June 30, 1931. J. M. YOUNG 1,811,986

METHOD OF AND MACHINE FOR SCORING CAN ENDS

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Fig. 1

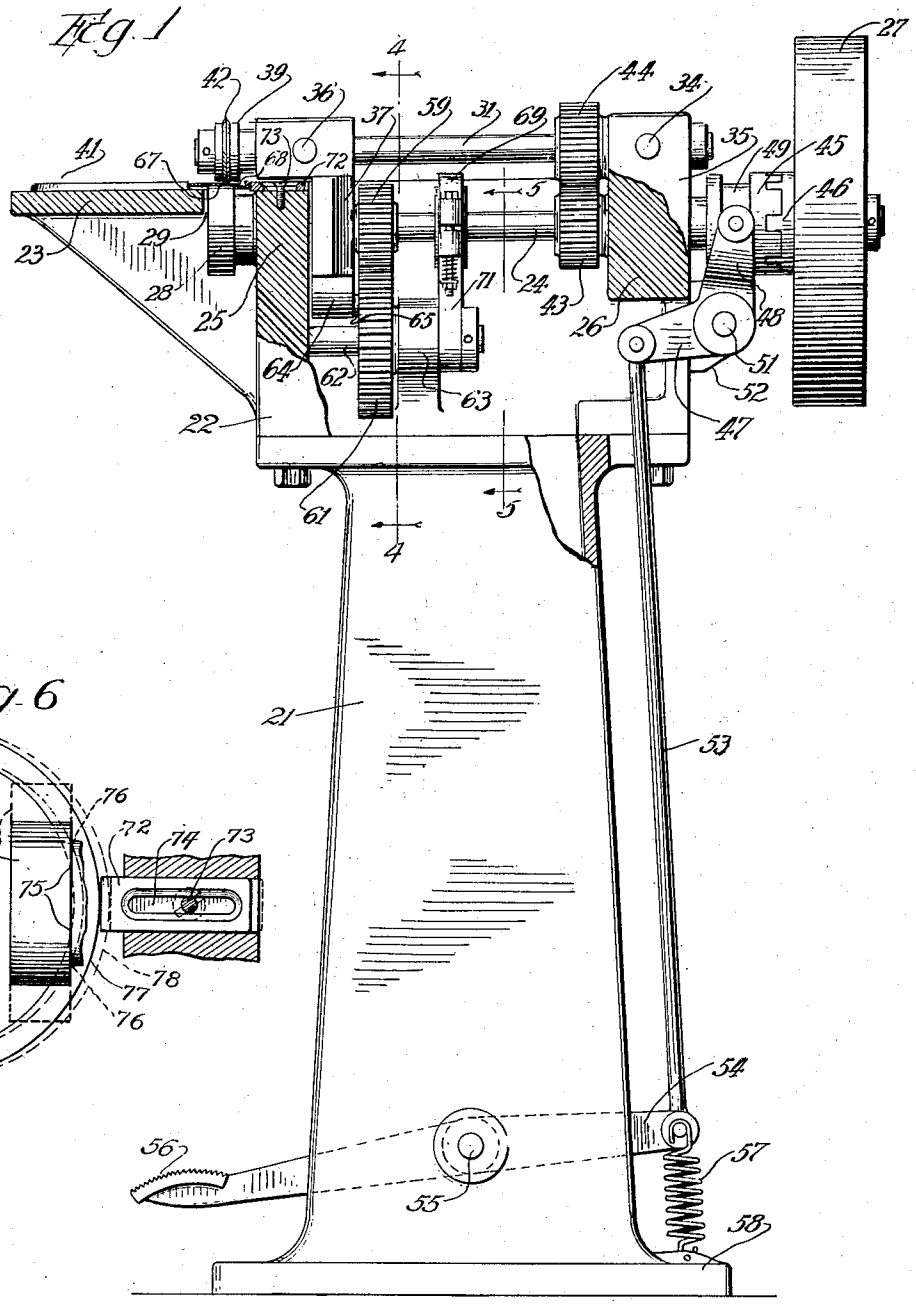


Fig. 6

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Fig. 2.

