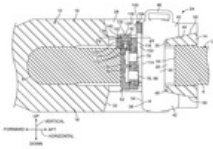
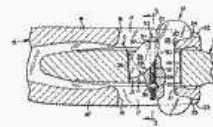
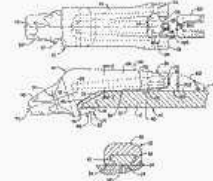
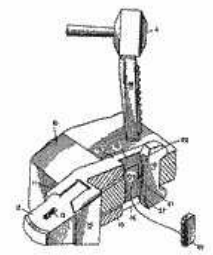
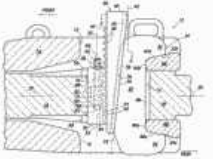
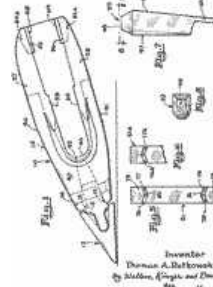
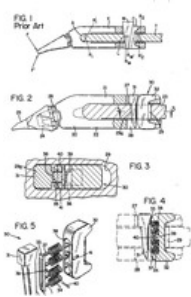
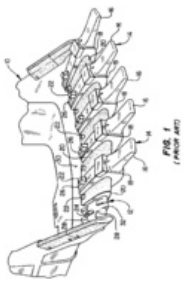
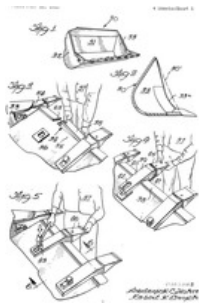
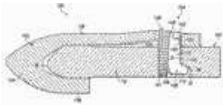
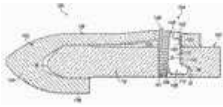
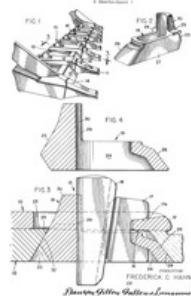
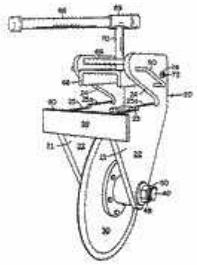
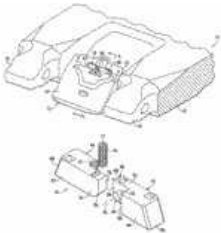
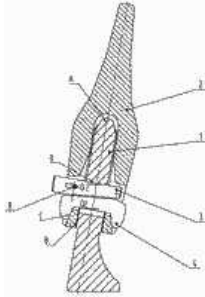
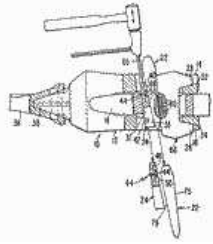
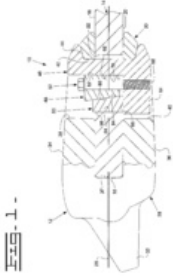
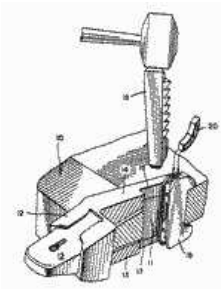
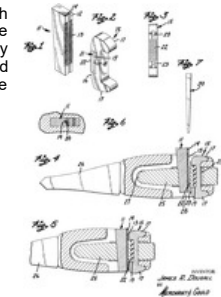
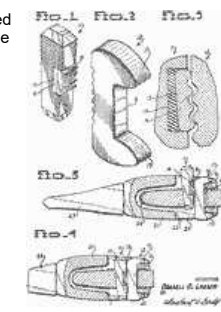
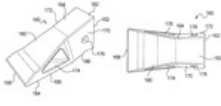
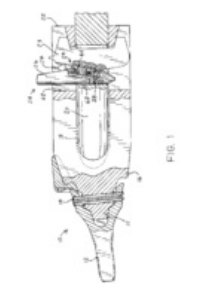
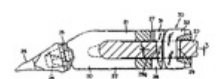


49 results for (((excavat+ or digger or backhoe or bulldozer))/TI/AB/CLMS/DESC/ODES/OBJ/ADB/ICLM/KEYW/TX AND (clamp 5d C)/TI/AB/CLMS/DESC/ODES/TX AND (wedge+)/TI/AB/CLMS/DESC/ODES/OBJ/ADB/ICLM/KEYW/TX) AND (E02F)/IPC AND PD <= 2014-02-27 - Collection: FAMPAT

