

C. F. MENDHAM.
CAN CAP SEAMING APPARATUS.

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CAN-CAP-SEAMING APPARATUS.

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To all whom it may concern:

Be it known that I, CONRAD FIELD MENDHAM, a British subject, residing at Victoria, in the British Colony of Hong Kong, China, have invented certain new and useful Improvements in Can-Cap-Seaming Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to expanding machines or apparatus for rolling out and uniting the touching cylindrical surfaces of folded joints in tin or other sheet-metal vessels, especially the closing or sealing of caps or coverings placed over the apertures of tins, cans, drums, and the like containing explosive or inflammable material and applicable also for attaching the ends to cylindrical vessels; and it consists of a series of tapered spindles suspended on a circular bearing or collar, actuated by a taper-mandrel, which presses the spindles in an outward direction toward the inner edge or jaw of a surrounding casing, thus rolling the touching surfaces of the cap and vessel into a homogeneous and air-tight seam.

My invention and the means employed in carrying the same into effect are fully described in connection with the accompanying sheet of drawings, in which—

Figure 1 is an elevation and part section of the expanding apparatus complete, showing the mandrel pressed down against the spindles, forcing them outward, a cap and part of a vessel being shown as just closed by the apparatus. Fig. 2 is a section of the lower part of the same, showing the mandrel in its normal position and the spindles pressed inward to enable the caps or the ends of cans and the like to be inserted and withdrawn. Fig. 3 is a plan of the circular collar on which the necks of the spindles rest; and Fig. 4 is a plan of a loose collar or cage, which fits loosely in the outer casing, partially inclosing the lower parts of the spindles and revolves with them to keep them at the right distance from each other and to insure accuracy in their working. Figs. 5 and 6 are half-elevation and half-section of a cap

used on circular holes made in sheet-metal vessels for filling purposes, the edges of the holes being flanged up to receive the caps, Fig. 5 showing the cap laid over the edge of the hole and Fig. 6 the same after it has been closed and welded by my expanding apparatus. Figs. 7 and 8 are enlarged sections of part of the concentric jaw and loose cage and part of one of the spindles with a cap in position in Fig. 7 ready for compressing and Fig. 8 showing the same with the foot of the spindle tight against the jaw and the edges of the cap and turned-up edge of the vessel welded into an air-tight seam.

Any number of spindles may be employed, but six appear to be a suitable number. Therefore the drawings are made in accordance therewith. In Figs. 1 and 2 only the two opposite spindles are shown, the position of the others being easily understood by reference to Figs. 3 and 4.

A is a center mandrel, tapering, as shown, with a shank *a* extending to the upper part of the apparatus.

B B are the tapering spindles, having conical heads *b b*, the necks of which bear on the circular collar C. The inner top edge of this collar is rounded to form a suitable fulcrum for the spindles.

D is a loose collar or cage with the required number of circular chases cut therein with sufficient slackness to receive the spindles. This cage fits loosely in the outer casing E and revolves with the spindles to keep them in their respective positions.

F is a thimble surrounding the shank of the mandrel, the lower outer surface *f* being tapered to rest on and engage with the heads of the spindles.

G is a helical spring placed around the shank above the thimble to keep it bearing tightly on the heads of the spindles.

H is a bracket or other suitable means for supporting the apparatus in such a position that the tins, drums, or the like to be operated upon may be easily placed in position for that purpose.

I is a lever fulcrumed at J, by which the pressure is put on the mandrel while it is actuated by turning the handle K or by any other suitable contrivance provided therefor.

L is the lower part of the spindles, which as they revolve press the cylindrical metal surfaces against the inner circular surface or jaw N of the outer casing. At the bottom of the spindles small beads M are formed for expanding the metal and forcing it up to and against the inner surface of the vessel, the lower edge of the jaw N holding the flanged-up edge of the vessel while the contact is being made and a small groove made in the cap or cover by the pressure of the beads M.

R is a metal cap with its edge U turned over and shaped at the bottom, as shown, to allow the metal to be expanded to form the joint.

S is part of the upper side of a sheet-metal vessel with a circular hole cut therein, and the edge of the hole T flanged up to receive the cap. When fastened by the apparatus, the cap and turned-up edge of the hole are compressed into a solid and air-tight seam, as shown at V, Figs. 6 and 8.

The respective diameters of the spindles and mandrel are so arranged that when in operation they will rotate in a perfectly vertical position and will advance in their planetary motion without any grinding or friction.

The various parts of the apparatus being provided and fixed in their respective positions, as described, their operation is as follows: The bracket H is attached to a standard or other support. Then, by means of the lever I, the circular foot N is brought down on the surface of the vessel, and then, by simultaneously turning the handle K and pressing the lever I, the mandrel A is brought against the tapered faces of the spindles B, which are spread outward by the internal pressure, the feet L engaging the metal edges T U between the feet and the jaw N, uniting them in a solid air-tight seam V, while the beads M will expand the inner face of the cap and press it against the lower part of the turned-up flange T, forming a small groove on the inside and a projection on the outside, which by metallic contact will afford additional security against leakage from the inside. When a cap has been fastened, the lever I is raised, which lifts the mandrel to the position shown in Fig. 2, the action of the spring G on the heads of the spindles b making the feet to converge when liberated from the pressure of the mandrel, thus allowing the cap and vessel to be released from the apparatus and another inserted, when the process is repeated.

Having thus described my invention and the manner in which it is put into operation,

I declare that what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a stationary casing provided with a circular jaw; of spindles arranged inside the said casing, and a depressible and revoluble mandrel operating to move the said spindles toward the jaw, and to revolve them about their own axes and the axis of the said jaw, substantially as set forth.

2. The combination, with a stationary casing provided with a circular jaw; of conical spindles pivotally supported inside the said casing, and a depressible and revoluble mandrel bearing against the conical surfaces of the said spindles, substantially as set forth.

3. The combination, with a stationary casing provided with a circular jaw; of spindles arranged inside the casing and provided with projecting heads arranged below the said jaw, and a depressible and revoluble mandrel for forcing outward and revolving the said spindles, substantially as set forth.

4. The combination, with a stationary casing provided with a circular jaw, and a collar above the jaw; of spindles provided with heads pivotally supported on the upper edge of the said collar, and a depressible and revoluble mandrel for forcing outward and revolving the said spindles, substantially as set forth.

5. The combination, with a stationary casing provided with a circular jaw at its lower part; a collar above the jaw, and a cage provided with chases and arranged intermediate of the said jaw and collar; of spindles journaled loosely in the said chases and provided with heads pivotally supported on the said collar; and a depressible and revoluble mandrel for forcing outward and revolving the said spindles, substantially as set forth.

6. The combination, with a stationary casing provided with a circular jaw; of spindles pivotally supported inside the said casing, a depressible and revoluble mandrel bearing against the said spindles below their fulcrums, and a spring-pressed thimble bearing against the spindles above their fulcrums and operating to move them away from the said jaw when the mandrel is raised, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CONRAD FIELD MENDHAM.

Witnesses:

G. A. SHUFELDT,
J. CURRIE HANSON.