【CLAIMS】

【Claim 1】

A hydraulic actuator employing a limit adjustable mechanical lock, the hydraulic actuator comprising:

a housing having a first hole to receive a piston, which is formed at one side thereof with a rack gear to be engaged with a pinion gear fixing a valve shaft, such that the piston is movable by a predetermined distance in the first hole, wherein both ends of the piston are recessed by a predetermined depth, and ball insertion grooves are formed in inner circumferential surfaces of recess parts,

side covers coupled to opposite sides of the housing and having holder insertion holes to be open toward a first hole of the housing, wherein opposite end faces in opposition to the housing are screwed with plugs to block the holder insertion holes from an outside,

a first holder in which one side of an outer circumferential surface of the first holder is inserted into the holder insertion hole in the side cover positioned at a side of the plug through screw-coupling with an inner circumferential surface of the side cover, and the first holder has a second hole hollowed and open toward the first hole, wherein hydraulic pressure is introduced or discharged through the second hole,

a second holder having one end screwed with the second

hole in the first holder while the second holder is fitted-coupled to the inner circumferential surface of the side cover, having a third hole open toward the first hole, and having an end face which is positioned at a side of the second hole and bored with an inner diameter smaller than a diameter of the second hole,

a locking unit having a rod inserted into the second hole and the third hole of the first holder and the second holder, respectively, while passing through a fourth hole of the second holder such that the rod is axially movable by a predetermined distance, wherein the rod allows a ball to be separated from the ball insertion hole of the piston by hydraulic pressure, which is applied to the first holder and equal to or greater than predetermined pressure, to unlock the piston and allows the ball to be inserted into the ball insertion hole of the piston by spring elastic force to lock the piston, and

a fluid passage extending from the housing to each of the side covers provided at the opposite sides of the housing such that the hydraulic pressure is selectively applied to first holes and second holes formed in both sides of the side covers and the housing.

【Claim 2】

The hydraulic actuator of claim 1, wherein the locking

unit comprises:

the rod provided in the first holder and the second holder such that the rod is axially movable, and having a locking step formed on an outer circumferential surface of one portion of the rod inserted into the second hole to axially move by the predetermined distance by a first spring elastically mounted in an end portion positioned at the side of the second hole or the hydraulic pressure applied to the second hole,

a ball guide allowing the rod to pass through the second holder, wherein an end portion of an outer circumferential surface of the ball guide is screwed with an inner circumferential surface of the second holder, which is positioned at a side of the fourth hole, and one end portion of the outer circumferential surface of the ball guide, which is positioned at a side of the first hole, has a plurality of balls arranged at regular intervals,

an inner ball guide inserted into a guide groove formed to expand an inner diameter of the end portion of the ball guide, which is positioned at the side of the first hole, along a predetermined length, shaft-supported on a front end of the rod, which is positioned at the side of the second hole, to be prevented from deviating from the guide groove by a stop ring, and elastically supported toward the stop ring by a second spring, and

an outer ball guide axially movably interposed between the outer circumferential surface of the ball guide and the inner circumferential surface of the second holder, preventing from deviating from a front end of the ball guide, and elastically supported toward the first hole by a third spring.

【Claim 3】

The hydraulic actuator of claim 2, wherein the locking step of the rod is formed in at least two stages such that an outer circumferential surface of the rod, which is inserted into the second hole, is greater than the fourth hole and a space having a predetermined width is formed in association with an end face of the second holder to introduce the hydraulic pressure.

【Claim 4】

The hydraulic actuator of claim 2, wherein the ball guide includes a portion, into which the balls are inserted, from an end portion of the housing at the side of the first hole such that an outer diameter of an outer circumferential surface, which has a predetermined length, of the ball guide is more expanded, and

wherein an inner diameter of an inner circumferential surface of the outer ball guide is expanded along a

predetermined length corresponding to the outer circumferential surface of the ball guide having the outer diameter expanded from the end portion of the housing at the side of the first hole.

【Claim 5】

The hydraulic actuator of claim 2, wherein the inner ball guide is configured such that an outer circumferential surface of an end portion thereof, which is supported by a stop ring, has a smaller outer diameter along a predetermined length, and a boundary surface stepped between outer circumferential surfaces is gently inclined.