#	  Title	Publication number	Publ. date	Applicant/Assignee	
1.	Hydraulic locking mechanism for securing teeth and tooth carrying adapters to excavating buckets of excavating equipment	WO2014/189979	2014-11-27	BIERWITH ROBERT	
A connection for firmly securing an adapter for detachably carrying a replaceable digging tooth at its front end to a lip of an excavating container of excavating equipment. The adapter has an upper leg and a lower leg located proximate respective upper and lower surfaces of the lip. The connection has substantially aligned openings in the legs and the lip, and engagement sections of the adapter legs traverse the opening in the lip proximate and forward of an aft end thereof. A pressure applying unit, such as a hydraulic actuator, is arranged inside the opening and generates a generally horizontally acting force which draws the adapter and the lip towards each other. A stress member, which can be a C-clamp, is operatively coupled to the hydraulic actuator and resiliently deforms relative to its relaxed shape when it is subjected to the horizontally acting force.					
2.	Locking device for excavating equipment	US4433496	1984-02-28	ESCO ESCO PORTLAND OREG NEWESCO	
A locking device for securing a straddle-type adapter to the lip of an excavator wherein the C-clamp and wedge have cooperating arcuate surfaces and are bolted together whereby tightening the bolt moves the wedge on the arcuate surface of the C-clamp to tighten the fit of the adapter on the lip.					
3.	Wear assembly for a digging edge of an excavator	EP1626132	2006-02-15	ESCO ESCROW	
A wear assembly for attaching to a digging edge (12) of an excavator (14) includes a boss (24), a wear member (10) and a lock (26). The boss is fixed to the excavator and defines a T-shaped coupling structure. The wear member includes a rearwardly extending mounting leg (54) and a forwardly extending working end (56). The leg includes a T-shaped slot (62) adapted to be received over the T-shaped structure (32) of the boss. The wear member further includes an opening (76) for receiving a lock. The lock includes an adjustment assembly (92) for eliminating any looseness which may exist between the adapter and the boss.					
4.	Excavator tooth retention device	EP2483482	2012-08-08	CATERPILLAR RAPTOR MINING PRODUCTS	
A tooth retention device (16) for attachment to an excavator bucket (10), which has a tooth mounting portion (20), a fork shaped body (22, 24) fitting over the edge (12) of the bucket (10), a clamp (32) passing through the body (22, 24) and the bucket (10), and a wedge (38) holding the clamp (32) in position, in which the wedge has a threaded rod (46) and (72) and a threaded block (50) on the rod (68). The rod (68) is rotatable to move the block (50) between locked and released positions.					
5.	Locking device for excavating equipment	EP0032790	1981-07-29	ESCO	
A locking device for securing a slip-over forwardly projecting adapter (11) to an excavator lip (10), comprising a C-clamp (18) and a wedge (19) for releasably locking the slip-over adapter (11) to the lip (10) wherein serrations (26, 27) on the wedge (19) are interlocked with serrations (31,32) on a resilient lock member (20) received within the clamp (18) and uniquely stabilized by confining sidewalls (36) on the clamp (18).					
6.	Hammerless c-clamp and wedge connector system	WO2008/140878	2008-11-20	HENSLEY INDUSTRIES	
A ground-engaging wear member is releasably retained on an associated support structure by a specially designed hammerless C-clamp and wedge connector system extending through aligned openings in the wear member and support structure Hammerless C-clamp design includes a wedge structure, spool structure, rotatable screw member and a tongue-and-groove interconnection Illustratively, the wear member is an adapter, and the support structure is a bucket lip.					
7.	Dipper teeth with stabilizing inclined faces	US3455040	1969-07-15	ABEX	
1,115,099. Excavator teeth. ABEX CORPORATION. 1 Nov., 1966 [15 Dec., 1965]. No. 48939/66. Heading E1F. To prevent transverse movement of an excavator tooth relative to a support embraced by opposed jaws at the rear of the tooth, the jaws and the support are provided with complementarily inclined surfaces extending parallel to the longitudinal axis of the tooth. (From GB1115099 A)					

