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(54) **MINING PLOW**

BERGBAUHOBEL

RABOT D'ABATTAGE

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Description

Technical Field

[0001] The present disclosure relates to a mining plow, in particular a coal mining plow, having a plow base which is guidable on a reversible conveyor.

Background

[0002] Coal mining plows with extraction cutting bits fastened to pivotable cutting bit carriers, which are connected in a direction-independent manner via a connecting rod or a catch that is connected to the plow chain for the mining plow, are known, for example, from DE 201 18 259 U1 or DE 196 37 789 A1. In order to be able to excavate different thicknesses (seam heights) with the same plow, the height of the mining plow can be adjusted to the actual desired working height, in which the height of the mining plow is increased using attachment members. In DE 196 37 789 A1, the height increase is achieved using an attachment member, which is supported via a supporting portal on the goaf side on a guide rail provided on the conveyor for this purpose, whereby even with mining plows having an especially high structure, and optionally provided with a plurality of set-on attachment members, a reliable stabilization of the plow can be achieved with effective removal of the forces on the plow guide.

[0003] In underground mining, there is an increasing need for mining plows, in particular coal mining plows, with which even small seam thicknesses (heights) can be mined as variably as possible and with short re-tooling times. Furthermore, DE 20 2010 000 457 U1 discloses a mining plow, which includes an attachment member and ancillary cutting bit columns that are disposable on the attachment member.

Summary of the Disclosure

[0004] According to an aspect of the present disclosure, a mining plow, in particular a coal mining plow, may comprise a plow base constructed to be guided on a reversible conveyor and having a pivot pin on an inclined supporting surface for pivotably supporting a cutting bit carrier in each direction of plow travel, two cutting bit carriers pivotably supported on a respective pivot pin, including extraction cutting bits, and being pivotable in a travel-direction-dependent manner, a roof cutting bit carrier attached to the plow base in a height-adjustable manner, and including roof cutting bit columns. The roof cutting bit carrier may be removably anchorable at different heights to an attachment surface formed between the inclined supporting surfaces. The disclosed mining plow may further comprise an attachment member settable on the plow base and elongating the attachment surface for the roof cutting bit carrier to increase the working height of the mining plow. The attachment member may include ancillary cutting bit columns provided with extraction cutting bits and attached to the attachment member. Each ancillary cutting bit column may be respectively positioned in its extraction position for a plow trip above a cutting bit carrier, and an intermediate member may be disposed between the attachment member and each ancillary cutting bit column. The intermediate member may be foldable attached to the attachment member and may be folded away into an installation position, in which the corresponding cutting bit carrier may be removable while the attachment member and the intermediate part remain installed.

[0005] Other features and aspects of this disclosure will be apparent from the following description and the accompanying drawings.

Brief Description of the Drawings

[0006]

Fig. 1 shows a view of the front side of a mining plow according the present teachings, the front side facing towards the mining face during operation.

Fig. 2 shows a plan view of the mining plow according to Fig. 1, in which a left-side ancillary cutting bit column is detached and an intermediate part is folded upward.

Fig. 3 shows a cross-sectional view of the mining plow of Fig. 1 along III-III in Fig. 1.

Fig. 4 shows a plan view of an attachment member for the mining plow according to the present disclosure.

Fig. 5 shows a side view of the attachment member of Fig. 4.

Fig. 6 shows a perspective view of the front side of the attachment member of Fig. 4.

Fig. 7 shows a perspective plan view of the attachment member of Fig. 4, in which a left-side ancillary cutting bit column is detached and an intermediate part is folded upward.

Fig. 8 shows a perspective view of the rear side of the attachment member of Fig. 7.

Detailed Description

[0007] The following is a detailed description of exemplary embodiments of the present disclosure. The exemplary embodiments described therein and illustrated in the drawings are intended to teach the principles of the present disclosure, enabling those of ordinary skill in the art to implement and use the present disclosure in many different environments and for many different applications. Therefore, the exemplary embodiments are not intended to be, and should not be considered as, a limiting description of the scope of patent protection. Rather, the scope of patent protection shall be defined by the appended claims.

[0008] The present disclosure may be based in part on

the realization that providing a mining plow having a plow base with the lowest possible design may offer a high variability for the mining of different seam thicknesses of the to-be-excavated mineral layer, in particular coal, may be easy to assemble and may have an improved mining behavior even in the face end region as well as the longwall tunnel itself when confined spaces are present due to the work situation or a narrow roadway.

[0009] The present disclosure may be further based in part on the realization that the extraction cutting bits of the disclosed mining plow may lie on the ancillary cutting bit column above or in extension of the line of the extraction cutting bits of the associated cutting bit carrier, such that by adding the ancillary cutting bit columns, which are disposed substantially farther forward in the direction of travel, may improve mining behavior, in particular in the face end region as well as in the longwall tunnel. Thus, an upper bank or a concrete pack, with which a tunnel support structure may be optionally backfilled, can be removed in the tunnel.

[0010] A mining plow according to the present disclosure is indicated overall with reference number 1 in Figs. 1 to 3. The mining plow 1 can be moved using a plow chain 2 (only shown in part) along plow guides (not shown) during underground mining operations. The plow guides are part of a conveyor apparatus, which is laid along the mining face over lengths of generally 200 m to 400 m for extracting minerals such as, for instance, coal, and may be automatically advanced forwarding the direction of the mining face using suitable advancing devices as the mining progresses.

[0011] In Fig. 3 a guide shoe 5 and a guide recess 6 on the rear side of a base 4 of the mining plow 1 can be seen, with which the mining plow 1 is guided on guide bars, which are part of the plow guide. The plow chain 2 is connected to a pull-sled serving as a catch, which is disposed in a recess on the underside of the plow base 4 and moves the mining plow 1 in the pulling direction of the plow chain 2 along the plow guide, as is known from the prior art.

[0012] The mining plow 1 is provided with a cutting bit carrier 7 for both plow travel directions, which are indicated with F and F', respectively, in Fig. 1. The cutting bit carrier 7 is pivotably supported on the plow base 4 about a pivot pin 8 that is visible in Figs. 2 and 3, and rests with its weight on an oblique supporting surface 9 of the plow base 4. As can be easily seen in Fig. 1, both cutting bit carriers 7 are provided with a row of extraction cutting bits 11 disposed one above another. The extraction cutting bits 11 extend over the entire height of the plow base 4 and over the height of the material to be mined by the mining plow 1 with the cutting bit carrier 7, which means the material that lies forward of the mining plow 1 in the direction of travel F or F'.

