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(54) **Device for printing bar codes on liquid petroleum gas containers.**

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Description

The invention refers to a device for printing bar codes on liquid petroleum gas containers.

The containers of liquid petroleum gas (Butane/Propane), which henceforth will be symbolized by the letters L.P.G. are supplied with a charge of gas which is defined by its weight; or what is the same thing, the charge in the gas (L.P.G.) containers is measured in Kg.

Naturally, the filling of this charge requires the prior knowledge of the respective weight of the empty container which is given the name of "tare", with the object of subtracting this weight from the total once the container has been filled, and thus obtain the specific weight or charge of gas.

At the moment, the tare referred to is printed on the container, in arabic numerals, on the upper cap of the said container so that it can be read by the operator who will feed the data into the memory of the scales.

The said method of working means that the operator must pay complete attention, so that errors do not occur in reading, in such a way that it makes it necessary to systematically rotate the job to prevent tiredness produced by the level of attention required.

It is an object of the present invention to provide for a device reducing the need for human work in this respect.

Devices for marking round pieces such as barrels, tubes and the like on their peripheral surface are generally known. DE-U-8811937 discloses such a device comprising a printing unit mounted at a L- or U-shaped arm. Said arm is rotatably mounted on a support and may be rotated about a vertical axis by a motor. This device, however, is not specifically adapted to the present problem of printing bar codes on liquid petroleum gas containers and thus will be of unsatisfactory performance.

The device as defined in claim 1 solves above problem in a completely satisfactory way, a device by means of which the tare is marked on the container, using a bar code which is going to be read by an automatic instrument thus avoiding the human element.

Structurally and fundamentally, the device consists of an arm in an inverted "U" shape and revolving around the side surface of the container, an arm which is equipped with a printing head by means of a jet of ink, which will print several times and all around the perimeter of the container, the bar code corresponding to the tare weight.

The device also includes the means for moving that arm, and also the means to move the container into and out of the zone in which the printing really takes place, a means made up of a transporter, a retractable buffer, as well as an elevator and a

centering device for the container itself, to position it in the correct zone or spot.

To aid the better understanding of the characteristics of the invention, a detailed description is going to be made, based on a set of drawings which are attached to this descriptive memorandum, forming an integral part of it, and in which in a purely orientative and non-limiting way the following has been described:

In the 1st. diagram a frontal elevation schematic description of the whole of the printing device is shown.

In the 2nd. diagram an overhead view schematic description of the same device is shown.

In the 3rd. diagram, a side elevation view of the part corresponding to the gate which closes in that side, and in which is seen in profile the control panel or console, is shown.

In the said diagrams, the numbered references correspond to:

- 1.- General structure.
- 2.- Container entry zone.
- 3.- Containers.
- 4.- Transporter.
- 5.- Brake.
- 6.- Control console.
- 7.- Retractable buffer.
- 8.- Elevating mechanism.
- 9.- Centering unit.
- 10.- Revolving arm of the printing unit.
- 11.- Printing head.
- 12.- Shaft on which the arm (10) is mounted.
- 13.- Ball race of the shaft (12).
- 14.- Belt for turning the shaft (12).
- 15.- Rotating element fixed to the arm (10).

As can be seen in the diagrams, the complete device is composed of a general structure (1) in which an entry zone (2) for the containers (3) is defined to which they gain access on a transporter (4). In the entry zone (2) there is a brake (5) which holds the containers (3) whilst the operator feeds in the tare weight of the corresponding container on the control console (6). At that moment, the brake (5) frees the first container (3), closing again immediately after to hold the next one.

For its part, the transporter (4), makes the said container move forward as far as a retractable buffer (7) which stops it facing the printing unit, which further on will be described in full detail. Simultaneously with the arrival of the container (3), an elevating mechanism (8) lifts it off the transporter (4), so that it is not affected by the vibrations of the belt. Likewise, the buffer (7) withdraws and a centering unit (9) operates on the container (3) holding the latter stationary in a vertical position.

Then the printing unit or mechanism in the true sense of the word operates, this being comprised of an arm (10) in the shape of an inverted "U",

which incorporates the printing head (11) to print the bar code, a defined number of times all the way around the perimeter of the container (3), some centimetres below its equator.

