United States Patent

[11] 3,619,324

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[21] Appl. No. **836,901**
[22] Filed **June 26, 1969**
[45] Patented **Nov. 9, 1971**

[73] Assignee **Sato Kiko Kabushiki Kaisha**
Tokyo-to, Japan

[32] Priorities **July 3, 1968**
[33] **Japan**
[31] **43/45914;**
Sept. 30, 1968, Japan, No. 43/71028; Feb. 24, 1969, Japan, No. 44/13775; June 4, 1969, Japan, No. 44/43870; June 4, 1969, Japan, No. 44/43871; June 5, 1969, Japan, No. 44/43570; June 7, 1969, Japan, No. 44/44945; June 10, 1969, Japan, No. 44/45607; June 10, 1969, Japan, No. 44/45608; June 11, 1969, Japan, No. 44/45393; June 12, 1969, Japan, No. 44/45760; June 14, 1969, Japan, No. 44/46535

[54] **MINIATURE LABELING APPARATUS**
13 Claims, 67 Drawing Figs.

[52] **U.S. Cl.** **156/576,** 156/384, 156/540
[51] **Int. Cl.** **B41m 1/40,** B32b 31/20
[50] **Field of Search** 156/384–388, 540–542, 576

[56] **References Cited**

UNITED STATES PATENTS

2,663,444	12/1953	Kaplan	156/576 X
3,220,909	11/1965	Kaplan et al.	156/386
3,231,446	1/1966	Satas	156/384
3,265,553	8/1966	Kind et al.	156/384
3,342,662	9/1967	Grasmann	156/384
3,440,123	4/1969	Hamisch	156/384
3,461,018	8/1969	Nagashima	156/384

Primary Examiner—Benjamin A. Borchelt
Assistant Examiner—James M. Hanley
Attorneys—Robert E. Burns and Emmanuel J. Lobato

ABSTRACT: A printing mechanism, and a label tape feeding mechanism both actuated by a hand-pushed drive lever, and a roll of label tape, are enclosed within a compact case, whereby a lightweight labeler is obtained and can be used continuously for a long period without fatiguing the user.

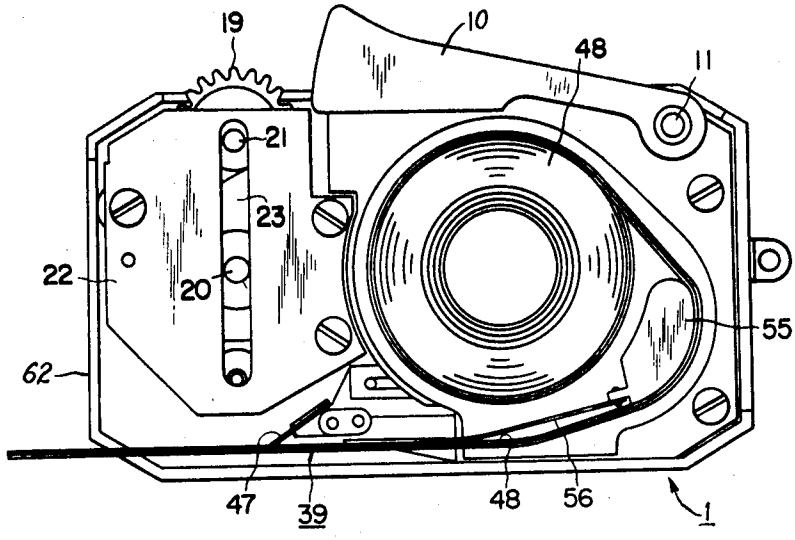


FIG. 1

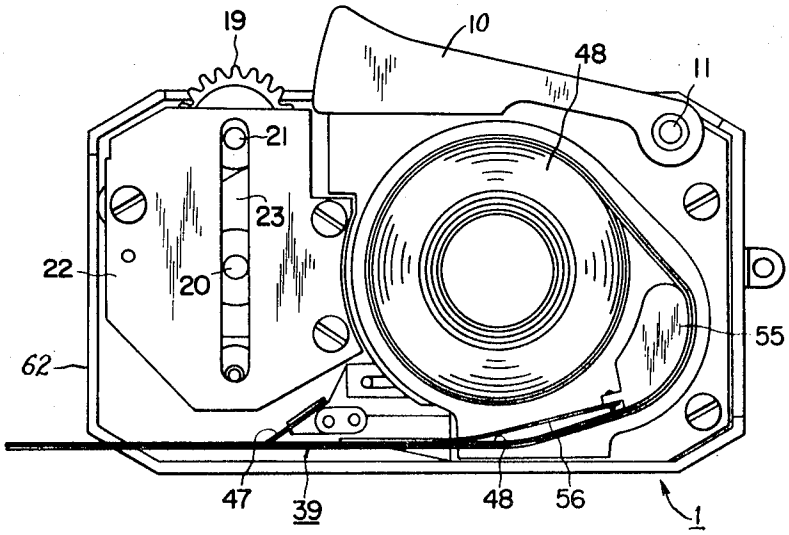


FIG. 2

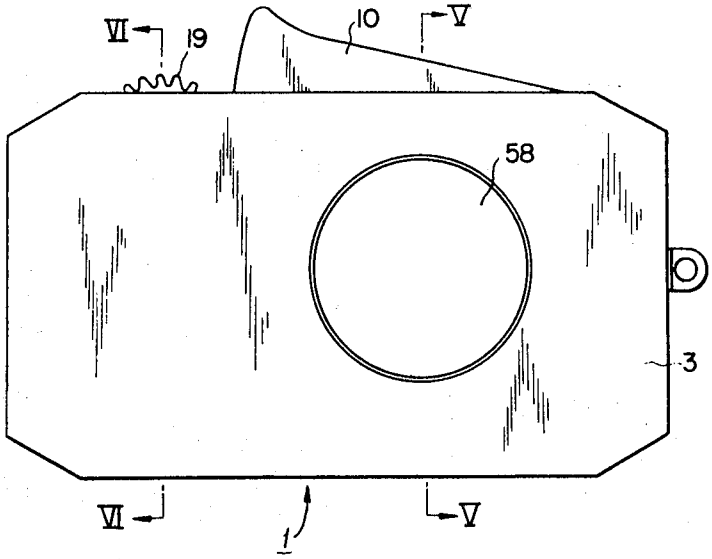


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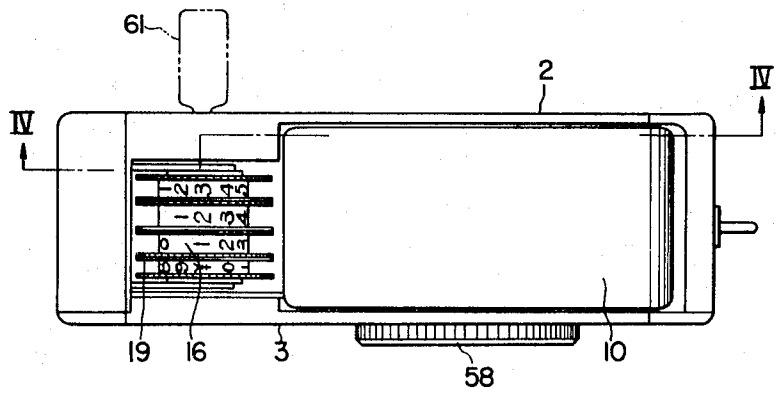

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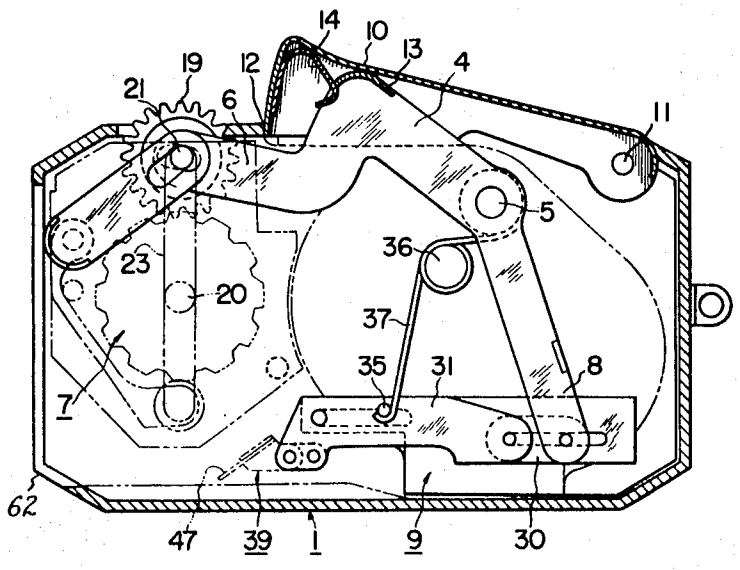

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FIG. 5

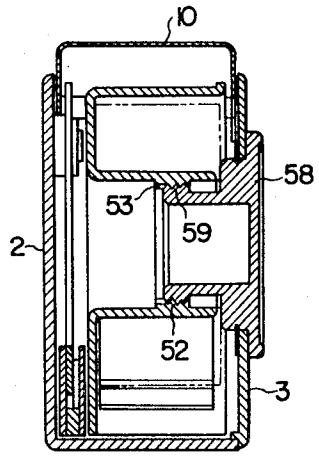


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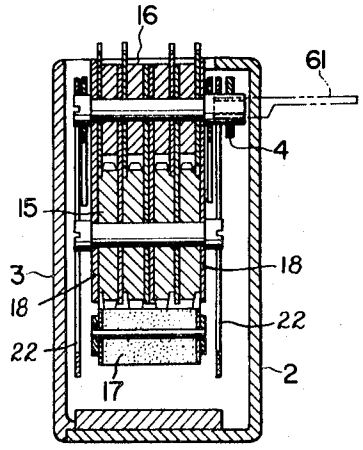


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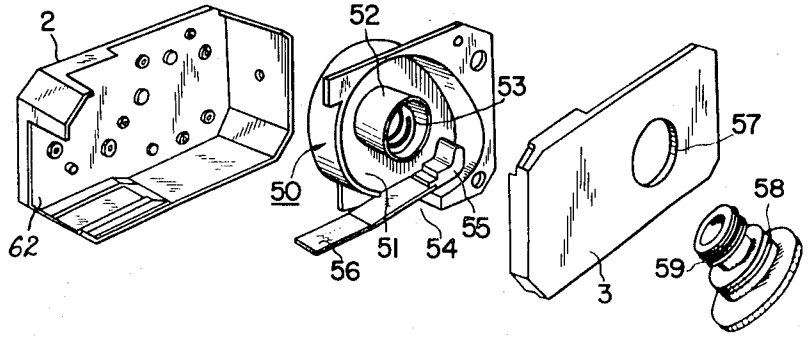


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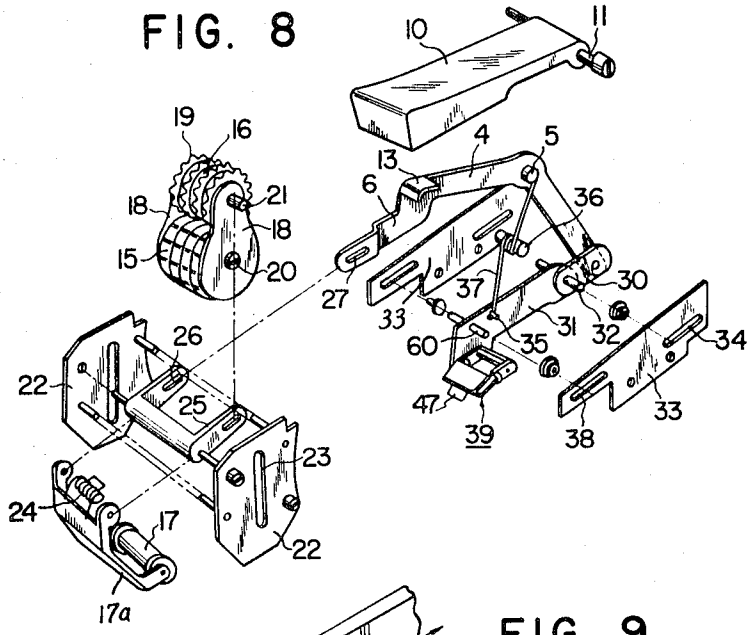

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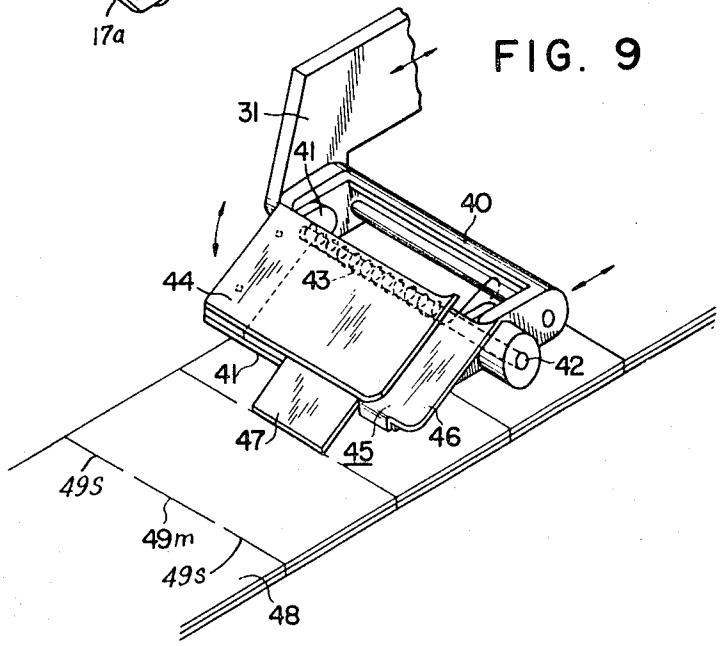

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FIG. 10

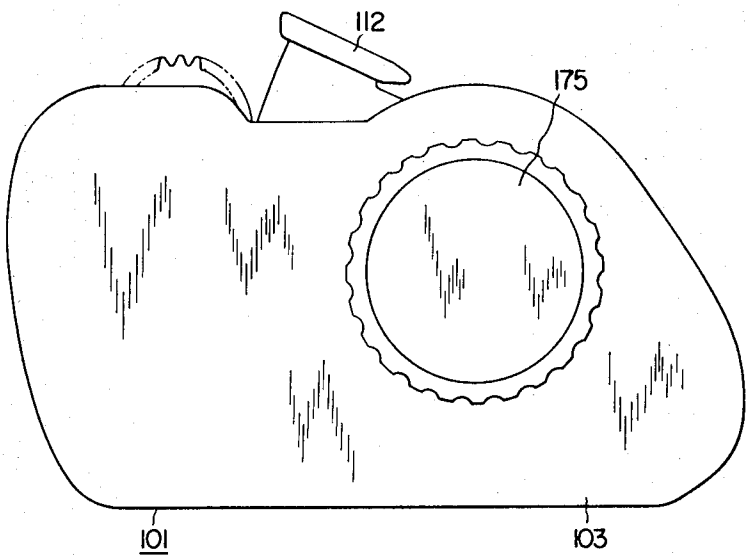


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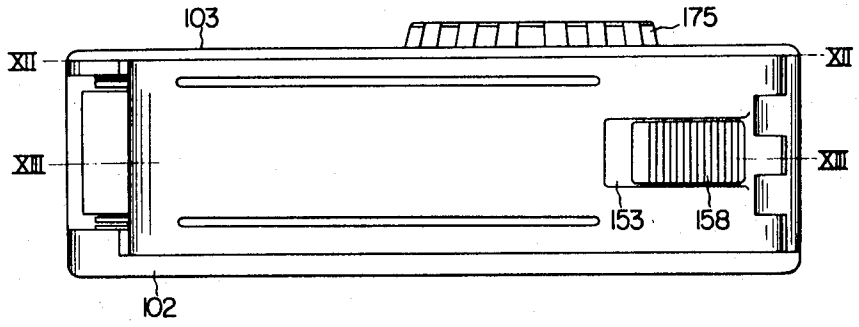


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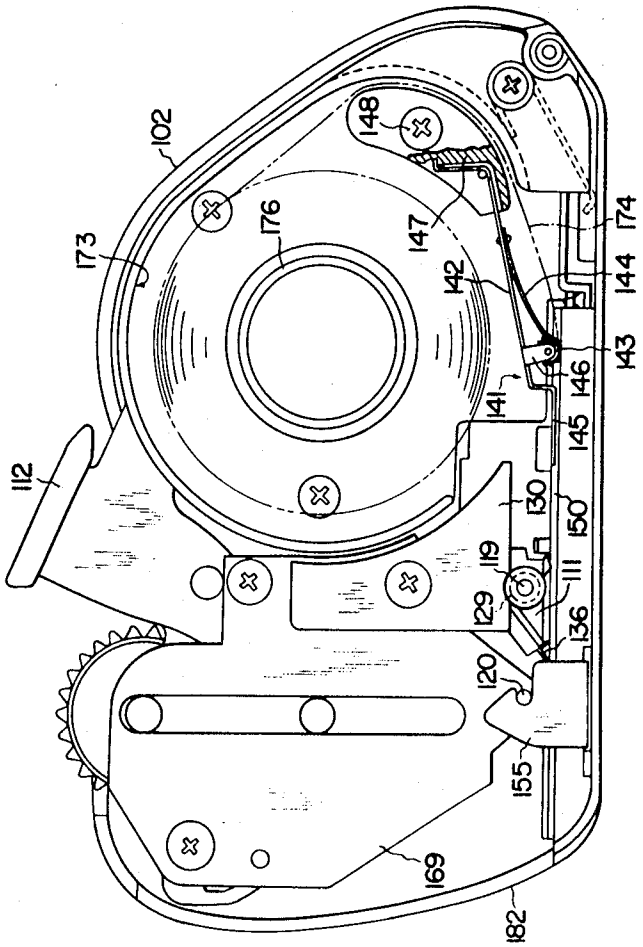

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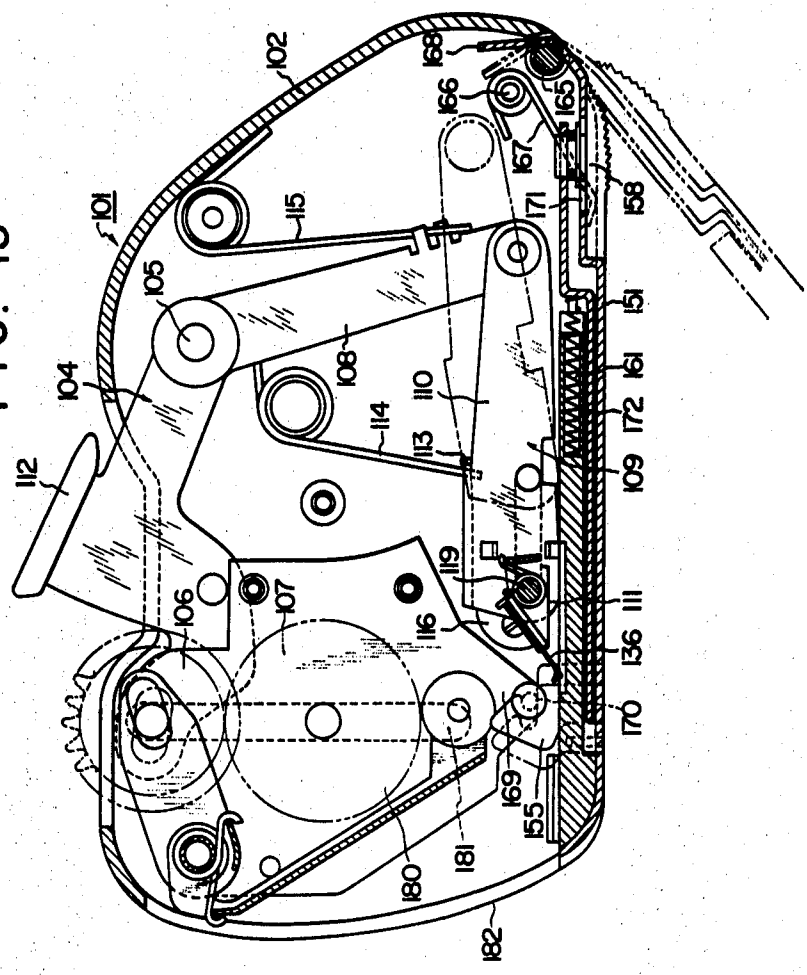

