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(54) **A SYSTEM COMPRISING AN IMPLEMENT ATTACHMENT MEANS AND AN IMPLEMENT**

SYSTEM UMFASSEND EIN GERÄTEBEFESTIGUNGSMITTEL UND EIN GERÄT

SYSTEME COMPRENANT UN DISPOSITIF DE FIXATION D'OUTIL ET UN OUTIL

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Description

Field of invention

[0001] In a first aspect of the present invention there is provided a system that comprises on the one hand an implement attachment means adapted to be fitted to a working machine, and on the other hand at least one implement or tool, wherein the implement attachment means includes first locking means and first drive coupling means, wherein the implement or tool includes second locking means and second drive coupling means and wherein the first and second locking means are adapted for mutual co-action in releasably locking the implement to the implement attachment means and the first and second drive coupling means are adapted for mutual co-action in releasably connecting said drive coupling means one to the other.

[0002] The phrase "drive coupling means" used in the instant application includes hydraulic coupling units, electrical coupling units and/or pneumatic coupling units.

Background of the invention

[0003] Implement attachment systems for the rapid exchange of buckets, scoops and other implements in connection with diggers, wheel mounted loaders, various types of material handling machines, have been a self-evident solution in the majority of European markets over the last ten to fifteen years. During this period, development has quickly progressed from simple mechanical solutions, where the driver leaves his cabin and locks or unlocks the attachment locking mechanism with a simple lever movement, to hydraulic solutions, where the driver controls a locking cylinder that actuates the attachment locking mechanism, by simply pressing a button in the driver's cabin. Even fully automatic implement attachment systems have become commercially available in recent years. In this case, mechanical and hydraulic buckets, scoops and other implements are locked and unlocked fully automatically directly from the driver's cabin. Hydraulic hoses and electric power cables are also coupled automatically.

[0004] For example, such a system, together with its implement attachment means and working implement, is described in EP 602 165. The system described in EP 602 165 provides considerable benefits, since the interconnection, locking and hydraulic and electrical coupling of the implement attachment means and the implement can be effected without the operator needing to leave his place in the working machine.

[0005] The majority of implement attachment systems are based on the principle of an implement attachment means that includes a "capture side" and a locking side. Most implement gates are of the same design, apart from symmetrical gate attachments or fasteners that are mechanically designed to be coupled and locked from two directions. The capturing side of the attachment means

picks up the implement and turns it into position, and then locks the implement with the aid of a locking mechanism in the form of a locking pin or a locking lip that passes into a locking position on the gate. The locking mechanism goes either in the coupling direction of the attachment or at an angle of 90 degrees to this direction. The gate is that part of the implement which is connected to the implement attachment means.

[0006] In the case of the system described in EP 602 165, the locking system comprises a rod-like element, a so-called gate axle, on each side of the gate and two U-shaped and two L-shaped grippers on the implement attachment means. In a coupling operation, the U-shaped grippers act as claw-like capturing elements and are caused to straddle the gate axle on the corresponding side of the gate, said axle constituting gripping means. The implement attachment means and the implement are then rotated relative to one another about the gate axle straddled by the U-shaped grippers to a position in which the other gate axle lies adjacent the L-shaped gripper. In this position, lock bolts are projected out into the L-shaped grippers so as to surround the other gate axle together with the L-shaped gripper, therewith firmly locking the implement to the implement attachment means. The hydraulic coupling units on the implement attachment means are coupled to corresponding hydraulic units on the implement in unison with this locking action.

[0007] Problems can occur when coupling up equipment in the manner proposed in EP 602 165, and also when using other similar systems.

- The driver is unable to see when the implement attachment means is in the correct capturing position for rotation of the attachment to its locking position. This makes coupling of the implement difficult to achieve, with the risk of dropping the implement.
- The driver has succeeded in reaching the correct capturing position, but rotates the implement attachment means down to a locking position with the lock mechanism in an outwardly activated state. The driver is normally unable to see the rear side of the attachment means at the moment of endeavouring to effect a coupling. This means that the implement attachment means will not be in the correct locking position. There is then a danger that the implement will not be truly coupled to the attachment means and that it may be dropped. A variant of this possibility is that the implement attachment means may be clamped firmly in a half-way position where the driver believes that the implement to be reliably coupled to the attachment means, but where the implement falls down onto the ground when subjected to load.
- When the implement attachment means is coupled with the locking pins extended in conjunction with an automatic quick hose-coupling function, there is a serious risk of striking and crushing couplings on the implement.

[0008] It will be obvious from the foregoing that there is a serious need for additional assistance in checking the position of the implement attachment means relative to the implement with regard to coupling and uncoupling operations.

[0009] For safety reasons, it is also important that the attachment locking mechanism is always in its locking mode when working with working implements. This creates the problem of checking that such is always the case.

[0010] Systems of the type concerned present other problems. The implements that shall be capable of connection to the implement attachment means may be of mutually different kinds. For reasons of a technical and safety nature, it is important that each implement is coupled to the correct hydraulic pressure and flow rate. For instance, should an hydraulic hammer that requires a large flow rate, a relatively low working pressure and a pressureless return line be mistakenly connected to a two-way hydraulic circuit, the return packing on the hammer will be quickly blown.

[0011] It also desirable in many instances to know just how long a working implement has been in use and under what conditions, and also to be aware of the condition of the implement.

[0012] The object of the present invention is to overcome the aforesaid problems, either completely or partially, and thus to provide an implement attachment means and implement system that will satisfy one or more of the following measures:

- Elimination or at least reduction in the danger of an error being made when coupling together attachment means and implement

ensuring that an implement cannot be loosened unintentionally from the implement attachment means during work, or at least reduce the danger of such an event taking place

ensuring that an implement connected to the implement attachment means will be manoeuvred in the manner intended with respect to the implement concerned facilitate control of the work carried out with a given working implement and also of its condition.

[0013] US 6301811 discloses a system according to the preamble of claim 1.

Summary of the invention

[0014] The object has been achieved in accordance with the first aspect of the invention by virtue of a system of the kind defined in the preamble of Claim 1 being provided with the features in the characterizing portion of claim 1.

[0015] The sensor and detection means enable information to be obtained regarding the mutual relationship of the implement attachment means and the implement and also regarding the working conditions of the implement. The sensor and detection means may consist re-

spectively of a plurality of sensor units and detection units and may be adapted to satisfy one or more of the aforesaid requisite measures. This will depend on the completeness and sophistication of the system that has been constructed around such sensor and detection means.