The said arm (10) can revolve around the container (3) and it is held in place by the central part of its intermediate and upper arm by means of a shaft (12) which, resting in a ball race (13), can revolve freely. A belt (14) driven by a reduction motor allows the arm (10) to revolve alternately in clockwise and anti-clockwise directions, printing in this way once to the right and another time to the left.

Once the printing is completed, the centering unit (9) and the elevator (8) are withdrawn, freeing the container (3) which will be removed by the transporter (4), in such a way that the retractable buffer (7) will again be positioned awaiting the next container.

The revolving arm (10) incorporates a rotary element (15) by means of which it is possible to turn the arm (10) for cleaning of printing head (11) from outside.

Finally, it should be mentioned that the whole unit will be complemented by the addition of the reduction motor mentioned already, which will be controlled by a frequency converter which allows progressive accelerations and decelerations, it being a set of inductive sensors which define the start of the deceleration slope and the activation of the brake when the entry position is reached. An incremental codifier will define the distance between the vertical bars of the codes, independently of the speed of turning, which allows a uniform print to be made during acceleration, deceleration and travel at a rapid and steady speed.

Claims

1. Device for printing bar codes on liquid petroleum gas containers (3), comprising
 - an arm (10) in an inverted U-shape for straddling the container to be printed, said U-shaped arm being rotatable alternately in both directions around a vertical axis,
 - a motor for rotating said U-shaped arm (10),
 - a printing head (11) installed at one of the arms of said U-shaped arm (10),
 - a container entry zone (2) with a transporter (4) and a brake (5) for stopping the containers, allowing the sequential passage of each of them to
 - a retractable buffer (7) for immobilizing the container,
 - an overhead elevating unit (8) for lifting the immobilized container to be printed

- off the transporter (4) and
- a centering unit (9) for positioning the container.

2. Device according to claim 1, characterized in that the U-shaped arm (10) is attached to a shaft (12) which turns on ball bearings (13).
3. Device according to claim 1 or claim 2, characterized in that the U-shaped arm (10) is driven by an electric motor.
4. Device according to one of the claims 1 to 3, characterized in that the U-shaped arm (10) is fitted with an element (15) by means of which the arm (10) can be turned manually in order to clean the printing head (11).

Patentansprüche

1. Vorrichtung, um Barcodes auf Behälter zu drucken, die flüssiges Erdgas enthalten (3), welche folgendes enthält:
 - einen Arm (10) in umgekehrter U-Form, um den Behälter zu spreizen, damit er bedruckt werden kann, wobei der U-förmige Arm alternativ in beide Richtungen und eine vertikale Achse rotiert werden kann,
 - einen Motor, um den besagten U-förmigen Arm zu rotieren (10),
 - einen Druckkopf (11), der an einem der Arme des besagten U-förmigen Arms (10) installiert ist,
 - eine Eingangszone für Behälter (2) mit einem Transporter (4) und einer Bremse (5), um die Behälter aufzuhalten und somit den folgerichtigen Durchgang jedes einzelnen zu einem einziehbaren Prellbock (7), um den Behälter zu stoppen, erlaubt,
 - eine von oben gesteuerte Hebeanlage (8), um den gestoppten Behälter hochzuheben, damit er vom Transporter (4) bedruckt wird, und
 - eine Zentrierungsanlage (9), um den Behälter in die richtige Lage zu bringen.
2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der U-förmige Arm (10) mit einer Achse verbunden ist (12), die sich auf einem Kugellager dreht (13).
3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der U-förmige Arm (10)

von einem elektrischen Motor angetrieben wird.

4. Vorrichtung nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß der U-förmige Arm (10) an ein Element (15) angepasst ist, durch welches der Arm (10) manuell gedreht werden kann, um den Druckkopf (11) zu reinigen.