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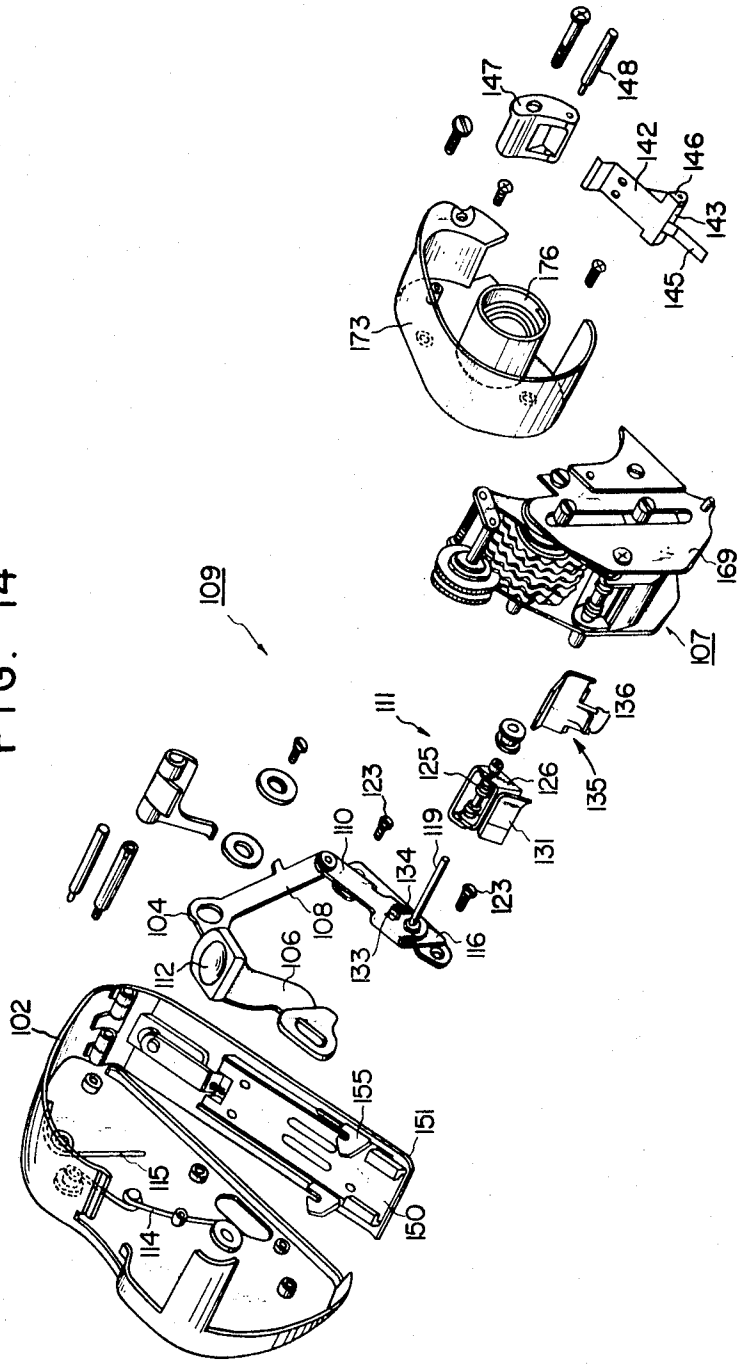

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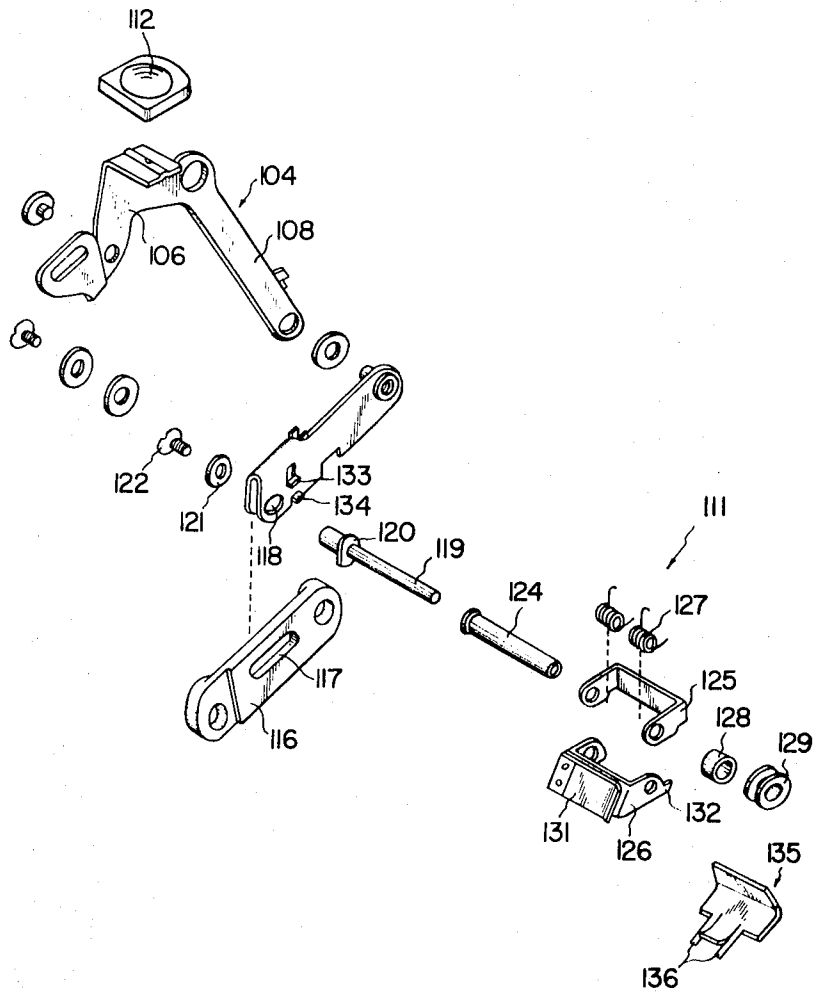

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FIG. 16

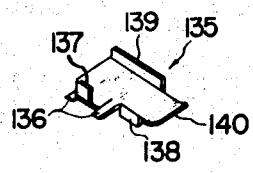


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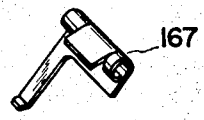


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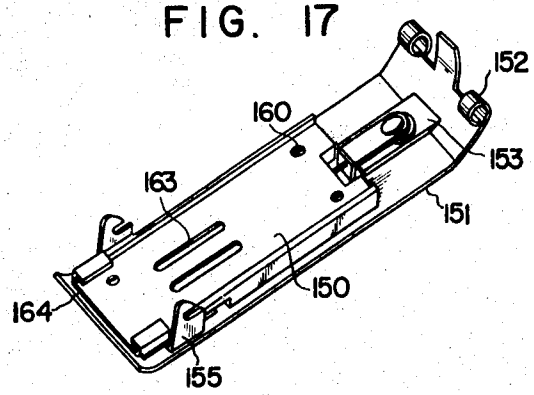


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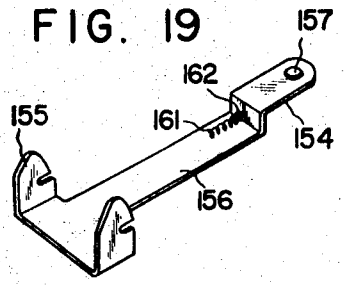


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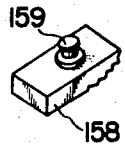


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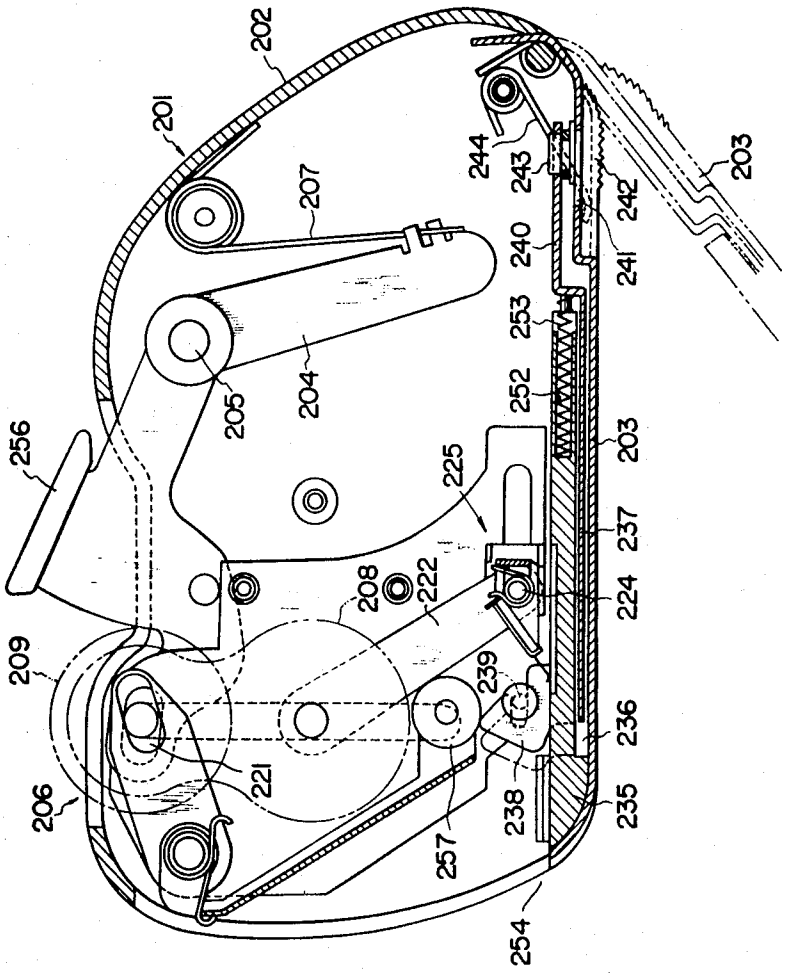

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FIG. 22

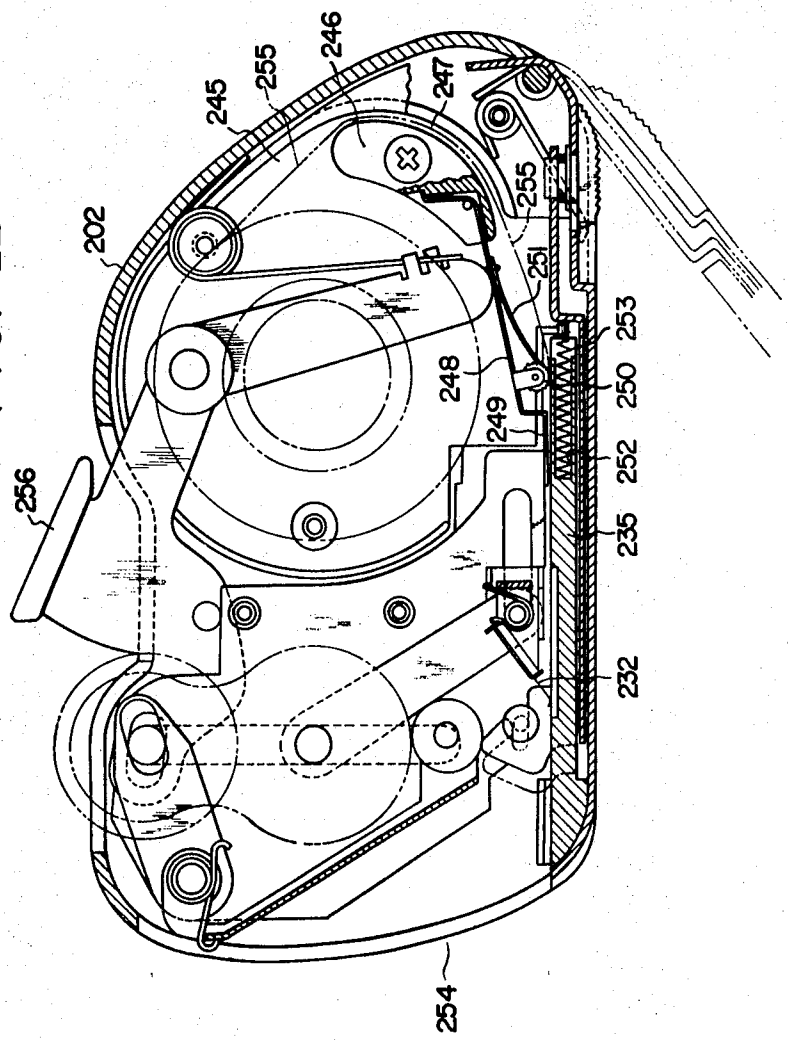


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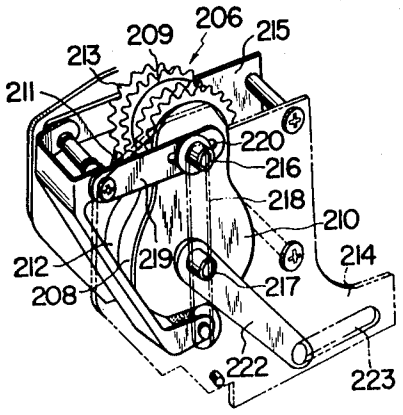


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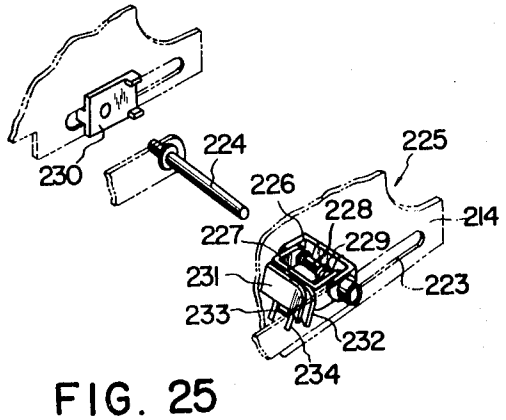


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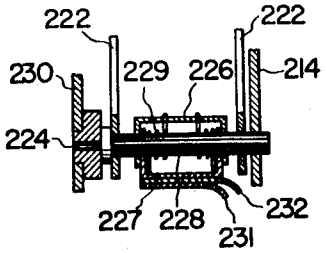


