July 21, 1925. 1,547,126

L. S. MAEDE

VACUUM TESTING MACHINE FOR EMPTY CANS

Filed July 2, 1923

Fig. 1.

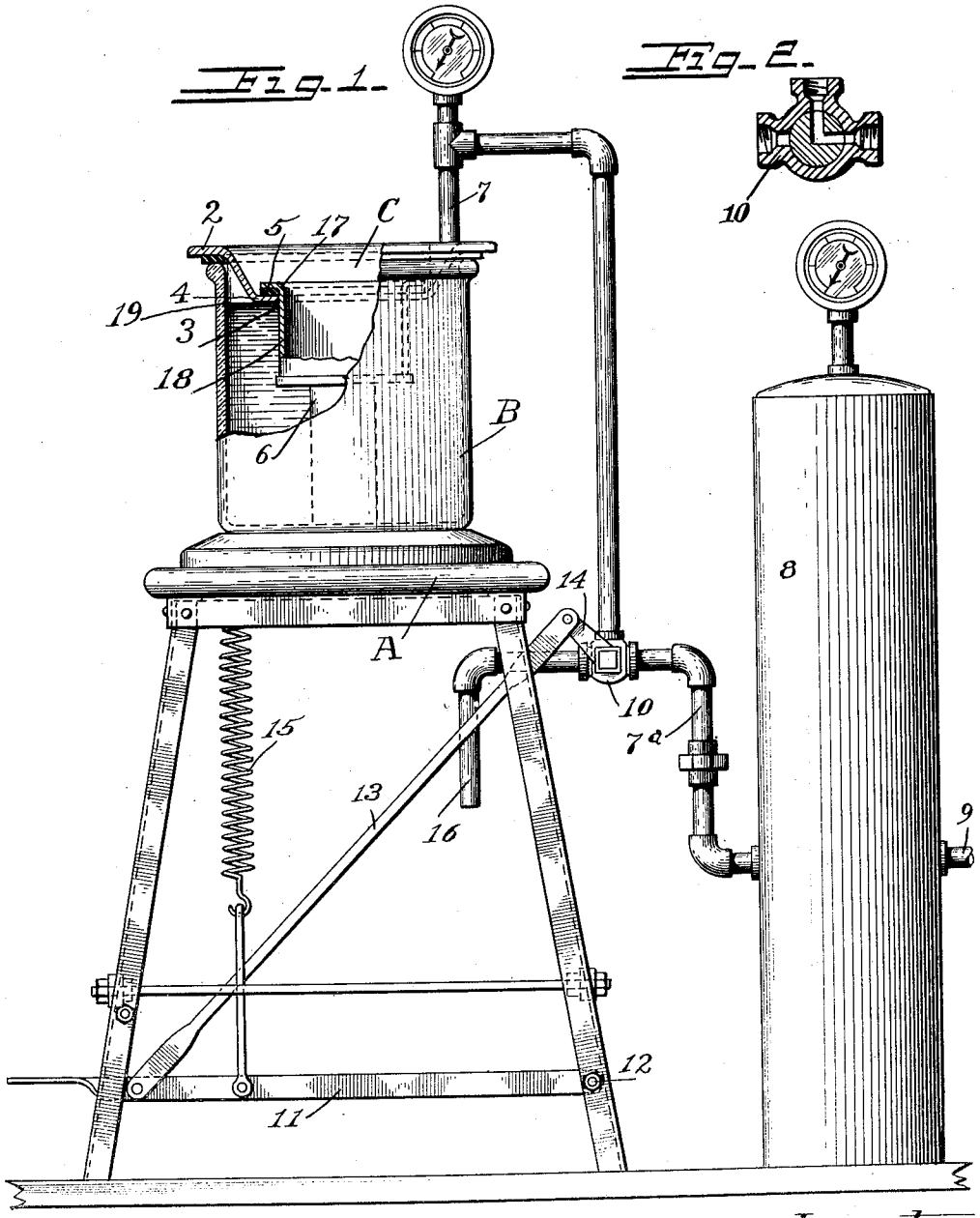


Fig. 2.

Inventor

LELAND S. MAEDE.

