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Carboni, Jr. et al.

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[54] **POSITIVE REGISTRATION LABELING GUN**

[75] Inventors: **Victor B. Carboni, Jr.**, San Mateo; **Paul Harrison**, Santa Barbara, both of Calif.

[73] Assignee: **Consolidated Foods Corporation**, Chicago, Ill.

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Related U.S. Application Data

[63] Continuation of Ser. No. 246,894, April 24, 1972, abandoned.

[52] **U.S. Cl.** **101/288,** 156/384

[51] **Int. Cl.** **B41f 3/18,** B41f 19/00, B41f 1/08

[58] **Field of Search** 101/288, 292; 156/384, 577

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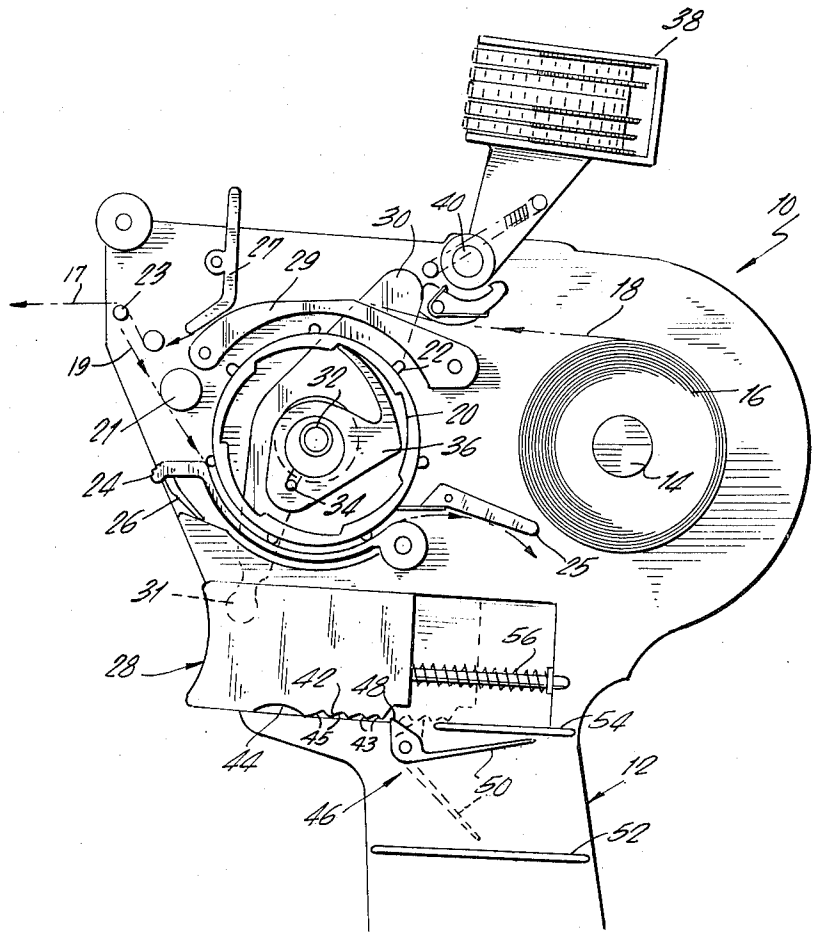
Primary Examiner—Edgar S. Burr

