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(54) **DEVICE COMPRISING A MULTIFUNCTIONAL BASKET AND A CONNECTING PIECE**

VORRICHTUNG UMFASSEND EINEN MULTIFUNKTIONSKORB UND EIN VERBINDUNGSSTÜCK
DISPOSITIF COMPRENANT UNE NACELLE MULTIFONCTION ET UNE PIÈCE DU CONNEXION

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Description

[0001] The present invention relates to a device for carrying out operations at locations difficult to access, such as at great heights, comprising a basket and a connecting piece.

[0002] Such baskets are generally known and are for instance used in aerial devices, telescopic handlers, cranes, etc. A drawback of the known baskets is that they are generally quite small and that the permitted load and the number of persons allowed in the basket are generally relatively low. European Patent Application EP1775255 discloses an extendible hoist platform, whereas United States Patent Application Publication US 2002/0144862 discloses apparatus for monitoring loading of a lift.

[0003] The invention has for its object to propose a device with improved properties according to claim 1.

[0004] The invention is distinguished for this purpose in that the basket comprises a first platform with first railing structures, at least one second platform with second railing structures and adjustable connecting means between the first platform and each second platform, this such that each second platform forms an extension of the first platform.

[0005] A multifunctional basket is in this way obtained with an adjustable width.

[0006] The term "adjustable connecting means" must be interpreted broadly in the sense that the overall width of the basket can for instance be adjustable in stepwise or continuous manner, or that the width can for instance have only two values. Telescopic connecting means can for instance thus be provided which allow a large number of variable widths. According to another embodiment however, hinges can also be provided between the first platform and each second platform, wherein each second platform is movable between a folded-in and a folded-out position, such that two or more different overall widths are possible in accordance with the number of second platforms.

[0007] The dimensions of the basket are preferably further chosen such that the basket is easily transportable in the position with minimal width.

[0008] According to an embodiment, the at least one second platform consists of two side platforms on either end of the first platform. The first platform preferably has an elongate form with a length greater than 5 metres, still more preferably greater than 6 metres and for instance about 7 metres. The side platforms preferably have a length roughly equal to half the length of the first platform or slightly smaller than said half.

[0009] According to yet another advantageous embodiment, the first elongate platform comprises a first railing structure on each longitudinal side of the platform. Each first railing structure is preferably provided with a plurality of vertical uprights, for instance at least five uprights, and a plurality of horizontal girders. Diagonal elements are preferably further provided between adjacent vertical uprights to enable better take-up and transfer of loads on

the side platforms.

[0010] According to another aspect the invention relates to a connecting piece for pivotally connecting a loadable platform to a machine, preferably for connecting a basket to a device for carrying out operations at locations difficult to access, comprising:

- a bearing construction part adapted to exhibit bending when the platform is loaded, and
- measuring means for measuring the magnitude of this bending. Such measuring means allow simple detection of an overload of the platform.

[0011] The measuring means are preferably adapted to measure the bending in different directions. This has the advantage that an overload in a determined direction can be detected.

[0012] Advantageous embodiments of the connecting piece can for instance have one or more of the following properties:

- the bearing construction part is adapted to exhibit bending under high loads which is clearly measurable by the measuring means;
- the bearing construction part is a profile piece, a hollow or solid rod, or any other element which can exhibit measurable bending;
- the bearing construction part is mounted substantially parallel to the pivot shaft of the connecting piece;
- the bearing construction part has a rectangular cross-section;
- the measuring means comprise a first set of measuring means on a first side, a second set of measuring means on a second, opposite side and a third set of measuring means on a front side between the first and second sides, this such that loads are measurable in different directions;
- the measuring means comprise at least one strain gauge;
- the measuring means are coupled to warning means for warning the user in the case of overload;
- the bearing construction part can be connected to the platform using clamping means.

[0013] An embodiment relates to a connecting piece for pivotally connecting a loadable platform to a machine, preferably for connecting a basket to a device for carrying out operations at locations difficult to access, comprising:

- a first tubular rigid body intended for connection to the platform, wherein the shaft of the first tubular rigid body in the mounted position is substantially parallel to the platform,
- a second tubular rigid body intended for connection to the machine, wherein the shaft of the second tubular rigid body in the mounted position is substantially parallel to the platform,

- a pivot shaft between the first and the second tubular bodies substantially perpendicular to the shafts of the first and second tubular bodies.

[0014] Such a construction has the advantage of being very rigid, simple and compact compared to existing connecting pieces.

[0015] According to a preferred embodiment, cylinders for actuating the pivoting are mounted in the second tubular body. The second tubular body can further be provided with a support platform for an auxiliary tool.

[0016] The details described hereinbelow in the embodiment variants shown in the figures can be added individually or in combination to any of the above described embodiments of the invention.

[0017] According to a particularly advantageous embodiment, the connecting piece for pivotally connecting a loadable platform to a machine comprises:

- a bearing construction part adapted to exhibit bending when the platform is loaded, and
- measuring means for measuring the magnitude of this bending in three directions, such that loads are measurable in different directions.

[0018] These features can advantageously be combined with the following measures:

- a first tubular rigid body intended for connection to the platform, wherein the shaft of the first tubular rigid body in the mounted position is substantially parallel to the platform,
- a second tubular rigid body intended for connection to the machine, wherein the shaft of the second tubular rigid body in the mounted position is substantially parallel to the platform,
- a pivot shaft between the first and the second tubular bodies substantially perpendicular to the shafts of the first and second tubular bodies.

[0019] The present invention will be further elucidated on the basis of a number of non-limitative exemplary embodiments with reference to the accompanying drawings, in which:

Figure 1 is a perspective front view of a first embodiment of a basket according to the invention;

Figure 2 is a view on a larger scale of the left-hand side of the embodiment of figure 1;

Figure 3 is a perspective rear view of the embodiment of figure 1;

Figure 4 is a detail view of the connection between the basket and the operating arm in the embodiment of figure 3;

Figures 5A-C illustrate schematically a front view of a second embodiment of a basket according to the invention in respectively a folded-in position, an intermediate position and a folded-out position;

Figure 6 illustrates a possible embodiment of the rod 25 of figure 4 on which strain gauges are mounted; Figures 7A and 7B are respective perspective bottom and top views of a bottom part of a third embodiment of a basket according to the invention;

Figure 8A shows a cross-section through the centre of an embodiment of the central platform of a basket according to the invention; and

Figures 8B and C show respective longitudinal sections along lines B-B and C-C in figure 8A; and Figures 9A-D show respectively a front, top, first side and second side view of an embodiment of a side platform of a basket according to the invention.

[0020] Figure 1 illustrates a connecting piece 2 which can be embodied in random manner and to which is attached a basket 1 according to an embodiment of the invention. Connecting piece 2 is intended for connection to an optionally mobile device, such as for instance an aerial device, a telescopic handler, a device with a jib, a forklift truck etc. In the shown embodiment connecting piece 2 is provided with a platform on which an auxiliary crane 20 is mounted, although the skilled person will appreciate that this is an option which can be omitted. Depending on the machine with which the basket is combined, one or more modified connecting pieces will typically be provided. In the case of a scissor lift the basket will typically be connected on its underside to the scissor arm. An example of a telescopic handler or crane with which the basket according to the invention can be combined is described in Belgian patent BE 1014361 in the name of applicant. An example of a telescopic boom with which the basket can be combined is described in the Belgian patent BE 1012862, likewise in the name of applicant. The basket can further also be used in combination with a crane.

