United States Patent

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[54] LABEL PRINTING AND DISPENSING TOOL

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[51] Int. Cl. B41j 7/70, B32b 35/00, B41j 1/08

[58] Field of Search 101/292, 291, 288, 92, 95, 101/90, 297, 287; 156/384, 277

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[57] ABSTRACT

A label printing and dispensing tool has a spring biased striker which is initially set and thereafter released in response to the dispensing operation to press a label of a label tape against a printing mechanism for printing such label before dispensing it from the tool.

2 Claims, 3 Drawing Figures

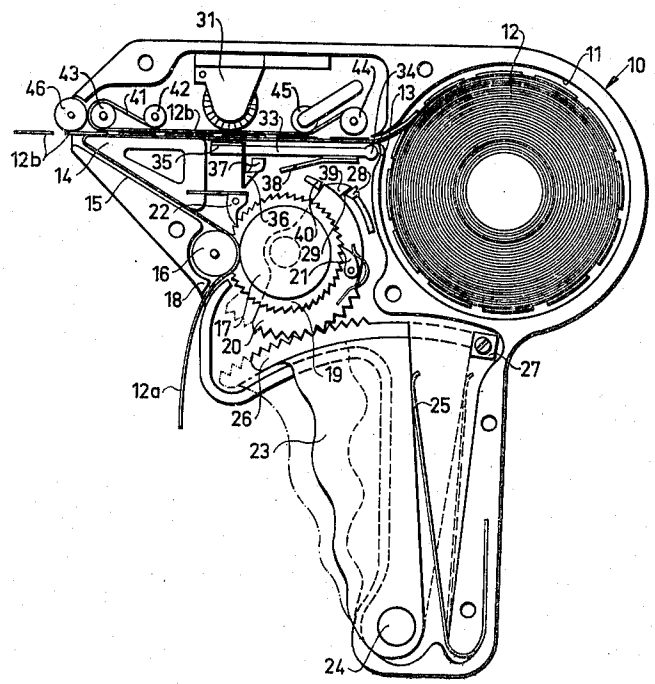
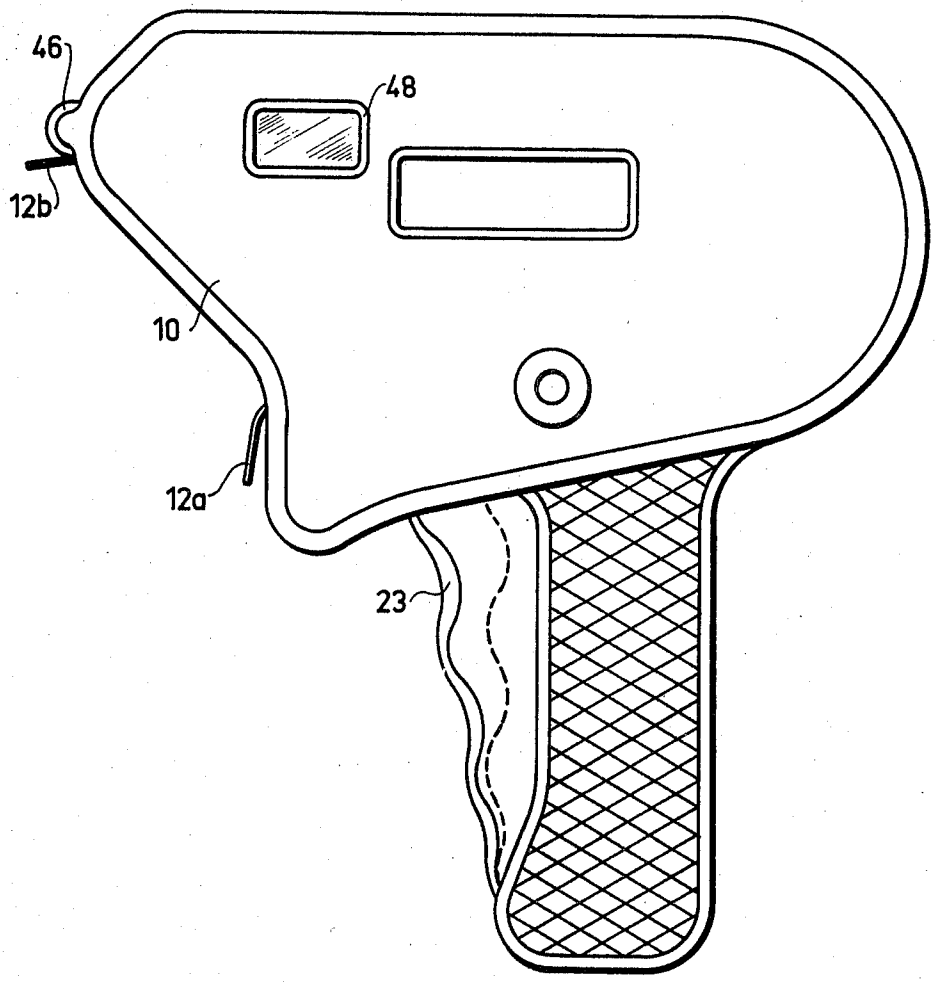


