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(54) Pressure multiplying element for locking drum doors

(57) Pressure multiplying element, using rockers for locking automatic or semi automatic drum doors, which is provided with at least one access mouth to its interior, with the aid of a door that is moveable by means of sliding over guides, with which a pneumatic or hydraulic chamber collaborates, together with rockers that exert pressure on the door against the mouth perimeter, with the interpositioning of a sealing gasket, the invention consisting of the use of a pneumatic or hydraulic chamber that exerts pressure on the rockers which in turn exert pressure on the cover and on the sealing gasket, and that is provided with adjustable, mechanical elements in order to hold said pressure.

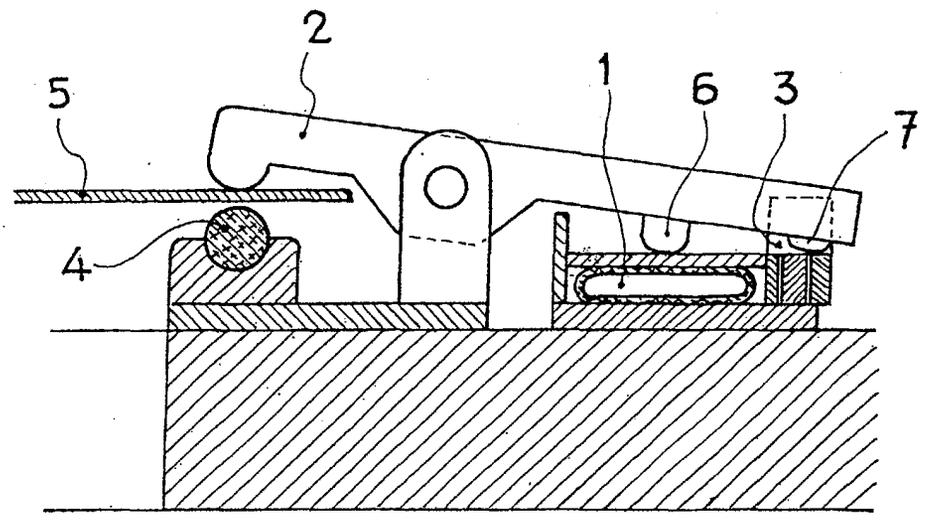

FIG. 2 A

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Description

OBJECT OF THE INVENTION

[0001] The present invention refers to a pressure multiplying device, using rockers, for locking automatic or semi automatic doors, specifically for doors which constitute the means of access to the inside of a drum used in leather-dyeing baths, A device that ensures the pretended locking situation, preventing accidental opening or leaks of the liquids housed inside the drum due to loss of pressure in the automatic locking systems caused by cuts in the electrical supply or produced by any other reason.

[0002] The device applies not only to leather-dyeing drums, but also to any other practical circumstances which require similar services.

BACKGROUND OF THE INVENTION

[0003] When automatic, all drum doors currently present as locking system, the constant maintenance of a pneumatic pressure on the cover or on its sealing element, which must be maintained indefinitely until opened.

[0004] This locking system implies the risk that said sealing element may, at any set moment, lose the necessary pressure that maintains the locking situation, for example, versus an eventual cut in the electrical power supply, versus a breakage of the sealing chamber, etc., in such a manner, that this loss of tightness in the drum lock causes the process that is operating inside, to lose the liquids or baths used to that effect, with the consequent deterioration or destruction of the leather housed inside the same, and in turn, with the consequent economic loss, in addition to the risks involved to the health of human beings, such as illnesses caused by irritation of the upper breathing tracks, skin diseases, etc....

DESCRIPTION OF THE INVENTION

[0005] The locking device proposed by the invention solves the previously described problem in a totally satisfactory manner, ensuring that the drum door that is automatically closed in a conventional way, is kept invariably stable in this locking situation versus any failure in the pneumatic system with which this locking is initially performed.

[0006] To achieve this, and more specifically, the device proposed by the invention is based on the use of pneumatic or hydraulic pressure using a pressure multiplying element, such as intermediate rockers placed between the generating element of said pressure and the door cover, simply to perform a first pressure on the locking element (rubber gasket, etc.,) and then, to automatically lock the cover by means of a mechanical system which is not affected by the existence or not of pressure in the pneumatic circuit.

[0007] Specifically, the door acts on a rubber gasket, operatively established on the drum mouth by the action of rockers that press against the door cover which in turn presses against the sealing element by the effect of pneumatic or hydraulic elements in the initial operative phase of the device, specifically to reach the sealed locking situation, after which, the mechanical system acts by means of the sliding of a runner provided with an element that acts as a cam and presses the rocker which assures the pressure exerted against the door, and which maintains it suitably attached and water-tight on the gasket associated to said drum.