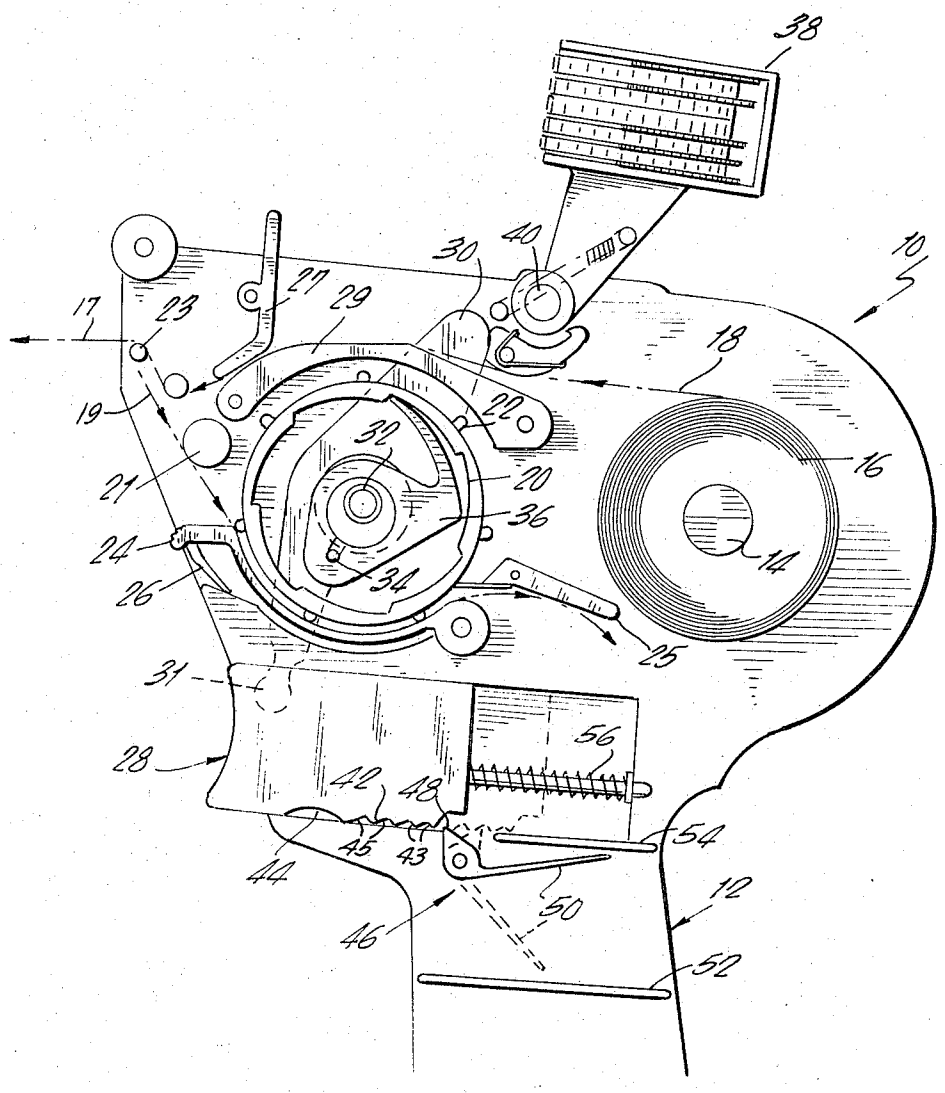
Attorney—Jordan B. Bierman et al.

[57] **ABSTRACT**

A labeling device of the type having a housing, tape, and a stamp to imprint the tape. Means for unidirectionally advancing the tape are provided as well as means for activating the advancing means. The activating means prevents the advancing means from being reactivated until the advancing means has been advanced a selected distance.

10 Claims, 1 Drawing Figure

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POSITIVE REGISTRATION LABELING GUN

This application is a continuation of Ser. No. 246,894, filed Apr. 24, 1972, now abandoned.

This invention relates to labeling machines and more particularly to a novel mechanism for preventing tape jamming.

In a conventional tape labeler, the tape is inserted within a housing and threaded so that it may move in response to the depression of a trigger. One or more sprockets are generally provided for engaging perforated edges provided on the tape, the tape being moved by rotating the sprocket. This can be done directly by the trigger or through one or more associated gears or other devices to transfer the motion of the trigger to the sprocket.

As the tape is moved, a printing stamp is pressed against the tape to print a desired indicia on the tape. The tape is then moved out of the device, is cut and then either applied to a surface through the medium of an adhesive backing or utilized without adhesive.

