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FR-A1- 2 706 581
GB-A- 931 193

DESCRIPTION

Field of the Invention

[0001] The present invention relates to hole-making systems used for making holes on collars provided on the holding portions of the pressurized cylinders such as LPG cylinders.

Background Art

[0002] Pressurized cylinders such as LPG cylinders comprise labels for inscribing certain information (i.e. date of production, date of filling, number of filling etc.) on the cylinders. Said labels are mainly positioned on the collar (preferably at the inner side of the collar) connecting the holding portion and body of the cylinders each other. In order to attach the label to the collar, at least one hole must be made on the said collar. In the prior art, one of the common applications utilized to make holes on a plate is to use a drill. However, sparkles may occur in making holes with the use of a drill, so such applications are not suitable for use in cylinders containing combustible gas such as LPG.

[0003] In prior art document FR2762241A1, there is disclosed a system for forming labels on a cylinder collar. In the said system, an automatically-controlled punch directly forms a label on the collar with pressure writing thereon. However, said method for forming labels disclosed in this document provides a permanent label on the collar, and does not describe making holes on the collar in order to attach an external label thereon.

[0004] FR636172A discloses a hole-making system according to the preamble of claim 1.

Brief Description of the Invention

[0005] With the present invention, there is provided a hole-making system for making holes on a cylinder collar according to claim 1. The said hole-making system comprises at least one hand unit for making holes on said cylinder collar and used with two hands; at least one control unit controlling operation of the said hand unit; and at least one pedal enabling the user to control the operation of the hand unit with his foot.

[0006] In the cylinder drilling system according to the present invention, the hand unit is held and controlled with two hands and a drilling command is provided by means of a pedal and thus the users are allowed to control the hand unit in a more reliable manner. Hence, user-related errors are minimized in the drilling process.

Object of the Invention

[0007] An object of the present invention is to provide a hole-making system for making holes on collars of the pressurized cylinders.

[0008] Another object of the present invention is to provide a hole-making system for making holes in a cylinder collar in a fast and reliable manner.

Description of the Drawings

[0009] The exemplary embodiments of the hole-making system according to the present invention are illustrated in the enclosed drawings, in which:

Figure 1

is a front view of the inventive hole-making system.

Figure 2

is a side view of the inventive hole-making system.

Figure 3

is a plan sectional view of a hand unit utilized in the hole-making system.

[0010] All the parts illustrated in the figures are individually assigned a reference numeral and the corresponding terms of these numbers are listed as follows:

Hole-making system	(S)
Cylinder	(T)
Hand unit	(1)
Control unit	(2)
Pedal	(3)
Cord	(4)
Load compensating member	(5)
Frame	(6)
Collar	(7)
Movable belt	(8)
Body	(9)
Drilling head	(10)
Recess	(11)
Drilling member	(12)
Holding handle	(13)

Power connection	(14)
Fixing member	(15)
Safety cover	(16)
Safety seat	(17)

Description of the Invention

[0011] In order to provide the pressurized cylinders such as LPG cylinders with certain information, labels are attached on the collars of the cylinders. In order to attach the said labels on the collar of the cylinder, a hole must be made on the collar. However, especially in cases where the cylinder contains combustible gas, the hole-making process should have an ex-proof design. Therefore with the present invention, there is provided a hole-making system for making holes on collars of cylinders in a reliable and fast manner.

[0012] The hole making system (S) according to the present invention, as illustrated in figures 1 and 2, comprises at least one hand unit (1) for making holes on the collar (7) of a cylinder (T) and preferably used with two hands; at least one control unit (2) controlling operation of the said hand unit (1); and at least one pedal (3) enabling the user to control the operation of the hand unit with his foot.

[0013] The hand unit (1), as detailed in figure 3, comprises at least one body (9); at least one hook-shaped drilling head (10) which is connected to the body (9) and wherein said collar (7) is placed into at least one recess (11) thereof; at least one drilling member (12) suitable for moving in the said drilling head (10) such that it passes through the recess (11) and, thus, for making a hole on the collar (7) located in the recess (11); at least two holding handles (13) located on the body (9) and enabling the user to hold the hand unit (1) with two hands; and at least one power connection (14) allowing power transfer from the control unit (2) to the hand unit (1). The movement of the said drilling member (12) is controlled by means of the control unit (2) and pedal (3).