[0021] Basket 1 is constructed according to a possible embodiment of the invention. Basket 1 comprises an elongate central work platform 3 and two side platforms 4, 4' extending on either end of elongate central platform 3 in line therewith.

[0022] Central platform 3 has a bottom 10 and two substantially parallel railing structures 5a, 5b. Each side platform 4 has a bottom 11, two parallel railing structures 6a, 6b and a closure 7 at the outer end furthest removed from the central platform. Closure 7 can for instance be embodied as a double-security door, such that two operations are necessary to open such a door. The door can for instance thus be connected hingedly on one side to railing structure 5a, and a spring bolt can for instance be provided on the other side between door and railing structure 5b, in combination with a hook/flange system, such that the spring bolt must be released on the one hand and the door must be lifted and opened on the other in order to open the door. The door can further be provided with a detection system which detects whether the door is open or closed. Loads can be loaded onto the work platform from the side in simple manner by providing such

doors.

[0023] At the outer end adjacent to bottom 10 of central platform 3 the bottom 11 is provided with anchoring points 8 for anchoring a load in the basket. Such anchoring points can of course also be provided at other locations.

[0024] The basket is preferably manufactured from very high-grade light materials, wherein specially rolled lightweight profiles with a high moment of inertia are for instance used, this such that the dead weight is very low in relation to the permitted load. The materials suitable for the basket are, among others, high-strength types of steel, aluminium, particularly the aluminium alloys typically used in aircraft, strong plastics, composite materials etc.

[0025] In the shown embodiment side platforms 4, 4' are mounted telescopically relative to central platform 3. The longitudinal sides of central platform 3 are more particularly provided with U-profiles 12a, 12b, in which sides 13a, 13b of a side platform 4 can be guided, see figure 2. These sides 13a, 13b are formed here as tubular profiles with a height adapted to that of the U-profiles.

[0026] The skilled person will appreciate that many variants are possible to obtain such a telescopic function, wherein it is for instance possible to envisage all manner of guide rails. According to another variant, side platforms 4, 4' can be connected in fold-out manner relative to central platform 3, wherein side platforms 4, 4' can for instance be folded out from a vertical position to a horizontal operating position.

[0027] According to yet another variant schematically illustrated in figures 5A-C, side platforms 104, 104' are movable from a folded-in position, in which the side platforms are situated on central work platform 103, to a folded-out position in which the side platforms lie in line with central work platform 103. In the shown embodiment a set of pivotally mounted support arms 105a, 105b; 105a', 105b' are provided for each side platform 104, 104' (only 105a and 105a' are shown in the figure, although arms 105b, 105b' are provided in similar manner on the other side of the side platforms). These support arms perform a circular sideward movement in order to move side platforms 104, 104' from the folded-in position to the folded-out position, see figures 5A-C.

[0028] In the shown embodiment bottom 10 of the central platform has a length l_c , for instance 7 metres, and a depth d , and the side platforms have a bottom 11 with a length l_z which is substantially equal to half the length l_c . In this way a basket with a variable length can be obtained, wherein the maximum length is equal to twice the length of the central platform minus the minimum overlap ($2 \cdot l_z$) between the central platform and the side platforms. In the case that the length l_c is 7 metres, the maximum length can for instance be 13 metres. The skilled person will however appreciate that the dimensions, and particularly the length and depth dimensions, can be adapted in accordance with the needs of the user and/or in accordance with the application.

[0029] The connection between the railing structures

of central platform 3 and side platforms 4, 4' typically takes place using an end of stroke safety 9a, 9b such as two hooks which mutually engage, optionally in combination with a locking or overlapping latches. The connection between bottoms 10, 11 can for instance take place in similar manner. According to a variant, side platforms 4, 4' can be locked in different, non-fully extended positions 3 relative to the central platform.

[0030] The underside of the bottom of central platform 3 can be further reinforced using stiffening ribs 15, 16, see figures 1 and 3. Depending on the length and depth of the platform, the desired strength etc., these can be arranged to greater or lesser extent in determined positions or according to a determined pattern, such as in a honeycomb structure, a diagonal structure, a lateral structure etc.

[0031] Figure 3 shows a rear view of the basket of figure 1. Particularly shown herein is connecting piece 2 between basket 1 and a random machine (not shown), this connecting piece being shown in further detail in figure 4.

[0032] In the shown embodiment the connection consists of a supporting tube construction 2 which allows pivoting of the basket through 180 degrees. According to a variant, a construction can be provided which allows pivoting of 0 to 360 degrees or 360 degree continuous pivoting. An overload detection system can further be built in, which is able to detect an overload in the different directions (frontal, left/right).

[0033] Railing structure 5b is reinforced with elements 17, 18, 19 on the side with supporting tube construction 2. A frame 21 and two mounting profiles 22, 23 are further provided for mounting of connecting piece 2. A rod 25 of rectangular cross-section is mounted between mounting profiles 22, 23 using upper (not shown) and lower clamping blocks 38, 39, between which respectively an upper and lower end of rod 25 is clampingly received.

[0034] In addition to a supporting function, rod 25 can also have an overload detection function in the shown embodiment. For this purpose rod 25 can be provided with one or more strain gauges, i.e. gauges whose resistance changes when they are deformed. When the rod bends as a result of loads in the basket, this bending can thus be measured. Holes with screw thread can be provided in rod 25 for mounting of the strain gauges. According to an advantageous embodiment as shown in figure 6, three strain gauges are mounted on rod 25:

- a first strain gauge 55 on a front side 51, mounted in holes 53a, 53b with bolts;
- a second strain gauge 54 on a right-hand side 50, mounted in holes 52a, 52b with bolts; and
- a third strain gauge (not visible in the figure) on the left-hand side opposite the right-hand side.

[0035] The bending of the rod can in this way be measured in different directions: frontal, left and right.

[0036] Welded onto rod 25 are two swivel mounts 31a,

31b, here in the form of horizontal flanges. Each swivel mount 31a, 31b is provided with a pivot shaft 32a, 32b extending mutually in line. Pivot shafts 32a, 32b are connected to a support tube 27 in which are mounted cylinders 29a, 29b for controlling the pivoting movement. Support tube 27 can be connected to a random machine by means of a connecting hook 35. The skilled person will however appreciate that another type of connecting means can also be used instead of a connecting hook. Support tube 27 is provided with recesses 36a, 36b (36b is not visible in figure 4, but lies opposite 36a), through which the respective cylinders 29a, 29b protrude outward. These recesses have dimensions adapted to the freedom of movement necessary for cylinders 29a, 29b.

[0037] A thick-walled tube 24 is further provided between the mounts, parallel to the pivot shafts, which tube 24 on the one hand strengthens the construction by forming a connecting piece between mounts 31a, 31b and on the other forms a push-off point for piston rods 33a, 33b of cylinders 29a, 29b. Tube 24 is provided for this purpose with fixing flanges 30 to which the outer ends of piston rods 33a, 33b are pivotally connected using vertical pins 34a, 34b. Note that piston rod 33b is drawn in the unconnected position.