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Revendications

1. Mécanisme pour imprimer des barres sur des containers remplis de gaz de pétrole liquide (3), comprenant:
- un bras (10) en forme de U renversé pour enfourcher le container qui doit être imprimé, ledit bras pouvant tourner alternativement dans les deux directions autour d'un axe vertical,
 - un moteur pour mettre en marche ledit bras (10),
 - une tête d'impression (11) qui est installée à un des bras dudit bras (10),
 - une zone pour l'entrée du container (2) avec un transporteur (4) et un frein (5) pour stopper les containers, en permettant le passage séquentiel de chacun d'eux vers un amortisseur rétractable (7) pour immobiliser le container,
 - un elevateur (placé au-dessus) (8) pour lever le container immobile pour que celui-ci soit imprimé hors du transporteur (4) et
 - une unité de centrage (9) pour placer le container.
2. Mécanisme selon la revendication 1, qui se caractérise par le fait que le bras en forme de U (10) est attaché à un axe (12) qui tourne sur un mécanisme de roulement à billes (13).
3. Mécanisme selon la revendication 1 ou 2, qui se caractérise par le fait que le bras en forme de U (10) est mû par un moteur électrique.
4. Mécanisme selon une des revendications 1 à 3, qui se caractérise par le fait que le bras en forme de U (10) est adapté à un élément (15) par lequel le bras (10) peut être tourné manuellement afin de nettoyer la tête d'impression (11).

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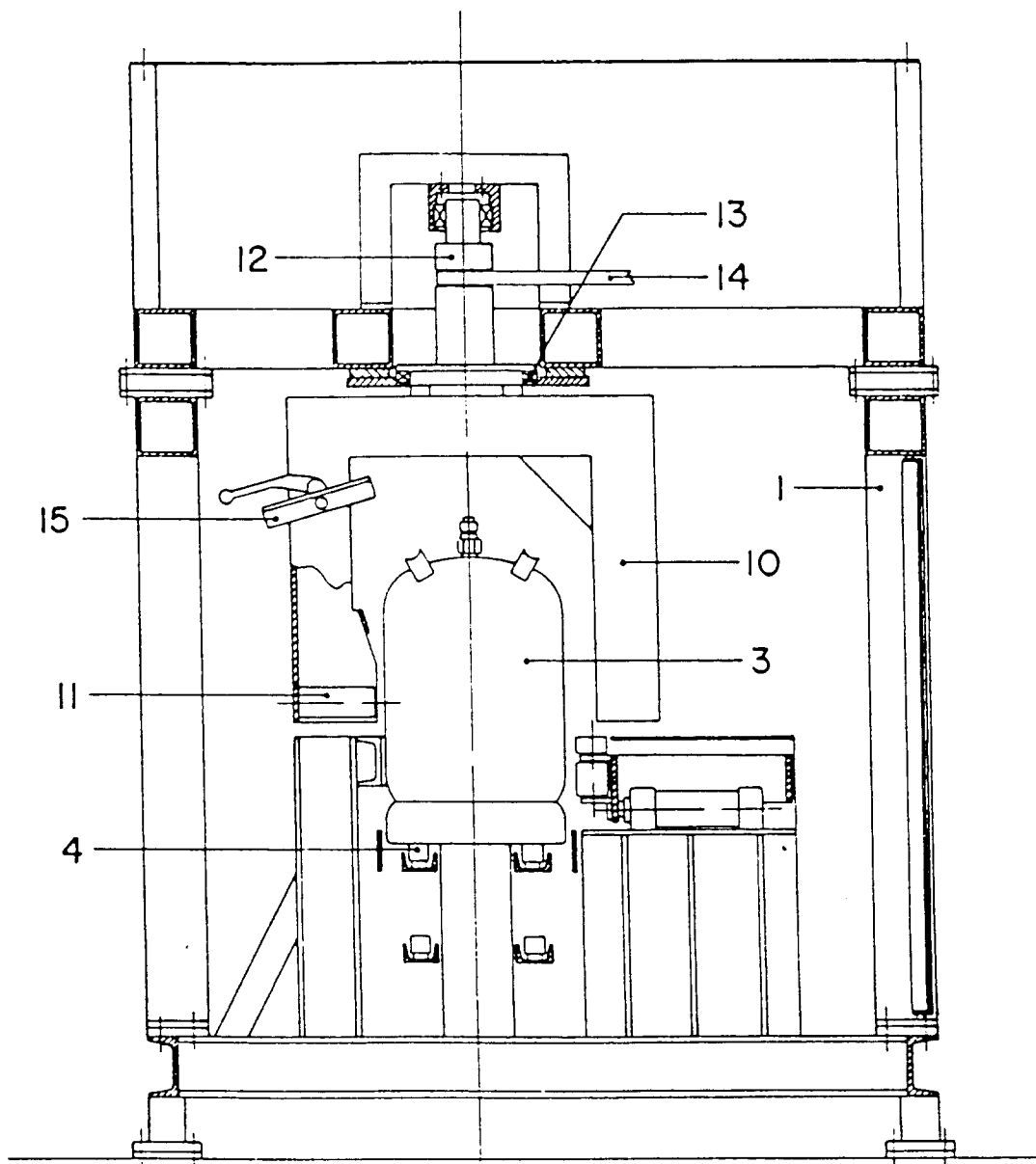