[0014] In an illustrative embodiment of the invention, the user moves the hand unit (1) with his two hands, thereby making the collar (7) to be holed to place in the said recess (11). When the collar (7) is placed into the recess, the user moves the drilling member (12) by pressing against the pedal (3). With the movement of the drilling member (12), a hole is made on the collar (7). After the drilling member (12) is returned to its original position (i.e. with the removal of the user's foot from the pedal (3)) the user moves the hand unit (1) so as to detach it from the collar (7). In this way, the drilling process is made in a fast and reliable manner.

[0015] In an illustrative embodiment of the invention, the said hand unit (1) comprises at least one piston (not shown) that moves the drilling member (12). In this embodiment, the said control unit (2) comprises at least one compressor applying pressure on the piston. Also in this

embodiment, the said power connection (14) is configured to transfer the pressure received from the control unit (2) to the piston (i.e. a pneumatic piston). With the embodiment comprising a piston, the drilling process is performed in an easy and effective manner.

[0016] In a preferred embodiment of the invention, each holding handle (13) comprises at least one sensor (not shown) sensing existence of the hand of the user. Said sensors are preferably in the form of a distance sensor or a switch. In this embodiment, if at least one hand of the user is not detected by the sensors, even if the said pedal (3) is used, the drilling process is not performed. Therefore, the users are prevented from using the hole-making system (S) without using the two hands.

[0017] In another preferred embodiment of the invention, the hole-making system (S) comprises at least one frame (6) carrying the hand unit (1) and at least one cord (4) connecting the hand unit (1) to the frame (6). The said hole-making system (S) also comprises at least one load compensating member (5) which is located on the said cord (4) and which compensates the weight of the hand unit (1). The said load compensating member (5) preferably comprises a spring reel system compensating the weight of the hand unit (1). Thus, the user may control the hand unit (1) in a reliable and fast manner without feeling the weight of the hand unit (1).

[0018] In another preferred embodiment of the invention, the hand unit (1) comprises at least one fixing member (15) that compresses the collar (7) between itself and the drilling head (10), after the collar (7) has been placed into the recess (11), in order to fix the collar (7). The said fixing member (15) prevents the collar (7) from moving in the recess (11) especially during the drilling process, thereby allowing a reliable drilling process.

[0019] In another preferred embodiment of the invention, the hand unit (1) comprises at least one safety cover (16) preventing access to the recess (11), after the collar (7) has been placed into the recess (11). After the collar (7) has been placed into the recess (11), the said safety cover (16) moves so as to close the inlet of the recess (11). In this way, a foreign substance (i.e. clothes or hands of the user) is prevented from sliding into the recess (11) so that a more reliable drilling process is performed.

[0020] In another preferred embodiment of the invention, the said hand unit (1) comprises at least one safety seat (17) located along the drilling head (10) and in alignment with the drilling member (12). In this embodiment, in case of a breakage of the drilling member (12) during the drilling process, the broken part can be removed by intervening from inside of the safety seat (17). In this manner, even in case of a breakage of the drilling member (12), the hand unit (1) is made re-usable in a short period of time.

[0021] In another preferred embodiment of the invention, the hole-making system (S) comprises at least one movable belt (8) on which the cylinders (T) are placed and which moves the cylinders (T) placed thereon along a line. In this embodiment, the cylinders (T) reaches to the hand drilling unit (1) so as to be drilled on the collar and transferred to another

station at the end of the drilling process. In this way, the drilling process is performed in a swift manner.

[0022] In the cylinder hole-making system (S) according to the present invention, the hand unit (1) is held and controlled with two hands and a drilling command is provided by means of a pedal (3) and thus the users are allowed to control the hand unit (1) in a more reliable manner. Hence, user-related errors are minimized in the drilling process.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- FR2762241A1 **[0003]**
- FR636172A **[0004]**

HULFREMBRINGELSESSYSTEM

PATENTKRAV

5 1. Hulfrembringelsessystem (S) til frembringelse af huller på kraven (7) af en cylinder (T), hvilket hulfrembringelsessystem omfatter;

- mindst én håndenhed (1) til frembringelse af huller på kraven (7) af cylinderen (T), og som anvendes med to hænder og omfatter mindst én krop (9),
- 10 mindst to fastholdelseshåndtag (13), der er lokaliseret på kroppen (9) og sætter brugeren i stand til at holde håndenheden med to hænder, og mindst én strømforbindelse (14), der tillader, at der overføres energi fra styreenheden (2) til håndenheden (1);
- mindst én styreenhed (2), som styrer driften af håndenheden (1);
- 15 – mindst én pedal (3), der sætter brugeren i stand til at styre driften af håndenheden med foden; og
- mindst ét boreelement (12);

kendetegnet ved, at håndenheden (1) yderligere omfatter mindst ét krogformet borehoved (10), som er forbundet med kroppen (9), og hvor kraven (7) kan være placeret i mindst én fordybning (11) deraf, og **ved, at** det mindst ene boreelement (12) kan bevæge sig i borehovedet (10), således at det kan passere gennem fordybningen (11) og frembringe et hul på kraven (7), der er lokaliseret i fordybningen (11).

