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⑤④ **Fill and compaction roller using readily replaceable cleat assemblies.**

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Description

This invention concerns generally compaction machinery such as a roller for mounting upon a driven compaction vehicle, the roller having both destructive and tractive characteristics adapted to break up, crush, grind and compact materials of the size of home appliances as encountered in sanitary land fill operations.

Compaction rollers and wheels used on land fill operations and particularly sanitary land fill operations are equipped generally with cleats or feet of a type for grinding and crushing the material beneath it so as to reduce the material in size for compaction. As shown in U.S. Patent 3,922,106, an earth and sanitary fill compaction roller has been shown employing two different types of feet having replaceable wear caps as part of its cleat assemblies. The wear caps are welded to a base portion of the assembly which in turn is welded to the roller.

While the foregoing arrangement operates entirely satisfactorily, users of the equipment have been known to permit the wear caps to become worn well past the point of replacement. In such an instance, the base portion becomes partially worn away so that a new wear cap will no longer fit properly onto its base portion and the entire cleat assembly must be replaced on the roller.

It has been determined that the primary reason that the wear caps are not replaced at an appropriate time to avoid damage to the base which supports it is found in the fact that the operator must employ a cutting torch to cut them from the roller since they are welded on. This extra annoyance contributed to the harmful procrastination.

It is also known from US—3358569 to provide a fill and compaction roller of a type having a rigid cylindrical body supported for rotation from a vehicle chassis and having cleat assemblies carried by the body, the cleat assemblies each comprising a rigid mounting pad assembly having a base portion attached to said body and a cap unit releasably attached to the base portion by a coupling pin, each cleat assembly including a bracket integral to said base portion protruding radially outwardly therefrom and having a coupling opening extending transversely through the bracket, and wherein the cap unit comprises a generally hollow body including sloping upwardly converging outer side walls and transverse end walls extending between the end edges of said side walls, a pair of aligned openings respectively being formed through the side walls and aligned with said coupling opening for receiving the coupling pin therethrough, which coupling pin being disposed through said coupling opening and said aligned openings to retain said cap unit to said mounting pad assembly, and there being further provided annular recesses surrounding each end of said coupling opening, radially enlargeable locking means disposed within each said recess, each said locking means defining an opening having a smaller diameter

than the diameter of said coupling pin whereby forcing said pin through said locking means enlarges them to cause the locking means to grip the pin on both sides of said bracket for retaining the removable cap unit thereto.

According to the present invention a fill and compaction roller is characterised by further including means serving to closely guide said cap unit on to said bracket including a pair of confronting substantially parallel abutments extending radially outwardly along the inner surface of the confronting sloping walls of the hollow body of said cap unit, said aligned openings being disposed to extend through said abutments, said bracket having a pair of transverse flanges flanking each end of said coupling opening to form a guide slot at opposite ends of the opening for receiving an associated one of said abutments slidable therein, said abutments being closely spaced to said locking means to capture and retain said locking means in their associated recesses.

Preferably each said locking means comprises a split ring disposed within each said recess.

An advantage of such an arrangement is that a compaction roller has been provided wherein the wear cap can be readily removed using common tools available at the job site. In this way replacement of the wear caps before the supporting base becomes worn to a point requiring its removal has been encouraged.

Preferably the rigid mounting pad assembly has a base portion adapted to be welded to the body.

An advantage of the invention is to provide a cleat assembly of a type requiring minimal time and labor to replace using ordinary tools.

The foregoing and other advantages of the invention will become more readily evident from the following detailed description of preferred embodiments when considered in conjunction with the drawings of which:

Figure 1 shows a side elevation diagrammatic view of a fill and compaction roller according to the invention;

Figure 2 shows an enlarged detailed view of the "tread" portion of the roller in Figure 1 and disclosing both tractive and crushing cleats;

Figure 3 shows a diagrammatic exploded perspective view of a cleat assembly, the lower portion of the figure being viewed from above and the upper portion being viewed from beneath;

Figure 4 shows a plan view of the wear cap of the cleat assembly of Figure 3 viewed from beneath;

Figure 5 shows a top plan view of the rigid mounting pad assembly shown in Figure 3;

Figure 6 shows a diagrammatic transverse section view of an assembled cleat assembly of the type shown in Figure 3 taken along the plane of the horizontal diameter of the coupling pin; and

Figure 7 shows a side elevation section view of a cleat assembly of a type for crushing.

A compaction roller 10 constructed according

to the present invention and diagrammatically illustrated in Figure 1 mounted upon a power-driven vehicle 13 (shown only fragmentarily) includes a rigid cylindrical body or rim 11 connected to a centrally disposed drum 12. The roller assembly 10 is represented diagrammatically and can be constructed according to U.S. Patent No. 3,724,342 assigned to Caron Compactor Company to incorporate cushioning elements, cleaning members, and the like.