However, since the movement of the tape is completely responsive to the movement of the trigger and since in conventional units the trigger can be partially depressed and then released, the tape tends to clog and jam due to this forward and backward motion.

In accordance with the present invention, apparatus is provided for advancing the tape in response to the movement of an activator. The apparatus for advancing the tape permits tape movement in one direction only. For best results, the activator is prevented from reversing direction once activation has begun and until the tape has advanced a selected degree.

To prevent cyclical movement of the tape, means for engaging the trigger to prevent return motion thereof is provided along with means for permitting return motion of the trigger only after a selected amount of tape has been dispensed.

Now turning to the drawing which depicts a preferred embodiment of the present invention:

The FIGURE is a side cutaway view of the labeling device.

The drawing shows the internal mechanism of the labeling device. Housing **10** is provided with an axle **14** to accept a spool **16** of tape **18.** Tape **18** consists of two portions, a label portion **17** on which symbols will be imprinted and a backing portion **19** to provide structural support. The tape **18** is provided with a series of perforations (not shown) along its edge.

Feed wheel **20** has teeth **22** mounted on its external surface for engaging the perforations along the edge of the tape. Tape guide **24** is held against the feed wheel **20** by means of spring arm **26** and is provided with a groove (not shown) to clear teeth **22** while holding backing portion **19** of tape **18** against the drive wheel **20.**

The tape is threaded past guide bar **27** be depressing the bar to pivot away from member **29,** past label separator **23** and onto guide wheel **20.** The tape is placed under the tape guide **24** by depressing the front edge of the tape guide **24** away from the wheel **20** and the end of the tape is inserted between the guide and the wheel. Guide **24** is then released and returns to its normal position by the urging of spring arm **26.** A spring-loaded stripper **25** has fingers above and below the feed wheel teeth to insure separation of the backing from the device wheel.

Housing **10** is provided with trigger **28** at the upper end of the handle portion **12.** Trigger **28** is slidably mounted in the housing so that it can be depressed to advance fly wheel **20** and, therefore, the tape. Trigger **28** is in communication with member **30** by means of pin **31** which extends through trigger **28** and the lower portion of member **30.** Member **30** is pivoted about shaft **32** in response to the movement of trigger **28.**

Protrusion **34** is provided on member **30** in engagement with pawl **36.** Pawl **36,** therefore, moves in accordance with the movement of protrusion **34.**

The feed wheel **20** is internally ratcheted such that wheel **20** may be engaged by pawl **36** and, therefore, rotated when the pawl **36** is moved in the counter-clockwise direction. Member **30,** pawl **36** and feed wheel **20** all rotate about shaft **32.** Pawl **36** is manufactured of flexible material which permits it to act as its own spring as its tip is travelling up the ratchet inclination when it is moving in the clockwise direction and not engaging wheel **20.**

In order to insure proper positioning of the tip of pawl **36** upon the return of the pawl to engage the next successive ratcheted surface on the internal portion of wheel **20,** it is necessary that the tip of pawl **36** travel at least the length of one ratchet surface and preferably a slightly greater distance in order to insure engagement of the wheel **20** each and every time member **30** is returned to its original position.

One way to accomplish this result is to maintain the distance between shaft **32** and protrusion **34** equal to and preferably less than the distance from shaft **32** to the tip of pawl **36.** Under these conditions the angles through which protrusion **34** and the tip of pawl **36** are rotated will be equal; however, the arc length through which each is moved will be different. The ratio of the arc length will be dependent upon the ratio of the distances from shaft **32,** which is the axis of rotation.