[0013] Through the pivotability of the two cutting bit carriers 7, which are here rigidly coupled by a connecting rod 62 between the two cutting bit carriers 7, it may be achieved that the cutting bit carrier 7 disposed forward in the direction of travel rearwardly displaces the cutting bit carrier 7 disposed rearward in the direction of travel. Therefore, the extraction cutting bits 11 disposed rearward in the direction of travel may not contact the coal mining face. Moreover, when the plow travel direction F is reversed to the reverse direction F', extraction work is now performed by the extraction cutting bits 11 on the other cutting bit carrier 7. That is, the other cutting bit carrier is caused to pivot by the extraction forces opposite of the direction of travel and accordingly shifts back the cutting bit carrier 7 that is now disposed rearward in the direction of travel, as is also known to the person of skill in the art.

[0014] The mining plow 1 is further provided in a conventional manner with a roof cutting bit carrier 12 having two roof cutting bit columns 13 equipped with extraction cutting bits 14. The roof cutting bit carrier 12 is fastened to the plow base 4 in a height-adjustable manner, and can be displaced along groove guides 15 in the height direction which means vertically, in order to be anchored at different height positions.

[0015] The mining plow 1 is further provided in a known manner with an attachment member 20, with which the height, and thus the extraction height, of the mining plow 1 can be increased. An ancillary cutting bit column 21, which is equipped with additional extraction cutting bits 22, is disposed on the attachment member 20 for each direction of travel, in order to additionally excavate minerals or rock on the coal mining face along the height of the attachment member 20.

[0016] Groove guides 26 (see Figs. 5 to 7) are disposed in the center of the attachment member 20 on its front surface. The groove guides 26 extend the groove guides 15 on the plow base 4, in order to be able to move the roof cutting bit carrier 12 upwards in such a manner that material can be excavated in the roof area by the roof cutting bit carrier 12 also when the attachment member 20 is attached. Both the roof cutting bit columns 13 and the ancillary cutting bit columns 21 are pivotable, so that only the roof cutting bit column 13 and ancillary cutting bit column 21 disposed forward in the travel direction F or F' perform extraction work.

[0017] In the mining plow 1 according to the present disclosure, both ancillary cutting bit columns 21 are positioned on the mining plow 1 in such a way that the extraction cutting bits 22 of the ancillary cutting bit columns 21 are located above the respective cutting bit carriers 7 and in an arc-like extension of the extraction cutting bits 11. A correspondingly far-forwardmost positioning of the ancillary cutting bit column 21 in the direction of travel is achieved in the mining plow 1 by arranging an intermediate part 30 between the attachment member 20 and each ancillary cutting bit column 21.

[0018] As shown in Fig. 2, the left-side intermediate part 30 has been folded away into an installation position, whereas the right-side intermediate part 30 is shown in the extraction position (or operational position) for the right-side ancillary cutting bit column 21. In the installa-

tion position, neither the intermediate part 30 nor an optional ancillary cutting bit column 21 fastened to the intermediate part 30 is disposed over the underlying cutting bit carrier 7 in such a way that accessibility of the pivot pin 8 would be hindered and/or the cutting bit carrier 7 could not be removed and lifted off of the pivot pin 8.

[0019] Therefore, in order to uninstall (remove) the cutting bit holder 7, it is sufficient in the present mining plow 1 to release a lock holding the respective intermediate part 30, and fold it back into the installation position as shown at the left of Fig. 2. Optionally, the associated ancillary cutting bit column 21 may be removed before the intermediate part 30 is folded back. The attachment member 20, which is usually very heavy, can remain on the plow base 4 during installation/removal of the cutting bit carrier 7.

[0020] Certain aspects of the structure of the attachment member 20, the intermediate part 30 and the ancillary cutting bit columns 21 will now be explained in further detail with reference to Figs. 4 to 8.

[0021] As shown in Fig. 5, the underside of the attachment 20 may be attached to the plow base 4. The latch pins 23 sit in corresponding latch recesses (not shown) on the plow base 4, and thus fix the attachment member 20 to the plow base 4 in an interference-fit manner and parallel to the direction of travel.

[0022] In order to prevent vertical movement between the attachment member 20 and the plow base 4, wedge-jaws 24 are provided and can be moved relative to each other using turnbuckles 25 (see Fig. 6) in such a way that the jaws of the wedge-jaws 24 extend beyond the attachment member 20 and grasp the plow base 4, thereby clamping the attachment member 20 onto the plow base 4. The wedge-jaws 24 are disposed on either side of the groove guides 26, which are removably anchored to the attachment member 20, for example, screw-fastened in this embodiment.

[0023] As shown in Fig. 6, a fork receptacle 29 is disposed on each end of the attachment member 20 and is open towards the front side. Spaced-apart bolt receptacles 27 define a gap for receiving a bolt eye 31 of the intermediate part 30. The bolt receptacles 27 and the bolt eye 31 are connected using a pivot bolt 45. The pivot axis of the pivot bolt 45 extends parallel to the groove guides 26 and connects the bolt receptacles 27 and the bolt eye 31, and thus the intermediate part 30 and the attachment member 20, to one another. The bolt receptacles 27 and the bolt eye 31 are designed to be suitably strong, so that the entire weight of the intermediate part 30 and the connected additional column 21 can be retained in a pivotable manner.

[0024] As shown in Fig. 7, the intermediate part 30 has a middle part 32 that is integrally connected with the bolt eye 31. A strong pressure plate 33 is formed on the rear side of the middle part 32, as can be seen on the left side in Fig. 7. In the extraction (mining or operational) position, as shown in the right-side intermediate part 30 in Fig. 7, a beveled rear end face 34 abuts in an form-fit manner on an abutment surface 28 of the attachment member 20. The abutment surface 28 also extends obliquely to the direction of travel, in order to direct all of the forces arising on the ancillary cutting bit columns 21 during the extraction movement to the attachment member 20 via the pressure plate 33.

[0025] As shown on the left side of Fig. 7, the middle part 32 is further provided with pin receptacles 35 opposite the bolt eye 31. As shown on the right side of Fig. 7, a supporting body 41 of the ancillary cutting bit column 21 is insertable into the pin receptacles 35, preferably only in a certain relative position between the ancillary cutting bit column 21 and the intermediate part 30. The supporting body 41 of the ancillary cutting bit column 21 can or must then be pivoted into a position, relative to the intermediate part 30, in which the supporting body 41 of the ancillary support column 21 is fixedly held between an arm pair 36 on the intermediate part 30. The arm pair 36 lies opposite the pin receptacles 35 at a short distance. The ancillary support column 21 is consequently supported in the extraction (mining or operational) position on the intermediate part 30 on the one hand via the pin receptacles 35 and on the other hand between the arm pair 36.