[0016] The inventive system enables high demands on safety and reliability to be achieved and also enhances the operator's ability to have control over working processes. The at least one sensor unit and at least one detection unit is adapted to send information to the effect that the locking elements are in locking engagement with one another. This solves a safety problem that is vital in the present context, namely that the operator is able to check continually that locking has been safely achieved.

This feature also fulfils the function of monitoring that a step in a third and last locking sequence has been carried out correctly. Since at least one sensor unit and at least one detection unit is adapted to send implement identifying information, it enables the type of implement that has been coupled to be identified and therewith allows the correct electricity supply, the correct oil supply, the correct pressure and the correct flow rate to be applied on the basis of this identification. In addition to identifying the type of implement that has been coupled-up, said function can also be used to identify the implement concerned individually - which may be of value in some cases.

[0017] According to a preferred embodiment of the inventive system, at least one sensor unit is mounted on the implement and at least one detection unit is mounted on the implement attachment means. Although it lies within scope of the invention to mount a respective sensor and detection unit on either the implement attachment means or on the implement itself, it is beneficial in many instances to mount the detection units on the implement attachment means since it is these units that are intended to forward said information. The detection units mounted on the implement attachment means facilitate the transfer of information carrying signals to the operator, for example through signal lines leading to the driving cabin of the working machine. The provision of a detection unit on the implement attachment means does not, of course, exclude other detection units of the detection means from being mounted on the implement when the system is designed to fulfil several of the aforesaid functions and when such placement of said detection units is beneficial in respect of certain of said functions.

[0018] According to a further preferred embodiment at least one sensor unit and at least one detection unit are adapted to transfer information that indicates whether or not the implement attachment means and the implement are in a predetermined positional area relative to one another. This embodiment is intended to fulfil one of the most important of said requirements, namely the creation of a first decisive condition for the safe and interference-free coupling of the implement attachment means with the implement. This embodiment thus enables the operator to be informed as to whether or not the implement

attachment means is ready for the next following sequence in the coupling procedure.

[0019] According to another preferred embodiment at least one sensor unit and at least one detection unit are adapted to transfer information as to whether or not the implement attachment means and the implement are in a predetermined position relative to one another. In many instances, this starting position represents a second sequence in the coupling procedure. The fact that the operator has control over this coupling sequence contributes still further to the safety aspect of the coupling procedure. This embodiment may conveniently constitute a compliment to the latter embodiment given above. This may, of course, be beneficial also when the first coupling sequence is effected in the absence of a control function.

[0020] According to a further embodiment of the invention the implement attachment means includes capturing means and the implement includes gripping means adapted for co-action with the capturing means, wherein either the capturing means or the gripping means includes a first sensor unit which is adapted to transfer information to a first detection unit when the capturing means is in engagement with the gripping means and wherein a second sensor unit is disposed in a determined angular position on the periphery of either the capturing means or the gripping means and functions to transfer information to a second detection unit when the implement attachment means and the implement occupy a predetermined position of rotation relative to one another about a pivot axle defined by the capturing means or the gripping means.

[0021] This embodiment is adapted to a beneficial constructive implement attachment means and implement design which has been well tested and found to function effectively. The specified placement of the sensor units means that said units are placed on the attachment component that is decisive with regard to the function of the coupling and therefor gives a clear indication as to whether or not the area in which the implement attachment means and the implement are positioned and their relative positions are correct.

[0022] According to a further preferred embodiment the capturing means includes at least one claw-like element and the gripping means includes at least one rod element or vice versa, in other words the capturing means may include a rod element and the gripping means may include a claw-like element. Such co-acting pairs of elements enable said capturing and locking procedures to be achieved in a constructively simple manner. Moreover, this solution provides a purposeful arrangement with respect to the sensor and detection units.

[0023] According to another preferred embodiment the second sensor unit is disposed on the rod element. These sensor units can be readily provided on the rod element in well defined angular positions, therewith ensuring that a correct function will be obtained.

[0024] According to another beneficial embodiment at least one sensor unit and at least one detection unit is

adapted to send information to the effect that the drive coupling devices are mutually coupled. This can ensure that a second step in the third coupling sequence has been carried out correctly, while also providing access to continual monitoring that the drive functions are intact.

[0025] According to another preferred embodiment at least one sensor unit and at least one detection unit is adapted to send information relating to the operating conditions of the implement. This information may, for instance, relate to the operating time of different implements. Such information can be used as a basis for implement servicing or as a basis for customer billing.

[0026] According to another preferred embodiment control means are provided for controlling the measures or steps involved in coupling the implement attachment means and the implement together and/or for controlling the measures or steps involved in manoeuvring the implement. Because of these control means there is achieved a re-coupling procedure, wherewith adequate measures will be taken in response to said information. This further enhances the safety aspect of the arrangement.

[0027] According to another preferred embodiment the system includes a microprocessor which is adapted to receive and to process received information and to deliver control signals when applicable.

[0028] The integration of a microprocessor in the system in this way enables information to be presented to an operator in a clear and lucid manner, so that adequate measures can be taken without delay. Since the system according to the immediately preceding embodiment includes control means, it is possible to trigger requisite measures automatically through the medium of said microprocessor. The microprocessor is therefore a component that further enhances the safety and reliability of the system. The working history of individual implements can be stored and processed in the microprocessor.

[0029] The preferred embodiments of the inventive system are set forth in the claims dependent on Claim 1.

[0030] Corresponding advantages are also gained with the working machine defined in claim 11 and with the method defined in claim 12, in accordance with further aspects of the invention.

[0031] The invention will be described more explicitly hereinafter by way of a detailed description of beneficial embodiments of the same and with reference to the accompanying drawings.

Brief description of the drawings

[0032]

Figure 1 is perspective view of an implement attachment means and an implement in a first relative position in accordance with known technology;

Figure 2 is a perspective view of the components shown in Fig. 1 in a second relative position;

- Figure 3 is a perspective view of the components shown in Fig. 1 in a third relative position;
 Figure 4 is a perspective view of a first part of an inventive implement attachment means;
 Figure 5 is a perspective view of a second part of an inventive implement attachment means;
 Figure 6 is a perspective view of a part of an inventive implement;
 Figure 7 is a diagram illustrating signal transmission in a system according to the present invention;
 Figure 8 is a perspective view of an alternative embodiment of part of an implement.