By Dewey, Strong, Jaussaud & Loftus

Attorneys

Patented July 21, 1925. 1,547,126

UNITED STATES PATENT OFFICE.

LELAND S. MAEDE, OF SAN FRANCISCO, CALIFORNIA.

VACUUM-TESTING MACHINE FOR EMPTY CANS.

Application filed July 2, 1923. Serial No. 649,052.

To all whom it may concern:

Be it known that I, LELAND S. MAEDE, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Vacuum-Testing Machines for Empty Cans, of which the following is a specification.

This invention relates to a vacuum testing machine for empty tin cans.

In can factories where tin cans are manufactured in large quantities, the body portions are formed, lock seamed and soldered in the body making machine. The bodies are then transferred to the flanging machine where a flange is formed on each end of the body and they are then finally transferred to the double seamer where the bottoms are applied; the several operations being here completed as far as the can factory is concerned as the cans are then crated and shipped to the canneries, where the tops are applied and double seamed when the cans have been packed.

The present invention is concerned with the manufacture of the cans only; the purpose being to determine whether the several machines are functioning properly; that is, the body making machine may be forming a poor lock seam or soldered joint; the seaming rolls in the double seamer may not be properly adjusted, etc. The result in each instance would be a leaky can. The several machines although properly adjusted are subject to constant wear and tear and they may furthermore gradually work out of adjustment, and it is therefore necessary to constantly watch the machines and to inspect and test the cans for leaks.

The present invention embodies a machine for vacuum testing empty cans, the object being to generally improve and simplify the construction and operation of machines of this character; to provide a machine which will visibly indicate whether a can is leaky or not, and which will also visibly indicate the point or place where the leak occurs; and furthermore to provide a machine in which the empty cans can be quickly inserted, tested and removed.

One form which my invention may assume is exemplified in the following description and illustrated in the accompanying drawing, in which Fig. 1 is a side elevation of the machine partially in section. Fig. 2 is a cross-section of the valve 10.

Referring to the drawing in detail, A indicates a stand or support of suitable construction upon which is mounted a container B. This container is preferably constructed of glass or like material to render the interior visible, and it is open at the upper end to permit insertion of the cans to be tested. The upper end is in this instance provided with a cover member 2 which is suitably secured and sealed with relation to the container. The cover member is slightly depressed as shown and is provided with a central opening 3 which is surrounded by an annular supporting flange 4. A rubber sealing gasket 5 is carried by the flange and the cans to be tested are supported by the sealing gasket as will hereinafter be described. Mounted interior of the visible container is a central supporting member 6 which serves the function of preventing excess bulging of the bottoms of the cans during the testing operation. Supported by the cover 2 and passing therethrough is a pipe 7. This pipe is connected with a vacuum tank 8 which in turn is connected with a vacuum pump not here shown through means of a pipe 9. A three-way valve is placed in the pipe 7 at the point indicated at 10 and this valve is controlled by a foot treadle 11 pivotally secured to the support A as indicated at 12 through means of a connecting link 13 and a crank arm 14. A spring is also attached to the foot treadle as shown at 15 and this serves the function of normally holding the valve in venting position; that is, one side of the valve is connected with a venting pipe indicated at 16 and the valve remains in normal communication therewith when the foot throttle is held in elevated position by the spring 15. A second connection is made between the valve and the tank 8 through means of pipe 7^a and a third connection is made with the valve through means of pipe 7. This pipe being connected with the can testing device.

The tin cans to be tested and which have been completed by the can factory are always provided with an annular flange at their upper open ends as indicated at 17. Therefore when it is desired to test a can it is only necessary to partially fill the visible container B with water and then to insert the can as shown at 18. The can when so inserted rests upon the sealing gasket 5 as the annular flange 17 engages the same. The