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2. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at** håndenheden (1) omfatter mindst ét stempel, der flytter boreelementet (12).

3. Hulfrembringelsessystem (S) ifølge krav 2, **kendetegnet ved, at** styreenheden (2) omfatter mindst én kompressor, som påfører tryk på stemplet.

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4. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at** hvert fastholdelseshåndtag (13) omfatter mindst én sensor, der registrerer forekomsten af brugerens hånd.

5. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at** sensoren er en afstandssensor.
- 5 6. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at** sensoren er en kontakt.
7. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at** det omfatter mindst én ramme (6), som bærer håndenheten (1), og mindst én snor
10 (4), der forbinder håndenheten (1) med rammen (6).
8. Hulfrembringelsessystem (S) ifølge krav 7, **kendetegnet ved, at** det omfatter mindst ét belastningsudligningselement (5), der er lokaliseret på snoren (4), og som udligner håndenhedens (1) vægt.
- 15 9. Hulfrembringelsessystem (S) ifølge krav 8, **kendetegnet ved, at** belastningsudligningselementet (5) omfatter et fjederspolesystem, der udligner håndenhedens (1) vægt.
- 20 10. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at** håndenheten (1) omfatter mindst ét fikseringselement (15), som sammenpresser kraven (7) mellem sig selv og borehovedet (10), efter at kraven (7) er blevet placeret i fordybningen (11), med henblik på at fiksure kraven (7).
- 25 11. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at** håndenheten (1) omfatter mindst én sikkerhedstildækning (16), der forhindrer adgang til fordybningen (11), efter at kraven (7) er blevet placeret i fordybningen (11).
12. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at**
30 håndenheten (1) omfatter mindst ét sikkerhedssæde (17), som er lokaliseret langs borehovedet (10) og på linje med boreelementet (12).

13. Hulfrembringelsessystem (S) ifølge krav 1, **kendetegnet ved, at** det omfatter mindst ét bevægeligt bånd (8), hvorpå cylinderen (T) er placeret, og som flytter cylindrene (T), der er placeret derpå langs en linje.