[0038] In order to further strengthen the whole, a stiffening tube 26 is mounted, typically welded, between swivel mounts 31a, 31b. This stiffening tube 26 here has end flanges and is provided with holes 40, 41 to make the construction lighter.

[0039] Support tube 27 can further be provided with a mounting platform 28 for a foot 37 of a machine such as an auxiliary crane or a gallows.

[0040] Typical materials used for the supporting tube construction 2 are high-strength types of steel, structural steel, special steel and others.

[0041] A further developed embodiment of a basket according to the invention will now be described with reference to figures 7A-B, 8A-C and 9A-D. The basket comprises an elongate central work platform 203, of which a bottom view is shown in figure 7A and a top view in figure 7B. Central work platform 203 comprises a bottom plate 210. The underside of bottom plate 210 is strengthened using a number of strengthening plates directed substantially perpendicularly of the bottom plate, typically a number of first diagonal plates 261 and a number of second diagonal plates 262. The first and second diagonal plates 261, 262 are preferably placed at an angle relative to each other, preferably substantially a right angle. A series of U-profiles 263 can further be provided against the underside which are arranged in the width direction of bottom plate 210 at a pitch distance from each other. A first and a second diagonal plate 261, 262 are arranged between each pair of adjacent U-profiles 263. The longitudinal sides of central platform 203 are provided with U-profiles 212a, 212b, in which sides 213a, 213b of a side platform 204 can be guided, see below.

[0042] Central platform 203 further has two substantially parallel railing structures 205a, 205b, which are il-

lustrated in figures 8A-C. Central platform 203 is strengthened with a girder 218 on the longitudinal side where the connecting piece can be fixed. A scissor-like frame 221 with integral diagonal elements extending between two vertical uprights 270 is further provided substantially in the centre of railing structure 205b, on said longitudinal side. In the shown embodiment each railing structure 205a, 205b is provided with a plurality of vertical uprights 270 and frame 221 is arranged between the two most central uprights 270. Preferably further provided for each railing structure are two strengthening rods 219 extending diagonally from the top corners of frame 221 in the direction of the longitudinal side of bottom 210, away from the centre of the railing structure. Two fixing profiles 222, 223 for mounting connecting piece 2 can further be provided. The railing structure preferably also comprises a number of horizontal girders 271 extending at different heights along substantially the full length of central platform 203. Finally, it is recommended to provide additional diagonal elements (tie rods) 272 between two adjacent vertical uprights 270 in order to receive side platforms 204. Between the two most central uprights 270 two diagonally oriented tie rods 272 are preferably provided between the bottom and the highest horizontal girder. Preferably provided between each other pair of adjacent vertical uprights is one diagonal element 272 extending diagonally away from the centre of central platform 203.

[0043] The basket further comprises two side platforms 204 which extend on either end of elongate central platform 3, in line therewith. An embodiment of side platform 204 is illustrated in figures 9A-9D. Each side platform 204 can be mounted telescopically relative to central platform 203. Side platform 204 has a bottom 211, two parallel railing structures 206a, 206b and a closure (not shown) which can be similar to closure 7 described with reference to figures 1 and 2. The longitudinal lower sides 213a, 213b are for instance formed as tubular profiles with a height adapted to that of U-profiles 212a, 212b. Each railing structure 206a, 206b is provided with a plurality of vertical uprights 280 and a plurality of horizontal girders 281. One or more diagonal elements (tie rods) 282 are preferably further provided which extend diagonally from top to bottom away from central platform 203.

[0044] The choice of material for the different components of central platform 203 and side platforms 204 is preferably the same as described above for the embodiment of figures 1 and 2. The present invention is of course not limited to the above described exemplary embodiments, and it will be apparent to the person with ordinary skill in the art that many more variants and modifications can be envisaged which fall within the scope of the invention, this scope being defined solely by the following claims.

Claims

1. Device for carrying out operations at locations diffi-

cult to access, such as at great heights, comprising:

a basket comprising
a first platform with first railing structures,
at least one second platform with second railing structures, adjustable connecting means between the first platform and each second platform, this such that each second platform forms an extension of the first platform;
a connecting piece (2) for pivotally connecting the basket to a machine, said connecting piece comprising:

a bearing construction part (25) adapted to exhibit bending when the basket is loaded, and
measuring means (54, 55) adapted for measuring a magnitude of this bending by performing measurements at three different locations such that loads are measurable in different directions.

2. Device as claimed in claim 1, **characterized in that** the bearing construction part has a rectangular cross-section and that the measuring means comprise a first set of measuring means (54) on a first side (50), a second set of measuring means on a second, opposite side and a third set of measuring means (55) on a front side (51) between the first and second sides.
3. Device as claimed in claim 1 or 2, **characterized in that** the bearing construction part is a profile piece.
4. Device as claimed in any of the claims 1-3, **characterized in that** the bearing construction part is a hollow or solid rod.
5. Device as claimed in any of the claims 1-4, said connecting piece having a pivot shaft, **characterized in that** the bearing construction part is mounted substantially parallel to the pivot shaft (32a, 32b) of the connecting piece.
6. Device as claimed in any of the claims 1-5, **characterized in that** the measuring means comprise at least one strain gauge.
7. Device as claimed in any of the claims 1-6, **characterized in that** the measuring means are coupled to warning means for warning the user in the case of overload.
8. Device as claimed in any of the claims 1-7, **characterized in that** the bearing construction part is connectable to the basket using clamping means.

9. Device as claimed in any of the claims 1-8, **characterized in that** the connecting piece comprises:

- a first tubular rigid body (26) intended for connection to the basket, wherein the shaft of the first tubular rigid body in the mounted position is substantially parallel to the basket,
- a second tubular rigid body (27) intended for connection to the machine, wherein the shaft of the second tubular rigid body in the mounted position is substantially parallel to the basket,
- a pivot shaft (32a, 32b) between the first and the second tubular bodies substantially perpendicular to the shafts of the first and second tubular bodies.

10. Device as claimed in claim 9, **characterized in that** cylinders for actuating the pivoting are mounted in the second tubular body.
11. Device as claimed in any of the previous claims, **characterized in that** the adjustable connecting means are adapted to obtain an adjustable extension.
12. Device as claimed in any of the previous claims, **characterized in that** the at least one second platform consists of two side platforms, one at either end of the first platform.
13. Device as claimed in claim 12, **characterized in that** the first work platform is provided on opposite sides with a first railing structure in each case which extends over substantially the full length of these sides, and that each side platform is provided with a second railing structure, this such that a continuous railing is provided along the whole periphery of the basket.
14. Device as claimed in any of the foregoing claims, **characterized in that** each second platform is mounted telescopically relative to the first platform, wherein the bottom of the first platform is mounted slidably relative to the bottom of the second platform.
15. Device as claimed in any of the foregoing claims, **characterized in that** each second platform is provided on opposite longitudinal sides with slide profiles, and that the first platform is provided on opposite longitudinal sides with guide channels for these slide profiles.

