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(54) **System for evacuating cartridges**

System zur Entnahme von Munitionshülsen

Système pour évacuer des cartouches

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Description

[0001] The present invention refers to a system for evacuating cartridge cases from the powder chamber or firing chamber of a firearm, normally a cannon, preferably in the direction of a system for expelling cartridge cases, following upon deflagration of an ammunition.

[0002] The ammunition is essentially made up of a cartridge case containing the gun powder for the deflagration of the ammunition, and a projectile which is fired by the firearm towards the target.

[0003] Such projectiles can be "intelligent", i.e., comprising a target identifying and targeting system, which is capable of varying the direction of the projectile itself after being shot.

[0004] Normally, a system for evacuating cartridge cases comprises an evacuation tray that is adapted to receive the cartridge case subsequent to the firing of the ammunition.

[0005] Such a tray is normally positioned in axis with the barrel of the firearm so as to be able to receive the cartridge case.

[0006] Subsequently, such a tray, through a movement mechanism, is moved so as to allow the cartridge case to be definitively expelled.

[0007] Such movement systems are normally slow, reducing the shooting frequency of the firearm, and they are also unstable, since especially in critical conditions, for example, if applied to a ship, in conditions of sea force 6 and more, they often risk to jam the whole firearm since they are not able to carry out their task.

[0008] Moreover, normally, such mechanisms for evacuating cartridge cases are not provided with safety systems which can avoid incidents between movement mechanism and the loading mechanism in the case of malfunctioning of the movement mechanism.

[0009] For example, from patent application GB217569, a quick-firing gun is known comprising a gun barrel, with ramming breech-block, recoil brake and recuperator for returning the gun barrel into firing position, guided in a support cradle. Said gun comprises a control member which is guided on said cradle and receives alternate longitudinal movements on one hand, by the action of the recoil of the gun barrel, and on the other hand by the return of the gun barrel and the ramming breech block into firing position.

[0010] Said control member having as its functions to assure when returning into firing position:

- the operation of an empty cartridge case ejector;
- the operation of a loading device for bringing a cartridge on to a carrier then engaging the cartridge on.

[0011] The present invention proposes to solve the above mentioned technical drawbacks by a system for evacuating cartridge cases according to claim 1 that is stable, even in extreme conditions, allowing cartridge cases to always be expelled by the firing chamber. Such a system, moreover, reduces the probability of collisions and incidents between the various mechanisms in the case of malfunction of the parts.

[0012] One aspect of the present invention concerns a system for evacuating cartridge case in a firearm that is capable of speeding up the time necessary to carry out such an operation, thus making it possible to increase the frequency with which the firearm itself is fired.

[0013] In particular, the system for evacuating cartridge cases according to claim 1 comprises a safety device that is capable of avoiding collisions between the evacuation system and the loading mechanism applied in a firearm.

[0014] The characteristics and the advantages of such a system for evacuating cartridge cases shall become clearer from the following description of an embodiment with reference to the attached figures, which specifically illustrate:

- figure 1 shows the structure of the firearm in which such a system for evacuating cartridge cases, according to the present invention, is applied;
- figure 2 illustrates in detail the system according to the present invention, from a side view;
- figure 3 illustrates the movement mechanism of the tray according to the present invention;
- figure 4 shows a schematic diagram of the positions that the system can take up when moving;
- figure 5 illustrates a rear view of the system in position "B" applied onto a firearm;
- figures 6A and 6B respectively show the cartridge case retention device (figure 6A) and the braking device (figure 6B), according to the present invention;
- figure 7 illustrates the mechanism for expelling the cartridge case with the tray in position "C";
- figure 8 illustrates a rear perspective view of the system for evacuating cartridge cases with the tray in position "C";
- figure 9 illustrates the tray according to the present invention in a rear view.

[0015] With reference to the mentioned figures, the system for evacuating cartridge cases is applied to a firearm 1 that typically comprises a breech 14, a firing chamber 12 in which the projectile is fired, coming out of a barrel 13.

[0016] Such an evacuation system, enclosed in a box-type protective structure 11, comprises an evacuation tray 2, adapted to receive the cartridge case following upon deflagration of an ammunition, and a movement mechanism 3 adapted to move such a tray 2.

[0017] Such a system for evacuating cartridge cases is characterised in that movement mechanism 3, is a double acting mechanism, i.e. it allows tray 2 to rotate about an axis "X", that is parallel to the axis of barrel 13 of firearm 1, to reach an expulsion mechanism 5 for definitively expelling the cartridge case and the subsequent return; such a rotation makes it possible to evacuate the

cartridge case, simultaneously with the loading of an ammunition inside firing chamber 12 by a loading mechanism.

[0018] Such a system for evacuating cartridge cases further comprises a safety mechanism adapted to move tray 2 in the case in which movement mechanism 3 malfunctions. Such a safety mechanism prevents onset of damage consequent upon the impact of tray 2 with the loading mechanism, adapted to insert new ammunition into firing chamber 12.

[0019] Tray 2 is preferably circular-shaped, with dimensions such as to receive the cartridge cases from firearm 1, and during its rotation about axis "X" it can take up three different positions, as illustrated in figure 4.

[0020] In position "A" tray 2 is aligned with the axis of barrel 13 of firearm 1, waiting to receive the cartridge case.

[0021] Position "B", defined as the safety position, is the position that tray 2 takes up in the case in which movement mechanism 3 malfunctions.

[0022] Said position "B" is also the intermediate position before returning into position "A".

[0023] Position "C" is the position that tray 2 takes up when it must be cleared of the cartridge case it contained by an expulsion mechanism 5.

[0024] Once the cartridge case has been expelled, tray 2 returns to the position "A" so as to receive a further cartridge cases. As mentioned above, when passing from position "C" to position "A", tray 2 can, for example, stop in position "B" in the case in which the loading mechanism has not yet finished its operations, averting the possibility of collisions between the parts involved, to then return to position "A" once the loading mechanism has been disengaged.

[0025] As mentioned above, the rotary movement of tray 2 occurs around axis "X" through a hooking portion 21, preferably U-shaped, comprised in such a tray 2, which is hinged to a pin 111.

[0026] Such a pin 111 is fixed to box-shaped structure 11 through a support flange 112.

[0027] The movement of tray 2 is carried out by movement mechanism 3 which comprises a double acting movement actuator 31, preferably hydraulic, dedicated to tray 2, which acts upon tray 2 itself, via a gear mechanism 32. The movements of tray 2 can be synchronised, with the rest of the mechanisms implemented in firearm 1, in a preset and appropriately cadenced way from a first position "A", where the cartridge case is received, to a second position "C", in which the cartridge case is expelled by an expulsion mechanism 5, and *vice versa.*

[0028] In normal operation conditions of the evacuation system, when tray 2 receives the cartridge case it is received inside tray 2 itself.