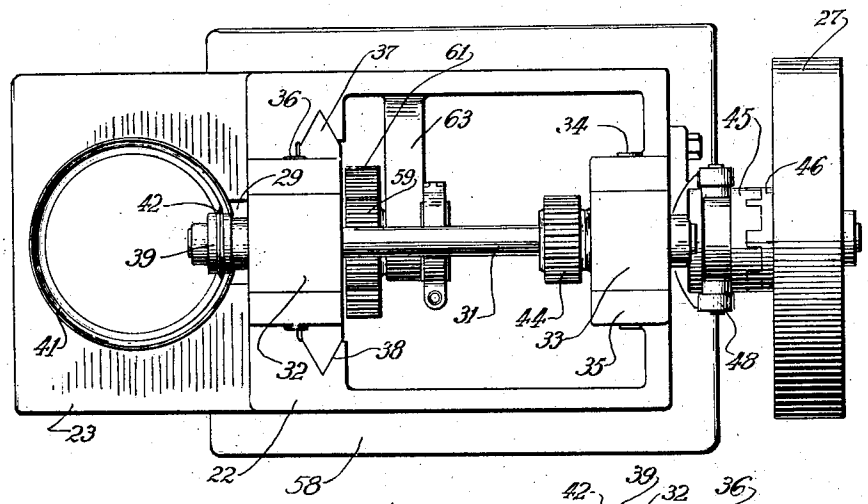


Fig. 3

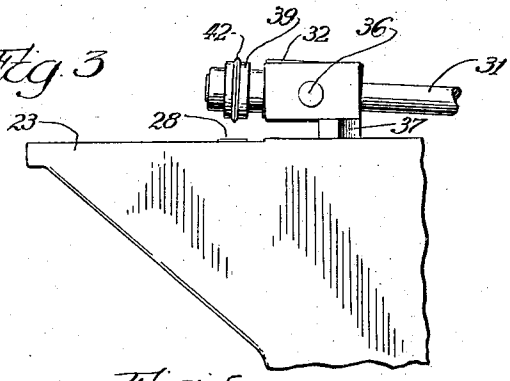


Fig. 4

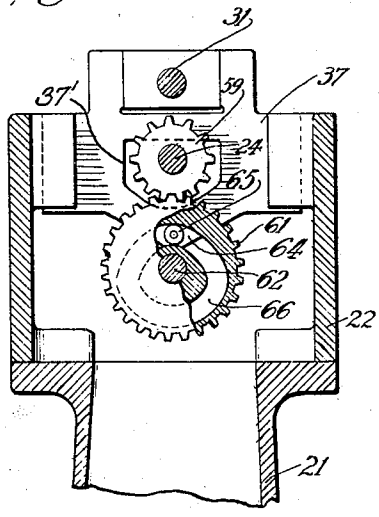
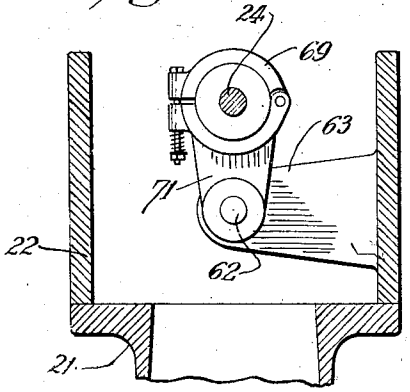


Fig. 5



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Patented June 30, 1931

1,811,986

UNITED STATES PATENT OFFICE

JOHN M. YOUNG, OF BROOKLYN, NEW YORK, ASSIGNOR TO AMERICAN CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY

METHOD OF AND MACHINE FOR SCORING CAN ENDS

Application filed January 9, 1924. Serial No. 685,120.

This invention relates to a method of and machine for scoring can ends to facilitate the removal of a section thereof to open the can after the end has been permanently secured to the body.

The method of scoring can ends which has heretofore been in general use involves the use of a variety of dies in a punch press, a special die being required for each size and shape of end. This obviously requires that a great many dies be kept on hand, since a single die is limited to a single specific form of score line. The provision of such dies entails very considerable expense and, furthermore, since they must be changed for each type of scoring operation, there is of necessity such delay and difficulty in effecting the substitution of dies that the cost of operation is relatively high. When it is considered, also, that such a die can be used only for a limited period of time, which, in practice, is comparatively short, it will be apparent that this method of scoring is far from economical.

In accordance with my invention, a single scoring roller is employed for all operations which the machine may be required to perform, and this irrespective of the particular size or type of end which is to be scored. It may, therefore, be said to be the main object of the invention to provide a new method of scoring, and a cover or end scoring machine which eliminates the necessity for the expensive die operations hereinbefore referred to and which involves the use of a single scoring element which is adapted to function equally well upon various forms and sizes of can covers.