Patentansprüche

1. Vorrichtung zum Durchführen von Tätigkeiten an Orten, die schwer zugänglich sind, wie zum Beispiel in großen Höhen, mit:

einem Korb mit
einer ersten Plattform mit ersten Geländerstruk-
turen, zumindest einer zweiten Plattform mit
zweiten Geländerstrukturen, einer einstellbaren
Verbindungseinrichtung zwischen der ersten
Plattform und jeder zweiten Plattform dergestalt,
dass jede zweite Plattform eine Erweiterung der
ersten Plattform bildet;
einem Verbindungsstück (2) zum schwenkbaren
Verbinden des Korbs mit einer Maschine,
wobei das Verbindungsstück Folgendes auf-
weist:

ein Lagerkonstruktionsteil (25), das daran
angepasst ist, gebogen zu werden, wenn
der Korb belastet wird, und
eine Messeinrichtung (54, 55), die daran
angepasst ist, eine Größe dieses Biegens
durch Durchführen von Messungen an drei
unterschiedlichen Orten derart zu messen,
dass Lasten in unterschiedlichen Richtun-
gen messbar sind.

2. Vorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** das Lagerkonstruktionsteil einen rechteckigen Querschnitt hat und dass die Messeinrichtung einen ersten Messeinrichtungssatz (54) an einer ersten Seite (50), einen zweiten Messeinrichtungssatz an einer zweiten, gegenüberliegenden Seite und einen dritten Messeinrichtungssatz (55) an einer Vorderseite (51) zwischen der ersten und der zweiten Seite aufweist. 25
3. Vorrichtung gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Lagerkonstruktionsteil ein Profilstück ist. 35
4. Vorrichtung gemäß einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** das Lagerkonstruktionsteil ein hohler oder solider Stab ist. 40
5. Vorrichtung gemäß einem der Ansprüche 1 bis 4, wobei das Verbindungsstück eine Schwenkwelle hat, **dadurch gekennzeichnet, dass** das Lagerkonstruktionsteil im Wesentlichen parallel an der Schwenkwelle (32a, 32b) des Verbindungsstücks angebracht ist. 45
6. Vorrichtung gemäß einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die Messeinrichtung zumindest einen Dehnungsmessstreifen aufweist. 50
7. Vorrichtung gemäß einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** die Messeinrichtungen an eine Warneinrichtung zum Warnen des Benutzers im Falle einer Überlast gekoppelt sind. 55
8. Vorrichtung gemäß einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** das Lagerkonstruktionsteil mit dem Korb unter Verwendung einer Klemmeinrichtung verbindbar ist. 5
9. Vorrichtung gemäß einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** das Verbindungsstück Folgendes aufweist:
 - einen ersten röhrenartigen, starren Körper (26), der für eine Verbindung mit dem Korb bestimmt ist, wobei die Welle des ersten röhrenartigen starren Körpers an der angebrachten Position im Wesentlichen parallel zu dem Korb ist,
 - einen zweiten röhrenartigen, starren Körper (27), der für eine Verbindung mit der Maschine bestimmt ist, wobei die Welle des zweiten röhrenartigen, starren Körpers an der angebrachten Position im Wesentlichen parallel zu dem Korb ist,
 - eine Schwenkwelle (32a, 32b) zwischen dem ersten und dem zweiten röhrenartigen Körper, die im Wesentlichen senkrecht zu den Wellen des ersten und des zweiten röhrenartigen Körpers ist.
10. Vorrichtung gemäß Anspruch 9, **dadurch gekennzeichnet, dass** Zylinder zum Betätigen des Schwenkens in dem zweiten röhrenartigen Körper angebracht sind. 30
11. Vorrichtung gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** die einstellbaren Verbindungseinrichtungen daran angepasst sind, eine einstellbare Erweiterung zu erhalten. 35
12. Vorrichtung gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** die zumindest eine zweite Plattform aus zwei Seitenplattformen besteht, wobei eine jeweils an einem Ende der ersten Plattform ist. 40
13. Vorrichtung gemäß Anspruch 12, **dadurch gekennzeichnet, dass** die erste Arbeitsplattform in jedem Fall an gegenüberliegenden Seiten mit einer ersten Geländerstruktur vorgesehen ist, die sich im Wesentlichen über die gesamte Länge von diesen Seiten erstreckt, und dass jede Seitenplattform mit einer zweiten Geländerstruktur dergestalt versehen ist, dass ein kontinuierliches Geländer entlang des gesamten Umfangs des Korbs vorgesehen ist. 45
14. Vorrichtung gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** jede zweite Plattform relativ zu der ersten Plattform teleskopisch angebracht ist, wobei der Boden der ersten Plattform relativ zu dem Boden der zweiten Plattform gleitbar 50

angebracht ist.

15. Vorrichtung gemäß einem der vorherigen Ansprüche, **dadurch gekennzeichnet, dass** jede zweite Plattform an gegenüberliegenden Längsseiten mit Gleitprofilen versehen ist, und dass die erste Plattform an gegenüberliegenden Längsseiten mit Führungskanälen für diese Gleitprofile versehen ist.

Revendications

1. Dispositif pour réaliser des opérations à des endroits difficiles d'accès, telles que des hauteurs importantes, comprenant :

une nacelle comprenant :

une première plateforme avec des premières structures de garde-corps, au moins une seconde plateforme avec des secondes structures de garde-corps, des moyens de raccordement réglables entre la première plateforme et chaque seconde plateforme, de sorte que chaque plateforme forme une extension de la première plateforme ;

une pièce de raccordement (2) pour raccorder de manière pivotante la nacelle à une machine, ladite pièce de raccordement comprenant :

une partie de construction d'appui (25) adaptée pour empêcher la flexion, lorsque la nacelle est chargée, et des moyens de mesure (54, 55) adaptés pour mesurer une grandeur de cette flexion en réalisant des mesures à trois endroits différents de sorte que les charges peuvent être mesurées dans différentes directions.

2. Dispositif selon la revendication 1, **caractérisé en ce que** la partie de construction d'appui a une section transversale rectangulaire et **en ce que** les moyens de mesure comprennent un premier ensemble de moyens de mesure (54) sur un premier côté (50), un deuxième ensemble de moyens de mesure sur un second côté opposé et un troisième ensemble de moyens de mesure (55) sur un côté avant (51) entre les premier et second côtés.
3. Dispositif selon la revendication 1 ou 2, **caractérisé en ce que** la partie de construction d'appui est une pièce profilée.
4. Dispositif selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la partie de construction

d'appui est une tige creuse ou pleine.