FIG. 26

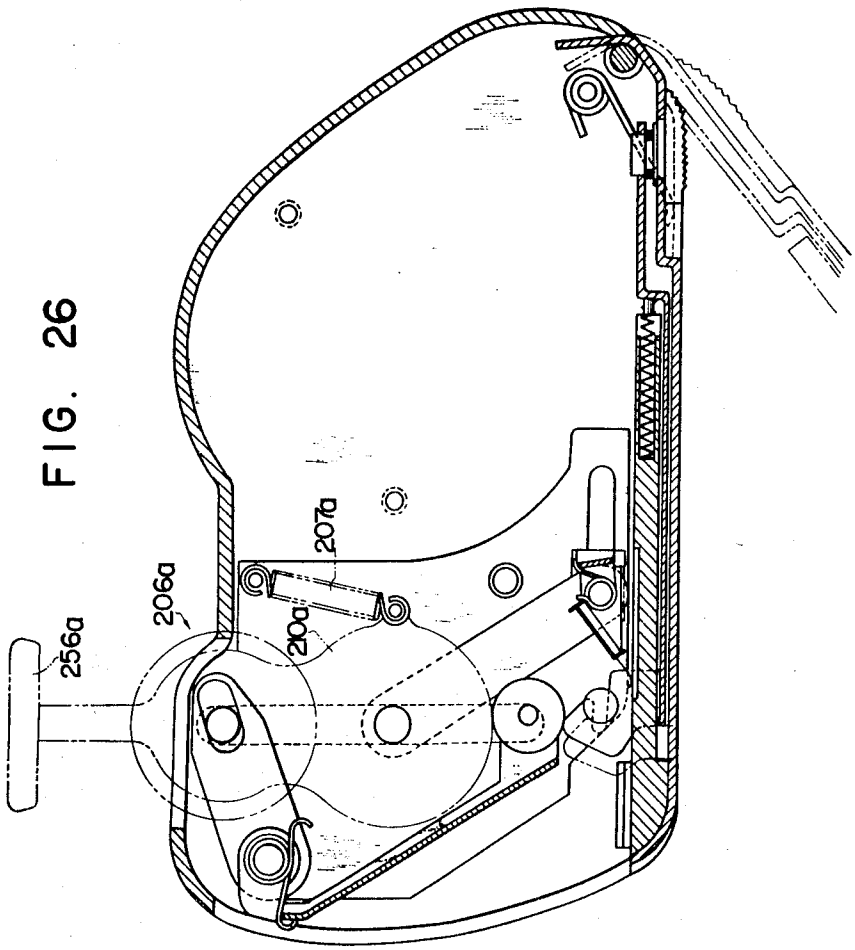


FIG. 27

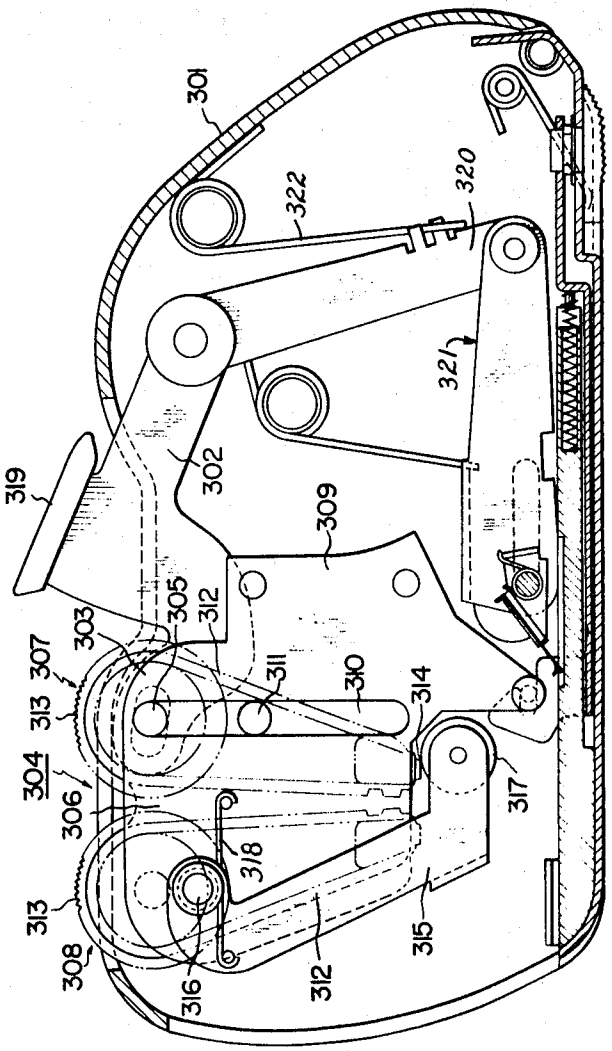

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FIG. 28

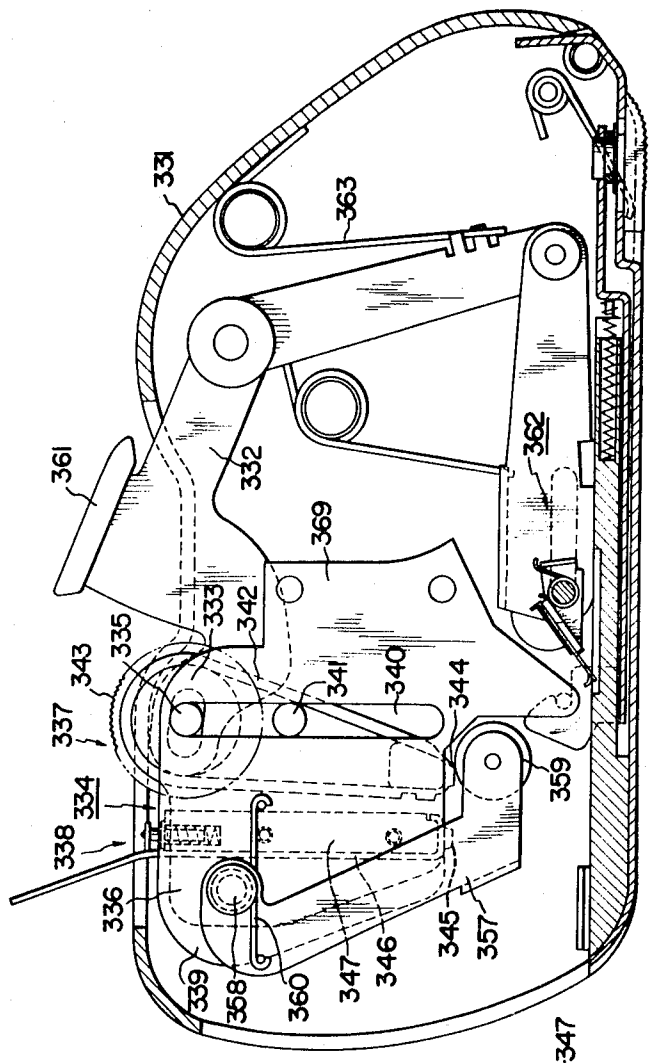

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FIG. 29

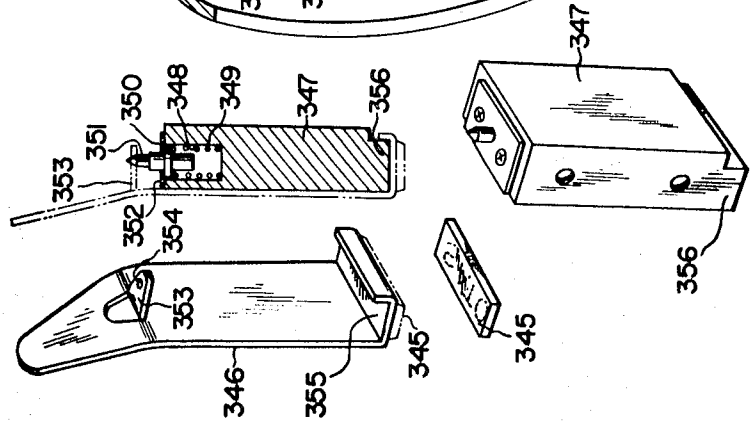

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FIG. 30

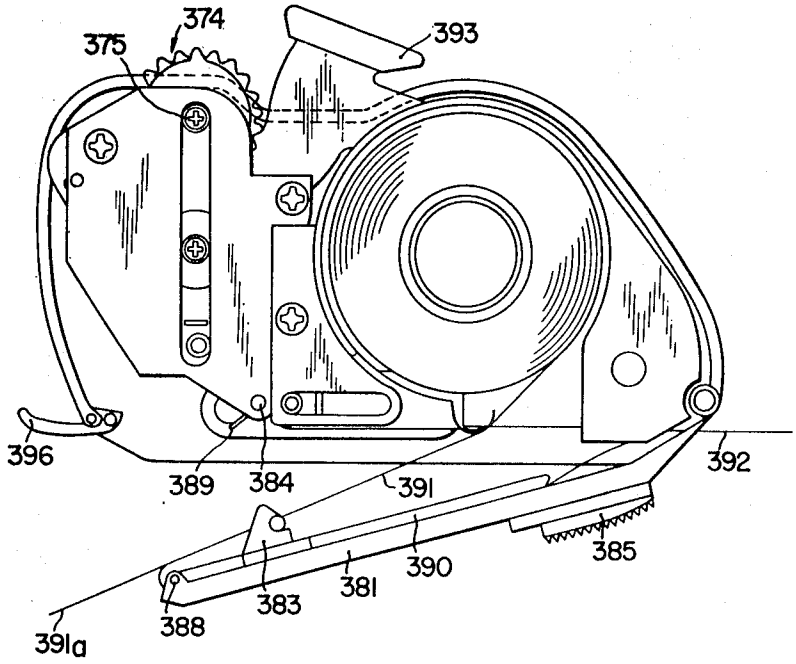

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FIG. 31

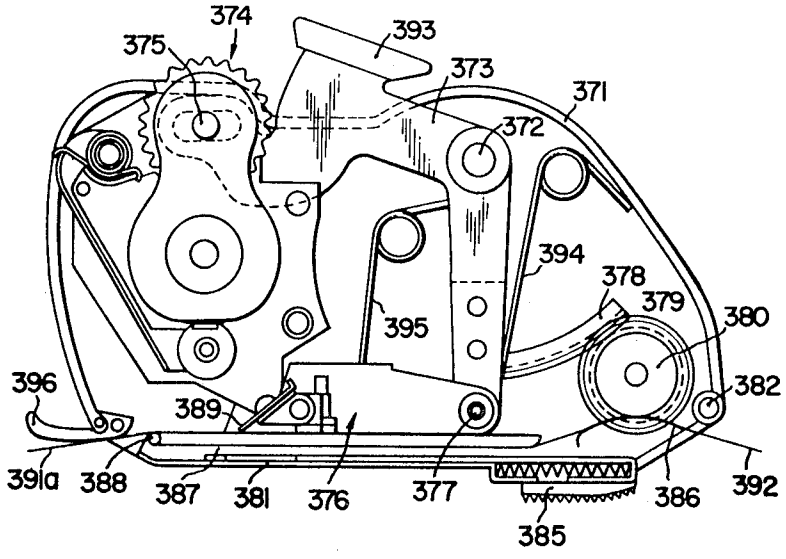

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FIG. 32

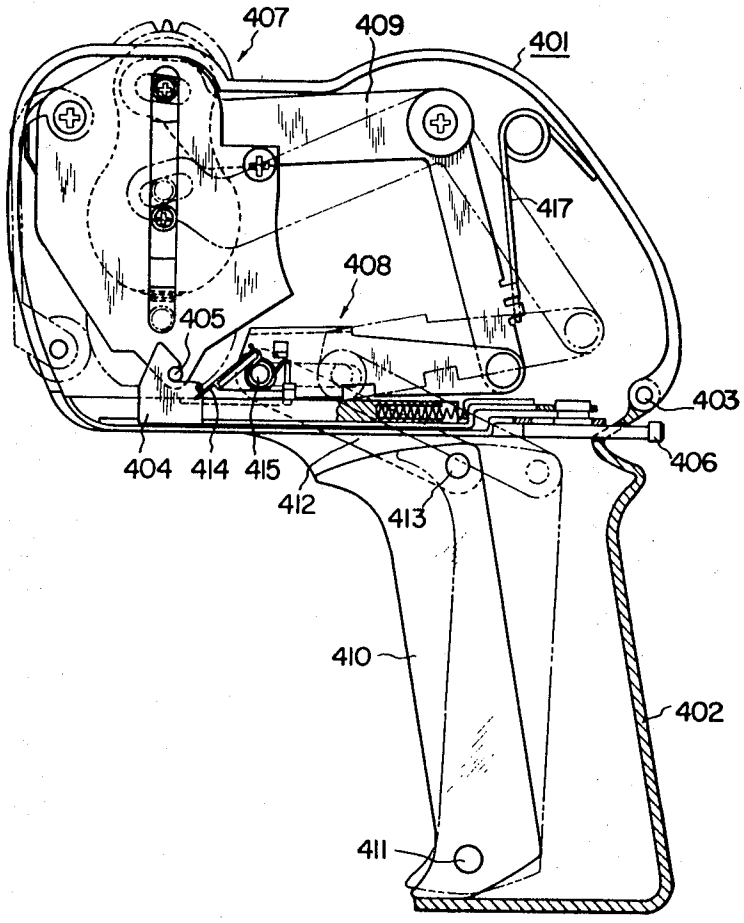


FIG. 33

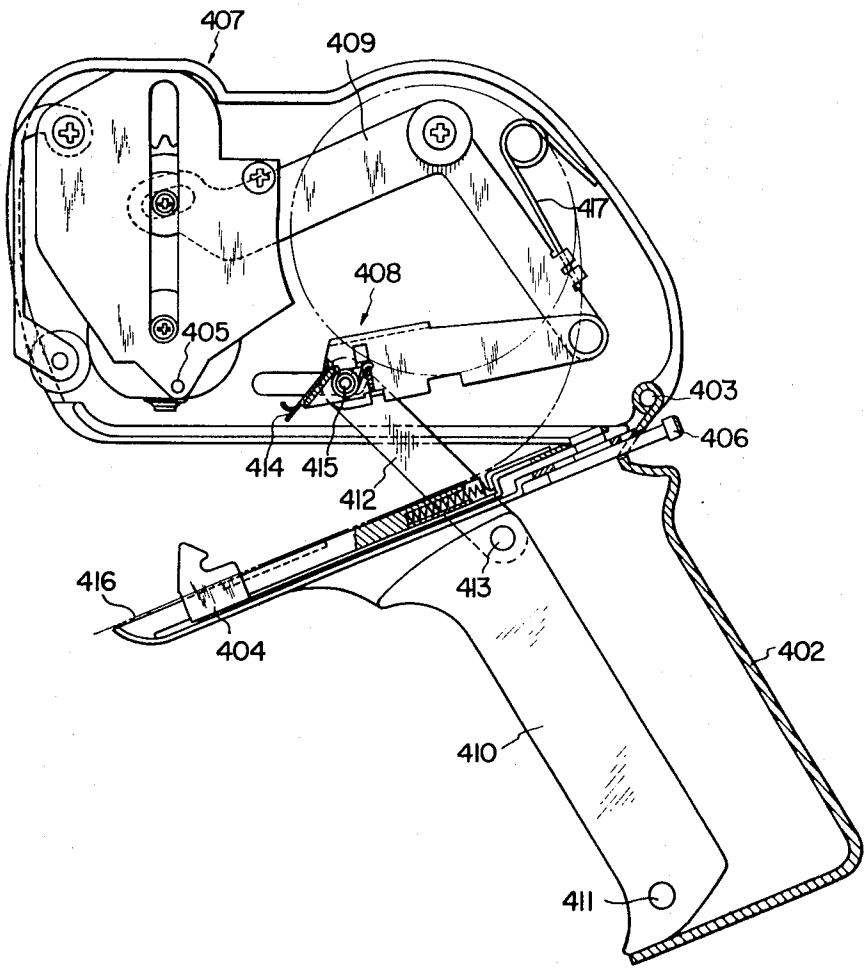


FIG. 34

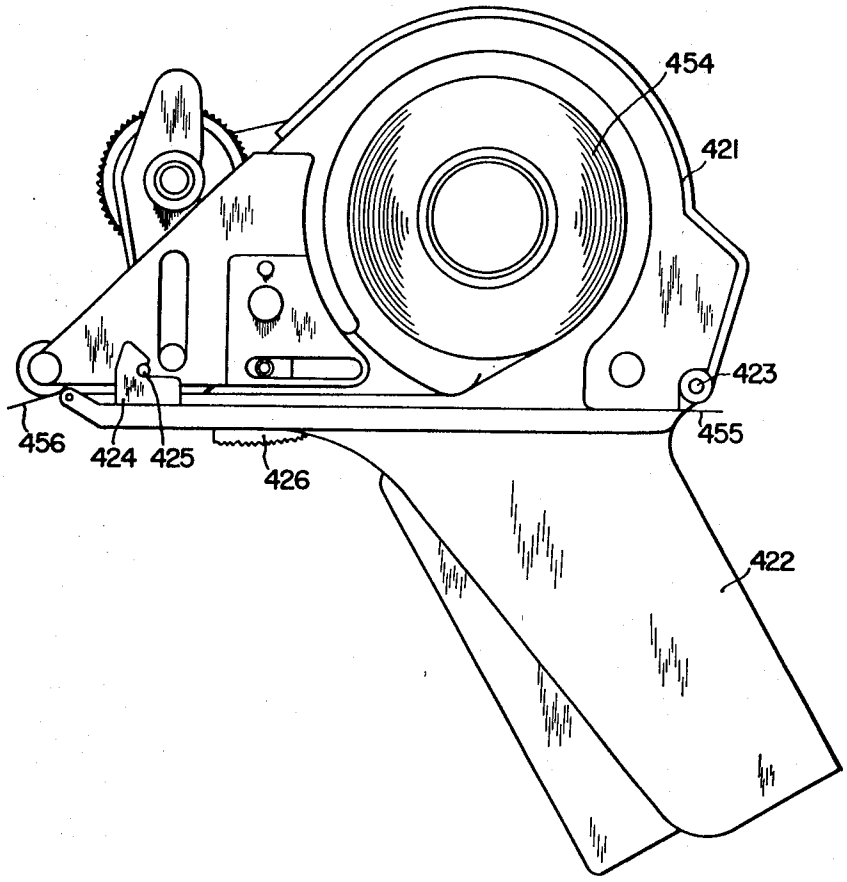


FIG. 35

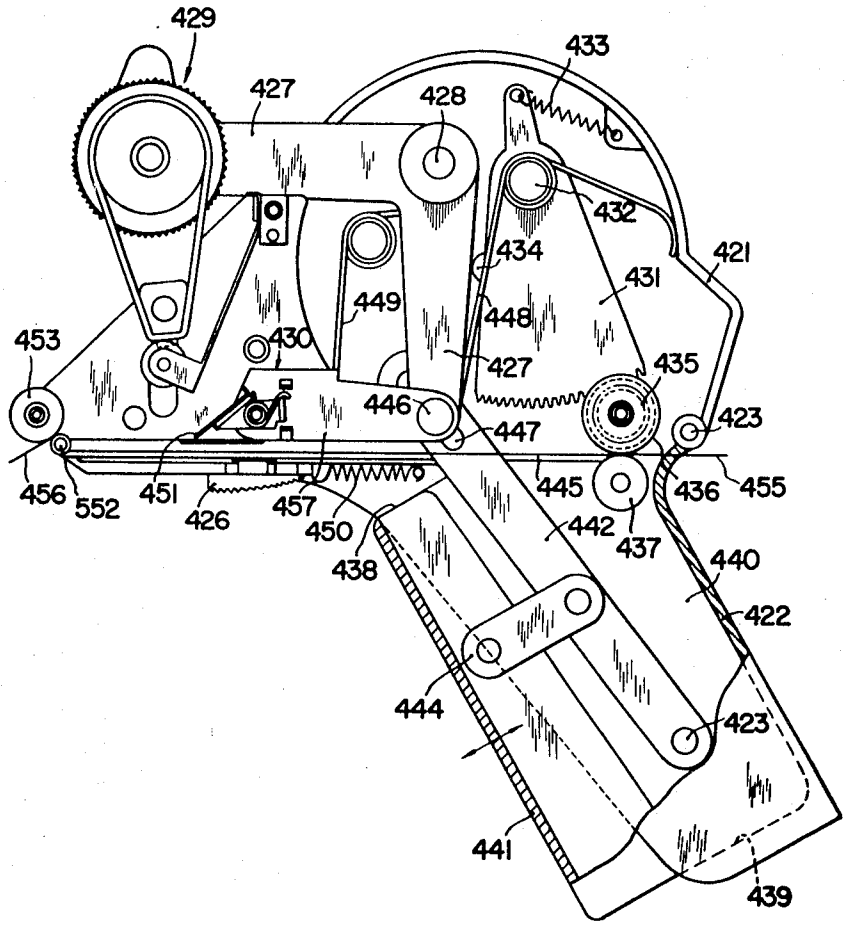

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FIG. 36

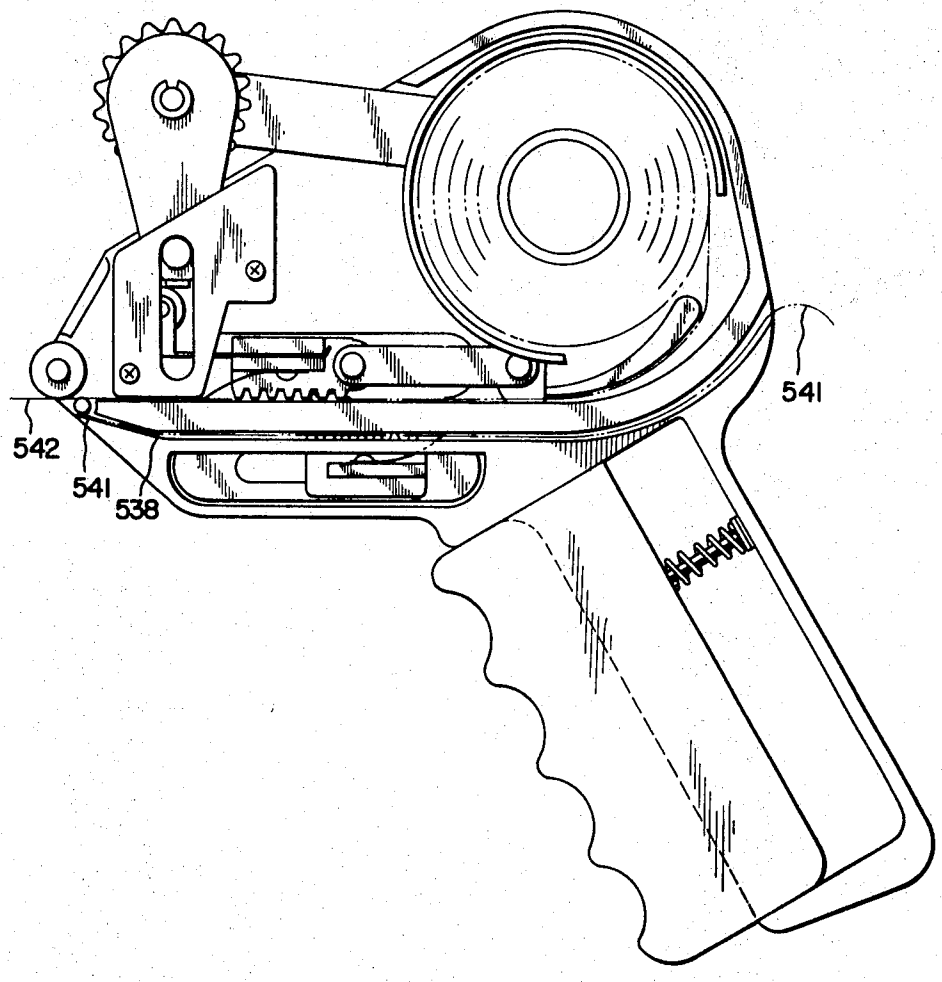


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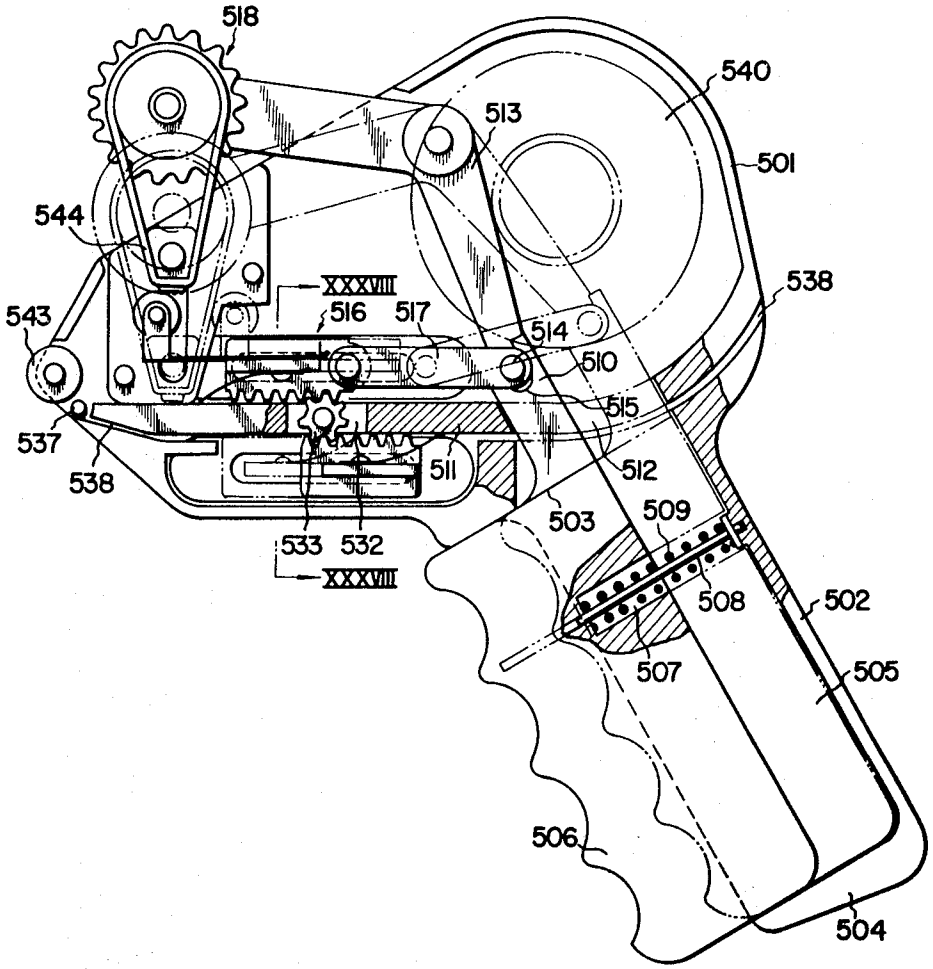