A preferred way of accomplishing this result is shown in the drawing. Wheel **20** and member **30** rotate about shaft **32,** but pawl **36** rotates about a center located generally between protuberance **34** and the center of shaft **32.** This produces a greater angular rotation of pawl **36** than of wheel **20.**

Thus, if the distance from shaft **32** to the tip of pawl **36** is calculated correctly, the tip will move through an arc length slightly greater than the length of an individual ratchet surface even though the actual displacement of protrusion **34** is substantially smaller. This enables the device to operate without jamming and also permits the use of a comparatively short stroke of trigger **28.**

This mechanical arrangement will insure the return of the tip of pawl **36** to a position slightly behind the next successive ratchet tooth upon the return of trigger **28** to its original position. Therefore, as long as the trigger is returned to its original position after complete depression and not after only partial depression, the wheel **20** will be engaged every time and no tape jamming can possibly occur. Means provided to prevent partial depression of the trigger are described below.

In operation, trigger **28** is depressed, pivoting member **30** such that protrusion **34** communicates with pawl **36** to rotate pawl **36** in the counter-clockwise direction. Because of the internal ratcheting of feed wheel **20,** the wheel is advanced in the counter-clockwise direction, thus advancing the tape. Once the trigger has been fully depressed, it is returned to its initial position which piv-

ots the member **30** and moves pawl **36** in the clockwise direction. Clockwise movement of pawl **36** does not engage the ratchet on the internal surface of feed wheel **20,** but because of the flexible characteristics of pawl **36,** the pawl moves to a position at which the next successive ratchet portion is engaged.

As the tape is advanced in accordance with the description set forth above, member **30** contacts stamp **38** and pivots it about pin **40** and to communicate with tape **18** to print the desired symbols thereon. Stamp **38** is a conventional stamp and can be adjustable to permit variation of the symbols to be imprinted, if desired.

After imprinting, the tape **18** passes over label separator **23** where the label portion is separated from the backing portion. The label portion is ejected from the device at this point and the backing portion returns past guide **21** to wheel **20** wherefrom it is eventually separated by stripper **25** and discarded.

In accordance with the present invention, the trigger **28** is provided with a series of indentations **42** and an opening **44** located on the lower edge. In addition, pawl **46,** having a head portion **48** and a tail portion **50,** is provided to prevent the trigger from reversing direction once depression has begun and until the trigger has been completely depressed. As trigger **28** is depressed, head portion **48** communicates with indentation **42** to pivot the pawl **46** in the clockwise direction, and head **48** is moved to position in which it does not prevent the depressing of the trigger. In this position tail **50** is in communication with bar **52** provided in handle **12** to limit the rotation of pawl **46.** Due to the flexibility of pawl **46,** the head portion **48** rides over actuating faces **45** and does not interfere with the depression of the trigger. However, should the trigger **28** reverse direction, the pawl **46** will be prevented from rotating counter-clockwise because there is insufficient space between the pivot of pawl **46** and the bottom of indentation **42.** Thus, head **48** is disengaging from disengging the indentation **42** in which it is located. Therefore, trigger **28** is capable of moving only in one direction - towards the handle and this motion cannot be reversed until the depression is completed.

Upon completion of the depression of trigger **28,** head portion **48** rests in opening **44** and is rotatable to a position which does not prevent the trigger return. The trigger can then be returned to its original position by means of spring **56** which is compressed during the depression of the trigger.

On the return stroke, head portion **48** assumes the position shown in lines in the drawing with tail **50** bearing resiliently against bar **54.** In this position the flexibility of tail **50** permits head portion **48** to ride over return bars **43** of indentations **42** as trigger **28** returns to its starting position. Any attempt to depress trigger **28** before it reaches the end of its return stroke will be prevented. Pawl **46** will engage one of indentations **42** and be prevented from rotating because there is insufficient space between the pivot point of pawl **46** and head portion **48.**

When trigger **28** has returned to its fully extended position, head portion **48** is clear of the restraint of indentations **42** and it can then rotate into the position shown in dotted lines. This allows the cycle to be repeated.