[0026] The ancillary cutting bit column 21 can be installed or uninstalled only in a certain pivot position, however not in the extraction (mining or operational) position, which is shown on the right side of Fig. 7. The pivot pin connection between the ancillary cutting bit column 21 and the intermediate part 30 can be effected using pin stumps which are integrally formed on the supporting body 41 of the ancillary cutting bit column 21.

[0027] As shown in Fig. 8, the intermediate part 30 is further provided with a supporting projection 37 directly adjacent to the bolt eye 31. The supporting projection 37 is cantilevered laterally beyond the bolt eye 31. In the extraction (mining or operation) position the supporting projection 37 abuts on an abutment surface located in a step-shaped recess 42 defined on the rear side of the attachment member 20. Receiving bores 38 and 43 are respectively formed in the supporting projection 37 and on the bottom of the step-shaped recess 42. Locking screws 44 can be screwed into the bores 38,43 in order to secure the intermediate part 30 and prevent unintentional pivoting-back in the extraction position. Because the forces arising in mining operation press the end face 34 of pressure plate 33 against the abutment surface 28, the locking screws 44 need not receive any transverse forces.

[0028] In order to be able to easily reach the locking screws 44, the pressure plate 33 is provided with a recess 39. The pivot axis formed by the pin projections and pin receptacles 35 and the pivot axis formed by the pivot bolts 45 lie parallel to one another and parallel to the groove guides 26.

[0029] As shown in Fig. 6, the front side of the supporting body 41 of the ancillary cutting bit columns 21 and the intermediate part 30 are each provided with hook

projections 48, 49, which lie opposite one another in the mining position and are surrounded by a chain link, which permits a limited pivoting of the supporting body 41 of the ancillary cutting bit columns 21 relative to the intermediate part 30, which is fastened on the attachment member 20 so as to prevent movement, and is secured against falling out using a cotter pin or the like.

Industrial Applicability

[0030] The roof cutting bit carrier may be fastened to the base in different ways. Under certain circumstances, the roof cutting bit carrier may also allow itself to be moved into a position in which the ancillary cutting bit columns may remain on the intermediate parts, if these are pivoted out for an installation/removal of the cutting bit carrier. The same could also be achieved through a different design of the supporting body for the ancillary cutting bit columns.

[0031] In some embodiments, instead of pin projections, pivot bolts may also be used, which could be secured in various ways. Different mining lines between the extraction cutting bits on the cutting bit carriers and the extraction cutting bits on the ancillary cutting bit carriers could be achieved through the choice of different intermediate parts.

[0032] If one of the cutting bit carriers which may be pivotably mounted on the base body may be replaced, the attachment member can remain on the base body, despite the ancillary cutting bit column still being positioned in a cantilevered forward manner, and it is only required to fold or pivot the intermediate part back into an installation position, optionally after removing the ancillary cutting bit column and releasing the associated locking means. In the installation position it may be possible to lift off the cutting bit carrier from the base body without the intermediate part disturbing the installation or removal of the cutting bit carrier.

[0033] For extraction work using the mining plow, it may be advantageous if the ancillary cutting bit columns may be fastened to the intermediate part so as to be partially-pivotable about an axis, so that when the plow may travel in the reverse direction they may swing into a position in which they may have no contact with the face. In some embodiments, the ancillary cutting bit columns may be pivotably fastened to the intermediate part about pin stubs, which may be integrally formed on the ancillary cutting bit column and which may be only insertable into edge-open pin receptacles when the ancillary cutting bit column is located at a defined pivot position relative to the intermediate part. By pivoting the ancillary cutting bit column to the extraction position, it can then be achieved that all forces may be absorbed in an interference-fit manner between the intermediate part and the ancillary cutting bit column.

[0034] In order to prevent a moving away from this position with a limited degree of freedom, in some embodiments the ancillary cutting bit column and the intermediate part may be provided with hook projections, which may lie opposite one another in the extraction position. In particular with corresponding hook projections, but also with other designs, the ancillary cutting bit columns may in each case be locked against pivoting back into the pivot position for uninstalling using a chain-link-like securing element on the associated intermediate part, wherein the eyelet length of the chain link may determine the degree of freedom of pivoting.

[0035] The attachment member may be provided with latch pins on its underside, which in the installation state may sit in latch recesses on the plow base, and/or the attachment member may be clampable or clamped onto the plow base using wedge-jaws that may be movable using turnbuckles.

[0036] In some embodiments, the intermediate part and the ancillary cutting bit column may be movable about mutually parallel axes.

[0037] Further, the fastening surface on the plow base may be laterally bounded by groove guides, and the attachment member may be provided with groove guides on its front surface, wherein the ancillary cutting bit columns may be disposed on both sides of the groove guides. The axes may then preferably extend parallel to the grooves on the fastening surface for the roof cutting bit carrier.

[0038] In some embodiments, since significant forces act on the ancillary cutting bit columns and the intermediate part during extraction travel (movement), the rear side of the intermediate part may be provided with a pressure plate, which may abut on the attachment member when the ancillary cutting bit column may be in the extraction position. In some embodiments, in view of force dissipation, it may be preferable that an end face of the pressure plate may abut on an abutment surface on the attachment member in the extraction position in the direction of travel. For this purpose the end face and the abutment surface may extend obliquely to the direction of travel, in order to achieve as large as possible a contact surface between the parts with a small width of the pressure plate.

[0039] In some embodiments, in order to be able to install locking means even when subjected to confined space conditions, the pressure plate may be provided with an opening. Receiving bores for locking screws may be respectively provided in the attachment member and in the intermediate part, with which the attachment member may be fixable to prevent folding back when disposed in the extraction position. In some embodiments, the receiving bores may be formed in the intermediate part in the region of the opening.

[0040] The height adjustment and support of the roof cutting bit carrier could also be effected in a way other than via groove guides.

[0041] Although the preferred embodiments of this invention have been described herein, improvements and modifications may be incorporated without departing from the scope of the following claims.

