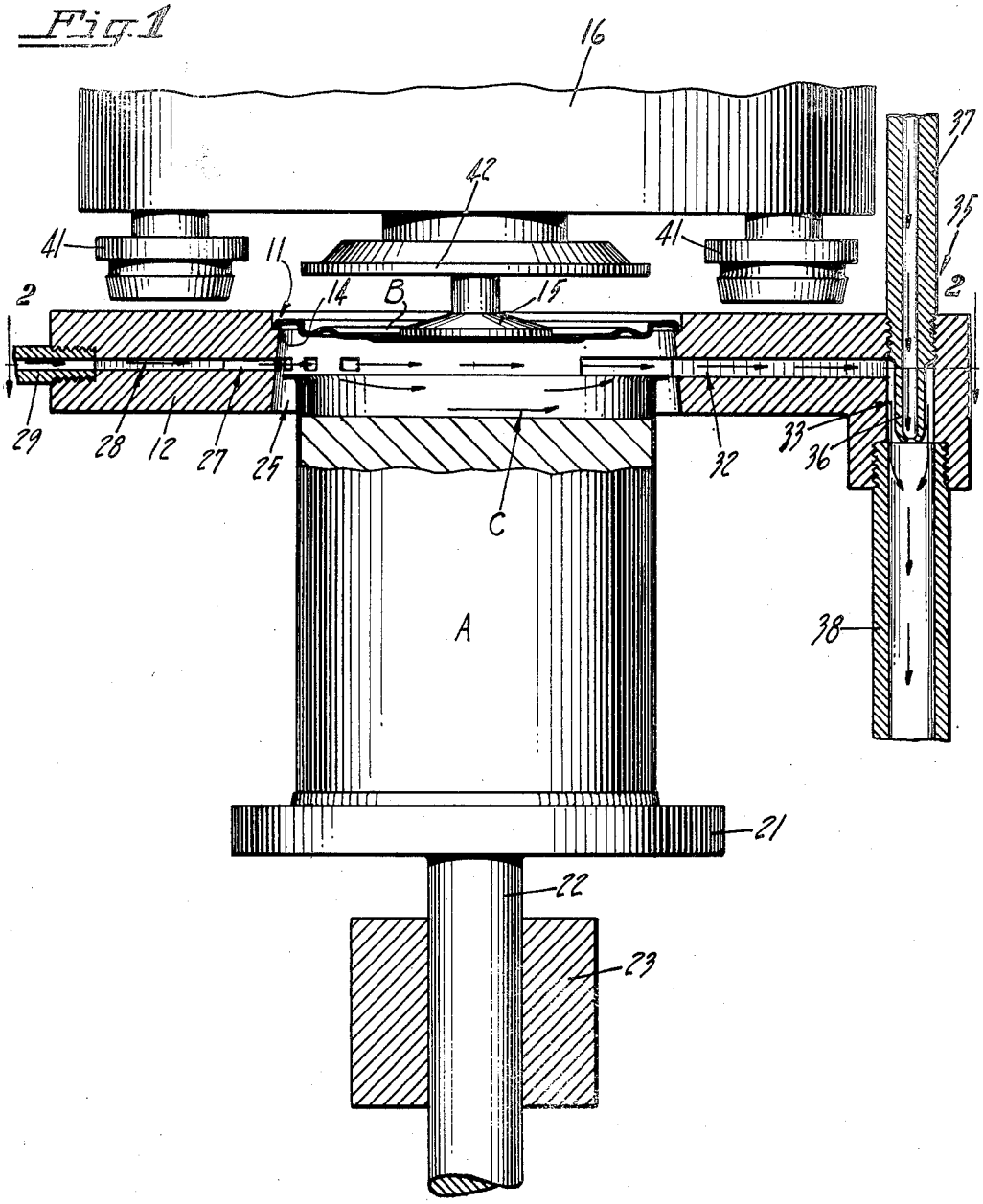
Aug. 22, 1950 E. V. CASSADY 2,519,353

CAN CLOSING MACHINE

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Fig. 1



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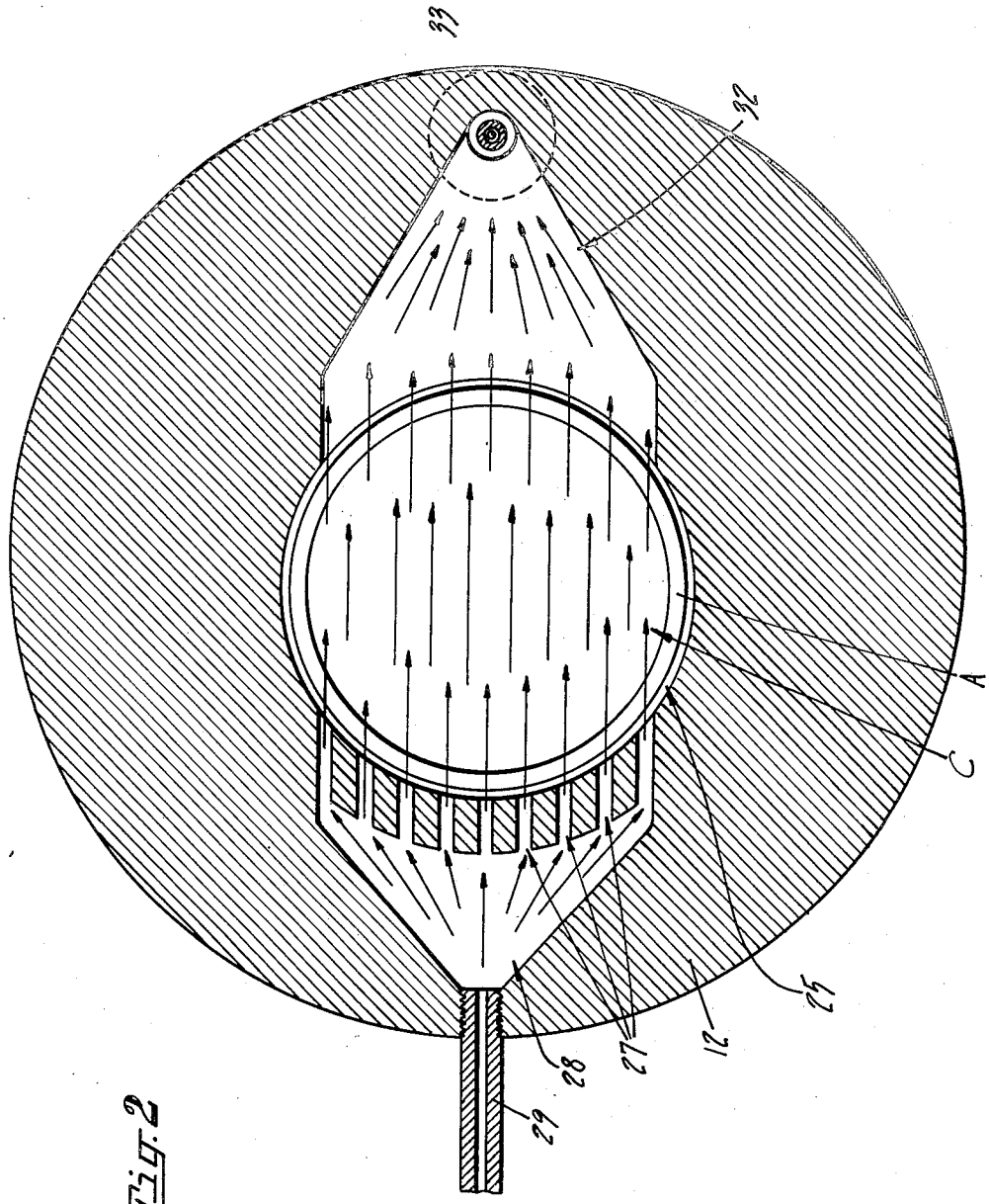


Fig. 2

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CAN CLOSING MACHINE

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2 Claims. (Cl. 226—82)

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The present invention relates to can closing machines and has particular reference to improved devices for passing steam across the head space of a filled can for eliminating air from the head space prior to closing the can.