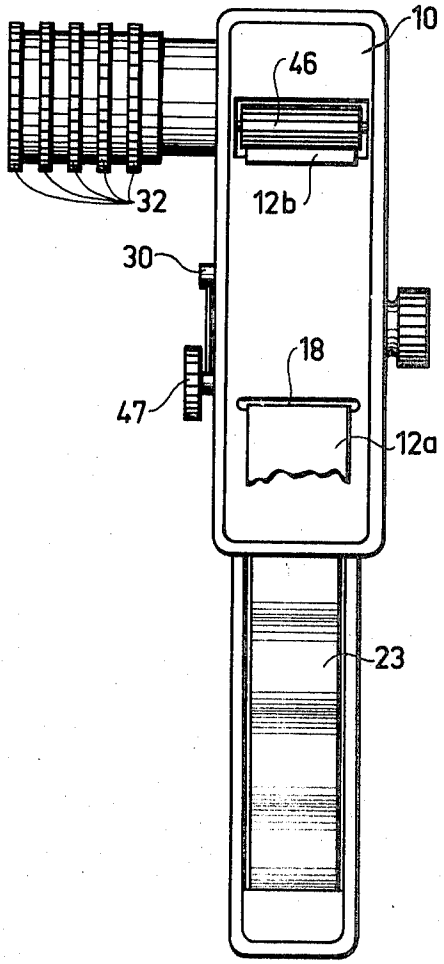
Fig. 1



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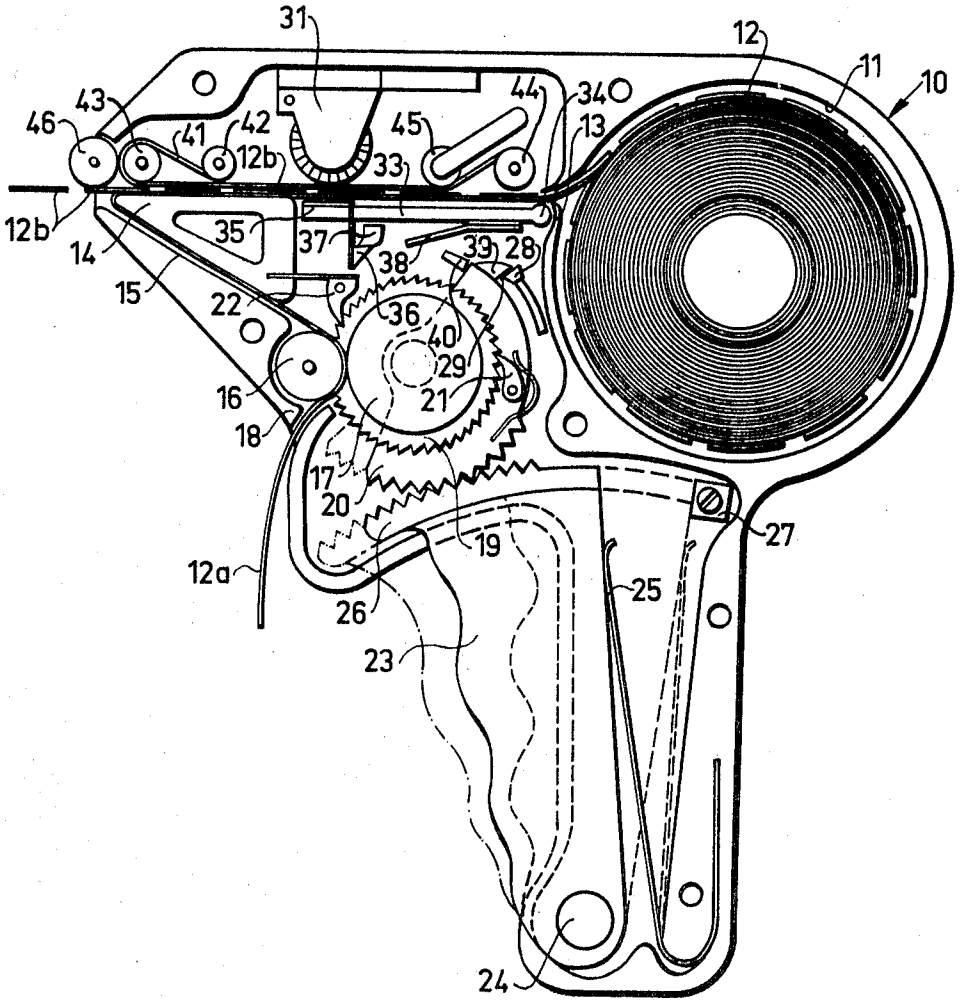
Fig. 2



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Fig.3



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LABEL PRINTING AND DISPENSING TOOL

BACKGROUND OF THE INVENTION

The present invention relates to a label printing and dispensing tool having means for advancing stepwise a continuous label tape and dispensing the labels thereof one at a time, and having a printing mechanism for printing the labels prior to the dispensing.

In prior art tools of this kind the printing mechanism is combined with an inking pad and is mobile in order to be pressed against the label at the printing thereof, the inking pad being simultaneously moved away from the printing mechanism. When the printing mechanism returns after the printing operation has been completed the inking pad is reapplied to the printing mechanism in order to ink its types and thus prepare the types for a following printing operation.

The primary object of the present invention is to provide a label printing and dispensing tool of the kind described above, wherein the printing of the labels is more distinct than in prior art tools of this kind and which is easier to handle and to operate than such tools since the printing operation proper is not derived directly from the advancing movement and since only very few moving members are involved in the printing operation.

SUMMARY OF THE INVENTION

In accordance therewith the invention provides a label printing and dispensing tool of the kind described, which comprises a magazine for a continuous label tape, means for advancing such tape stepwise and dispensing the labels thereof one at a time, a stationary printing mechanism for printing the labels prior to the dispensing, a