Roller 10 has been mounted upon a perimeter frame 14 of vehicle 13. Frame 14 is of a type including cross members 16, 17 extending across the tread of the roller 10.

Cleat assemblies 18, 19 as described more fully below are arranged on the outer surface of the cylindrical rim 11. Cleat assemblies 18 primarily serve to provide traction while the primary function of assemblies 19 is to crush materials.

As shown in Figure 3 cleat assembly 18 includes a rigid mounting pad unit 21 having a base portion 22 curved along edge 21a to conform to the curvature of rim 11 so as to be adapted to be welded to the rigid body formed by rim 11. A bracket 23 formed integral with base portion 22 protrudes generally radially outwardly therefrom.

A coupling opening 24 extends transversely of bracket 23 and enlarged annular recesses 26 surround each end of opening 24.

Radially enlargeable split rings 27 when disposed within recesses 26 serve to lock a coupling pin 28 therein as described further below for retaining a wear cap unit 29. Accordingly wear cap unit 29 is adapted to be readily releasably coupled to base portion 22. Wear cap unit 29 has a generally hollow body including sloping upwardly converging outer side walls 29a and transverse end walls 29b extending between the end edges of side walls 29a. A pair of aligned openings 31 extend through side walls 29a in position to be aligned with coupling opening 24 of bracket 23. In this way coupling pin 28 can be readily disposed to extend through openings 31 and 24 to couple wear cap unit 29 to its mounting pad unit 21.

Means for readily releasably locking pin 28 in openings 31, 24 serves to prevent decoupling of cap unit 29 from pad assembly 21 as now to be described.

While the diameter of openings 31, 24 is sufficient to readily permit the insertion of pin 28 therethrough, the inner diameter of split rings 27, is somewhat less than that of coupling pin 28. Accordingly, in order to dispose coupling pin 28 fully within openings 31 it is necessary for it to be forced through the center of each split ring 27. Thus, as shown in Figure 6, pin 28 has been disposed within openings 31, 24, and through each of split rings 27 so that pin 28 cannot be inadvertently or accidentally removed.

When it is desired to remove cap unit 29 a hammer can be used to drive a screw driver against an end of pin 28 to move it through cap unit 29 until pin 28 is released from split rings 27.

Within cap unit 29 means have been provided serving to closely guide cap unit 29 onto bracket 23. Accordingly a pair of confronting substantially parallel abutments 32, 33 extend radially outwardly along the inner surface of the confronting sloping walls 29a of the hollow body of cap unit 29.

As noted above openings 31 extend through these abutments in alignment with coupling opening 24 of bracket 23. The confronting faces 23a, 23b of a pair of transverse flanges flank each end of coupling opening 24 to form a guide slot at opposite ends of opening 24 for receiving an associated one of abutments 32, 33.

Bracket 23 includes a registration surface or face 23c extending between the confronting faces 23a, 23b. When cap unit 29 has been disposed onto bracket 23 as represented by the phantom lines 34 in Figure 3 the opposed faces of abutments 32, 33 will be disposed in closely spaced relation to the registration surfaces 23c of bracket 23 so as to fully capture split rings 27 in their respective recesses 26.

Accordingly, after cap unit 29 has been placed over mounting pad unit 21, and with split rings 27 disposed within their respective recesses 26 the faces of abutments 32, 33 will be closely spaced from and capture rings 27 whereby as pin 28 is inserted through the first opening 31 the first ring 27 encountered will be expanded radially as pin 28 is driven into the wear cap unit 29. Pin 28 will enter the second split ring and expand it as well because the face of its associated abutment 32 (as shown) will prevent the ring from being moved out of its recess by pin 28.

Thus, as explained above, bracket 23 includes a pair of "slots" on opposite sides of the bracket for receiving abutments 32, 33. The "slots" are defined by the wall faces 23a, 23b and 23c. Accordingly, these guide "slots" serve to receive an associated one of the abutments closely spaced therein.

From the foregoing it will be readily evident that there has been provided an improved cleat assembly such as cleat assembly 18 wherein the wear cap can be readily removed using ordinary tools of the type found at the job site simply by driving the pin 28 far enough through the cap unit 29 to release both split rings 27 therefrom.

It has been observed that the time and labor involved in replacing a worn-out wear cap according to this invention is sufficiently minimal that the wear caps are more likely to be replaced before damage is incurred by the rigid mounting pad unit 21, causing it to be cut off and replaced.

In this way it is possible to avoid the unnecessary extra time and expense required in cutting off the damaged rigid mounting pad units 21.