5. Dispositif selon l'une quelconque des revendications 1 à 4, ladite pièce de raccordement ayant un arbre de pivot, **caractérisé en ce que** la partie de construction d'appui est montée sensiblement parallèlement à l'arbre de pivot (32a, 32b) de la pièce de raccordement.
6. Dispositif selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** les moyens de mesure comprennent au moins un extensomètre.
7. Dispositif selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** les moyens de mesure sont couplés aux moyens d'avertissement pour avertir l'utilisateur en cas de surcharge.
8. Dispositif selon l'une quelconque des revendications 1 à 7, **caractérisé en ce que** la partie de construction d'appui peut être raccordée à la nacelle en utilisant des moyens de serrage.
9. Dispositif selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** la pièce de raccordement comprend :
- un premier corps rigide tubulaire (26) prévu pour le raccordement à la nacelle, dans lequel l'arbre du premier corps rigide tubulaire dans la position montée est sensiblement parallèle à la nacelle, un second corps rigide tubulaire (27) prévu pour le raccordement à la machine, dans lequel l'arbre du second corps rigide tubulaire, dans la position montée, est sensiblement parallèle à la nacelle, un arbre de pivot (32a, 32b) entre le premier et le second corps tubulaire étant sensiblement perpendiculaire aux arbres des premier et second corps tubulaires.
10. Dispositif selon la revendication 9, **caractérisé en ce que** des cylindres pour actionner le pivotement sont montés dans le second corps tubulaire.
11. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les moyens de raccordement réglables sont adaptés pour obtenir une extension réglable.
12. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la au moins une seconde plateforme se compose de deux plateformes latérales, une à chaque extrémité de la première plateforme.
13. Dispositif selon la revendication 12, **caractérisé en ce que** la première plateforme de travail est prévue

sur des côtés opposés avec une première structure de garde-corps qui s'étend, dans chaque cas sensiblement sur toute la longueur de ses côtés, et **en ce que** chaque plateforme latérale est prévue avec une seconde structure de garde-corps, de sorte qu'un garde-corps continu est prévu le long de toute la périphérie de la nacelle. 5

14. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** chaque seconde plateforme est montée de manière télescopique par rapport à la première plateforme, dans lequel le fond de la première plateforme est monté de manière coulissante par rapport au fond de la seconde plateforme. 10 15

15. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** chaque seconde plateforme est prévue sur des côtés longitudinaux opposés avec des profilés coulissants, et **en ce que** la première plateforme est prévue sur des côtés longitudinaux opposés avec des canaux de guidage pour ces profilés coulissants. 20 25

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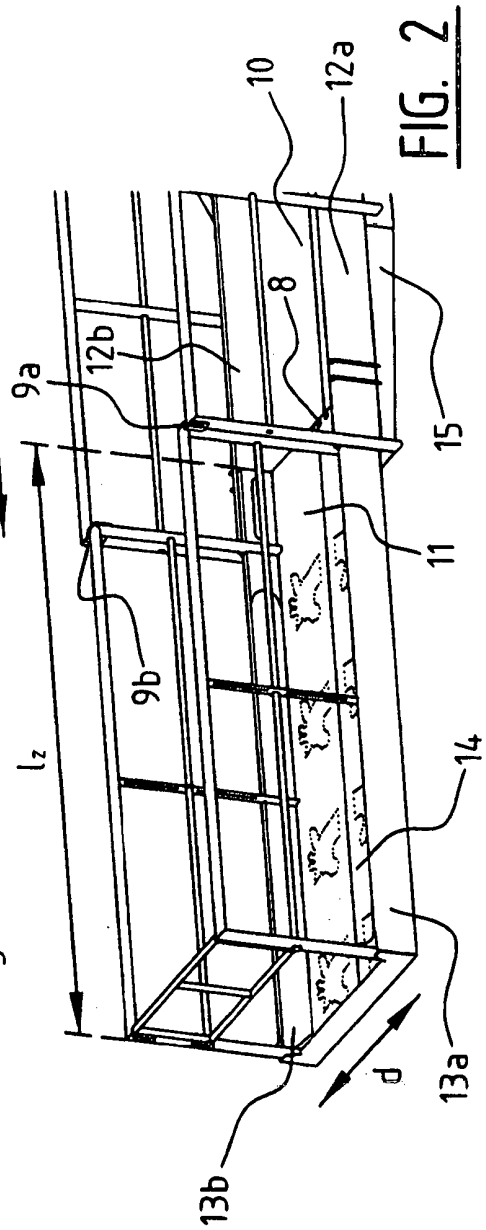
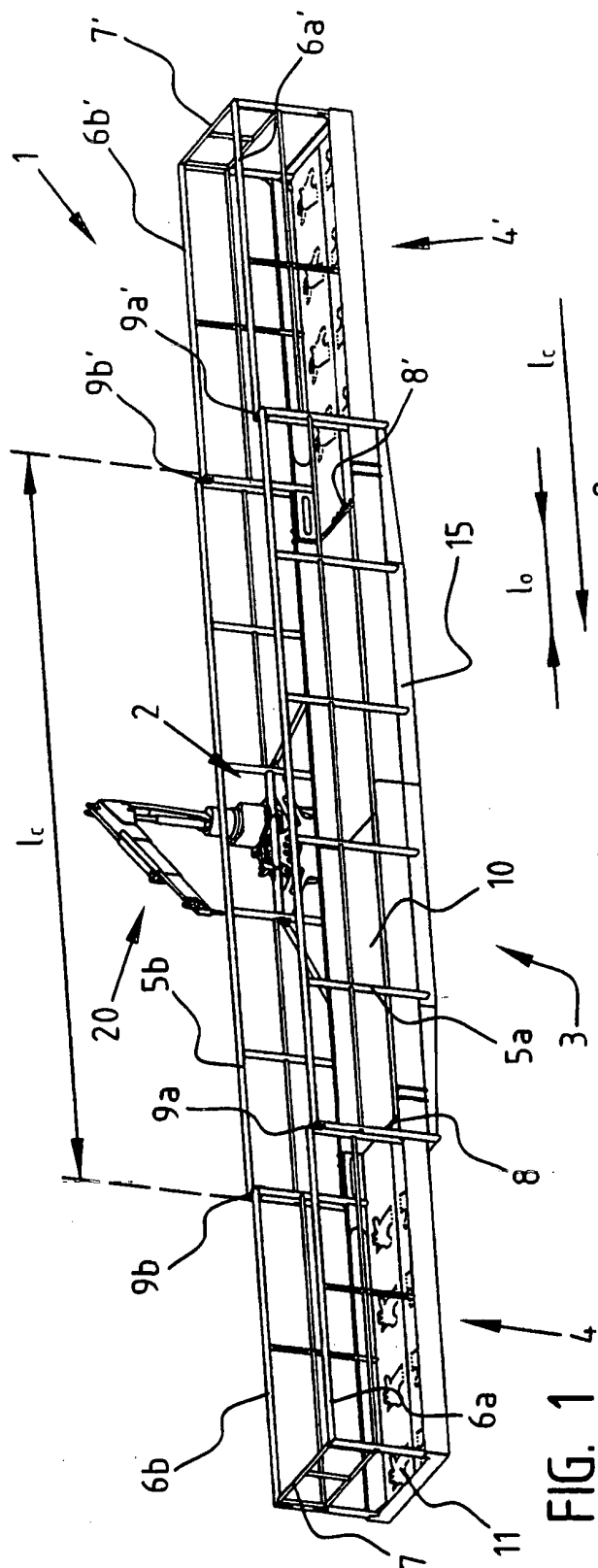
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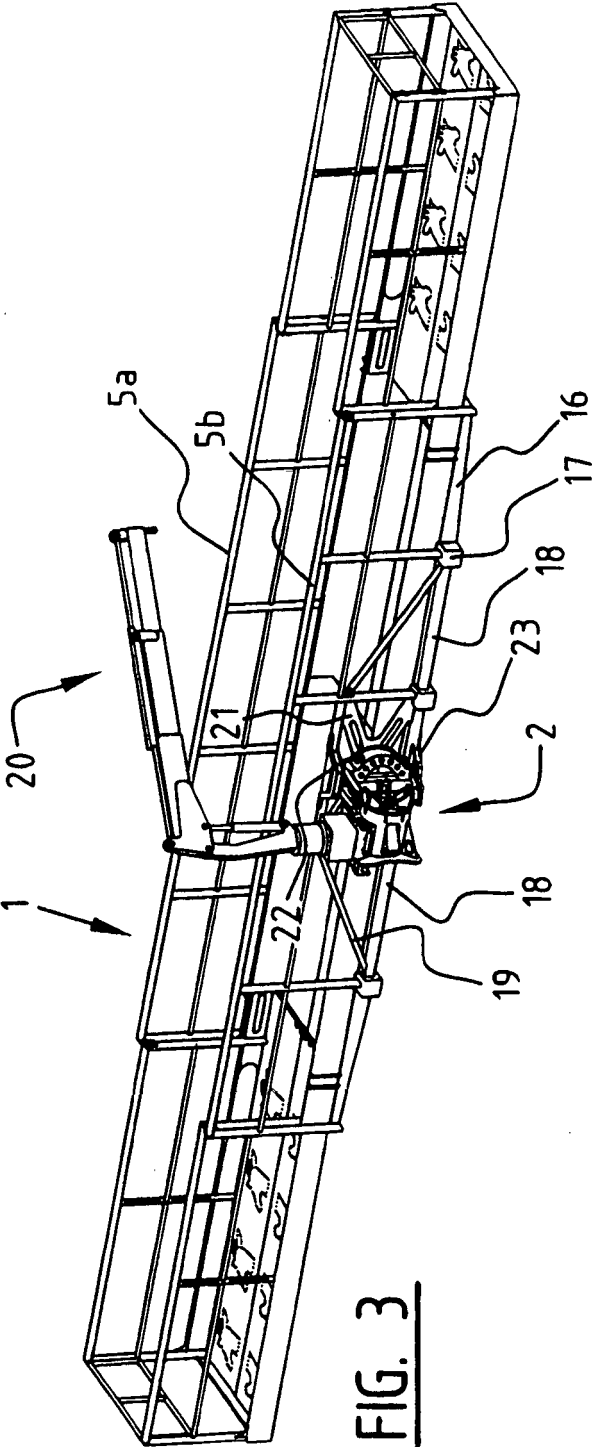


