

No. 797,862.

PATENTED AUG. 22, 1905.

C. F. MENDHAM.

MACHINE FOR HERMETICALLY SEALING SHEET METAL VESSELS.

APPLICATION FILED FEB. 3, 1904.

2 SHEETS—SHEET 1.

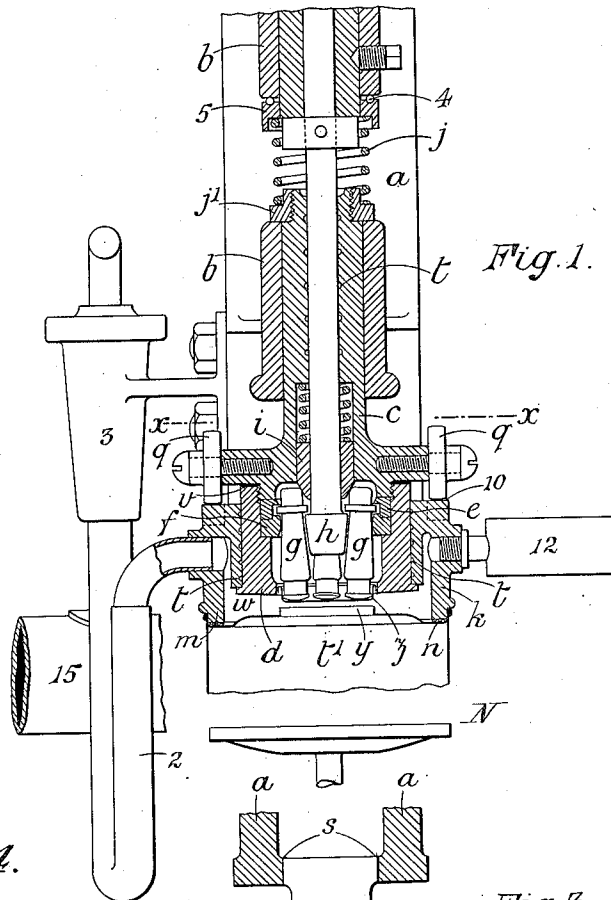


Fig. 1.

Fig. 4.

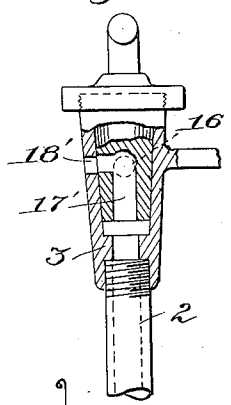
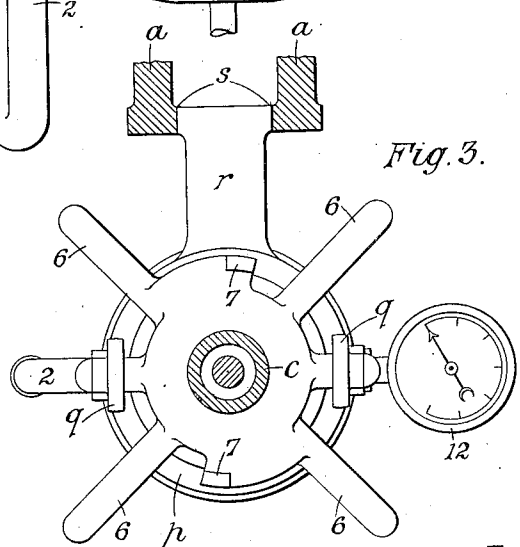


Fig. 3.