A cleat assembly 19 primarily used for crushing, breaking and grinding of materials of the size of home appliances as encountered in sanitary land fill operations includes a rigid mounting pad unit 37 including a rigid metallic base portion 38. Base portion 38 supports an elongate relatively

thin aligning guide 39 formed integrally with base portion 38.

Aligning guide 39 includes an upwardly extending bracket portion 41 characterized by an upwardly protruding key 42 disposed within a downwardly opening pocket 43 defined within a removable wear cap 44.

The rigid mounting pad assembly 37 and its associated aligning guide 39 support wear cap 44 from within in a manner to minimize twisting and bending of wear cap 44 with respect to base portion 38. Accordingly, aligning guide 39, including key 42, serves to provide three spaced points of support as now to be described.

The hollow interior 46 of cap 44 slopes downwardly and away to form a notch 47, 48 for receiving the tip ends 49, 51 of guide 39. Accordingly, as thus mounted, by lodging the tips 49, 51 in notches 47, 48 wear cap 44 is restrained against being twisted relatively to base portion 38 about an axis normal thereto, such as axis 52.

Further, key 42 engaged in pocket 43 serves to restrain wear cap 44 from being twisted laterally with respect to base portion 38, for example, as about the axis 53 parallel to base portion 38.

Finally, a coupling pin 54 extends through an opening disposed transversely of bracket portion 41 as described above with regard to bracket 23. Each end of the coupling opening 56 is similarly surrounded by an annular recess 57.

Coupling pin 54 accordingly retains wear cap 44 to mounting pad assembly 37.

Finally, the underside of base portion 38 is arcuately formed to conform to the peripheral surface of rim 11 and adapted to be welded thereto.

In this way as wear cap 44 becomes worn, it can be readily replaced without undue expenditure of labor and time.

Claims

1. A fill and compaction roller (10) of a type having a rigid cylindrical body (11) supported for rotation from a vehicle chassis and having cleat assemblies (18, 19) carried by the body, the cleat assemblies each comprising a rigid mounting pad assembly (21, 37) having a base portion (22, 38) attached to said body and a cap unit (29, 44) attached to the base portion by a coupling pin (28, 54), each cleat assembly including a bracket (23, 41) integral to said base portion (22, 38) protruding generally radially outwardly therefrom and having a coupling opening (24, 56) extending transversely through the bracket, and wherein the cap unit comprises a generally hollow body including sloping upwardly converging outer sidewalls (29a) and transverse end walls (29b) extending between the end edges of said side walls, a pair of aligned openings (31) respectively being formed through the side walls and aligned with said coupling opening (24, 56) for receiving the coupling pin (28, 54) therethrough, which coupling pin being disposed through said coupling opening and said aligned openings to retain

said cap unit to said mounting pad assembly, and there being further provided annular recesses (26) surrounding each end of said coupling opening, radially enlargeable locking means (27) disposed within each said recess, each said locking means defining an opening having a smaller diameter than the diameter of said coupling pin (28, 54) whereby forcing said pin through said locking means enlarges them to cause the locking means to grip the pin on both sides of said bracket (23, 41) for retaining the removable cap unit (29, 44) thereto, characterised by including means serving to closely guide said cap unit on to said bracket including a pair of confronting substantially parallel abutments (32, 33) extending radially outwardly along the inner surface of the confronting sloping walls of the hollow body of said cap unit (29, 44), said aligned openings (31) being disposed to extend through said abutments, said bracket (23, 41) having a pair of transverse flanges flanking each end of said coupling opening to form a guide slot at opposite ends of the opening for receiving an associated one of said abutments slidably therein, said abutments being closed spaced to said locking means to capture and retain said locking means in their associated recesses.

2. A fill and compaction roller as claimed in claim 1 wherein each said locking means comprises a split ring (22) disposed within each said recess.

3. A fill and compaction roller as claimed in either of claims 1 and 2 in which the cleat assemblies (18, 19) each comprise a rigid mounting pad assembly (21, 37) having a base portion (22, 38) adapted to be welded to said body (11).

4. A roller as claimed in any of claims 1 to 3, including cleat assemblies of two types (18, 19) which are adapted for tractive and crushing use respectively.

5. A roller as claimed in claim 4 in which the tractive cleats (18) include means inhibiting twisting of the cap unit about vertical and horizontal axis relative to the base portion (38).