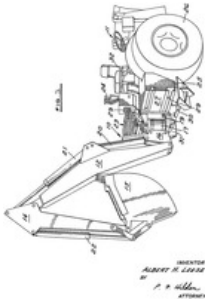
8.	Locking device for an adapter	EP0264480	1988-04-27	ESCO ESCO CORPORATION	A locking device for an adapter, which has upper and lower legs 21, 22 flanking an excavator lip (23) having aligned openings and which are adapted to receive a wedge (31) and C-clamp (30), the lock including a C-clamp and cooperating wedge which are spaced apart, and interposed therebetween is a spring loaded keeper member so as to permit movement of the adapter relative to the lip under an applied load. 
9.	Wear resistant excavating apparatus	US5713145	1998-02-03	HENSLEY INDUSTRIES	A wear resistant excavating apparatus provides reduced wear, resilient compensation for such wear, reduced time required for installation, maintenance, and repair, and reduced hazards of operation. In a preferred embodiment, a wear resistant excavating apparatus has a lip which penetrates the earth, a structure which overlaps the lip, a fastener which biases the overlapping structure to contact the lip, and a compression member which resiliently maintains the overlapping structure in contact with the lip. 
10.	Cutting edge for excavating devices	US3621594	1971-11-23	ESCO ESCO PORTLAND OREG	1292795 Excavator scoop digging edge assembly ESCO CORP 23 Jan 1970 [13 Feb 1969] 3319/70 Heading E1F The leading edges of the base 35 and sides 30 of an excavating scoop are protected from wear by embracing shrouds 38, 57 that are easily replaced when worn since they are only clamped in position about said edges by embracing digger teeth and wing adapters 39, 57 that are releasably secured to the scoop. (From GB1292795 A) 
11.	Locking device for excavator adaptor - has c-clamp and cooperating wedge , spaced apart by sprung keeper to allow movement w.r.t. excavator lip	PT83847	1987-01-01	NEWESCO	An excavator has a lip adapted to extend horizontally during digging and an adapter having upper and lower legs flanking the lip and having a nose portion projecting forwardly of the lip during digging. Vertically aligned openings are provided in the legs and lip for receipt of a locking device. The leg openings are spaced from the rear ends of the legs. A locking device is removably mounted in the openings and includes vertically extending, spaced apart wedge and C-clamp members. The locking device further provides a rocking action of the adapter relative to the lip. This is achieved by springs interposed between the wedge and C-clamp members. The spring constitute the only bearing contact when the adapter is not under load. 
12.	Wear assembly	EP1969189	2008-09-17	ESCO Escrow Corporation	In a wear assembly for securing wear members to excavating equipment, a spool is used with a wedge to hold the wear member in place. The spool is formed with at least one laterally extending arm at its upper end in lieu of an axial arm such as used in a conventional C-shaped spool. In this way, the spool can be easily supported in the assembly as the wedge is installed. The spool does not fall through the opening and no special care is needed to prevent it from falling. The spool also holds itself in place when the wedge is driven into the passage. As a result, installation of the wear assembly is easier and less hazardous. In addition, the lateral support reduces the risk that the spool will suffer spreading. 
13.	Releasable lock arrangement for excavating teeth and the like	US3664044	1972-05-23	ESCO	A replaceable bushing capable of self-supporting seating in the aperture of an excavator lip whereby worn bearing areas are easily and mechanically replaced, and thereby function better to support and tie an adapter or other excavating teeth components to the excavator. 