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FIG. 38

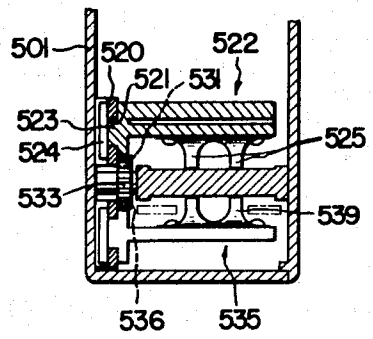

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FIG. 39

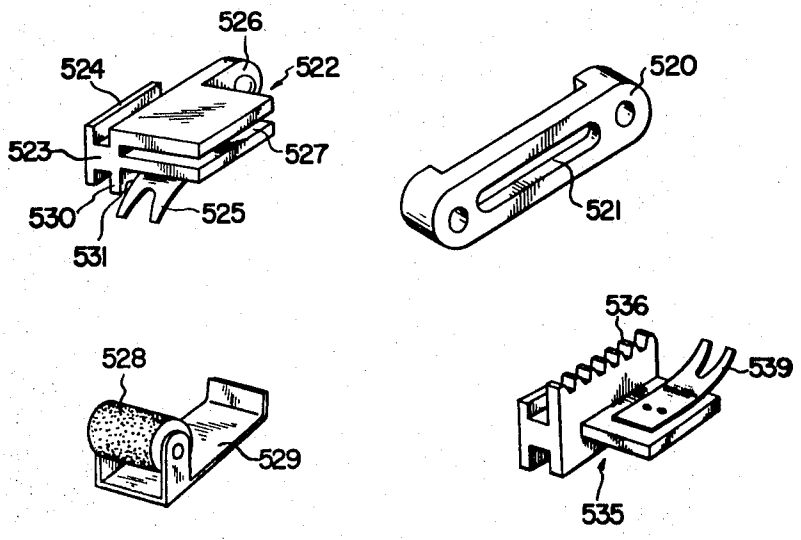

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FIG. 40

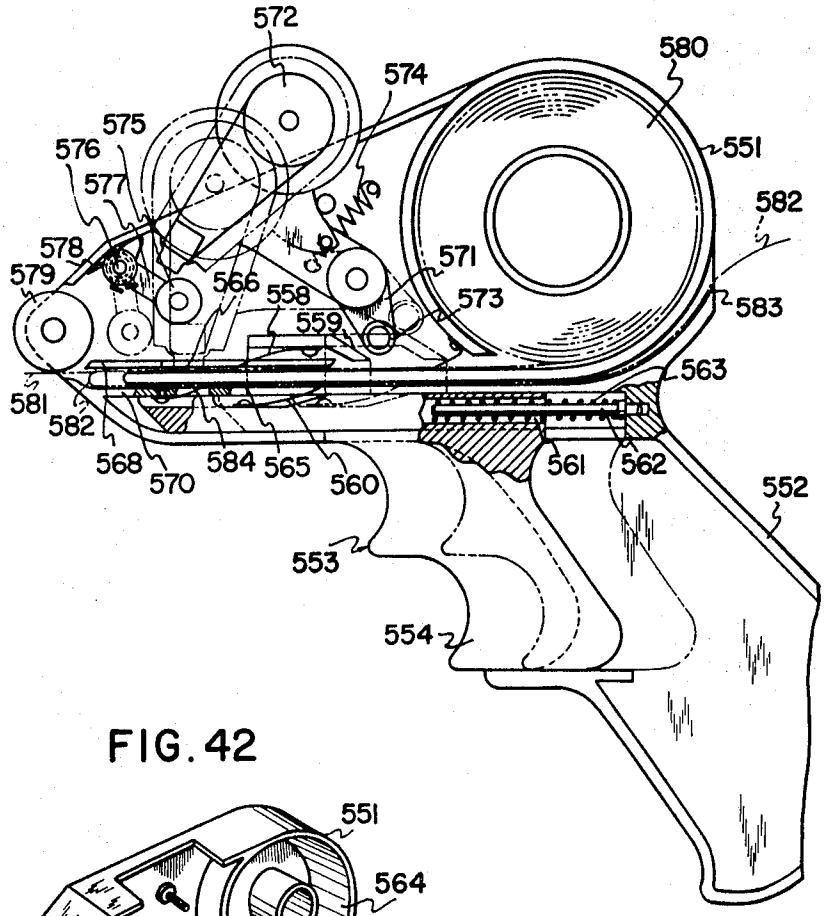


FIG. 42

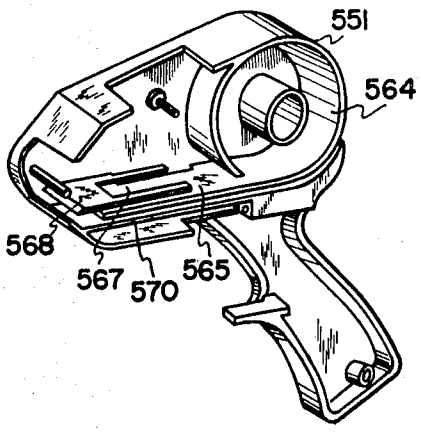


FIG. 41

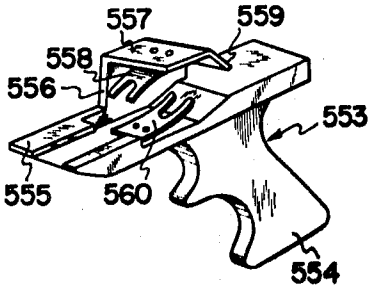


FIG. 43

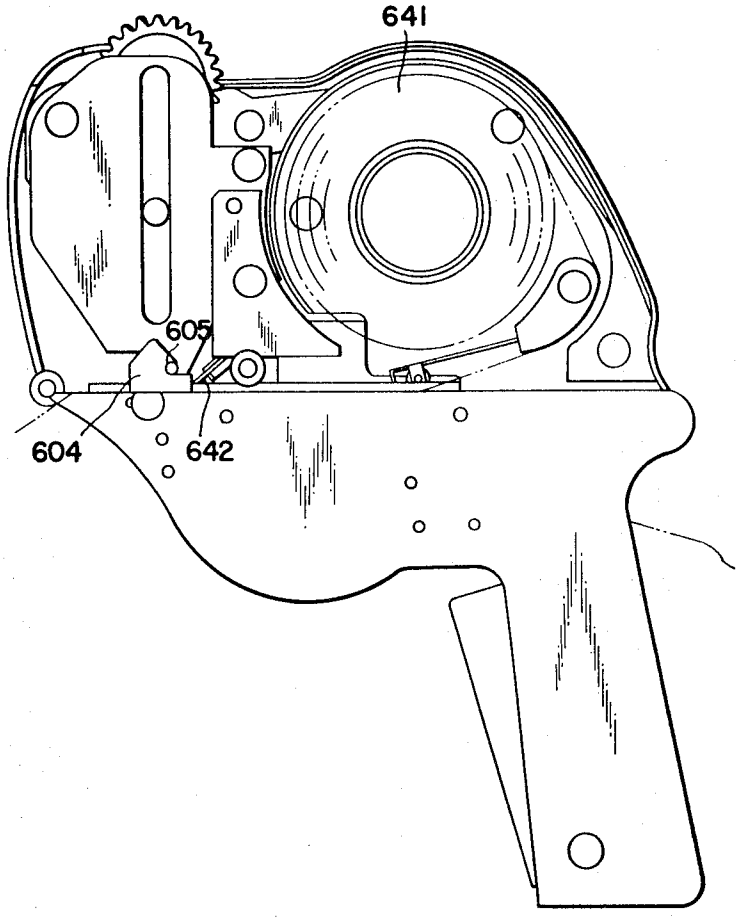


FIG. 44

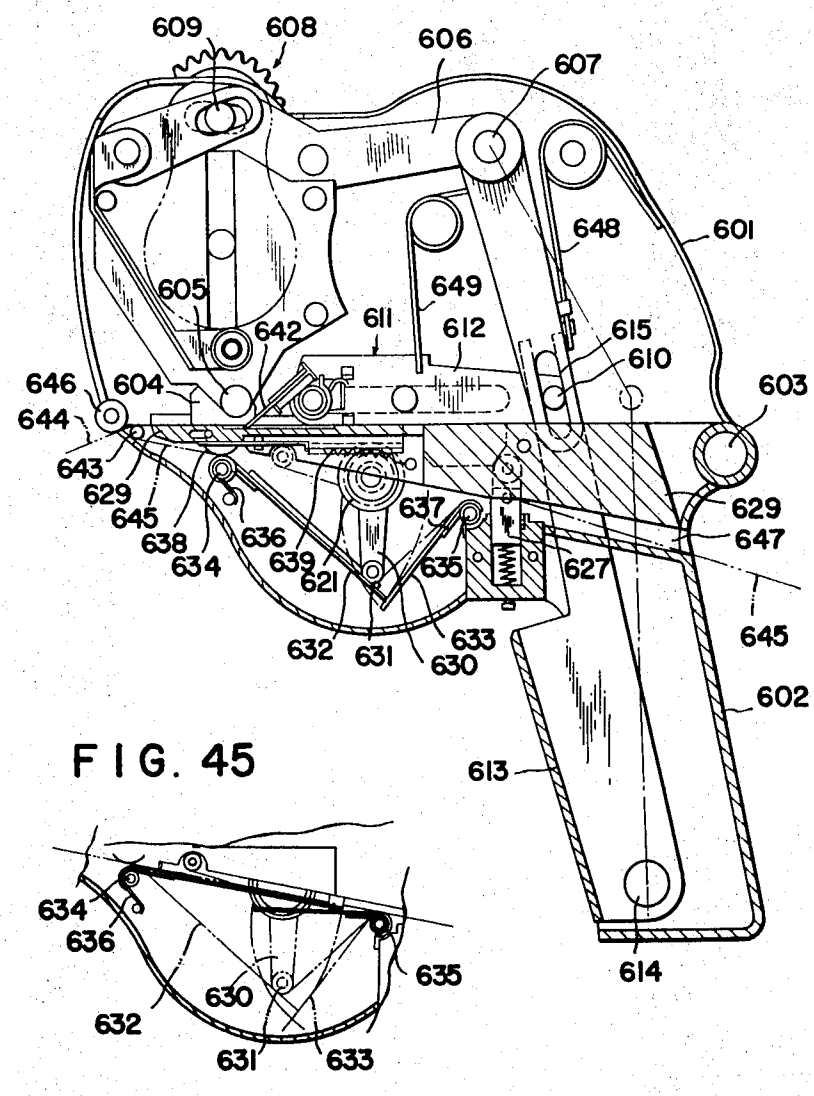

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FIG. 45

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FIG. 46

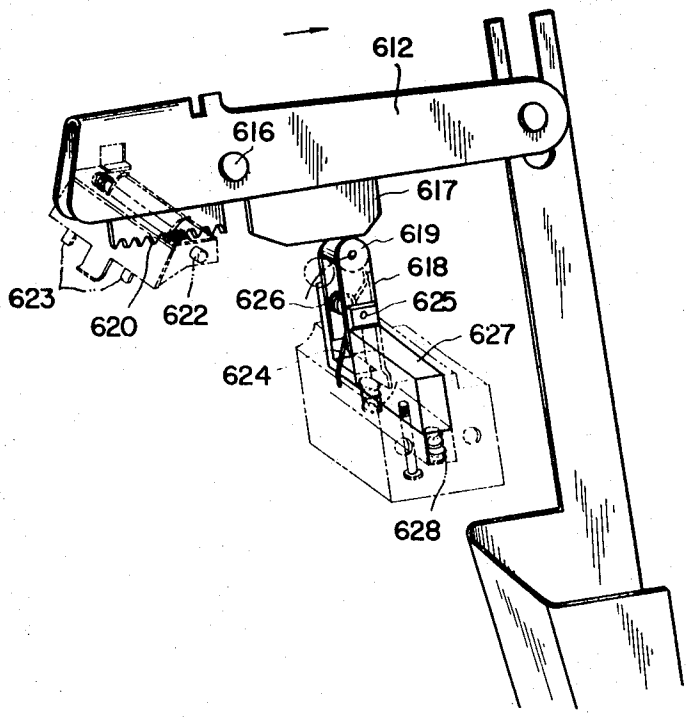


FIG. 47

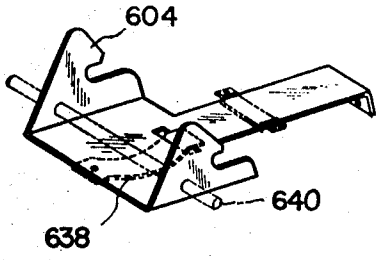


FIG. 48

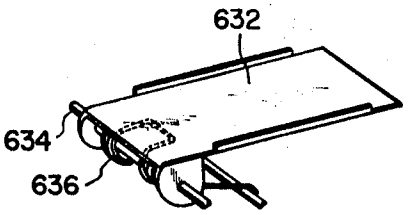


FIG.49

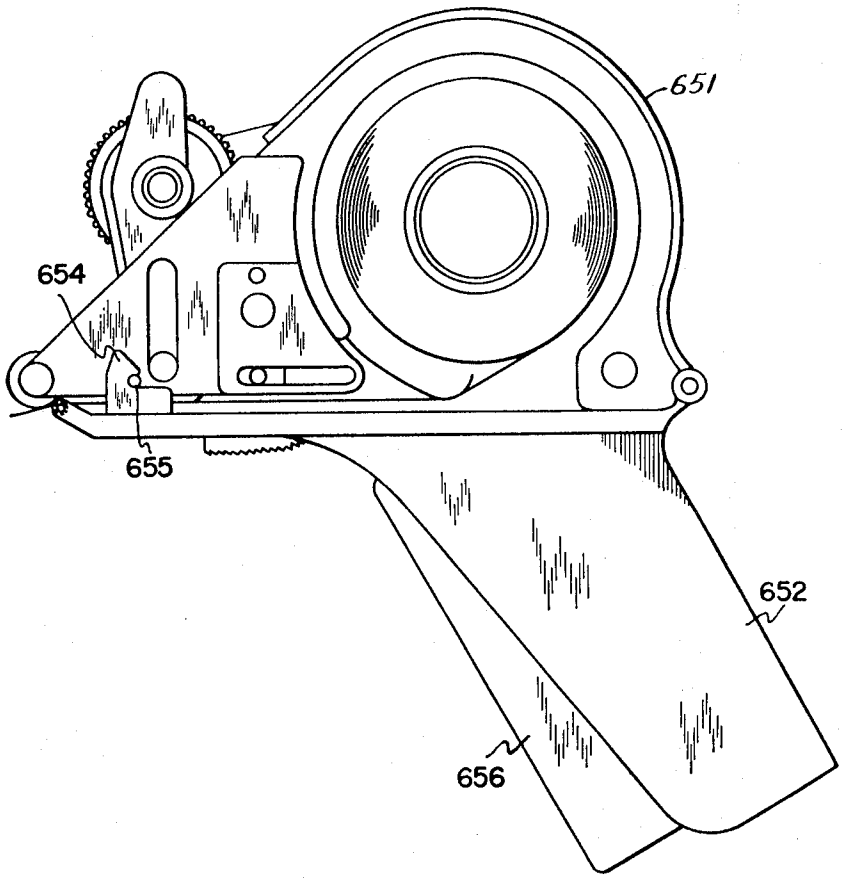


FIG. 50

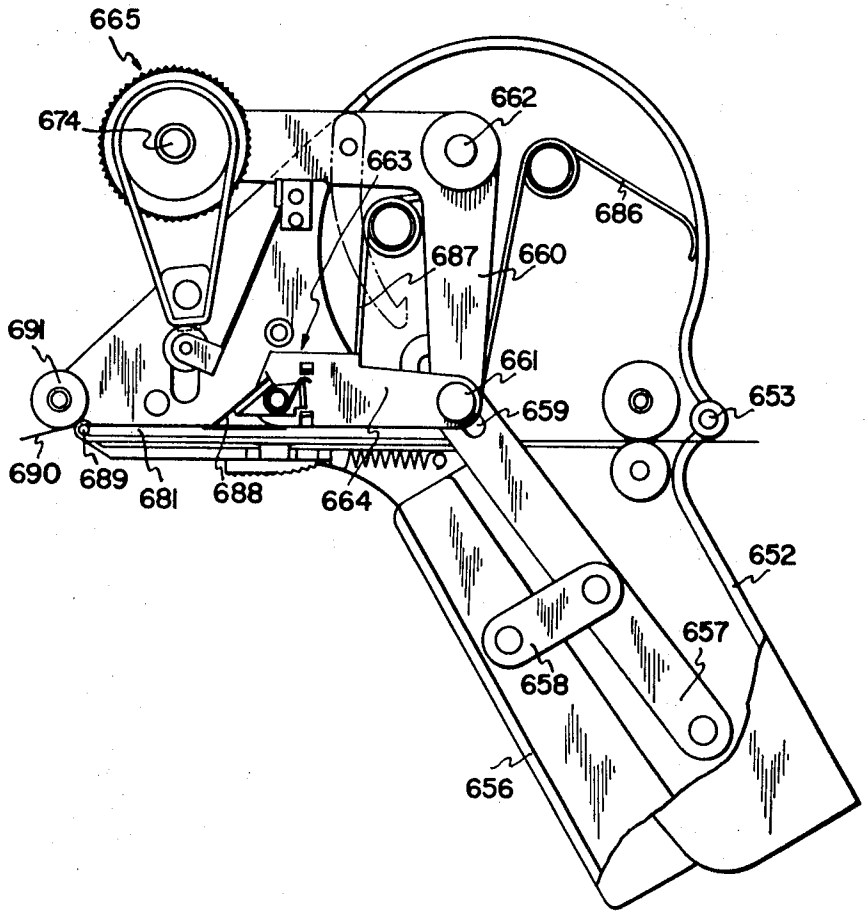

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FIG. 51

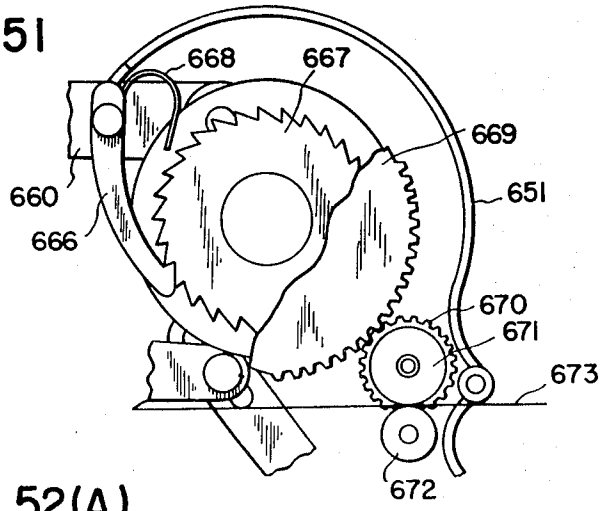


FIG. 52(A)

