight range of 70,000-120,000 lbs.
10 The high vehicular weights are desirable to achieve high compaction densities in
11 the sanitary land fill thereby to increase the capacity life of the landfill.

12

13 [0037] The cylindrical rim 12 of each of the four wheels shown in FIG. 1 is
14 equipped with cleat assemblies 16-17 as described more fully below which are
15 arranged in rows as shown. For ease of reference the cleat assemblies 16
16 referred to as traction cleats being that the cleat are provided with broad flat
17 faces presented to the direction of wheel rotation. The cleat assemblies 17 may
18 be referred to as contour cleats being that they are oriented on the rim 12 with
19 the long dimension of the cleat assembly extending in the direction of travel and
20 their configuration follows the contour of the wheel rim. Both the contour cleats
21 17 and the traction cleats 16 have broad faces oriented in the direction of travel,
22 and thus, both provide substantial traction effect for the wheel or if viewed in
23 another way, the driving force applied by the transmission and a motor of the
24 compactor are distributed onto both the traction and contour cleats which
25 together serve to crush and grind materials normally deposited in a landfill.

26

27 [0038] As shown in FIGS. 2 and 3, the contour cleat assembly 17 includes a rigid
28 mounting pad unit 18 having a base portion 19 curved to conform to the
29 curvature of cylindrical rim 12 so as to be welded to the rigid body formed by the
30 rim. It will be understood that the metallurgical composition of the cast steel

1 mounting pad 18 is such as to facilitate welding to the steel rim. On the other
2 hand, the metallurgical composition of the cast steel wear cap 21 is substantially
3 harder and cast from a steel formulation selected to resist abrasion over a long
4 service life. This material is not conducive to welding and for this reason, a
5 mechanical connection is highly desirably so that a very hard wear cap may be
6 coupled to a relatively softer, readily weldable, supporting base 18. Serving to
7 maintain the wear cap 21 releaseably secured to the mounting pad 18, faster
8 means including a pin 22 and a coil spring member 23 are mountable in the
9 associated apertures 24 and 26, respectively, as taught in the assignee's U.S.
10 Pat. No. 4,919,566, FIGS. 26-33. Although but a single pin 21 and capture spring
11 23 are shown in FIGS. 2 and 3, it is apparent that a pair may be usefully received
12 in the contour cleat 17 to promote a good fit between the parts. It will be seen
13 that the central bracket 25 is cast integral with the base portion 19 and protrudes
14 generally radially outwardly therefrom.

15

16 [0039] The wear cap unit 21 has a generally hollow body including sloping
17 upwardly converging outer side walls 27 and end walls 28 which at the edges
18 bulge outwardly so that the end walls 28 taper from a narrow portion adjacent the
19 base mounting pad 19 to a wider top end portion 29 as shown in FIG. 4. This
20 configuration presents broad traction faces 28 to the contour cleat 17 and further
21 provides bulbous metal masses along the end faces 28 to resist abrasion and
22 wear over the desired along service life of the wear cap. The top wall 29 of the
23 wear cap 21 is thus configured to have its narrowest dimension near the cleat
24 center portion with the widest dimensions near the juncture with the end walls 28
25 providing substantial masses of steel in an ideal position to resist abrasive wear.

26

27 [0040] Referring now specifically to FIGS. 5, 6 and 7, the traction cleat 16
28 includes a wear cap 31 and a rigid mounting pad unit 32 having a base portion
29 33 curved to conform to the curvature of the cylindrical rim 12 to as to be welded
30 to the rigid body formed by the rim. The metallurgical composition of the wear

1 cap 31 and adaptor base 32 is the same as that referred to in connection with the
2 corresponding component parts of the contour cleat 17. The pad 33 includes
3 integrally formed bracket 35 which extends generally outwardly from the pad 33
4 and is mounted generally centrally of the pad. At its edges the pad is recessed as
5 indicated at 34 along two parallel sides so as to receive skirt-like extensions 35 of
6 the side wall of the wear cap to thus protect the mounting pad unit 32. A plurality
7 of anti-twist gussets 36, triangular in shape are formed between the pad 33 and
8 central bracket 32, three being indicated on each side of the bracket.
9 Complimentary gusset receiving recesses 37, 38 are formed in the wear cap 31
10 so as to enclose the gussets 36 in a snug fit. A central recess 40 is configured to
11 receive the central bracket 35.

12

13 [0041] The wear cap 31 includes sloping, upwardly converging side walls 39, 42
14 and end walls 41. The end walls 41 converge with the side walls 39, 42 in
15 enlarged outwardly protruding, bulbous corner portions 44 and thus the top wall
16 43 has its broadest portions arranged adjacent the end walls 41 and the narrower
17 portion centrally located. This configuration preserves the desired tractive effect
18 of the cleat 16 while permitting a long service life by positioning substantial metal
19 masses at the four corners of the wear cap which has been found in use to
20 abrade more rapidly than the central portions of the wear cap. It will be apparent
21 that the complimentary recesses and anti-twist elements 36 between the wear
22 cap and adaptor provide for a snug and highly twist-resistant fit being that the
23 elements 36 that are disposed adjacent to the end portions of the bracket 32.

24

25 [0042] Fastener means 22, and 23 as shown are provided to releaseably secure
26 the adaptor base to the wear cap in the manner already described.

27

28 [0043] Referring to FIG. 8, another embodiment of contour cleat 47 is shown and
29 for the reason that it comprises elements previously described, the same
30 reference numbers will be used but with the prime symbol. As shown, the contour

1 cleat assembly 47 includes the rigid mounting pad 18' having a base portion 19'
2 and a central bracket 25' cast integral with the base portion to protrude generally
3 radially outwardly therefrom.

4
5 [0044] The contour cleat 47 includes the wear cap unit 21' configured as
6 previously described and is provided with apertures 24' to receive the holding pin
7 22' whereas the adaptor base 18' is provided with the aperture 26' to receive the
8 coil retaining spring 23'. A plurality of anti-twist elements having a general
9 configuration of tapered billets are positioned on the base 19' two on each side of
10 the central bracket 25'. The billets or pintles 48 may be tapered upwardly as
11 shown in FIGS. 8 and 9 or may be substantially cylindrical and of uniform
12 diameter according to foundry practice. Their height may be on the order of 3/4"
13 to 1 1/2" in length. Although four anti-twist billets 48 are illustrated, this number
14 may be varied so that two billets will be positioned on one side of the bracket 25'
15 and but a single billet on the opposite side. Further, it is practical to use two
16 billets 48 with one positioned on either side of the bracket 25' or both on the
17 same side of the bracket 25'.

18
19 [0045] Complementing the billets or pintles 48 the wear cap 21' is equipped with
20 receiving cavities configured to fit closely with the billet elements 48. Thus, when
21 the wear cap 21' is mounted on the adaptor 18' the billets 48 are received in their
22 complementary recesses and the coupling elements 22, 23 connected thereto
23 serve to unite the parts together in a tight relationship resisting twisting of the
24 wear cap 21' with respect to the adaptor 18'.

25
26 [0046] Referring now specifically to FIGS. 10 and 11, another preferred form of
27 traction cleat 46 is illustrated and includes parts previously described, thus
28 designated with the reference numerals primed. The traction cleat 46 includes a
29 wear cap 31' and a rigid mounting pad unit 32' having a base portion 33' for
30 welding to the wheel rim. The pad 33' includes the integrally formed central

1 bracket 35' which extends generally outwardly from the pad 33' as shown. At its
2 edges the pad is recessed as indicated at 34' to receive skirt-like extensions 35'
3 of the sidewalls 39', 42'. A plurality of anti-twist billets or pintles 48 are formed on
4 the pad 33' and project generally upwardly on both sides of the central bracket
5 35'. Complementary shaped recesses are formed in the wear cap 31' so as to
6 receive the billets or pintles 48 therein. A central recesses 37' is provided for
7 receiving the gusset antitwist elements 36'. On the traction cleat 46, the billet
8 elements 48 are indicated as being deployed in pairs on either side of the central
9 bracket, but it is practical to achieve substantially the same anti-twist effect by
10 using three integral elements and as the application dictates or two elements,
11 one each side of a central bracket. The wear cap is provided with apertures or
12 recesses for receiving the pintle elements.

13

14 [0047] Still another preferred form of the traction cleat 56 is shown in FIGS. 12
15 and 13. As was the practice above, similar parts have been designated with
16 similar reference numerals accompanied by a prime symbol. Similar parts
17 previously described and contained in the traction cleat 56 include the wear cap
18 31', mounting pad unit 32', base portion 33', central bracket 35', recesses 34',
19 wall extensions 35', and sidewalls 39' and 42'. The recesses 30' and 40' are also
20 present in the wear cap 56. A plurality of anti-twist stub posts or bosses 57 and
21 complementary recesses 58 are disposed respectively on the adaptor pad 33'
22 and in the under side of the wear cap 41'. It will be apparent that the
23 complementary recesses and anti-twist elements 58 and 57 when fitted together
24 interact to permit the wear cap 31' and adaptor base 33' to achieve a highly twist-
25 resistant fit between the elements. Faster means (not shown) are provided as in
26 the instance of the embodiments illustrated in FIGS. 5, 6, and 10 to releaseably
27 secure the adaptor base to the wear cap in the manner already described.
28 Although four anti-twist stub posts or bosses 57 are illustrated together with the
29 associated recesses 58, this number may be varied so that either 3 or 2 stub
30 posts may be disposed on the adaptor pad 33' as the need dictates. It is to be

1 understood that the receiving cavities 58 and the wear cap are configured to fit
2 closely with the stub post or boss elements 57 so that the parts may unite in a
3 tight relationship resisting twisting of the wear cap with respect to the adaptor 33'.
4 The stub post or boss 57 configuration with the associated recesses 58 can be
5 applied to the contour cleat, e.g., applied to the embodiment shown in FIGS. 8
6 and 9. In that instance the stub post 57 would exist in place of the billets or
7 pintles 48 and their associated recesses.

8

9 [0048] Referring now specifically to FIGS. 14 and 15, yet another preferred form
10 of traction cleat 66 is disclosed. Parts previously described above are
11 enumerated in FIGS. 14 and 15 with the reference numerals primed, as practiced
12 above. These will not be further described. A plurality of anti-twist wedges 67 are
13 formed on the wear cap 31', the wedges 67 being disposed on the undersurface
14 so as to project outwardly therefrom. Triangular recesses 68 are disposed in the
15 pad surface 33' to receive the wedge elements. When the wear cap 31' is drawn
16 tightly into the adaptor pad 32', the wedge protrusion 67 seat snugly within the
17 recesses 68 to provide for the substantial anti-twist resistance within the two
18 piece cleat unit 66. Although an exemplary four anti-twist elements are illustrated,
19 actual practice may dictate few than four will serve satisfactory the desired
20 purposes.

21

22 [0049] Referring to FIGS. 16 and 17, another embodiment of contour cleat 77 is
23 shown and for the reason that it comprises elements previously described, the
24 same reference numbers will be used with the prime symbol. A plurality of anti-
25 twist elements 79 having a general configuration of a greatly enlarged saw tooth
26 are positioned on the central outer edge of the mounting base or pad 19' and
27 correspondingly on the lower portion 79 of the walls 27' of the wear cap 21'.
28 Whereas when formed integrally with the pad 19', the saw tooth antitwist element
29 78 protrude upwardly and are shown as comprising four projections. On the wear
30 cap 21', the bottom or skirt portions of the sidewalls 27' are recessed so as to

1 receive the four projections from the adaptor pad 19'. It will be apparent that
2 when the wear cap and adaptor pad are drawn together, the saw tooth elements
3 78,79 interfit and provide the desired highly twist-resistant interconnection
4 between the parts.

5
6 [0050] Referring now to FIGS. 18 and 19, still another preferred form of traction
7 cleat 86 is disclosed. Parts previously described above are enumerated in FIGS.
8 18 and 19 with reference numerals prime, as practiced above. These will not be
9 further described. A plurality of anti-twist, enlarged saw tooth like elements 87
10 and 88 are arranged on the wear cap 31' and the adaptor base 32'. The anti-
11 twist, saw tooth like elements 87, 88 are provided respectively on the sidewalls of
12 the pad 33' and the enwalls 41' of the wear cap 31'. As mounted on the
13 compaction roller 10 the saw teeth are disposed or aligned in the direction of
14 rotation or are aligned in the direction of rotation. When the wear cap 31' and
15 base 32' of unit 86 are pulled together, the tooth-like elements fit into mutual
16 complementary recesses. Fastener means as mentioned above are received
17 within the apertures 26' and thus enable the parts to nest tightly together for
18 resisting twisting forces applied between the wear cap 31' and base 32' of the
19 cleat 86.

20
21 [0051] Referring now specifically to FIG. 20, another preferred form of contour
22 cleat 97 is shown and comprises elements previously described as signified by
23 reference numerals carrying primes. On the cleat 97 there is provided a plurality
24 of anti-twist elements 98, each having a general configuration of a cylindrical
25 pintle and a complimentary recess 99. These are arranged such that the
26 recesses 99 are provided both in the base 19' of the mounting pad 18' as well as
27 in the bottom surface of the wear cap 21', as shown. The pintle elements 98
28 during cleat assembly are positioned in the holes or apertures 99 and extend
29 above the upper surface of the pad 19' so as to project into corresponding
30 apertures or holes 99 within the wear cap. One of the advantages of this

1 configuration is that in the foundry casting process it is necessary only to cast the
2 recesses 99 in the two cleat parts. The pintle elements 98 may be cut from
3 cylindrical or other shape bar stock to the desired lengths on the order 3/4" to
4 13/4". The length is selected so that the parts of the wear cap base and pintle 98
5 will all nest securely together for resisting twisting actions imparted to the wear
6 cap and adaptor. Although two anti-twist elements are illustrated in FIG. 20, as
7 the need dictates, three or four such elements may be provided simply by the
8 addition of more complimentary, in registration recesses in the pad 18' and wear
9 cap 21' of the contour cleat 97.

10

11 [0052] The pintle element 98, as an alternative to being formed from steel bar
12 stock, may be a fabricated "flex-pin" wherein two curved metal side portions
13 define a sandwich with a compressible somewhat elastic central member. The
14 flex-pins when driven into the apertures 99 compress the elastic central portion,
15 and thus establish a snug fit within the aperture 99.

16

17 [0053] On the other hand, it has been found advantageous to employ cylindrical
18 slugs 98 which are somewhat smaller in diameter than the inside diameter of the
19 aperture so as to accommodate easily the tolerances in general foundry casting
20 practice. This is especially useful when two or more slug elements 98 are
21 employed and the foundry general casting tolerance accommodates the
22 dimensional allowance furnished by the undersized slugs or pins 98. Although it
23 is indicated in FIGS. 20 and 21 that the anti twist means are arranged to straddle
24 the medial axis of the traction cleats 97, 106, it is appropriate in some
25 applications to locate the anti twist element substantially on the medial axis,
26 especially with regard to the cleat element 97.

27

28 [0054] Referring to FIG. 21, another preferred form of traction cleat 106 is
29 illustrated and includes parts previously described, thus designated with
30 reference numerals primed. The traction cleat 106 includes a wear cap 31' and a

1 rigid mounting pad unit 32' having a base portion 31' for welding to the wheel rim
2 12. A plurality of recesses 99 are formed in registry in both the cap 31' and
3 adaptor base 32', as shown. These serve with the pintle or slug elements 98 as
4 anti-twist means. The "flex-pins" are useful in this application as described
5 above. The wear cap 106 is adapted to receive the connection means 22, 23 (not
6 shown), and thus when the pins or slugs 98 are positioned in the holes or
7 recesses 99, the wear cap 31' and adaptor 32' can be assembled in a tight fit
8 resisting twisting forces applied to the wear cap and adaptor of the traction cleat
9 106 in severe usage over a long service life.