DRAWINGS

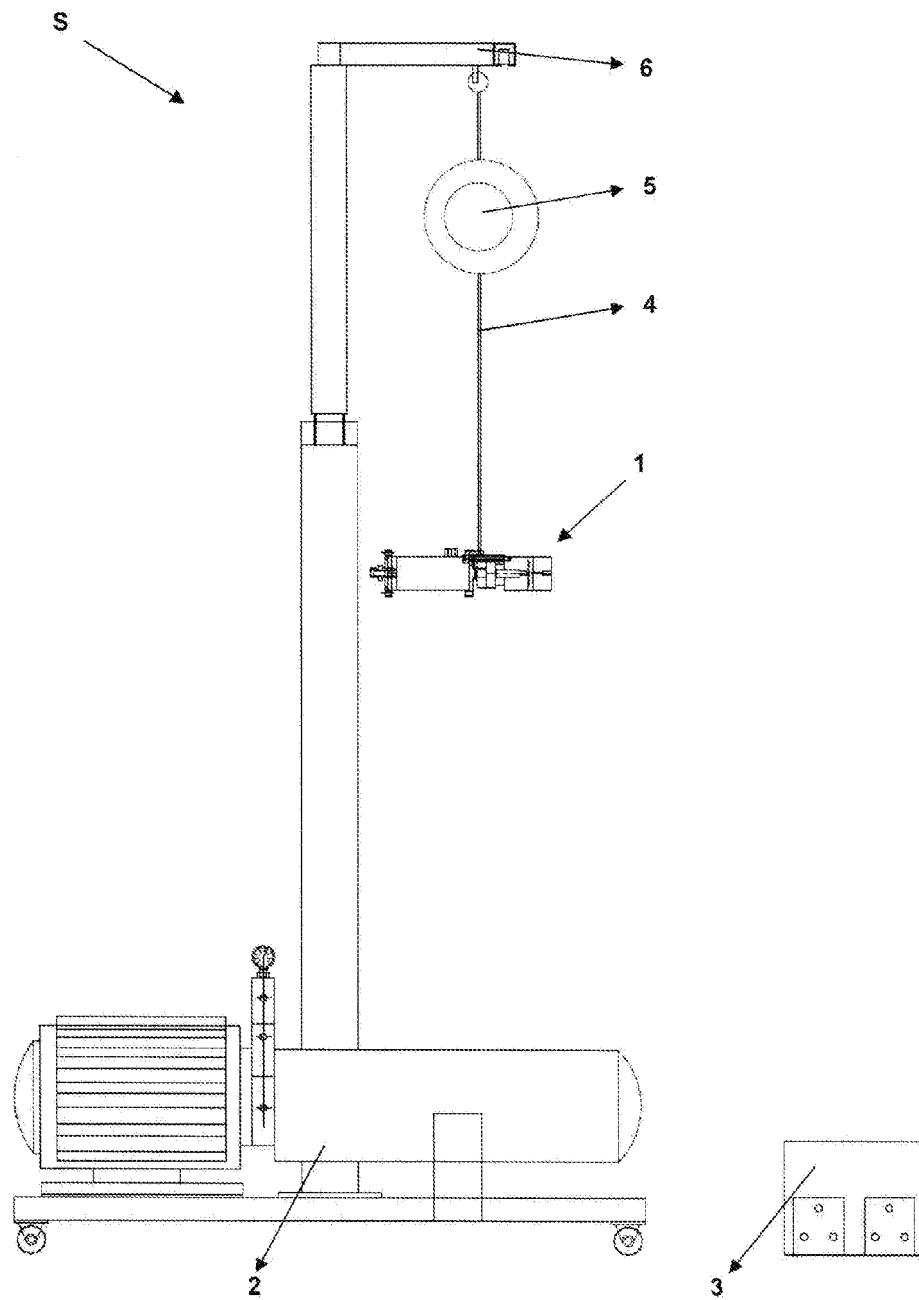


Figure – 1

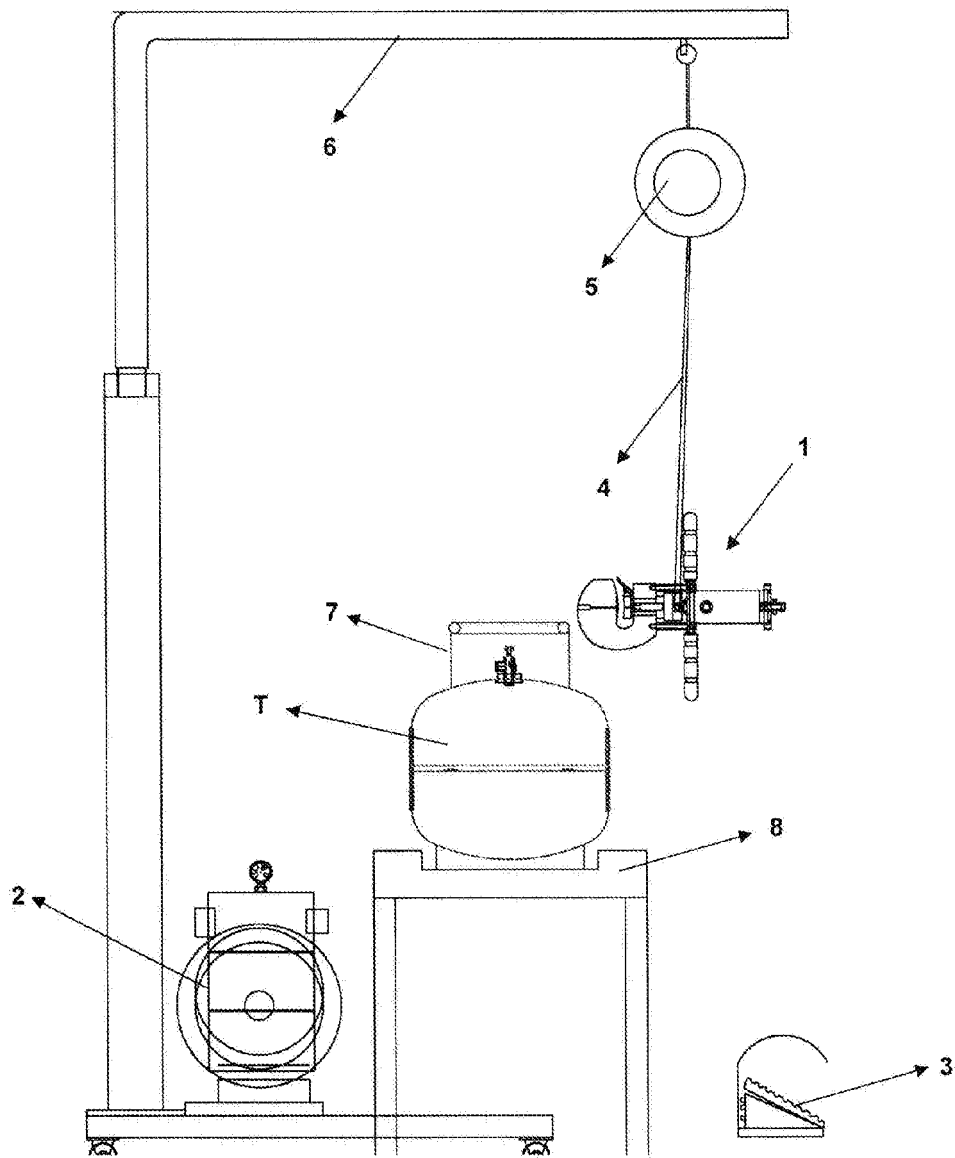


