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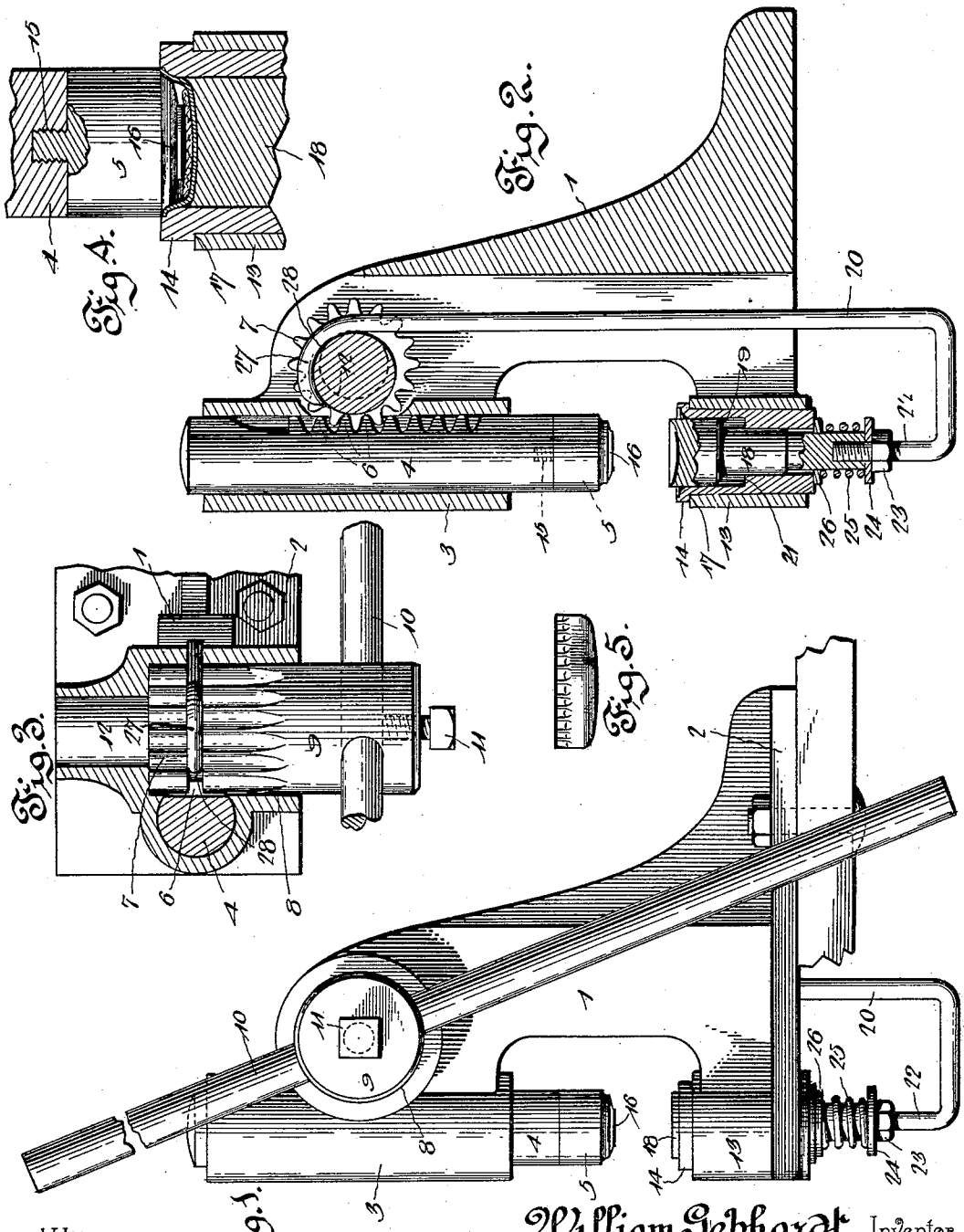
W. GEBHARDT.

MACHINE FOR REBENDING CROWN CAPS OR SEALS FOR BOTTLES.

(Application filed Dec. 20, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

WILLIAM GEBHARDT, OF SAN ANTONIO, TEXAS.

MACHINE FOR REBENDING CROWN CAPS OR SEALS FOR BOTTLES.