Patentansprüche

1. Schüttungs- und Verdichtungswalze (10) von einer Art, die einen starren zylindrischen Körper (11) hat, der zur Drehung von einem Fahrzeugchassis her gelagert ist und Keilanordnungen (18, 19) hat, die von dem Körper getragen werden, wobei die Keilanordnungen je einen starren Befestigungskonsolaufbau (21, 37) umfassen, der einen an dem Körper angebrachten Basisteil (22, 38) und eine mittels eines Verbindungsstifts (28, 54) an dem Basisteil angebrachte Kappeneinheit (29, 44) hat, wobei jede Keilanordnung einen mit dem Basisteil (22, 38) integralen Ständer (23, 41) hat, welcher generell radial auswärts davon vorsteht und eine Verbindungsöffnung (24, 56) hat, die sich quer durch den Ständer erstreckt, und worin die Kappeneinheit einen generell hohen Körper umfaßt, der geneigte, nach aufwärts konvergierende äußere Seitenwände (29a) und quer-

verlaufende Endwände (29b), die sich zwischen den Endkanten der Seitenwände erstrecken, aufweist, sowie ein Paar von fluchtenden Öffnungen (31), die jeweils durch die Seitenwände ausgebildet sind und mit der Verbindungsöffnung (24, 56) zum Aufnehmen des Verbindungsstifts (28, 54) durch dieselben hindurch fluchten, welcher Verbindungsstift durch die Verbindungsöffnung und die fluchtenden Öffnungen zum Halten der Kappeneinheit an dem Befestigungskonsolaufbau angeordnet ist, und wobei weiter ringförmige Vertiefungen (26) vorgesehen sind, die jedes Ende der Verbindungsöffnung umgeben, sowie radial vergrößerbare Arretierungsmittel (27), die innerhalb jeder Vertiefung angeordnet sind, wobei jedes Arretierungsmittel eine Öffnung begrenzt, die einen kleineren Durchmesser hat, als es der Durchmesser des Verbindungsstifts (28, 54) ist, wodurch ein Drücken des Stifts durch die Arretierungsmittel diese vergrößert, so daß bewirkt wird, daß die Arretierungsmittel den Stift auf beiden Seiten des Ständers (23, 41) zum Halten der entfernbaren Kappeneinheit (29, 44) an demselben greifen, dadurch gekennzeichnet, daß Mittel inbegriffen sind, die dazu dienen, die Kappeneinheit eng auf dem Ständer zu führen, umfassend ein Paar von gegenüberstehenden, im wesentlichen parallelen Widerlagern (32, 33), die sich radial auswärts entlang der inneren Oberfläche der gegenüberstehenden geneigten Wände des hohlen Körpers der Kappeneinheit (29, 44) erstrecken, wobei die fluchtenden Öffnungen (31) so angeordnet sind, daß sie sich durch die Widerlager erstrecken, wobei der Ständer (23, 41) ein Paar von querverlaufenden Flanschen hat, die jedes Ende der Verbindungsöffnung flankieren, so daß sie einen Führungsschlitz auf entgegengesetzten Enden der Öffnung zum verschiebbar darin Aufnehmen eines zugeordneten einen der Widerlager bilden, wobei die Widerlager zu den Arretierungsmitteln eng beabstandet sind, um die Arretierungsmittel in ihren zugeordneten Vertiefungen einzufangen und zurückzuhalten.

2. Schüttungs- und Verdichtungswalze nach Anspruch 1, worin jedes Arretierungsmittel einen geschlitzten Ring (27) umfaßt, der innerhalb jeder Vertiefung angeordnet ist.

3. Schüttungs- und Verdichtungswalze nach einem der Ansprüche 1 und 2, worin die Keilanordnungen (18, 19) je einen starren Befestigungskonsolaufbau (21, 37) umfassen, der einen Basteil (22, 38) hat, welcher dazu geeignet ist, an den Körper (11) angeschweißt zu werden.

4. Walze nach irgendeinem der Ansprüche 1 bis 3, umfassend Keilanordnungen von zwei Arten (18, 19), welche für jeweils traktiven und verkleinernden Gebrauch geeignet sind.

5. Walze nach Anspruch 4, worin die traktiven Keile (18) Mittel aufweisen, welche ein Verwinden der Kappeneinheit um Vertikal- und Horizontalachse relativ zu dem Basisteil (38) hemmen.