Description of advantageous embodiments of the invention

[0033] A known system of mutually coupling an implement attachment means and an implement is described in Figs 1 - 3. The system illustrated in these Figures and described with reference thereto is included in the standpoint of techniques as disclosed, for instance, in EP 602 615, to which reference is made here.

[0034] The system shown in Fig. 1 thus includes an implement attachment means 100 and an implement 200. The implement attachment means is intended to be fitted to a working machine (not shown). The implement 200 includes a gate 201, which is that part which is connected to the implement attachment means and which has a standard design for different types of implement. The active part of the implement has been shown only in broken lines and has different designs for different purposes. Thus, this system enables implements intended for different types of work to be connected to the implement attachment means 100 fitted to the machine.

[0035] The implement attachment means includes a connection part 101 which comprises a capturing side 102 to the right in the Figure, and a locking side 103 to the left of the Figure. The capturing side 102 has two U-shaped recesses 104, of which only one can be seen in the Figure. The locking side 103 is an L-shaped profile from which two lock bolts 105 can be projected such as to form a U-shaped profile together with the L-profile. The lock bolts 105 are shown extended in Fig. 1.

[0036] The gate 201 on the implement 200 includes a first gate axle 202 which is adapted for co-action with the capturing side 102 of the implement attachment means, and a second gate axle 203 which is adapted for co-action with the locking side 103 of the implement attachment means. Each gate axle may be replaced with a short axle stump on a respective side wall of the gate.

[0037] When the implement attachment means is to be connected to the implement, the implement attachment means is manoeuvred to a capturing position, shown in Fig. 2. This means that the U-profiles 104 of the implement attachment means will be caused to straddle the first gate axle 102 of the implement. In this position, the gate axle 202 will lie against the bottom of the

U-profiles or generally in this position. As will be seen from the Figure, the implement attachment means 100 is angled upwards in this position. The angular position is not particularly critical in this stage of the proceedings and the angle between the implement attachment means and the implement may have any value within a given range. The capturing position can thus be defined as a positional region.

[0038] The next step in the procedure involves rotating the implement attachment means 100 and the implement 200 from the position shown in Fig. 2 relative to one another, so that the attachment 100 will face towards the implement. This is done with the lock bolts withdrawn, so that the implement can be turned to an extent such that the second gate axle 203 will be positioned in the L-profile. When there, the components are ready to be firmly locked. This is achieved by extending the bolts so as to lock the second gate axle between the L-profile 103 and the lock bolts 105. The lock bolts 105 are manoeuvred between their two positions hydraulically.

[0039] Figure 3 shows the components in a firmly locked state. The implement attachment means is provided with a number of hydraulic coupling units and electrical coupling units which shall be coupled to corresponding units provided on the implement. The coupling units are mounted on a coupling ramp on respective units. The coupling ramp on the implement attachment means is mounted so that it will be manoeuvred by the same hydraulic cylinders as those that manoeuvre the lock bolts. The rear side of the implement coupling ramp 104 is visible in Figure 3, whereas its front side and the coupling ramp on the implement attachment means are hidden from view. The lock bolts are thus extended at the same time as the coupling units are connected. It will be understood that the invention is not restricted to such simultaneous connection.

[0040] Neither is the invention restricted to a design in which the lock bolts are manoeuvred in the longitudinal direction of the implement attachment means as shown in Fig. 3. For example, the lock bolts may be arranged to be extended at right angles to said direction, i.e. in a direction parallel with the first gate axle 202. In such case, the bolts may be projected into openings in the side members of the implement gates. Other lock bolt manoeuvring arrangements are, of course, conceivable within the scope of the invention.

[0041] Similarly, the capturing device may have a different design to the claw-like elements, the U-profiles, on the implement attachment means and the gripping device may have a different design to the rod elements, i.e. to the gate axle, on the implement. For instance, the implement may be provided with claw-like hooks for co-action with complimentary elements on the implement attachment means, as shown in Fig. 8 for example.

[0042] An example of the special arrangement of sensor units and detector units on which the present invention is based will now be described more specifically with reference to Figs 4 - 6.

[0043] Figure 4 is a perspective view of an implement attachment means according to the invention, although some of its components have been excluded for the sake of simplicity. These components are shown in perspective in Fig. 5.

[0044] Four detection units 109 110 are disposed adjacent the capturing side of the implement attachment means so as to be situated in the U-profiles 104. These detection units are adapted to co-act with sensor units on the first gate axle 202 of the implement (see Fig. 6). One of these sensor units consists in the gate axle 202 itself. When the implement 200 is in the correct capture position in relation to the implement attachment means 100, as shown in Fig. 2, the first gate axle 202 will be located in the U-profile. The detection units 109 therewith indicate that the gate axle is in this position. A positive indication is triggered when the distance between the detection units 109 and said gate axle 202 is less than a given value, say from 2 to 5mm inclusive. This information is transferred on signal lines 111 to the operator or to a microprocessor which automatically allows the next coupling sequence to take place.

[0045] As earlier mentioned, the next coupling sequence is to turn the implement attachment means 100 and the implement relative to one another from the position shown in Fig. 2 to the position shown in Fig. 3.

[0046] An indication that the position shown in Fig. 3 has been reached is achieved with the aid of a given number of sensor units 210 disposed on the front gate axle in given angular positions around the periphery of said axle (see Fig. 6). In the illustrated example these are located "in the nine o'clock" position, i.e. on the inside of the gate axle on a level with its centre line. When the position shown in Fig. 6 has been reached, the detection units 110 on the implement attachment means will be located in a rotary direction opposite the sensor unit 210 on the gate axle 202 and therewith forward this information to the operator or to a microprocessor on signal lines 112.

[0047] At this stage the system is ready to lock the implement firmly to the implement attachment means, which is effected in the manner described with reference to Figs 1 - 3. The hydraulic cylinders 113 shown in Fig. 5 are therewith activated, causing the cylinders to move an H-shaped yoke 107 upwards to the left in Fig. 5. The yoke 107 carries the lock bolts 105 and the coupling ramp 114 of the implement attachment means, which accompany the yoke as it moves. When this locking movement has terminated, the bolts 105 will protrude through openings 106 on the implement attachment means (see Fig. 4), said bolts straddling the second gate axle 203 of the implement together with the L-profile 103, so as to firmly lock the implement. At the same time, the coupling units on the coupling ramp 114 of the implement attachment means have been coupled together with the coupling units on the coupling ramp 204 of the implement (see Fig. 6). The system includes guides 108 for guiding movement of the yoke 107.