striker mounted for movement towards and away from said printing mechanism, spring means for biasing said striker towards said printing mechanism, means to set said striker against the action of said spring means by said advancing movement, and means to momentarily release said striker when initially set, at the end of an advancing step to press a label against said printing mechanism thereby printing such label.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the invention will become apparent from the following specification which describes an embodiment of the tool with reference to the accompanying drawings, wherein

FIG. 1 is an elevational view of a label printing and dispensing tool in accordance with the invention;

FIG. 2 is a front view of the label printing and dispensing tool; and

FIG. 3 is a longitudinal sectional view of the label printing and dispensing tool, showing its functional parts.

DESCRIPTION OF A PREFERRED EMBODIMENT

The label printing and dispensing tool shown in the drawings comprises a casing **10** forming a magazine **11** holding a roll of label tape **12**. Such tape may be of a known type and may consist for example of a backing **12***a* carrying individual pressure-sensitive labels **12***b* which are disposed on one side of the backing with a proper spacing of the labels. Label tape **12** passes from magazine **11** through a slot **13** and extends from the said slot in a straight path to a folding edge **14**. From the said edge backing **12***a* extends through a passage **15** to a nip between a rubber roller **16** rotatably mounted in casing **10**, and a driving tape drum **17** also rotatably mounted in casing **10**, in order subsequently to be discharged from the tool through a slot **18**, labels **12***b* being separated from the backing when the latter passes around folding edge **14**.