Revendications

1. Rouleau de remblayage et de compactage

(10) du type comportant un corps cylindrique rigide (11) supporté de manière à pouvoir tourner sur le châssis d'un véhicule et portant des éléments saillants (18, 19) supportés par le corps et comprenant chacun un ensemble formant bloc rigide de fixation (21, 37) possédant une partie de base (22, 38) fixée audit corps et une unité formant chapeau (29, 44) fixée à la partie de base au moyen d'une goupille d'accouplement (28, 54), chaque élément saillant comprenant un étrier (23, 41) solidaire de ladite partie de base (22, 38) faisant saillie d'une manière générale radialement vers l'extérieur à partir de cette partie de base et possédant une ouverture d'accouplement (24, 56) s'étendant transversalement dans l'étrier, et dans lequel l'unité formant chapeau comprend un corps de forme générale creuse incluant des parois latérales extérieures inclinées (29a), qui convergent vers le haut, et des parois d'extrémité transversale (29b) qui s'étendent entre les bords d'extrémité desdites parois latérales, un couple d'ouvertures alignées (31) formées respectivement dans les parois latérales et alignées avec ladite ouverture de couplage (24, 56) destinée à loger la goupille d'accouplement (28, 54), qui traverse ladite ouverture d'accouplement et lesdites ouvertures alignées de manière à maintenir ladite unité formant chapeau sur ledit ensemble formant bloc de fixation, et dans lequel il est en outre prévu des renforcements annulaires (26) entourant chaque extrémité de ladite ouverture de couplage, des moyens de verrouillage (27) pouvant être élargis radialement et disposés à l'intérieur de chacun desdits renforcements, chacun desdits moyens de verrouillage définissant une ouverture possédant un diamètre inférieur au diamètre de ladite goupille de couplage (28—54), ce qui a pour effet que l'enfoncement à force de ladite goupille dans lesdits moyens de verrouillage élargit ces derniers de sorte qu'ils serrent la goupille des deux côtés dudit étrier (23, 41) de manière à retenir l'unité formant chapeau mobile (29, 44) sur l'étrier, caractérisé en ce qu'il comporte des moyens servant à guider étroitement ladite unité formant chapeau sur ledit étrier et incluant un couple d'éléments de butée (32, 33) sensiblement parallèles et en vis-à-vis, qui s'étendent radialement vers l'extérieur le long de la surface intérieure des parois inclinées, situées en vis-à-vis, du corps creux de ladite unité formant chapeau (29, 44), lesdites ouvertures alignées (31) étant disposées de manière à s'étendre à travers lesdits éléments de butée, ledit étrier (23, 41) possédant un couple de brides transversales flanquant chaque extrémité de ladite ouverture de couplage de manière à former sur des extrémités opposées de l'ouverture une fente de guidage servant à loger en elle, avec possibilité de glissement, l'un associé desdits éléments de butée, qui sont placés très près desdits moyens de verrouillage de manière à capturer et retenir lesdits moyens de verrouillage, dans leurs renforcements associés.

2. Rouleau de remblayage et de compactage selon la revendication 1, dans lequel lesdits

moyens de verrouillage comprennent une bague fendue (27) disposée à l'intérieur de chacun desdits renforcements.

3. Rouleau de remblayage et de compactage selon l'une quelconque des revendications 1 et 2, dans lequel les éléments saillants (18, 19) comprennent chacun un ensemble formant bloc de fixation (21, 37) comportant une partie de base (22, 38) apte à être soudée audit corps (11).

4. Rouleau selon l'une quelconque des revendi-

cations 1 à 3, comportant des éléments saillants de deux types (18, 19), qui sont adaptés pour réaliser respectivement une traction et un écrasement.

5. Rouleau selon la revendication 4, dans lequel l'élément saillant de traction (18) inclut des moyens empêchant un pivotement de l'unité formant chapeau autour d'un axe horizontal et d'un axe vertical par rapport à la partie de base (38).