10

11 [0055] It will be further understood that in use of the compaction cleats 97, 106,
12 normally in a sanitary land fill site, fine materials usually migrate into the interior
13 of the cleat and wear-cap assembly such that although the pintle or slug 98 and
14 recess 99 may initially be somewhat of a loose fit in a very short period of
15 operational time, the interstices accumulate these fine materials which come to
16 act as a cement uniting the pintles or pins in the recesses in both the wear cap
17 and base. This furnishes a rigid connection. As is apparent, the antitwist means
18 when the cleat assembly is in use are concealed. Disassembly of the two part
19 unit exposes the pintles for removal if necessary. A strong blow with a sledge
20 hammer or the like will loosen the part sufficiently for removal or replacement.

21

22 [0056] Referring to FIG. 22, another preferred form of traction cleat 110 is
23 illustrated and includes parts previously described, thus are designated with
24 reference numerals primed or in certain instances double primed. The traction
25 cleat 110 includes a wear cap 31" and a rigid mounting pad unit or adaptor 32"
26 having a base portion for welding to the wheel rim 12 (not shown but previously
27 described). To protect the attachment weld from abrading during the service life
28 of the cleat 110 an undercut or bevel 115 is disposed on the longer sides of the
29 base or adaptor 32" as seen in the view from below of FIG. 22. When the adaptor
30 32" is welded to the wheel rim along the bevel 115 the attachment weld is

1 protected. Furthermore, the wear cap 31" is configured with depending skirts 117
2 at the lower margins of the walls 110 and these skirts 117 overlie substantially
3 the attachment welds when the parts are assembled for working use. The end
4 walls 111 of the traction cleat 110 are substantially enlarged curves bulging
5 outwardly into a rotund and bulbous configuration for substantially their full
6 height. This configuration provides an arrangement of substantial masses of
7 metal for both strength, weight and wear purposes. The traction faces 112 of the
8 wear cap 31' merge into the end walls 111 at enlarged corner bulbous portions
9 extending the full height of the wear cap, thus enhancing the mass and weight of
10 the wear cap. The two apertures 24' which extend through the side walls 112 and
11 are adapted to receive the pins 22' and retainer springs 23' are at each side wall
12 furnished with counter bores 109 so that the pins 22' may penetrate the cleat
13 assembly and reside in a recessed position beyond the bevel or counter bore
14 109. This configuration shields the pin ends from being abraded from long
15 service and to preserve the pin ends in their original squared off condition for
16 easier removal when changing wear caps 31".

17

18 [0057] At its lower periphery, as clearly shown in FIG. 22, the wear cap 31' in
19 each end wall 111 is provided with a generally rectilinear shaped recess or
20 mortise 113a which complements an upstanding, generally rectilinear tenon 113b
21 on each end of the base 32". Thus it will be understood that mortise and tenon
22 lock joint 113a, b is present on each end wall 111 of the traction cleat 110. The
23 base or pad 32", is equipped with a substantial thickness of metal to the effect
24 that its upper surfaces extend a substantial vertical distance from the wheel rim
25 (not shown). Thus the tenon element 113b is elevated above the wheel rim.

26

27 [0058] Complementing the mortise and tenon lock configuration 113a, b is the
28 pintle and hole arrangement extending into the mortise and tenon joint, pintle 98',
29 hole 99'. The mortise and tenon lock act together with the pintle 98' and the
30 associated recess 99' to insure a rigid, torque resistive interconnection between

1 the wear cap and adapter. This configuration serves to resist and oppose the
2 high traction and twisting forces imparted to the traction cleats by the high
3 horsepower compaction equipment used on sanitary landfill sites today.

4
5 [0059] Referring to FIG. 23, another preferred form of contour cleat 116 is
6 illustrated and includes parts previously described, thus being designated with
7 reference numerals primed. The contour cleat 116 includes the wear cap unit 21'
8 and supportive adaptor base 19' which are configured to interconnect together
9 with a mortise and tenon lock arrangement 117a , b on opposite side walls. In
10 this instance the generally rectilinear mortises or recesses 117a are arranged
11 along a medial portion of opposite sides of the base 19'. The generally rectilinear
12 tenon elements 118b project downwardly from the opposite sides of the wear cap
13 21' and constitute its lower extremities. A plurality of holes or recesses 99' are
14 formed in a registry relationship within both the wear cap 21' and the base 19'.
15 Although the holes 99' in the wear cap 21' are not visible in FIG. 23, it will be
16 understood that they are present to effect the locking interaction with the pintles
17 or slugs 98". Thus, the pintles or billets 98" are adapted for reception into the
18 holes 99' and interact together to secure the wear cap 21' from twisting forces
19 with respect to the base 19'. This feature is further enhanced by the lock supplied
20 by the mortise 117a and tenon 117b elements.

21
22 [0060] As may be perceived from FIG. 23, it will be understood that the wear cap
23 21' has a generally hollow body including sloping, upwardly converging sidewalls
24 27" and end walls 28". The upwardly sloping converging sidewalls 27" and end
25 walls 28" merge along edges portions that bulge outwardly over substantially the
26 entire height of the wear cap, as illustrated in FIG. 23. This provides a substantial
27 mass of material for enhancement of both strength, wear and weight of the
28 contour cleat 116. This provides steel in optimum locations to resist abrasive
29 wear and to establish an ideal joint between the wear cap and adaptor that will
30 resist twisting and torsion from the powerful modern compactors employed today

1 at sanitary landfill sites. Shielding the two apertures 24' for the retainer springs
2 23' and protecting the ends of the pins 22' on each side wall 27' there is
3 provided a ledge of metal 119. This configuration protects the ends of the pins
4 22' and maintains them in a substantially unabraded condition for the time for
5 their removal so as to furnish a planar face for engagement by the removal tools.
6 Moreover at a time after a long service life, the wear cap may be dismantled
7 from the adaptor with the use of common tools available to workmen in the field.

8

9 [0061] Referring to FIG. 24, another preferred form of traction cleat 121 is
10 illustrated and includes parts previously described, designated with reference
11 numerals primed or double primed. The cleat 121 is especially adapted for work
12 on bio-mass applications at sanitary landfills and provided with a cross-like
13 configuration at its working tip face. The action of this cleat serves to induce
14 improved penetration of air into the landfill materials to encourage good bacterial
15 action analogous to fermentation within the landfill materials. The bio-mass cleat
16 121 resembles generally the contour cleat 116 and includes a generally similar
17 adapter base. The cleat 121 is equipped with the mortise and tenon lock
18 arrangement including the recess 117 in the base and the tenon 118' in the
19 sidewalls of the wear cap. The pins 98' and holes 99' are provided for the anti-
20 twist locational functions mentioned above. The sidewalls 122 are each further
21 equipped with a vertically extending spur 123 which extends vertically over one
22 half of the length or height of the wear cap. The spurs on each side acting with
23 the top or tip working face and the ends of the sidewalls provide the cross-
24 configuration for enhanced punching action into the landfill bio-mass applications.

25

26 [0062] From the foregoing, it will be readily evident that there have been provided
27 improved cleat assemblies for fill and compaction rollers whereby the wear cap
28 and associated adaptors have a long service life being that the wear caps are
29 equipped with bulbous metal portions protruding from their plane surfaces for
30 presenting metal in optimum locations to achieve a long wear life, as much as

1 20,000 useful working wear life. It will be further evident that anti-twist means are
2 provided acting between the wear cap and adaptor to resist twisting moments
3 there between. This further enhances the extends the service life of the cleats by
4 substantially reducing the "working" or vibration between the wear caps and the
5 adaptors which wears down the softer steel adapters from rubbing against the
6 harder steel wear caps.

7

8 [0063] The embodiments disclosed herein where chosen to best explain and
9 describe the principles of the invention and its practical application to thereby
10 enable any others skilled in the art to best utilize the invention in various
11 embodiments and with various modifications as are suited to the particular use
12 contemplated. It is intended that the scope of the invention be defined by the
13 claims appended hereto.

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Claims

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What is claimed

1. A cleat assembly for attachment to a fill and compaction roller of a type having a rigid annular body, said assembly comprising a rigid mounting pad assembly having a base portion adapted to be welded to the annular body and a bracket integral to said base portion protruding generally outwardly therefrom, at least one coupling opening extending transversely through said bracket, a wear cap unit adapted to be releaseably coupled to said base portion, said cap unit having a generally hollow body including radially outwardly convergent outer side walls, at least one pair of aligned openings respectively formed through the side walls and disposed to be aligned with said coupling opening for receiving coupling means there through, coupling means disposed through said coupling opening and said aligned openings to retain said wear cap unit to said mounting pad assembly, said cleat assembly being characterized by means restraining twisting of said wear cap unit with respect to said base portion, said means restraining twisting of said wear cap unit including a plurality of at least three complementary projections and recesses arranged respectively on said base portion and said wear cap unit and positioned outwardly on said base portion from said bracket, said wear cap unit including transverse end walls extending between the end portions of said side walls and merging therewith into four enlarged, bulbous corner portions protruding outwardly for substantially the full height of the wear cap from the general plane of said side walls forming therewith a pair of converging broad working faces on said wear cap unit.

2. The cleat assembly of claim 1 wherein said twist restraining means includes a plurality of pintle elements projecting radially outwardly from the base portion of

1 the mounting pad assembly and a plurality of recesses formed radially inwardly in
2 said wear cap.

3

4 3. The cleat assembly of claim 1 wherein said twist restraining means includes a
5 plurality of cylindrical upstanding projections extending generally radially
6 outwardly from the base portion of the mounting pad assembly, and
7 complementary recesses in said wear cap positioned to receive said cylindrical
8 projections.

9

10 4. The cleat assembly of claim 3 wherein said twist restraining means includes a
11 plurality of recesses disposed in mutual registration in the confronting mating
12 surfaces of said wear cap and said base portion of said mounting pad assembly,
13 and a plurality of cylindrical pins mounted in said recesses.

14

15 5. The cleat assembly of claim 4 wherein said recesses in the confronting mating
16 surfaces have a general diametral dimension larger than that of said cylindrical
17 pins.

18

19 6. The cleat assembly of claim 1 wherein said twist restraining means comprises
20 mating saw tooth like projections formed in the side walls of said wear cap and
21 base.

22

23 7. The cleat assembly of claim 1 wherein said twist restraining means comprises
24 a plurality of gusset elements formed on said base portion of said mounting pad
25 assembly and complementary recesses in said wear cap.

26

27 8. The cleat assembly of claim 1 wherein said twist restraining means comprises
28 a plurality of polygonal projections disposed on said wear cap and
29 complementary recesses arranged in the base portion of the mounting pad
30 assembly.

1 9. The cleat assembly of claim 1 wherein said twist restraining means comprises
2 a plurality of polygonal projections disposed on said base portion of said
3 mounting pad assembly and complementary recesses disposed on the mating
4 surface of said wear cap.

5

6 10. The cleat assembly of claim 1 wherein said twist restraining means
7 comprises at least two cylindrical recesses in the confronting, mating surfaces of
8 each said wear cap and base portion of said mounting pad assembly and at least
9 two cylindrical pins disposed in said recesses.

10

11 11. A fill and compaction roller of a type having a rigid cylindrical body supported
12 for rotation from a vehicle chassis and having cleat assemblies carried by the
13 body, said cleat assemblies each comprising a rigid mounting pad unit having a
14 base portion adapted to be welded to the body and a bracket integral to said
15 base portion protruding generally radially outwardly therefrom, a plurality of
16 coupling openings extending transversely through said bracket, a wear cap unit
17 adapted to be readily releasably coupled to said base portion, said cap having a
18 generally hollow body including a radially outwardly convergent outer side walls,
19 a pair of aligned openings formed through the side walls and disposed to be
20 aligned with said coupling openings for receiving coupling means therethrough,
21 coupling means disposed through said coupling openings and said aligned
22 openings to retain said wear cap unit to said mounting pad, said wear cap unit
23 including transverse end-walls extending between end portions of said side walls
24 and merging therewith into four enlarged, bulbous corner portions protruding
25 outwardly from the general plane of said side walls for substantially the full height
26 of the wear cap forming a pair of converging broad working faces on said wear
27 cap unit, said cleat assemblies including embedded means serving to restrain
28 twisting of said wear cap unit with respect to said base, said means including a
29 plurality of holes formed in said mounting pad outwardly of said bracket and
30 complementary positioned holes in the mating surface of said wear cap, and

1 slugs positioned in said holes serve to inhibit twisting about an axis substantially
2 normal through the axis of said coupling means.

3

4 12. The fill and compaction roller of claim 11 wherein said slugs are radially
5 compressible serving to snugly fit within said holes.

6

7 13. The fill and compaction roller of claim 11 wherein the slugs fit loosely in said
8 holes.

9

10 14. The fill and compaction roller of claim 11 wherein said twist restraining means
11 includes a plurality of cylindrical elements projecting from the surface of the base
12 portion of the mounting pad unit and a plurality of recesses formed in said wear
13 cap.

14

15 15. The cleat assembly of claim 10 wherein said twist restraining means includes
16 a plurality of cylindrical upstanding projections extending generally radially
17 outwardly from the surface of the base portion of the mounting pad assembly and
18 complementary recesses in said wear cap positioned to receive said cylindrical
19 projection.

20

21 16. A cleat assembly for a fill and compaction roller, comprising a mounting pad
22 having a base portion adapted to be affixed to the roller and a bracket which
23 projects outwardly from the base portion, a wear cap having a generally hollow
24 body with outwardly convergent side walls and end walls which merge into four
25 enlarged bulbous corner portions that extend laterally from the faces of the walls
26 and provide substantially the full height of the wear cap and provide substantially
27 increased masses of material at the four corners of the wear cap, and means
28 securing the wear cap to the mounting pad with the mounting pad bracket
29 extending into the hollow body of the wear cap.

30 17. The cleat assembly of claim 16 wherein the end walls are outwardly

1 convergent.

2

3 18. The cleat assembly of claim 16 wherein the end walls are tapered and
4 increase in width away from the base portion of the mounting pad.

5

6 19. The cleat assembly of claim 16 wherein the wear cap has an outer wall at the
7 outer extremities of the end and side walls which has portions of increased width
8 toward the end walls.

9

10 20. The cleat assembly of claim 16 including at least three interfitting projections
11 and recesses on the base portion of the mounting pad and the wear cap to resist
12 twisting of the wear cap on the mounting pad.

13

14 21. A fill and compaction roller assembly having a rigid roller body and a plurality
15 of cleat assemblies mounted on the cylindrical body, each of the cleat
16 assemblies comprising: a mounting pad having a base portion affixed to the
17 cylindrical body and a bracket which projects outwardly from the base portion in a
18 generally radial direction, a wear cap having a generally hollow body with
19 outwardly convergent side walls and end walls which merge into four enlarged
20 bulbous corner portions that extend substantially for the full height of the wear
21 cap and laterally from the faces of the walls and provide substantially increased
22 masses of material at the four corners of the wear cap, and means securing the
23 wear cap to the mounting pad with the mounting pad bracket extending into the
24 hollow body of the wear cap.

25

26 22. The roller assembly of claim 21 wherein the end walls are outwardly
27 convergent.

28

29 23. The roller assembly of claim 21 wherein the end walls are tapered and
30 increase in width away from the base portion of the mounting pad.

1 24. The roller assembly of claim 21 wherein the wear cap has an outer wall at the
2 outer extremities of the end and side walls which has portions of increased width
3 toward the end walls.

4

5 25. The roller assembly of claim 21 including at least three interfitting projections
6 and recesses on the base portion of the mounting pad and the wear cap to resist
7 twisting of the wear cap on the mounting pad.

8

9 26. The roller assembly of claim 21 including at least two mortise and tendon lock
10 joints arranged for a locking interconnection between the mounting pad and the
11 wear cap.

12

13 27. The roller assembly of claim 26 wherein the mortise and tendon lock joints
14 are configured with the tendons therein projecting downwardly from the wear cap
15 and the mortises are notched into the mounting pad.