FIG. 3

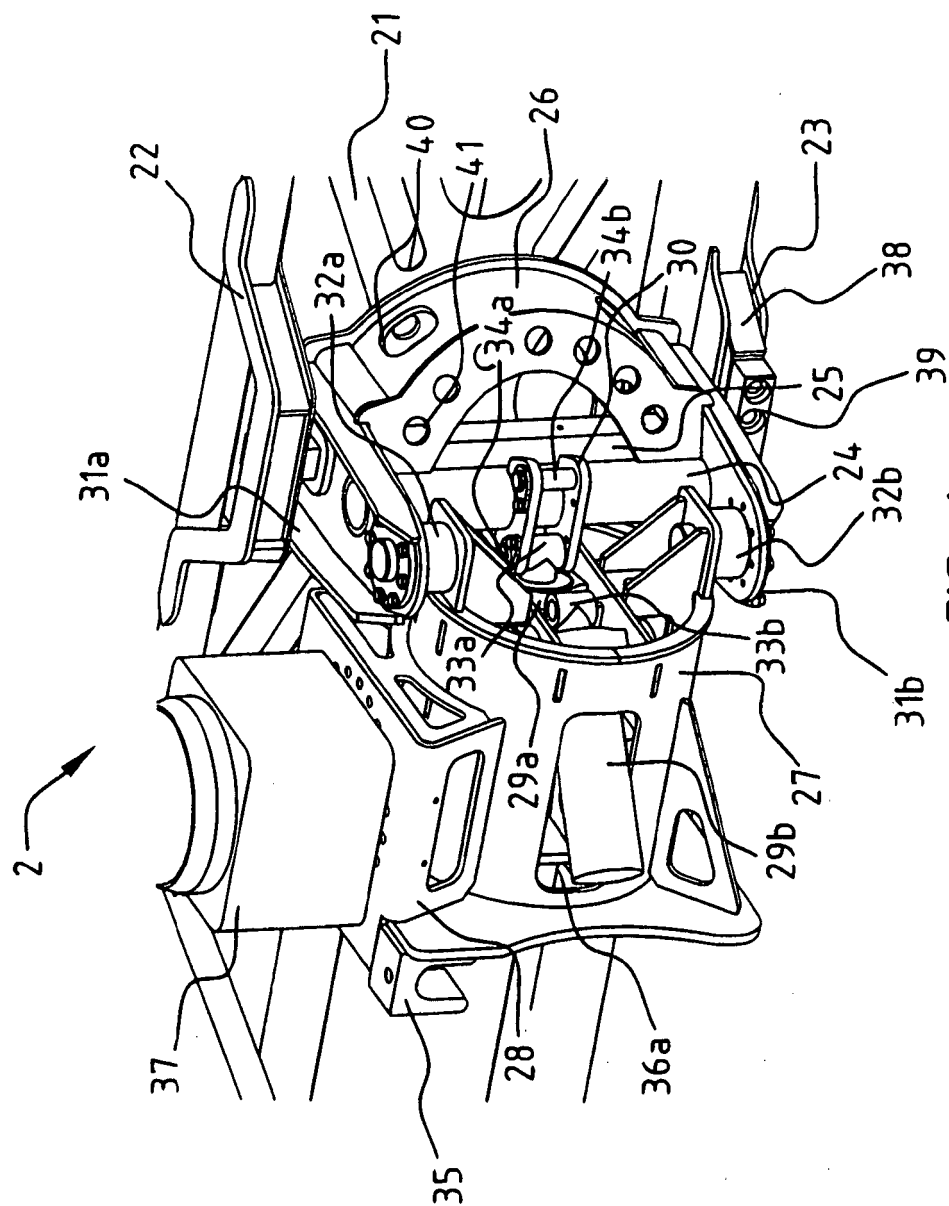


FIG. 4

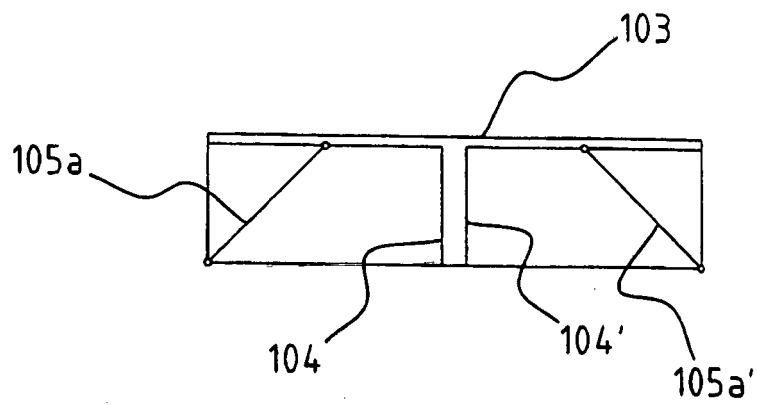


FIG. 5A

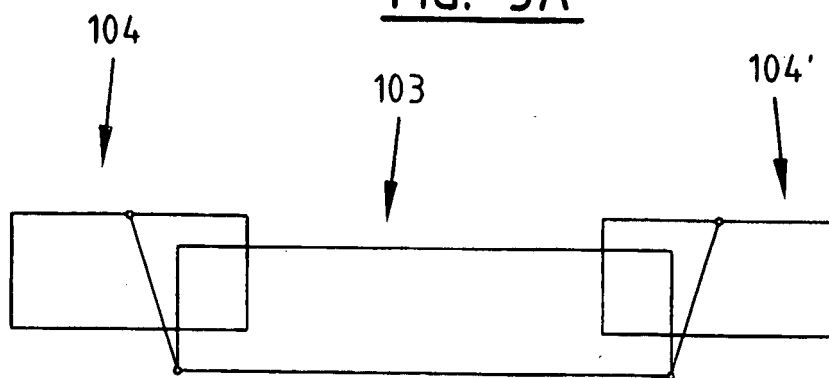


FIG. 5B