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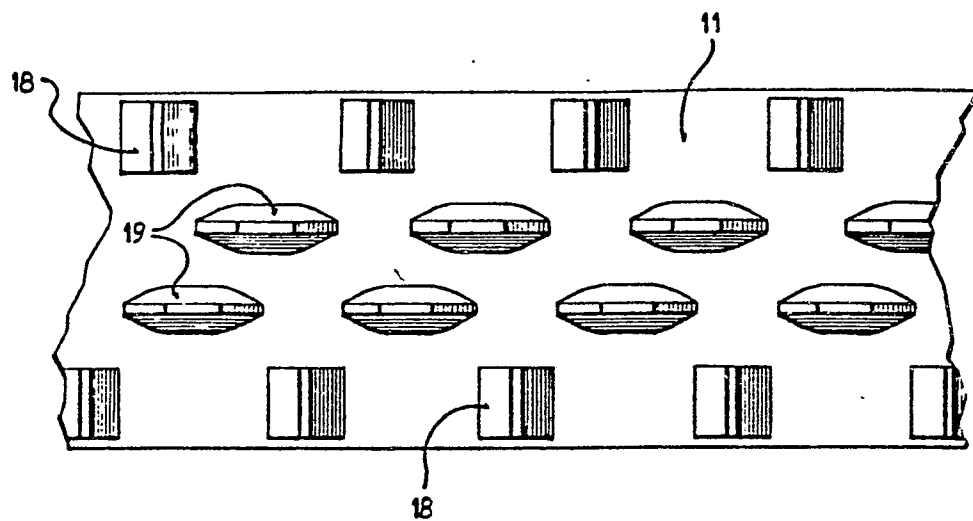
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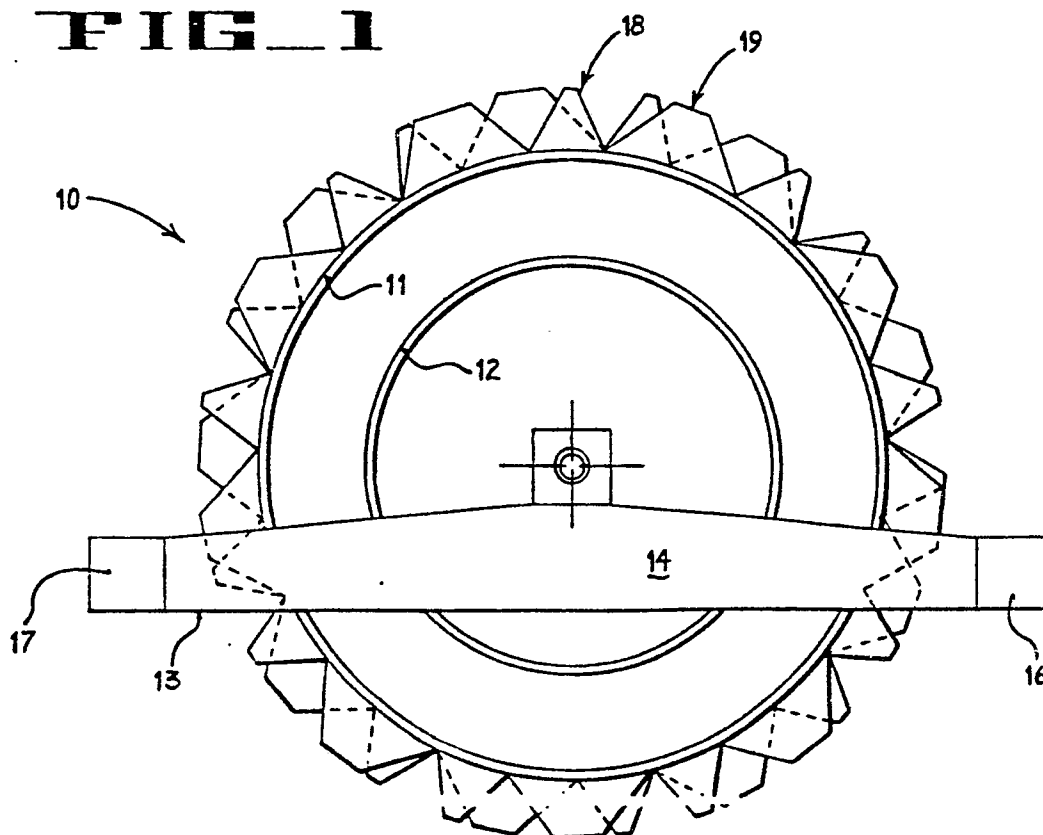
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FIG_2