DESCRIPTION OF THE DRAWINGS

[0008] Figures 1A, 1B, 1C and 1D respectively show schematically cross sectional representations of a drum door at one of the ends of the assembly, corresponding to the free opening sequences of the door, pneumatic tie-down position only, pneumatic and mechanical tie-down position and mechanical tie-down position only.

[0009] Figures 2A, 2B, 2C and 2D show detailed longitudinal cross-sections of the assembly represented in Figures 1A, 1B, 1C and 1D.

PREFERRED EMBODIMENT OF THE INVENTION

[0010] In view of said figures, the device recommended by the invention is applicable to drum doors, where at least one access mouth to the inside is established, aided by a door (5), sliding by runners over guides, with with which a pneumatic or hydraulic chamber (1) collaborates, and rockers (2), with parts acting as cams (3), which act on the rocker (2), holding the pressure of door (5) constant on the rubber gasket (4), thus sealing its locking position.

[0011] Therefore, the locking device proposed by the invention, and parting from the basic and conventional structure, centres its characteristics on the inclusion of a pressure multiplying device, formed by rockers (2), that act on the door (5), which seals their locking on the rubber gasket (4), and can be kept permanently pressed as is shown in Figures 1D, and 2D, with independence from which is the operative or inoperative situation pf the pneumatic or hydraulic element (1), because the sealing is only carried out by the mechanical tie-down action (3), which is the technical objective that the invention wishes to achieve.

[0012] In a sequential process of the mechanical tie-down (closing) / opening system it can be observed, according to the descriptions in Figures 1A and 2A, how the door (5) is to be found in resting condition and the cover can be moved in order to open / close the same.

[0013] According to Figures 1B and 2B, in the closing phase, the pneumatic or hydraulic element acts on the rocker lug (6), which causes its tilting when door (5) is pressed against the gasket (4), thus sealing the lock.

[0014] In a subsequent phase, as can be observed in

Figures 1C and 2C, the pneumatic action is reinforced by the mechanical tie-down where parts (3) are displaced by the door movement until they are located at the rocker support foot (7), with a sail effect, exerting its pressure on the door (5), which in turn, exerts it on the rubber gasket (4), ensuring the pressure exerted by the pneumatic or hydraulic element.

[0015] Once this phase is achieved, the pneumatic action disappears and the tie-down is only mechanical as has been previously described, and is represented according to Figures 1D and 2D.

[0016] This technical effect is achieved thanks to the special configuration of the rockers (2) which are provided with adjustment screws and parts (3) acting as cams which, as has been described, achieve that the sealed locking is maintained indefinitely without requiring that the pneumatic or hydraulic tie-down continues being operative.

Claims

1. Pressure multiplying element, using rockers for automatic or semi automatic drum-type doors, **characterized in that** it comprises rockers which are specially arranged on the door structure, which, together with the elements arranged on the same, such as the pressure lug (6), which receives the pneumatic or hydraulic action and the support lug (7), which receives the action of the parts acting as cams, permit their tilting and exert the corresponding pressure on the door which in turn exerts it on the sealing gasket (4), the lugs (6) and (7) and the screws being likewise for the adjustment of the mechanical tie-down.

2. Pressure multiplying element, using rockers for automatic or semi automatic drum-type doors, which, according to Claim 1, is **characterized in that** the closing process of the door until a permanent sealing is obtained, without depending on the operation or non operation of the pneumatic element, is configured during a first phase, only by the pneumatic tie-down action which exerts pressure through lugs (6) of the rocker, which permits its tilting and performs the corresponding pressure on the door cover.

3. Pressure multiplying element, using rockers for automatic or semi automatic drum-type doors, which, according to Claim 2 is **characterized in that** the second phase of the door closing process is performed by the combination of the pneumatic or hydraulic element of the previous phase and the mechanical action of the metallic element which is moved until it encounters the rocker support lug (7), which holds the sealing situation stable.

4. Pressure multiplying element, using rockers for automatic or semi automatic drum-type doors, which, according to the previous Claims is **characterized in that** the third phase of the door closing process, with the object of making said pneumatic or hydraulic locking action independent, is to maintain the locking stable only by means of the mechanical tie-down, eliminating the pneumatic action.

5. Pressure multiplying element, by using rockers for automatic or semi automatic drum-type doors, which, according to the previous Claims, is **characterized in that** the phases must be completed in reverse to what is described in the previous Claims for the door opening process.