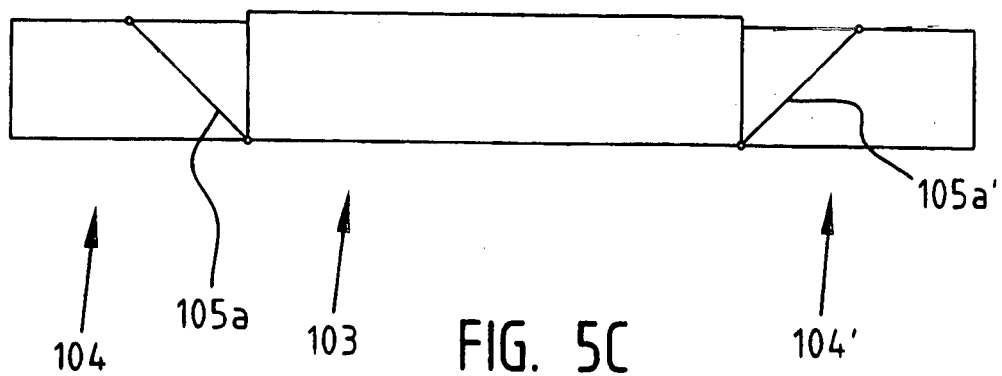


FIG. 5C

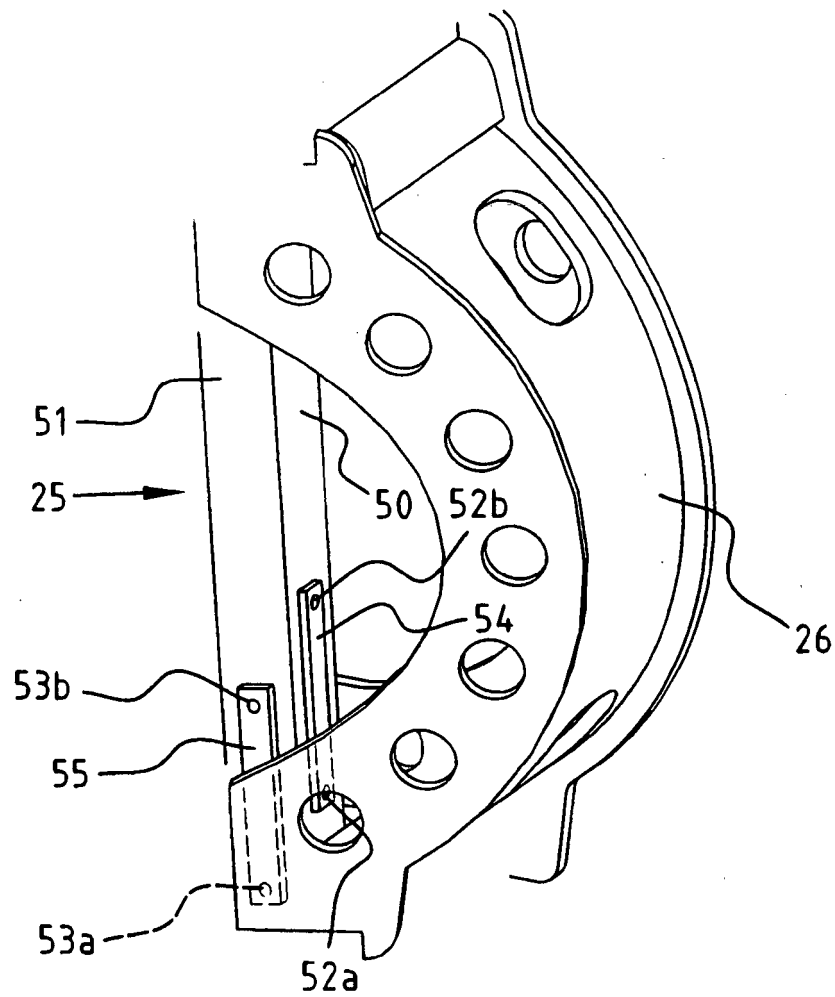
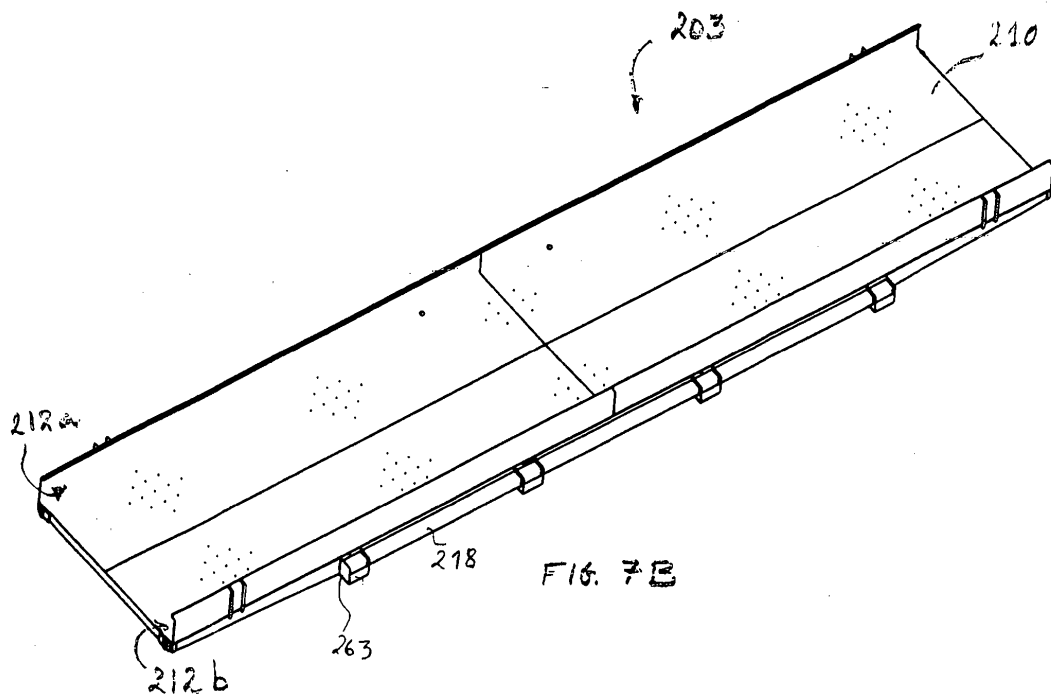
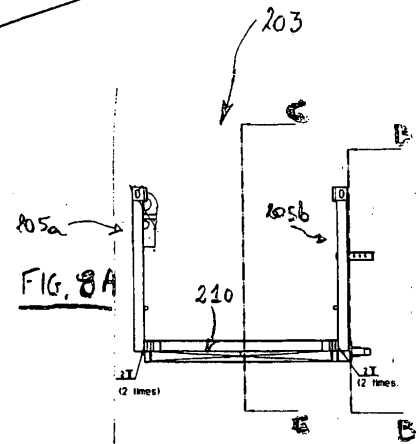