16

17 28. The roller assembly of claim 26 wherein the mortise and tendon lock joints
18 are configured with the tendons therein projecting upwardly from the mounting
19 pad and the mortises are notched into the wear cap.

20

21 29. The roller assembly of claim 26 wherein each mortise and tendon lock joint is
22 provided with aligned cylindrical recesses and a slug is disposed within the
23 recesses to extend from the recess in the mounting pad into the recess in the
24 wear cap.

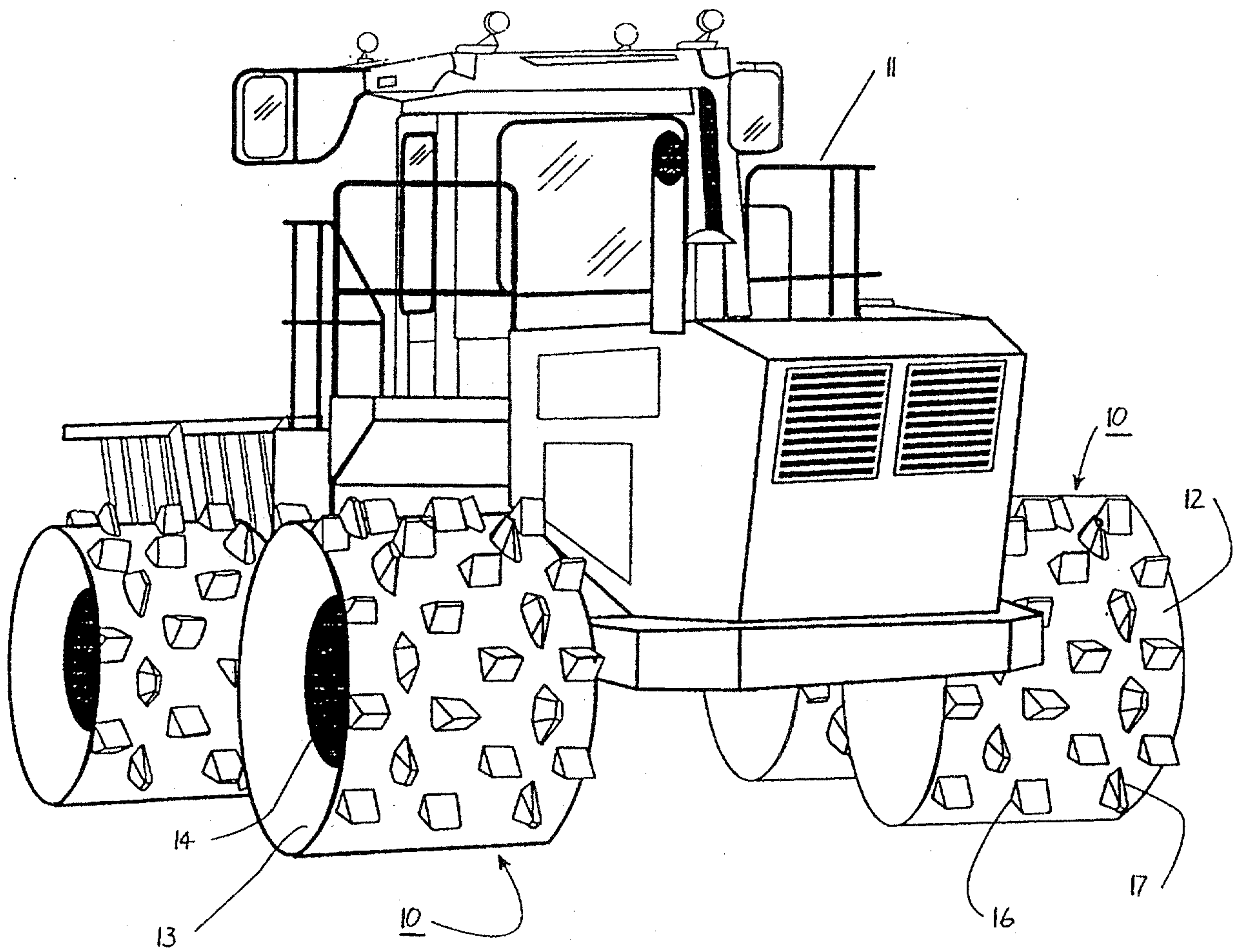
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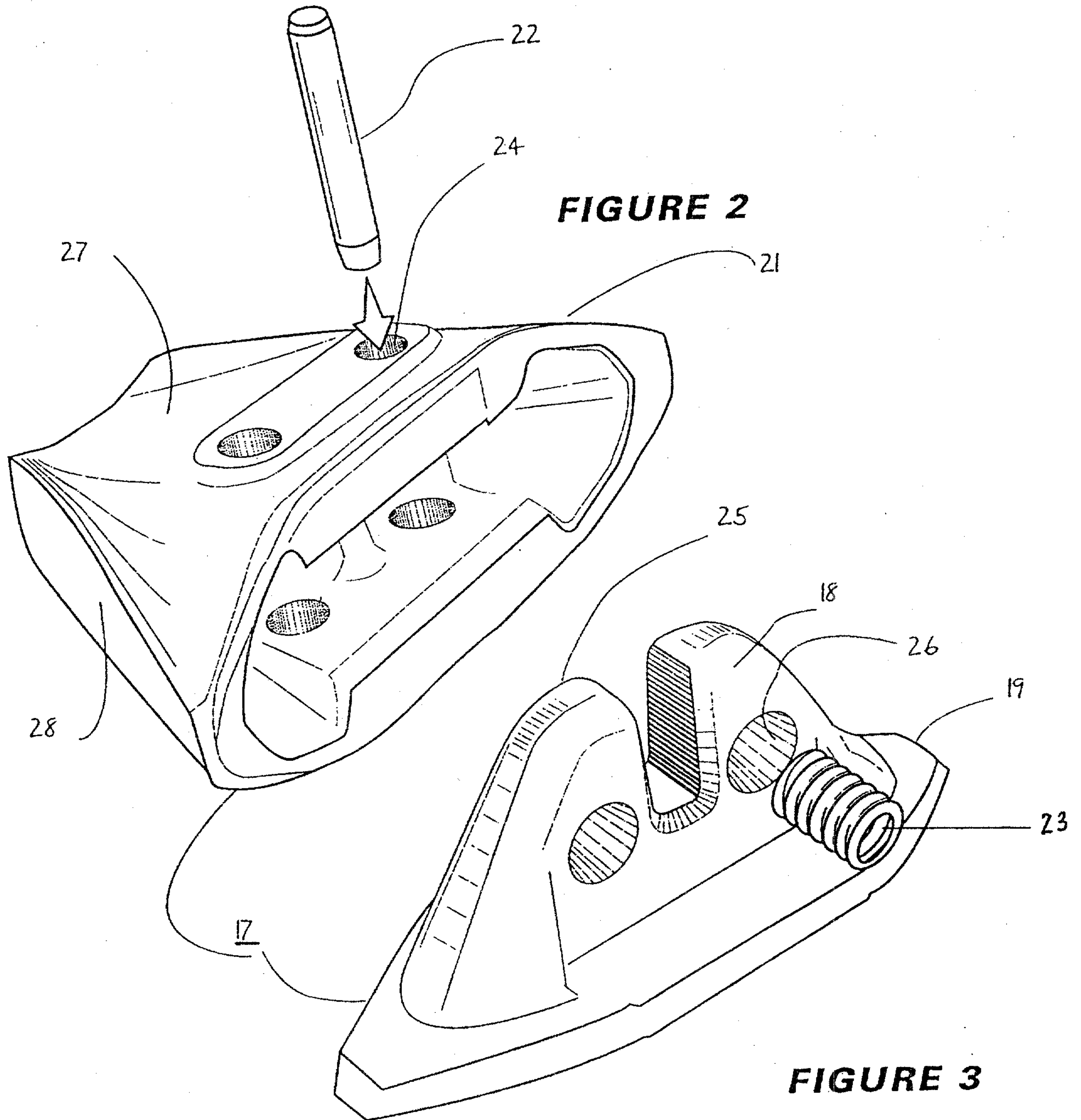
26 30. The roller assembly of claim 21 wherein the mortise and tendon lock joints
27 are arranged in the sidewalls of the wear cap.

28

29 31. The roller assembly of claim 21 wherein the mortise and tendon lock joints
30 are arranged in the end walls of the wear cap.

FIGURE 1





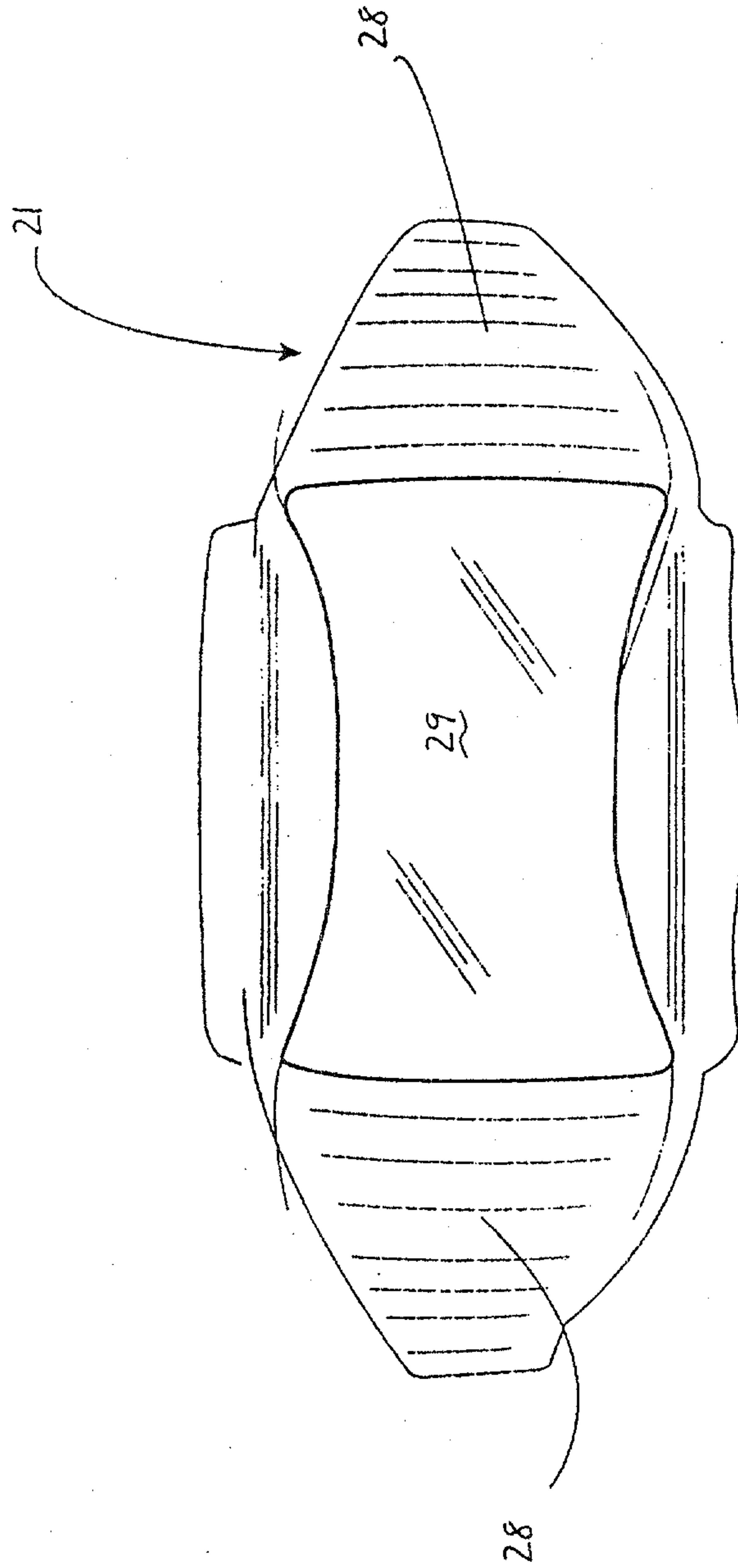
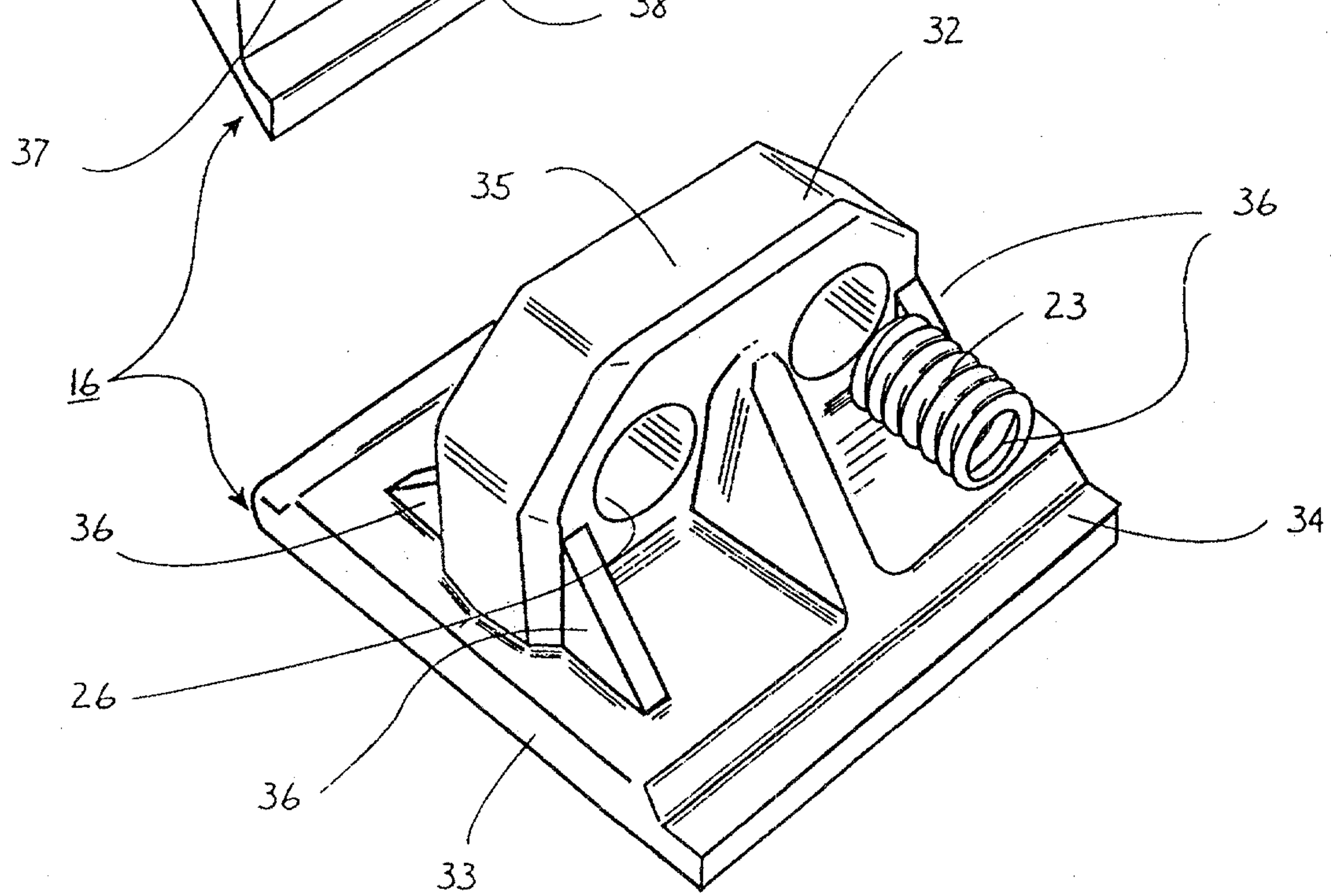
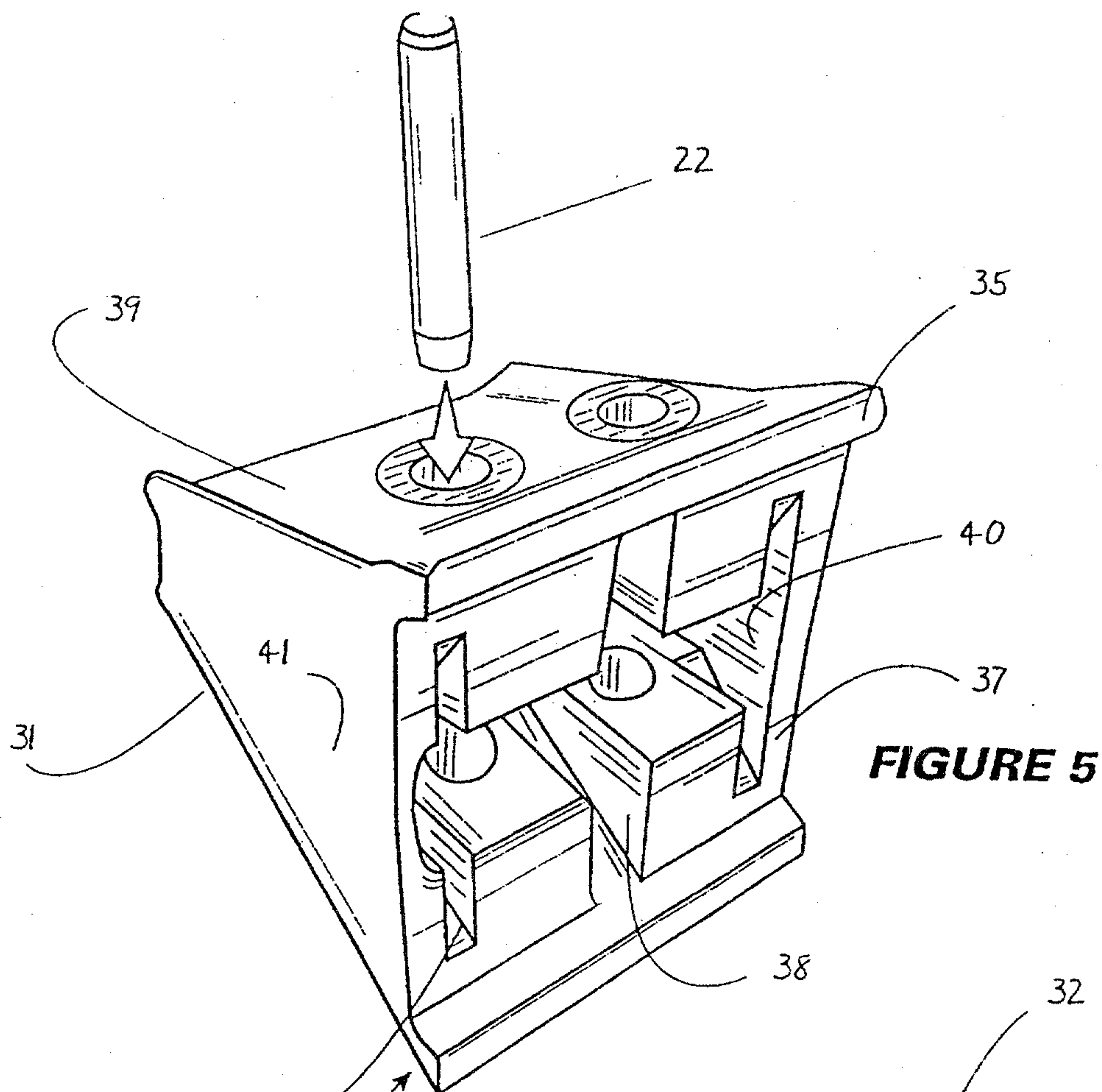