14.	Device for attaching earth-working tools to excavating equipment	US4910891	1990-03-27	YAMAMOTO CONSTRUCTION TECHNOLOGY	
A device for attaching various earth-working tools to a bucket of excavating equipment, such as a front-end loader, backhoe, or excavator. A frame has two spaced parallel plates, each having a wedge-shaped notch on one side. A stabilizing bar, adjacent to the open end of the notches, connects the plates. The tool, such as an asphalt roller or cutter, is attached to the bottom of the frame between the plates. At the top of the frame, a clamping mechanism, having a pivoting arm, is mounted between the plates. To use the device, the excavator bucket is inserted into the wedge-shaped notch, with the device holding the bucket in place against the edges of the wedge-shaped notch, the stabilizing bar, and the pivoting arm of the clamping mechanism.					
15.	Assembly of a wear part and a lock for securing the wear part to earth-working equipment	EP2038486	2009-03-25	ESCO	
A lock for securing a wear part to earth-working equipment that is foldable between a retaining position to hold the wear part to the equipment and a release position that permits removal of the lock and release of the wear part from the equipment. The lock includes a retainer for releasably holding the lock in the retaining position. The retainer may comprise a threaded wedge received into a complementary threaded passage.					
16.	Bucket tooth assembly for large mine excavator	CN202208941	2012-05-02	TAIYUAN HEAVY INDUSTRY	
A bucket tooth assembly for a large mine excavator relates to mine excavator buckets and solves the problem that during using process bucket tooth loosing and breaking is prone to happen. The bucket tooth assembly for the large mine excavator comprises a bucket lip welded on a bucket body, bucket teeth and a sheath which are installed on the bucket lip. The bucket teeth and the bucket lip are tightly wedged through a bucket tooth C-shaped clamp board and a bucket tooth wedge, and the sheath and the bucket lip are tightly wedged through a sheath C-shaped clamp board and a sheath wedge. The bucket tooth assembly for the large mine excavator is characterized in that an L-shaped pin hole is arranged on the bucket teeth, a long circular pin hole is arranged on the bucket tooth wedge, and a lock pin penetrates through the L-shaped pin hole and the long circular pin hole to tightly lock the bucket tooth wedge and the bucket teeth. The bucket tooth assembly is applied to a large mine face shovel type excavator bucket and solves the problems of bucket tooth loosing and breaking.					
17.	Tooth mount for excavating bucket	US5134793	1992-08-04	BIERWITH ROBERT S	
A C-clamp and a wedge of an adapter for an excavating bucket have locking parts which substantially eliminate any tendency for the wedge to become loosened from a space between the C-clamp and a wedge block. Spring loaded teeth in the front surface of the C-clamp are received in corresponding notches in the juxtaposed rear surface of the wedge. As the wedge is driven into its operating position, the spring loaded teeth in the front of the C-clamp alternately move into and out of the adjacent notches until the wedge is tight and as the teeth are received in the notches, thus locking the wedge in place. The wedge is removed by driving the wedge block downwardly, shearing a shear pin, thereby allowing the wedge block, the wedge and the C-clamp to be separated from the adapter and fall to the ground.					
18.	Hammerless mechanically attached adapter system	WO01/25551	2001-04-12	CATERPILLAR	
The present invention provides a hammerless mechanical attachment system (10) comprising a C-clamp member (46), a first wedge member (48), a second wedge member (50) and a threaded tensioning device (52) for attaching a tooth adapter (12) to a base cutting edge (14) of an implement that eliminates bending forces on the tensioning bolt (52) or the misalignment between the mounting holes for such tensioning bolt (52). The threaded tensioning device (52) is disposed through the bolt hole (76) in the first wedge member (48) and threadably engaged with the threaded aperture (68) in the flange (64) of the C-clamp member (46), whereby the second wedge member (50) is caused to move in a forward direction upon tightening of the threaded tensioning device (52) for securing the adapter (12) to the base edge (14).					