FIG. 1A

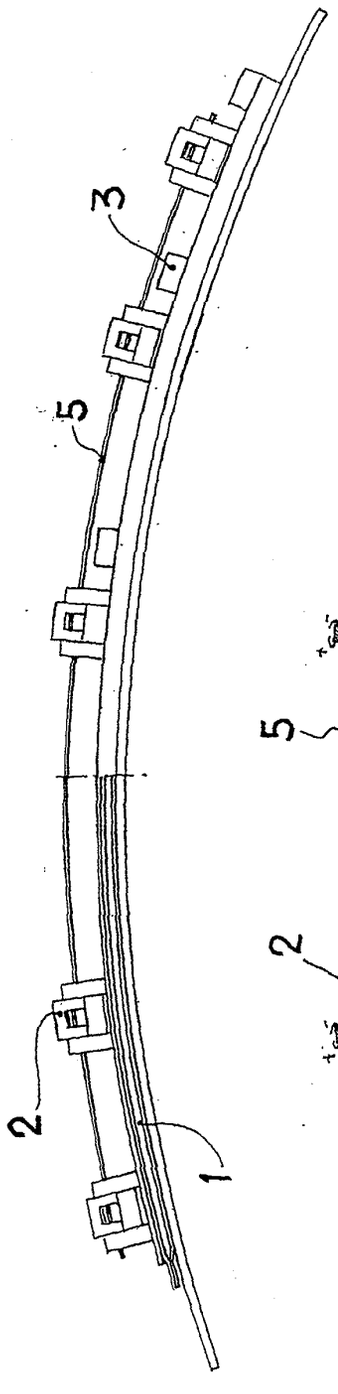


FIG. 1B

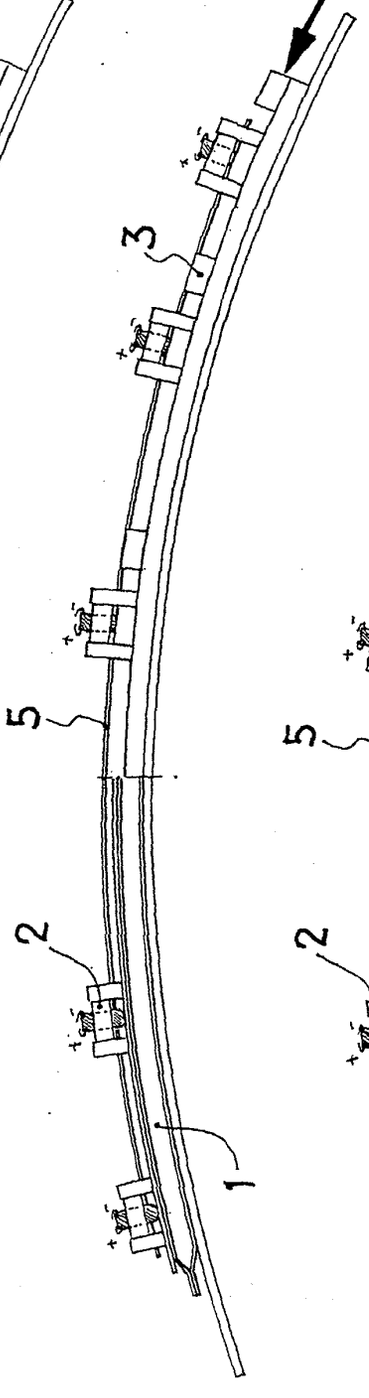