Claims

1. A mining plow (1), in particular a coal mining plow, comprising:

   a plow base (4) constructed to be guided on a reversible conveyor, the plow base (4) having a pivot pin (8) on an inclined supporting surface (9) for pivotably supporting a cutting bit carrier (7) in each direction of plow travel;
   two cutting bit carriers (7) pivotably supported on a respective pivot pin (8), including extraction cutting bits (11), and being pivotable in a travel-direction-dependent manner;
   a roof cutting bit carrier (12) attached to the plow base (4) in a height-adjustable manner, and including roof cutting bit columns (13), the roof cutting bit carrier (12) being removably anchorable at different heights to an attachment surface formed between the inclined supporting surfaces (9); and
   an attachment member (20) mountable on the plow base (4) and elongating the attachment surface for the-roof cutting bit carrier (12) to increase the working height of the mining plow (1), the attachment member (20) including ancillary cutting bit columns (21) provided with extraction cutting bits (22) and attached to the attachment member (20), wherein
   each ancillary cutting bit column (21) is respectively positioned in its extraction position for a plow trip above a cutting bit carrier (7), and
   an intermediate member (30) is disposed between the attachment member (20) and each ancillary cutting bit column (21) **characterised by** the intermediate member (30) being foldably attached to the attachment member (20) and may be folded away into an installation position, in which the corresponding cutting bit carrier (7) is removable while the attachment member (20) and the intermediate part (30) remain installed.

2. The mining plow (1) according to claim 1, wherein the ancillary cutting bit columns (21) are attached to the intermediate parts (30) so as to be partially pivotable about an axis.

3. The mining plow (1) according to claim 2, wherein the ancillary cutting bit columns (21) are attached to the intermediate parts (30) so as to be pivotable about pin stubs, which are integrally formed on a supporting body (41) of the ancillary cutting bit column (21) and are insertable into edge-open pin receptacles on the intermediate part (30) in a defined pivot position between the intermediate parts (30) and the ancillary cutting bit column (21).

4. The mining plow (1) according to claim 3, wherein the ancillary cutting bit columns (21) and the intermediate parts (30) are provided with hook projections (48, 49), which lie opposite one another in the extraction position.

5. The mining plow (1) according to any one of claims 3 or 4, wherein each ancillary cutting bit column (21) is lockable to prevent pivoting back into a pivot position for removal by a chain-link-like securing element (47) disposed on the associated intermediate part (30).

6. The mining plow (1) according to any one of claims 1 or 5, wherein:

   latch pins (23) are provided on an underside of the attachment member (20), and in the installation state the latch pins (23) sit in latch recesses on the plow base (4), and/or
   the attachment member (20) is clampable onto the plow base (4) using wedge-jaws (24) that are movable using turnbuckles.

7. The mining plow (1) according to any one of claims 1 to 6, wherein the intermediate part (30) and the ancillary cutting bit column (21) are movable about mutually parallel axes.

8. The mining plow (1) according to any one of claims 1 to 7, wherein:

   the attachment surface on the plow base (4) is laterally bounded by groove guides,
   a front surface of the attachment member (20) is provided with groove guides (26), and
   the ancillary cutting bit columns (21) are respectively disposed on both sides of the groove guides (26).

9. The mining plow (1) according to any claim 7 or 8, wherein the axes extend parallel to the grooves on the fastening surface for the roof cutting bit carrier (12).

10. The mining plow (1) according to any one of claims 1 to 9, wherein a rear side of the intermediate part (30) is provided with a pressure plate (33), which abuts on the attachment member (20) when the ancillary cutting bit column (21) is disposed in the extraction position.

11. The mining plow (1) according to claim 10, wherein:

    an end face (34) of the pressure plate (33) abuts on an abutment surface (28) on the attachment member (20) in the direction of travel, and
    the end face (34) and the abutment surface (28) preferably extend obliquely to the direction of

travel.

12. The mining plow (1) according to any one of claims 10 or 11, wherein the pressure plate (33) is provided with an opening (39).

13. The mining plow (1) according to any one of claims 1 to 12, wherein:

receiving bores are respectively defined in the attachment member (20) and in the intermediate part (30), and
locking screws extend through the receiving bores to fix the intermediate part (30) in the extraction position and prevent folding back.

14. The mining plow (1) according to any one of claims 12 or 13, wherein the receiving bores are formed in the intermediate part (30) in the region of the opening (39).

Patentansprüche

1. Gewinnungshobel (1), insbesondere Kohlegewinnungshobel, umfassend:

eine Hobelbasis (4), die ausgelegt ist, auf einem reversiblen Förderer geführt zu werden, wobei die Hobelbasis (4) einen Schwenkstift (8) auf einer geneigten Stützfläche (9) aufweist, um einen Meißelträger (7) in jeder Richtung der Hobelbewegung schwenkbar zu lagern;
zwei schwenkbar an einem jeweiligen Schwenkstift (8) gelagerte Meißelträger (7), die Extraktionsmeißel (11) umfassen und in einer von der Bewegungsrichtung abhängigen Weise schwenkbar sind;
einen Firstmeißelträger (12), der an der Hobelbasis (4) in einer höhenverstellbaren Weise angebracht ist und Firstmeißelsäulen (13) umfasst, wobei der Firstmeißelträger (12) lösbar in verschiedenen Höhen an einer Befestigungsfläche verankerbar ist, die zwischen den geneigten Stützflächen (9) gebildet ist; und
ein Befestigungsglied (20), das an der Hobelbasis (4) montierbar ist und die Befestigungsfläche für den Firstmeißelträger (12) verlängert, um die Arbeitshöhe des Gewinnungshobels (1) zu erhöhen, wobei das Befestigungsglied (20) Nebenmeißelsäulen (21) umfasst, die mit Extraktionsmeißeln (22) versehen und am Befestigungsglied (20) angebracht sind, wobei
jede Nebenmeißelsäule (21) jeweils in ihrer Extraktionsposition für eine Hobeltour über einem Meißelträger (7) positioniert ist, und
ein Zwischenglied (30) zwischen dem Befestigungsglied (20) und jeder Nebenmeißelsäule (21) angeordnet ist, **dadurch gekennzeichnet, dass** das Zwischenglied klappbar am Befestigungsglied (20) angebracht ist und in eine Installationsposition weggeklappt werden kann, in welcher der entsprechende Meißelträger (7) lösbar ist, während das Befestigungsglied (20) und der Zwischenteil (30) installiert bleiben.

2. Gewinnungshobel (1) nach Anspruch 1, wobei die Nebenmeißelsäulen (21) an den Zwischenteilen (30) so angebracht sind, dass sie teilweise rund um eine Achse schwenkbar sind.

3. Gewinnungshobel (1) nach Anspruch 2, wobei die Nebenmeißelsäulen (21) an den Zwischenteilen (30) so angebracht sind, dass sie rund um Schwenkzapfen schwenkbar sind, die einstückig auf einem Stützkörper (41) der Nebenmeißelsäule (21) gebildet und in randoffene Stiftaufnehmer auf dem Zwischenteil (30) in einer definierten Schwenkposition zwischen den Zwischenteilen (30) und den Nebenmeißelsäulen (21) einsetzbar sind.