Figure - 2

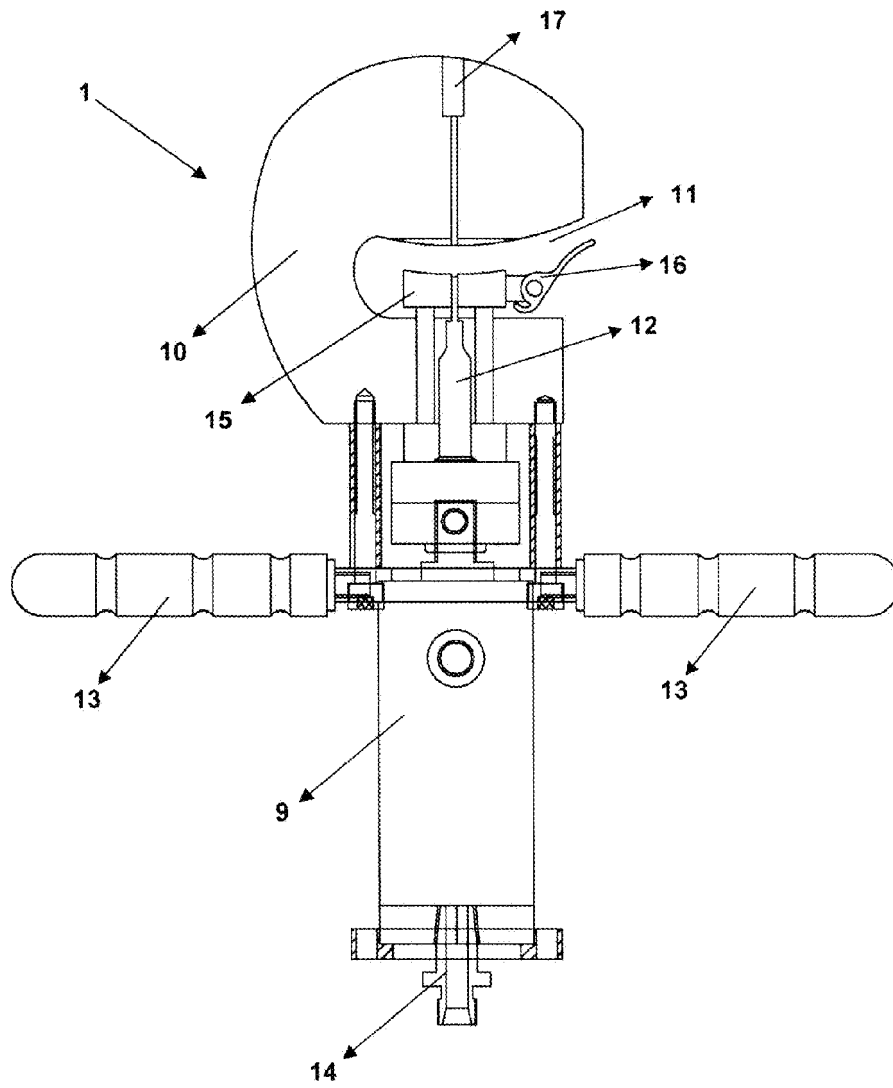


Figure - 3