[0048] A detection unit 115 is provided on the yoke 107, to indicate when this position has been reached. A sensor unit 116 is provided on a non-movable part of the implement attachment means in a position such that it will be located opposite the yoke-carried detection unit 115 when the correct position has been reached. Information to this effect, i.e. that locking has been completed, is then forwarded to the operator or to a microprocessor. In the case when the coupling ramps are mutually coupled at the same time as locking is achieved, as in the case of the illustrated example, this signal also constitutes information to the effect that said ramp coupling has been achieved. Otherwise, a separate pair of sensor - detection units can be provided to this end.

[0049] Should the aforescribed sensor - detection units in either capturing position, locking position or locked position fail to forward information to the effect that respective positions have been reached, the operator is able to stop the coupling process and take necessary measures.

[0050] Further sensor units 217 that function to identify the implement may be provided at a suitable location, for instance on the implement coupling ramp, and that also co-act with corresponding detection units 117 on the implement attachment means. These units may also be adapted to provide information concerning parameters related to the hydraulic and/or the electrical power transmission.

[0051] The sensor and detection units included in the system may be based on appropriate conventional technology and include contact-based magnetic, optical, electrical units or units that function in some other way.

[0052] Figure 7 illustrates an example of how the information generated by the sensor and detection units can be utilised. As earlier described, sensor units 202, 210, 217, 115 on the implement 100 and on the implement attachment means 200 co-act with respective detection units 109, 110, 117, 116 on the implement attachment means. The information thus obtained is transferred via a signal line bundle 120 to a microprocessor 121 that includes a program 122 for processing said information.

[0053] The processed information is sent from the microprocessor to a terminal 124 in the driving cabin of the machine via the signal line 123. The terminal 124 includes a display 125 for presentation of the information concerned to the operator. Also included are a number of control buttons 126 for executing control measures initiated by the operator. These signals are transmitted from the terminal to the microprocessor 121 via a signal line 127.

[0054] The microprocessor is connected by a signal line 128 to a control unit 129 which initiates control measures on the basis of the information processed in the microprocessor 121 and/or on the basis of measures commanded from the terminal 124. The control unit is designed to select the correct hydraulic function, pressure and fluid flow rate for respective implements and to control locking process functions, among other things.

[0055] The system described in Fig. 7 may, of course, be expanded with further input and output functions and therewith made more sophisticated. Conversely, it may, of course, be made simpler than described. The signal lines in the system may, of course, be replaced with wireless signal transmission means.

Claims

1. A system comprising an implement attachment means (100) adapted to be fitted to a working machine, and further comprising at least one working implement (200), wherein the implement attachment means (100) includes first locking means (105) and first drive coupling means, wherein the implement (200) includes second locking means (203) and second drive coupling means and wherein the first and second locking means (203) are adapted for mutual co-action in releasably locking the implement (200) to the implement attachment means (100) and the first and second drive coupling means are adapted for mutual co-action in releasably connecting said drive coupling means one to the other, which system further comprises sensor means (115, 202, 210, 217) and detection means (109, 110, 116, 117) adapted for the transfer of information from the sensor means to the detection means, wherein the sensor means (115, 202, 210, 217) include at least one sensor unit mounted on either the implement attachment means or the working implement, and wherein the detection means (109, 110, 116, 117) include at least one detection unit mounted on the other of said implement attachment means or working implement, whereby at least one sensor unit (115) and at least one detection unit (116) is adapted to send information to the effect that the first (105) and the second (203) locking means are in locking engagement with one another, **characterised in that** at least one sensor unit (217) on the implement (200) and at least one detection unit (117) on the implement attachment means (100) is adapted to send implement identifying information.
2. A system according to Claim 1, **characterised in that** at least one sensor unit (202, 210, 217) is mounted on the implement and at least one detection unit (109, 110, 116, 117) is mounted on the implement attachment means (100).
3. A system according to Claim 1 or 2, **characterised in that** at least one sensor unit (202) and at least one detection unit (109) is adapted to send information to the effect that the implement attachment means (100) and the implement (102) are positioned relative to one another in a predetermined positioning area.
4. A system according to Claim 3, **characterised in that** the implement attachment means (100) includes capturing means (104) and the implement (200) includes gripping means (202) adapted for co-action with the capturing means; **in that** either the capturing means (104) or the gripping means (202) include a first sensor unit (202) which is adapted to send information to a first detection unit (109) when the capturing means (104) is in engagement with the gripping means (202); and **in that** a second sensor unit (210) is disposed in a determined angular position on the periphery of either the capturing means or the gripping means (202) and functions to send information to a second detection unit (110) when the implement attachment means (100) and the implement (200) occupy a predetermined position of rotation relative to one another about a pivot axle defined by the capturing means or the gripping means.
5. A system according to Claim 4, **characterised in that** the capturing means (104) includes at least one claw-like element (104) and the gripping means (202) includes at least one rod element (202) or vice versa, wherein said pivot axle is defined by the rod element (202).
6. A system according to Claim 5, **characterised in that** said second sensor unit (210) is disposed on the rod element (202).
7. A system according to any one of claims 1 - 6, **characterised in that** at least one sensor unit (115) and at least one detection unit (116) is adapted to send information to the effect that the first and second drive coupling means are coupled together.
8. A system according to any one of claims 1 - 7, **characterised in that** at least one sensor unit (115) and at least one detection unit (116) is adapted to send information relating to implement working conditions.
9. A system according to any one of claims 1 - 8, **characterised in that** the system includes control means for governing the measures or steps involved in coupling together the implement attachment means (100) and the implement (200) in response to said information, and/or for governing the measures or steps involved in manoeuvring the implement.
10. A system according to any one of claims 1 - 9, **characterised by** a microprocessor (121) which is adapted to receive and process received information and to deliver control signals when applicable.
11. A working machine equipped with the system according to any of claims 1-10.

12. The use of a system according to any one of claims 1 - 11 for connecting a working implement to an implement attachment means.