4. Gewinnungshobel (1) nach Anspruch 3, wobei die Nebenmeißelsäulen (21) und die Zwischenteile (30) mit Hakenfortsätzen (48, 49) versehen sind, die in der Extraktionsposition einander gegenüberliegen.

5. Gewinnungshobel (1) nach einem der Ansprüche 3 oder 4, wobei jede Nebenmeißelsäule (21) verriegelbar ist, um ein Zurückschwenken in eine Schwenkposition zur Entfernung durch ein Sicherungselement (47) ähnlich einer Kettenverbindung zu verhindern, das auf dem assoziierten Zwischenteil (30) angeordnet ist.

6. Gewinnungshobel (1) nach einem der Ansprüche 1 oder 5, wobei:

Verriegungsstifte (23) auf einer Unterseite des Befestigungsglieds (20) bereitgestellt sind und im Installationszustand die Verriegelungsstifte (23) in Verriegelungsvertiefungen auf der Hobelbasis (4) sitzen, und/oder
das Verriegelungsglied (20) auf die Hobelbasis (4) unter Verwendung von Keilbacken (24) klemmbar ist, die unter Verwendung von Spannern bewegbar sind.

7. Gewinnungshobel (1) nach einem der Ansprüche 1 bis 6, wobei der Zwischenteil (30) und die Nebenmeißelsäule (21) rund um zueinander parallele Achsen bewegbar sind.

8. Gewinnungshobel (1) nach einem der Ansprüche 1 bis 7, wobei:

die Befestigungsfläche auf der Hobelbasis (4)

lateral durch Nutführungen begrenzt ist,
eine Vorderfläche des Befestigungsglieds (20) mit Nutführungen (26) versehen ist, und
die Nebenmeißelsäulen (21) jeweils auf beiden Seiten der Nutführungen (26) angeordnet sind.

9. Gewinnungshobel (1) nach einem der Ansprüche 7 oder 8, wobei sich die Achsen parallel zu den Nuten auf der Befestigungsfläche für den Firstmeißelträger (12) erstrecken.

10. Gewinnungshobel (1) nach einem der Ansprüche 1 bis 9, wobei eine Rückseite des Zwischenteils (30) mit einer Druckplatte (33) versehen ist, die am Befestigungsglied (20) anliegt, wenn die Nebenmeißelsäule (21) in der Extraktionsposition angeordnet ist.

11. Gewinnungshobel (1) nach Anspruch 10, wobei:

eine Endfläche (34) der Druckplatte (33) an einer Anlagefläche (28) auf dem Befestigungsglied (20) in der Bewegungsrichtung anliegt, und sich die Endfläche (34) und die Anlagefläche (28) vorzugsweise schräg zur Bewegungsrichtung erstrecken.

12. Gewinnungshobel (1) nach einem der Ansprüche 10 oder 11, wobei die Druckplatte (33) mit einer Öffnung (39) versehen ist.

13. Gewinnungshobel (1) nach einem der Ansprüche 1 bis 12, wobei:

Aufnahmebohrungen jeweils im Befestigungsglied (20) und im Zwischenteil (30) definiert sind, und
sich Verriegelungsschrauben durch die Aufnahmebohrungen erstrecken, um den Zwischenteil (30) in der Extraktionsposition zu fixieren und ein Rückklappen zu verhindern.

14. Gewinnungshobel (1) nach einem der Ansprüche 12 oder 13, wobei die Aufnahmebohrungen im Zwischenteil (30) im Bereich der Öffnung (39) gebildet sind.

Revendications

1. Rabot d'abattage (1), en particulier rabot d'abattage de charbon, comprenant :

une base de rabot (4) conçue pour être guidée sur un transporteur réversible, la base de rabot (4) ayant une broche pivot (8) sur une surface de support inclinée (9) pour supporter à pivotement un support de mèche coupante (7) dans chaque direction de déplacement du rabot ;
deux supports de mèches coupantes (7) supportées à pivotement sur une broche pivot respective (8), comprenant des mèches coupantes d'extraction (11) et pouvant pivoter de manière dépendant de la direction de déplacement ;
un support de mèches coupantes de toit (12) fixé à la base de rabot (4) de manière ajustable en hauteur et comprenant des colonnes de mèches coupantes de toit (13), le support de mèches coupantes de toit (12) pouvant être ancré de manière amovible à différentes hauteurs à une surface de fixation formée entre les surfaces de support inclinées (9) ; et
un élément de fixation (20) montable sur la base de rabot (4) et allongeant la surface de fixation pour le support de mèches coupantes de toit (12) afin d'augmenter la hauteur de travail du rabot d'abattage (1), l'élément de fixation (20) comprenant des colonnes de mèches coupantes auxiliaires (21) pourvues de mèches coupantes d'extraction (22) et fixées à l'élément de fixation (20), dans lequel :

chaque colonne de mèches coupantes auxiliaires (22) est respectivement positionnée dans la position d'extraction pour un déplacement du rabot au-dessus d'un support de mèche de coupe (7) et
un élément intermédiaire (30) est disposé entre l'élément de fixation (20) et chaque colonne de mèches de coupe auxiliaires (21), **caractérisé en ce que** l'élément intermédiaire (30) est fixé de manière repliable à l'élément de fixation (20) et peut être déplié dans une position d'installation, dans laquelle le support de mèche coupante correspondant (7) peut être retiré tandis que l'élément de fixation (20) et la partie intermédiaire (30) restent installés.

2. Rabat d'abattage (1) selon la revendication 1, dans lequel les colonnes de mèches coupantes auxiliaires (21) sont fixées aux parties intermédiaires (30) de manière à pouvoir pivoter partiellement autour d'un axe.

3. Rabat d'abattage (1) selon la revendication 2, dans lequel les colonnes de mèches coupantes auxiliaires (21) sont fixées aux parties intermédiaires (30) de manière à pivoter autour de bouts de broche qui sont formés d'un seul tenant sur un corps de support (41) de la colonne de mèches coupantes auxiliaires (21) et peuvent être inséré dans des réceptacles de broche à bord ouvert sur la partie intermédiaire (30) dans une position de pivotement définie entre les parties intermédiaires (30) et la colonne de mèches coupantes auxiliaires (21).

4. Rabat d'abattage (1) selon la revendication 3, dans lequel les colonnes de mèches coupantes auxiliaires (21) et les parties intermédiaires (30) sont pourvues de saillies à crochet (48, 49) qui sont situées en regard l'une de l'autre dans la position d'extraction.

5. Rabat d'abattage (1) selon l'une quelconque des revendications 3 ou 4, dans lequel chaque colonne de mèches coupantes auxiliaires (21) peut être verrouillée pour empêcher le re-pivotement dans une position pivot de retrait par un élément de fixation (47) du type à maillons de chaîne disposé sur la partie intermédiaire associée (30).