[0029] Said tray 2 must respect a certain distance from firing chamber 12 so as to avoid impacts during the recoil of firearm 1 following upon deflagration of the ammunition.

[0030] The position of tray 2 with respect to firing chamber 12, from which the cartridge case comes, varies according to the angle of inclination of firearm 1.

[0031] The cartridge case extracted from such a chamber 12 undergoes the effect of gravity differently according to the angle of inclination of firearm 1, and therefore tray 2 will be positioned correctly so as to be able to always receive the cartridge case.

[0032] Tray 2 comprises a cartridge case - retention device 22 and a braking device 23.

[0033] The cartridge case arrives inside tray 2 with a certain speed suitable for the correct insertion into tray 2. In the embodiment described, such a speed is moreover exploited so as to activate cartridge case - retention device 22 which generates a signal of receiving the cartridge case when the latter is inside tray 2.

[0034] In the illustrated embodiment, given as an example and not for limiting purposes, the cartridge case is inserted inside tray 2 exploiting the recoil of firing chamber 12 consequent to the deflagration of the ammunition. The receiving signal is received by a control device, which is suitable for controlling and activating the systems, mechanisms and devices present in firearm 1, which will activate movement mechanism 3. Such a cartridge case - retention device 22 comprises a contact portion 221 with the cartridge case, adapted to detect the presence of the cartridge case itself inside tray 2, sending the receiving signal to the control device. In the following embodiment contact portion 221 is preferably a metallic element that is hinged so as to rotate around an axis, which is preferably perpendicular with respect to the longitudinal axis of - the cartridge case inserted in tray 2.

[0035] The rotation of contact portion 221, through a first lever mechanism, activates such a retention device 22, which transmits the signal of received cartridge case to the control device.

[0036] Braking device 23 is adapted to slow down the cartridge case, from firing chamber 12, in its insertion inside tray 2, preferably after sending the receiving signal towards the control device by cartridge case retention device 22.

[0037] Such a braking device 23 makes it possible to avoid collisions between the cartridge case and the bottom of tray 2, in any case allowing retention device 22 to detect the presence of the cartridge case inside tray 2.

[0038] In embodiment illustrated in figure 6B, braking device 23 preferably comprises a contact plate 231, a second lever mechanism 232, connected to a damper 233.

[0039] Said plate 231, rotating around a pin with an axis that is preferably perpendicular to the longitudinal axis of the cartridge case, comes into contact with the bottom of the cartridge case and thanks to the lever mechanism, connected to damper 233, it slows down cartridge case.

[0040] A buffer 25, for example in rubber, is applied to the bottom of tray 2, said buffer being adapted to soften impacts of the cartridge cases if they have not been sufficiently slowed down by braking device 23.

[0041] When the receiving signal is received by the control device it activates movement mechanism 3, in a way such as to pass from position "A" to position "C" passing by position "B", which is preferably about half way between the other two positions.

[0042] With such a system, the firing frequency of firearm 1 is increased, since the different shooting steps of firearm 1 are carried out almost simultaneously. In the illustrated embodiment, position "C" is preferably at a rotation of about 130° of tray 2 with respect to position "A"; consequently, position "B" is preferably at a rotation of about 60° of tray 2 with respect to position "A".

[0043] The movement of movement mechanism 3, on tray 2, is preferably decelerated when approaching stroke end, more precisely when approaching position "A" and in position "C", so as to avoid impact between parts, and so as to reduce oscillations of tray 2.

[0044] Such oscillations would be harmful, since they could propagate to the devices interacting with the evacuation system, making the system less stable. Tray 2, once it has reached position "C", is freed from the cartridge case that was previously contained in the tray itself, by expulsion mechanism 5, which comprises a rigid tube 51, adapted to channel the cartridge case to be expelled, at least an expulsion actuator 52, preferably hydraulic, adapted to thrust the cartridge case from tray 2 towards tube 51, through at least one thrust portion 521 comprised in actuator 52 itself.

[0045] Rigid tube 51 is preferably fixed above breech 14 so as to not get in the way of the various devices comprised in the firearm.

[0046] Said actuator 52 is placed in a position such as to not get in the way of the rotation of tray 2, preferably parallel to tube 51. It is supported above tray 2 through at least one support rod 54 preferably fixed both to tube 51 and to box-shaped structure 11.

[0047] Thrust portion 521, also positioned so as to not get in the way of the movement of tray 2, is fixed both to actuator 52 and to at least one sliding block 522 adapted to slide along a guide together with such a portion 521, along the support rod 54 when actuator 52 is activated.

[0048] When tray 2 is in position "C", aligned with tube 51, a signal for the expulsion positioning reaches the control device.

[0049] Once the control device has received the positioning signal, it activates actuator 52, which is in the point of maximum extension, moving portion 521, which is channelled in a slit 24 in tray 2.

[0050] Such a slit 24 is preferably formed along the entire length of tray 2, so as to allow thrust portion 521 to expel the cartridge case from tray 2 itself more easily. said portion 521 presses against the bottom of the cartridge case thrusting it from tray 2 towards tube 51. Expulsion mechanism 5 also comprises a further anti-return device 53, which activates in the case in which the thrust of actuator 52 on the cartridge case is not enough to thrust it beyond tube 51.

[0051] Said device 53 consists of a lock portion 531, which is placed inside tube 51 in the case in which the cartridge case returns towards tray 2, because the thrust from actuator 52 was not strong enough to make it come out from tube 51.

[0052] Said device is advantageous in the case in which firearm 1 is at a high angle of inclination, in which the thrust of actuator 52 can be insufficient for the cartridge case to pass beyond tube 51.

[0053] When the cartridge case is expelled from the tray 2, the control device receives a signal of successful expulsion in this way giving tray 2 consent to return to position "A" so as to receive another cartridge case.

[0054] The control device activates movement mechanism 3 so as to pass from position "C" to the position "A" passing by position "B".

[0055] When passing from the second position (C) to the first position (A) of tray 2, the control device, in the case in which the loading mechanism is still performing its operating steps, makes it possible for the loading mechanism to terminate its operating steps, before allowing movement mechanism 3 to make tray 2 return, to the first position (A), so as to receive a new cartridge case.

[0056] In the following embodiment, before reaching position "A", in the aforementioned case, movement mechanism 3 is slowed down, once position "B" has been reached, by means of a bypass valve.

[0057] The movement from position "C" towards position "A" of tray 2 is slowed down as much as possible allowing the loading mechanism to terminate its operating steps without causing interference or impacts between the various mechanisms.

[0058] The slowing down of the descent preferably occurs by reducing the pressure in an oleodynamic circuit connected to actuator 31 by opening the bypass valve.