It is to be understood that modifications may be made which are not specifically described herein, but which will be obvious to those skilled in the art. It is intended to cover all such modifications which fall within the spirit and scope of the invention as described in the appended claims.

What we claim is:

1. A labeling device having a supply roll of tape and a means for imprinting symbols on said tape comprising means for advancing the tape in one direction only comprising: a rotatable feed wheel having internal ratchet teeth and an exterior surface adapted to grip said tape; a first pawl within said wheel, said first pawl being movable with respect to said wheel between a first position in which a tip of the first pawl engages one of said ratchet teeth and a second position wherein said first pawl engages the next successive ratchet tooth; and means for moving said pawl between said first and second positions comprising: a pivotal member in contact with an activator movable between a first position and a second position, movement of said activator causing said member to pivot, a protrusion on said member in engagement with said pawl such that said first pawl moves in accordance with the movement of said protrusion, the first distance between said protrusion and the pivot of said member being not greater than the second distance from the axis of rotation of said pawl to said tip.

2. A device according to claim **1** further comprising means for preventing said activator from moving towards said first position after movement towards said second position has begun and before said movement is completed.

3. A device according to claim **1** wherein the third distance between said protrusion and said axis of rotation is not greater than said first distance.

4. A device according to claim **1** wherein said first distance is less than said second distance.

5. A device according to claim **3** wherein said third distance is less than said first distance.

6. A device according to claim **1** further comprising a second pawl having a head and a tail and being rotatable about a point between said head and said tail, a plurality of indentations on one edge of said activator, each of said indentations having an actuating face and a return face, said second pawl rotatable between an actuating position and a return position, said second pawl yieldably bearing against the actuating faces when in said actuating position, the clearance between said point and said indentations being less than the radial distance between said point and the end of said head nearest said indentations, an opening at the forward end of said activator of such size and depth that the clearance between said point and said opening is at least equal to said radial distance whereby during motion from said first position toward said second position, said activator is prevented from return motion toward said first position until said activator has reached said second position.

7. A device according to claim **6** further comprising said second pawl yieldably bearing against said return faces when in said return position, a space at the rearward end of said activator of such size and depth that the clearance between said point and said space is at least equal to said radial distance whereby during motion from said second position toward said first position, said activator is prevented from motion toward said second position until said activator has reached said first position.

8. A labeling device having a supply roll of tape and a means for imprinting symbols on said tape comprising

means for advancing the tape in one direction only comprising: a rotatable feed wheel having internal ratchet teeth and an exterior surface adapted to grip said tape; a first pawl within said wheel, said first pawl being movable with respect to said wheel between a first position in which a tip of the first pawl engages one of said ratchet teeth and a second position wherein said first pawl engages the next successive ratchet tooth; and means for moving said pawl between said first and second positions comprising: a pivotal member in contact with an activator movable between a first position and a second position, movement of said activator causing said member to pivot, a second pawl having a head and a tail and being rotatable about a point between said head and said tail, a plurality of indentations on one edge of said activator, each of said indentations having an actuating face and a return face, said second pawl rotatable between an actuating position and a return position, said second pawl yieldably bearing against the actuating faces when in said actuating position, but clearance between said point and said indentations being less than the radial distance between said point and the end of said head nearest said indentations, an opening at the forward end of said activator of such size and depth that the clearance between said point and said opening is at least equal to said radial distance whereby during motion from said first position toward said second position, said activator is prevented from return motion toward said first position until said activator has reached said second position.

9. A device according to claim **8** further comprising said second pawl yieldably bearing against said return faces when in said return position, a space at the rearward end of said activator of such size and depth that the clearance between said point and said space is at least equal to said radial distance whereby during motion from said second position toward said first position, said activator is prevented from motion toward said second position until said activator has reached said first position.

10. A device according to claim **1** wherein said rotatable feed wheel is provided with teeth on its exterior surface, said tape having a plurality of openings therein for engagement by said exterior surface teeth.

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