To all whom it may concern:

Be it known that I, GEORGE HOLTHAUS, a citizen of the United States, residing at Baltimore, State of Maryland, have invented new and useful Improvements in Methods of and Means for Assembling Sifter-Top Members for Cans, of which the following is a specification.

This invention relates generally to a method of assembling can tops and more particularly to a method and apparatus for properly locating the two relatively movable members of a sifter top construction before such members are finally assembled as by crimping.

The object of this invention is to provide a method and automatic means for adjusting a cap on the sifter top so as to bring it into proper register with the top before crimping. A further object is to provide constantly rotating means for adjusting the cap. I also provide such means operative automatically in conjunction with a crimping machine. A further object is to produce a machine simple in structure, easily and cheaply manufactured and suitable for attachment to standard crimping presses.

My machine is intended primarily for use in assembling cans of the sifter top type, in which holes in the can top register with holes in a rotatable cap mounted on said top. Such cans ordinarily have interengaging elements on the top and cap to stop the rotation of the cap in one direction when the holes are in register, and in the other direction when the holes are out of register and the can is therefore closed. It has been the practice in assembling the cap and top to have an operator take from the tray the assembled can breast and top and place the cap thereon, adjust it so that the top device is in engagement, and then place top and cap on the platform of a crimping press to be crimped together. To have the crimper run at full capacity it is necessary for the operator to assemble the caps and tops very rapidly; and the object of this machine is to avoid the necessity for registering the top device by hand, permitting the operator to place the cap on the top and both on the machine without any delay for adjustment, thus considerably increasing the speed of the process.

My machine operates to automatically register the cap and top regardless of their relative position when placed on the crimper table and to feed them to the crimper in closed position, that is, with the holes out of register. This is of particular advantage as it dispenses with subsequent inspection to make sure that the tops are closed before placing them on the filled container. Further objects and advantages will be obvious from the following description taken in connection with the annexed drawings in which:

Figure 1 is a front view of the device attached to a standard crimping press;

Fig. 2 is a plan view of the press table and feeding means;

Fig. 3 is a plan view of the driving connections and bracket;

Fig. 4 is a vertical section through the lower portion of the device showing a can cap engaged thereby;

Fig. 5 is a plan view of a can top with the cap in open position;

Fig. 6 is a similar view with the cap in closed position;

Fig. 7 is a cross sectional view taken centrally of the crimper and one of the platforms shown in Fig. 1;

Fig. 8 is a view taken on the line 8—8 of Fig. 7, and

Figs. 9 and 10 are detailed views of the expansion stake shown in Fig. 7.

The standard press shown has a drive shaft 10 reciprocating the crimping head 11 by means of crank 12, pitman 13 and reciprocating carriage 14 carried in ways in the frame 15. Said frame also carries a rotating table 16 having a series of platforms 17 upon each of which may be located a can top 18, each platform also having a stop pin 19 to prevent the rotation of a top thereon. The table is provided at its underside with a form of Geneva motion driven by shaft 21 which is driven through bevel gears 22 from drive shaft 10 and intermittently rotates the table. The operation is so timed that the crimp head 11 descends on a can top carried by a platform 17 during the pause of the platform under the crimper head and operates thereon to crimp the cap into position. This mechanism hereinafter described more in detail is well known in the art and is shown for illustrative purposes only as my device is applicable to different forms of crimping presses, or may be operated in-
dependent of a crimping press. My device comprises a vertical shaft 22 carried in bearings in bracket 23 mounted on carriage 14. A collar 24 on said shaft limits its downward motion and spring 25 pressing upwardly against the lower arm of bracket 23 and downwardly against collar 26 on the shaft 22 tends to hold the shaft in its lowermost position, with collar 24 against the bracket arm. As collars 26 and 24 are adjustable on the shaft the lowermost position of the shaft and the tension of spring 25 may be varied at will.