Another important feature of the invention is that no feeding devices, other than the scoring roller itself, are required to direct the covers in their movement during the scoring operation.

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 side elevation, partially broken away, of a scoring machine in which my invention is embodied;

Fig. 2 is a top plan view of the machine;

Fig. 3 is an elevational detail, showing the scoring roller in elevated position;

Fig. 4 is a sectional view, taken substantially along the section line 4—4 in Fig. 1 and illustrating the scoring roller lifting means;

Fig. 5 is a section taken substantially on the line 5—5 of Fig. 1 and showing in detail the brake mechanism employed to overcome the momentum of the machine after the driving mechanism is disconnected; and

Fig. 6 is a bottom plan view of the cover, feeding roller and gauge, certain parts of the mechanism being broken away for better illustration.

The machine which I have shown on the drawings for purposes of illustration, comprises primarily a substantial standard 21 and a head 22 in which the operating mechanism is mounted, said head having an extended table, or cover support 23 at one side thereof. A driven shaft 24 is journaled in bearings 25 and 26 in the head and carries at its outer end, beyond the bearing 26, a driving pulley 27, which is adapted to be driven by a suitable belt from any available source of power. A roller 28 is mounted on the inner end of said shaft 24 and extends through an opening 29 in the table 23 so that the upper part of said roller protrudes slightly above the surface of said table. A second shaft 31 is mounted above the shaft 24 and has bearings 32 and 33, the latter of which is pivoted at 34 to an upwardly extending bracket 35 formed integrally with the head 22. The bearing 32 is pivoted at 36 to a slide 37 mounted in ways 38 in the head 22. The slide 37 is formed with a central cut-out or opening 37′ arranged around the shaft 24. A scoring roller 39 is carried upon the inner end of the shaft 31 and is adapted to operate upon a can cover 41 upon the table 23, as will hereinafter appear. By "scoring roller" I mean one having a scoring edge projecting in a radial direction relative to the axis of the roller. Said roller, in the present instance, is provided with a single scoring edge 42 and is mounted in alignment

with the roller 28 upon the shaft 24. The shafts 24 and 31 are geared together by means of spur gears 43 and 44 mounted respectively upon said shafts at the inner side of the bearings 26 and 33.

A clutch 45, of standard construction, is provided upon the shaft 24 and is adapted to mesh with a hub portion 46 on the pulley 27, to connect said shaft and pulley to cause operation of the machine. Said clutch is operated by means of a bell crank lever 47, having a bifurcated upper arm 48, engaging in a circumferential groove 49 on the clutch 45, said bell crank being pivoted at 51 to a bracket 52 attached to the head 22. A rod 53 connects the lower arm of said lever to a foot lever 54 pivoted at 55 in the standard 21 and having a pedal 56 on the front end thereof. The clutch is normally held disengaged by means of a spring 57 connected at one end to the foot lever 54 and at the opposite end to the base 58 of the standard 21. It will be obvious that the machine may be thrown into operation by an attendant by merely depressing the foot lever 56 and is automatically stopped by release of said lever.

Mounted upon the shaft 24, intermediate the bearings 25 and 26, is a spur gear 59, meshing with a combined gear and cam 61 mounted on a short shaft 62, having bearings in the head 22 and in a bearing bracket 63 extending inwardly within the head 22. The slide 37 has an extension 64 on its under side, which carries a roller 65 adapted to ride in a cam groove 66 (Fig. 4) in the cam gear 61. When the shaft 24 is rotated, the motion thereof is thus imparted to said cam gear 61, which periodically lifts the slide 37, thereby raising the shaft 31 about the pivot 34. In this manner, the roller 39 is elevated and held in raised position long enough to permit insertion or removal of a cover.

In operation, the rollers 39 and 28 are continuously rotated and can ends are supplied to them as they separate and are scored as they come together again. In the form of machine shown in the drawings, the covers are positioned by hand when the rollers are separated, as shown in Fig. 3. The roller 39 then descends into engagement with said cover, which is also in contact with the roller 28. The cutting edge 42 cuts a score line, in the present instance on the under side of the cover, and the feeding roller 28 is adapted to engage in the depressed panel 67 of said cover, the wall 68 of said panel engaging said roller and guiding the cover in its rotation.