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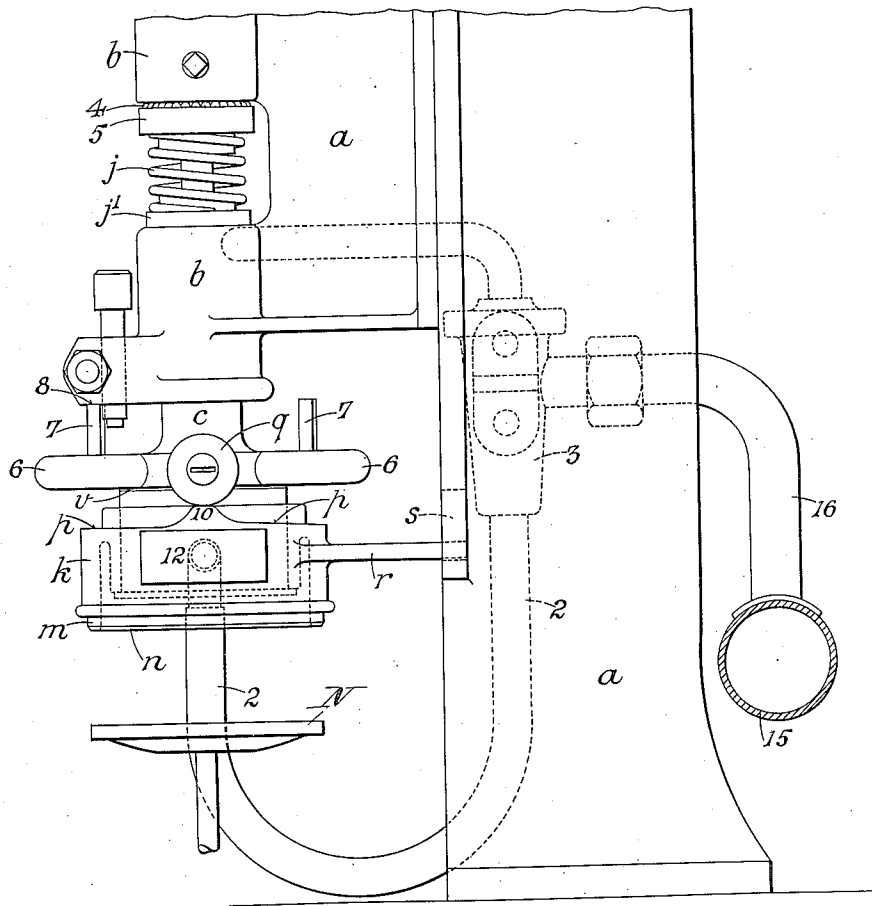
PATENTED AUG. 22, 1905.

C. F. MENDHAM.
MACHINE FOR HERMETICALLY SEALING SHEET METAL VESSELS.

APPLICATION FILED FEB. 8, 1904.

2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

CONRAD F. MENDHAM, OF LONDON, ENGLAND, ASSIGNOR TO OSCAR HEINDORF, OF LONDON, ENGLAND.

MACHINE FOR HERMETICALLY SEALING SHEET-METAL VESSELS.

No. 797,862.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed February 3, 1904. Serial No. 191,807.

To all whom it may concern:

Be it known that I, CONRAD FIELD MENDHAM, a subject of the King of Great Britain, residing at London, England, have invented certain new and useful Improvements in and Relating to Machines for Hermetically Sealing Sheet-Metal Vessels and for Exhausting Air Therefrom, of which the following is a specification.

This invention relates to an improved arrangement applicable to machines employed for hermetically sealing sheet-metal vessels by the use of caps united to the edges of the filling-openings of the said vessels by solderless circular seams or spun joints; and the said invention particularly relates to means for subjecting the contents of the said vessels to the action of an air-exhausting pump or the like previous to the putting in place of the caps upon the filling-openings and for maintaining a more or less complete vacuum around the coacting edges of the said filling-openings and caps until the circular seams or spun joints are completely formed.

The present improvements are hereinafter described in their application to a machine for securing closing-caps to sheet-metal vessels of the kind described in the specification of Letters Patent No. 623,802, dated April 25, 1899.

In the accompanying drawings, Figure 1 is a front view, partly in vertical central section, of the parts comprised by the present invention shown in combination with such parts of a can-seaming machine as are necessary to illustrate the operation of the improved apparatus. Fig. 2 is a side elevation of Fig. 1. Fig. 3 shows a section in the line *xx*, Fig. 1; and Fig. 4 illustrates in detail a certain valve for controlling the exhaustion of air from and admission of air to a certain chamber *w*.