Patentansprüche

1. System umfassend ein Anbaugerätebefestigungsmittel (100), das ausgelegt ist, an einer Arbeitsmaschine angebracht zu sein, und ferner umfassend mindestens ein Anbaugerät (200), wobei das Anbaugerätebefestigungsmittel (100) erste Arretierungsmittel (105) und erste Antriebskupplungsmittel umfasst, wobei das Anbaugerät (200) zweite Arretierungsmittel (203) und zweite Antriebskupplungsmittel umfasst und wobei die ersten und zweiten Arretierungsmittel (203) für ein gegenseitiges Zusammenwirken bei einem lösbaren Arretieren des Anbaugeräts (200) an dem Anbaugerätebefestigungsmittel (100) ausgelegt sind, und die ersten und zweiten Antriebskupplungsmittel für ein gegenseitiges Zusammenwirken bei einem lösbaren Verbinden der Antriebskupplungsmittel aneinander ausgelegt sind, wobei das System ferner Sensormittel (115, 202, 210, 217) und Detektionsmittel (109, 110, 116, 117) umfasst, die für das Übertragen von Informationen von den Sensormitteln zu den Detektionsmitteln ausgelegt sind, wobei die Sensormittel (115, 202, 210, 217) mindestens eine Sensoreinheit umfassen, die entweder an dem Anbaugerätebefestigungsmittel oder dem Anbaugerät montiert sind, und wobei die Detektionsmittel (109, 110, 116, 117) mindestens eine Detektionseinheit umfassen, die an dem anderen des Anbaugerätebefestigungsmittels oder des Anbaugeräts montiert sind, wobei mindestens eine Sensoreinheit (115) und mindestens eine Detektionseinheit (116) ausgelegt ist, Informationen zu dem Zweck zu senden, dass die ersten (105) und die zweiten (203) Arretierungsmittel in Arretierungseingriff miteinander sind, **dadurch gekennzeichnet, dass** mindestens eine Sensoreinheit (217) an dem Anbaugerät (200) und mindestens eine Detektionseinheit (117) an dem Anbaugerätebefestigungsmittel (100) ausgelegt ist, Anbaugerätidentifizierungsinformationen zu senden.
2. System nach Anspruch 1, **dadurch gekennzeichnet, dass** mindestens eine Sensoreinheit (202, 210, 217) an dem Anbaugerät montiert ist und mindestens eine Detektionseinheit (109, 110, 116, 117) an dem Anbaugerätebefestigungsmittel (100) montiert ist.
3. System nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** mindestens eine Sensoreinheit (202) und mindestens eine Detektionseinheit (109) ausgelegt ist, Informationen zu dem Zweck zu senden, dass das Anbaugerätebefestigungsmittel (100)

und das Anbaugerät (102) in einem vorbestimmten Positionierungsbereich relativ zueinander positioniert sind.

4. System nach Anspruch 3, **dadurch gekennzeichnet, dass** das Anbaugerätebefestigungsmittel (100) ein Erfassungsmittel (104) umfasst und das Anbaugerät (200) ein Greifmittel (202) umfasst, das für ein Zusammenwirken mit dem Erfassungsmittel ausgelegt ist; dass entweder das Erfassungsmittel (104) oder das Greifmittel (202) eine erste Sensoreinheit (202) umfasst, die ausgelegt ist, Informationen an eine erste Detektionseinheit (109) zu senden, wenn das Erfassungsmittel (104) in Eingriff mit dem Greifmittel (202) ist; und dass eine zweite Sensoreinheit (210) in einer bestimmten Winkelstellung am Umfang entweder des Erfassungsmittels oder des Greifmittels (202) angeordnet ist und dazu dient, Informationen an eine zweite Detektionseinheit (110) zu senden, wenn das Anbaugerätebefestigungsmittel (100) und das Anbaugerät (200) eine vorbestimmte Drehstellung relativ zueinander um eine Drehachse einnehmen, die durch das Erfassungsmittel oder das Greifmittel definiert ist.
5. System nach Anspruch 4, **dadurch gekennzeichnet, dass** das Erfassungsmittel (104) mindestens ein klauenähnliches Element (104) umfasst und das Greifmittel (202) mindestens ein Stabelement (202) umfasst oder umkehrt, wobei die Drehachse durch das Stabelement (202) definiert ist.
6. System nach Anspruch 5, **dadurch gekennzeichnet, dass** die zweite Sensoreinheit (210) an dem Stabelement (202) angeordnet ist.
7. System nach einem der Ansprüche 1-6, **dadurch gekennzeichnet, dass** mindestens eine Sensoreinheit (115) und mindestens eine Detektionseinheit (116) ausgelegt ist, Informationen zu dem Zweck zu senden, dass die ersten und zweiten Antriebskupplungsmittel miteinander gekoppelt sind.
8. System nach einem der Ansprüche 1-7, **dadurch gekennzeichnet, dass** mindestens eine Sensoreinheit (115) und mindestens eine Detektionseinheit (116) ausgelegt ist, Informationen in Bezug auf Anbaugerätarbeitsbedingungen zu senden.
9. System nach einem der Ansprüche 1-8, **dadurch gekennzeichnet, dass** das System Steuermittel zum Steuern der Maßnahmen oder Schritte, die beim miteinander Koppeln der Anbaugerätebefestigungsmittel (100) und des Anbaugeräts (200) involviert sind, in Reaktion auf die Informationen und/oder zum Steuern der Maßnahmen oder Schritte, die beim Manövrieren des Anbaugeräts involviert sind, umfasst.

10. System nach einem der Ansprüche 1-9, **gekennzeichnet durch** einen Mikroprozessor (121), der ausgelegt ist, empfangene Informationen zu empfangen und zu verarbeiten und bei Bedarf Steuersignale zu liefern.
11. Arbeitsmaschine, die mit dem System nach einem der Ansprüche 1-10 ausgestattet ist.
12. Verwendung eines Systems nach einem der Ansprüche 1-11 zum Verbinden eines Anbaugeräts mit einem Anbaugerätebefestigungsmittel.