6. Rabat d'abattage (1) selon l'une quelconque des revendications 1 ou 5, dans lequel :

   des broches de verrouillage (23) sont prévues sur la partie inférieure de l'élément de fixation (20) et, à l'état installé, les broches de verrouillage (23) sont disposées dans des cavités de verrouillage sur la base de rabot (4) et/ou
   l'élément de fixation (20) peut être bloqué sur la base de rabot (4) en utilisant des mors de calage (24) qui sont mobiles en utilisant des manchons de serrage.

7. Rabat d'abattage (1) selon l'une quelconque des revendications 1 à 6, dans lequel la partie intermédiaire (30) et la colonne de mèches coupantes auxiliaires (21) sont mobiles autour d'axes mutuellement parallèles.

8. Rabat d'abattage (1) selon l'une quelconque des revendications 1 à 7, dans lequel :

   la surface de fixation sur la base de rabot (4) est délimitée latéralement par des guides-rainures, une surface avant de l'élément de fixation (20) est pourvue de guides-rainures (26) et
   les colonnes de mèches coupantes auxiliaires (21) sont respectivement disposées des deux côtés des guides-rainures (26).

9. Rabat d'abattage (1) selon l'une quelconque des revendications 7 ou 8, dans lequel les axes s'étendent parallèlement aux rainures sur la surface de fixation pour le support de mèches coupantes de toit (12).

10. Rabat d'abattage (1) selon l'une quelconque des revendications 1 à 9, dans lequel un côté arrière de la partie intermédiaire (30) est pourvue d'une plaque de pression (33) qui s'appuie sur l'élément de fixation (20) lorsque la colonne de mèches coupantes auxiliaires (21) est disposée dans la position d'extraction.

11. Rabot d'abattage (1) selon la revendication 10, dans lequel :

   une face d'extrémité (34) de la plaque de pression (33) s'appuie sur une surface de butée (28) sur l'élément de fixation (20) dans la direction de déplacement et
   la face d'extrémité (34) et la surface de butée (28) s'étendent de préférence en oblique par apport à la direction de déplacement.

12. Rabat d'abattage (1) selon l'une quelconque des revendications 10 ou 11, dans lequel la plaque de pression (33) est pourvue d'une ouverture (39).

13. Rabat d'abattage (1) selon l'une quelconque des revendications 1 à 12, dans lequel :

   des alésages de réception sont respectivement définis dans l'élément de fixation (20) et la partie intermédiaire (30) et
   des vis de blocage s'étendent à travers les alésages de réception pour fixer la partie intermédiaire (30) en position d'extraction et empêcher un repli en arrière.

14. Rabat d'abattage (1) selon l'une quelconque des revendications 12 ou 13, dans lequel les alésages de réception sont formés dans la partie intermédiaire (30) de la région de l'ouverture (39) .