The label tape is advanced through the tool by means of label drum **17** which is connected with a ratchet wheel **19** to be rotatable as a unit therewith. Label drum **17** and ratchet wheel **19** may be formed as a unitary element. A tooth segment **20** is pivoted for movement about the rotational axis of

tape drum **17** and ratchet wheel **19** independently of these two elements and preferably on a common shaft thereof and is provided with a pawl **21** to engage ratchet wheel **19** when swung counter-clockwise as seen in FIG. **3**, and thereby to bring along said ratchet wheel in its motion. When segment **20** moves clockwise as seen in FIG. **3** pawl **21** will be disengaged and will slide over the teeth of ratchet wheel **19** a stationary pawl **22** engaging the ratchet wheel to prevent it from following pawl **21** as a result of frictional engagement, if any, between this pawl and the teeth of ratchet wheel **19**. In order to oscillate segment **20** and consequently to rotate stepwise tape drum **17** and thus to advance stepwise label tape **12**, the tool is provided with an operating member formed as a trigger **23** which is pivoted to casing **10** at **24** and is biased by means of a pressure spring **25** tending to move the trigger towards the left as seen in FIG. **3**. A further tooth segment **26** on trigger **23** is operatively engaged with segment **20**, and when trigger **23** is manually moved towards the right as seen in FIG. **3**, segment **20** will consequently move tape drum **17** counter-clockwise. However, the tape drum is kept stationary by means of pawl **22** when trigger **23** resumes its initial position under the action of biasing spring **25**, with pawl **21** sliding over ratchet wheel **19**. The magnitude of the stroke of trigger **23** and consequently the magnitude of the advancing step of the label tape is controlled by a stationary stop **27** which will be engaged by trigger **23** when manually actuated, and a stop **28** which is engaged by a shoulder **29** on segment **20** when trigger **23** and segment **20** resume their initial position. Stop **28** is adjustable and consequently determines the stroke of trigger **23** by limiting the return movement thereof under the action of spring **25**. Stop **28** can be adjusted from the outside of the tool in a curved slot centered on the rotational axis of tape drum **17** and ratchet wheel **19**, by means of an adjustment member **30**.

In the straight path of the label tape between slot **13** and folding edge **14** there is stationary mounted in the tool a printing mechanism **31** the types of which are adjustable from outside by means of a number of wheels or dials **32**. Beneath the printing mechanism there is provided a striker **33** formed as an arm which is pivotally mounted at **34** and the free end of which is provided with a platen **35** arranged to be applied against printing mechanism **31** in a manner to be described. Arm **33** is provided with a pawl **36** preferably a resilient pawl which is adapted to co-operate with a stationary abutment **37** provided in casing **10** in order to keep striker **33** slightly spaced from the printing mechanism. Striker **33** may be brought to the retracted position in which it is anchored by pawl **36**, by gravity when the tool is held substantially in the position shown in the drawings. Furthermore, striker **33** is provided with a leaf spring **38** on its lower side, and said leaf spring is adapted to be engaged by a cam surface **39** on segment **20** when said segment is swung counter-clockwise as seen in FIG. **3**, in order to be tensioned against striker **33** when arrested by means of pawl **36**. On segment **20** there is also provided a releasing member formed by a projection **40** in order to actuate pawl **36** at the end of the counter-clockwise movement of segment **20** so that striker **33** is released so as to be forced under the action of tensioned leaf spring **38** against printing mechanism **31** at the end of an advancing movement produced by means of trigger **23**.