FIGURE 4



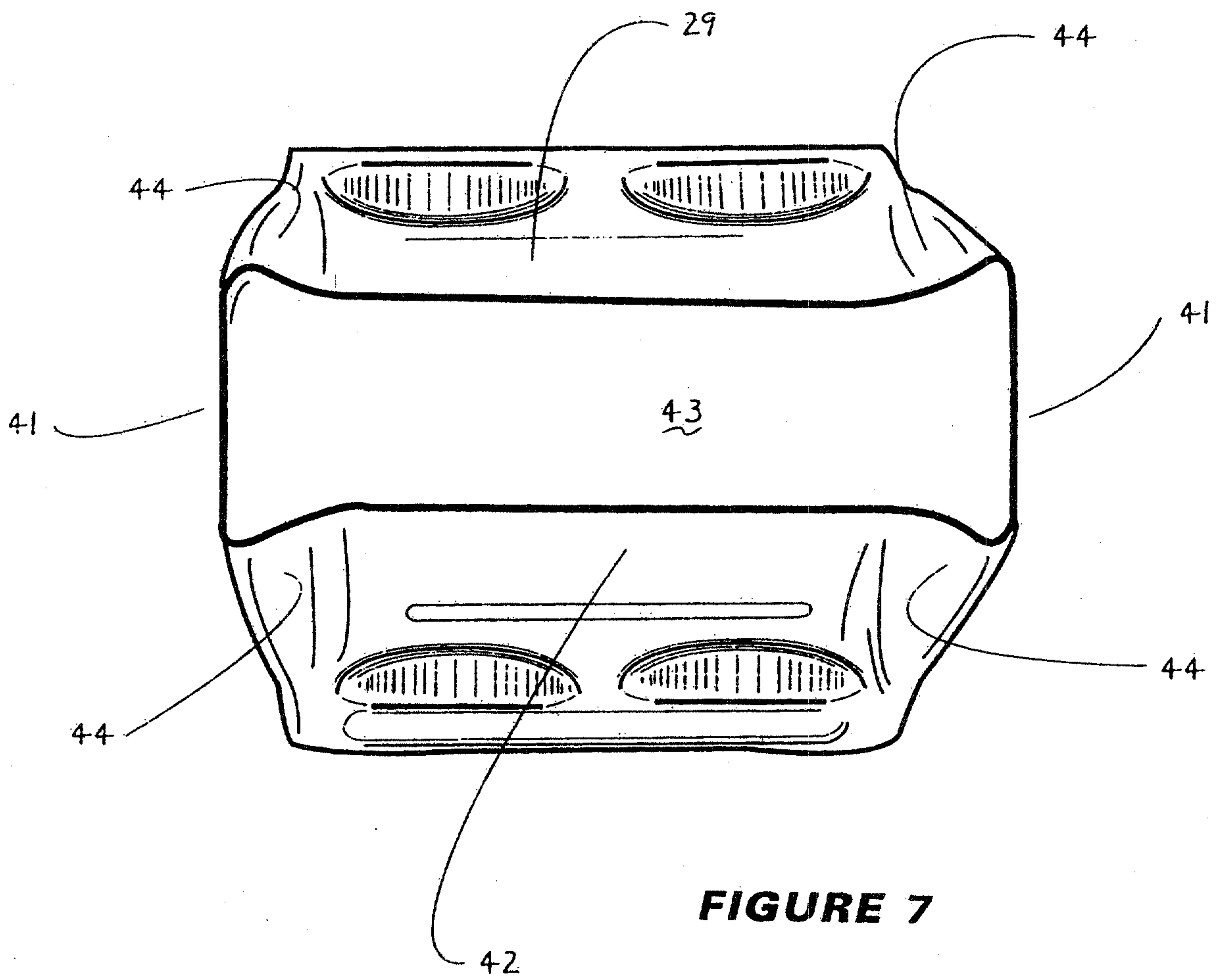


FIGURE 7

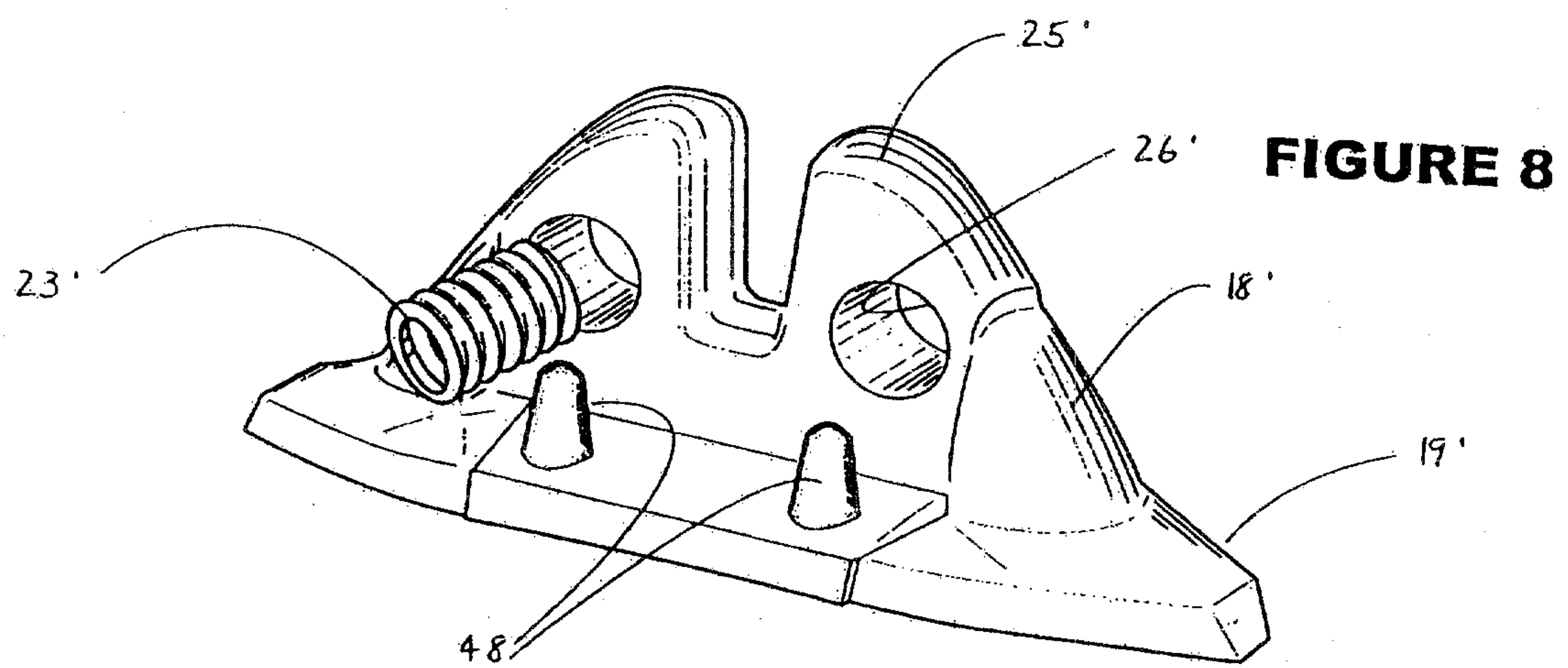
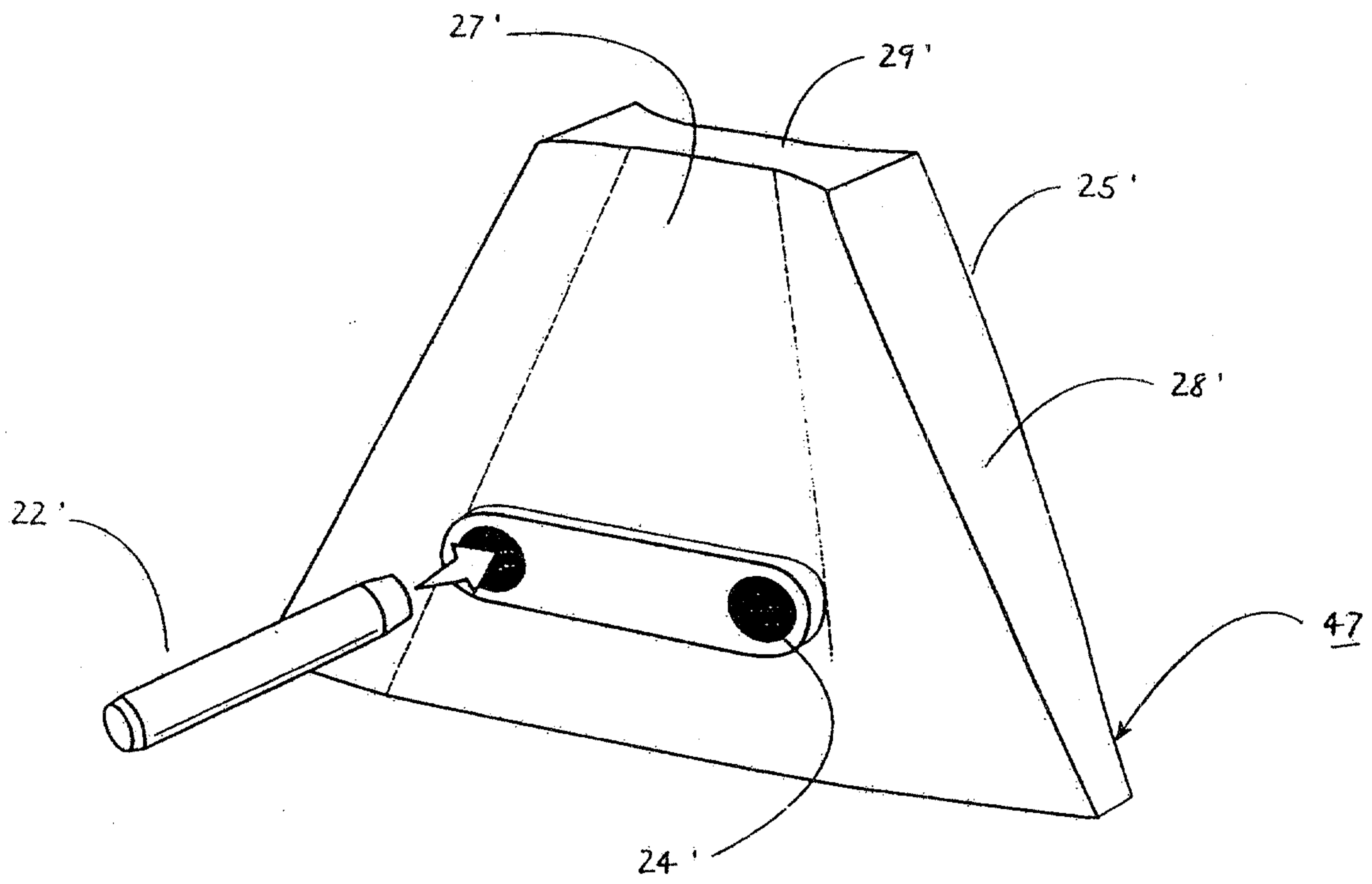