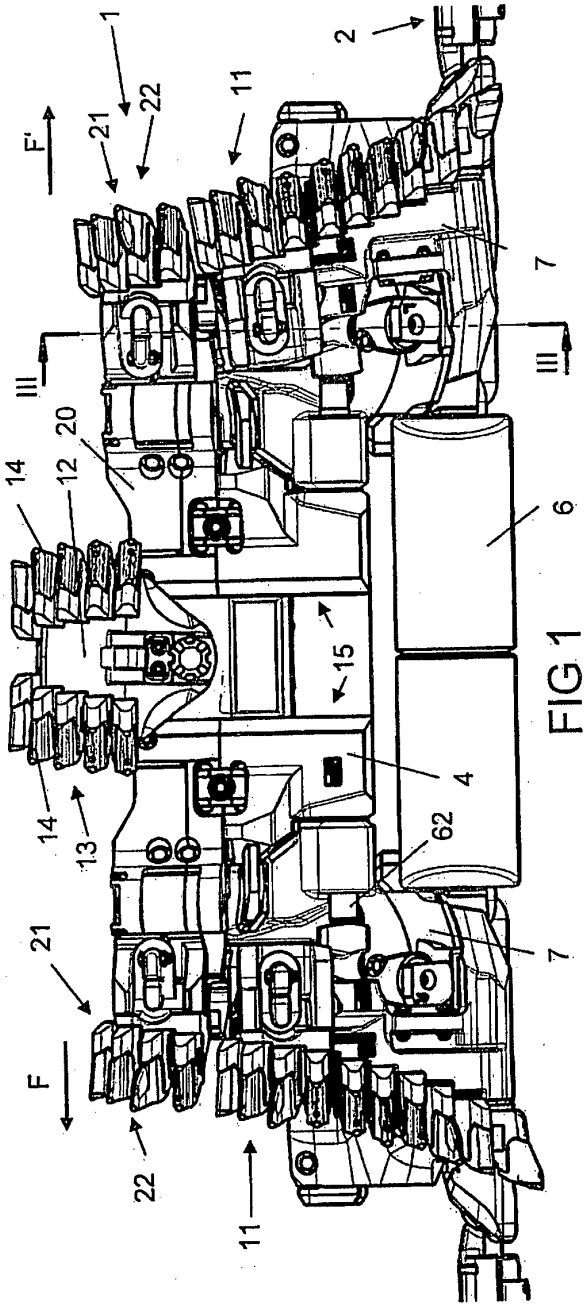


FIG 1

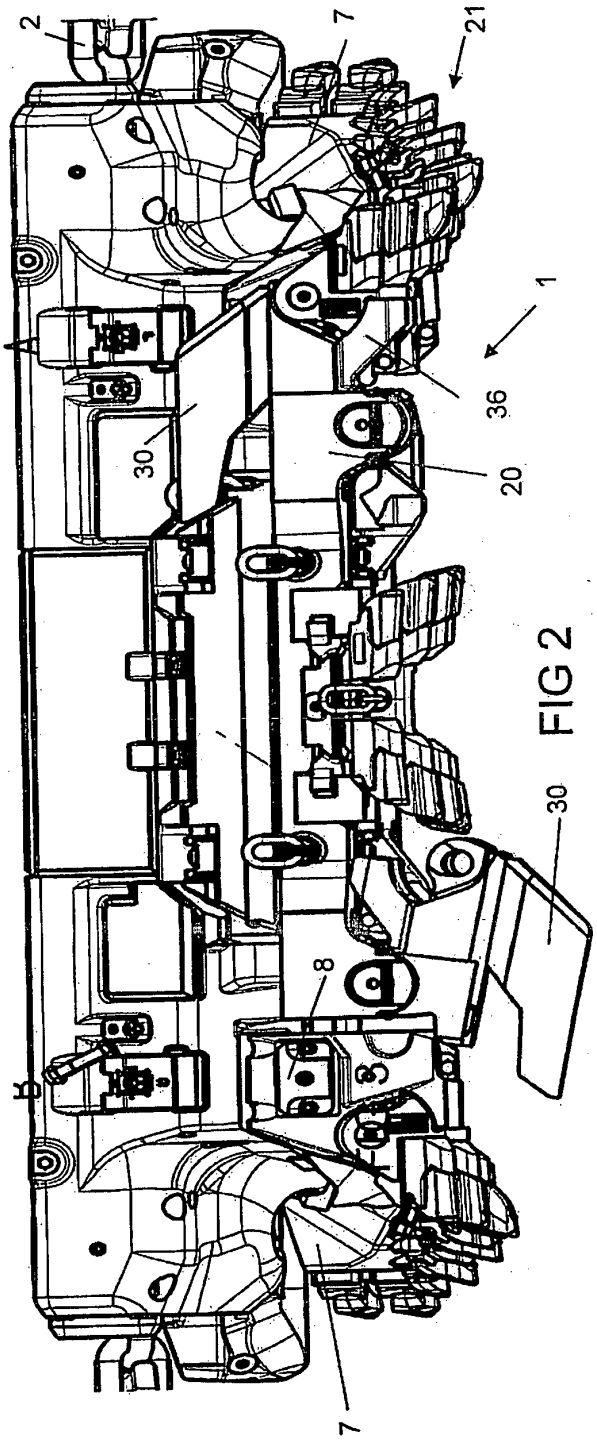


FIG 2

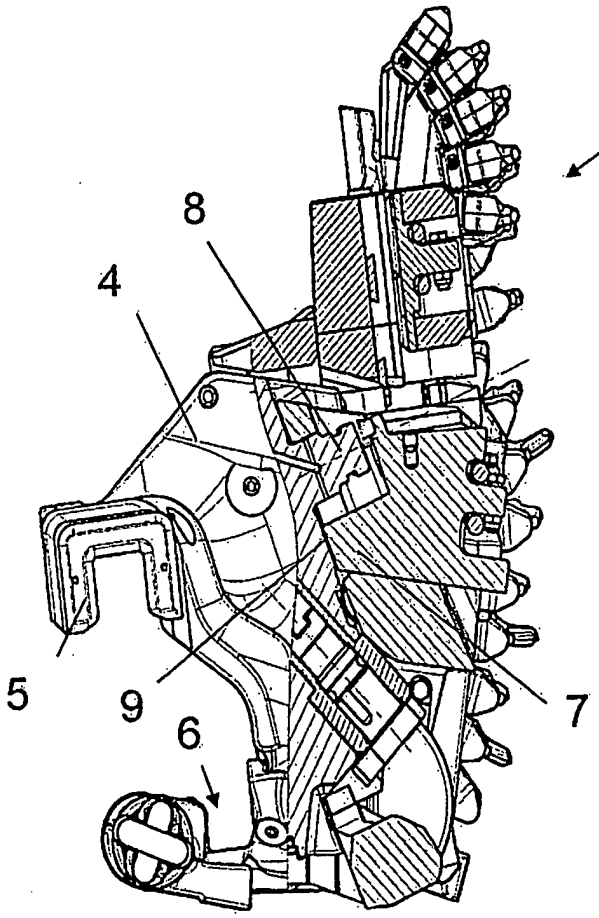


FIG 3

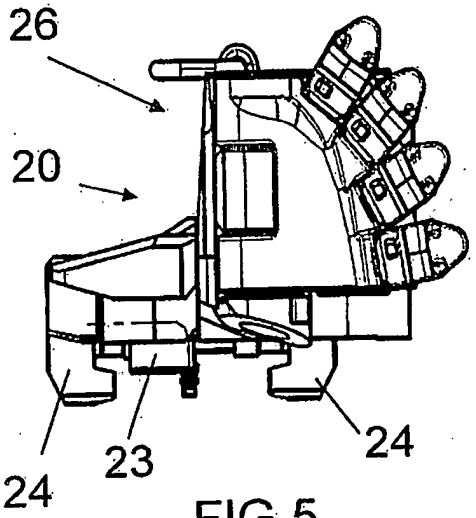


FIG 5

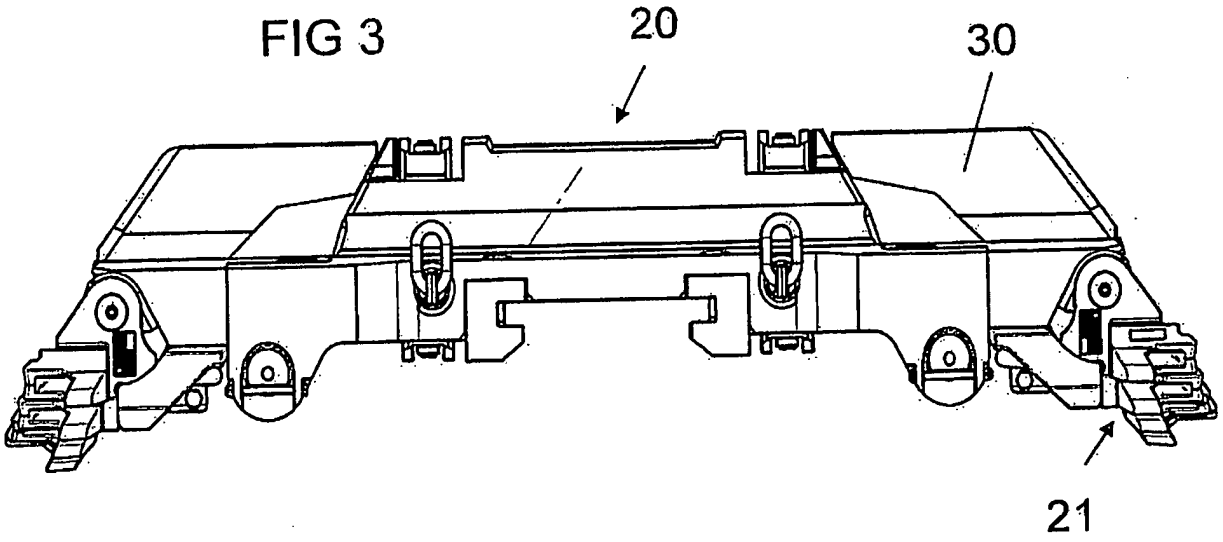