Revendications

1. Système comprenant un moyen de fixation d'outil (100) conçu pour être fixé à une machine de travail et comprenant en outre au moins un outil de travail (200), dans lequel le moyen de fixation d'outil (100) comprend un premier moyen de verrouillage (105) et un premier moyen d'accouplement de transmission, dans lequel l'outil (200) comprend un second moyen de verrouillage (203) et un second moyen d'accouplement de transmission et dans lequel les premier et second moyens de verrouillage (203) sont conçus pour une coaction mutuelle lors d'un verrouillage libérable de l'outil (200) au moyen de fixation d'outil (100) et les premier et second moyens d'accouplement de transmission sont conçus pour une coaction mutuelle lors d'un raccordement libérable desdits moyens d'accouplement de transmission l'un à l'autre, lequel système comprend en outre des moyens de capteur (115, 202, 210, 217) et des moyens de détection (109, 110, 116, 117) conçus pour le transfert d'informations des moyens de capteur aux moyens de détection, dans lequel les moyens de capteur (115, 202, 210, 217) comprennent au moins une unité de capteur montée soit sur le moyen de fixation d'outil, soit sur l'outil de travail et dans lequel les moyens de détection (109, 110, 116, 117) comprennent au moins une unité de détection montée sur l'autre desdits moyen de fixation d'outil ou outil de travail, grâce à quoi au moins une unité de capteur (115) et au moins une unité de détection (116) sont conçues pour envoyer des informations voulant que le premier (105) et le second (203) moyen de verrouillage soient en prise par verrouillage l'un avec l'autre, **caractérisé en ce qu'**au moins une unité de capteur (217) sur l'outil (200) et au moins une unité de détection (117) sur le moyen de fixation d'outil (100) sont conçues pour envoyer des informations d'identification d'outil.
2. Système selon la revendication 1, **caractérisé en ce qu'**au moins une unité de capteur (202, 210, 217) est montée sur l'outil et qu'au moins une unité de détection (109, 110, 116, 117) est montée sur le

moyen de fixation d'outil (100).

3. Système selon la revendication 1 ou 2, **caractérisé en ce qu'**au moins une unité de capteur (202) et au moins une unité de détection (109) soient conçues pour envoyer des informations voulant que le moyen de fixation d'outil (100) et l'outil (102) sont positionnés l'un par rapport à l'autre dans une zone de positionnement prédéterminée.
4. Système selon la revendication 3, **caractérisé en ce que** le moyen de fixation d'outil (100) comprend un moyen de capture (104) et l'outil (200) comprend un moyen de préhension (202) conçu pour une coaction avec le moyen de capture ; **en ce que** soit le moyen de capture (104), soit le moyen de préhension (202) comprend une première unité de capteur (202) qui est conçue pour envoyer des informations à une première unité de détection (109) lorsque le moyen de capture (104) est en prise avec le moyen de préhension (202) ; et **en ce qu'**une seconde unité de capteur (210) est disposée dans une position angulaire déterminée sur la périphérie soit du moyen de capture, soit du moyen de préhension (202) et a pour fonction d'envoyer des informations à une seconde unité de détection (110) lorsque le moyen de fixation d'outil (100) et l'outil (200) occupent une position de rotation prédéterminée l'un par rapport à l'autre autour d'un axe de pivot défini par le moyen de capture ou le moyen de préhension.
5. Système selon la revendication 4, **caractérisé en ce que** le moyen de capture (104) comprend au moins un élément semblable à une griffe (104) et le moyen de préhension (202) comprend au moins un élément de tige (202) ou vice versa, dans lequel ledit axe de pivot est défini par l'élément de tige (202) .
6. Système selon la revendication 5, **caractérisé en ce que** ladite seconde unité de capteur (210) est disposée sur l'élément de tige (202).
7. Système selon l'une quelconque des revendications 1 à 6, **caractérisé en ce qu'**au moins une unité de capteur (115) et au moins une unité de détection (116) sont conçues pour envoyer des informations voulant que les premier et second moyen d'accouplement de transmission soient couplés ensemble.
8. Système selon l'une quelconque des revendications 1 à 7, **caractérisé en ce qu'**au moins une unité de capteur (115) et au moins une unité de détection (116) sont conçues pour envoyer des informations se rapportant à des conditions de travail d'outil.
9. Système selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** le système comprend des moyens de commande pour déterminer les me-

sures ou étapes impliquées lors du couplage l'un à l'autre du moyen de fixation d'outil (100) et de l'outil (200) en réponse auxdites informations et/ou pour déterminer les mesures ou étapes impliquées dans la manoeuvre de l'outil.

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10. Système selon l'une quelconque des revendications 1 à 9, **caractérisé par** un microprocesseur (121) qui est conçu pour recevoir et traiter des informations reçues et pour émettre des signaux de commande lorsqu'ils sont applicables.

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11. Machine de travail équipée du système selon l'une quelconque des revendications 1 à 10.

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12. Utilisation d'un système selon l'une quelconque des revendications 1 à 11 pour raccorder un outil de travail à un moyen de fixation d'outil.

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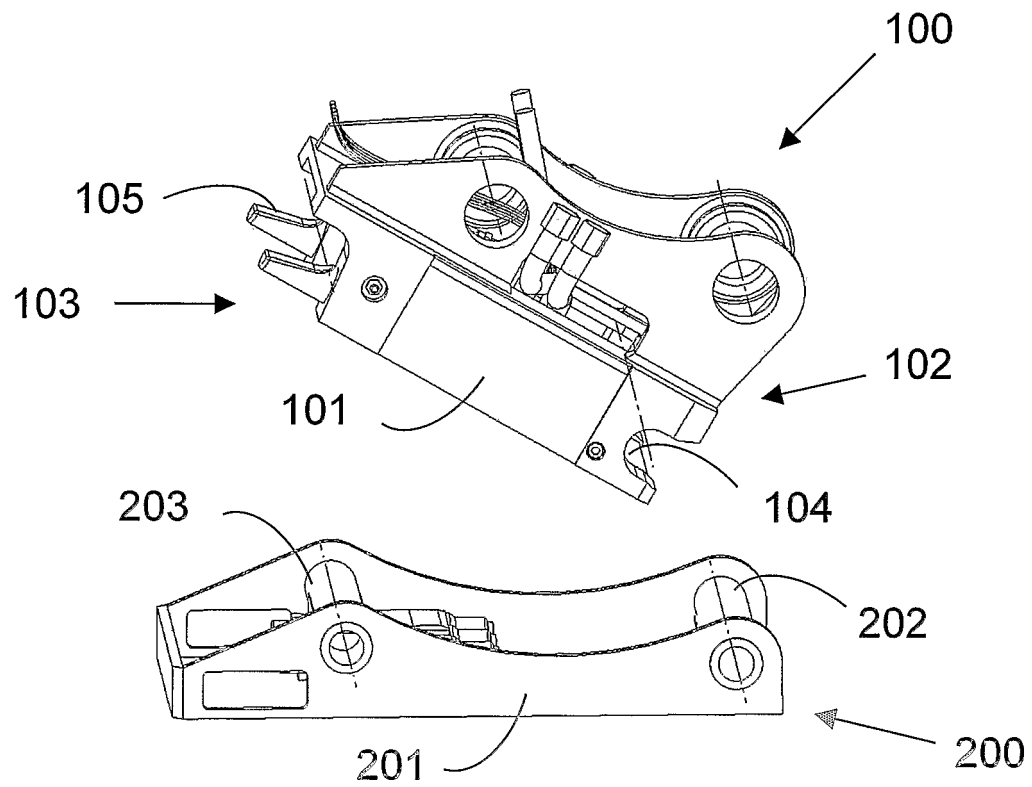