19.	Locking device for excavating equipment	US4271615	1981-06-09	ESCO	
A locking device for excavating equipment including a C-clamp member and a wedge member, the wedge member having ratchet-type teeth held in position against the C-clamp member by means of an arcuate lock which itself is resiliently mounted within the C-clamp member.					
20.	Connecting apparatus for tooth adapter assembly	US3722932	1973-03-27	ME INTERNATIONAL	
Apparatus for removably connecting a digger tooth adapter to an excavating shovel. The adapter and lip of the shovel fit together in overriding relation, with openings in each aligning to form a passage which receives a C-shaped clamp and wedge . The back side of the C-clamp has a rectangular recess which receives a locking member. The locking member has an exposed face which is serrated, and it is urged out of the recess by a resilient mounting pad. The wedge also has a serrated face which mateably engages the locking member. To simplify removal of the adapter from the shovel, a longitudinal groove is formed in the engaging face of the wedge which extends through and below the serrations. A partial groove is formed in the C-clamp , and the grooves together guidably receive a spike therebetween which, upon insertion, separates the respective serrated faces and enables the wedge to be removed.					
21.	Lip assembly including side portions with projections	US20050241195	2005-11-03	ROBERT BIERWITH	
A lip assembly is disclosed and includes a lip having an upper surface, a lower surface, a front portion, a rear portion, a first side portion, a second side portion, and a plurality of holes disposed between the front portion and the rear portion and extending from the upper surface to the lower surface. The first and second side portions are on opposite sides of the front portion of the lip, and the front portion, the first side portion, and the second side portion include projections and valleys. Tooth assemblies extend away from at least the front portion of the lip and are respectively coupled to the lip via the plurality of holes.					
22.	Connecting apparatus for power shovel tooth adapters	US3572785	1971-03-30	ME INTERNATIONAL	
The disclosure is directed to apparatus for connecting a digger tooth adapter to an excavating shovel. The apparatus consists of a C-shaped block having undulations formed on its back side, and a wedge having a resiliently mounted block-engaging member of the face of which is also undulated to cooperate with the block. The adapter and lip of the shovel fit together in overlapping relation, with openings in each aligning to form a passage which receives the block and wedge .					
23.	Ground engaging tip of a tooth assembly	EP2766530	2014-08-20	CATERPILLAR	
A ground engaging tooth assembly (10) for a cutting edge of a ground engaging implement (1) may include an adapter (12) and a ground engaging tip (14, 160, 190). The adapter (12) may have a forward extending adapter nose (26) having an inverted or reverse keystone-shaped contour, with the ground engaging tip (14, 160, 190) having a nose cavity (120) for receiving the adapter nose (26) and exterior surfaces (72, 74, 90, 92, 162, 164, 170, 172, 192, 194, 200, 202) having complementary shapes to the adapter nose (26). The adapter nose (26) and an adapter cavity (120) of the tip (14, 160, 190) may also be configured with complimentary surfaces that increase retention between the adapter nose (26) and the tip (14) when downward forces are applied to the tip (14, 160, 190). In other embodiments, the surfaces of the tip (14, 160, 190) may include reliefs (102, 104, 174, 176, 204, 206) extending inwardly into the body of the tip (14, 160, 190) to reduce weight and facilitate penetration of the tip (14, 160, 190) into work material as wear material wears away from a front edge (76, 166, 196) of the tip (14, 160, 190).					
24.	Tooth assembly for excavation bucket	US6032390	2000-03-07	BIERWITH ROBERT	
In an excavation bucket, the nose of an adapter has two surfaces to take the horizontal loads and four surfaces to take the vertical loads. A pin holds and locks a tooth to the adapter. Projections on the pin engage sloping surfaces of the nose. A recess placed ahead of the nose of the adapter will become visible as the tooth erodes due to wear. A recess at the nose of the adapter indicates that the tooth has worn too much and, unless the tooth is replaced, will commence to cause wear of the adapter and adjacent parts. To attach the adapter to the lip of the excavation bucket, wedge members are joined together near one end thereof to form a wedge-shaped block insertable into a wedge-shaped space formed by a C-clamp surface and a slot in the lip. The block is forced into the space, and spring biased teeth carried by the lock box progressively enter and leave the recesses in the outer surface of the C-clamp . When the C-clamp is tight enough in the gap, the installation of the lock box is complete. The lock box can be subjected to hammer blows so as to shear the bolt or cap screw so that the lock box can be removed from its operative position in the gap. Thus, the lock box can be used over and over again.					
25.	Lock mechanism for whisler-shape connecting device	CN86209608	1988-03-09	ESCO	
The utility model discloses a lock mechanism for Whisler-shaped connecting device which is provided with an upper arm and a lower arm. The upper arm and the lower arm are respectively connected with the top and the bottom of the bucket front edge of an excavating machine. The arm is provided with an opening which is used for mounting the lock mechanism which is composed of an iron and a C-shaped clamp . The lock mechanism comprises the C-shaped clamp and the iron matching with the C-shaped clamp ; the C-shaped clamp and the iron are separated with each other. In the load bearing situation, a support plate under the effect of a spring is inserted between the C-shaped clamp and the iron to make the connecting device move corresponding with the bucket front edge.					

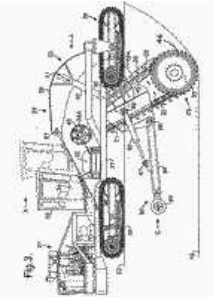
26. Locking means for offset backhoe US3407945 1968-10-29 FORD MOTOR

No abstract available



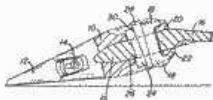
27. Trenching method and apparatus EP1444405 2004-08-11 MASTENBROEK
MASTON BRÄCKE ELTY

Trenching apparatus comprises a cutting device (23), preferably an endless chain cutter, mounted on a prime mover (21) for positioning the cutting device in a trench (18) with the prime mover movable on the ground surface (22) above the level of the trench. Where the cutting device is a chain cutter, the boom projects forwardly and downwardly relative to the direction of cutting the trench, and drive means are arranged to drive the chain in a direction to carry the cutting elements upwardly around the distal end of the boom and rearwardly along the upper run (30) of the endless chain cutter (23). In operation the distal end of the chain cutter (23) is positioned against the end face of the trench at the bottom of the trench (18); the prime mover (21) moves the chain cutter forwardly in the trench while operating the chain cutter, so as to produce an undercut (55) in the end face (54) of the trench; and the lifting means (25) lifts the cutting device (23) upwardly from the undercut through the material of the end face so as to cut material from the end face of the trench.