In eliminating air from the head space of filled cans by the injection of steam into the head space considerable difficulty is often experienced due to the uncontrolled turbulent motion of the steam. This motion of the steam results in uncontrolled air elimination and produces clouds of steam adjacent the working parts of the machine so that supplying the machine with can parts is a hazardous task.

The instant invention contemplates overcoming these difficulties by blowing the steam across the head space of the can from one side of the can and withdrawing it and the air in the head space from the opposite side of the can at a controlled velocity by the use of a vacuum pull on the steam.

An object of the invention is the provision in a can closing machine of devices wherein steam projected into the head space of a filled can is withdrawn rapidly at an increased controlled velocity by a vacuum pull effective on the steam so that the air in the head space of the can will be eliminated prior to closing the can.

Another object is the provision of such devices wherein control of the movement and velocity of the steam and the resulting uniform evacuation of air from the head space of the can is insured with an increased operational efficiency.

Another object is the provision of such devices wherein less steam escapes from the machine with the result that supplying can parts to the machine may be readily effected without danger to the operators and without danger of softening or bleeding of compound usually used on can covers to produce a hermetic seal when the can is closed,

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a transverse sectional view of can closing devices embodying the instant invention, with a filled can and a cover in place prior to being united for closing the can, with parts broken away; and

Fig. 2 is a sectional view taken substantially along the line 2—2 in Fig. 1.

As a preferred embodiment of the instant invention the drawings illustrate principal parts of a machine for closing and sealing filled sheet metal cans A with sheet metal can covers or end members B. Such a machine is disclosed in

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United States Patent 2,287,016, issued June 23, 1942 to N. P. Bach, on Can Closing Machine.

In the machine, a can cover B is received in a pocket 11 (Fig. 1) of a ring member 12 which is supported in any suitable manner above the path of travel of the filled cans A passing through the machine. The cover is supported in a horizontal position on a ledge or seat 14 formed in the pocket. In this position the cover is retained in place by a retractable knockout pad 15 which forms a part of a rotatable seaming head 16 located immediately above the pocket 11.

The filled can A to be closed with the positioned cover B is received on a lifter pad 21 which is located below the ring member 12 and is in vertical alignment with the pocket 11. This lifter pad is mounted on the upper end of a vertically reciprocable lifter rod 22 carried in a bearing 23 which may be a part of the frame of the machine. Reciprocation of the lifter rod 22 and the pad 21 carried thereon through a lifting stroke and thence through a return stroke may be effected in any suitable manner in time with the other moving parts of the machine.

On the up or lifting stroke of the lifter pad 21, the filled can A is raised toward the positioned cover B, the upper open end of the can entering into an opening 25 formed in the ring member 12 concentric with and communicating with the pocket 11. During this upward travel of the can and while it moves through the opening 25 in the ring member, provision is made for eliminating the air from the head space, marked C, of the can.

Elimination of the air from the can head space C is effected by steam under pressure which is projected or blown into the opening 25 between the upper end of the can A and the positioned cover B. This steam issues from a plurality of orifices 27 (see also Fig. 2) which are formed in the ring member 12 and which are located just below the cover support ledge 14. The ends of these orifices communicate with a recess 28 which in turn is in communication with the machine end of a steam supply pipe 29 threadedly engaged in the ring member 12. This pipe leads from any suitable source of supply of steam under pressure. The orifices 27 are arranged in parallelism so as to direct the steam into and across the head space of the filled can A and in one direction only.

The velocity of the steam moving into and across the head space C of the can A is increased and its motion is controlled by a vacuum pull created on the side of the can opposite the steam orifices 27. For this purpose the ring member 12 opposite the orifices 27 is formed with an exhaust slot or port 32 which is located immediately below the cover seat 14 in the ring member. The outer end of the slot 32 com-

municates with the opening 25 in the ring member, this end of the slot being in horizontal alignment with the orifices 27. The outer end of the slot communicates with a recess 33 formed in the ring member.