Fig. 1

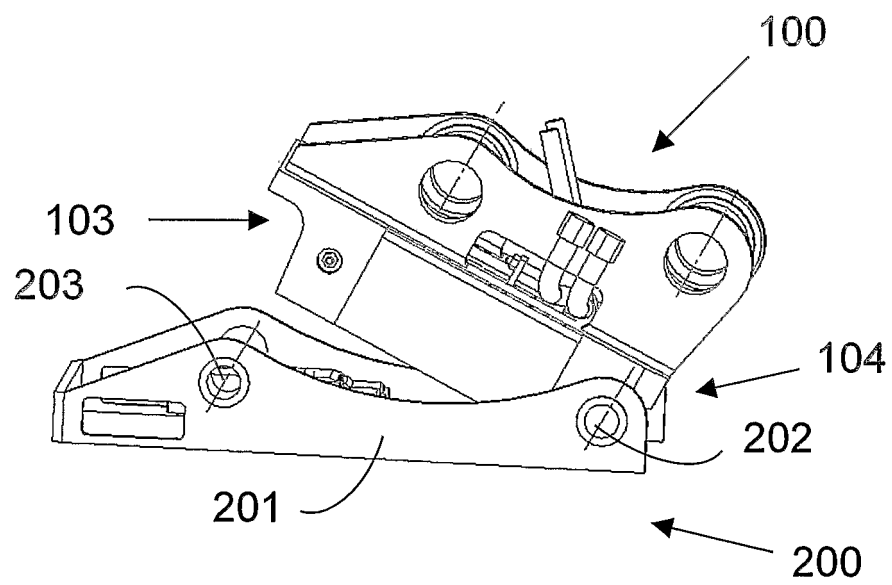


Fig. 2

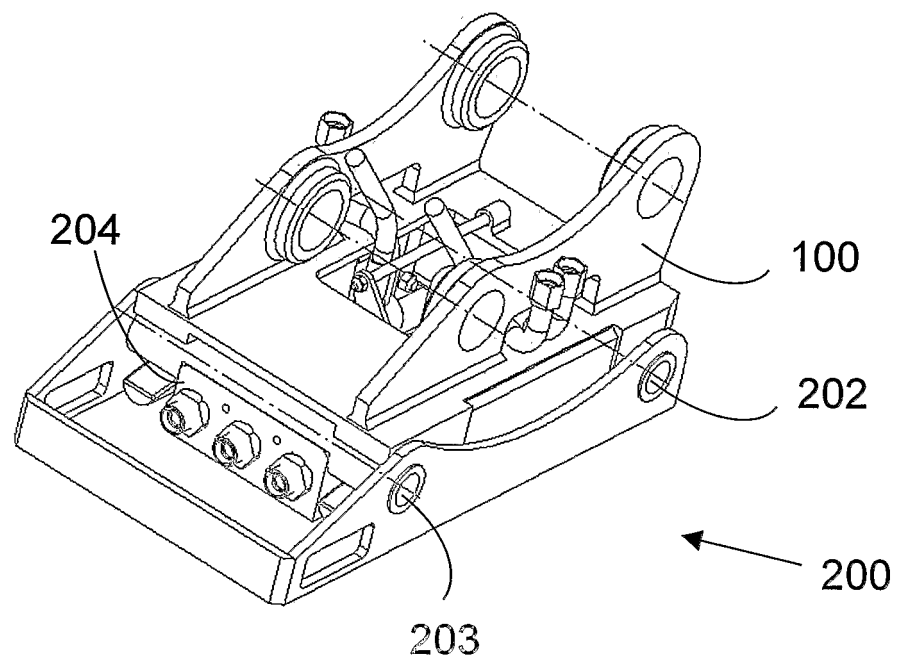


Fig. 3

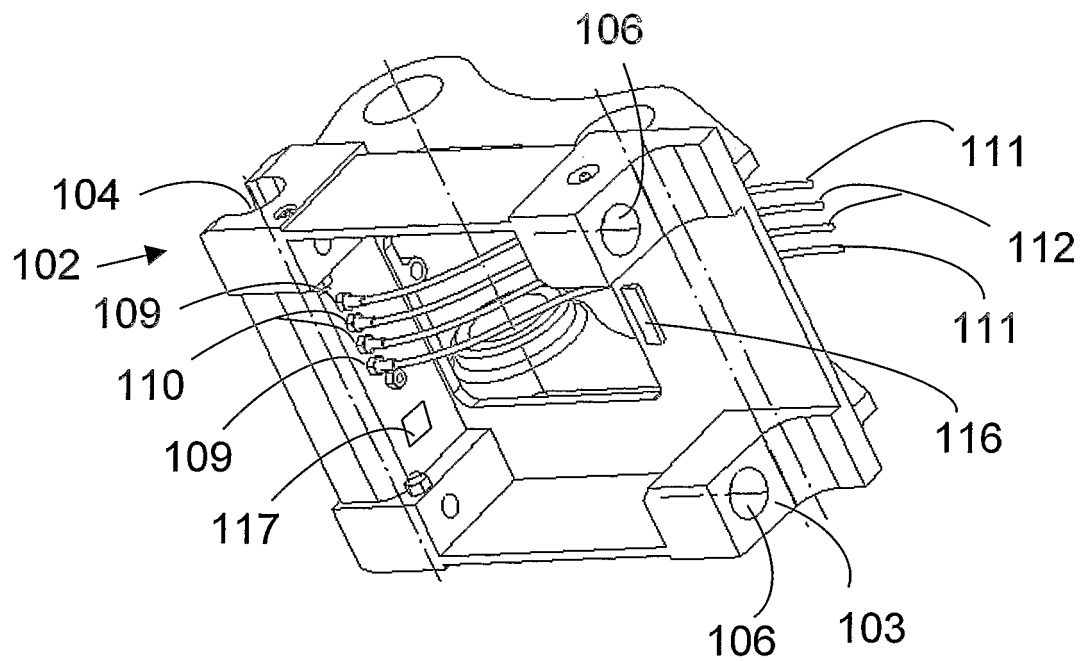


Fig. 4

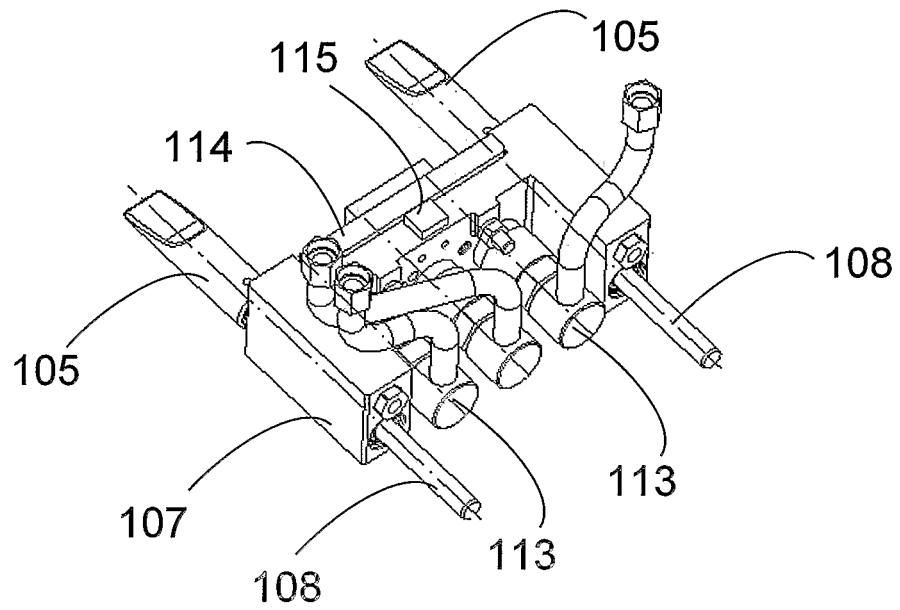


Fig. 5