28. Apparatus for securing overlapping portions of two digger tooth members together US4357765 1982-11-09 USX

An improvement is provided in apparatus for securing overlapped portions of two members together. In addition to a **wedge** conventionally inserted in holes generally axially aligned in the overlapped portions, a locking bar is provided for insertion longitudinally in the holes and has a notch with opposed faces for tightly engaging the outer surfaces of one of the members which is subject to less flexing movement than the other. The **wedge** and bar are secured together after insertion to prevent loosening of the **wedge** in service.

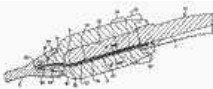


29. Locking device for whisler type adapter CA1252492 1989-04-11 ESCO

A locking device for a Whisler style adapter, which has upper and lower legs flanking an **excavator** lip having aligned openings and which are adapted to receive a wadge and **C-clamp** lock, the lock including a **C-clamp** and cooperating **wedge** which are spaced apart, and interposed therebetween is a spring loaded keeper member so as to permit movement of the adapter relative to the lip under an applied load.

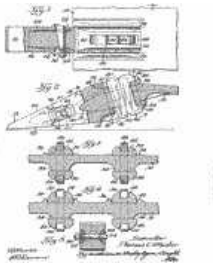
30. Excavator bucket tooth retention device US5063696 1991-11-12 ATLANTIC RICHFIELD

Digging teeth and support adapters for **excavating** buckets and the like are retained connected to the lip portion of the bucket in the event of failure of a tooth, its adapter or any device which normally secures the tooth and the adapter to the bucket lip by an elongated, flexible cable trained through a passage in the bucket lip, a passage in the adapter and secured to the tooth. Retainer fittings on the cable engage cooperating retainer parts on the tooth and the lip portion to prevent loss of the tooth due to such failure.



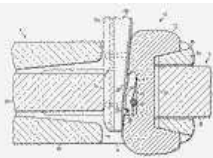
31. Dipper tooth and front for excavating dippers US1992591 1935-02-26 AMERICAN MANGANESE STEEL

No abstract available



32. Retaining mechanism US5311681 1994-05-17 HENSLEY INDUSTRIES

A retaining mechanism (10) for captively retaining an adapter (4) to the forward lip (2) of a bucket for earth **excavating** utilizes a ratcheted pawl (14) within a **C-clamp** (12). The pawl ratchet (24) engages a complementary pawl surface (26) of the rear half (16b) of a split pin assembly (16). The forward half (16a) of the split pin can be attached to the rear half (16b) by shear screws (52). Moreover, the forward half (16a) of the split pin can be attached to the rear half (16b) by an elastomeric element (64). The split pin assembly (16) acts as a **wedge** member, firmly securing the adapter (4) to the lip (2). To remove the retaining mechanism (10) from the adapter (4) and lip (2), the pawl (14) may be disengaged from the rear split pin (16b) by manipulating the pawl through an access port (28) in the **C-clamp** (12). Alternatively, the forward split pin (16) may be driven through the opening in the adapter and lip.



33.

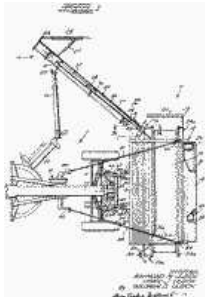
Earth materials handling apparatus

US3466989

1969-09-16

ULRICH MANUFACTURING

No abstract available



34.

Digging hardware signalling apparatus

CA2198304

1997-08-24

H & L TOOTH

An apparatus for providing a signal indicative of loss or imminent loss of digging hardware normally arranged in operable association with an earth working implement.



35.