[0059] A further embodiment foresees for example stopping tray 2 in position "B", staying in position "B" until the control device receives the signal of end of loading, from the loading mechanism.

[0060] Once such a command has been received, the control device activates movement mechanism 3 so as to bring tray 2 from position "B" towards position "A".

[0061] In the case in which movement mechanism 3 fails to operate the system for evacuating cartridge cases comprises a safety mechanism which is adapted to free tray 2, in position "A", from the resistance that actuator 31, by not operating, exerts on such a tray 2 making the movement of such a tray 2 idle around pin 111. Said solution prevents such a tray 2 from getting in the way of the loading mechanism when new ammunition is to be loaded in firearm 1.

[0062] Said safety mechanism comprises at least one relief valve connected to the oleodynamic circuit that controls actuator 31.

[0063] Such a relief valve, preferably a maximum pressure valve, is activated only in the case in which the loading mechanism reaches a certain operating step without such a tray 2 being moved from position "A". Going into details, when the loading mechanism presses against

tray 2, the relief valve opens due to the increase in pressure inside the oleodynamic circuit of actuator 31 that opposes such a movement of tray 2.

[0064] The relief valve is opened, emptying out the oleodynamic circuit of actuator 31, since the limit pressure of such a valve is exceeded, preferably 20 Bar.

[0065] Once such a valve has been opened the oleodynamic circuit of actuator 31 is discharged making tray 2 idle in the movement around pin 111.

[0066] The operating steps of the loading mechanism, in the aforementioned case, do not stop but rather continue loading new ammunition.

[0067] In such a situation, tray 2 is physically moved, for example to position "B", by the structure of the loading mechanism, since tray 2 is free to move.

[0068] Tray 2 is kept in such a position until the loading mechanism terminates its operating steps after which tray 2 goes back down into position "A" since it is still idle.

[0069] After the projectile has been loaded in such a condition an alarm is activated by the control circuit which indicates malfunctioning of mechanism 3, the emptying out of the oleodynamic circuit of actuator 31 and the idle movement of tray 2.

[0070] Said solution makes it possible to move for example tray 2 into position "B" without causing irreparable damage due to the impact between mechanisms. In alternative embodiments a safety actuator is also comprised which, connected to an oleodynamic circuit, moves tray 2, for example to position "C" or position "B", in the case of malfunctioning of movement mechanism 3, after the relief valve has released tray 2, exploiting for example part of the power of the loading mechanism.

[0071] With such a system for evacuating cartridge cases it is possible to increase the firing frequency of a firearm 1, since the step of evacuating the cartridge case from firing chamber 12 is carried out almost simultaneously with the step of loading new ammunition by the loading mechanism.

[0072] With such an evacuation system, the step of loading a new projectile occurs with a very slight delay that corresponds to the time it takes the cartridge case to come out summed to the time it takes tray 2 to reach position "B", since after such a position the system for evacuating cartridge cases does not get in the way of the loading mechanism.

REFERENCE NUMBERS

[0073]

Firearm 1
Box-shaped structure 11
Pin 111
Support flange 112
Firing chamber 12
Barrel 13
Breech 14
Tray 2
Hooking portion 21
cartridge case-retention device 22
Contact portion 221
Braking device 23
Contact plate 231
Lever mechanism 232
Damper 233
Slit 24
Buffer 25
Movement mechanism 3
Movement actuator 31
Gear mechanism 32
cartridge case expulsion mechanism 5
Rigid tube 51
Expulsion actuator 52
Thrust portion 521
Sliding blocks 522
Anti-return device 53
Lock portion 531
Support rod 54
Position A
Position B
Position C
Axis X

Claims

1. System for evacuating cartridge cases, applied to a firearm (1), said firearm comprising a loading mechanism, a breech (14), and a firing chamber (12) in which the projectile that will come out through a barrel (13) is fired;
said evacuation system comprising an evacuation tray (2), for receiving the cartridge case following upon deflagration of an ammunition, and a movement mechanism (3), for moving said tray (2);
the movement mechanism (3) being configured to turn the evacuation tray (2) about an axis (X), parallel to the axis of the barrel (13) of the firearm (1), in a preset and appropriately cadenced way, passing from a first position, where the cartridge case is received, to a second position, where the cartridge case is expelled by an expulsion mechanism (5), and vice versa;
said system being **characterized in that** it comprises a safety mechanism for moving the evacuation tray (2) in the event of malfunctioning of the movement mechanism (3), thus preventing onset of damage consequent upon the impact of the tray (2) with the loading mechanism.

2. System according to claim 1, wherein the movement mechanism (3) comprises a movement actuator (31) for the evacuation tray (2), which acts, via a gear mechanism (32), on the tray (2) itself, in such a way that the movements of the tray (2) will be synchronized with the rest of the mechanisms implemented

in the firearm (1).

3. System according to claim 2, wherein the movement mechanism (3) is preferably decelerated as it approaches stroke end to prevent any impact and to reduce the oscillations of the evacuation tray (2).

4. System according to claim 1, wherein the evacuation tray (2) comprises a cartridge case - retention device (22), for generating a signal of reception of the cartridge case when the latter is in the tray (2).

5. System according to claim 1, wherein the evacuation tray (2) comprises a braking device (23), for decelerating the cartridge case coming from the firing chamber (12) when it is entering the tray (2).

6. System according to claim 2, wherein, once the evacuation tray (2) has reached the second position, the cartridge case contained therein is disengaged by the expulsion mechanism (5), which comprises a rigid tube (51), adapted for channeling the cartridge case for its final expulsion, and at least one actuator (52), for thrusting the cartridge case from the evacuation tray (2) towards the tube (51), via at least one thrust portion (521).

7. System according to claim 6, wherein the expulsion mechanism (5) comprises an anti-return device (53), including a blocking portion (531), for interposing itself within the tube (51), in the case where the cartridge case returns towards the evacuation tray (2).

8. System according to claim 6, wherein in the passage from the second position to the first position of the evacuation tray (2), in the case where the loading mechanism is still performing its operating steps, the loading mechanism terminates its operating steps before the movement mechanism (3) causes return of the tray (2) to the first position to receive a new cartridge case.

9. System according to claim 1, wherein the safety mechanism comprises at least one relief valve, comprised in an oleodynamic circuit connected to the actuator (31), which is activated, emptying said oleodynamic circuit, only in the case where the evacuation tray (2) is still in the first position when the loading mechanism reaches a given operating step, making the tray (2) idle in rotation about the pin (111).