SPECIFICATION forming part of Letters Patent No. 631,785, dated August 29, 1899.

Application filed December 20, 1898. Serial No. 699,825. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GEBHARDT, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented a new and useful Machine for Rebending Crown Caps or Seals for Bottles, of which the following is a specification.

The invention relates to improvements in machines for rebending crown caps or seals for bottles.

The object of the present invention is to provide a simple, inexpensive, and efficient machine adapted for rebending or flaring crown-seals after the latter have been used in order that the same may be reused a number of times and capable of enabling such bending or flaring to be quickly effected without bending the center of the cap inward and without loosening the cork.

A further object of the invention is to provide a simple and automatic device for freeing the cap or seal from the female die after it has been operated on.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is an elevation of a rebending-machine constructed in accordance with this invention. Fig. 2 is a vertical longitudinal sectional view. Fig. 3 is a horizontal sectional view. Fig. 4 is an enlarged detail sectional view showing the dies in engagement with a seal or cap. Fig. 5 is an elevation of a seal or cap, showing the same after use.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a frame provided at its lower end with a base 2 and having a tubular portion 3 at its upper end to form a guide for a vertically-reciprocating plunger 4, which carries an upper male die 5. The base is designed to be mounted upon a suitable bench or support, and it is provided with perforations for the reception of fastening devices for securing the frame in position.

The vertically-reciprocating plunger is provided at its inner side with teeth 6, which mesh with a gear 7, journaled in suitable bearings of the upper portion of the frame, such bearings 8 being horizontal and intersecting the tubular portion 3 at a point between the ends thereof. The gear 7 has one end, 9, extended beyond the bearing and perforated for the reception of a handle or lever 10, which is secured in place by a set-screw 11, mounted in a threaded perforation of the outer end of the gear. The other end, 12, of the gear is slightly reduced, and the adjacent bearing forms a partial cap for the same.

The frame is provided at the front end of the base with a tubular seat or socket 13, in which is arranged a removable female die 14, which coöperates with the upper male die 5, and the latter has a threaded stem 15, which fits in a corresponding socket of the plunger. The dies are removable, in order that different sizes may be employed. The upper die is provided with a rounded lower end 16, and the central portion thereof is adapted to engage the cork of a crown-seal before the crimped edge thereof is operated on, whereby the central portion of the seal is prevented from being bent inward and loosening the cork. The lower die, which is tubular, is provided with an exterior shoulder 17 to engage a shoulder of the socket or seat 13, and within the lower or female die is arranged a vertically-movable core 18, forming a bottom for the die and normally projecting upward, so as to receive the crown-seal before the same engages the body portion of the lower die, and this movable inner core, which is yieldingly mounted, is adapted to compensate for crown-seals of different thicknesses, and its upper end, which forms a bottom for the female die, is slightly concaved or dished to fit the center of a seal or cap. The top of the die is flared to receive the edge of the cap. (See Figs. 2 and 4.) The lower portion or stem of the core is reduced to provide a shoulder 19, and its lower end has a threaded socket to receive an operating-rod 20, which is connected with the operating mechanism and is adapted to move the core vertically to release a cap from the female die as the plunger moves

upward. The shoulder 19 of the core is adapted to abut against a corresponding shoulder 21, formed on the interior of the female die and adapted to limit the downward movement of the core.

The rod 20, which extends vertically through the frame, is provided at its lower end with a return bend 22, its lower terminal being threaded and engaging the socket of the core, and the nut 23 is disposed on the threaded lower end of the rod to support a disk or washer 24 and to serve as a jam-nut to lock the core against rotation. The disk or washer forms a seat for a spiral spring 25, which is coiled around the stem of the core and interposed between the lower disk or washer 24 and an upper ring or washer 26.

The upper end 27 of the rod is curved to form a partial hook, which engages a cam 28 of the gear 7. The cam is formed by annularly grooving the gear at a point between the ends of the teeth, the groove varying in depth to form an eccentric or cam, as clearly illustrated in Fig. 2 of the accompanying drawings. When the plunger moves upward, the cam lifts the rod and the core, and thereby releases the cap or seal and prevents the latter from remaining in the female die. As the plunger moves downward the spring causes a positive downward movement of the rod, and the latter has sufficient resiliency at the bend to allow for any variation in the thickness of a seal or cap.