I provide a gauge 72 adjustably secured to the frame by means of a screw 73 extending through a slot 74, the purpose of said gauge being to contact with the outer edge of the cover 41 to hold the latter inwardly toward the feeding roller 28. This gauge, in connection with said feeding roller 28, thus provides means for maintaining a definite relationship between the line of score and the periphery of the cover.

By employing a different size feeding roller 28, this relationship may be varied and I have shown, in dotted lines in Fig. 6, a larger roller 28, indicating also in dotted lines, the resultant changed position of the cover 41 and gauge 72. The points of contact between the smaller roller 28, shown in full lines in Fig. 6, and the panel wall 68 on the under side of the cover are indicated by the reference character 75 and the points of contact between the larger roller and panel wall 68 are indicated at 76. This results in the different peripheral positions indicated respectively by the numerals 77 and 78 in said Fig. 6 and a corresponding change in the distance of the line of score from the periphery of the cover.

For the purpose of overcoming the momentum of the machine in stopping, I employ a standard brake 69 mounted on the shaft 24 and connected by means of an arm 71 with the auxiliary shaft 62.

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. The method of scoring circular can ends which consists in rotating a cutting edge relative to the can end and thereby cutting a score in the can end, without penetrating through the metal of the same, at a predetermined distance from the edge of the end, and at the same time causing the rotation of the can end by the scoring direction and pressure, and confining the rotation of the can end to a circular direction.

2. A machine for scoring can ends, comprising a frame, a non-cutting feeding roller rotatably mounted in said frame and having a cylindrical smooth surface, a scoring and can end rotating roller adapted to cooperate with said feeding roller to rotate a can end and cut a score line in the surface thereof, the axes of said rollers being arranged side by side, and frame bearings holding said rollers from moving towards or from each other.

3. A machine for scoring can ends, comprising a frame, a feeding roller rotatably mounted in said frame, a scoring roller adapted to cooperate with said feeding roller to rotate a can cover and cut a score line in the surface thereof, and means for periodically separating said rollers to permit insertion or removal of an end and for unyieldingly

holding the rollers together when they are in scoring position.

4. A machine for scoring can ends, or the like, comprising a frame, a scoring roller having an axis pivotally mounted in said frame, a cooperating base roller having a fixed axis in the frame, means independent of said rollers for confining the can end to rotation in a circle, and means for automatically raising and lowering the scoring roller during operation of the machine.

5. A machine for scoring can ends, or the like, comprising a frame, cooperating rollers mounted in the frame, and adapted to engage an end therebetween, one of said rollers being a scoring roller, a pivoted shaft upon which said scoring roller is mounted, means independent of said rollers for confining the can end to rotation in a circle and means for periodically lifting said shaft about its pivot to separate said rollers and permit insertion and removal of the ends.

6. A machine for scoring can ends, or the like, comprising cooperating rollers for rotating an end therebetween, one of said rollers having a scoring edge thereon and cutting a circumferential score line during rotation of the end, a pivotally mounted shaft upon which said scoring roller is mounted, means independent of said rollers for confining the can end to rotation in a circle and means for periodically raising and lowering said shaft about its pivot to bring the roller intermittently into scoring position and to permit insertion and removal of the ends.

7. A machine for scoring can ends, or the like, comprising cooperating rollers for rotating an end therebetween, one of said rollers having a scoring edge thereon and cutting a circumferential score line during rotation of the end, a pivotally mounted shaft upon which said scoring roller is mounted, means independent of said rollers for confining the can end to rotation in a circle and means for periodically raising and lowering said shaft about its pivot to bring the roller intermittently into scoring position and to permit insertion and removal of the ends, said means comprising a slide moving in ways within the frame and a cam for actuating said slide.

8. A machine for scoring can ends, or the like, comprising a frame, cooperating rollers having respectively knife edged and smooth surfaces, mounted in said frame and adapted to perform a scoring operation upon a cover positioned therebetween, and a gauge for retaining the edge of the cover in predetermined position with respect to said rollers and causing the cover to rotate in a circle while it is being scored.

9. A machine for scoring can ends, or the like, comprising a frame, cooperating rollers mounted in said frame and adapted to perform a scoring operation upon a cover positioned therebetween, and a gauge for retaining the edge of the cover in predetermined position with respect to said rollers, said gauge being adjustable and adapted to cooperate with feeding rollers of different size to vary the distance of the score line from the periphery of the cover and causing the cover to rotate in a circle while it is being scored.

JOHN M. YOUNG.