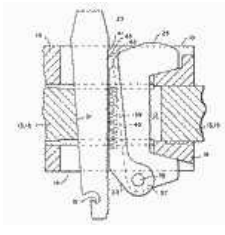
Wedge and clamp locking system

US4413432

1983-11-08

BIERWITH ROBERT S

An improved **wedge** and **clamp** locking system having an unidirectional interlock which can be disassembled to unlock the system rather than reversing the locking procedure by driving out the **wedge**.



36.

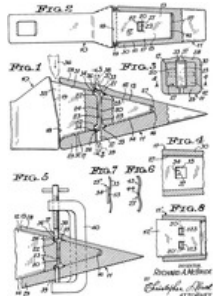
Excavating tooth structure

US3106256

1963-10-08

MCBRIDE RICHARD A

No abstract available



37.

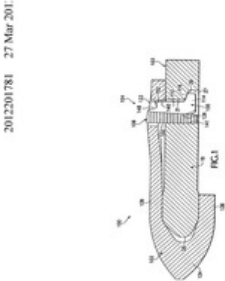
Wear assembly

AU2012201781

2012-04-19

ESCO

Abstract In a wear assembly for securing wear members to **excavating** equipment, a spool is used with a **wedge** to hold the wear member in place. The spool is formed with at least one laterally extending arm at its upper end in lieu of an axial arm such as used in a conventional **C**-shaped spool. In this way, the spool can be easily supported in the assembly as the **wedge** is installed. The spool does not fall through the opening and no special care is needed to prevent it from falling. The spool also holds itself in place when the **wedge** is driven into the passage. As a result, installation of the wear assembly is easier and less hazardous. In addition, the lateral support reduces the risk that the spool will suffer spreading.



38.

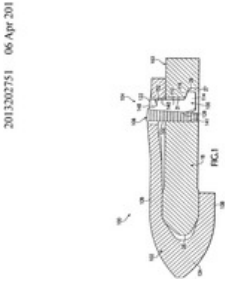
Wear assembly

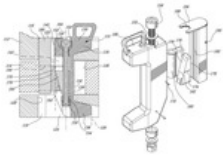
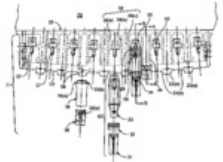
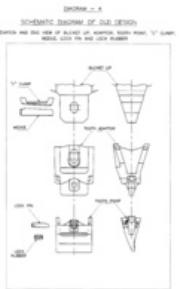
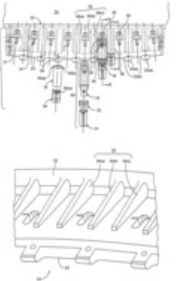
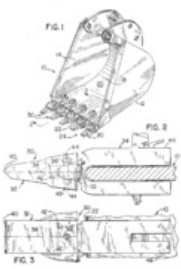
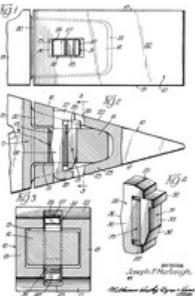
AU2013202751

2013-05-02

ESCO

Abstract In a wear assembly for securing wear members to **excavating** equipment, a spool is used with a **wedge** to hold the wear member in place. The spool is formed with at least one laterally extending arm at its upper end in lieu of an axial arm such as used in a conventional **C**-shaped spool. In this way, the spool can be easily supported in the assembly as the **wedge** is installed. The spool does not fall through the opening and no special care is needed to prevent it from falling. The spool also holds itself in place when the **wedge** is driven into the passage. As a result, installation of the wear assembly is easier and less hazardous. In addition, the lateral support reduces the risk that the spool will suffer spreading. i,