Patentansprüche

1. System zum Entleeren von Patronenhülsen, das auf eine Schusswaffe (1) angewendet ist, wobei die Schusswaffe einen Lademechanismus, einen Verschluss (14) und eine Schusskammer (12) umfasst, in der das Geschoss abgeschossen wird, das durch einen Lauf (13) herauskommt;
wobei das Entleerungssystem eine Entleerungsschale (2) zum Aufnehmen der Patronenhülse im Anschluss an die Deflagration einer Munition und einen Bewegungsmechanismus (3) zum Bewegen der Schale (2) umfasst;
wobei der Bewegungsmechanismus (3) zum Drehen der Entleerungsschale (2) um eine Achse (X) parallel zur Achse des Laufs (13) der Schusswaffe (1) auf vorgegebene Art und Weise und mit zweckmäßiger Feuergeschwindigkeit konfiguriert ist, wobei er aus einer ersten Position, in der die Patronenhülse aufgenommen ist, zu einer zweiten Position läuft, in der die Patronenhülse durch einen Ausstoßmechanismus (5) ausgestoßen wird, und umgekehrt;
wobei das System **dadurch gekennzeichnet ist, dass** es einen Sicherheitsmechanismus zum Bewegen der Entleerungsschale (2) im Falle einer Fehlfunktion des Bewegungsmechanismus (3) umfasst, wodurch der Beginn einer Beschädigung infolge des Aufpralls der Schale (2) auf den Lademechanismus verhindert ist.

2. System nach Anspruch 1, wobei der Bewegungsmechanismus (3) ein Bewegungsbetätigungselement (31) für die Entleerungsschale (2) umfasst, das derart über einen Getriebemechanismus (32) auf die Schale (2) selbst einwirkt, dass die Bewegungen der Schale (2) mit dem Rest der Mechanismen, die in der Schusswaffe (1) implementiert sind, synchronisiert ist.

3. System nach Anspruch 2, wobei der Bewegungsmechanismus (3) vorzugsweise verlangsamt wird, wenn er sich an das Hubende annähert, um jeglichen Aufprall zu verhindern und die Schwingungen der Entleerungsschale (2) zu verringern.

4. System nach Anspruch 1, wobei die Entleerungsschale (2) eine Patronenhülsenrückhaltevorrichtung (22) zum Erzeugen eines Aufnahmesignals der Patronenhülse, wenn sich letztere in der Schale (2) befindet, umfasst.

5. System nach Anspruch 1, wobei die Entleerungsschale (2) eine Bremsvorrichtung (23) zum Verlangsamen der Patronenhülse, die von der Schusskammer (12) kommt, wenn sie in die Schale (2) eintritt, umfasst.

6. System nach Anspruch 2, wobei, wenn die Entleerungsschale (2) die zweite Position erreicht hat, die darin enthaltene Patronenhülse durch den Ausstoßmechanismus (5) ausgerückt wird, der ein starres Rohr (51), das zum Kanalisieren der Patronenhülse zu ihrem endgültigen Ausstoß geeignet ist, und zumindest ein Betätigungselement (52) zum

Schieben der Patronenhülse von der Entleerungsschale (2) über zumindest einen Schubabschnitt (521) zum Rohr (51) hin umfasst.

7. System nach Anspruch 6, wobei der Ausstoßmechanismus (5) eine Rückkehrsperrvorrichtung (53) umfasst, die einen Blockierabschnitt (531) enthält, zum Einschieben derselben innerhalb des Rohrs (51) in dem Falle, in dem die Patronenhülse zur Entleerungsschale (2) zurückkehrt.

8. System nach Anspruch 6, wobei beim Durchlauf der Entleerungsschale (2) von der zweiten Position zur ersten Position in dem Falle, in dem der Lademechanismus immer noch seine Betriebsschritte durchführt, der Lademechanismus seine Betriebsschritte beendet, bevor der Bewegungsmechanismus (3) die Rückkehr der Schale (2) zur ersten Position zum Aufnehmen einer neuen Patronenhülse bewirkt.

9. System nach Anspruch 1, wobei der Sicherheitsmechanismus zumindest ein Entlastungsventil umfasst, das in einem öldynamischen Kreis umfasst ist, welcher mit dem Betätigungselement (31) verbunden ist, und das nur in dem Fall aktiviert wird, und den öldynamischen Kreis leert, wenn die Entleerungsschale immer noch in der ersten Position ist, wenn der Lademechanismus einen jeweiligen Betriebsschritt erreicht, wodurch die Schale (2) in der Drehung um den Stift (111) leerlaufend hergestellt ist.

Revendications

1. Système destiné à évacuer les douilles, appliqué à une arme à feu (1), ladite arme à feu comprenant un mécanisme de chargement, une culasse (14) et une chambre de mise à feu (12), dans laquelle le projectile qui sortira à travers un canon (13) est tiré,
ledit système d'évacuation comprenant un plateau d'évacuation (2) pour recevoir la douille après déflagration d'une munition et un mécanisme de déplacement (3) pour déplacer ledit plateau (2),
le mécanisme de déplacement (3) étant configuré pour tourner le plateau d'évacuation (2) autour d'un axe (X), parallèle à l'axe du canon (13) de l'arme à feu (1) d'une manière préalablement définie et rythmée de façon appropriée, en passant d'une première position où la douille est reçue, à une deuxième position où la douille est expulsée par un mécanisme d'expulsion (5) et vice versa ;
ledit système étant **caractérisé en ce qu'**il comprend un mécanisme de sécurité pour déplacer le plateau d'évacuation (2) en cas de dysfonctionnement du mécanisme de déplacement (3), évitant ainsi l'apparition d'un dommage consécutif au choc du plateau (2) avec le mécanisme de chargement.

2. Système selon la revendication 1, dans lequel le mécanisme de déplacement (3) comprend un actionneur de déplacement (31) pour le plateau d'évacuation (2) qui agit via un mécanisme à engrenage (32) sur le plateau (2) lui-même, de telle manière que les déplacements du plateau (2) seront synchronisés avec le reste des mécanismes mis en oeuvre dans l'arme à feu (1).

3. Système selon la revendication 2, dans lequel le mécanisme de déplacement (3) est de préférence décéléré lorsqu'il s'approche de la fin de course pour éviter tout choc et réduire les oscillations du plateau d'évacuation (2).

4. Système selon la revendication 1, dans lequel le plateau d'évacuation (2) comprend un dispositif de retenue de douille (22) pour générer un signal de réception de la douille lorsque cette dernière est dans le plateau (2).

5. Système selon la revendication 1, dans lequel le plateau d'évacuation (2) comprend un dispositif de freinage (23) destiné à décélérer la douille venant de la chambre de mise à feu (12) lorsqu'elle entre dans le plateau (2).

