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H. K. SMITH

ADJUSTABLE CURLING DIE

Filed Nov. 16, 1922

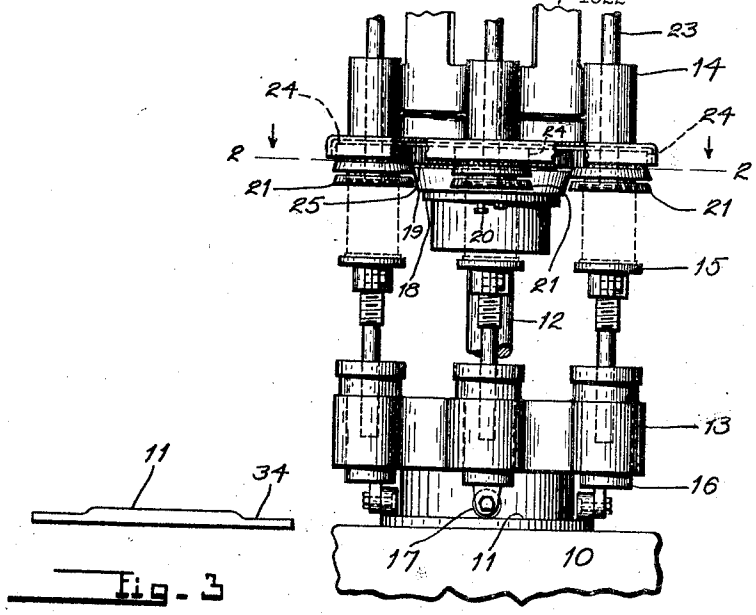


Fig. 1

Fig. 3

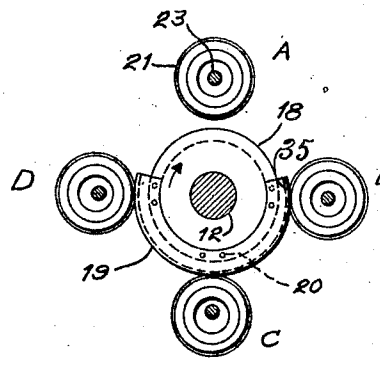


Fig. 2

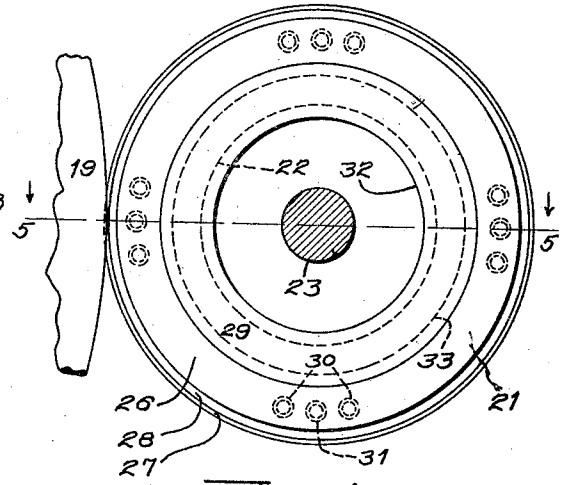


Fig. 4

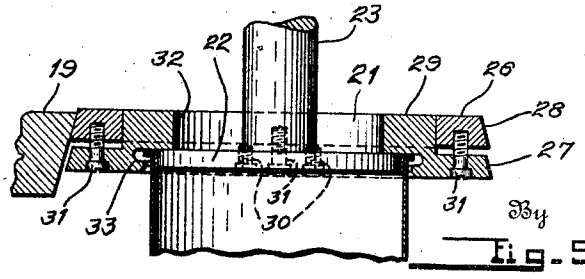


Fig. 5

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE CURLING DIE.

Application filed November 16, 1922. Serial No. 601,205.

My invention relates to adjustable curling dies for double seaming machines. It has a more particular application to that type of machine wherein the curling of the edges of the can body and can top is accomplished by rotating the body and top about the axis of the body. During this operation the can body and top are held in and against the curling die by means of a can table and the pressure exerted against the curling die by the curling die cam effects the curling of the edges of the body and top.