By arranging the upper curved end of the rod 20 in the groove of the gear the latter is detachably retained in its bearings, as clearly illustrated in Fig. 3 of the accompanying drawings.

By making the central portion of the male die of greater length, the device will be adapted for operating on the crown seals or caps after the cork-disks have been removed, the central portion when extended in this manner being adapted to engage and prevent the central portion of the cap from bending inward.

The invention has the following advantages: The machine, which is simple and comparatively inexpensive in construction, is adapted for rebending or flaring crown seals or caps after they have been used and are of the shape illustrated in Fig. 5 of the accompanying drawings, and it is capable of engaging the central portion of the cap or seal before operating on the crimped edge, so that there is no liability of bending the said central portion inward and loosening the cork. The flaring action of the machine does not injure the crimped edge of a seal or cap, and it will enable the same to be reused a considerable number of times. The vertically-movable core which forms the bottom of the female die engages the cap or seal before the edges thereof strike the body portion of the lower die, and it is also adapted to lift the cap from the latter and prevent it from sticking therein. The dies are removable, so that different sizes may be employed to adapt the machine for operating on caps or seals of various sizes.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is—

1. A machine of the class described comprising a frame, a female die having a tubular body portion, a vertically-movable core forming the bottom of said bottom portion, a spring for forcing the core downward, a reciprocating plunger carrying a male die, and direct mechanical connections between the plunger and the core, whereby the latter will be operated as the plunger is reciprocated, substantially as described.

2. A machine of the class described comprising a frame, a female die having a movable core and mounted on the frame, a reciprocating plunger carrying a male die and provided with teeth, a gear meshing with the teeth of the plunger, and connections between the gear and the core, whereby the latter will be automatically operated as the plunger is reciprocated, substantially as described.

3. A machine of the class described comprising a frame, a female die arranged at the base of the frame, a vertically-movable plunger carrying a male die, gearing for raising and lowering the plunger, said gearing being provided with a cam or eccentric, a vertically-movable core forming the bottom of the female die, and connections between the cam or eccentric and the core, whereby the latter will be automatically operated as the plunger is reciprocated, substantially as described.

4. A machine of the class described comprising a frame, a female die mounted on the base of the frame, a vertically-movable plunger carrying a male die, a vertically-movable core forming the bottom of the female die, gearing for reciprocating the plunger, said gearing being provided with a cam, a rod connected at its lower end with the core and having its upper end arranged to be engaged by the cam, whereby the core will be moved upward, and a spring for moving the core downward, substantially as described.

5. A machine of the class described comprising a frame, provided at its base with a socket, a tubular die removably fitted in the socket and provided with inner and outer shoulders, the outer shoulder engaging the frame, a core forming the bottom of the female die and having a reduced portion or stem forming a shoulder for engaging the inner shoulder of the die, a spring disposed on the lower portion of the core to force the latter downward, a rod extending vertically through the frame and having its lower end connected with the core, a reciprocating plunger having a male die, and gearing for operating the plunger and the rod, substantially as described.

6. A machine of the class described com-

prising a frame, a female die having a movable core and mounted on the frame, a reciprocating plunger carrying a male die and provided with teeth, a gear meshing with the teeth of the plunger and provided with an annular groove varying in depth and forming a cam, and a rod engaging the cam and connected with the core, substantially as described.

7. A machine of the class described comprising a frame provided with a vertical opening and having a horizontal bearing, a vertically-reciprocating plunger mounted on the frame and having teeth, a gear arranged in the bearing and meshing with the plunger, said gear having a groove forming a cam, a rod passing through the opening of the frame, engaging the groove of the gear to retain the latter in its bearing and adapted to be operated by the cam, and a female die having a core connected with and operated by the rod, substantially as described.

8. A machine of the class described comprising a frame provided with a socket, a tubular guide removably fitted in the socket, a core forming the bottom of the tubular guide, a spring connected with the core and adapted to force the same downward, a rod connected with the core, a reciprocating plunger having a male die, and gearing for operating the plunger and the rod, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM GEBHARDT.

Witnesses:
C. G. CARTTAR,
ALBERT KRANKOSKY.