To all whom it may concern:

Be it known that I, LEONARD DEE STEPHENSON, a citizen of the United States, and resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Machines for Capping Multisided Paper Bottles, of which the following is a specification.

The object of my invention is to provide a machine for applying metal caps to multisided paper bottles, and is particularly directed to machines for applying the top caps to said multi-sided paper bottles.

My invention comprises certain improvements in machines for capping multi-sided paper bottles, in which the top sides of the paper bottle and the inner uprising walls of the metal cap are first flared by the action of a plunger and then the outer depending walls of the metal cap are forced inwardly by the action of crimping jaws to pinch the top sides of the bottle snugly between the inner and outer walls of the metal cap, the inclination of the said top sides of the bottle and the inner and outer walls of the cap serving to securely lock the cap to the bottle.

A further object is to provide very simple and effective means for accomplishing the above result.

A practical embodiment of my invention is represented in the accompanying drawings, in which,

Figure 1 represents the bottle capping machine in front elevation, certain of the parts being broken away.

Fig. 2 is a side elevation of the machine.

Fig. 3 is a section taken in the plane of the line III--III of Fig. 2, looking in the direction of the arrow.

Fig. 4 is a section taken in the plane of the line IV--IV of Fig. 2, looking in the direction of the arrow.

Fig. 5 is a considerably enlarged detail section at the top of the machine, showing the parts in the position which they assume with the plunger raised and the crimping jaws open.

Fig. 6 is a similar view with the parts shown in dotted lines in the position which they assume with the plunger lowered and the crimping jaws open and in full lines in the position they assume with the plunger lowered and the crimping jaws closed.

The present invention is directed particularly to the capping of the top of the paper bottle, a co-pending application being directed to means for capping the bottom of the bottle.

The paper bottle 1, illustrated herein, to be capped, is shown of tapered rectangular form with its bottom cap 2 already applied. The top metal cap 3 has uprising inner side walls 4 and depending side walls 5. This cap is placed on the top of the bottle with the top sides of the bottle located between the inner and outer side walls of the cap.

The base 6 of the capping machine is provided with an upright 7 having an over-hanging arm 8. A vertical plunger 9 is slidably mounted in the over-hanging arm 8 of the upright, the head at the bottom of the plunger having tapered sides 10 arranged, when the plunger is lowered, to enter the cap 3 and force its inner side walls 4 outwardly 75 and at the same time force the top sides of the bottle 1 outwardly. This plunger has a double pin and slot connection 11, 12, with the overhanging arm 8 of the upright 7.

The lower end of the plunger is provided with pairs of ears 13, 14, spaced apart, the pairs of ears corresponding in number to the sides of the bottle to be capped. Between each pair of ears, I pivot a crimping jaw 15 at 16, which jaw is provided with a tapered uprising arm 17 and with a laterally extended crimping face 18. This crimping face is arranged to be brought toward and away from its corresponding tapered side 10 of the head of the plunger as the jaw is rocked. A spring 19 serves to open the jaws by swinging the uprising arm 17 inwardly toward the plunger 9.

The means for controlling the movement of the plunger and the movements of the crimping jaws is constructed, arranged and operated as follows:

A wedge block 20 is slidably mounted on the plunger 9, and it is provided with wedges 21 corresponding in number to the crimping jaws, the narrow ends of which wedges are interposed between the upper ends of the arms 17 of the jaws and the plunger. A pin 22 carried by the plunger 9, rests upon the top of the wedge block 20, when the block and plunger are in their raised position.

A lever 23 is pivoted at 24 to the over-
hanging arm 8 of the machine upright, the free end of which lever is connected to the upper end of a vertically sliding rod 23, which passes downwardly through the upright 7 to some suitable operating means, not shown herein, for raising and lowering the rod. The lever 23, intermediate its ends, is connected to the wedge block 20 by links 26.

A holder 27 is provided on the upright 7, for holding the bottle in position on the base 6, with the top of the bottle directly beneath the head of the vertically sliding plunger 9.

In operation, assume the parts to be in the positions shown in Figs. 1 and 2, with the multi-sided paper bottle placed in position beneath the plunger, and the metal cap placed in position on the top of the bottle. The lever 23 is rocked downwardly. The first part of the downward movement of the lever 23 is accompanied by the downward movement of the plunger 9 and wedge block 20 together. This simultaneous downward movement of the plunger and wedge block continues until the head of the wedge block enters and seats within the metal cap 3, this movement serving to flare the inner side walls of the cap and the top sides of the bottle outwardly. To prevent undue endwise strain on the bottle, the downward movement of the plunger is limited by its pin and slot connection 11, 12, with the overhanging arm 8 of the upright. The further downward movement of the lever 23 will cause the wedge block 20 to be forced downwardly along the plunger, thus swinging the arms 17 of the crimping jaws downwardly to close the jaws. This closure of the jaws will force the outer side walls 5 of the metal cap inwardly into snug engagement with the top sides of the bottle and crimp the same into a permanent locking position. The lever 23 may then be swung upwardly. The first portion of this upper movement will withdraw the wedge block 20 from its engagement with the arms of the jaws, permitting the jaws to open under the influence of the springs 19. The further upward movement of the lever 23 will cause the wedge block 20 to raise the plunger 9, through the medium of the pin 22, sufficiently to permit the removal of the capped bottle.

It is to be understood that this machine is applicable for capping bottles of many different sides.

It is evident that various changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the construction herein described, but...

What I claim is:

In a machine for securing metal caps to multi-sided paper bottles, a suitable support, a plunger movable therein and having a tapered head for flaring the inner cap walls and the top sides of the bottle, crimping jaws carried by the plunger for clamping the top sides of the bottle between the inner and outer cap walls, and means for controlling the operation of the plunger and crimping jaws comprising a wedge block having a lost motion connection with the plunger and wedge block operating means.

In testimony, that I claim the foregoing as my invention, I have signed my name this 31st day of October 1917.

LEONARD DEE STEPHENSON.