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(54) **Cap clamping system**

(57) The present invention relates to a cap clamping system (10) which indicates that quality and safety con-

trols are made and that nobody has previously used it, and enables preferably hologram cups to be placed automatically onto the gas bottles (80).

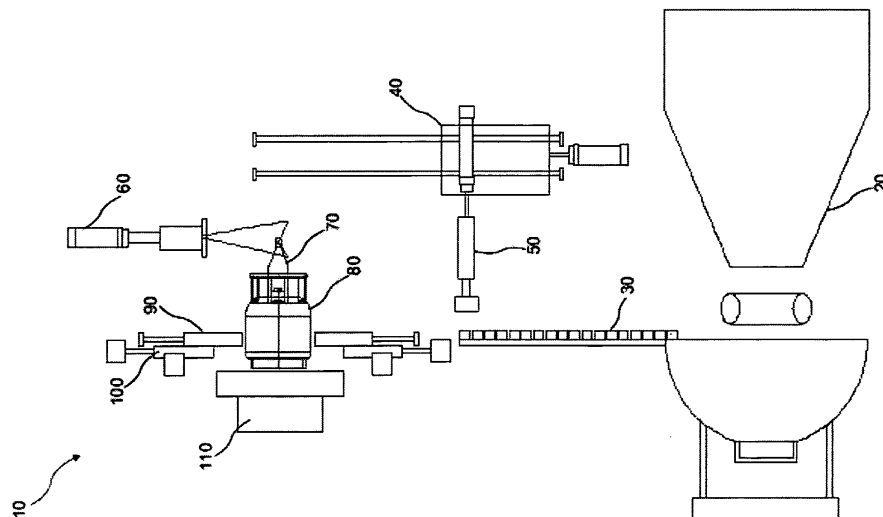


Figure 1

## Description

### Field of the Invention

[0001] The present invention relates to a cap clamping system which indicates that quality and safety controls are made and that nobody has previously used it, and enables preferably hologram caps to be placed automatically onto the gas bottles.

### Prior Art

[0002] In making product preferences, consumers prefer that the product to be purchased has firstly passed safety controls, has been tested for quality control and has not been previously used by anyone. Producers have developed some applications in order to provide guarantee for the issues such as quality and safety which are important for the consumer. The most prominently used application for the gas bottles is hologram caps. Hologram caps indicate that quality control tests of the product have been made, safety conditions are provided and it will be used for the first time, which assures the consumer.

[0003] In the gas bottle production and/or filling plants, there are various cap embodiments for informing the consumer. In the plants, said caps are mounted manually. This results in labor and cost losses.

[0004] There are some automated systems for clamping caps of various kinds of products other than the gas bottle; however, it is impossible to apply said cap clamping systems to gas bottle since these products (such as plastic bottle) have different sizes and physical structures completely different than the gas bottles.

[0005] In JP1157851, one of the applications in the state of the art, a hologram foil thermal transfer apparatus is disclosed. The apparatus detects an alignment mark of a hologram and a pattern by means of a sensor. A fluctuating unit then leads the hologram to move toward the pattern.

[0006] In JP2006147113, another application in the state of the art, a position adjusting device is disclosed. Said apparatus accurately position a hologram unit in the predetermined position.

### Summary of the Invention

[0007] The objective of the present invention is to realize a cap clamping system which indicates that quality and safety controls are made and that nobody has previously used it, and enables the caps to be placed automatically onto the gas bottles.

### Detailed Description of the Invention

[0008] The cap clamping system realized to fulfill the objective of the present invention is illustrated in the accompanying figures wherein,

[0009] Figure 1 is the schematic view of the cap clamping system.