FIGURE 8

FIGURE 9

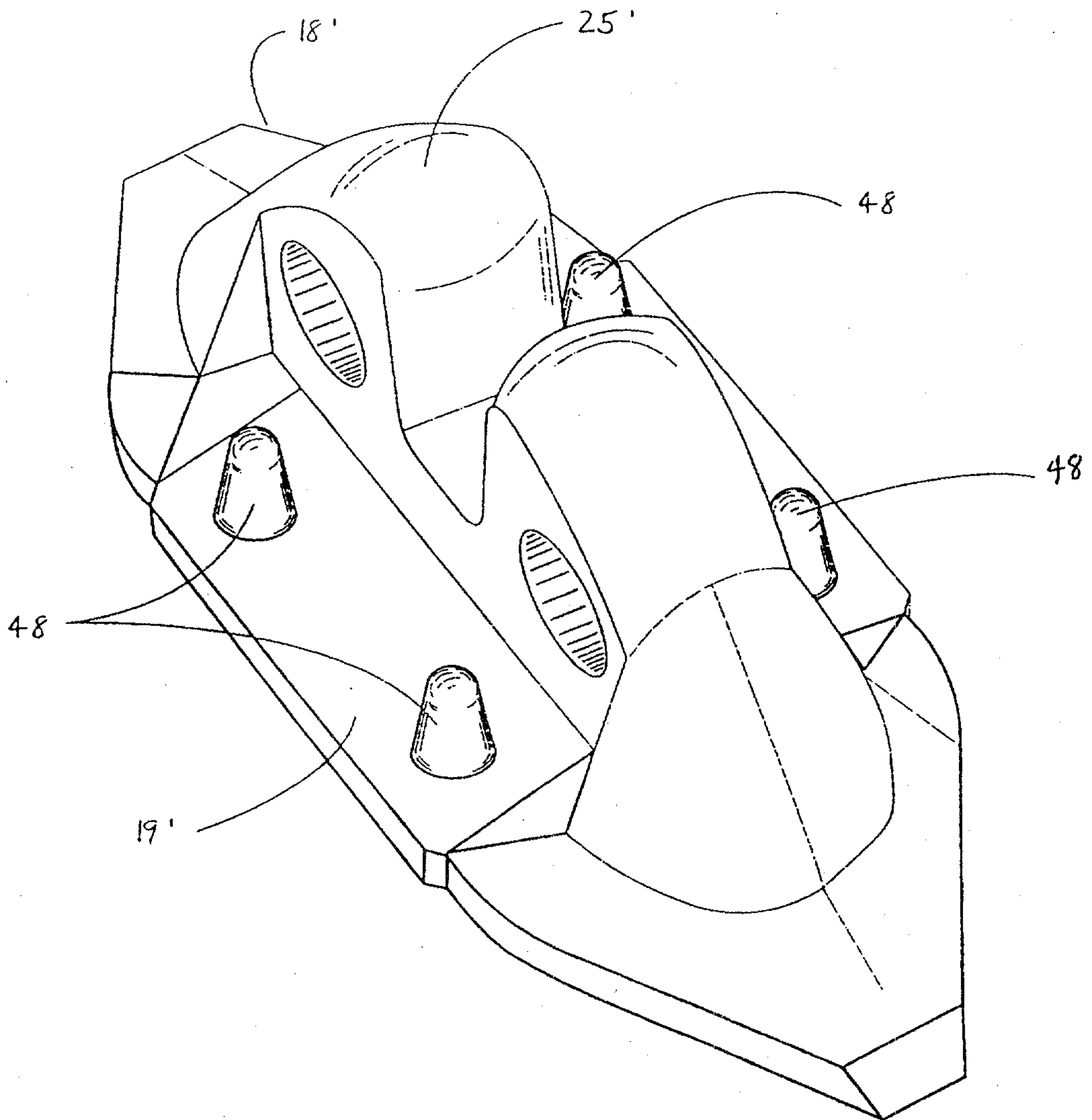


FIGURE 10

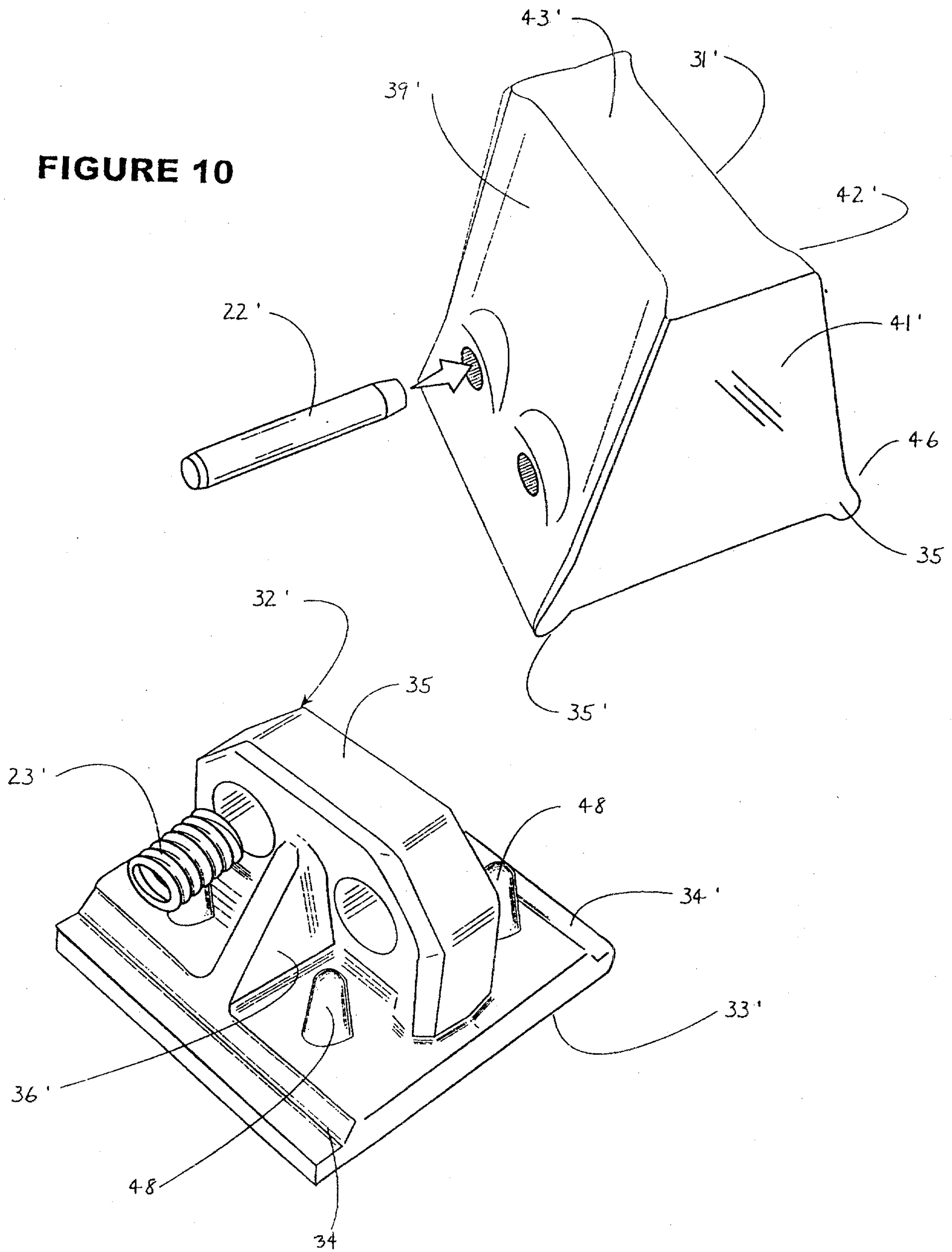
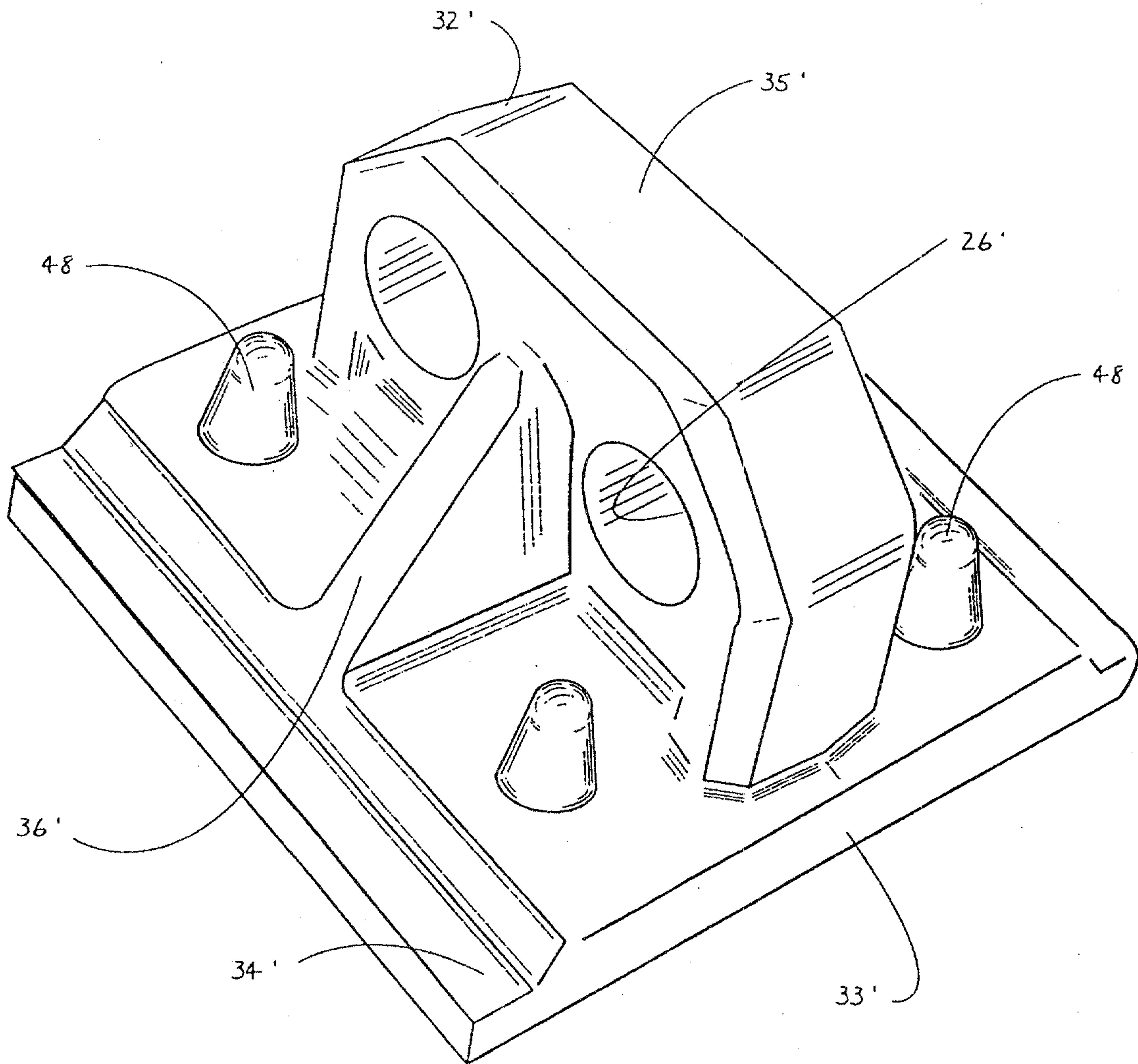
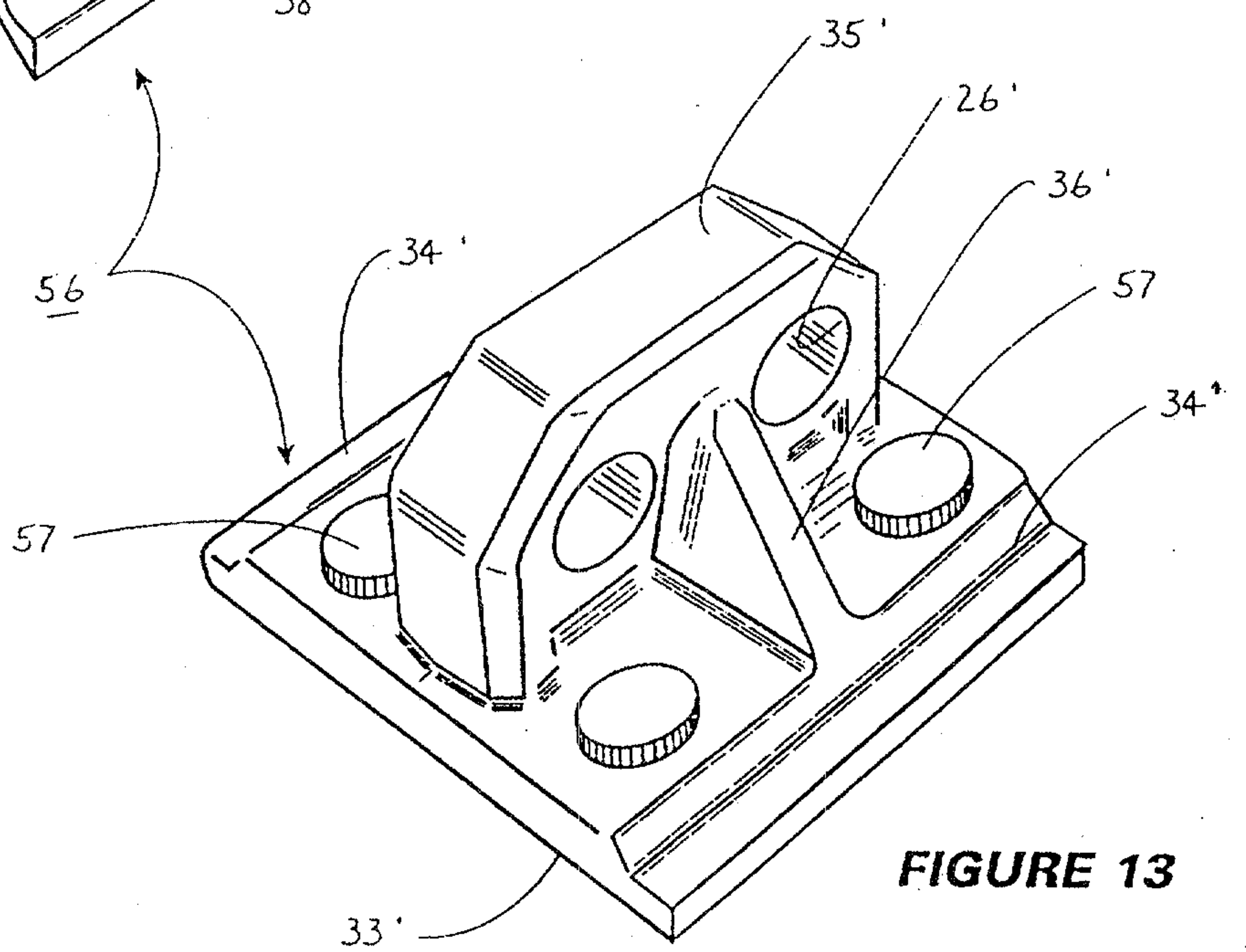
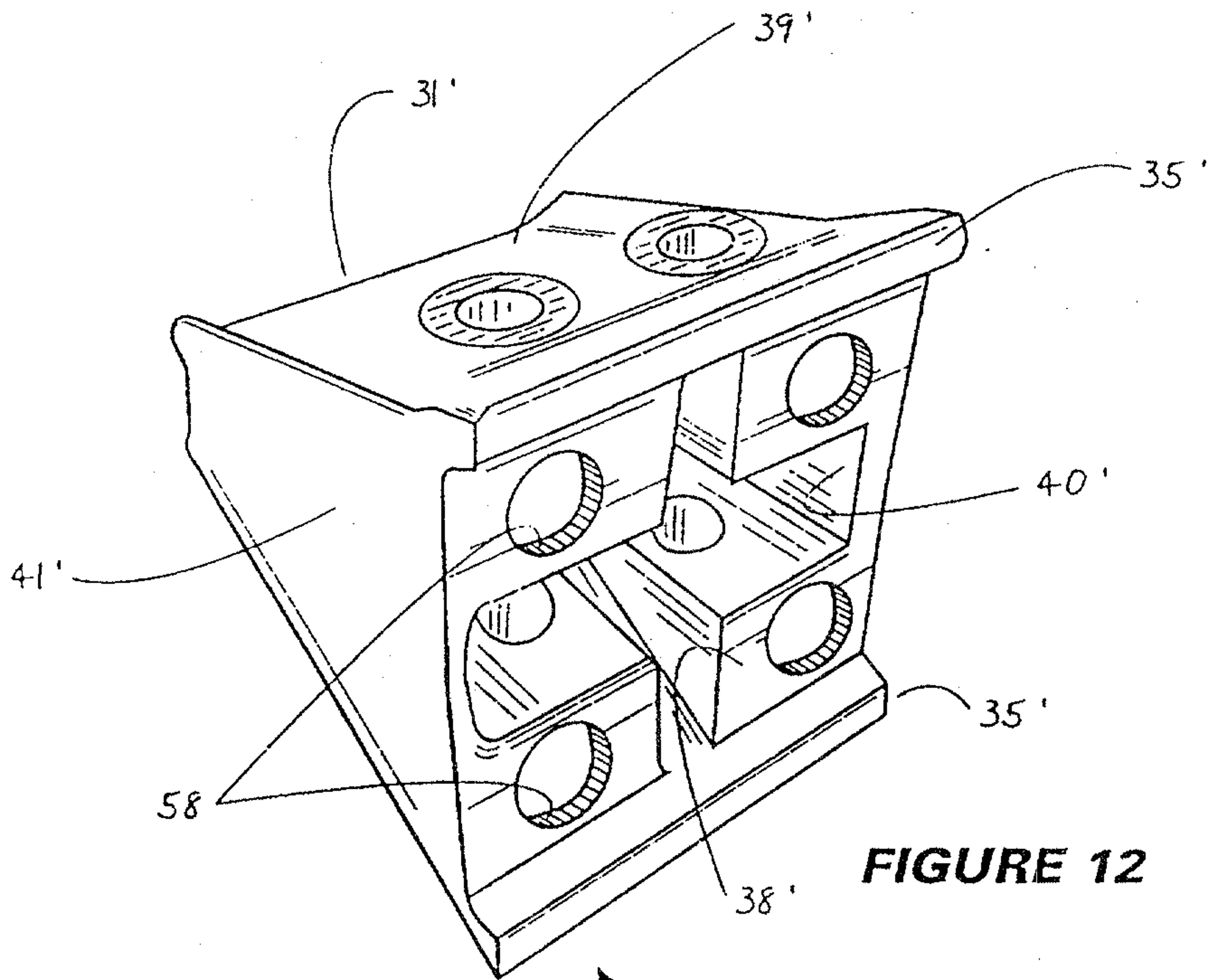