FIG 4

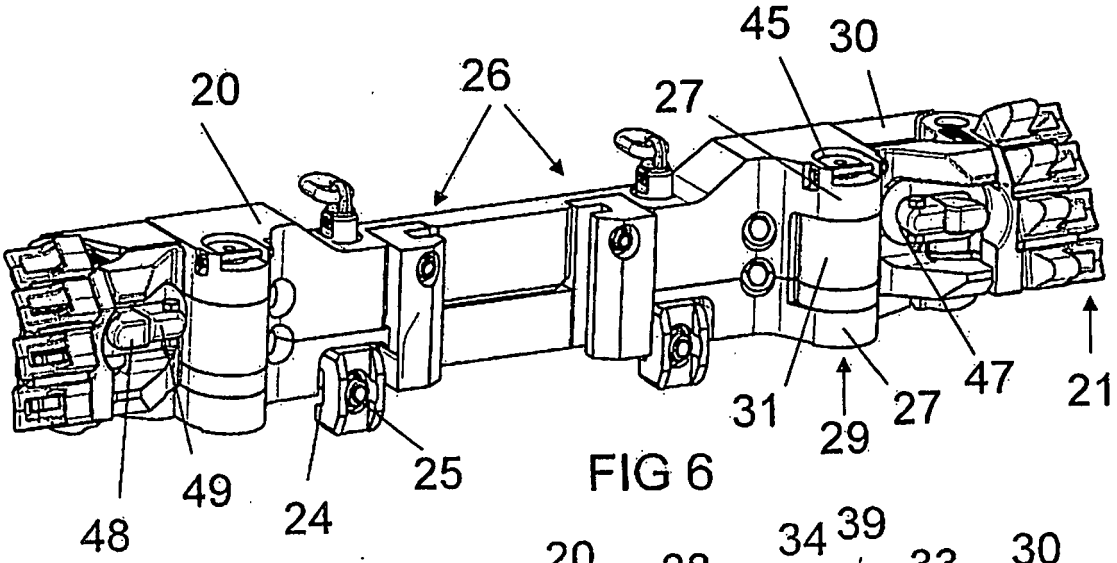


FIG 6

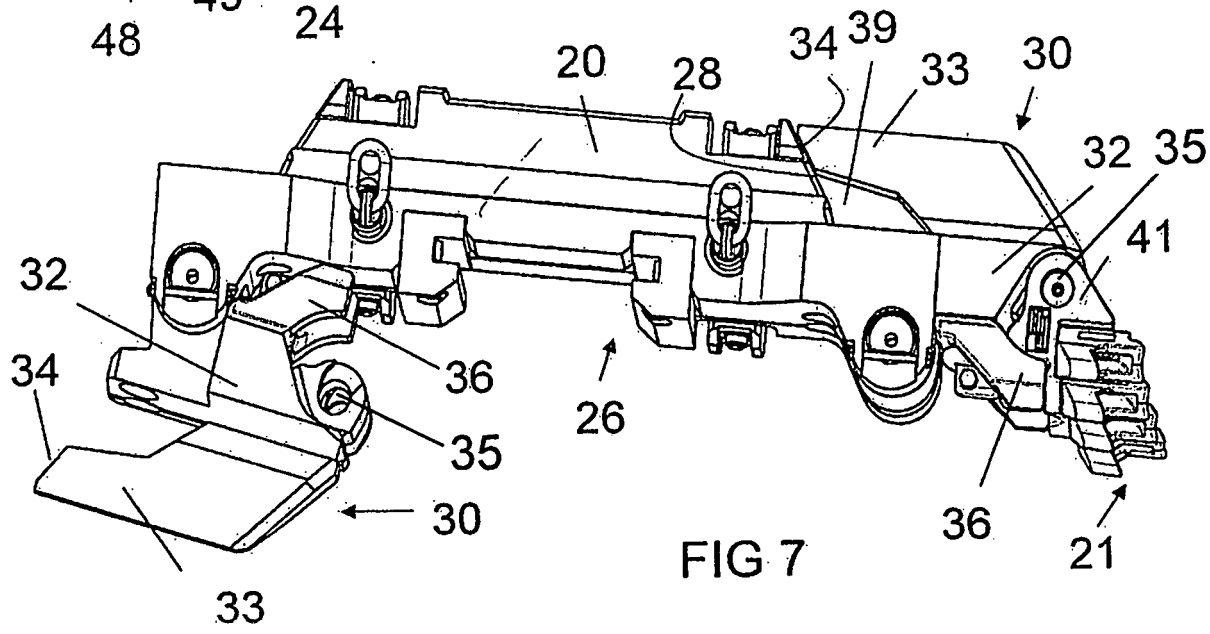


FIG 7

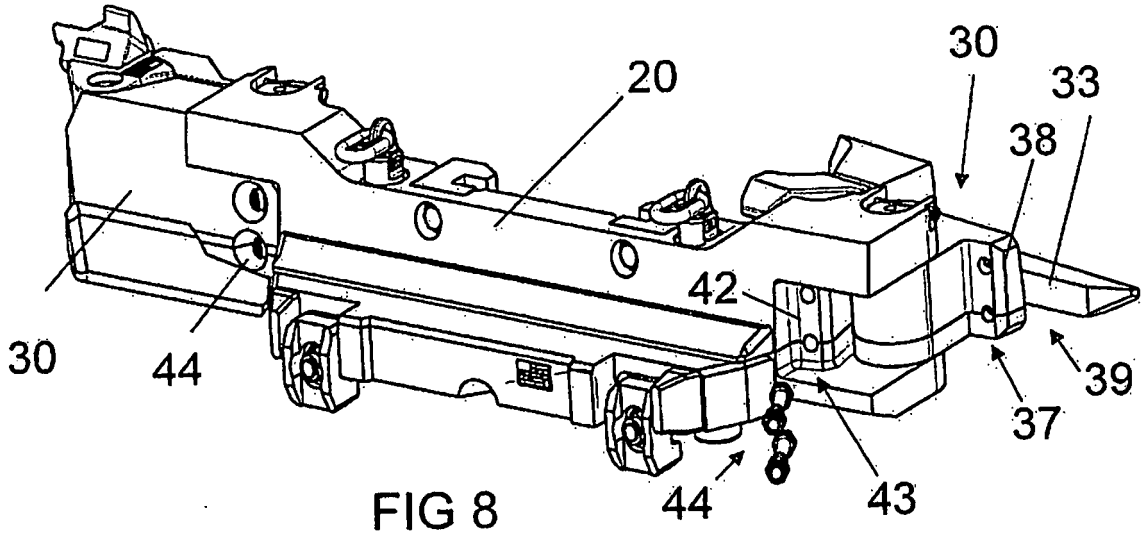


FIG 8

REFERENCES CITED IN THE DESCRIPTION

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