Mounted on the lower end of the shaft 22 is the adjusting head 27 having a cup shaped recess at its lower side carrying a cork contact pad 28, the diameter of the cup being slightly greater than the diameter of the can top. The shaft 22 is rotated through pinion 29 carried by shaft 21, driving pinions 30 and 31 carried by bracket 32 mounted on the frame of the machine. Pinion 31 meshes with a pinion 33 splined on shaft 22 and constantly rotating the adjusting head regardless of its vertical reciprocation.

The crimping mechanism which I prefer to use is well known in the art and is shown in detail in Figs. 7 to 10. In this mechanism carriage 14 is provided with a central bore 36, in which is mounted a core 37, held in engagement with the bore by any preferable means such, for example, as by split sleeve 38, and locking bolt 39. Fixed to the bottom of the carriage 14 is a ring 40, and fixed on the bottom of the core is another ring 41, these rings defining therebetween an annular space in which are mounted the four sectional blocks 42, shown more clearly in Fig. 8, these blocks having a small radial movement in the said space and being urged radially against the interior surface of ring 40 by means of expansion springs 43 seated in bores in the blocks 42, as more clearly shown in Fig. 8. These blocks are supported on the rings by means of accurate members 44 fixed to the blocks and seated in opposed annular recesses formed in the upper portions of the rings. Mounted to move vertically in core 37 is a plunger 45, having at its lower end a cap engaging head 46, and being urged downwardly by means of compression spring 47, the plunger being limited in its downward motion by adjustable nuts 48, the plunger being limited in its upward movement by the engagement of the upper face of head 46 against the lower face of core 37. Blocks 42 are provided with inwardly projecting beads 49 for a purpose hereinafter described. Platform 17 is provided with a bore, in which is movably mounted the stake support 50, this support being upwardly urged through compression springs 51 seated in the base of platform 17, the support being limited in its upward motion by means of the heads on guide screws 52, attached to the support 50. The support 50 retains four sectional expansion stakes 53, shown more clearly in Figs. 9 and 10 of the drawings. These expansion stakes are retained against longitudinal motion by a retaining ring 54, fixed to the stake support 50, the retaining ring having an annular flange engaging retaining shoulders on the expansion stakes 53. These stakes when assembled have an internal bore 55, tapered at its upper portion 56, as shown in Figs. 9 and 10. Cooperating with this bore is an expansion bolt 57 mounted fixedly with respect to platform 17, as for example, on bolt 58. Each stake is provided with a radially projecting rib 59 for crimping purposes. The top and cap are adapted to be received upon the stake members as shown clearly in Fig. 7. In operation of this crimping device, as carriage 14 moves downwardly the head 46 first engages the cap and the stakes and in its further downward motion the blocks 42 engage the interior surface of platform 17, these blocks being pressed inwardly by the said surface by reason of the fact that the diameter of the bore in platform 17 is somewhat smaller than the external diameter of the assembled blocks 42. The lower outside edges of the blocks and the upper interior edges of the platform are suitably curved, providing for easy engagement of the blocks with the platform. The blocks are thus moved inwardly against the compression springs 43, the beads 49 engaging and pressing inwardly the lower inturned portions of the cap. Upon further downward motion of the carriage 14, when head 46 has reached the limit of its upward motion, this head begins its driving operation and drives stakes 53 downwardly against the stationary expansion bolt 57. The stakes 53 are thus driven outwardly by reason of the engagement of expansion bolt 57 with the tapered portion of the core in the expansion stakes. The ribs 59 in this operation crimp the neck of the can top just above the inturned portion of the cap held by the head and the beads 49. As will be apparent, in the upward motion of carriage 14, the can top and cap are freed from engagement with the head 46 and blocks 42, the support 50 being driven upwardly with the stakes 53, by means of compression spring 51, thus loosening the stakes 53 and permitting the subsequent easy removal of the now crimped can top and cap.