FIG_1



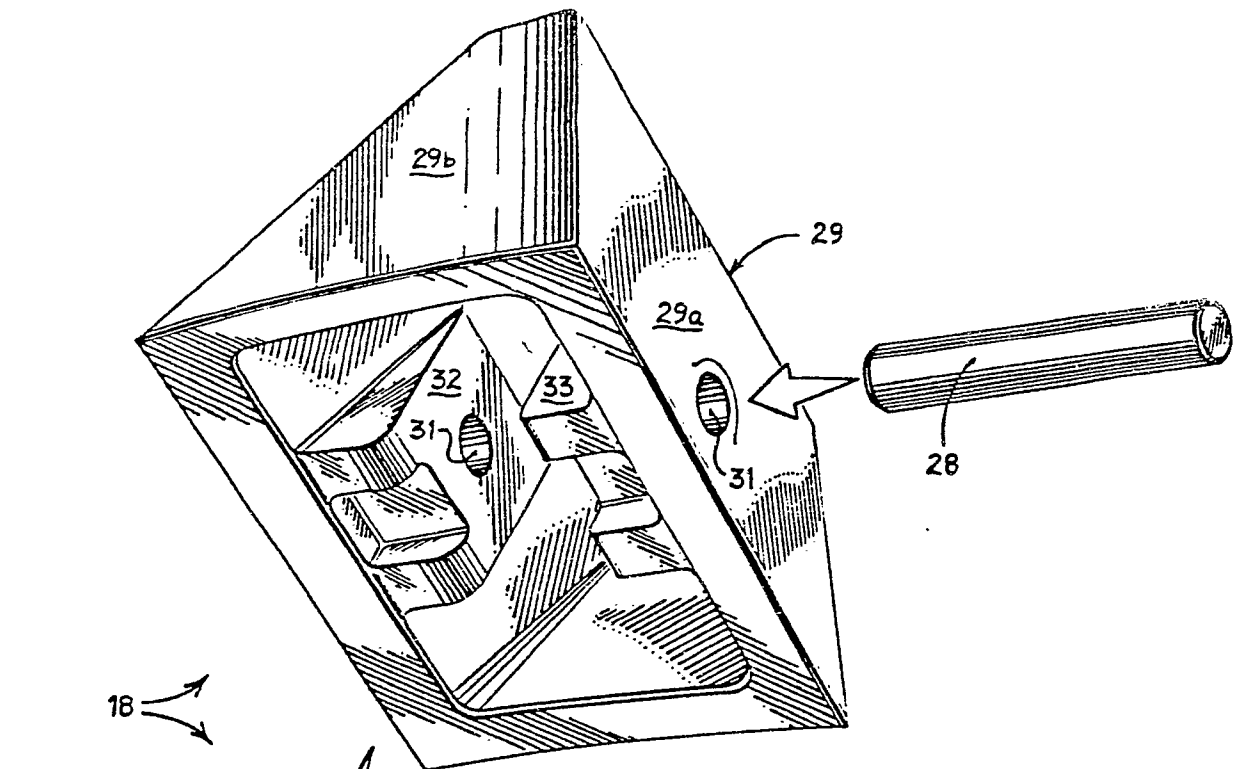


FIG. 3

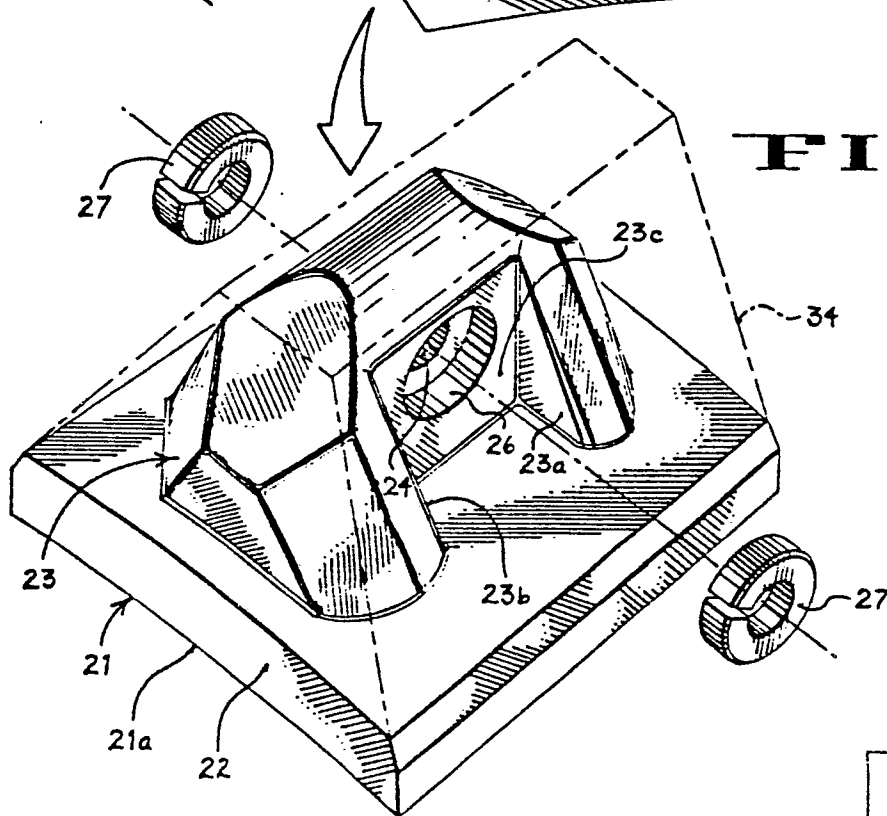


FIG. 4