6. Système selon la revendication 2, dans lequel une fois que le plateau d'évacuation (2) a atteint la deuxième position, la douille contenue dans celui-ci est désengagée par le mécanisme d'expulsion (5), qui comprend un tube rigide (51) adapté pour acheminer la douille pour son expulsion finale et au moins un actionneur (52) pour pousser la douille du plateau d'évacuation (2) vers le tube (51) via au moins une partie de poussée (521).

7. Système selon la revendication 6, dans lequel le mécanisme d'expulsion (5) comprend un dispositif antiretour (53) incluant une partie de blocage (531) pour s'interposer elle-même dans le tube (51) au cas où la douille revient vers le plateau d'évacuation (2).

8. Système selon la revendication 6, dans lequel dans le passage de la deuxième position à la première position du plateau d'évacuation (2), au cas où le mécanisme de chargement effectue encore ses phases de fonctionnement, le mécanisme de chargement termine ses phases de fonctionnement avant que le mécanisme de déplacement (3) déclenche le retour du plateau (2) à la première position pour recevoir une nouvelle douille.

9. Dispositif selon la revendication 1, dans lequel le mécanisme de sécurité comprend au moins une soupape de sûreté, comprise dans un circuit oléodynamique raccordé à l'actionneur (31) qui est actionné, vidant ledit circuit oléodynamique, uniquement au

cas où le plateau d'évacuation (2) se trouve encore dans la première position lorsque le mécanisme de chargement atteint une phase de fonctionnement donnée, rendant le plateau (2) inactif en rotation autour de l'axe (111).

