G. KIRKEGAARD.

CAPPING MACHINE HEAD.

APPLICATION FILED MAY 6, 1908.

931,626. Patented Aug. 17, 1909.

Fig. 2.

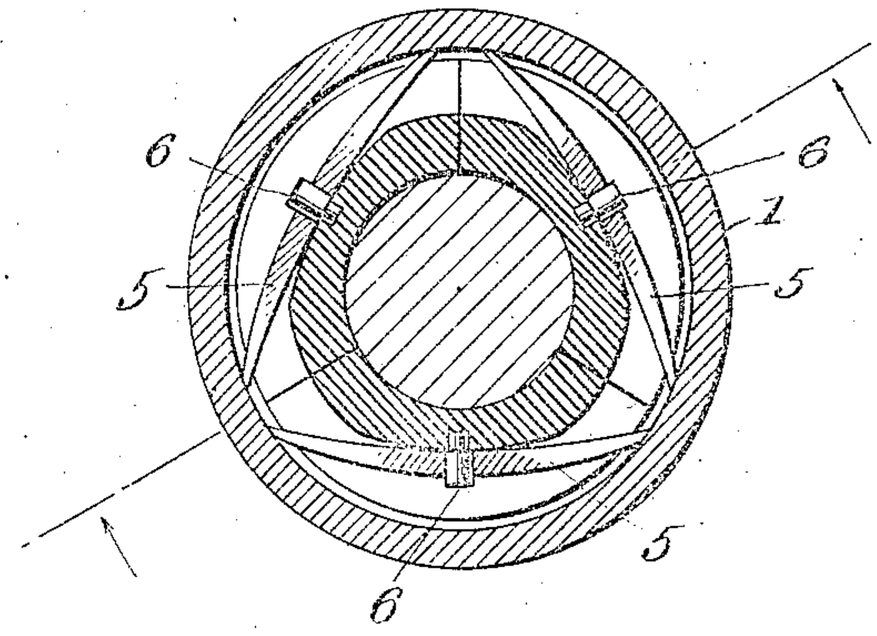
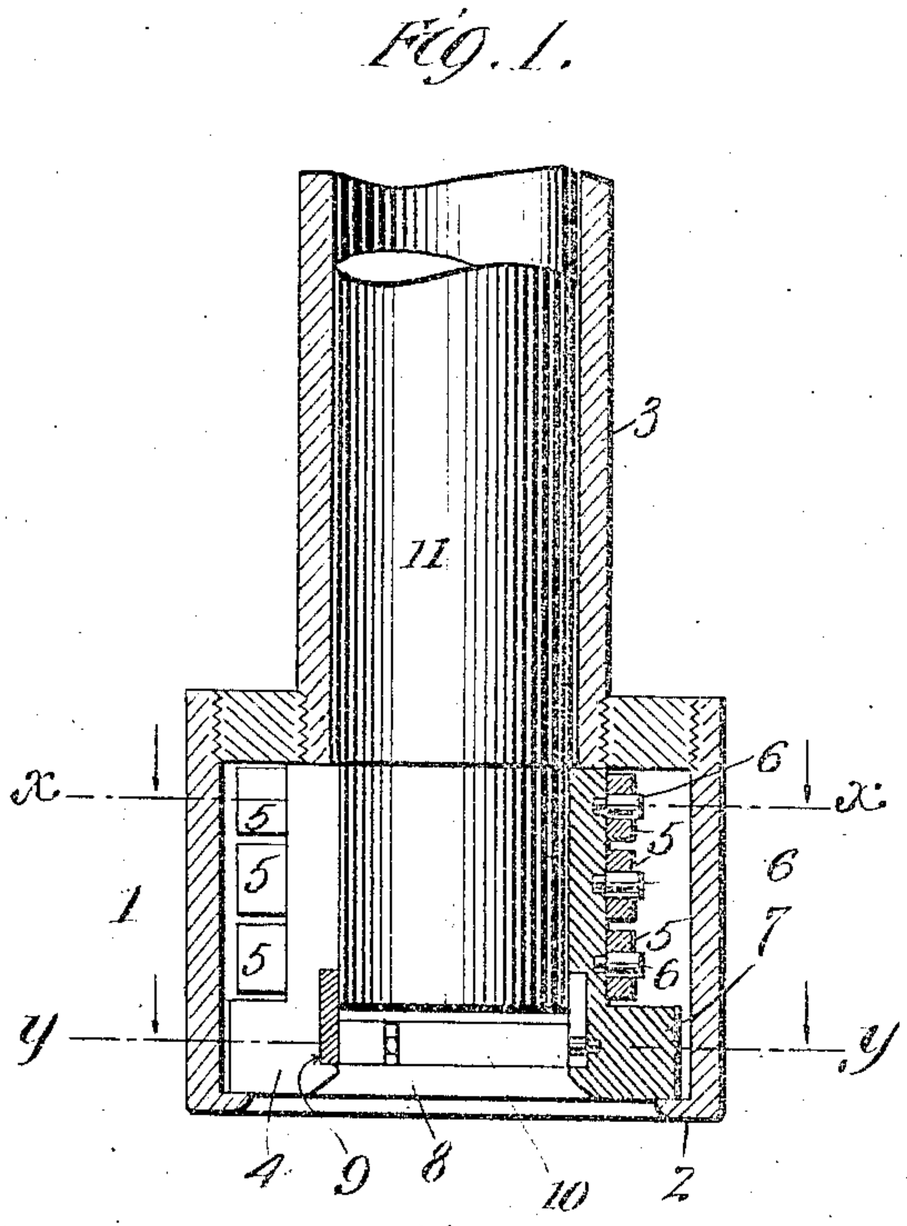