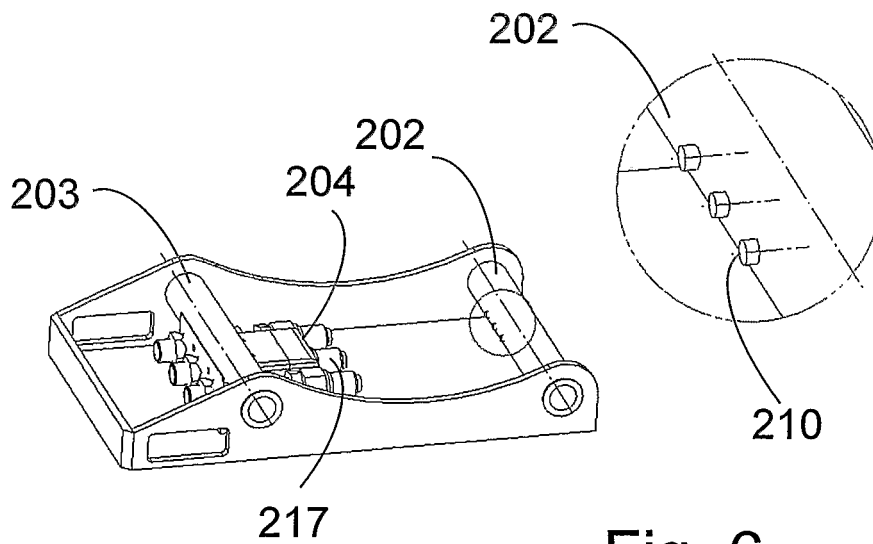
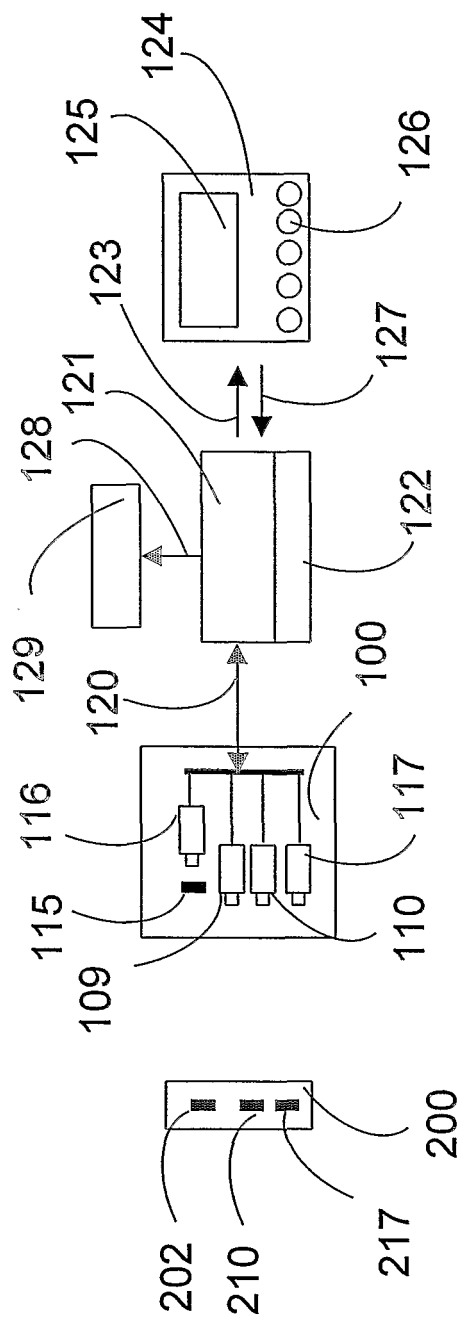


Fig. 6



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Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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