FIGURE 11





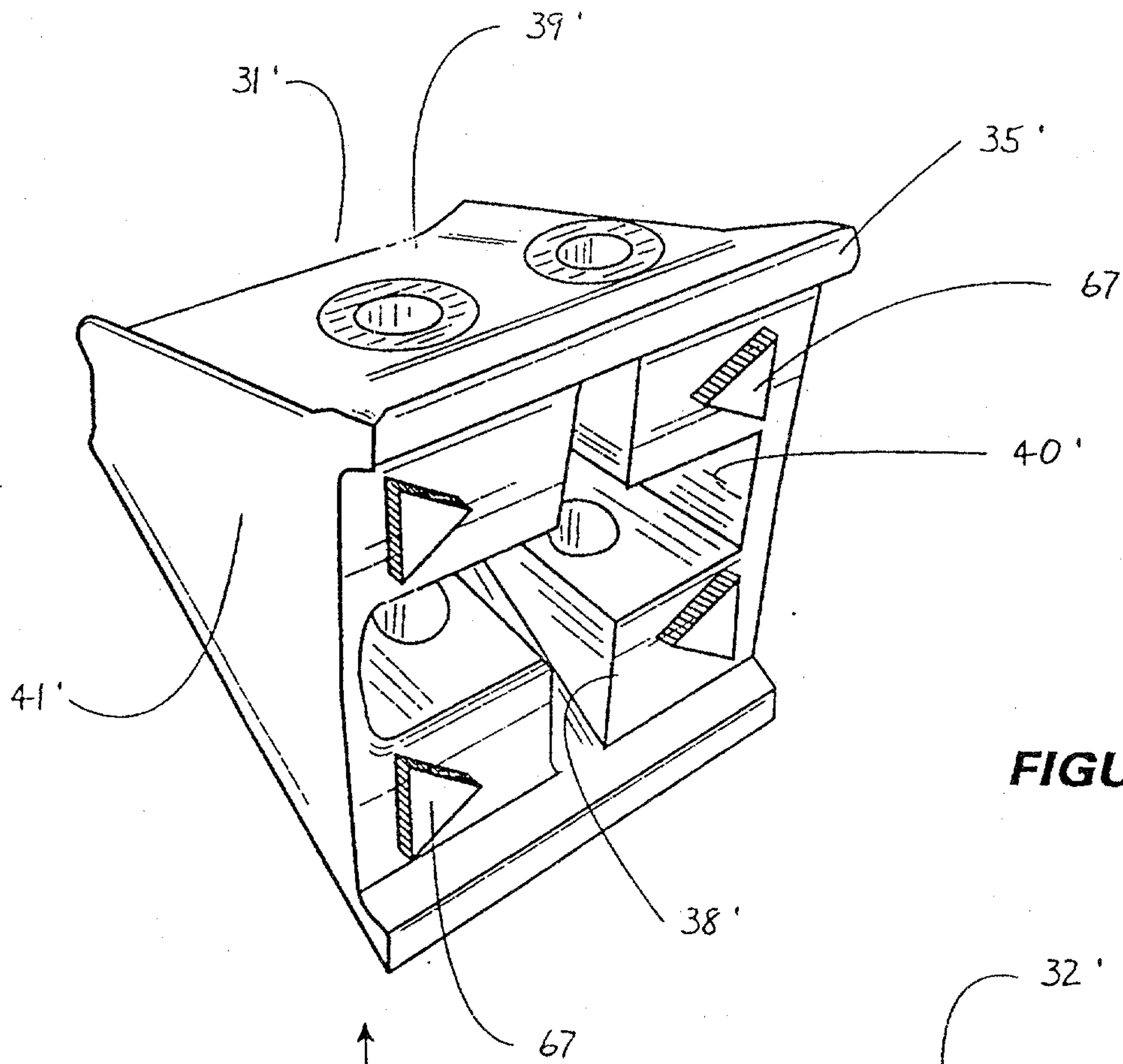


FIGURE 15

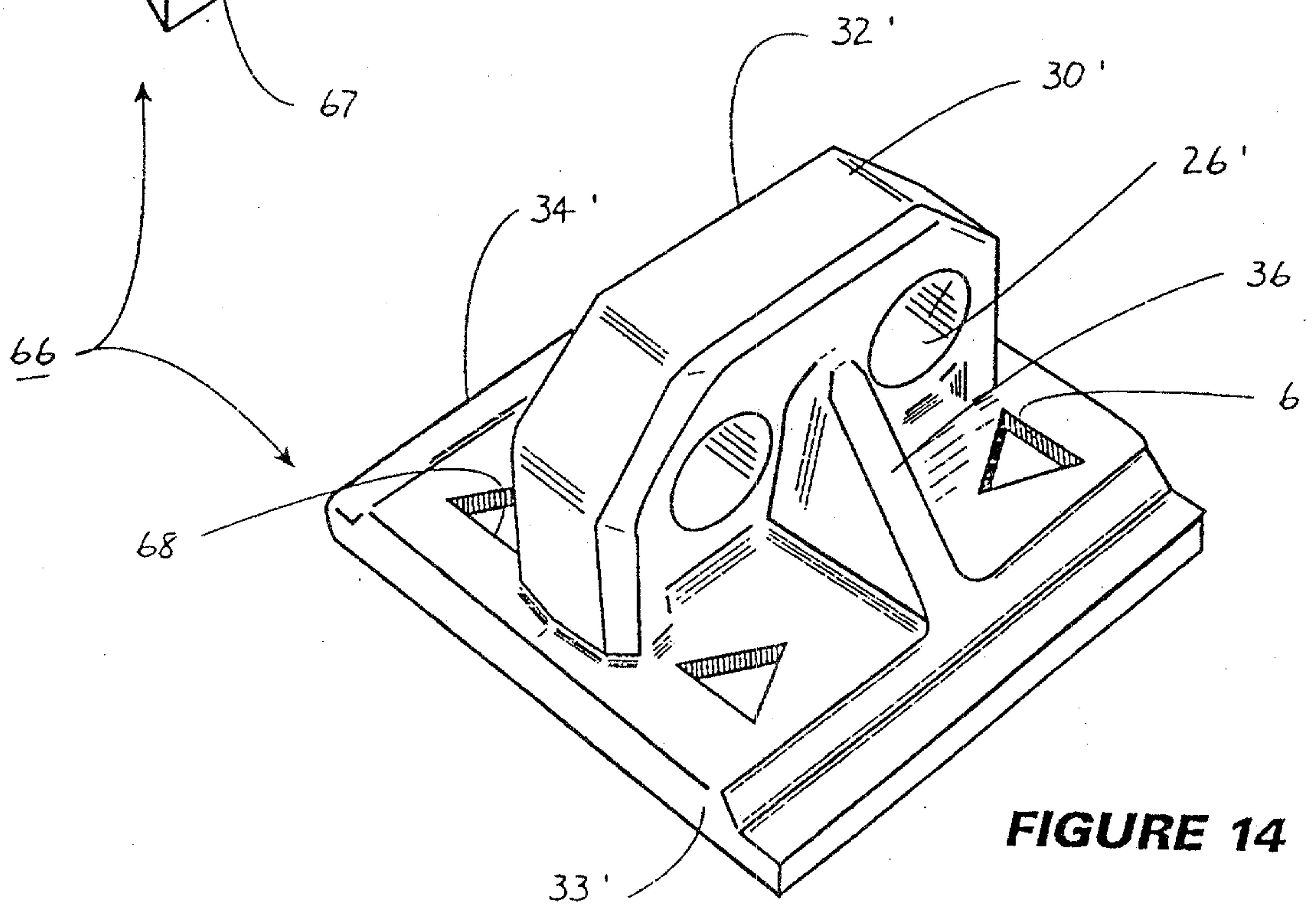


FIGURE 14

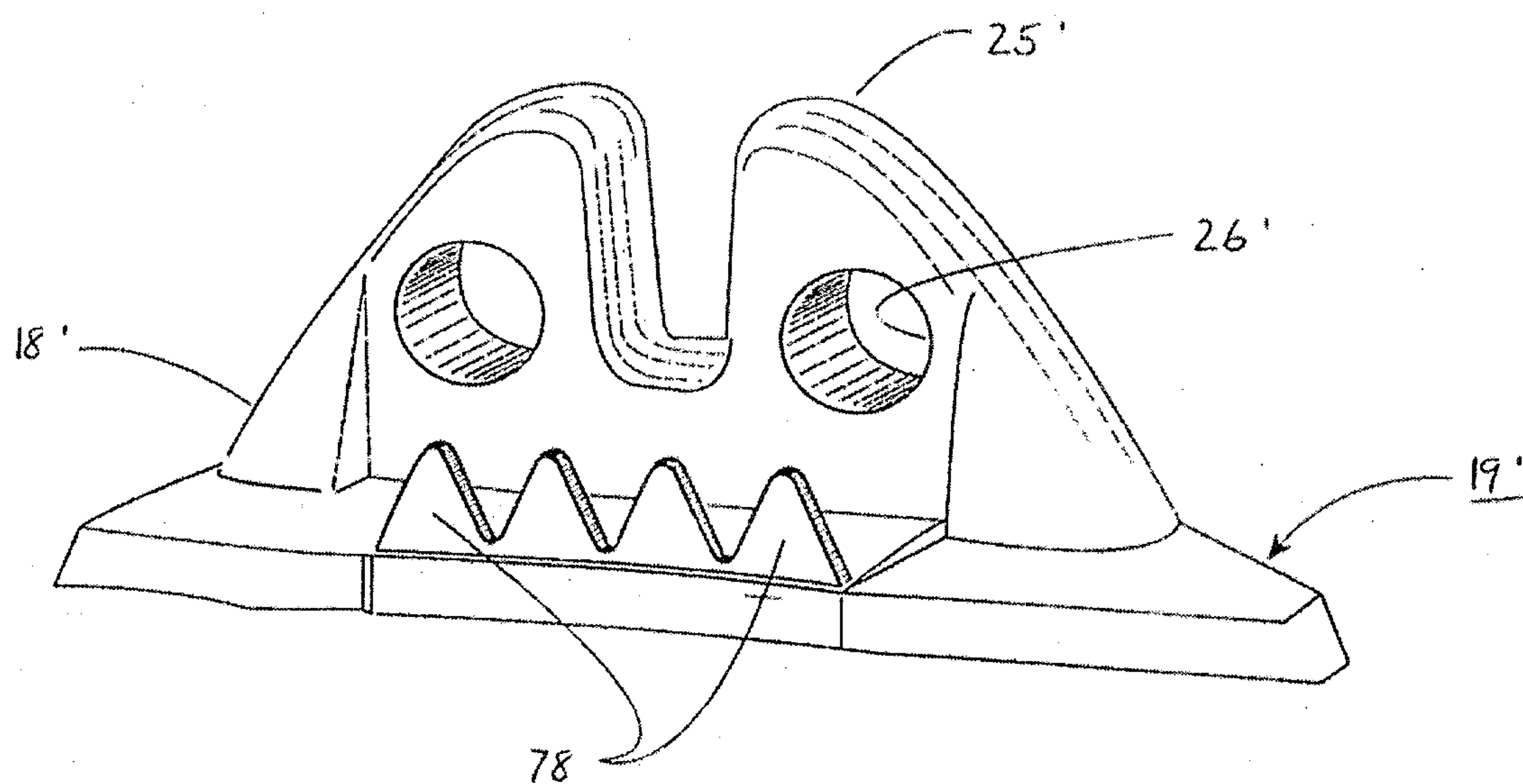
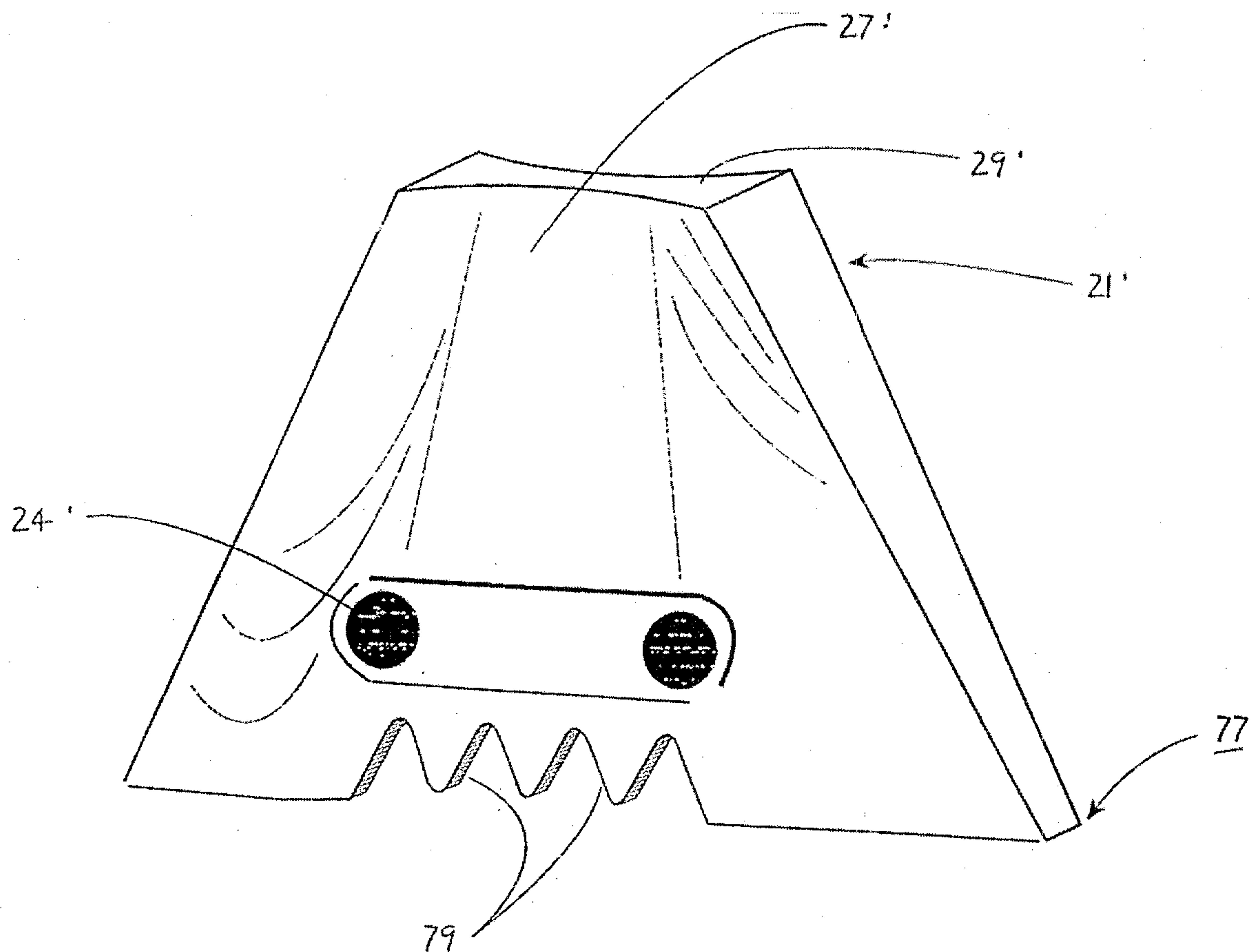