Heretofore, in machines of this character, this pressure has been varied by adjusting the position of the curling die cam, but due to the fact that there are several curling dies which revolve about this cam, slight differences in the distances of these dies from the center of the cam will not be compensated for by the mere adjusting of the curling die cam. A different pressure would then be exerted upon each die with a consequent lack of uniformity in the product.

My invention obviates this defect, and it consists in the novel construction and combination of parts and devices herein shown and described, whereby individual adjustment of the curling dies is effected.

In the drawings:—

Figure 1 is an elevation of a portion of a double seaming machine.

Fig. 2 is a section along the line 2—2 in Fig. 1 looking in the direction of the arrows, certain parts being omitted.

Fig. 3 is a development of the cam herein described.

Fig. 4 is a plan view of my adjustable curling die.

Fig. 5 is a section along the line 5—5 in Fig. 4 looking in the direction of the arrows.

In the drawings:—

10 represents the frame of a double seaming machine upon which is secured the cam 11. The drive shaft 12 carries a lower turret 13 and an upper turret 14, said shaft being rotatably mounted in the frame 10 in any approved manner. The lower turret 13 serves as a carrier of the can tables 15. Said can tables are rotatably supported by sleeves 16 which are slidably mounted in the turret 13 and supported by rollers such as 17 which coact with the cam 11 for a purpose hereinafter explained.

Just below the upper turret 14 and concentric with the shaft 12 is a fixed cam support 18, and secured thereto is the curling die cam 19 which is fixed in position. Vertical adjustment of the cam 19 is effectuated by the adjusting screws 20.

The upper turret 14 serves as a carrier of the curling dies 21, of which there is one for each can table 15.

The disc 22 is secured upon the end of the shaft 23 and serves as a chuck for the can top.

It is to be noted that the can tables 15 are placed around the shaft 12 so that under each die will be a table.

Secured to the spindles 23 and just above the curling dies 21 are the curling die gears 24 which mesh with the curling die cam gear 25, which is mounted in any approved manner upon the portion 18 so that when the turret 14 is rotated, the spindles 23 will also rotate.

The above described mechanism is old in the art and hence its construction has not been described in detail, and I shall now describe how my improved adjustable curling die is used therewith.

The die 21 is composed of a frustro-conical ring 26 and a flange 27. The inclined surface 28 of the ring 26 during the curling operation bears against a similarly inclined surface on the cam 19. The ring 26 is carried on a shoulder 29 provided on the flange 27, and said ring is vertically adjusted by means of screws such as 30 mounted in the flange 27, said adjustment being locked by means of screws such as 31.

In Fig. 5, the ring 26 is shown in its uppermost position.

The shoulder 29 is provided with a hole 32 for the passage of the spindle 23 and with a curling groove 33. The under surface of the shoulder 29 rests upon the top of the disc 22 and hence the die 21 has free horizontal motion with reference to the shaft 23.

The operation of my improved curling die is as follows:—

A can body with its top is placed upon a can table 15 while the corresponding roller 17 is on the portion 34 of the cam 11, that is between the positions A and B of the curling die 21, as shown in Fig. 2.

The can table is then in its lowest position so that the can body and top will clear the curling die 21. When through rotation of the turret 14 the die 21 has reached the posi-

tion B in Fig. 2, the roller 17 is then on the raised portion of the cam 11 and the can body and top are thereby clamped between the can table 15 and the disc 22. In this position the curling die 21 and the spindle 23 are in axial alignment and in order to permit said alignment, the curling die cam 19 is made eccentric as at 35 for a portion of its curvature.

The curling operation takes place when the turret moves in a clockwise direction from B to D, and during said movement, the die 21 is forced by the cam 19 into an eccentric position with reference to the spindle 23 causing the groove 33 to bear against the edges of the can body and top.