Referring to the drawings, *a* is the machine-frame; *b b* are bearings formed therein and one of which supports a sleeve *c*, carrying a die-ring *d*. *e* and *f* are neck-rings forming the raceway for seaming-rollers *g*, which are acted upon by a mandrel *h* and a spring-pressed thimble *i*. *j* is a spring acting on the sleeve *c*, and *j'* is a collar limiting the downward movement of the said sleeve. *N* is a table for supporting the can and elevating it to the range of operation of the seaming means. These parts operate in substantially

the same manner as the corresponding members of the machine described in specification No. 623,802, above quoted.

In the improved arrangements forming the subject of the present invention the exterior surface of the ring *d* is shaped to receive a cup *k* of convenient shape and having an annular extension *m* formed thereon to receive a packing-ring *n*. This ring is of suitable material to form a fluid-tight joint around the filling-opening of a vessel pressed against it. A cam-surface *p*, formed on the upper side of the cup *k*, is operated upon by rollers *q*, mounted on the sleeve *c*. The cup *k* is held from rotation by a lug *r* engaging in a guide-way *s*, formed in the frame *a*, so that axial movement of the said cup is permitted. The bearing-surfaces between the mandrel *h* and sleeve *c* and between the die-ring *d* and the cup *k* are packed, for example, by oil-grooves *t*, charged with oil to insure fluid-tightness without restriction of movement. A washer *v* is also inserted between the die-ring and its sleeve. Thus when a vessel *v'* is pressed against the packing-ring *n* a fluid-tight chamber *w* is formed, within which are contained the filling-opening *y* of the said vessel, the closing-cap *z*, the die-ring *d*, and the seaming-rollers *g*. This chamber is put in communication with an air-exhausting main 15, through a flexible conduit 2, a cock 3, and a pipe 16. In lieu of a flexible conduit 2 I may have a telescopic conduit.

In the present arrangement the sleeve *c* is rotatable in the bearing *b*. An antifriction or ball bearing 4 is inserted between the upper bearing *b* and the upper collar 5, taking the thrust of the spring *j*. The sleeve *c* is rotated by the hand-wheel 6 for the purpose of causing the cam-rollers *q* to travel on the cam-surface *p*. Stops 7 are arranged on the sleeve *c* and engage, as hereinafter described, either with the under surface or with the side of a lug 8, projecting from the machine-frame.

In some instances the seaming-rollers *g* are magnetized and the magnetic attraction exercised thereby is employed to support the closing-cap placed in position within the die-ring, as hereinafter explained.

12 is a vacuum-gage.

The operation of the improved apparatus is as follows: A cap *z* is placed in position either within the die-ring *d* in the case where magnetized seaming-rollers are employed or in other cases the said cap is laid loosely on

the filling-hole of the vessel, which is then pressed up against the ring *n* on the cup *k* by table *N*. The said cup is prevented from rising by the cam-rollers *q*, resting on the elevated parts 10 of the cam-surface *p* and in turn by the left-hand stop 7, Fig. 2, engaging the under surface of the lug 8, and thus by resisting the pressure of the can forms therewith a hermetic seal about its filling opening or mouth. The filling-opening *y* is now contained within a hermetically-closed chamber with the cap *z* resting thereon or raised above it by the magnetic attraction of the rollers *q*. The cock 3 is now operated to cause air to be exhausted from the chamber *w* through the conduit 2. The reduction of pressure in the chamber *w* draws the vessel closer to its seat on the packing-ring *n*, and the action of the exhausting apparatus is continued until the required degree of vacuum is attained, as shown by the gage 12. The hand-wheel 6 is now rotated and as an effect partly of atmospheric pressure and partly of the pressure of table *N* whose up-thrust is still maintained, since the rollers *q* are now over the low parts of the cam-surface, the cup slides up on the die-ring, so that the edge of the filling-opening *y* of the can is forced into the channel of the cap *z*, the unseamed joint being then in exact position within the die-ring *d* to be efficiently acted upon between the rollers *q* and die-ring *d* for the purpose of hermetically closing the joint in the known manner. The seaming or spinning of the joint is now proceeded with, the aforesaid rotation having caused said left-hand stop 7 to slip out from under the lug 8 and permit the sleeve to rise slightly, cushioned now by spring *j*, until the other lug 7 projects high enough so that upon further rotation it will bring up against lug 8 and prevent the die-ring *d* and its sleeve *c* from being revolved during the spinning process. When the joint is completed, the cock 3 is operated to admit air to the chamber *w* in order to equalize the pressure forcing the vessel against the packing-ring *n*. By rotating the hand-wheel 6, so that the rollers *q* are again brought upon the parts 10 of the cam, the consequent movement of the cup *k* along the die-ring *d* releases the sealed vessel from the die-ring and from the rollers *q*, to which it is held by magnetic attraction if the said rollers are magnetized.