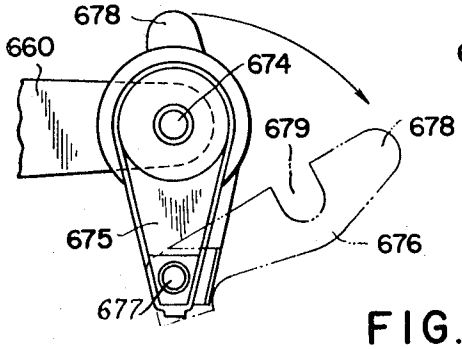


FIG. 52(B)

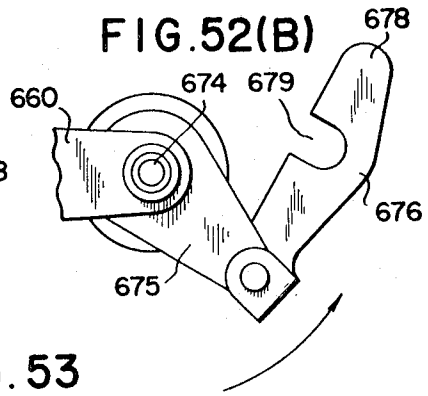


FIG. 53

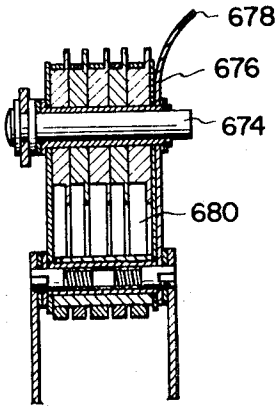


FIG. 54

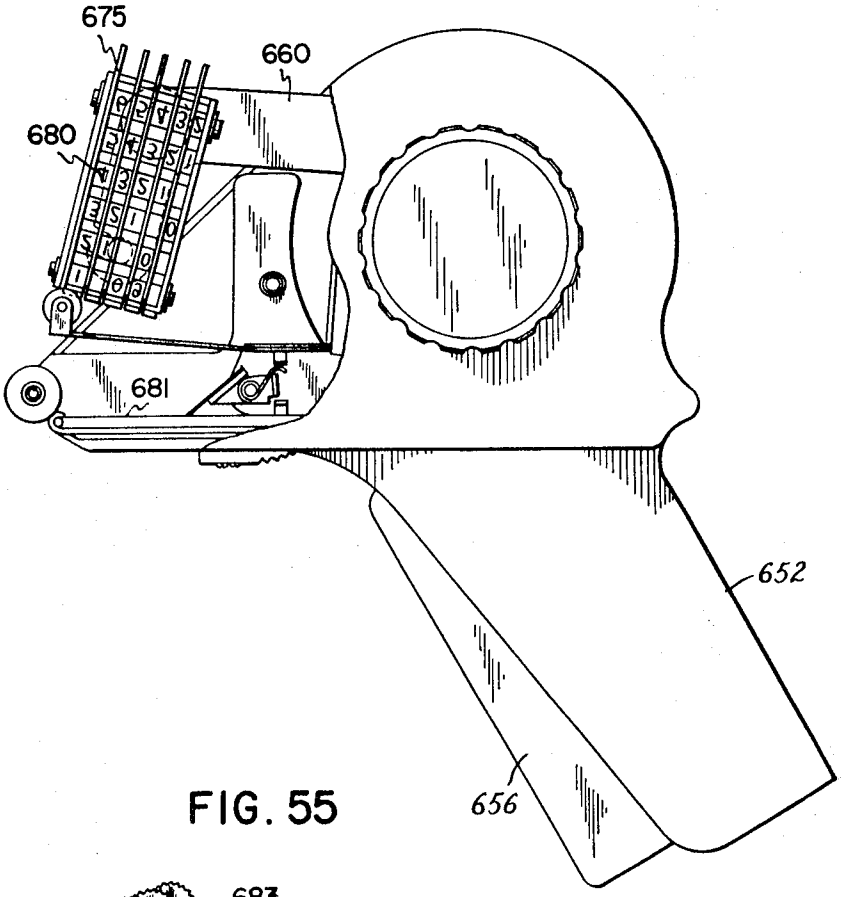


FIG. 55

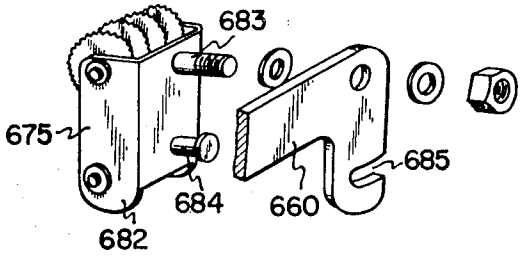


FIG. 56

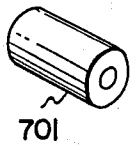


FIG. 57

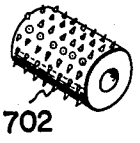


FIG. 58(A)

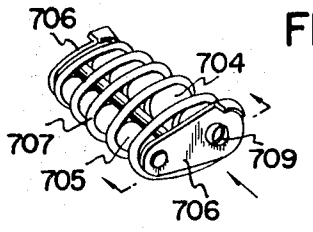


FIG. 58(B)



FIG. 58(C)

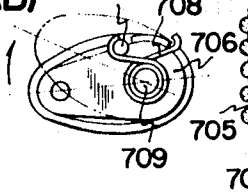


FIG. 58(D)

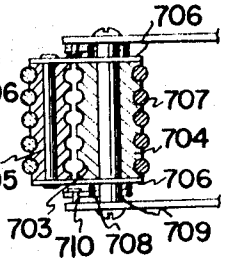


FIG. 59(A)

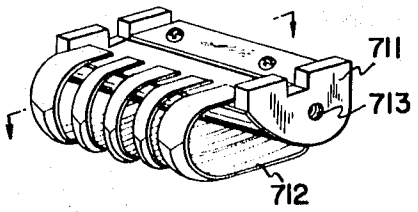


FIG. 59(B)

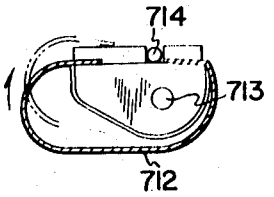


FIG. 60(A)

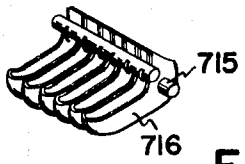


FIG. 60(B)

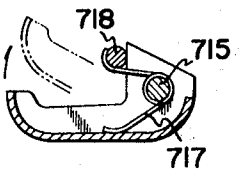
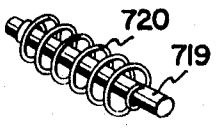


FIG. 61



MINIATURE LABELING APPARATUS

BACKGROUND OF THE INVENTION

This invention relates to apparatus for printing, dispensing, and applying labels with adhesive on one surface thereof, and more particularly to a new and improved labeler of this character of miniature size and light weight which is conveniently portable and easily operable for long periods without fatigue on the part of the operator.

In small shops, stores, and like establishments, while automatic sticking of labels on commodities may not be feasible, there is still a frequent need for mechanically recording information such as prices directly on the labels themselves.

A large number of labeling apparatus have heretofore been proposed or produced with the object of satisfying this need, but in almost all cases, these apparatus have been bulky and heavy, or have been accompanied by disadvantages such as complicated procedures for loading the labels. Bulky and heavy labeling apparatus causes fatigue on the part of the operator, whereby the number of labels which can be applied in a given time is reduced.

SUMMARY OF THE INVENTION

It is an object of the present invention to satisfy the above mentioned need by providing an improved labeler of simple organization and operation and of light weight and compact size which can be easily loaded with labels and continuously operated with minimum fatigue on the part of the user.

According to the present invention, briefly summarized, there is provided a miniature labeler comprising a push member depressably operated by manual application of a pushing force, a printing mechanism operated by the pushing force to undergo vertical movement to print desired inscriptions successively on labels, a label tape feeding mechanism operated by the pushing force to undergo horizontal reciprocation to feed a label tape at a rate equal to one label per operational cycle, and a case structure for accommodating and enclosing the label tape, the printing mechanism, and the tape feeding mechanism, said tape feeding mechanism retracting during descent of the printing mechanism thereby permitting the printing of a label and advancing during ascent of the printing mechanism thereby permitting the advance of the tape by a distance corresponding to one label per operational cycle.

The nature, details, and utility of the invention will be more clearly apparent from the following detailed description with respect to preferred embodiments of the invention when read in conjunction with the accompanying drawings, in which like parts are designated by like reference numerals.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a side elevation showing the left side of one example (herein referred to as example 1) of a labeler according to the invention with the side cover removed;

FIG. 2 is a side elevation of the same labeler with the side cover secured in place;

FIG. 3 is a top plan view of the labeler shown in FIGS. 1 and 2;

FIG. 4 is a side elevation in section taken along discontinuous planes indicated by line IV–IV in FIG. 3 as viewed in the arrow direction;

FIG. 5 is an elevation in vertical section taken along the plane indicated by line V–V in FIG. 2 as viewed in the arrow direction;

FIG. 6 is an elevation in vertical section taken along the plane indicated by line VI–VI in FIG. 2 as viewed in the arrow direction;

FIG. 7 is a perspective view showing the outer case of the main case structure, an internal frame, a side cover, and a latch knob in a disassembled state of the labeler illustrated in the preceding figures;

FIG. 8 is an exploded perspective view showing the principal parts of the printing mechanism and the tape feeding mechanism of the instant labeler;

FIG. 9 is a relatively enlarged perspective view showing a tape feeding pawl assembly of the feeding mechanism shown in FIG. 8 and indicating its relation to a label tape;

FIG. 10 is a somewhat enlarged side elevation showing the left side of another example (herein referred to as example 2) of a labeler embodying the invention;

FIG. 11 is a bottom view of the labeler shown in FIG. 10;

FIG. 12 is a left side elevation showing the labeler illustrated in FIG. 10 with its cover removed;

FIG. 13 is a side elevation in section taken along the vertical plane indicated by line XIII–XIII in FIG. 11;

FIGS. 14 and 15 are exploded perspective views showing in detail the various essential parts of the labeler shown in FIG. 10;

FIG. 16 is a perspective view of a pawl blade suitable for use in the labeler shown in FIG. 10;

FIG. 17 is a perspective view of the bottom cover of the same labeler;

FIG. 18 is a perspective view of a spring for springing open the bottom cover illustrated in FIG. 17;

FIG. 19 is a perspective view of a latch member adapted for mounting on and locking the bottom cover shown in FIG. 17;

FIG. 20 is a perspective view of a slide button and for locking and releasing the bottom cover shown in FIG. 17;

FIGS. 21 and 22 are left side elevations, partly in section, showing essential parts of still another example (herein referred to as example 3) of a labeler according to the invention;

FIG. 23 is a perspective view of the printing mechanism of the labeler illustrated in FIGS. 21 and 22;

FIG. 24 is an exploded perspective view showing the essential parts constituting the tape feed mechanism of the same labeler;

FIG. 25 is a fragmentary elevation, in vertical section as viewed from front to rear, of the mechanism illustrated in FIG. 24;

FIG. 26 is a left side elevation, partly in vertical section, showing still another example of a labeler embodying the invention;

FIG. 27 is a left side elevation, partly in vertical section, showing a further example (herein referred to as example 4) of a labeler according to the invention;

FIG. 28 is a left side elevation, partly in vertical section, showing a still further example (herein referred to as example 5) of a labeler of the invention;

FIGS. 29(A), 29(B), and 29(C) are perspective views and a side elevation, in vertical section, showing an example of a device for printing additional information;

FIG. 30 is left side elevation showing another example (herein referred to as example 6) of a labeler according to the invention with the side cover removed;

FIG. 31 is a left side elevation, partly in vertical section, showing the mechanisms of the labeler shown in FIG. 20;

FIG. 32 is a left side elevation, partly in section, showing another example (herein referred to as example 7) of a labeler of the invention;

FIG. 33 is a left side elevation of the labeler shown in FIG. 32 with the bottom cover in opened state;

FIG. 34 is a left side elevation of still another example (herein referred to as example 8) of the invention with the side cover removed;

FIG. 35 is a left side elevation, partly in vertical section and with parts cut away, showing the essential mechanisms of the labeler illustrated in FIG. 34;

FIG. 36 is a left side elevation of another example (herein referred to as example 9) of the invention with the side cover removed;

FIG. 37 is a left side elevation, partly in vertical section and with parts cut away, showing the essential mechanisms of the labeler illustrated in FIG. 36;

FIG. 38 is an elevation, in vertical section as viewed from rear to front, showing a pinion and rack mechanism and related parts of the tape feeding mechanism of the labeler shown in FIG. 36;

FIG. 39 consists of perspective views showing in detail the parts of the feeding mechanism of the labeler illustrated in FIG. 36;

FIG. 40 is a left side elevation, with parts cut away, showing another example (herein referred to as example 10) of the invention;

FIG. 41 is a perspective view of the operating carriage in the labeler shown in FIG. 40;

FIG. 42 is a perspective view of the case structure of the same labeler;

FIG. 43 is a left side elevation of another example (herein referred to as example 11) of the invention with the side cover removed;

FIG. 44 is a left side elevation, partly in vertical section, showing the essential mechanisms of the labeler illustrated in FIG. 43;

FIG. 45 is a fragmentary left side elevation showing a base strip tensioning mechanism in the same labeler;

FIG. 46 is a partial perspective view showing a rear base strip holding device and related parts in the same labeler;

FIG. 47 is a perspective view of a latch device functioning as a front base strip holding device in the same labeler;

FIG. 48 is a perspective view of a base strip guide in the same labeler;

FIG. 49 is a left side elevation of another example (herein referred to as example 12) of the invention with the side cover removed;

FIG. 50 is a left side elevation showing the essential mechanisms of the labeler shown in FIG. 49;

FIG. 51 is a partial left side elevation, with parts cut away, showing a mechanism for applying tension to the base strip of the label tape in the same labeler;

FIGS. 52(A) and 52(B) are side elevations showing a mechanism for rotating the printing mechanism in the same labeler;

FIG. 53 is a front elevation of the printing mechanism in the same labeler;

FIG. 54 is a left side elevation, with parts cut away, showing still another embodiment of the invention wherein the printing mechanism is turned 90 degrees to align the row of types thereof in the front-rear direction;

FIG. 55 is an exploded perspective view showing parts for mounting of a printing mechanism; and

FIGS. 56 through 61, inclusive, are perspective, plan, and side elevational views showing various forms of label pressing members for pressing labels against articles and causing the labels to stick thereto.

Directional terms such as "upper," "front," and "left" are herein used to indicate the directions and parts as follows. The front and rear ends of the labeler are, respectively, the left and right ends as viewed in FIGS. 1, 2, and other similar figures. The upper and lower parts are the upper and lower parts as viewed in these same figures. The left and right sides are the near and far sides as viewed in these same figures, the lower and upper sides as viewed in FIG. 3, or the right and left sides as viewed in FIG. 5, respectively.

DETAILED DESCRIPTION

Example 1

Referring first to FIGS. 1 through 9, inclusive, the principal operational parts of the labeler shown therein are housed within a case structure 1 made up of an outer case 2 and a side cover 3 as shown in FIG. 7. Within the outer case 2, a main drive lever 4 is rotatably supported at an intermediate part thereof by a horizontal pivot pin 5 fixed to the case, said lever 4 being coupled at the end 6 of its front arm to a printing mechanism 7, and at the end 8 of its rear arm to a label tape feed mechanism 9 as shown in FIG. 4.

At the upper part of the outer case 2, there is provided an operating lever 10 pivoted at its rear end on a horizontal pivot pin 11 fixed to the case. The greater part of the operating lever 10, in its inoperative state protrudes out of the outer case 2 through a cutout opening 12 in the upper wall thereof, and, at the same time, the inner surface of the operating lever is in contact with an upwardly bulging knuckle part 13 of the drive lever 4.

The knuckle part 13 is in the form of a flange projecting laterally from the drive lever 4 as shown in FIG. 8, and is engaged with a leaf spring 14 (FIG. 4) secured at its proximal end to the interior of the operating lever 10, which is thereby prevented from springing excessively outward.

As indicated in FIG. 8, the printing mechanism 7 is made up essentially of type wheels 15 in a coaxial group rotatably supported on a transverse axial pin 20; type-indicating wheels 16 also in a corresponding coaxial group rotatably supported on a transverse axial pin 21; the axial pins 20 and 21 being supported in mutually parallel disposition by side plates 18, 18; an ink pad or roller 17, and a frame structure including outer side frame plates 22, 22. The type-indicating wheels 16 are respectively provided with cog wheels 19 by which the type-indicating wheels and type wheels 15 can be rotated.

The outer extremities of the axial pins 20 and 21 extend outside of the side plates 18, 18 and are slidably engaged in vertical slots 23 formed in the side frame plates 22, 22, whereby the assembly of the type wheels 15, type-indicating wheels 16, axial pins 20 and 21, and side plates 18, 18 is guided in vertical printing movement, normally held in the uppermost position of the printing stroke when the labeler is inoperative.

The ink pad 17 is rotatably mounted on a member 17*a* which is also supported, pivotally, by and between the side frame plates 22, 22, the ink pad being normally positioned by a spring 24 to be in contact against the lower part of the type wheel 15.

The side frame plates 22, 22 further support, pivotally therebetween, a frame lever 25 made up of two spaced-apart crank arms joined rigidly by a torque tube and having slotted holes 26 at their distal ends. The axial pin 21 of the type-indicating wheels 16 is passed through these slotted holes, as well as through a slotted hole 27 formed in the main drive lever 4 at the front extremity of the front arm 6 thereof. Accordingly, rotational movement of the drive lever 4 causes vertical movement of the type wheels 15 relative to the side frame plates 22. The above described printing mechanism is similar in organization and operation to a dater of known type.

The label tape feeding mechanism 9 is provided within the case structure 1 at the lower part thereof. As shown in FIGS. 4 and 8, a link 30, pin-connected at its rear end to the rear extremity of the rear arm 8 of the drive lever 4, is pin-connected at its front end by a transverse pin 32 mounted on the rear end of a pawl actuating bar 31 which is adapted to undergo reciprocation in the front-and-rear direction. The ends of the pin 32 extend outward and are fitted slidably in horizontal guide slots 34 formed in side plates 33, 33, which are fixed to the outer case 2 by screws.

A stud pin 35 is fixedly imbedded in the pawl actuating bar 31 and is engaged by one end of a spring 37 wound at its middle part around a stud pin 36 imbedded in the side plate 33, the other end of the spring 37 being anchored in engagement with the pivot pin 5 of the main drive lever 4. The actuating bar 31 is thereby urged continually forward. The actuating bar 31 is further provided near its front end with another stud pin 60 imbedded therein and extending outward from opposite sides thereof, the outer extremities of this pin 60 being slidably fitted in respective horizontal guide slots 38 formed in the side plates 33.

The actuating bar 31 is further provided at the lower part of its front end with a feed pawl mechanism 39 which, as shown most clearly in enlarged perspective in FIG. 9, comprises a bracket frame 40 fixed to one lateral (left) side of the actuating bar 31, a pawl holder 41 rotatably hinged by a pivot pin 42 on the front open end of the bracket frame 40. A coil spring 43 is wound around the pin 42 and imparts a downward elastic

force to the pawl holder 41. On one side of the pawl holder 41, preferably on the side of the actuating bar, a pawl clamping plate 44 is fixed with a gap left therebetween.