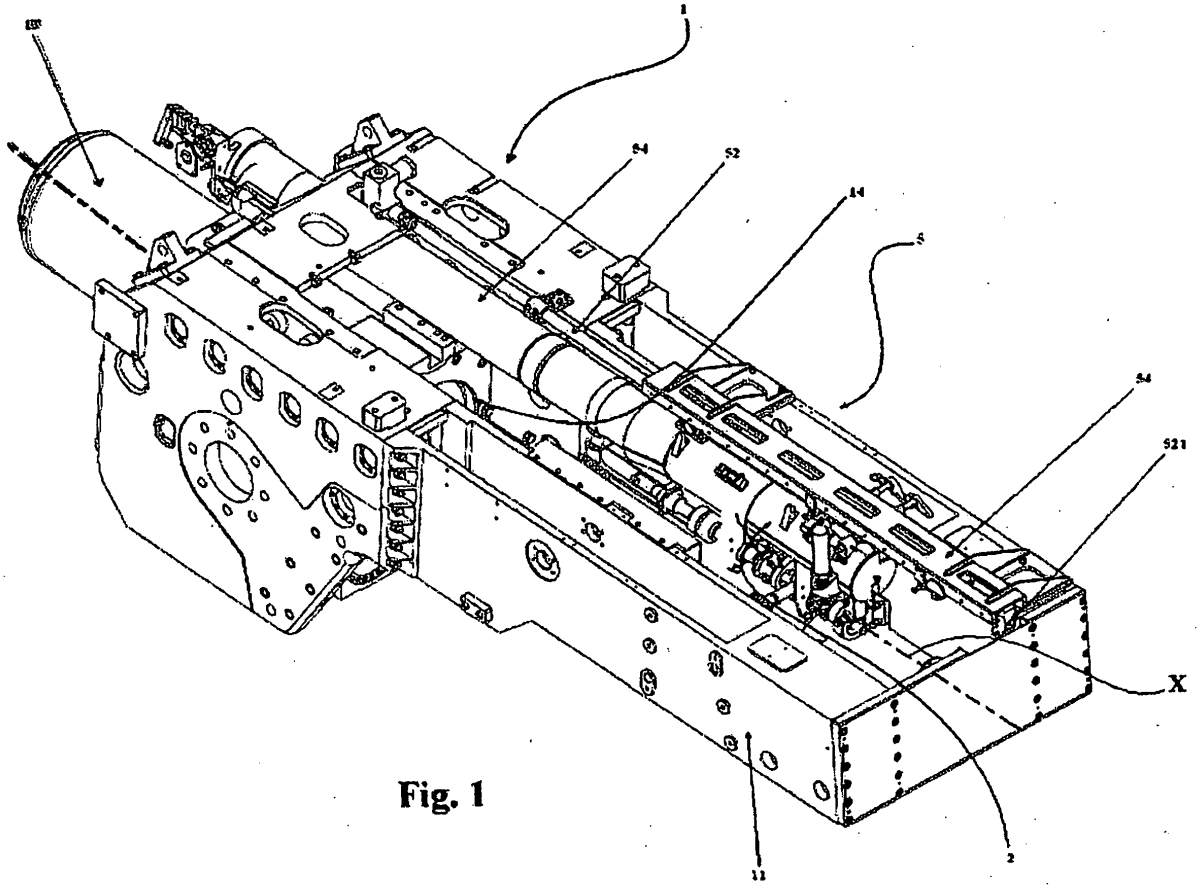

Fig. 1

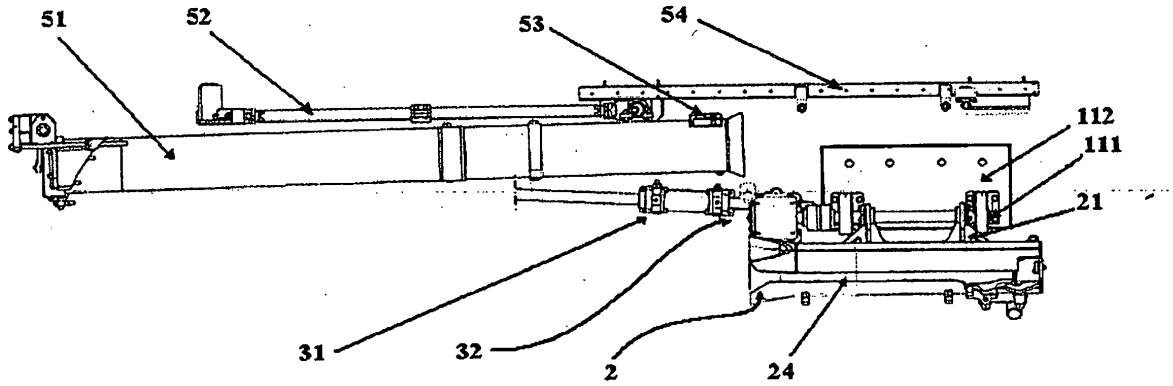

Fig. 2

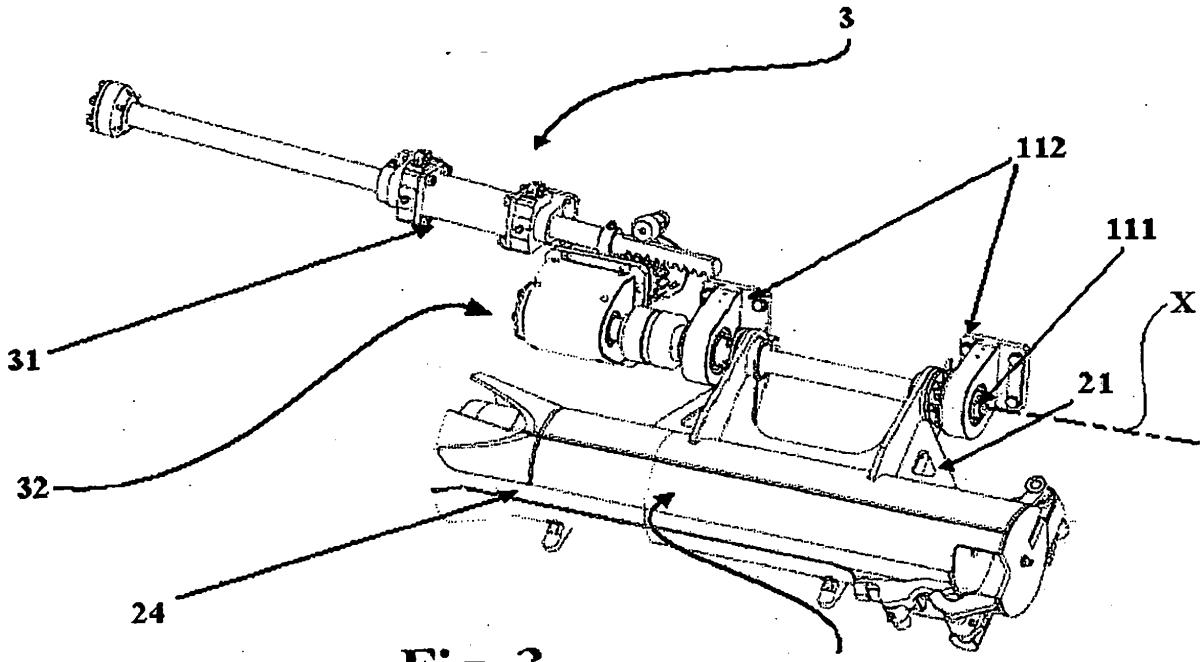

Fig. 3

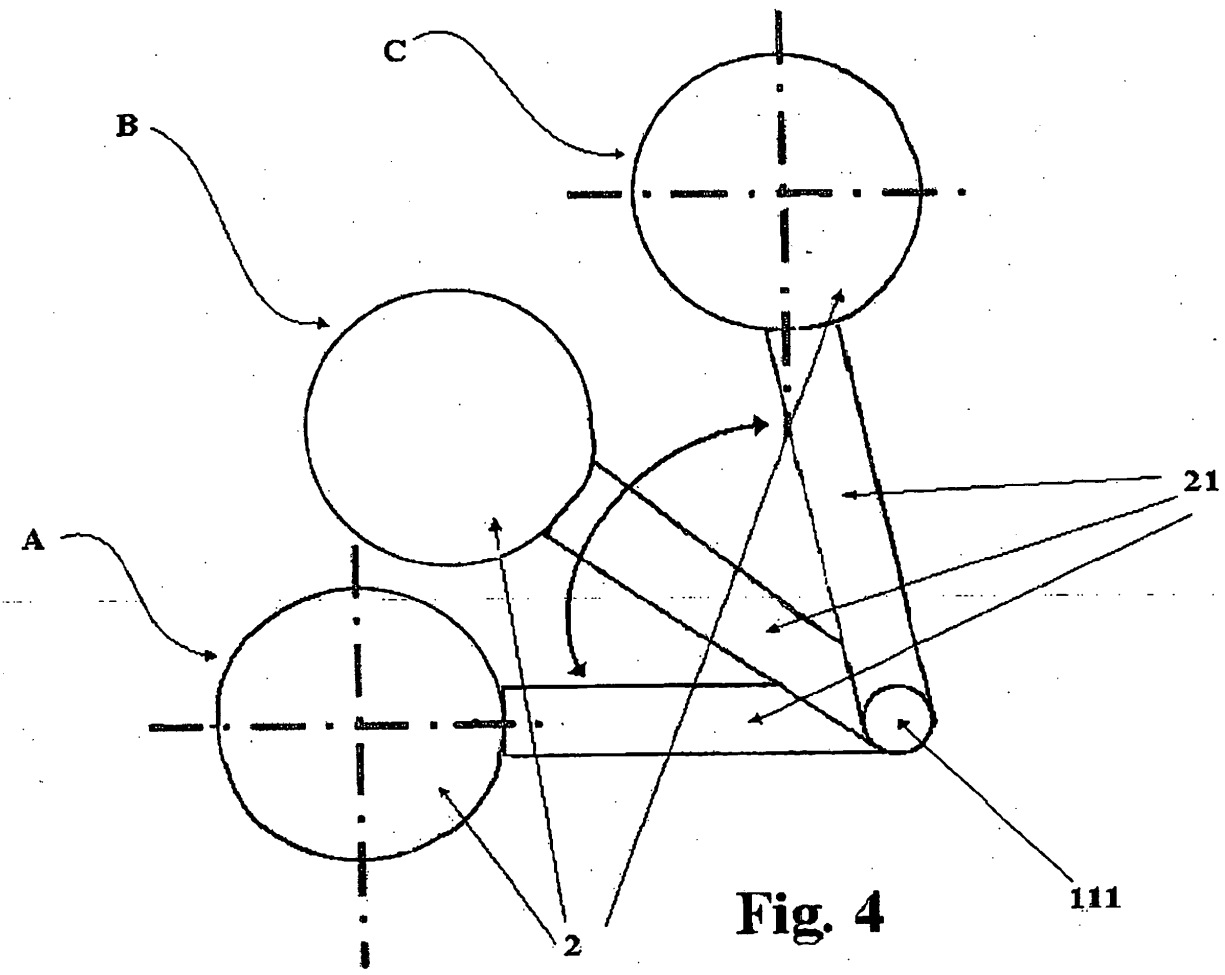

Fig. 4

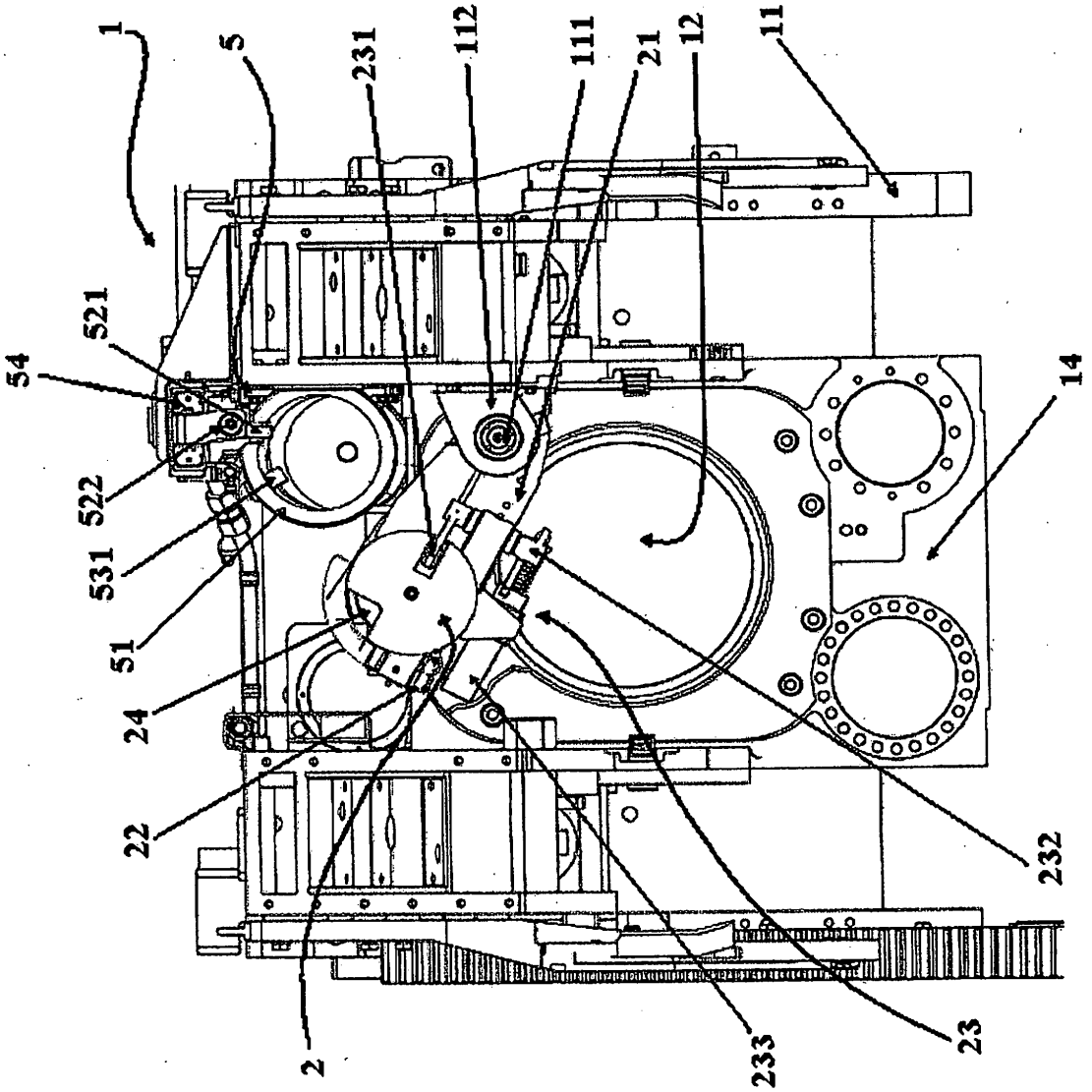