FIG. 1C

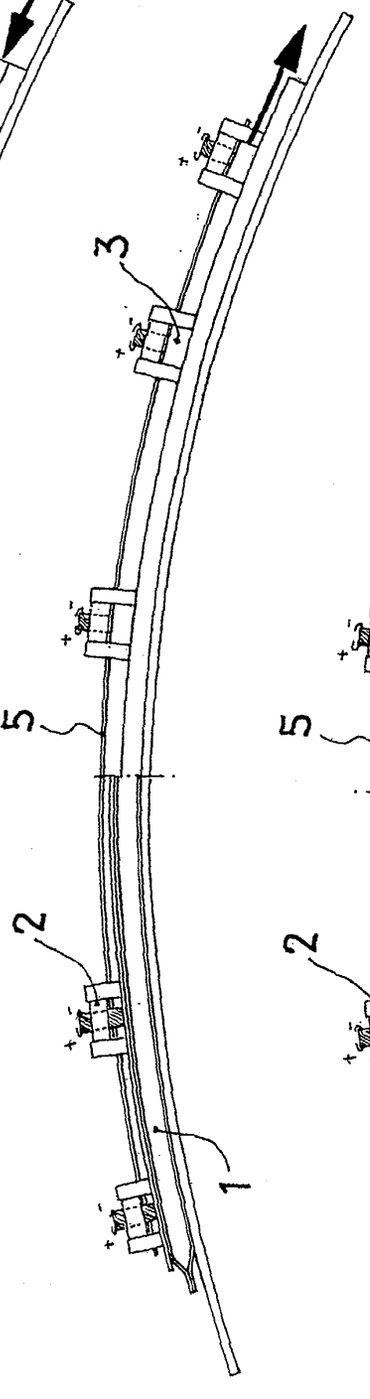
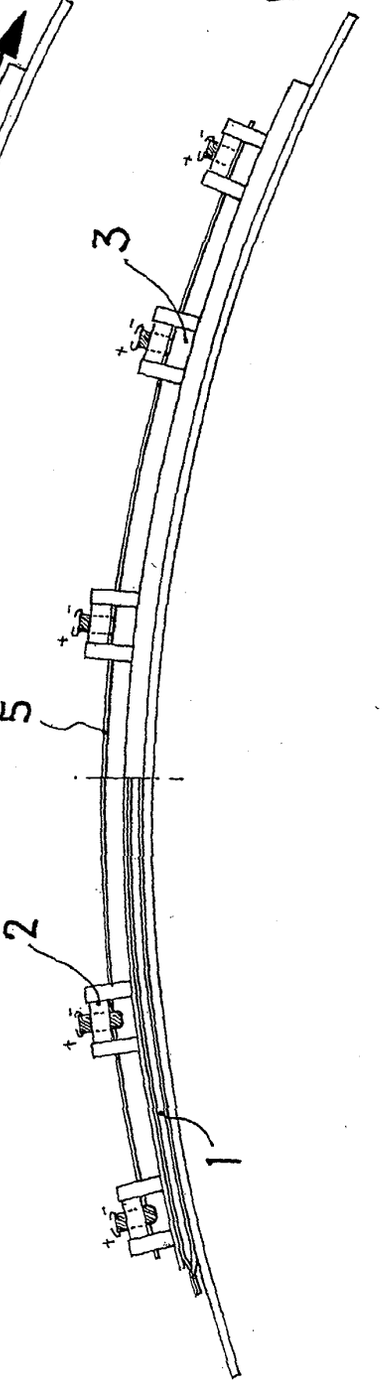