[0010] The components in the figures are numbered individually, where the numbers refer to the following:

- 5 10. Cap clamping system
- 20. Feeding unit
- 30. Cap
- 40. Cap clamping piston
- 10 50. Cap pressing piston
- 60. Positioning piston
- 70. Positioning housing
- 80. Gas bottle
- 90. Centering piston 1
- 15 100. Centering piston 2
- 110. Rotating plate

[0011] The inventive cap clamping system (10) essentially comprises

- 20 caps (30) which placed onto the gas bottle (80) and indicates that safety controls have been tested and nobody has been previously used,
- at least one feeding unit (20) in which the caps (30) are stored and provided when necessary,
- 25 at least one cap clamping piston (40) which moves in horizontal and vertical direction and brings the cap (30) into the place where it will be mounted,
- at least one cap pressing piston (50) which secures the cap (30) into the place where it is mounted on the gas bottle (80),
- 30 at least one positioning piston (60) which stipulates the positioning housing (70) which enables the valve to become in the desired position after the gas bottle (80) comes onto the rotating plate (110),
- 35 at least one positioning housing (70) which enables the valve to become in the desired position after the gas bottle (80) comes onto the rotating plate (110),
- at least one centering piston 2 (100) which centers the gas bottle (80) on the conveyor and carries the gas bottle (80) to the area on which the cap (30) is mounted,
- 40 at least one centering piston 1 (90) which allows the gas bottle (80) to rotate while centering the gas bottle (80),
- at least one rotating plate (110) which rotates the gas bottle (80) in preferred times.

45 [0012] In the filling and/or production plants, the gas bottle (80) to be filled is transferred to the storage region by means of the conveyor belts. The inventive system (10) is integrated into the transmission lines in the plants. In the inventive cap clamping system (10), the gas bottle (80) is taken from the conveyor, the cap (30) is placed and then the gas bottle (80) is put on this conveyor again. In addition, preferably a hologram cap indicating that quality and safety tests have been made and it will be used for the first time is mounted onto the gas bottle.

55 [0013] In the inventive cap clamping system (10), caps (30) are in the shape of hexagon as valves and are loaded into the feeding unit (20). Caps (30) are conveyed to the cap pressing piston (50) by means of conveyor belts. The

hexagonal valve of the gas bottle (80) and the hexagonal structure of the cap (30) should be overlapped.

**[0014]** In the inventive cap clamping system (10), the gas bottle (80) is centered while being carried on the conveyor belt. The gas bottle (80) is centered by the centering pistons (90,100). The centering piston 2 (100) centers the gas bottle (80), and conveys the same to the place where the cap (30) is mounted. After completing this process, the centering piston 2 (100) moves back to its previous position. The centering piston 1 (90) surrounds the gas bottle (80) so as to allow its rotation. The positioning housing (70) preferably in the shape of hexagon which is stimulated by the positioning piston (60) is fastened onto the valve. The gas bottle (80) is rotated by rotating plate (110) in this position. While rotating, the gas bottle (80) stops rotating upon fitting into the positioning housing (70), preferably in the shape of hexagon, even if the underlying rotating plate (110) keeps rotating. Thereby, the gas bottle is positioned as desired.

**[0015]** In the inventive cap clamping system (10), the rotating plate (110) stops after completion of positioning process. When the rotating plate (110) stops, the positioning piston (60) opens. After this stage, the cap pressing piston (50) receives the cap (30) to be mounted onto the gas bottle (80), and brings the cap (30) onto the valve by means of the cap clamping piston (40), preferably with a horizontal movement. When the cap (30) is onto the gas bottle, the cap pressing piston (50) fits the cap (30) onto the valve, preferably with a vertical movement. Thereby, the cap (30) is mounted onto the gas bottle. After completion of cap montage (30), the cap clamping and cap pressing pistons (40,50) return to their former positions. The centering piston 1 (90) puts the gas bottle (80) onto the conveyor belt, and the gas bottle (80) goes on moving on the conveyor belt.

**[0016]** The inventive cap clamping system (10) operates in full automatic manner by being controlled with a microprocessor control unit and/or PLC. Amount of the caps in the feeding unit (20) is controlled by the sensors, and a warning is given by the system (10) when cap amount decreases under the preferred level.

**[0017]** In an alternative embodiment of the invention, during the process of valve montage, the position of the valve is sensed via a sensor and the cap (30) is mounted by being turned instead of turning the gas bottle (80) in a certain position.

**[0018]** In another alternative embodiment of the invention, a camera and/or laser sensor controls whether the cap (30) is mounted accurately.