Fig. 1

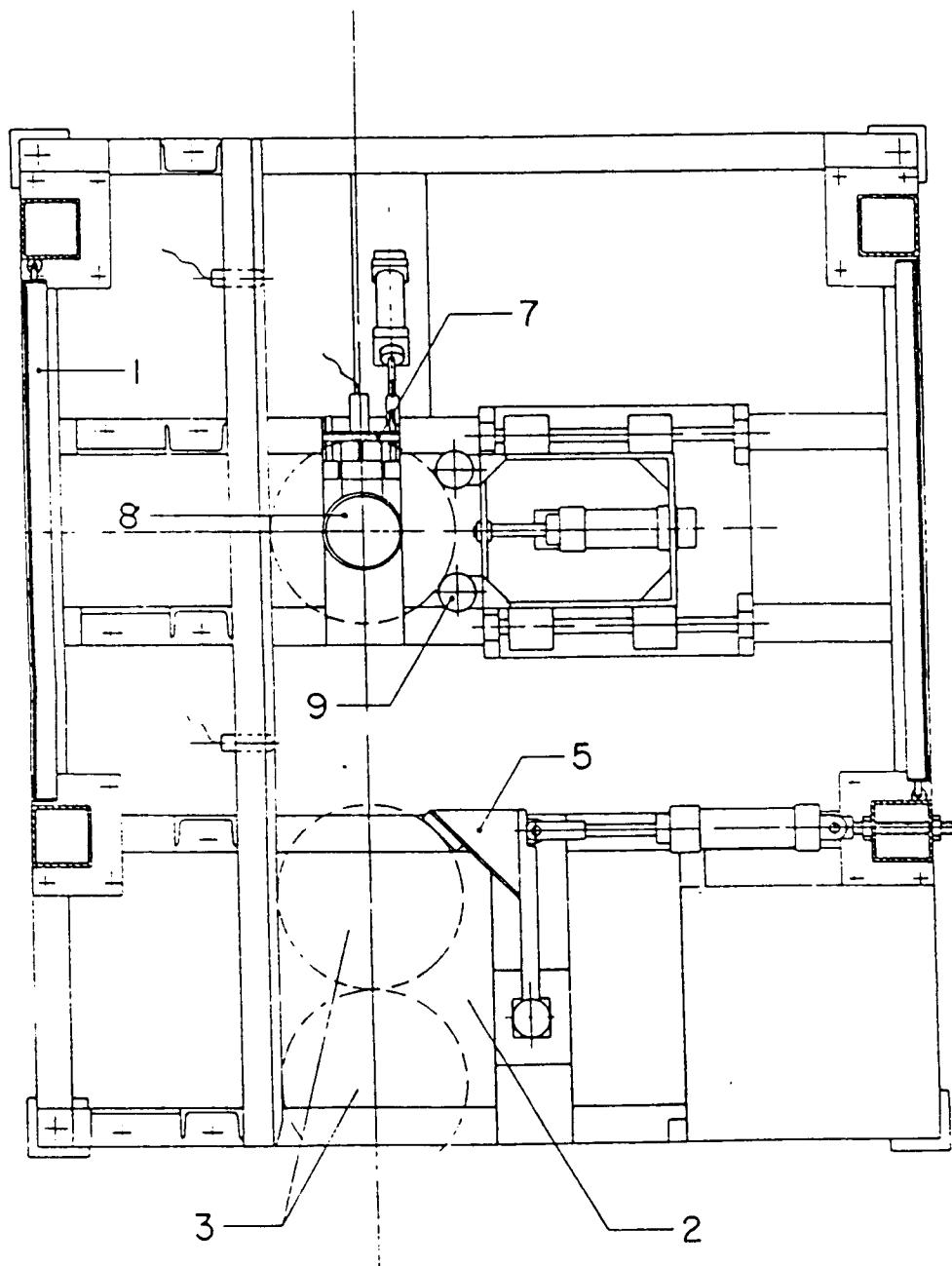