A tape feeding pawl 45 is adjustably mounted on the pawl holder 41. That is, in mounting this pawl 45, the gripping part 46 thereof is held, and the other end thereof is inserted into the space below the clamping plate 44 as the pawl 45 is caused to slide along the top of the holder 41. The pawl 45 has a pawl blade 47 of somewhat narrow transverse width for directly contacting and feeding the label tape 48.

The label tape 48 is divided into unit label parts by transverse incision lines equally spaced in the tape longitudinal direction. Each line of incisions consists in a row of a central incision 49*m* and two outer incisions 49*s* on the laterally outer sides of the tape 48. In the operation of the tape feeding mechanism 9, as described hereinafter, the working edge (lower front edge) of the pawl blade 47 enters each central incision 49*m* in turn to push the label tape 48 forward through a distance equal to the dimension of each label in the tape longitudinal direction.

In superposed relationship (as viewed from the lateral side of the labeler) to the aforedescribed main drive lever 4, the actuating bar 31, and related parts, there is mounted an inner frame 50, as shown in FIG. 7, screw fastened to the outer case 2. This inner frame 50 is an enclosed spool structure for accommodating therein a roll of the label tape and has a cavity 51 open on its left flank side and a central spool hub 52 around which the tape roll is fitted. The hub 52 is hollow and is provided with internal screw threads 53.

The inner frame 50 has a cutout 54 in its outer wall part at the lower part thereof. Within the inner frame 50 and near the rear rim of this cutout 54, a label tape guide member 55 is fixed to the inner frame with a narrow guide passage therebetween. A tape holding plate 56 is fixed and anchored at its rear proximal end to the front edge part of the guide member 55. The holding plate 56 extends forward and out of the inner frame 50 through the cutout 54 to a position below the actuating bar 31.

As shown in FIG. 7, the side cover 3 has a through hole 57 in a position coaxial with the axis of the hub 52 when the side cover is fastened in place against the outer case 2. This hole 57 is for insertion therethrough of the inner part of a latch knob 58, said inner part being provided with external screw threads 59 for engagement with the internal threads 53 of the hub 52, whereby the side cover 3 can be positively secured to the outer case 2 by a fractional turn of the knob 58.

As shown in FIGS. 1 and 7, the roll of label tape 48 is placed within the cavity 51 of the inner frame 50 around the hub 53, and the free end of the tape is passed around the tape guide member 55, under the tape holding plate 56, and out of the case structure through a front opening 62 in the outer case.

It is also possible as a modification, to secure a member 61 directly to the axial pin 21 of the printing mechanism 7 as indicated in FIG. 6, instead of using an operating lever 10, this member 61 extending out of one side of the case structure actuation by fingertip manipulation.

The labeler of the above described organization according to the invention operates in the following manner.

The labeler is first loaded with a roll of label tape 48 in the above described manner. By rotating cog wheels 19, the desired types for printing are brought into printing position on type wheels 15 as indicated by the corresponding type-indicating wheels 16. This typesetting operation can be facilitated by swinging operating lever 10 outward by overcoming the elastic force of leaf spring 14 thereby to provide more space around cog wheels 19.

When one or more labels are then to be successively printed and applied, the labeler case structure is grasped in one hand, and operating lever 10 (or member 61) is depressed downward. Consequently, as will be apparent from FIG. 4, main drive lever 4 is rotated counterclockwisely about pivot pin 5 and, at its front end 6, compels printing mechanism 7 to descend. Simultaneously, the rear end 8 of the drive lever 4 pulls tape feed mechanism 9 rearward. Operating lever 10 is then released, whereupon the above described motions are reversed.

More specifically, in the operation of printing mechanism 7, axial pin 21 is first forced downward by drive lever 4, whereupon this pin 21 descends vertically within guide slots 23 together with pin 20. As a result, the lower type part of type wheels 15, pushing aside ink pad 17, imprints the selected type marks on one label in label tape 48 lying on the bottom part of the labeler.

In the tape feeding mechanism 9, the counterclockwise rotation of the rear end 8 of drive lever 4 is transmitted by way of link 30 to pull actuating bar 31 toward the rear, which bar 31 moves horizontally toward the rear, pins 32 and 60 thereof being guided respectively by guide slots 34 and 38. During this operation, actuating bar 31 is thus pulled rearward against the spring force of spring 37 urging bar 31 forward, and pawl blade 47, in sliding contact over the upper surface of label tape 48 under the elastic force of spring 43, undergoes its rearward retraction stroke.

When the depressing force on operating lever 10 is reduced, actuating bar 31 is advanced forward by the force of spring 37, and the working edge of pawl blade 47, penetrates into an incision 49*m* in label tape 48 and causes the tape to advance by one label, i.e., by a distance equal to the dimension of a label in the tape longitudinal direction. Since label tape 48 is fed in a state of tension, being pressed and held by holding plate 56, the engagement of the working edge of pawl blade 47 and incision 49*m* in the tape is positive.

By repeating the above described operational actions of depressing and releasing operating lever 10, labels with the desired inscriptions imprinted thereon are successively fed and delivered out of opening 62 at the front of case structure 1. Each label can then be torn off and peeled away from the base paper and adhesively attached to an article.

When the working edge of pawl blade 47 becomes worn, the blade can be dismounted in a simple manner by pulling the gripping part 46 thereof. The edge of the blade can then be reground, or the blade can be replaced.

Example 2

In another example of a labeler according to the invention as illustrated in FIGS. 10 through 20, inclusive, the case structure 101 of the labeler shown therein is made up of an outer case 102 and a (left) side cover 103. Within the outer case 102, a main drive lever 104 is pivotally supported at an intermediate part thereof by a transverse pivot pin 105 fixed to the outer case 102, and is coupled at the end of its front arm 106 to a printing mechanism 107, and at the end of its rear arm 108 to a label tape feeding mechanism 109. A part of the front arm 106 of the drive lever 104 extends upward and out of the outer case 102 through an upper aperture thereof and is provided with a push button or plate 112 fixed thereto for operating the drive lever 104.

The label tape feeding mechanism 109 is disposed within the outer case 102 at the lower part thereof and is made up essentially of an actuating bar 110 capable of undergoing horizontal reciprocation in the front-rear direction and a feeding pawl mechanism 111 mounted elastically on the front end of the actuating bar 110. The rear end of this actuating bar 110 is rotatably pin jointed to the lower rear end of the main drive lever 104. The actuating bar 110 is continually urged forward by a spring 114 acting against a flange part 113 formed at the upper middle part of the actuating bar. The drive lever 104 is also urged in the clockwise direction by another spring 115 acting against the lower rear part of its rear arm 108.

The various parts of the tape feeding mechanism 109 are shown in detail in exploded perspective views of FIGS. 14 and 15. As shown therein, the front part of the actuating bar 110 is formed into a shape with an inverted U-shaped cross section having a recessed interior, into which a guide plate 116 is

slidably inserted. This guide plate **116** is provided at its middle part with a horizontal slot **117**, which is aligned with a through hole **118** in the front part of the actuating bar **110** and coupled thereto by a shaft pin **119** inserted at one end thereof, and up to a flange part **120** thereof, into and through the slot **117**, and through hole **118**, and secured in place by a screw **122** screwed into the end of the pin **119** through a washer **121** interposed therebetween.

The actuating bar **110**, guide plate **116**, and pin **119** are in a loosely fitting state whereby the actuating bar **110** can move in reciprocation within the stroke range determined by the slot **117**. The guide plate **116** is fixed to the outer case **102** by screws **123**.

The aforementioned pawl feeding mechanism **111** is assembled and mounted on the shaft pin **119** in the following manner. First, a sleeve **124** is fitted onto and around the end of the pin **119** opposite the end inserted into the slot **117** and through hole **118**. Then feed pawl holding members **125** and **126** of clevis shape and coil springs **127** interposed between the ends thereof are fitted onto the sleeve **124**. In addition a collar **128** and a guide roller **129** provided with a peripheral groove are loosely fitted onto the end of the pin **119**.

The two ends of each coil spring **127** are securely engaged with the upper parts of the pawl holding members **125** and **126**, respectively, applying downward force thereto. The peripheral groove around the guide roller **129** engages the lower horizontal edge of a guide plate **130** as shown in FIG. **12**. The guide plate **130** is fixed to a side frame plate **169** of the printing mechanism **107**.

Referring again to FIGS. **14** and **15**, a pawl pressing plate **131** having an outwardly bent end is fixed at the opposite end thereof to the pawl holding member **126** at one side part thereof, a small gap being left therebetween. The pawl holding member **126** is provided at the extreme end of one of its arms with a projection **132**, which strikes against the lower edge of the other holding member **125**, whereby excessive rotation of the holding members relative to each other is prevented.

The aforementioned actuating bar **110** is provided on its (left) side with two projections **133** and **134** spaced apart in vertical alignment and receiving therebetween a crank arm of the pawl holding member **125** to limit the rotation thereof.

A feed pawl blade **135** is inserted into the above mentioned gap between the pawl pressing plate **131** and the holding member **126**. As shown in FIG. **16**, this pawl blade **135** is press formed from a sheet metal piece and has two teeth **136**, an upwardly curved flange **137**, front and rear bent flanges **138** and **139**, and a (left) side curved part **140**. When the pawl blade **135** is to be mounted, the curved part **140** is grasped or held, and the blade is pushed into the gap between the pressing plate **131** and the holding member **126** shown in FIG. **15**, whereby the blade is held securely by the elastic spring force of the pressing plate **131**. The bent flanges **138** and **139** contact the upper edge of the holding member **126** and the lower edge of the pressing plate **131**, thereby causing a positive pawl holding action.

To the rear of the label tape feeding mechanism **111**, there is provided a label tape holding mechanism **141** as shown in FIG. **12**. As indicated in FIG. **14**, this mechanism comprises a tape holding plate **142** having bent flanges **146**, a roller **143** rotatably supported by the flanges **146** and having a roulette or knurled surface, and a roller pressing plate **144** fixed at the rear end thereof to the lower surface of the holding plate **142** and pressing against the knurled surface of the roller **143**.

The holding plate **142** is provided at its front extremity with a tongue **145** for holding down the tape and has a bent rear end which is fastened by a pin **148** to the lower end of a label tape guide member **147**. The knurled surface of the roller **143** has serrations of ratchetlike shape in cross section whereby rotation of the roller in the reverse direction of travel of the label tape, that is, in the counterclockwise direction as viewed in FIG. **12**, is prevented by the pawl action of the roller pressing plate **144**.

A label tape supporting platform **150** is mounted substantially horizontally on the inner surface of the bottom cover **151** of the outer case **102**. As indicated in FIG. **12**, the teeth **136** of the tape feed pawl, the tongue **145**, and the roller **143** are in contact under elastic force with the upper surface of this platform **150**.

The bottom cover **151** of the case structure **101** is provided at its rear end with hinge knuckles **152** as shown in FIG. **17** for pivotal attachment to the lower part of the outer case **102**. Near these hinge knuckles, the bottom cover **151** is provided with a recess in the bottom surface thereof, which is in the form of an embossed protruding part **153** as viewed from above and is provided with a slot **171** (FIG. **13**) extending in the front-rear direction.

A latch member **156** having a joggled rear part **154** for superposition over the protruding part **153** and upwardly bent front flanges **155** in the form of catches is disposed on the bottom cover **151**. In the assembled state, a hole **157** in the rear end of the joggled part **154** is aligned with the slot **171** (FIG. **13**). A slide button **158**, adapted to fit in the above mentioned recess in the bottom surface of the bottom cover **151**, for sliding movement therein, has a vertical pin **159** (FIG. **20**) which is passed upward through the slot **171** and the hole **157** and then headed, thereby connecting the button **158** and the latch member **156**.

The aforementioned tape supporting platform **150**, which is provided with recessed parts on its lower surface for accommodating the latch member **156** and permitting its sliding motion therein, is disposed above the latch member and is fixed to the bottom cover **151** by screws **160**. A blind hole **172** (FIG. **13**) is formed in the front-rear direction in the front-rear direction in the rear end of the tape supporting platform **150** and accommodates a compression spring **161**, the rear end of which is retained by a pin **162** fixed to the shoulder at the joggled part of the latch member **156**, whereby the latch member, together with the slide button **158**, is continually urged rearward.

The tape supporting platform **150** is further provided with two parallel grooves **163** in the front-rear direction in positions for entrance thereinto of the pawl teeth **136**. The platform **150** is provided further at its front end with inwardly bent web and flange parts **164** forming grooves for guiding the label tape.

The bottom cover **151** is hinged at its rear end to the lower rear end of the outer case **102** by a hinge pin **165** passed through the knuckles **152** of the cover **151** and corresponding knuckles of the outer case and is urged downward (toward the opened position thereof) by a spring **167** supported by a pin **166** fixed to the outer case. The bottom cover **151** is further provided at its extreme rear end with a rigid lug **168** which, upon contacting the part of the spring **167** wrapped around the pin **166** as the bottom cover is opened, prevents the cover from opening further.

When the bottom cover **151** is closed, the catches **155** of the latch member **156** engage with stud pins **170** fixed to the lower part of side frame plates **169** for guiding the printing mechanism **107**. To open the bottom cover **151**, the slide button **158** is pushed forward, counter to the returning force of the spring **161**, whereby the catches **155** disengage from the pins **170** to release or unlatch the bottom cover **151**, which thereby is compelled by the elastic force of the spring **167** to open automatically.

The side cover **103** of the case structure **101** is provided with a latch knob **175** having a stem with screw threads at its end for screw engagement with internal screw threads in a hollow hub **176** similarly as in the labeler of example 1. The printing mechanism **107** has a group of type wheels **180** and an ink roll or pad **181**. The case structure **101** has a front opening **182** for delivering printed labels.

The labeler of the above described organization according to the invention operates in the following manner. Referring to FIG. **12**, side cover **103** and bottom cover **151** are first opened, and a roll of label tape **174** is inserted into inner

frame 173 and around hub 176. The free end of tape 174 is drawn out, passed around tape guide member 147, passed through the gap below roller 143 and tongue 145 of tape holding mechanism 141 and under pawl blade 136, and led out through opening 182.

Bottom cover 151 is then closed to cause catches 155 to catch on pins 170. Side cover 103 is then fitted in place, and knob 175 is turned in the indicated "CLOSE" direction to lock the side cover in place. The labeler is then in a tape loaded state in preparation for dispensing printed labels.

The labeler thus prepared is grasped in one hand, and button 112 is depressed with the thumb, whereupon drive lever 104 rotates in the counterclockwise direction about pivot pin 105, counter to the forces of springs 114 and 115, and, at the lower rear end thereof, pulls actuating bar 110 rearward. Actuating bar 110 thereby retracts rearward as pin 119, passed through the front end thereof is guided by slot 117 is guide plate 116 (guide roller 129 at the other end being guided by guide plate 130), and as some rotation in the counterclockwise direction about this pin 119 is permitted. Tape feeding pawl 111 mounted elastically on this pin 119 thereby retracts rearward as pawl blade 136 thereof slides along and in contact with the surface of the label tape.

This rearward retraction of the feeding pawl tends to urge the label tape rearward, but since roller 143 does not rotate in the retraction direction, the tape is held by this roller and is prevented from retracting rearward as indicated in fig. 12. Furthermore, any tendency of the tape toward the front to assume a buckled or an undulating form is suppressed by tongue 145. Accordingly, rearward retraction and undulation of the tape are completely prevented.

Printing mechanism 107, pivotally coupled to the drive lever 104, is driven downward as the front end of lever 104 descends, whereby printing type wheels 180 deflect ink pad 181 forward and imprint an inscription on a label on tape supporting platform 150.

Button 112 is then released, whereupon drive lever 104 is rotated clockwise by the returning force of springs 114 and 115, and printing mechanism 107 is thereby raised. At the same time, label tape feeding mechanism 102 is advanced forward by the clockwise rotation of drive lever 104.

Pawl blade teeth 136 of the tape feeding pawl thereby penetrate into incisions in the label tape and cause the tape to advance forward. During this advancing movement, the curved part 137 of pawl blade 135 as shown in FIG. 16 contacts the tape surface and prevents excessive penetration thereinto of teeth 136, thereby preventing the tips of the teeth from striking against the bottoms of grooves 163 in the tape supporting platform and adversely affecting the tape feeding action. At the same time, the side surface of pawl holding member 125 strikes against projection 133 of actuating bar 110, whereby further rotation of the holding member is controlled, and teeth 136 are prevented from thrusting into the tape supporting platform.

The above described operation is repeated as necessary to deliver the tape bearing printed labels successively through the front opening 182 of the labeler. The required number of labels are then torn off and adhesively applied to articles.

Example 3

Still another example of a labeler according to the invention is illustrated in FIGS. 21 through 26, inclusive. This labeler differs from that described in example 2 in that the horizontal reciprocation of the tape feeding pawl is interrelated, not to the lower rear end of the main drive lever, but to the printing mechanism, the vertical movements of which are utilized to cause the pawl reciprocation.

More specifically, one of each of two feed pawl actuating levers 222 is pivotally connected to a pin 217 (FIG. 23) serving as the axial pin of the type wheels of the printing mechanism 209, and the other end of the lever is pivotally connected to a sleeve 228 for pivotal mounting of the feed pawl. This sleeve 228 is fitted slidably in a horizontal guide slot 223 in a side frame plate 214.

When push button 256 is depressed, printing mechanism 209 descends to imprint a preset inscription on a label. Simultaneously, levers 222 coupled to the printing mechanism compel sleeve 228 to slide reward along guide slot 223, thereby causing rearward retraction of tape feed pawl 232 rockably supported on sleeve 228.

When button 256 is released, drive lever 204 is returned clockwise by return spring 207, thereby raising printing mechanism 209, whereby feed pawl 232 is caused to advance forward to feed the tape by one label length.

In a modification of the above described labeler as illustrated in FIG. 26, the main drive lever 204 is bellcrank shape is eliminated, and, instead, a push plunger 356*a* is secured directly to the printing mechanism 206*a* which is provided with an upward return force by a tension spring 207*a* connected at one end thereof to the printing mechanism and at the other end to a side frame plate 210*a*. In other respects including the pawl mechanism and other parts, this labeler is the same as that of the above described example in organization and in the operations of printing and tape feeding.

Example 4 (FIG. 27)

A printer 304 is pivoted by means of a pin 305 at a front end 303 of a driving member 302 pivotally mounted in a case 301. The printer 304 includes first and second printers 307 and 308 sandwiched between two side plates 306 and 306, printers 307 and 308 being of nearly the same shape and being opposed to each other. The side plates 306 are further held between other side frame plates 309 and 309. A pin 311 implanted in the side plates 306 is inserted into a longitudinally elongated hole 310 bored in the side plates thus enabling vertical movement of the side plates 309. The side plates 309 are secured to the case 301. The printers 307 and 308 are respectively provided with several endless printing belts 312 so that any desired digits, marks and the like are indicated at a lower portion 314 by turning a printing wheel 313.

The outer side plates 309 are pivotally mounted to an arm 315 by means of a shaft 316, while the lower end of the arm 315 is bent and reaches the lower end of the first printer 307. Fixed at its front end is an ink roller 317 which is pressed against the lower end of a printing belt 312 of the first printer 307 by means of a spring 318.

By depressing a pressure member 319 with a finger tip, the driving member 302 is turned so that the printer 304 is pressed down. The ink roller 317 is pushed off by the lower end of the first printer 307, and further by the second printer 308. In the meantime, a type at the bottom end of the printing belt is inked and further pressed down to be printed onto a label disposed immediately therebelow. A feed pawl mechanism 321 is retracted by the other end 320 of the driving member 302.

When the pressure member 319 is pressed down, the driving member 302 is turned in the opposite direction by means of a spring 322, thereby lifting the printer 304, advancing the feed pawl mechanism 321 and feeding a printer label by a prescribed length.

Example 5 (FIGS. 28 and 29)

A printer 334 is pivoted by means of a pin 335 at the front tip 333 of a driving member 332 pivotally mounted in a case 331. The printer 334 includes a first printer 337 and a second printer 338 sandwiched between two side plates 336 and 336, while the side plates 336 are further held between outer side frame plates 339 and 339. A pin 341 planted in the side plates 336 is inserted into a longitudinally elongated hole 340 bored in the side plates 339, thus permitting vertical movement of the side plates 339. The side plates 339 are secured to the case 331.