## Claims

1. A cap clamping system (10) essentially comprising caps (30) which are placed onto the gas bottle (80), and indicate that safety controls have been made and nobody has been previously used, at least one feeding unit (20) in which the caps (30)

are stored and provided when necessary, at least one cap clamping piston (40) which preferably moves in horizontal direction and carries the cap (30) into the pressing piston (50) which takes and mounts the cap (30),

at least one cap pressing piston (50) which secures the cap (30) into the place where it is mounted on the gas bottle (80), and **characterized by**

at least one positioning piston (60) which stipulates the positioning housing (70) which is fastened onto the valve after the gas bottle (80) comes onto the rotating plate (110),

at least one positioning housing (70) which enables the gas bottle to become in the desired position during rotation by being fastened on the valve,

at least one centering piston 2 (100) which centers the gas bottle (80) on the conveyor and carries the gas bottle (80) to the area on which the cap (30) is mounted,

at least one centering piston 1 (90) which allows the gas bottle (80) to rotate while centering the gas bottle (80),

at least one rotating plate (110) which rotates the gas bottle (80) in preferred times.

2. A cap clamping system (10) according to Claim 1, **characterized by** at least one positioning piston (60) and at least one positioning housing (70) preferably in the shape of hexagon which enable the gas bottle to be brought into a desired position by being fastened to the valve on the gas bottle (80).
3. A cap clamping system (10) according to Claims 1 and 2, **characterized by** at least one rotating plate (110) which enables the gas bottle to come into the desired position by rotating the gas bottle upon attachment of the positioning housing (70) onto the gas bottle (80).
4. A cap clamping system (10) according to claims 1 to 3, **characterized in that** in an alternative embodiment of the invention, during the process of cap montage, the position of the valve is sensed via a sensor and the cap (30) is mounted by being turned instead of turning the gas bottle (80) in a certain position.
5. A cap clamping system (10) according to Claims 1 to 4, **characterized in that** in another alternative embodiment of the invention, a camera and/or laser sensor controls whether the cap (30) is mounted accurately.

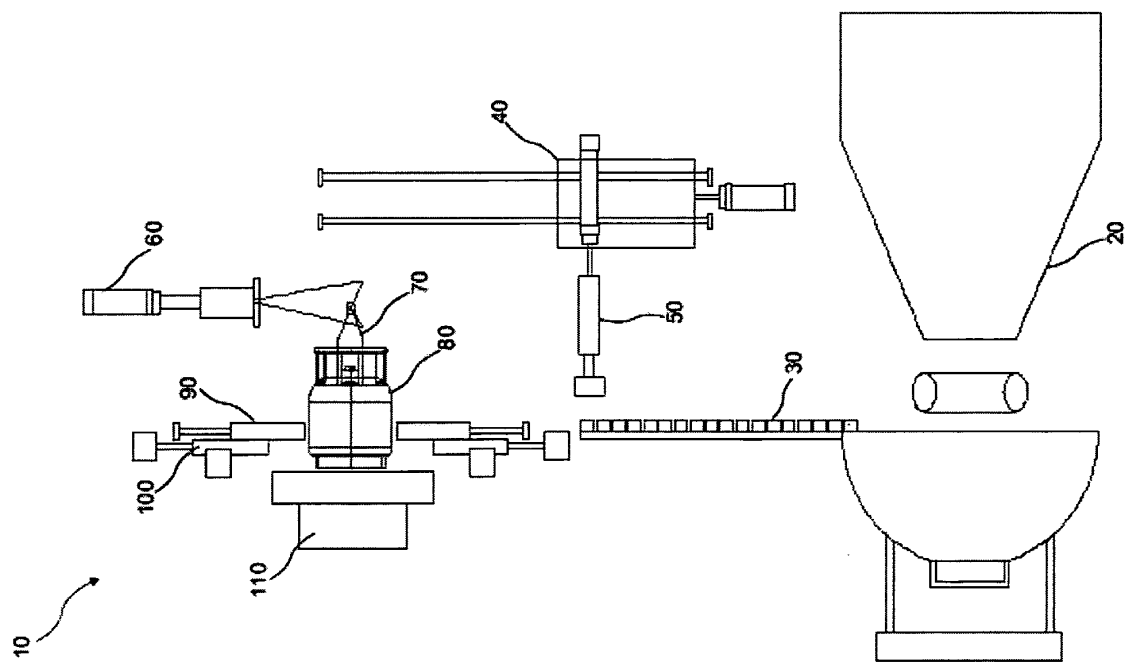


Figure 1

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- JP 1157851 A [0005]
- JP 2006147113 B [0006]