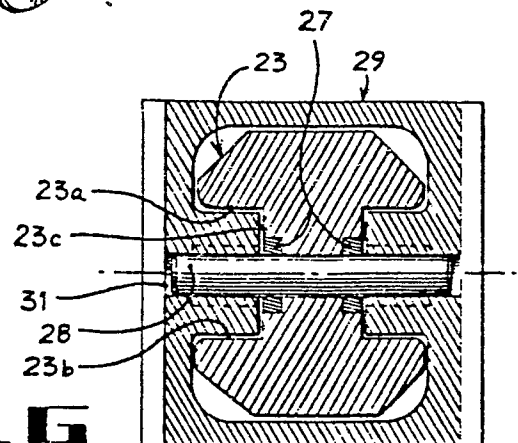


FIG 4

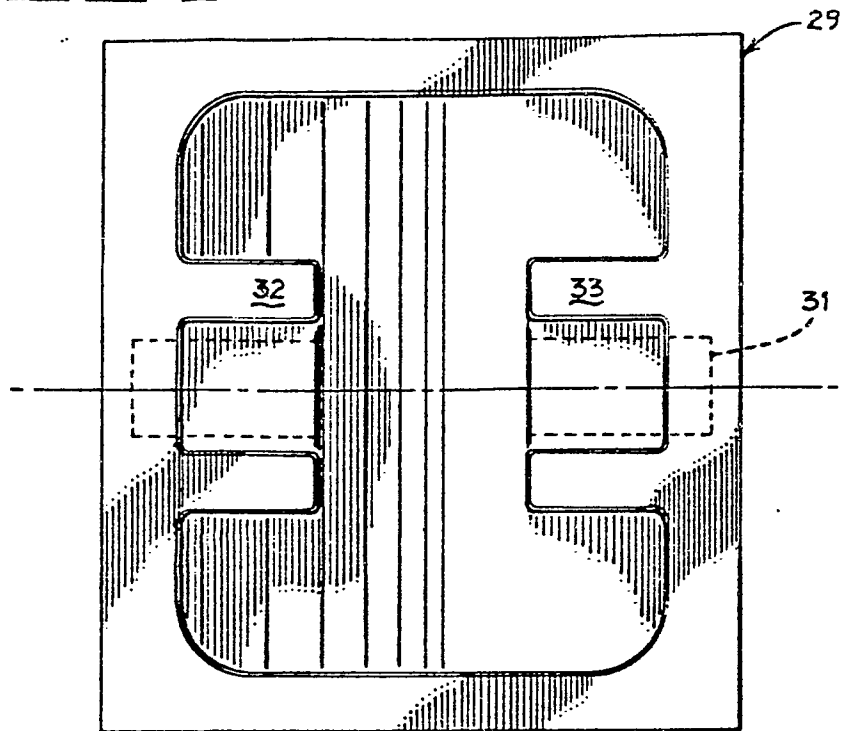


FIG 5

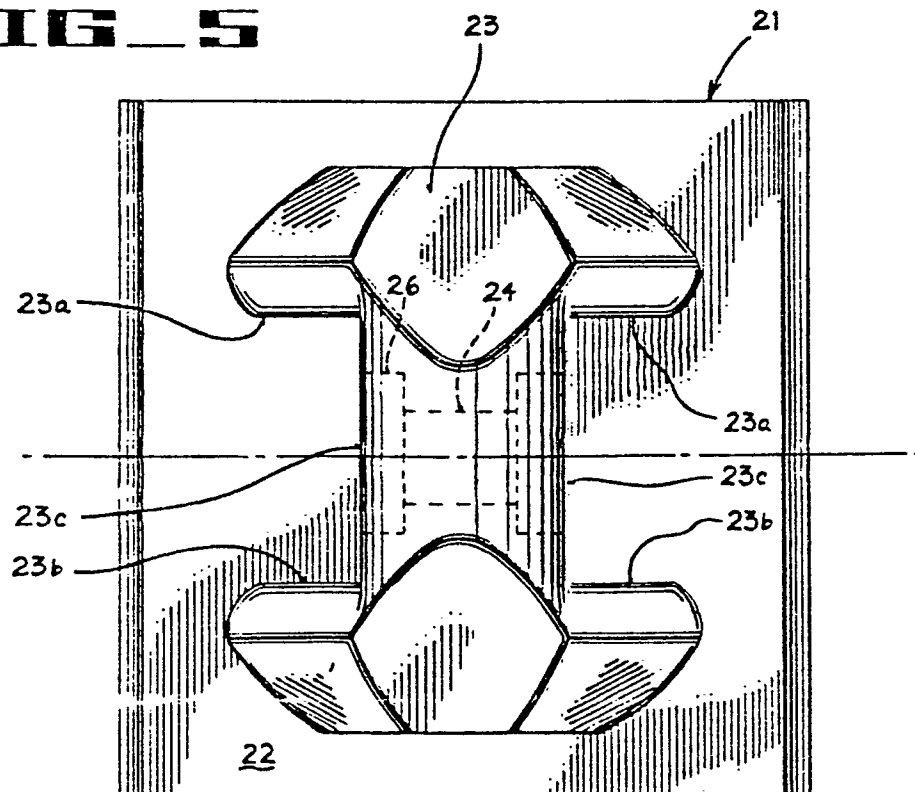


FIG. 7