FIGURE 16

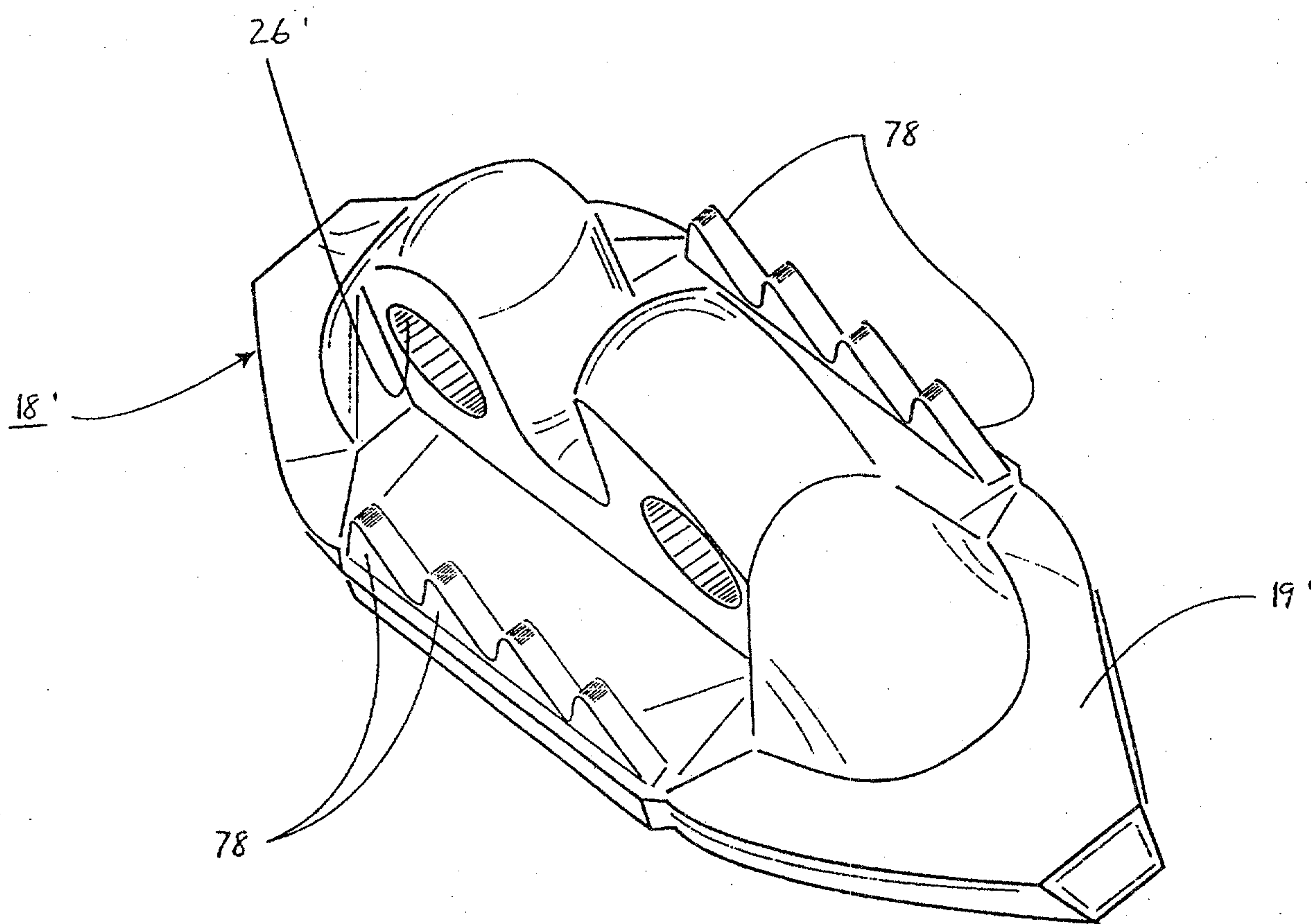
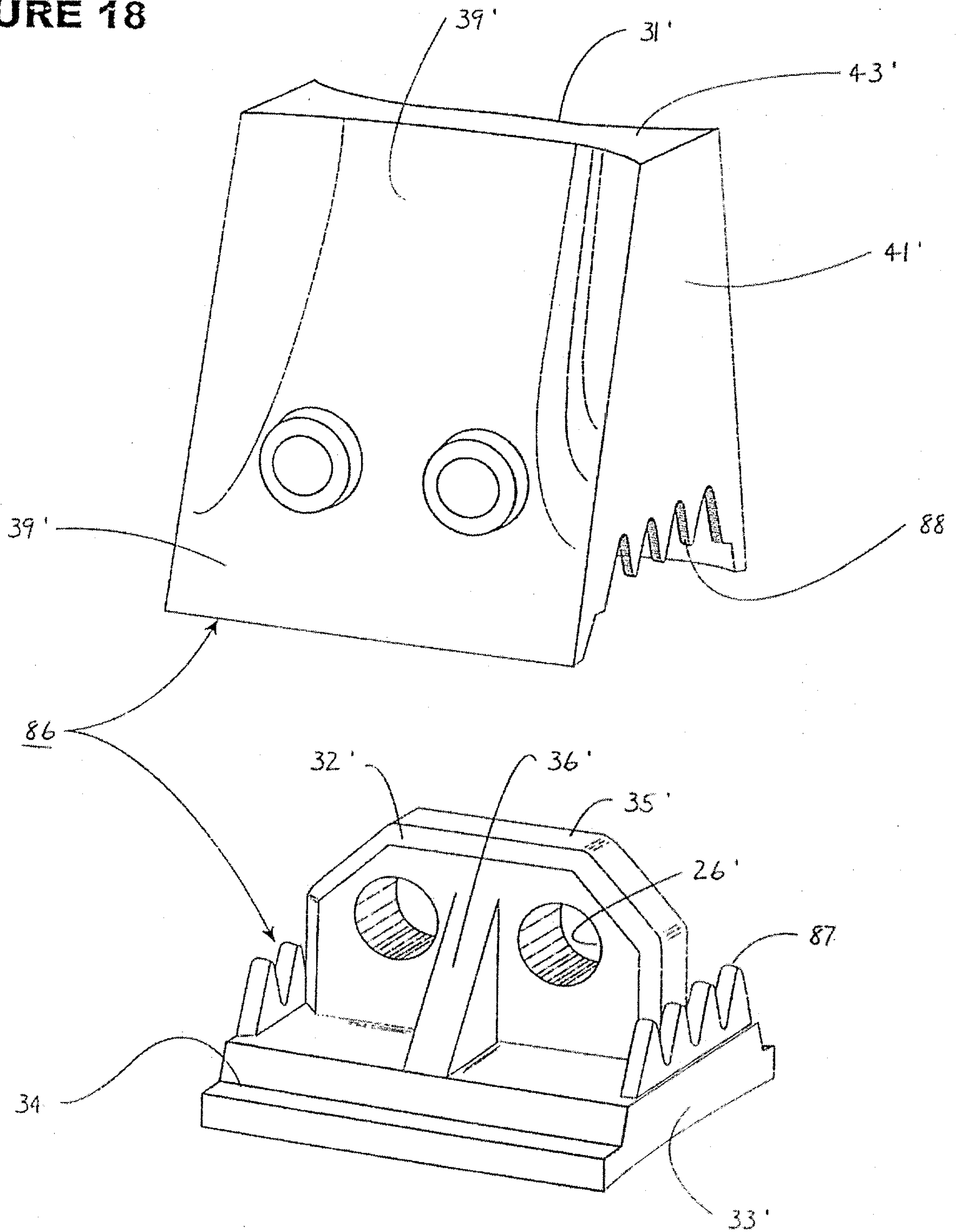