The recess 33 is maintained in a vacuumized condition by any suitable means. By way of example, the drawings illustrate an aspirator 35 which includes a steam nozzle 36 formed on the machine end of a steam inlet pipe 37. This pipe leads from any suitable supply of steam under pressure. Above the nozzle the pipe 37 is threadedly secured in the ring member 12. The nozzle extends down into the recess 33 and terminates well below the outer end of the exhaust slot 32. At the bottom the recess communicates with a discharge pipe 38 which is threadedly engaged in the ring member 12. This pipe leads to any suitable place of discharge for spent steam and air withdrawn from the can.

Hence as steam issues from the nozzle 36 into the discharge pipe 38, it creates a vacuum within the recess 33. This vacuum within the recess draws the steam issuing from the orifices 27 through and across the head space C of the rising filled can A and into the exhaust slot 32. It empties into the recess 33 and is discharged through the discharge pipe 38. The steam passing through the head space of the can displaces the air therefrom and the air swept out by the steam, at an increased velocity controlled by the vacuum pull, passes through the recess 33 into the discharge pipe 38. In this manner the head space of the can is vacuumized.

The steam issues from the orifices 27 continuously and in like manner the vacuum pull on the steam may be continuous. Thus the steam passes through and across the head space of the can A during the entire travel of the can upwardly through the opening 25 in the ring member 12. The steam in its accelerated travel caused by the vacuum pull thus not only evacuates the head space of the can but also prevents any outside air from entering the can.

As the can continues to move up through this atmosphere of steam, it engages the positioned cover B and carries it up into the seaming head 16. The knockout 15 moves up into the head with the cover and can and thus holds the cover under a slight pressure. The cover closes off the head space of the can and thus excludes the outside atmosphere. However, when the can moves up into the path of travel of the steam issuing from the orifices 27, the steam forms a new path of travel around the can. Some of this steam travels up with the can adjacent the cover and thus effectively forms a protecting cloud which further excludes the outside air from the can.

While the can and its cover are in the seaming head 16 the cover is permanently seamed in place in the usual manner. This hermetically seals the can against the subsequent entrance of outside air. The seaming operation is effected, as the head rotates, by seaming rollers 41, a chuck 42 backing up the seam. These are conventional elements of such a head.

It should be understood that this evacuating of the head space of the filled can and the movement of the can upwardly into the seaming head for seaming as well as its return movement after seaming, is very rapid as in regular high speed production lines. Therefore the evacuating time is very short. However, it has been found by use of such a steam-vacuum flow across the can head space that the efficiency of the machine is greatly increased and that the cans are more uniformly evacuated.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a machine for vacuumizing and closing filled cans, the combination of a ring member having an opening therein for the reception of a filled can and having a seat surrounding the opening adjacent its upper surface for holding an end member in spaced position above the top of a can within the opening the end member closing off the top of the opening, said ring member at one side of said opening having an orifice in the opening wall just above the inserted can, said ring member at the opposite side of said opening having an exhaust port in horizontal alignment with said orifice, means for projecting steam from said orifice across the head space of the filled can below said held end member and into said exhaust port, and vacuum means disposed adjacent said held end member and having communication with said exhaust port for exhausting both steam and air from the head space of the can preparatory to vacuum sealing the end member onto the can.

2. In a machine for vacuumizing preparatory to closing filled cans with superimposed end members during relative movement of a can and its end member, the combination of a ring member having an opening therein for the reception of a filled can and having a seat surrounding the opening adjacent its upper surface for holding an end member in spaced position above the top of a can within the opening the end member closing off the top of the opening, said ring member at one side of said opening having a plurality of orifices in the opening wall just above the inserted can, said ring member at the opposite side of said opening having an exhaust port in horizontal alignment with said orifices with a connecting vertically disposed receiving recess, a can lifter member located below said ring member opening for a lifting a filled can into the opening and for holding it with its top edge just below said orifices and said exhaust port, means for projecting steam from said orifices across the head space of the can and below said held end member and into said exhaust port, and a steam aspirator connected to said ring member and discharging steam into said receiving recess for creating a vacuum in the recess thereby accelerating the steam movement and exhausting both steam and air from the head space of the can, said can lifter member thereupon assembling the can and its end member preparatory to vacuum sealing the same.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
28,424	Twing et al.	May 22, 1860
2,338,047	Winaker	Dec. 28, 1943