39.	Earth working bucket and connector assembly securing wear member thereto	WO2012/151703	2012-11-15	9257 5810 QUEBEC GLOBAL CASTING	The connector assembly is used in securing a wear member to a support structure of the earth working bucket in an engaged position in which corresponding apertures of the wear member and the support structure are aligned and form a connector passage. The connector assembly is engaged into the connector passage and comprises : an endless screw extending in the connector passage and having an externally operable head, abutment portions facing opposite walls of the connector passage, and a movement transfer mechanism operable to transform rotary movement of the endless screw into a transversal movement of one abutment portion relative the other, to push the abutment portions against corresponding opposite walls of the connector passage. 
40.	Lip assembly	US20030093928	2003-05-22	BIERWITH ROBERT S.	A lip assembly is disclosed. The lip assembly comprises a lip having an upper surface, a lower surface, a front portion, and a rear portion. A plurality of holes is disposed between the front portion and the rear portion. The lip also includes support members. Each support member is disposed adjacent to a hole within the plurality of holes and is positioned to inhibit movement of a tooth assembly coupled to the hole. A plurality of tooth assemblies extend away from the lip and are respectively coupled to the lip via the plurality of holes. The lip assembly may be used with an excavation bucket body. 
41.	Tooth point assembly for walking dragline buckets	IN0291/CHE/2008	2009-09-11	BEML	This Tooth point being developed indigenously to replace Imported Tooth and Tooth Adapter castings and locking component for substantial cost savings, easy handling and assembly on the Dragline bucket wear and to provide increased service life. 
42.	Lip assembly	US20050241194	2005-11-03	BIERWITH ROBERT S	A lip assembly is disclosed. The lip assembly comprises a lip having an upper surface, a lower surface, a front portion, and a rear portion. A plurality of holes is disposed between the front portion and the rear portion. The lip also includes support members. Each support member is disposed adjacent to a hole within the plurality of holes and is positioned to inhibit movement of a tooth assembly coupled to the hole. A plurality of tooth assemblies extend away from the lip and are respectively coupled to the lip via the plurality of holes. The lip assembly may be used with an excavation bucket body. 
43.	Digging hardware signaling apparatus	US5743031	1998-04-28	H & L TOOTH	An apparatus for providing a signal indicative of loss or imminent loss of digging hardware normally arranged in operable association with an earth working implement. 
44.	Retaining key for dipper tooth parts having resilient pad	US2870667	1959-01-27	AMERICAN BRAKE SHOE & FOUNDRY	No abstract available 
45.	Adapter fixing apparatus in drilling machine	JPS63122831	1988-05-26	ESCO	No abstract available

46.

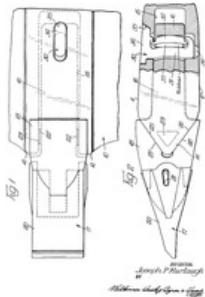
Retainer pins for dipper teeth

US2772492

1956-12-04

AMERICAN BRAKE SHOE & FOUNDRY

No abstract available



47.

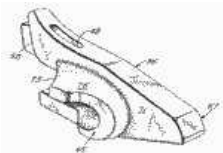
Dipper bucket corner member with integral shroud

US3812608

1974-05-28

AMALLOY

The corners of the lip of a power shovel adjacent the digging edge of the lip are protected by removable guards, more specifically in the form of teeth, and projecting forwardly at each corner; each corner guard preferably includes an integral shroud embracing the portion of the digging edge of the lip which intervenes between the corner and the next adjacent dipper tooth, the latter being of any preferred form. Additionally the guard is so constructed as to present an extension at the rear thereof constituting a portion of the side wall of the dipper.



48.

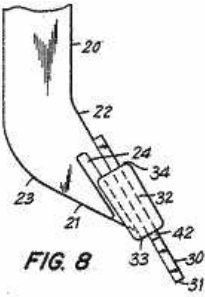
Cutting tooth assembly

EP0400767

1990-12-05

MAGUINA LARCO ALFREDO

A cutting tooth assembly for heavy duty earth working machines has a replaceable cutting point (30) consisting of a length of metal bar of constant transverse cross-section, which is frictionally held on a shank (20) by a reusable holding **clamp** (32) and which is repositionable on the shank. As the point (30) wears, a used length of the metal bar (30) is welded to an unused length of metal bar or to another used length of metal bar, thus permitting the entire length of the cutting point material to be utilized, thus limiting discarded scrap.



49.

Device and method for coupling wear parts to implement borders for earth moving machines

EP0618334

1994-10-05

AFE METAL
AFUE METAL
F & METAL
FIGARO PIONEER METALS
PASQUALINI CHARLES
3 more...

The device is noteworthy in that the tooth (D) and the adaptor (A) relating thereto are arranged with respect to each other with complementary shapes to allow, after fitting, the formation and definition of one or more volumes (V) of variable shape, according to the need, the adaptor and the tooth being arranged with one or more openings allowing the insertion and fitting of a specific substance (M) in the abovementioned volume or volumes, said specific substance fulfilling the functions of immobilising the tooth with respect to the adaptor through absolute contact between the tooth and the adaptor by forming a contact cushion providing a distribution of the stresses and strains over all of the areas to be filled by the substance. <IMAGE>