Fig. 5

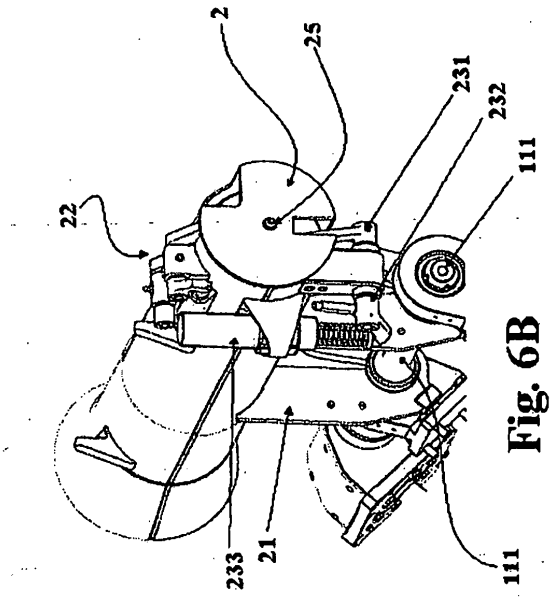

Fig. 6B

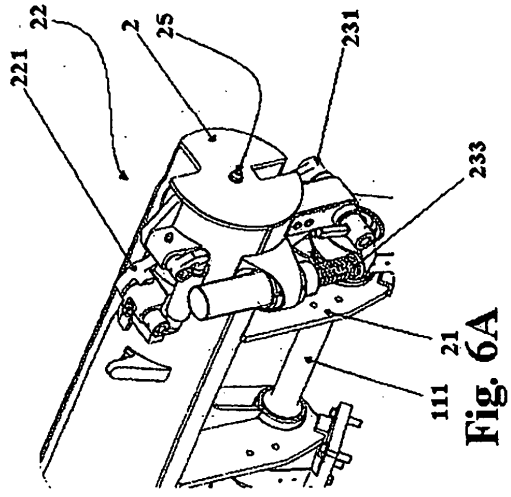

Fig. 6A

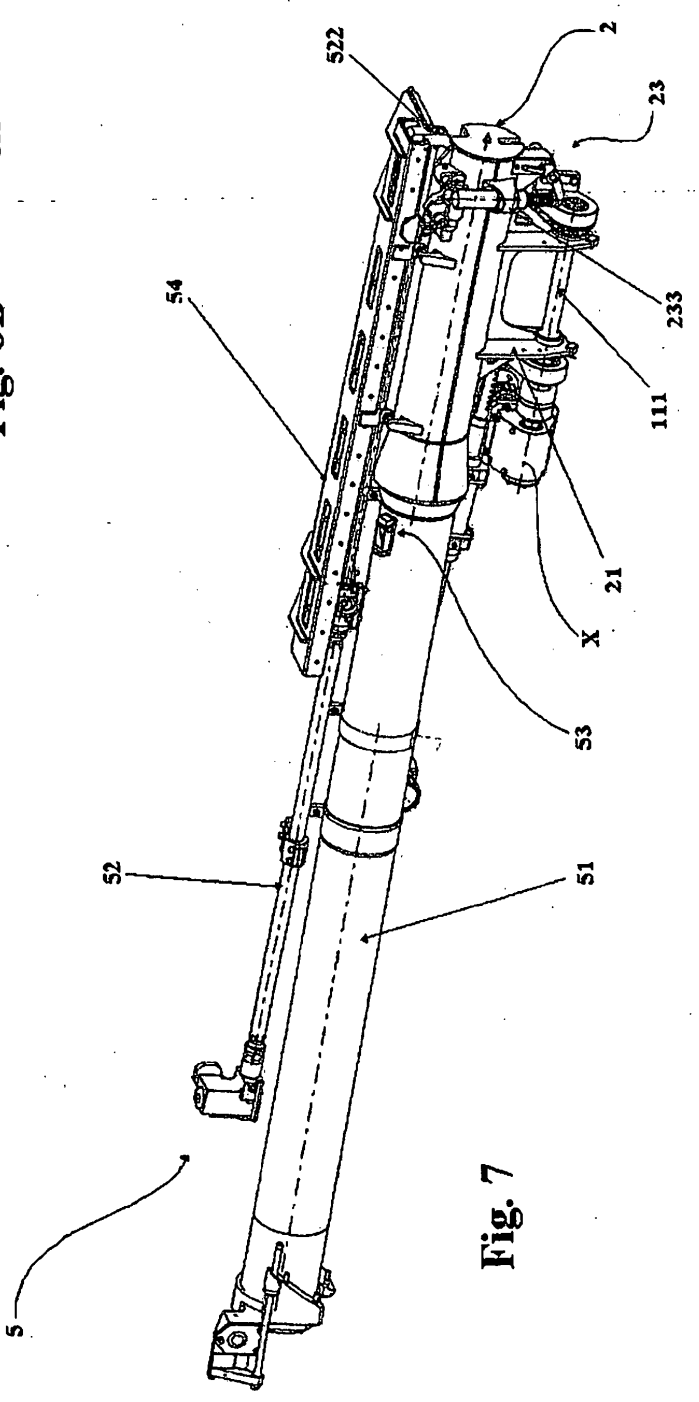

Fig. 7

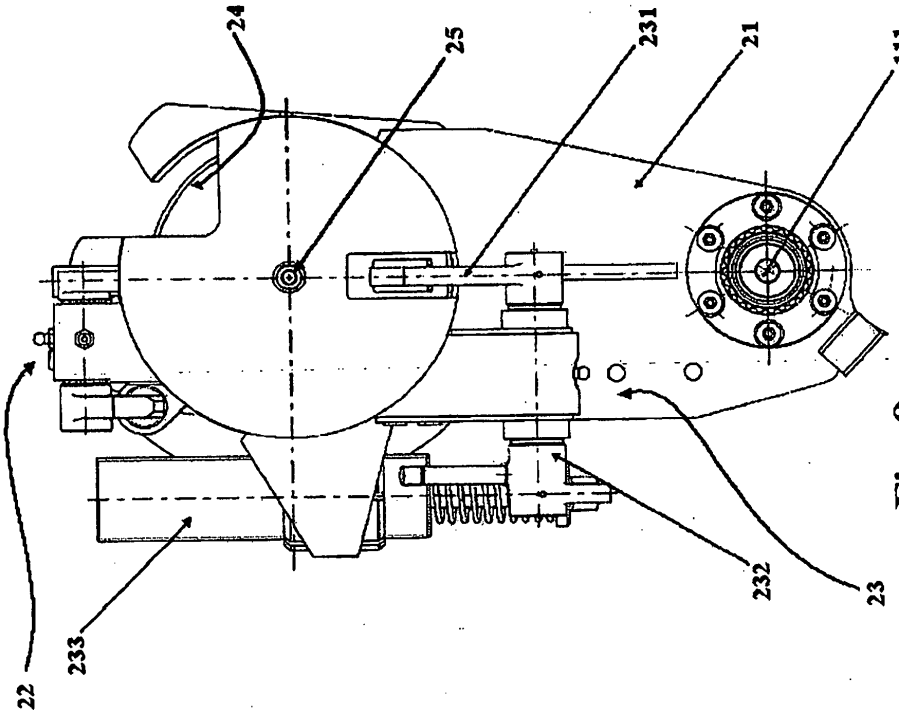
24
25
231
21