Fig. 1.



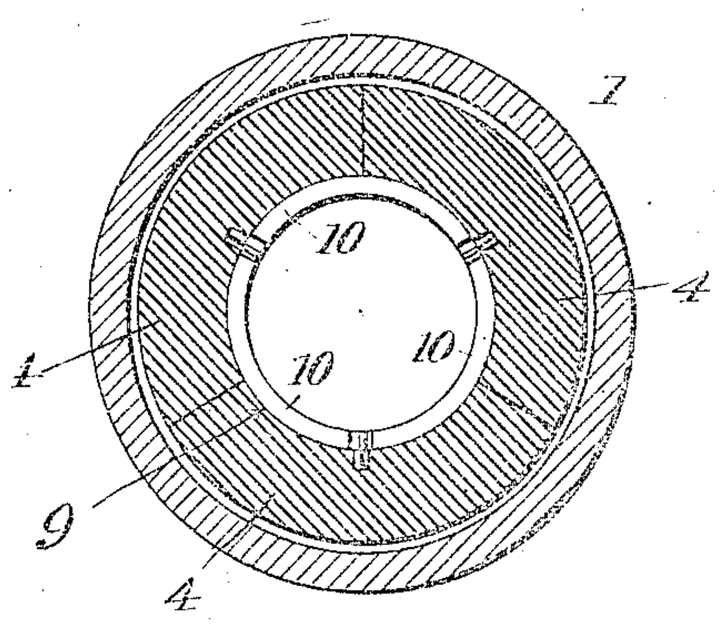


Fig. 3.

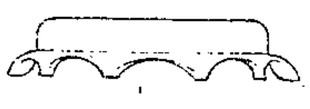


Fig. 4.

Witnesses:
Frank O. Ober
Waldo M. Chapin

Inventor
Georg Kirkegaard
By his Attorneys
Rosenbaum & Lackenbach

UNITED STATES PATENT OFFICE.

GEORG KIRKEGAARD, OF NEW YORK, N. Y., ASSIGNOR TO IMPERIAL STOPPER COMPANY, A CORPORATION OF MAINE.

CAPPING-MACHINE HEAD.

No. 931,626. Specification of Letters Patent. Patented Aug. 17, 1909.

Application filed May 6, 1908. Serial No. 431,150.

To all whom it may concern:

Be it known that I, GEORG KIRKEGAARD, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Capping-Machine Heads, of which the following is a full, clear, and exact description.

This invention relates to bottle capping machines which are used to apply to bottles stoppers consisting of metallic caps containing a packing disk and having a flange adapted to be forced into locking engagement with a shoulder on the exterior of the neck of the bottle.

In U. S. Patent No. 873,245, dated December 10, 1907, and issued to me, there is described a head for bottle attaching machines, comprising three sectors forming a hollow cylindrical die adapted to press the cap upon the bottle. The sectors are held together in cylindrical form by springs embracing them, which permit the sectors to open or separate whenever the bottle upon which the cap is to be placed is abnormally large, the die being, in effect, an expanding die, which prevents breakage of the bottle. The cap which the patented die or head is intended to apply is provided with three depending ears which are to be forced into engagement with the bottle, and the sectors of the die are provided with grooves corresponding to these ears, the formation being such that the flanges of the cap between the adjacent ears is not required to be acted upon by the die.

In the present invention the type of cap intended to be applied by the capping machine has a continuous depending flange, instead of the three ears above referred to, and the sectors of the die or head must act upon the entire circumference of the flange. In applying a cap of this character with a die of the kind described, in those instances where the die must expand to apply the cap to an extra-large bottle, there are three places around the edge of the applied cap which are not touched by the sectors, these places being opposite the openings between the adjacent ends of the sectors caused by the expansion of the die. A bottle with a cap applied in this way will sometimes leak on account of three protuberances which are left in the cap, which protuberances present an unsightly appearance also.