In operation can tops are placed either by an operator or automatically in position on the platforms with the central stud of the platform positioning the top thereon, and the caps are placed on the tops as described but no care need be taken to position them accurately thereon. In the form of top shown in Figs. 5 and 6 it is 34 carried by the top engages the slot 35 in the cap to
stop the cap in position on the top either with the holes registering or completely closed; but it is obvious that my device is applicable to various forms of cap top having registering means thereon. The table in its intermittent revolution locates the cap first under the adjusting head which descends thereon and by frictional engagement of pad 28 with the cap rotates the cap until the interengaging slot 35, when the rotation of the cap will be stopped by the engagement of the tip with the end of said slot. The head 27, however, continues its rotation, sliding over said cap, which will be in closed position shown in Fig. 6 with the holes out of register. The pressure of spring 25 can be adjusted so as to produce rotation of the cap but with a minimum of friction after the cap is in closed position. The adjusting head 34 rises simultaneously with the crimmer and the adjusted cap is moved under the crimmer and crimped simultaneously with the adjustment of the succeeding cap. The crimped tops are then moved past the crimmer and new tops and caps substituted thus providing a continuously operating machine.

While I have shown my invention in its preferred form it will be apparent that changes and modifications may be made in the specific structure disclosed without departing from the spirit of the invention as embodied in the following claims.

I claim:—

1. In a machine for preliminarily adjusting a rotatable cap on a can top prior to the crimping thereof, the cap and top having means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, means for supporting the top and means for rotating the cap to bring the interengaging means into operative relation whereby an assembled top and cap in registry is provided ready for crimping.

2. In a machine for preliminarily adjusting a rotatable cap on a can top prior to the crimping thereof, the cap and top having means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, means for supporting the top and continuously rotating means for rotating the cap to bring the interengaging means into operative relation, whereby an assembled top and cap in registry is provided ready for crimping.

3. In a machine for preliminarily adjusting a rotatable cap on a can top prior to the crimping thereof, the cap and top having means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, means for supporting the top and means for frictionally engaging the cap to rotate and bring the interengaging means into operative relation, whereby an assembled top and cap in registry is provided ready for crimping.

4. In a machine for preliminarily adjusting a rotatable cap having a recess on a can top having a projection, prior to the crimping thereof, the projection and the recess constituting means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, means for supporting the can top, a rotating head rotated above said support, and means for bringing said head and cap into engagement to rotate the cap to bring the interengaging means into operative relation, whereby an assembled top and cap in registry is provided ready for crimping.

5. In a machine for adjusting a rotatable cap on a can top prior to the crimping thereof, the cap and top having means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, an intermittently movable table providing supports for a plurality of can tops and means operable when the said table is stationary, for rotating the caps on the tops to bring the interengaging means into operative relation, whereby an assembled top and cap in registry is provided ready for crimping.

6. In a machine for preliminarily adjusting a rotatable cap on a can top prior to the crimping thereof, the cap and top having means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, an intermittently movable table providing supports for a plurality of can tops, a continuously rotatable reciprocable head operable when the said table is stationary, for rotating the caps on the tops to bring the interengaging means into operative relation, and means for synchronously operating the table and the head.

7. An attachment to a crimping machine comprising a support having means for attachment to the reciprocating crimping head of the crimping machine, and rotatable means provided with a cap adjusting head mounted in said support.

8. An attachment to a crimping machine comprising a support having means for attachment to the reciprocating crimping head of the crimping machine, and rotatable means provided with a cap adjusting head yieldably mounted for sliding movement in said support.

9. An attachment to a crimping machine comprising a support having means for attachment to the reciprocating crimping head of the crimping machine, rotatable means provided with a cap adjusting head mounted in said support, a bracket adapted to be mounted on a stationary part of the crimping machine, and rotatable means...
mounted in said bracket including an element for rotating said first rotatable means.

10. An attachment to a crimping machine comprising a support having means for attaching to the reciprocating crimping head of the crimping machine, rotatable means provided with a cap adjusting head yieldably mounted for sliding movement in said support, a bracket adapted to be mounted on a stationary part of the crimping machine and rotatable means mounted in said bracket including an element in which the first rotatable means is supported for sliding movement.

11. In a can assembling machine, the combination of means for holding in position a can top having a rotatable cap thereon, the cap and top having means adapted for registration and interengagement so as to limit the movement of the cap on the top, means for rotating said cap into adjusted position to bring the interengaging means into operative relation and means for crimping said cap in adjusted position.