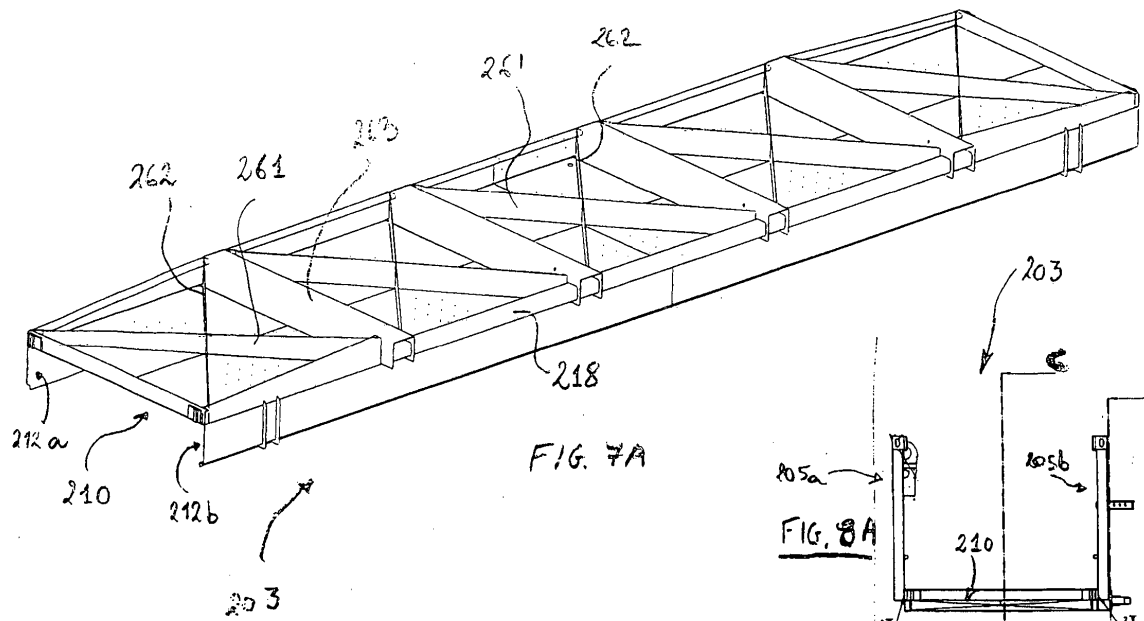
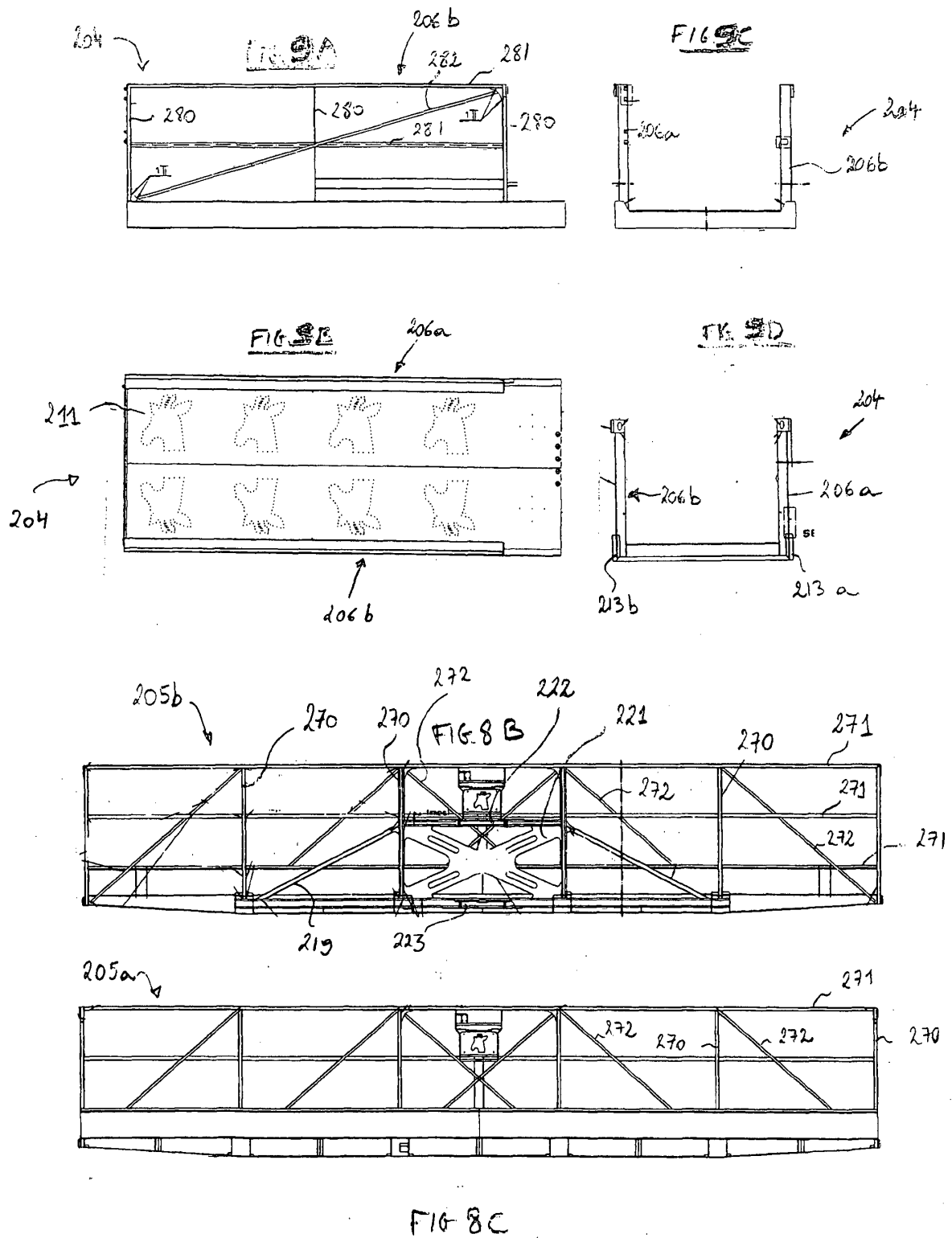


FIG. 6





REFERENCES CITED IN THE DESCRIPTION

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