FIGURE 17

FIGURE 18



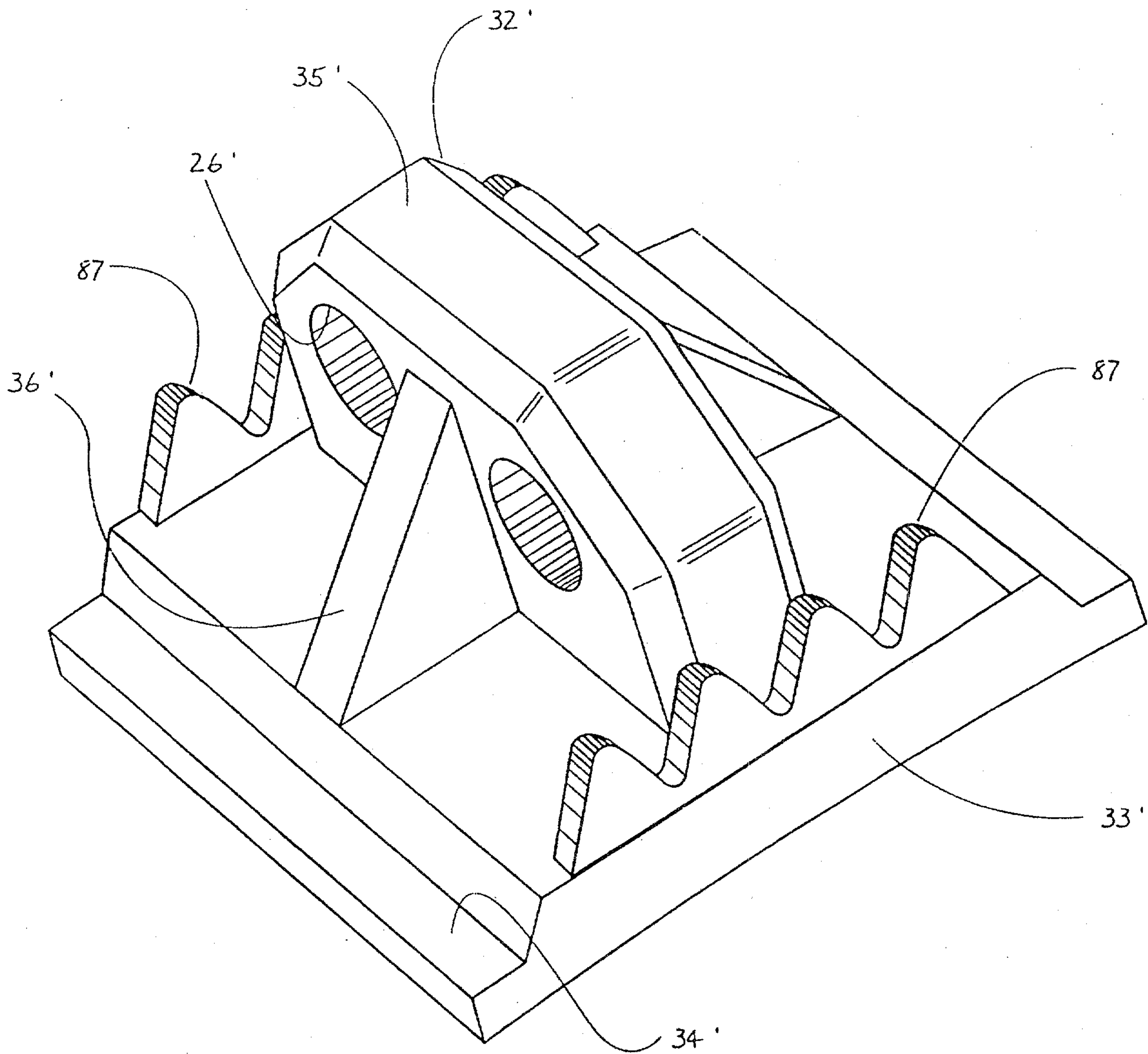


FIGURE 19

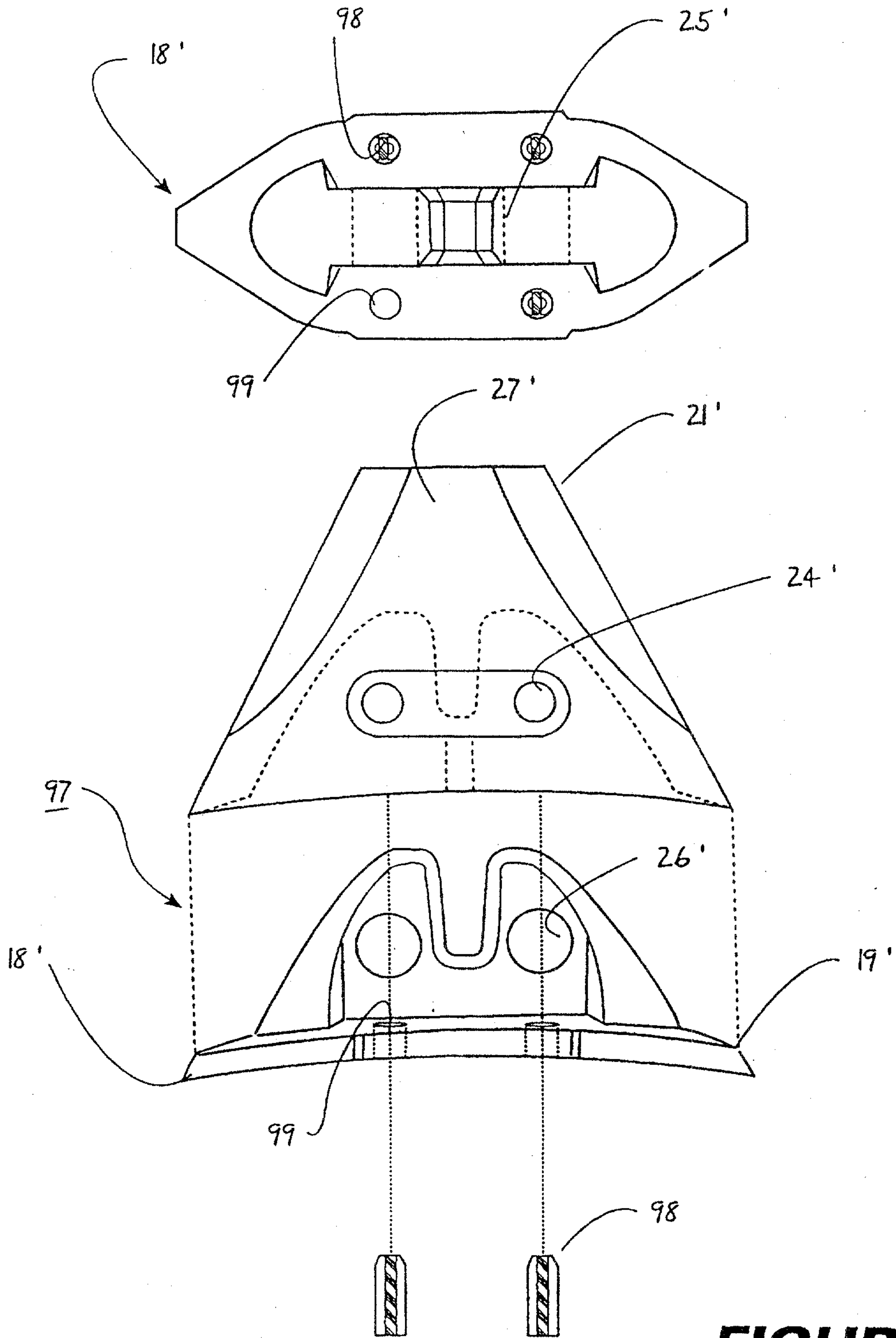


FIGURE 20

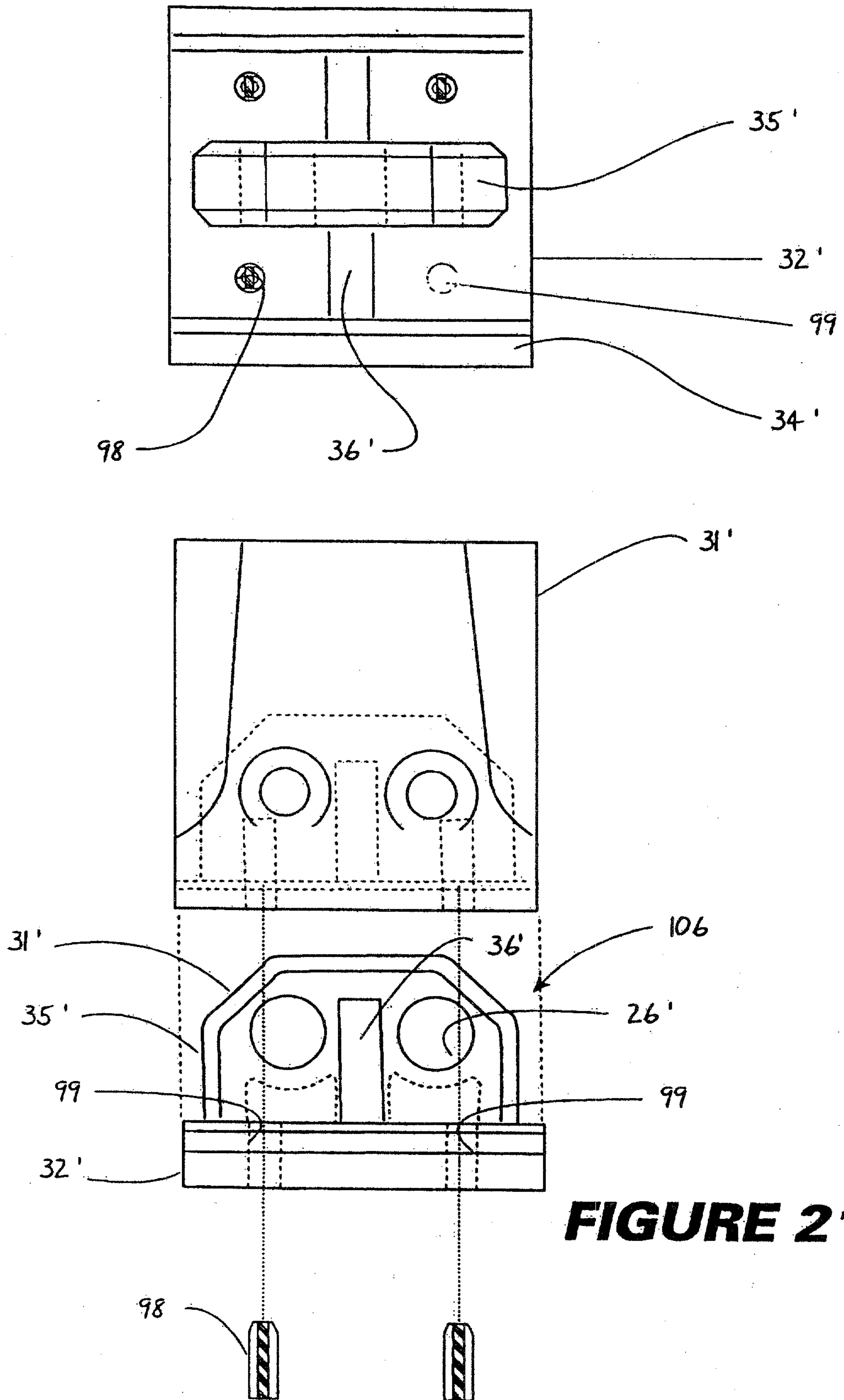


FIGURE 21

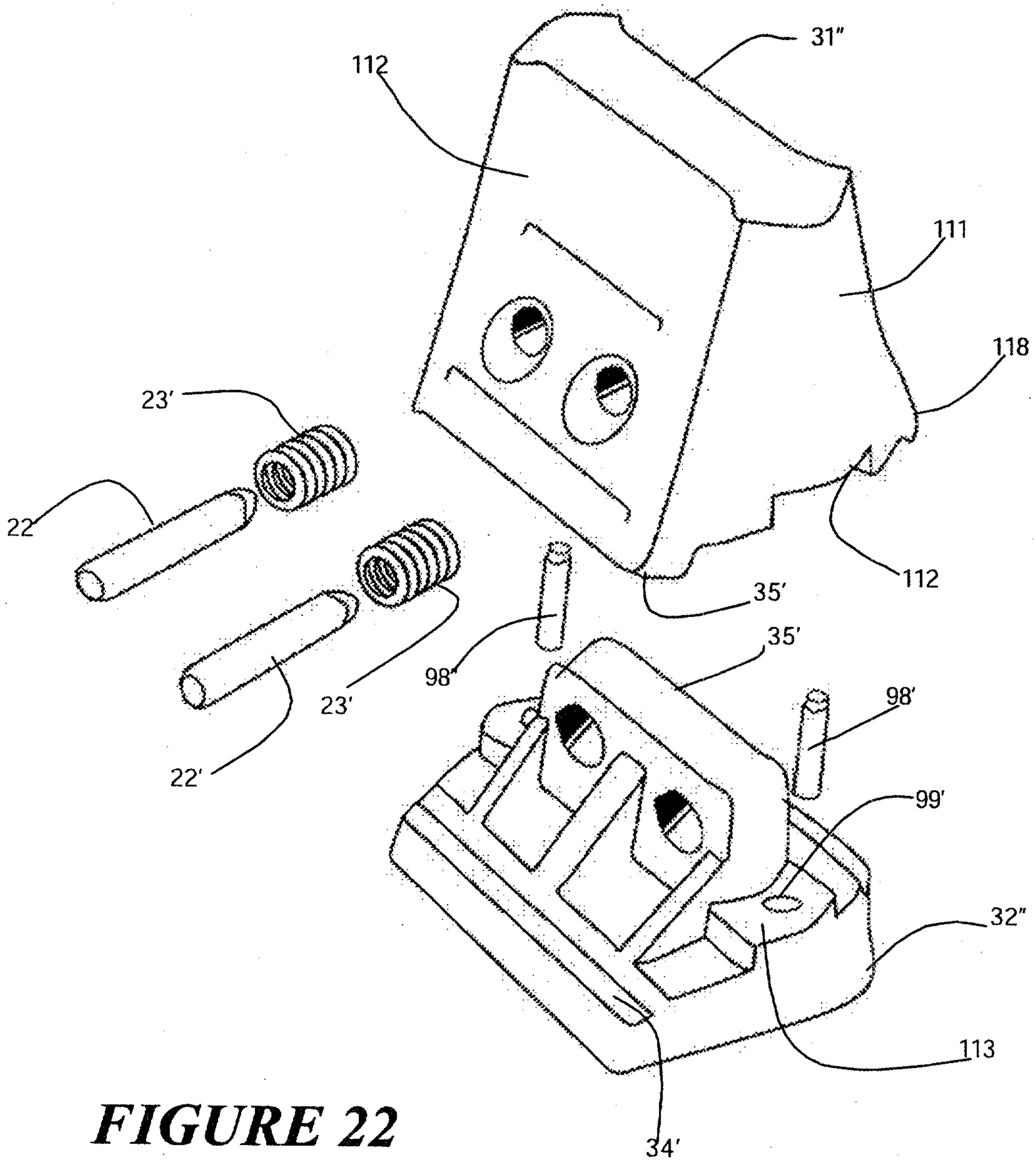


FIGURE 22

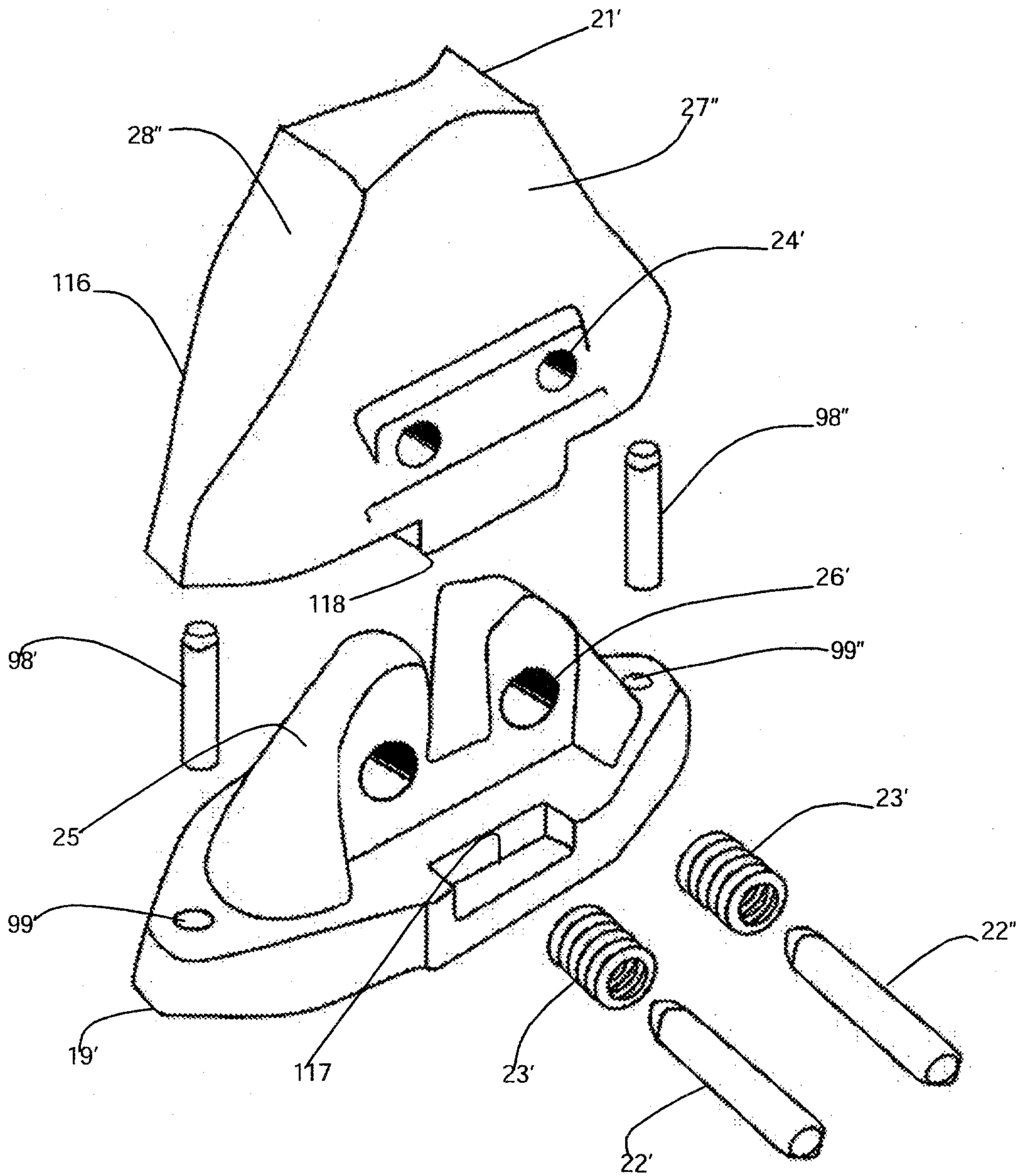


FIGURE 23

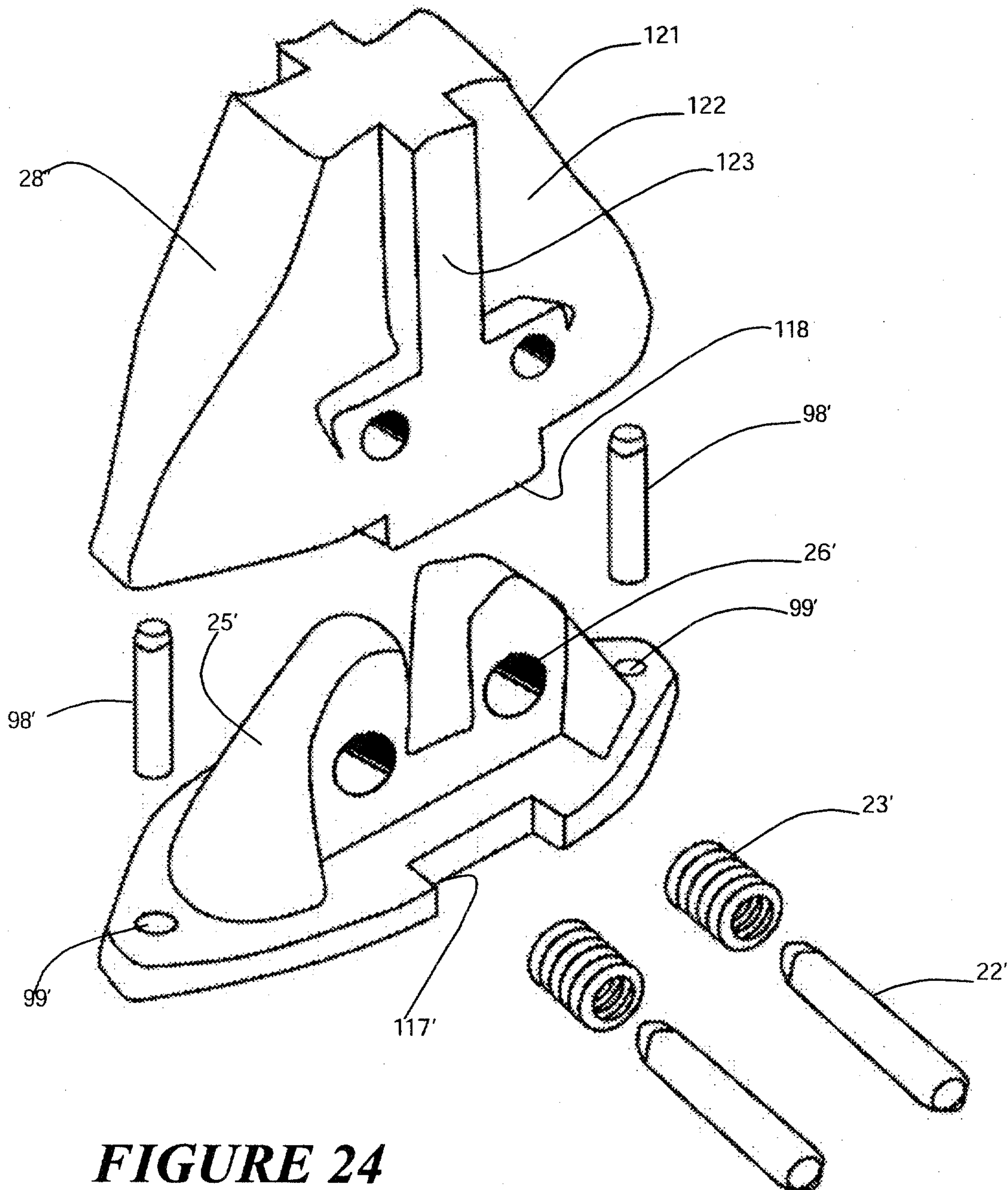


FIGURE 24