The first printer 337 is provided with several endless printing belts 342, so that any desired digit can be indicated at a lower end 344 by rotating a printing wheel 343. The second printer 338 is mounted in front of the first printer and, as illustrated in FIG. 29*a* code plate 346 having types 345 pasted to its bottom is detachably mounted on a code plate supporter 347 secured to the side plate 336. The supporter 347 has a blind hole 348 bored in its upper portion into which a spring 349 is inserted, and a pin 351 provided with a flange 350 is inserted so as to press the spring 349.

A cover plate 352 is screwed to the supporter from above the flange 350. The leading end of the pin 351 is sharpened for engagement with a small hole 354 bored in a bent member 353 of the code plate 346. For the fixture of the code plate 346, the leading end of the pin 351 is inserted into the small hole 354 of the bent member 353 and pressed down obliquely so that the spring 349 is depressed by the pin 351, with the result that the bottom end of the code plate 346 is moved past that of the support 347. Then a U-shaped portion 355 at the bottom end of the code plate may be fitted in the lower end 356 of the supporter and, when the operator's hand is released, the code plate 346 is pushed up by the spring 349 so that the cod plate and the supporter are attached closely to each other.

For removal, the code plate 346 may be depressed and tilted and then the U-shaped portion 355 at its bottom end may be detached from the lower end 356 of the supporter. Code replacement may be effected either by repasting the types 345 or using another code plate.

Pivoted by a shaft 358 to the outer side frame plates 339 is an arm 357, the bottom end of which is bent and led to the bottom end of the first printer and is provided with an ink roller 359 mounted on it tip and pressed against the bottom end of the printing belt 342 by means of the spring 360.

Example 6 (FIGS. 30 and 31)

In FIG. 31, a printing mechanism 374 is pivoted by a pin 375 at the top of a driving member 373 pivotally mounted in a case 371 by a pin 372, while a label feed mechanism 376 is pivoted at its root by means of a pin 377. A sector gear 378 is formed at the root for engagement with a gear 379. The gear 379 is provided coaxially with a roller 380 rotated unidirectionally only in a counterclockwise direction by ratchet and other means.

Pivoted by a pin 382 at a lower portion of the case 371 is a bottom cover 381 which is to be closed by having a catch 383 engaged by a pin 384 as illustrated in FIG. 1. For opening the bottom cover, a button 385 provided therein is pressed forwardly to disengage the catch and pin from each other. The bottom cover 381 is provided with a plate spring 386 by which it is urged toward a roller 380 provided for the gear 379.

Provided at a slight distance 387 from the bottom cover 381 is a label tape platform or bed 390 having a small roller 388 fixed at its leading end.

The reference numeral 391 designates a label tape (refer to FIG. 30) to be fed between the feed pawl 389 and label tape bed 390 to the small roller 388, where a label 391*a* is peeled from a base strip 392. Thereafter the label 391*a* is advanced, while the base strip 392 is bent back and fed via the gap 387 between the bottom surface of the bed and the bottom cover to be discharged out of the case after passing between the roller 380 and plate spring 386.

The present device operates as follows:

In FIG. 31, when the pressing member 393 is depressed, the driving member 373 is turned counterclockwise, and the printing mechanism 374 is lowered to effect printing on a label 391. The label feed mechanism, on the other hand, is retracted. Although the gear 379 engaged with the sector gear 378 is rotated in a clockwise direction, the roller 380 is not rotated due to the presence of a ratched mechanism and the like.

When the pressure member 393 is released, the driving member 373 is rotated reversely in a clockwise direction by the springs 394 and 395, while the printing mechanism 374 is elevated and the label feed mechanism 376 is advanced. In this instance the feed pawl 389 enters a notch in the base strip through a seam between labels, feeding the label tape by a predetermined length. The gear 379 engaged with the sector gear 378 is rotated counterclockwise, and the roller 380 is also rotated counterclockwise by the ratchet mechanism and the like, pulling back the base paper 392 pressed thereagainst by the plate spring 386. The label 391*a*, being stiffer than the base strip 392, is bent only to such a degree at the small roller than the label 391*a* is peeled off the base strip to be advanced separately therefrom.

Example 7 (FIGS. 32 and 33)

A grip frame 402 is pivoted to a lower portion of a case 401 by means of a pin 403 and made openable by the detachment of a hook 404 and pin 405 as shown in FIG. 33. The opening and closing are effected by operating a push rod 406. The case 401 contains a printing mechanism 407 and label feed mechanism 408 which are pivoted at the two ends of a driving member 409. The revolution of the driving member 409 causes vertical movement of the printing mechanism 407 and horizontal movement of the label feed mechanism 408.

The lower end of a trigger member 410 is pivotally attached to the grip frame 402 by means of a pin 411, while the upper end thereof has one end of a connecting lever 412 pivoted by means of a pin 413, and the other end thereof is pivoted to a pin 415 to which a tape feed pawl 414 of the label feed mechanism 408 is pivoted.

Reference numeral 416 designates a label tape, and 417 represents a spring adapted to revolve the driving member 409 in clockwise direction.

The present device operates as follows:

A push rod 406 is pushed so that hook 404 is detached from bin 405, and case 401 and grip frame 402 are opened (refer to FIG. 33). Label tape 416 is loaded as shown in the dotted line, and the case and grip frame are closed (refer to FIG. 32).

By pulling trigger member 410, after taking hold on grip frame 402, the trigger member is turned clockwise around pin 411, thus pulling connecting lever 412 and retracting feed pawl mechanism 408. Driving member 409 is turned counterclockwise, lowering printing mechanism 407 and pressing down the lower end of the printer onto the label to effect printing.

When trigger member 410 is loosened, driving member 409 is pushed by spring 417 to turn in a clockwise direction, lifting printing mechanism 407, advancing feed pawl mechanism 408 and engaging feed pawl 414 with a notch formed in the label tape to feed it by a prescribed length.

Example 8 (FIGS. 34 and 35)

In FIG. 34, a grip frame 422 is pivoted to a lower portion of a case 421 by means of a pin 423, the case 421 and grip frame 422 being kept closed by the engagement of a catch 424 provided for the grip frame 422 and a pin 425 provided for the case 421 to open the device. A button 426 is pressed forward to detach the catch 424 from the pin 425.

In FIG. 35, a driving member 427 is pivoted to a case 421 by a pin 428. A printing mechanism 429 is pivoted at its front end, while a label feed mechanism 430 is pivoted at its rear end.

Pivoted at the back of the driving member 427 by a pin 432 is a sector gear 431 to be rotated in a clockwise direction by a spring 433. Said sector gear 431 is formed with a projection 434 contacting the driving member 427. The sector gear 431 is also engaged with a gear 435, which is fixed coaxially with a roller 436 by means of a ratchet mechanism, the roller 436 being rotated unidirectionally in a counterclockwise direction and being contacted under pressure with a roller 437 pivoted on the grip frame 422.

A chamber 440 having parallel slide portions 438 and 439 provided at the top and bottom is formed in the grip frame 422, and a trigger member 441 is fitted therein so as to be capable of sliding in a direction indicated by an arrow mark. Also, in the chamber of the grip frame, a lever 442 has its one end pivoted by a pin 423 and its middle portion connected to the trigger member 441 by means of a connecting lever 444. The front end of the lever 442 protrudes into the case 421 from an opening 445 at an upper portion of the grip frame and is coupled with the pin 446 at the rear end of said driving member 427 with an elongated hole 447. The pin 446 is common to a pivoting pin of a working lever 457 of the label feed mechanism 430.

Reference numerals 448 and 449 designate springs adapted to turn the driving member 427 in the clockwise direction, while 450 represents another spring adapted to pull a button 426 in the backward direction and maintain engagement between the catch 424 and pin 425. Numeral 451 designates a feed pawl pivoted at the front end of the working lever 452 a roller pin provided at the front end of the grip frame for pulling off base strips from labels, and a label applying roller 453 provided adjacent the roller pin 452. Numeral 454 represents a label tape stored in the case to be fed below the label feed pawl 451 to the roller pin 452, where a base strip 455 is peeled off from a label 456. The base strip 455 is then bent back and fed in a rearward direction to be sandwiched between rollers 436 and 437 and discharged out of the labeler. Each unconnected label 456 is pasted on the base paper 455, while the base paper 455 is provided with notches or incisions into which the feed pawl 451 enters.

The operation of the present device is as follows:

By pulling trigger member 441 after taking hold on grip frame 442, lever 442 is turned clockwise around pin 443, while driving member 427 is turned counterclockwise around pin 428; printing mechanism 429 is lowered to effect printing on the label; and label feed mechanism 430 is retracted. Sector gear 431, having its projection 434 pressed by driving member 427, is swung around pin 432 and rotates gear 435 in a clockwise direction. Roller 436 of unidirectional rotation is not rotated by the clockwise rotation of the gear.

When trigger member 441 is released, driving member 427 is turned clockwise by means of springs 448 and 449, while printing mechanism 429 is elevated and the label feed mechanism is advanced. The front tip of feed pawl 451 of label feed mechanism 430 enters a notch in the base strip through a seam between labels and feeds label tape 454 by a prescribed length. Sector gear 431, on the other hand, is pulled by spring 433 and follows the rotation of driving member 427, rotating gear 435 in a counterclockwise direction and also rotating roller 436 in a counterclockwise direction by means of a ratchet mechanism and the like, so that base strip 455 sandwiched between roller 436 and roller 437 is pulled in a backward direction. At pin 452 at the front end of the grip frame, the base strip is pulled while being bent into an acute angle so that a label is peeled off from the base strip since the label is stiffer than the base strip and, thus, is not bent into any acute angle. Label 456 thus peeled off and fed forward is pushed against an article by roller 453, whereupon one cycle of label application is completed.

Example 9 (FIGS. 36, 37, 38 and 39)

A grip frame 502 is provided at the lower end of a case 501, integrally therewith, and the grip frame 502 is provided with a chamber 505 having parallel walls 503 and 504 at the top and bottom and being fitted with a slidable trigger member 506. The trigger member 506 is formed with an opening which receives a rod 508 imbedded in the grip frame 506 the rod 508 being fixed with a spring 509 energizing the trigger member 506 outwardly. The front end 510 of the grip member is projected into the case 501 through an opening 512 bored in a label tape bed 511. A pin 514 at the rear end of the driving member 513 pivoted to the case is fitted with an elongated hole 515. A connecting lever 517 of a label feed mechanism 516 is pivotally fixed to the pin 514. A printing mechanism 518 is pivoted at the front end of the driving member 513.

In the label feed mechanism 516, a label guide member 520 is fixed to the case 501 as illustrated in FIGS. 38 and 39, and a label guide member of a feed pawl member 522 enters the elongated hole 521 and is secured by a plate 524 so as not to be disengaged. The feed pawl member 522 also has a feed pawl made of an elastic substance and secured downwardly, and further, at its rear end, a flange 526 is projected to be pivoted to the connecting lever 517. The feed pawl member 522 is also provided with an indentation 527 to hold a support member 539 of an ink roller 528. Further in juxtaposition with the feed pawl 525, a flange 530 projects in a downward direction and a rack 531 is formed on its lower surface.

A pinion 533 is provided at a depression 532 made to one side of a label tape bed 511 and engaged with the rack 531. Below this pinion, a feed pawl member 535 of exactly the same structure as the forgoing feed pawl mechanism is provided oppositely, and the rack 536 thereof is engaged with the pinion 533.

A roller pin 537 is provided at the front end of the label tape bed 511. A groove 538 for the passage of a base paper is provided, running from the back of the pin to the rear end of the case, and the feed pawl 539 of the feed pawl member of the base strip is exposed to this groove.

A label tape 540 stored in the case 501 is fed below the feed pawl 525 to the roller pin 537, where the base paper 541 is bent back and fed to the rear end of the case past the groove 538. The label tape is such that each disconnected label 542 is pasted on a base strip which is provided with incisions or notches, into which the feed pawl enters, at positions corresponding to the seams of the labels. The reference numeral 543 represents a roller for the application of labels.

The operation of the present device is as follows:

When trigger member 506 is pulled by taking hold of grip frame 502, driving member 513 is turned in a counterclockwise direction, thus lowering printing mechanism 518 to effect printing on a label and retracting label feed mechanism 516.

The retraction of the label feed mechanism is effected in such a manner that the feed pawl member is pulled firstly by connecting lever 517 while feed pawl 525 is retracted, sliding on the labels. The ink roller is fed back in contact with the lower end of printer 544. A lower rack 536 is retracted by pinion 533 engaged with rack 531 of feed pawl member 522. Thus, feed pawl 538 of the base strip is brought back, sliding on the base strip (in a forward direction of the device in the drawings).

When trigger member 506 is pressed outwardly by spring 509, with the result that driving member 513 is turned in the clockwise direction, printing mechanism 518 is lifted, and label feed mechanism 516 is advanced.

The advancement of label feed mechanism 516 causes the advancement of feed pawl member 533 of the label tape by means of connecting lever 517 and then feeds the front tip of feed pawl 525 into a seam between labels to feed the labels by a predetermined length. Ink roller 528 is also advanced, contacting the lower end of the printer. Rack 531 rotates pinion 533, which then advances feed pawl member 535 (in the backward direction in the drawings) by its engagement with rack 536 below so that the front tip of feed pawl 539 enters a notch in the base strip 541 to feed it rearward.

A label is peeled off, from its base paper at its position near roller pin 537 because the label 542 is stiffer than the base strip so that it is not bent into an acute angle. A label thus peeled off is advanced and pasted onto an article by roller 543.

Example 10 (FIG. 40, 41, 42)

As shown in the drawings, case 551 is formed integrally with holder 552, and in these parts is received a trigger member

553 shown in FIG. 41. The trigger member 553 comprises trigger 554, at the upper end of which, and integral therewith, there is provided an elongated plate 555. From a side of the plate 555 a wall 556 extends vertically upward, and is bent at a point spaced a distance from the former into a horizontal upper wall 557. To this wall 557 is affixed a feed pawl 558 for feeding label tape, and the rear part of the wall 557 is inclined rearwardly downward, forming a cam surface 559. To the bottom face of feed pawl 558 is fixed a feed pawl 560 directed in the direction opposite to that of the aforementioned pawl 558. At the rear end of the plate 555 is formed a bore 561 (FIG. 40), into which is inserted a rod 562 is fixed to the rear end of the case 551. Surrounding the 562 is provided a coil spring 563, by which the trigger member 553 is urged forwardly.

Between the upper and lower feed pawls 558 and 560 is received a label tape bed plate 565, which is an extension of inner case 564. Overlying the plate 565, and spaced by a narrow gap 566, is provided a label guide plate 568 with a cutout 567, wherein underneath the plate 565 is provided a label guide plate 570 spaced a small gap from side plate 565, in the same manner.

On the case 551 is pivotably mounted a rotating member 571, and at the front end of the member is affixed a printer 572, while at the rear end of the member is provided a roller 573, which is adapted to engage with the aforementioned cam 559. The rotating member 571 is urged by a spring 574 to rotate (or swing) counter clockwise. Under the printer 572 there is provided an ink roller 575, which is mounted at the free end of lever 577 pivotally supported by a pin 576. The lever 577 is urged by a spring 578 to rotate in the counter clockwise direction. At the front end of the case 551 is provided a roller 579 for applying labels.

Label tape 580 is fed through the space between the label bed plate 565 and the feed pawl 558, and then through the gap 566 between the bed plate 565 and the guide plate 568, to the front end of bed plate 565. Then, after being moved forward a distance corresponding to one label beyond said front end, the tape is turned back leaving a piece of label 581 separated from the base strip 582 of the label tape. After this turning, the separated label continues to move forward, while the base strip 582 is pulled rearward. Then the base strip 582, after traveling through the gap between the bed plate 565 and base strip guide plate 570, and through the gap between the bed plate 565 and base plate holder 584, and further through the gap between the bed plate and the feed pawl 560, leaves the case 551 at the rear end 583 thereof. The label tape is comprised of, a continuous strip (i.e. base strip) and a continuous series of labels precut individually and adhering in succession on the base strip. In this base strip, at each border line between two adjacent labels, there is provided notches or incisions, which are adapted to be engaged by pawls 558 or 560. The aforementioned holder 584 is an elastic member provided at the forward portion of the base strip guide plate 570, and serves to hold or restrain the base strip.

In operation, grip frame 552 is gripped by hand, and as trigger 554 is retracted, cam 559 provided on plate 555 (formed integrally with the trigger) pushes upward roller 573 supported by rotating member 571, thereby rotating forcing member 571 in the counterclockwise direction. Printer 572 affixed to the front end of member 571 is thereby moved downward, forcing ink roller 575 aside, and, through cutout 567 in label guide plate 568, thereby printing the label. During this printing, feed pawl 560 for the base strip engages with the incisions in the base strip and moves the base strip rearward. In this instance, since base strip 582 has a "reserved" length corresponding to one label at the front end of bed plate 565 (as mentioned previously) the rearward motion of the base strip has no effect upon the part of the label tape lying over the upper face of bed plate 565 (i.e., this part of the label is not subjected to pulling action). During this rearward motion of the base strip, under feed pawl 558 merely slides over the label tape.

When the trigger 554 is released, trigger member 553 is pushed forward by spring 563, and upper feed pawl 558, engaging the incisions in the base strip at divisions between adjacent labels, feeds the base strip by a predetermined length per cycle of operation, while lower feed pawl 560 merely slides over the base strip. Furthermore, in this instance, the unintended reverse feed of the base strip, which could be caused the sliding of pawl 560, is arrested by base strip holder 584. Thus, by the feeding action described above, the label tape is fed by a distance corresponding to one label. That is, the label tape is extended by this distance forward beyond the front end of label bed plate 565. It is to be noted here that, during this feed action, because of the narrow gaps between upper and lower guide plates 568, 570 and label bed plate 565, labels of relatively stiff nature cannot follow a sharp turning back of the base strip in front of the bed plate front end, and, as a result, are separated from the base strip, continuing to move forward until they reach a position under label applying roller 579.

On the other hand, rotating member 571, being disengaged from cam 559, is swung back to the original position, whereby printer 577 is lifted out of the path of the labels. The application (or sticking) of labels to objective articles is carried out by pressing the labels to the articles by means of roller 579.

Example 11 (FIGS. 43–48)

An outer case 601 and a grip frame 602 are interconnected by a pin 603 which permits the case and the frame to be opened when desired, and these two parts are normally locked in closed position by engagement of a catch 604, provided on the frame side, with a pin 605 provided on the case side.

A rotating lever 606 is pivotally connected to the case 601 by means of a pivot pin 607. At one end of lever 606, a printing mechanism 608 is pivotally attached by means of a pin 609, while in the other end of the lever there is formed a slot 615, in which is slidably received an pin 610 fixed to an actuating bar 612 of a label tape feeding mechanism 611.

A squeeze lever (or trigger) 613 is pivotally attached to the grip frame 602 by a pivot pin 614, the free end of which is bifurcated into a fork 615 adapted to receive the pin 610 of the above mentioned actuating bar 612.

As shown in FIG. 46, from a side of the actuating bar 612 of the tape feeding mechanism, there extends a guide pine 616, which is received in a horizontal guide groove formed in the other case or other suitable supporting plate, From the bottom of the bar 612 there extends a cam 617, which is engageable with a roller 619 provided at the upper end of a base strip holding member 618 provided in the grip frame 602. Upstream (to the left in the drawing) of the cam 617, there is provided a rack 620, which is fixed to the bar 612 and adapted to mesh with a pinion 621 pivoted on the grip frame 602. At a side of the front end portion of the actuating bar 612, a feeding pawl 623 is pivotally attached by a pin 622 fixed to the bar 612. The above-mentioned base trip holding member 618 is attached pivotally to a support frame 624 by means of a pin 625 and is urged to rotate (or swing) in the clockwise direction by a spring 626. However, this rotating motion is limited by a suitable stopping means so that the upper end of the member 618 cannot move to the right (in the drawing) beyond its upright position. To a side of the support frame 624 is fixed a base strip gripper 627, the upper face of which is urged to be in contact with the bottom face of a label tape bed 629 by a compression spring 628 provided at the bottom of the gripper 627. The above-mentioned pinion 621 has a fixed arm (or, base strip tensioning arm) 630 including a roller 631 pivoted at the free end of the arm.