Since the can and its top are fixed in their relation to the spindle 23 by the can table 15 and the disc 22, and since the can and top are revolved by the action of the gears 24 and 25, the horizontal movement of the groove 33 effects the curling of the edges of the can body and top.

After the can is removed from the can table between positions D and A the die 21 is brought back into concentric relation with the spindle 23 by a suitable guide on the frame of the machine said guide not being shown since it is old in the art and forms no part of my invention. By reason of the frustro-conical surface 28 a change in the vertical position of the ring 26 will produce, through its reaction with the cam 19, a corresponding change in the pressure which the groove 33 will exert during the curling operation. Thus by reason of the individual adjustment on each curling die I am able to insure that the proper pressure will be exerted on each of the dies during the curling operation for the production of uniformly sealed cans.

While I have shown one combination of mechanisms for carrying out my invention yet it is to be understood that I do not desire to be limited to the exact structure shown since changes may be made therein without departing from the spirit of my invention.

I claim:—

1. In a seaming machine for cans having a body and a top, comprising means for holding and revolving said body and top, the combination with a die for rolling together the edges of said body and top, of a cam for moving said die transversely to said body to press said die against said edges, and adjustable means for varying the pressure of said die upon said edges.

2. In a seaming machine for cans having a body and a top, comprising means for holding and revolving said body and top, the combination with a die for rolling together the edges of said body and top, of a fixed cam for moving said die transversely to said body to press said die against said edges, a frustro-conical ring mounted on said die and engaging said cam and means for varying the position of said ring with reference to said die.

3. In a seaming machine for cans having a body and a top, comprising a can table for holding said body, a disc for engaging said top and means for rotating said disc, the combination with a die for rolling together the edges of said body and top, of a fixed cam, a frustro-conical ring on said die engaging said cam and means for varying the relative positions of said ring and die to vary the pressure of said die on said edges.

4. In a seaming machine for cans having a body and top, comprising a plurality of means for holding and rotating said cans, the combination with a plurality of dies for rolling together the body and top edges of said cans, of means for equalizing the pressure of said dies upon said edges, whereby a uniform product is obtained.

5. In a seaming machine for cans having a body and top, comprising a plurality of means for holding and rotating said cans, the combination with a plurality of dies for rolling together the body and top edges of said cans, of means for individually adjusting the pressure of said dies upon said edges, whereby a uniform product is obtained.

6. In a seaming machine for cans having a body and top, the combination of rotatable means for clamping a plurality of said bodies and tops together, means encircling each of said tops for rolling together the edges thereof and of the corresponding body, said encircling means being individually adjustable to effect a uniform rolling of said edges.

7. In a seaming machine for cans having a body and top, the combination of a fixed cam, rotatable means for clamping a plurality of said bodies and tops together, said means being adapted to revolve around said cam, means encircling each of said tops for coacting with said cam to roll together the edges of said tops and of the corresponding body, said encircling means being individually adjustable to effect a uniform rolling of said edges.

8. In a seaming machine for cans having a body and a top, comprising means for holding and revolving said body and top, the combination with a die for rolling together the edges of said body and top, of a cam for moving said die transversely to said body to press said die against said edges, and adjustable means carried by said die for varying the pressure of said die upon said edges.

9. In a seaming machine for cans having a body and a top, comprising a can table for holding said body, a disc for engaging said top and means for rotating said disc, the combination with a die movably mounted on said disc for rolling together the edges of said body and top, of a fixed cam, a frustro-conical ring on said die engaging said

cam and means for varying the relative positions of said ring and die to vary the pressure of said die on said edges.

10. In a seaming machine for cans having a body and top, the combination of a fixed cam, rotatable means for clamping a plurality of said bodies and tops together, said means being adapted to revolve around said cam, a die encircling each of said tops for rolling together the edges thereof and of the corresponding body, a frustro-conical ring on said die adapted to engage with said cam and means for varying the position of said ring relative to the corresponding die for effecting a uniform rolling of said edges.

In testimony whereof, I affix my signature.

HARRY K. SMITH.