An inking ribbon **41** extends from a storage reel **42** rotatably mounted in casing **10**, over a driving roller **43** rotatably mounted in casing **10**, between printing mechanism **31** and the label tape to a rewinding reel **44** past a tensioning roller **45**. Rewinding wheel **44** may be spring biased to rotate for rewinding the ribbon or may be operatively connected with other driving mechanism. Also, it may be connected by frictional engagement with the tape advancing mechanism to be rotated thereby. The feeding of ribbon **41** past printing mechanism **31** is controlled by means of a roller **46** engaging roller **43** and serving to apply the labels separated from the label tape. Roller **46** is rotated through a small portion of a full revolution thereof during each application. When striker **33** is

released platen **35** is applied by the spring force against the label tape, which is consequently pressed against printing mechanism **31** with the inking ribbon **41** interposed therebetween. Other inking ribbon arrangements than that described having means for moving stepwise the ribbon in response to the operation of the tool may be provided. Also, a stationary inking mechanism may be used.

When the label printing and dispensing tool described above is used, actuation of trigger **23** provides advancing of the label tape step by step, the magnitude of a step being dependent on the adjusted position of stop **28**. The label tape passes beneath inking ribbon **41** and the labels are printed when they are positioned opposite printing mechanism **31**. In that position the advancing of the label tape has just been completed and the printing takes place when pawl **36** is moved by means of releasing member **40** out of engagement with abutment **37**, so that spring **38** recently tensioned by the cam surface **39** causes striker **33** to strike a label positioned opposite the printing mechanism against the types of the printing mechanism by means of platen **35**. When the labels approach application roller **46** at folding edge **14** during the stepwise advancing, they will be separated from the backing due to the bending of the backing at said edge and pushed out of the tool in order to be adhered by means of application roller **46** directly onto the object to be provided with the label. At the same time inking ribbon **41** is fed forward. The backing is discharged from the tool through slot **18**.

Thus, for each movement of trigger **23** there is a predetermined movement of segment **20** and the same movement is imparted rotationally to tape drum **17**. Immediately before the trigger engages stop **27** a label is printed in the manner described above and when the trigger subsequently returns to its previous position under the action of spring **25** segment **20** returns simultaneously and will be immobilized at stop **28**, tape drum **17** remaining stationary during such return movement. Striker **33** falls down by gravity and is latched by means of pawl **36**. Striker **33** may be biased by a spring considerably weaker than spring **38**, towards the retracted position.

Due to the fact that stop **28** is adjustable the tool can be set for labels of different spacing on the backing since such stop determines the stroke of the trigger and consequently the length of the advancing step. In order that a label may be positioned opposite printing mechanism **31** during each printing operation, roller **16** may be adjustable from outside by means of a rotatable member **47** in order to advance the label tape independently of the trigger mechanism, and in casing **10** there may be provided a window **48** through which it may be checked that a label is positioned opposite printing mechanism **31** when the label printing and dispensing operation begins.

The invention is not limited to the embodiment shown and described above but may be modified within the scope of the appended claims.

What is claimed is:

1. A label printing and dispensing tool comprising

a casing;

a magazine for a continuous label tape;

a tape feed means including a ratchet wheel, a segment and a first pawl for advancing the tape stepwise and dispensing the labels thereof one at a time;

means including a pivoted trigger and means operatively connecting such trigger with the segment for manually operating the tape feed means during an operating stroke thereof;

first spring means for rotating the tape feed means during a return stroke thereof;

a stationary printing mechanism for printing labels;

a striker mounted for pivotal movement towards and away from the printing mechanism between a retracted position and an advanced position;

second spring means for biasing the striker towards the advanced position;

means comprising a resilient pawl and an abutment for releasably connecting the striker with said casing to arrest the striker in the retracted position thereof;

a cam provided on the segment and thereby operatively connected with the advancing means for tensioning the second spring means during the operating stroke of the tape feed means; and

means formed as a projection on the segment for actuating said pawl of the arresting means at the end of the operating stroke to release the striker whereby the striker is forced towards the printing mechanism by the tensioned second spring means to press a label against the printing mechanism for printing the label.

2. A tool as in claim **1** further comprising an adjustable stop to limit the return movement of said driving pawl.

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