sealing gasket thus serves two functions, first, that of a support which limits downward movement of the can within the container, and secondly, that of sealing the can with relation to the container. At the same time the can is being inserted, the foot treadle 11 is depressed and the valve is thus turned to a position where the pipes 7 and 7ª communicate with the tank 8. The upper interior end of the container B is thus evacuated and the can is pulled downwardly into snug engagement with the sealing gasket. The water is displaced and rises upwardly and reaches the level indicated at 19 when the can is in position for testing. The evacuated condition of the container will cause air to enter through the empty can if it is leaky and air bubbles will thus pass upwardly through the water from the point of leakage. The test therefore determines two things, first, that the can is leaking, and it secondly visibly indicates the point of leakage. This is of importance as it immediately indicates which machine is at fault; that is, if the leak occurs along the vertical lock seam of the body portion it is fairly certain that it is either a poor lock joint or a poor solder seam, but if the leak occurs along the bottom portion the fault can be traced to the double seamer. Again, it may happen that a small pin hole is discovered in the metal proper, but this is not so important as it is not caused by any fault of either the body forming machine, the flanger or the double seamer, and would under such conditions merely indicate poor material.

When the can has been tested it will either indicate a leak or no leak, and in either instance it is removed by merely releasing the foot treadle. Release of the foot treadle swings the valve to venting position as it brings the pipes 7 and 16 into communication. Air will thus enter the container B and the evacuated condition is relieved. The buoyancy of the partially submerged can causes it to rise upwardly in the central opening C and it is thus readily grasped and removed and a new can may be inserted and tested as previously described.

The central support shown at 6 is only provided for the purpose of preventing excess bulging of the bottoms during the testing operation; that is, a high vacuum might bulge the bottom to such an extent as to spring the seams and an unfair test would thus be given, but this is prevented in the present instance as excess bulging and springing or opening of the seams are prevented.

While certain features of the present invention are more or less specifically illustrated, I wish it understood that various changes in form and proportion may be resorted to within the scope of the appended claims. I similarly wish it understood that the materials and finish of the several parts employed may be such as the experience and judgment of the manufacturer may dictate or various uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A vacuum testing machine for empty tin cans, which cans have an annular flange formed at their upper open end, said machine comprising a transparent container open at the upper end to permit a can to be inserted therein, said container being partially filled with water to surround the can when inserted, means for sealing the upper end of the can and container with relation to each other, and means for evacuating the container above the water level and exterior of the can.

2. A vacuum testing machine for empty tin cans, which cans have an annular flange formed at their upper open end, said machine comprising a transparent container open at the upper end to permit a can to be inserted therein, said container being partially filled with water to surround the can when inserted, a sealing ring adjacent the upper end of the container adapted to receive the can flange to support and seal the can with relation to the container, and means for evacuating the container above the water level and exterior of the can.

3. A machine of the character described comprising a transparent container open at the upper end and adapted to be substantially filled with water, a sealing ring on the open end of the container adapted to receive and support an empty tin can, means for evacuating the container above the water level and exterior of the can, and means for preventing excess bulging of the bottom of the can when being tested.

4. A vacuum testing machine for empty tin cans, which cans have an annular flange formed at their upper open end, said machine comprising a transparent container open at the upper end to permit a can to be inserted therein, said container being partially filled with water to surround the can when inserted, means for sealing the upper end of the can and container with relation to each other, means for evacuating the container above the water level and exterior of the can, and a standard interior of the container adapted to engage the bottom of the can to prevent excess bulging thereof when the container is evacuated.

5. A vacuum testing machine for empty tin cans, which cans have an annular flange formed at their upper open end, said machine comprising a transparent container open at the upper end to permit a can to be inserted therein, said container being par-

tially filled with water to surround the can when inserted, a sealing ring adjacent the upper end of the container adapted to receive the can flange to support and seal the can with relation to the container, means for evacuating the container above the water level and exterior of the can, and a vertically disposed standard interior of the container engageable with the bottom of the can to prevent bulging thereof.

6. A vacuum testing machine for empty tin cans, which cans have an annular flange formed at their upper open end, said machine comprising a transparent container open at the upper end to permit the cans to be inserted therein, said container being partially filled with water to surround the can when inserted, a cover member on the upper end of the container and sealed with relation thereto, said cover having a central opening formed therein surrounded by a supporting flange, a sealing ring supported on said flange adapted to receive the can flange to support and seal the can with relation to the container, a pipe passing through the cover member and communicating with the interior of the container, means connecting the pipe with an evacuating device, and a valve on said pipe adapted to alternately form communication with the evacuating device and conversely to vent the pipe and the container.

LELAND S. MAEDE.