Fig. 2

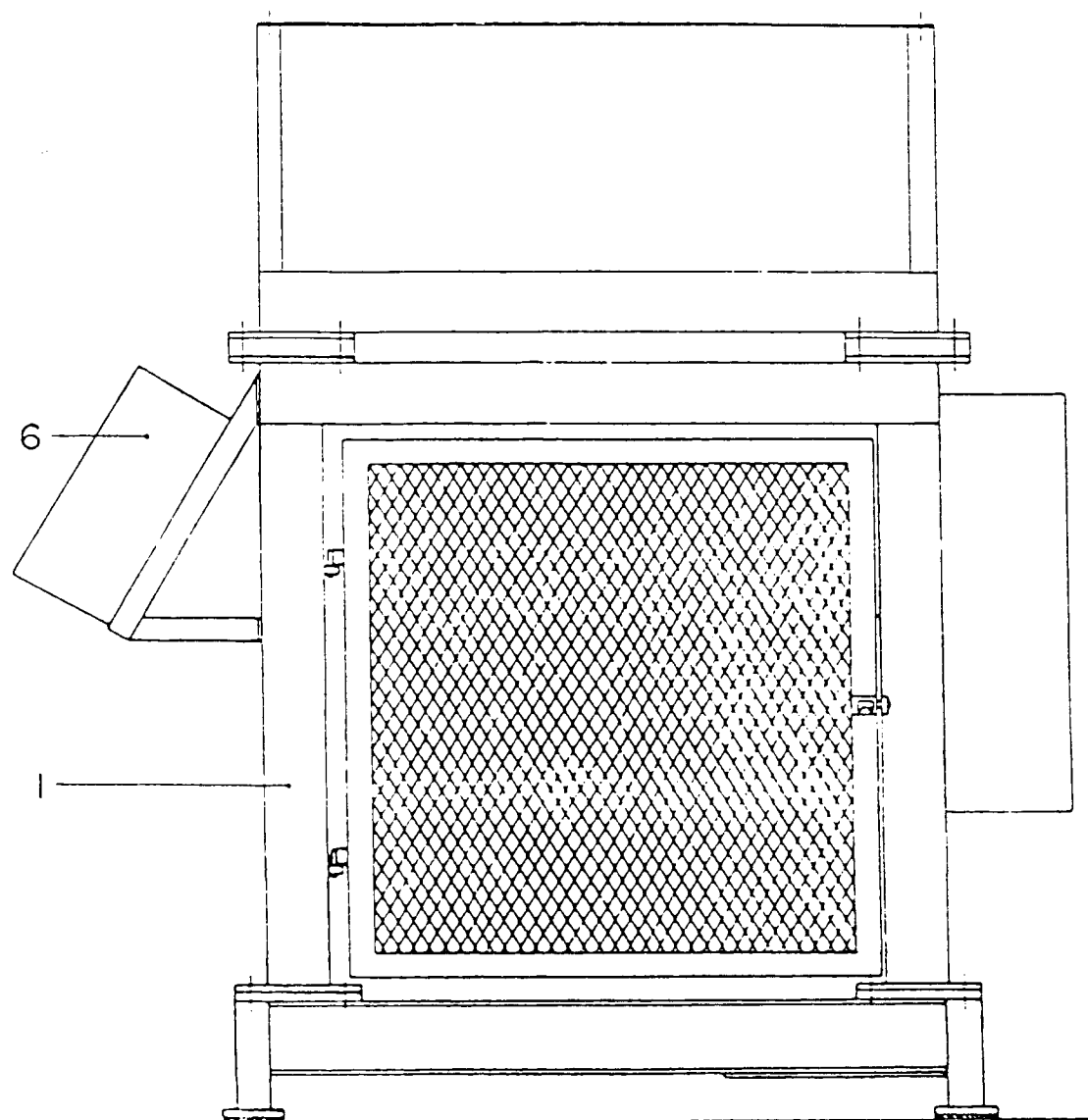


Fig. 3