Guide plates 632 and 633 are pivotally connected to the grip frame 602 by means of pins 634 and 635, respectively, and are urged upward by springs 636 and 637 (i.e., to swing counterclockwise and clockwise, respectively). The aforesaid roller 631 at the free end of the tensioning arm 630 is adapted to be engaged with the guide plate 632.

As shown in FIG. 47, at the bottom face of the catch 604 there is provided a leaf spring 638 which serves to impart a pressing force against the pivoted portion of the guide plate 632.

A spring 639 serves to urge the catch 604 to the right (in the drawing), forcing it to engage with the pin 605. A pin 640 is provided for convenience in disengaging the catch from the pin 605.

A label tape 641 is fed through the space below the front end of the feed pawl 642, and when it reaches a roller pin 643 provided at the fore end of the frame 602, a label 644 is separated from the base strip 645. This separated label continues to move forward until it reaches the gap under a label applying roller 646, while the base paper 645 is turned sharply around the roller pin 643 into substantially the rearward (to the right in the drawing) direction, and, reaching the space under the leaf spring 638 (provided at the bottom face of the hook 604), the base paper is gripped between the spring and the pivoted portion of the guide plate 632. Thereafter the base strip is guided along the guide plate 632, then passed around the roller 631 at the free end of the tensioning arm 630, further through the gap between the bottom face of the label tape bed 629 and the upper face of the gripper 627, and finally through a passage 647 to the outside of the apparatus. In operation, when the grip frame 602 is gripped by hand and, the lever 613 is is retracted, the rotating lever 606 rotates in the counterclockwise direction, whereby printing mechanism 608 at the fore end of the lever is moved downward, and printing is carried out on a label, while tape feeding mechanism 611 retracts. During this retraction, cam 617 at the bottom face of actuating bar 612 pushes base strip holding member 618 downward (since, member 618 cannot swing to the right beyond the upright position because of the stopping means as mentioned previously), and permits free passage of base strip 645. At the same time, rack 620 in front of cam 617 rotates pinion 621 in the clockwise direction until tensioning arm 630 fixed to the pinion assumes an approximately horizontal position, allowing guide plates 632 and 633 to squeeze the base strip against the bottom face of tape bed 629, as shown in FIG. 3. By this squeezing action and by the fact that the base strip is, at its left side, pressed (or gripped) by leaf spring 638, the base strip is forced to pass through the gap between bed 629 and gripper 627 (the gap is left free in this instance as above-mentioned, and directed rearward.)

When the squeeze lever 613 is released, rotating lever 606 is rotated in the clockwise direction by the force of springs 648 and 649. Accordingly, printing mechanism 608 moves upward, and tape feeding mechanism 611 moves forward, feeding the label tape by a length corresponding to one label by the action of pawl 642. At the same time, roller 619 at the upper end of base strip holding member 618 is swung to the left (in the drawing) about pin 625 (because of the friction between roller 619 and cam 617), allowing spring 628 to push gripper 627 toward the bottom face of tape bed 629, whereby the portion of the base strip existing in the gap between bed 629 and gripper 627 is gripped between the two. On the other hand, rack 620 rotates pinion 621 and tensioning arm 630 in the counterclockwise direction until the latter is brought into a substantially vertical position. By this rotation of arm 630, the base strip is stretched outward (downward as viewed in the drawing), with guide plates 632, 633 pushed outward. At this instance, the base strip is tightly gripped at the right (or downstream) side of arm 630 by gripper 627 while, at the left of the arm, it is elastically held by the force of leaf spring 638. Consequently, when the base strip is stretched as mentioned directly above, tension in the base strip generated by this stretching overcomes the holding force of leaf spring 638. As a result, the base strip is pulled from left to right. By this pulling action, a label is separated from the base strip at roller pin 643 and continues to move forward.

Example 12. (FIGS. 49–55)

An outer case 651 and a grip frame 652 are interconnected by a pin 653 to permit the case and the frame to be opened when desired, and normally these two are locked in closed position by engagement of a catch 654, provided in the frame side, with a pin 655 provided in the case side.

The grip fame 652 slidably receives a squeeze lever 656, which is connected by a connecting link 658 to a drive lever 657. The lever 657 is at its one end pivoted on the grip frame 652, and, in the other end of the lever, there is formed a slot 659, in which is received a pin 661 fixed to the rear end of a rotating lever 660. This lever is pivoted on the case 651 by means of a pin 662.

A lever 664 of a label feeding mechanism 663 is also pivotally connected to the pin 661. At the front end of the rotating lever 660 there is attached, pivotally, a printing mechanism 665.

As shown in FIG. 51, the rotating lever 660 has a pawl or claw 666, which engages with a ratchet wheel 667 mounted in the case 651. The claw 666 is urged by a spring 668 so that its tip bears against the ratchet wheel 667. The engagement between the claw and the ratchet wheel is effective only when the rotating lever rotates in the clockwise direction, at which time, of course, the ratchet wheel 667 is rotated in the same direction. To the ratchet wheel 667 is fixed a gear 669, with which a pinion 670 meshes. The pinion 670 has a roller 671 fixed thereto, which roller, bearing against a roller 672 provided in the grip frame side, serves to draw the label base strip.

The printing mechanism 665 comprises a printer 675 pivotally attached by a pin 674 to the fore end of the rotating lever 660, and a plate 676 adapted to rotate the printer 675. This plate 676 is pivotally connected at its lower end to the lower end of the printer 675 by a pin 677, and at its upper end has a grip portion 678 fashioned as a curved elongation of the plate. At the root of the grip portion 678 there is formed a cutout 679, which is adapted to engage with the pivot pin 674.

In another embodiment shown in FIG. 54, the printer 675 is attached to the rotating lever 660 in a direction (relative to the lever 660) normal to that of the preceding example. That is a series of printing belts 680 are arranged side-by-side along the feeding direction (or path) of the label tape 681. FIG. 55 shows the details of the connecting mechanism between the printer and the rotating lever. As shown, the printer 675 has a pin 683 fixed to its supporting frame 682, which pin 683 is adapted to be received in a hole formed in the fore end of the rotating lever 660, and another pin 684, which is also fixed to the supporting frame 682, is adapted to be engaged with a cutout 685 formed in the fore end of the rotating lever 660.

In operation, when grip frame 652 is first gripped and lever 656 is retracted, rotating lever 660 is rotated in the counterclockwise direction, whereby printing mechanism 665 is moved downward and label feeding mechanism 663 is retracted.

At the same time, ratchet claw 666 pivoted on rotating lever 660 (FIG. 51) moves downward riding over the teeth of ratchet wheel 667.

When the squeeze lever 656 is released, rotating lever 660 is rotated in the clockwise direction by the forces of springs 686 and 687, and printing mechanism 665 is lifted, while label feeding mechanism 663 is moved forward. At this instance, the tip end of a feed pawl 688 engages with the notches (or incisions) in the base strip, feeding the label tape by a length corresponding to one label.

On the other hand, claw 666 pivoted on rotating lever 660 moves upward after engagement with ratchet wheel 667 and rotates the wheel in the clockwise direction. As a result, of the gear 669 fixed to wheel 667, pinion, 670 and roller 671 fixed to the pinion are rotated in the counterclockwise direction, and this roller 671, in cooperation with roller 672, pulls base strip 673 gripped between these two rollers.

As base strip 673 is sharply turned back at a roller pin 689 provided at the front end of the label, label 690 of rather stiff

nature cannot follow the turning of the base strip and continues to move forward until it reaches the space below an applying roller **691**.

When it is desired to change (or rearrange) the type on printing (or type belt) **680**, grip portion **678** of plate **676** is gripped and is pulled. By this pulling action cutout **679** of plate **676** is disengaged from pin **674**, and plate **676** assumes the position as shown by phantom line in FIG. **52**(A). By further pulling, as shown in FIG. **52**(B), printer **675** is rotated about pin **674**, allowing types at the bottom end of the printer to be seen easily. At this position, as one can turn the printing belts as desired while looking at the types placed at the bottom, changing (or rearranging) of types can be accomplished very easily and simply.

In the case of the embodiment shown in FIGS. **54** and **55**, by rotating printer **675** with its supporting frame **682** about pin **683**, pin **684** is disengaged from rotating lever **660**, permitting the lowermost type to be seen easily. Therefore, also in this case, changing of types can be accomplished very easily in the same manner as mentioned above.

Example 13 (FIGS. **56–61**)

In each of the labelers described in the foregoing examples, any label applying member, which is used for applying labels separated from the base strip, can be used and may have various forms. However, the several forms described below are especially suitable for use in this invention.

FIG. **56** shows a label applying member comprising an ordinary rubber roller **701**.

FIG. **57** shows another applying member, which is made from a plastic material and has many projections **702** of conical shape formed over its entire periphery.

FIG. **58** shows still another applying member, which comprises two rollers **704** and **705**, each with a plurality of grooves **703**. These two rollers are disposed parallel to each other and are supported rotatively by two parallel to each other and are supported rotatively by two parallel side plates **706**, with a plurality of rubber rings **707** passed around corresponding grooves **703** of the rollers **704**, **705**. This applying member as a whole is urged by a spring **708** to move its front (left) end downward. For this purpose, the spring **708** is wound around a supporting shaft **709**, and one end of the spring is engaged with the side plate **706** and the other end is engaged with a pin **710** fixed to the case of the labeler. The outer peripheral surfaces of the rubber rings **707** constitute a label applying (or pressing) surface.

FIG. **59** shows still another applying member, which comprises a plurality of elastic applying bands **712**. These bands are fixed at their rear ends to the rear part of a support frame **711**, then turned downward, next turned forward and again upward, their fore ends being left free (i.e., not fixed). A tapped hole **713** is provided to receive a fixing screw to affix the applying member to the case of the labeler, and a lock screw **714** serves to prevent the applying member from rotating. The outer surfaces of the applying bands **712** constitute a label applying surface.

In another applying member as shown in FIG. **60**, the member comprises a plurality of shoe-shaped pressing elements **716** supported pivotally by a common shaft **715**. These pressing elements are urged downward by springs **717**, each of which is wound around the shaft **715**, one end of the spring bearing against the bottom of each element **716** and the other end being engaged with a pin **718**. The shaft **715** and pin **718** are both fixed to the case of the labeler. The bottom surfaces of the pressing elements **716** constitute a label applying surface.

In still another applying member as shown in FIG. **61**, the member comprises a pin **719** and a coil spring **720** wound around the pin. The pin **719** is fixed to the case of the labeler, and the outer peripheral surface of the coil spring **720** constitutes a label applying surface.

We claim:

1. In a compact labeler including a case, a roll of tape held within the case, manually operable driving lever means pivotally attached to said case, a printing mechanism operated by said drive lever means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle, said tape feeding mechanism retracting during the printing motion of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle: the improvement wherein said tape feeding mechanism comprises, in combination, label holding means mounted within said case for allowing the tape to advance in a feeding direction but preventing retraction of the tape in the opposite direction, an actuating member coupled to said driving lever means, and a tape feeding pawl rockably supported on said actuating member and including a pin secured to said actuating member, a feed pawl holding member rotatably supported on said pin a feed pawl blade held by said pawl holding member, and spring means engaging said tape feeding pawl for urging said pawl blade into engagement with said tape.

2. In a compact labeler including a case, a roll of tape held within the case, manually operable driving lever means pivotally attached to said case, a printing mechanism operated by said drive lever means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a label tape feed mechanism operated in response to said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle, said label tape feed mechanism retracting during the printing motion of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle: the improvement comprising a grip frame connected to a lower portion of said case and extending outwardly therefrom, and a trigger member pivotally connected to said grip frame, means coupling said trigger member to said label tape feed mechanism and said printing mechanism for operating said label tape feed mechanism and printing mechanism upon manipulation of said trigger member.

3. In a compact labeler including a case, a roll of tape held within the case, manually operable driving lever means pivotally attached to said case, a printing mechanism operated by said drive lever means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle, said tape feeding mechanism retracting during the printing motion of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle; the improvement wherein said tape feeding mechanism comprises, in combination, an actuating member coupled to said printing mechanism for movement therewith, a tape feeding pawl rockably supported on said actuating member, spring means for urging said pawl into engagement with said tape, guide slot means mounted within said casing, and pin means connected to said actuating member and received in said guide slot means for causing reciprocal movement of said tape feeding pawl upon movement of said actuating member.

4. In a compact labeler including a case, a roll of tape held within the case, manually operable driving lever means pivotally attached to said case, a printing mechanism operated by said drive lever means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving lever means to undergo reciprocation adapted to

feed said tape by a length corresponding to one label per operational cycle, the improvement wherein said printing mechanism comprises support plate means, first and second printing means connected to said support plate means, means mounting said plate means for reciprocal movement within said case, said first printing means comprising a plurality of endless belts mounted on said plate means, and said second printing means comprising a carrier member connected to said support plate means, and printing plate means releasably held by said carrier member.

5. In a compact labeler including a case having front and rear openings, a roll of tape held within the case, said tape consisting of a base strip having labels adhesively attached thereto, manually operable driving lever means pivotally attached to said case, and a tape feeding mechanism operated in response to movement of said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle: the improvement wherein said tape feeding mechanism comprises, in combination, an actuating member pivotally mounted within said case and coupled to said driving lever means for pivotal movement thereby, tape feeding pawl means pivotally connected to said actuating member for advancing said tape, a first roller mounted within said case and forwardly of said pawl means, means for guiding said labels through said front case opening upon said advancing movement of said tape, means for guiding said base strip around said first roller and through said rear case opening, a sector gear mounted on said actuating member, a circular gear connected to said casing mounted for unidirectional rotation and disposed in engagement with said sector gear, a second roller connected to said circular gear for rotation therewith, leaf spring means connected to said casing for pressing said base strip against said second roller, whereby said pivotal movement of said actuating member causes said base strip to be discharged through said rear case opening.

6. In a compact labeler including a case having front and rear openings, a roll of tape held within the case, said tape consisting of a base strip having labels adhesively attached thereto, manually operable driving lever means pivotally attached to said case, and a tape feeding mechanism operated in response to movement of said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle: the improvement wherein said tape feeding mechanism comprises, in combination, means for guiding said labels through said front case opening upon advancing movement of said tape, means for guiding said base strip through said rear case opening, a grip frame connected to said case, a first lever pivotally connected at one end to said grip frame and at another end to said driving lever means, a trigger member slidably received in said grip frame, a connecting lever connected between said trigger member and said first lever, a sector gear pivotally mounted within said case, means mounted within said case for moving said sector gear upon movement of said trigger member, a second gear rotatably mounted within said case and disposed in engagement with said sector gear, and roller means connected to said second gear for rotation therewith to propel said base strip through said rear case opening upon rotation of said roller means.

7. In a compact labeler including a case having front and rear openings, a roll of tape held within the case, said tape consisting of a base strip having labels adhesively attached thereto, manually operable driving lever means pivotally attached to said case, and a tape feeding mechanism operated in response to movement of said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle: the improvement wherein said tape feeding mechanism comprises, in combination, means for guiding said labels through said front case opening upon advancing movement of said tape, means for guiding said base strip through said rear case opening, a grip frame connected to said case, a trigger member slidably connected within said grip frame and connected to said driving lever means for moving said driving lever means upon movement of said trigger member, said tape feed mechanism having a gear rotatably mounted within said case, a first rack connected for slidable movement to said driving lever means and in engagement with said gear, a second rack mounted for slidable movement within said case on a side of said gear opposite said first rack, and first and second pawl means connected respectively to said first and second racks for engaging said tape and said base strip, respectively, whereby said tape is advanced forwardly and said base strip is propelled rearwardly within said case.

8. In a compact labeler including a case having front and rear openings, a roll of tape held within the case, said tape consisting of a base strip having labels adhesively attached thereto, manually operable driving means connected to said case, a printing mechanism operated by said driving means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving means to feed said tape by a length corresponding to one label per operational cycle, said tape feeding mechanism retracting during printing of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle: the improvement wherein said tape feeding mechanism comprises, in combination, a grip frame connected to said case and extending therefrom, a trigger member slidably connected within said grip frame, plate means disposed within said case and fixedly connected to said trigger member, first and second pawl means attached to said plate means spaced vertically relative to one another, each of said first and second pawl means having tape moving edges directed oppositely to one another, a fixed support plate connected to said case and disposed within said space between said first and second pawl means, said tape being received between an upper face of said support plate and said first pawl means for forward movement within said case, and said base strip being received between a lower face of said support plate and said second pawl means for rearward movement within said case, lever means pivotally connected to said case, means connecting one end of said lever means to said printing mechanism to operate said printing mechanism upon pivotal movement of said lever means, and cam means connected to said trigger member for engaging said lever means to pivot said lever means.

9. In a compact labeler including a case having front and rear openings, a roll of tape held within the case, said tape consisting of a base strip having labels adhesively attached thereto, manually operable driving means connected to said case, a printing mechanism operated by said driving means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving means to feed said tape by a length corresponding to one label per operational cycle, said tape feeding mechanism retracting during printing of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle: the improvement wherein said tape feeding mechanism comprises, in combination, a grip frame connected to said case and extending therefrom, a trigger lever pivotally connected to said grip frame, lever means pivotally connected to said case and to said trigger lever, a cam and a rack attached to said tape feeding mechanism for slidable movement within said case, said cam being disposed for engagement by said trigger lever and for movement thereby, a base strip tensioning arm connected to said case beneath said tape feeding mechanism for engaging said base strip, a pinion fixed to said tensioning arm and disposed in engagement with said rack and holding means disposed upstream of said arm for holding said base strip, whereby said base strip is propelled rearwardly by said tensioning arm.

10. In a compact labeler including a case, a roll of tape held within the case, manually operable driving lever means pivotally attached to said case, a printing mechanism operated by said driving lever means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle, said tape feeding mechanism retracting during printing of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle: the improvement comprising a lever, means connecting said lever to said case for rotation in response to movement of said driving lever means, and pin means pivotally connecting said lever to said printing mechanism for rotating said printing means about said pin means upon rotation of said lever.

11. In a compact labeler including a case, a roll of tape held within the case, manually operable driving lever means pivotally attached to said case, a printing mechanism operated by said drive lever means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle, said tape feeding mechanism retracting during printing of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle; the improvement comprising label applying means including a support frame connected to said case, and a plurality of curved bands disposed in parallel and each having one end fixedly connected to said support frame to extend outwardly of said case, whereby said bands provide a label pressing surface.

12. In a compact labeler including a case, a roll of tape held within the case, manually operable driving lever means pivotally attached to said case, a printing mechanism operated by said drive lever means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle, said tape feeding mechanism retracting during printing of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle: the improvement comprising label applying means including a shaft connected to said case, a plurality of pressing elements each having a shoe shaped form and being mounted on said shaft, and spring means resiliently urging each said pressing element in the same direction, whereby said pressing elements provide a label pressing surface.

13. In a compact labeler including a case, a roll of tape held within the case, manually operable driving lever means pivotally attached to said case, a printing mechanism operated by said drive lever means to undergo printing and return motions to print desired inscriptions successively on labels on the tape, and a tape feeding mechanism operated in response to said driving lever means to undergo reciprocation adapted to feed said tape by a length corresponding to one label per operational cycle, said tape feeding mechanism retracting during printing of said printing mechanism thereby allowing the printing of a label, and advancing during the return motion of said printing mechanism thereby advancing the tape by said length for each operational cycle: the improvement comprising label applying means including a shaft connected to said case, a coil spring wound around said shaft to provide a plurality of spring coils spaced resiliently from said shaft, whereby the outer peripheral faces of said spring coils provide a label pressing surface.

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