FIG. 1D



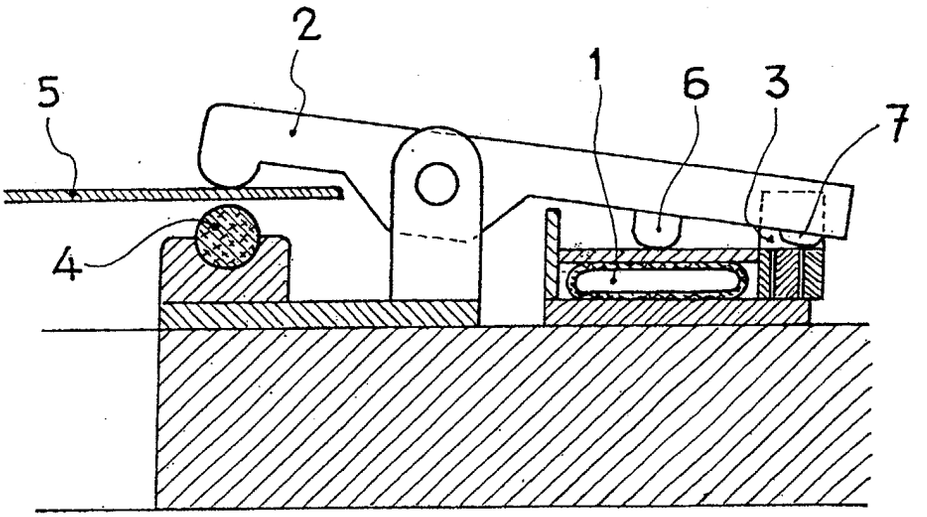


FIG. 2 A

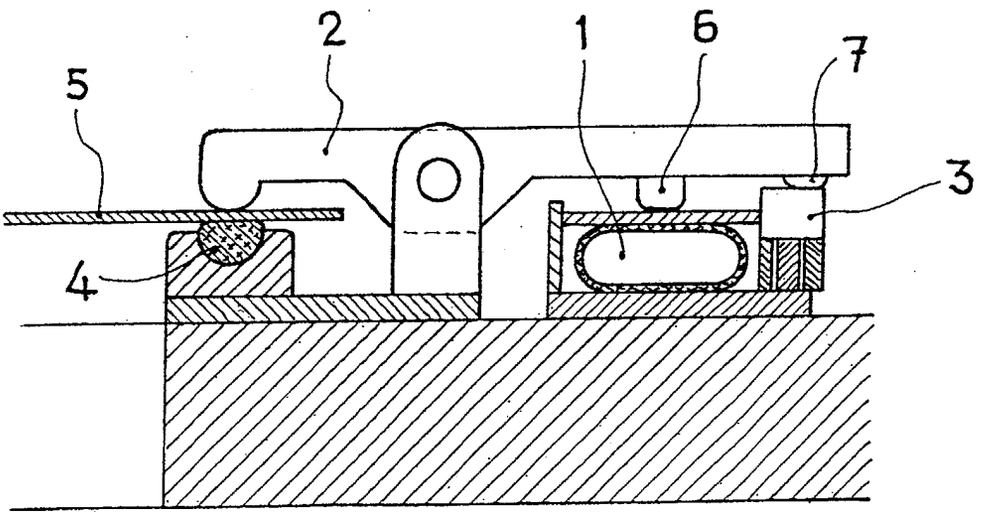


FIG. 2 B

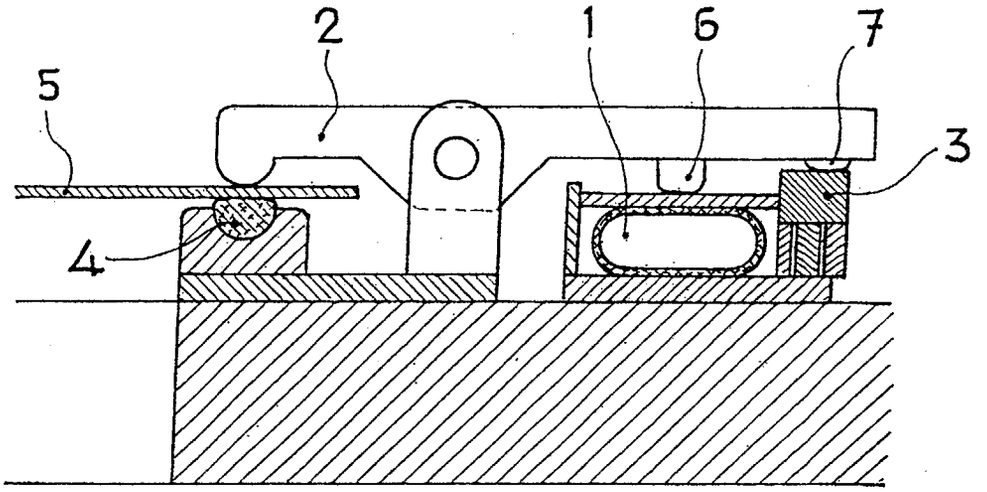


FIG. 2 C

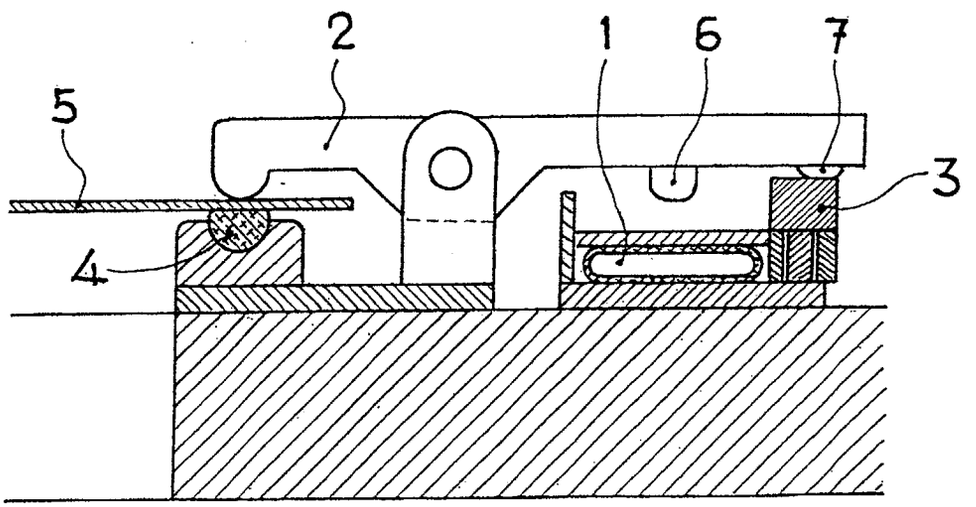


FIG. 2 D