What I claim is—

1. The combination, in a machine for sealing sheet-metal vessels, of a die-ring, and seaming means operatively arranged to cooperate with said die-ring, a cup mounted on the said die-ring and forming therewith a chamber, exhausting means connected with said chamber, a cam-surface on the said cup, and rollers having a fixed position with relation to said die-ring and disposed in operative relation to said cam-surface, substantially as described.

2. The combination in a machine for hermetically sealing sheet-metal vessels, of a die-ring, a cup mounted on the said die-ring, stops for preventing the rotation of the said cup, and cam mechanism controlling the relative axial movement of the said cup and die-ring.

3. The combination, in a machine for hermetically sealing sheet-metal vessels, of a cup, a packing-ring on said cup, an air-exhausting means, a die-ring, a seaming means operatively arranged to cooperate with said die-ring, said cup being movable axially on the die-ring, and a cam mechanism controlling the relative axial movement of the said cup and die-ring, substantially as described.

4. The combination in a machine for hermetically sealing sheet-metal vessels, of a non-rotating cup, a flange and packing-ring on the said cup, an air-exhausting main, a conduit connecting said cup with the air-exhausting main, a die-ring mounted on a rotatable sleeve, a cam-surface on the said cup, and rollers on the said sleeve coacting with the said cam-surface.

5. In a machine for hermetically sealing sheet-metal vessels, the combination of a die-ring and magnetized seaming-rollers cooperating with the said die-ring.

6. In a machine for hermetically sealing sheet-metal vessels, the combination of a die-ring, magnetized rollers, and cam mechanism for ejecting a sealed vessel from the said die-ring.

7. In a machine for hermetically closing sheet-metal vessels and the like, the combination of a hollow structure, an exhausting means, and a closing means located in said hollow structure, said hollow structure comprising an annular vessel-impinging part having a direct axial movability independently of the remainder of said structure to permit operative proximation of the vessel and said closing means and being non-participative in the control of said exhausting means, substantially as described.

8. In a machine for hermetically closing sheet-metal vessels and the like, the combination of a hollow structure, an exhausting means, and a closing means located in said hollow structure, said hollow structure comprising telescoped parts one of which is impingeable by the vessel to be closed and has a direct axial movability independently of the other to permit operative proximation of the vessel and the closing means, said part being non-participative in the control of said exhausting means, substantially as described.

9. In a machine for hermetically closing sheet-metal vessels and the like, the combination of a hollow structure, an exhausting means, a closing means located in said hollow structure, said hollow structure comprising an annular vessel-impinging part having a direct axial movability independently of the remainder of said structure to permit opera-

tive proximation of the vessel and the closing means and being non-participative in the control of said exhausting means, and means for temporarily securing said part against movement, substantially as described.

10. In a machine for hermetically closing cans or other vessels, the combination of a frame, a hollow structure, exhausting means communicating therewith, a closing means located therein, said structure comprising an annular can-impinging part movable in said structure to permit operative proximation of the can and said closing means, means whereby said part may be secured against, or made free for, such movement, and a cushioning means interposed between said structure and the frame and adapted to ease the thrust of the can being operated upon, substantially as described.

11. In a machine for hermetically closing

cans or other vessels, the combination of a frame, a rotatable die-ring, exhausting means, seaming devices inclosed by said die-ring and operatively arranged to cooperate with the same, an annular can-impinging part carried by said die-ring and movable axially thereon, means whereby said part may be secured against, or made free for, such movement, said die-ring being also axially movable, and stops adapted to limit the axial movement of said die-ring in the frame or the rotary movement of said die-ring in the frame, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CONRAD F. MENDHAM.

Witnesses:

H. D. JAMESON,
A. NUTTING.