12. In a can assembling machine, the combination of means for holding in position a can top having a rotatable cap thereon, means for rotating said cap into adjusted position, means for crimping said cap in adjusted position and means for conveying said holding means from adjusting to crimping position.

13. In a can assembling machine, means for holding a can top having a rotatable cap thereon, the cap and top having means adapted for registration and interengagement so as to limit the movement of the cap on the top, a reciprocating crimping head connected to and reciprocating with said crimping head connected to and reciprocating with said crimping head, and means for rotating the can cap into adjusted position on said can top to bring the interengaging means into operative relation.

14. In a can assembling machine, means for holding a can top having a rotatable cap thereon, the cap and top having means adapted for registration and interengagement so as to limit the movement of the cap on the top, a reciprocating crimping head connected to and reciprocating with said crimping head, and means for operating said crimping and adjusting means simultaneously.

15. In a can assembling machine, a crimping head connected to and reciprocating with said crimping head, and crimping means adapted for registration and interengagement so as to limit the movement of the cap on the top, the steps of placing the cap on the can top, stationarily supporting the can top while moving a continuous rotating element into frictional contact with the cap for the rotation thereof on the can top until the means on the top and cap interengage, whereby an assembled can and top in proper registry is obtained, and in then crimping the can on the top while the parts are thus in interengaged position.

16. In a can assembling machine, a crimping head connected to and reciprocating with said crimping head, and crimping means adapted for registration and interengagement so as to limit the movement of the cap on the top, the steps of placing the cap on the can top, stationarily supporting the can top while moving a continuous rotating element into frictional contact with the cap for the rotation thereof on the can top until the means on the top and cap interengage, whereby an assembled can and top in proper registry is obtained, and in then crimping the can on the top while the parts are thus in interengaged position.

17. In a can assembling machine, a reciprocating crimping head connected to and reciprocating with said crimping head, rotatable means adapted for crimping said cap into adjusted position and means for crimping said cap into adjusted position and means for reciprocating said crimping machine as crimping shaft.

18. In the art of assembling and crimping caps on can tops, in which the top and cap have means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, the steps of placing the cap on the can top, stationarily supporting the can top while moving a continuous rotating element into frictional contact with the cap for the rotation thereof on the can top until the means on the top and cap interengage, whereby an assembled can and top in proper registry is obtained, and in then crimping the can on the top while the parts are thus in interengaged position.

19. In the art of assembling and crimping caps on can tops, in which the top and cap have means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, the steps of placing the cap on the can top, stationarily supporting the can top while moving a continuous rotating element into frictional contact with the cap for the rotation thereof on the can top until the means on the top and cap interengage, whereby an assembled can and top in proper registry is obtained, and in then crimping the can on the top while the parts are thus in interengaged position.

20. In the art of assembling and crimping caps on can tops, in which the top and cap have means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, the steps of placing the cap on the can top, stationarily supporting the can top while moving a continuous rotating element into frictional contact with the cap for the rotation thereof on the can top until the projection and the recess on the top and cap interengage, whereby an assembled can and top in proper registry is obtained, and in then crimping the can on the top while the parts are thus in interengaged position.

21. In the art of assembling and crimping caps on can tops, in which the top and cap have means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, the steps of placing the cap on the can top, stationarily supporting the can top while...
moving a continuous rotating element into contact with the cap for the rotation thereof on the can top until the means on the top and cap interengage, whereby an assembled can and top in proper registry is obtained.

22. In the art of assembling and crimping caps on can tops, in which the top and cap have a projection and a recess respectively constituting means adapted for registration and interengagement so as to limit the movement of the cap on the top in opposite directions, the steps of placing the cap on the can top, stationarily supporting the can top while moving a continuous rotating element into contact with the cap for the rotation thereof on the can top until the projection and the recess on the top and cap interengage, whereby an assembled can and top in proper registry is obtained.

In testimony whereof I have hereunto set my hand.

GEORGE HOLTHAUS.