It is the object of this invention to improve the die or head described in the above mentioned patent in such a manner as to avoid this objection, and the invention consists in combining with a die or head of the character described a second set of sectors which are seated in an internal groove in the main sectors, located immediately above the mouth of the die, the members of this additional set of sectors being placed so as to break joints with the first set. In this way, those portions of a cap which may not be acted upon by the main sectors will be acted upon by the additional sectors, and the entire flange of the cap will, therefore, be uniformly driven into locking engagement with the shoulder on the bottle.

My present invention also includes an improvement in the form of the springs which are used to hold the sectors together, all as will be fully described and pointed out in the claims.

In the accompanying drawing, Figure 1 is a vertical central section of my improved head for capping machines. Fig. 2 is a section on line *x*—*x* of Fig. 1. Fig. 3 is a section on line *y*—*y* of Fig. 1, and Fig. 4 is a side elevation of one form of cap which my improved head is intended to apply to a bottle.

The capping head comprises a casing 1 cylindrical in form and having its lower side open, but provided with an annular lip 2 to hold the die therein. This casing is carried at the end of the plunger tube 3. Within the casing are placed three sectors 4, 4, 4 of a cylinder. Each of these sectors is provided with one or more flat springs 5 which are applied horizontally and tangentially to the outside of the sector, being held in place by a pin 6, and its extremities bearing, under strain, against the inner wall of the casing. Thus these springs tend to force all of the sectors 4 toward a common center, and, in fact, do hold the sectors with their extremities in contact with each other along radial planes 120° apart. The lower ends of the sectors are provided with lateral flanges 7 which rest upon the lip 2 of the casing, furnishing a means for freely supporting the sectors within the casing. The three sectors together form a cylindrical die hav-

ing a smooth bore which terminates at the lower end in a flaring mouth or annular surface 8. Immediately above this flaring mouth, the die is provided with an internal annular groove 9 rectangular in cross section and in which is placed three sectors 10, 10, 10 of a ring. These sectors, which may be regarded as supplemental to the main sectors 4, are placed in the groove so as to bridge the respective joints between the main sectors 4. These smaller sectors, when thus inserted in the larger ones, are flush with the bore of the die, so that the compression plunger 11 can reciprocate through the die without interference. The sectors 10 are prevented from working around in the groove by pins 12 fixed in the main sectors.

It will now be seen that, in the operation of applying a cap to a bottle, in all cases where normal size bottles are encountered, the main sectors 4 will act upon the flange of the cap and bend it uniformly into engagement with the bottle, leaving no projecting or unsightly portions upon the cap, and, in this respect, the die will act very much in the same way as the patented die referred to. When a bottle having an abnormally wide mouth is encountered, which often occurs by reason of the crudity with which these bottles are manufactured, the main sectors 4 open outward or expand, the springs 5 flexing sufficiently to permit this movement, while furnishing sufficient resistance to properly act upon the flange of the cap. In thus opening or separating, the sectors 4 present spaces between their adjacent ends, which do not touch the flange of the cap. The head, nevertheless, travels downward sufficiently to bring the second set of sectors 10 into engagement with the cap flange, and, since they are arranged across the spaces between the sectors 4, they will act upon those parts of the flange of the cap which escape the action of the main sectors 4, the result being that the entire cap will be acted upon by the die, and, notwithstanding the different size of bottle, the cap will come out of the machine presenting as good an appearance and being as tightly sealed as if the bottle were of ordinary size.

I have found that individual springs for each of the sectors 4, such as described, act better than springs which surround the entire die and are common to all the sectors. The open-ring form of springs shown in the patent referred to, spread more at one part of the circumference than at another, and tend to throw the sectors out of proper relative position. The individual springs provided by the present invention overcome this and supply a uniform pressure upon each sector, toward the common center or axis of the die.

What I claim is:

1. A head for bottle capping machines, comprising a cylindrical expanding die composed of two sets of concentrically arranged sectors in concentric annular zones one within the other, the members of each set symmetrically breaking joints with those of the other, and adapted to act in succession upon the cap in applying the same to the bottle.

2. A head for bottle capping machines, comprising a plurality of sectors forming together a hollow cylindrical die, said die having an internal concentric groove in its wall, and a plurality of supplemental sectors located in said groove and breaking joints with the first-mentioned sectors, substantially as described.

3. A head for bottle capping machines, comprising a plurality of sectors together forming a hollow cylindrical die having a flaring mouth and an internal concentric groove arranged at right-angles to the axis of the die and immediately above its mouth, and a plurality of supplemental sectors located in said groove, breaking joints with the first-mentioned sectors, and being flush with the internal surface of the die, substantially as described.

4. A head for bottle capping machines, comprising a casing, a plurality of sectors together forming a hollow cylindrical die located within the casing, and a flat spring for each sector attached at its middle to the sector, arranged in a tangential position thereon and bearing under compression at its extremities against the inner wall of the casing.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

GEORG KIRKEGAARD.

Witnesses:

WALDO M. CHAPIN,

JAMES DE ANTONIO.