111
22
233
232
23

Fig. 9

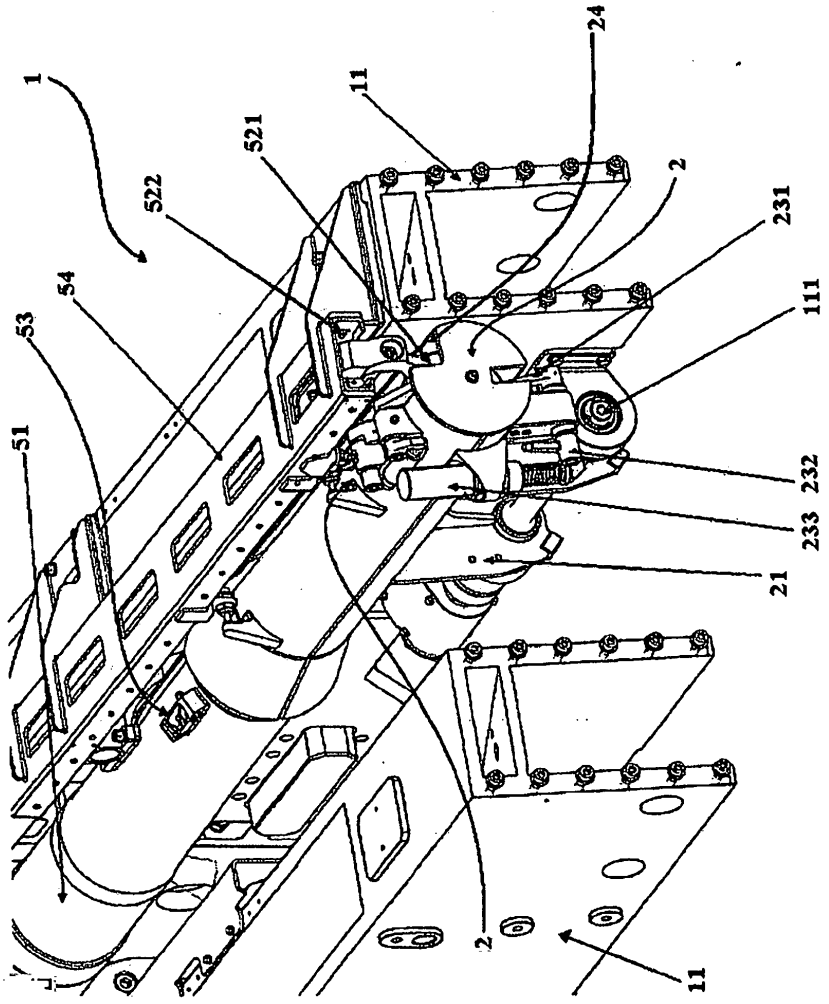
1
24
11
521
522
2
231
54
111
53
51
232
233
21
2
11

Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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