United States Patent [19]

Forthmann, Jr. et al.

[11] **3,776,441**

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[54] **STRIP MATERIAL FEEDING DEVICE**

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[73] Assignee: **Forthmann Label Services Company**, Westwood, N.J.

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[52] **U.S. Cl.**..... **226/114**, 226/115, 226/118

[51] **Int. Cl.**..... **B65h 17/42**

[58] **Field of Search**..... 226/113, 114, 115, 226/116, 118, 112

[56] **References Cited**

UNITED STATES PATENTS

1,859,962 5/1932 Ferenci..... 226/114 X

FOREIGN PATENTS OR APPLICATIONS

227,279 5/1943 Switzerland..... 226/114

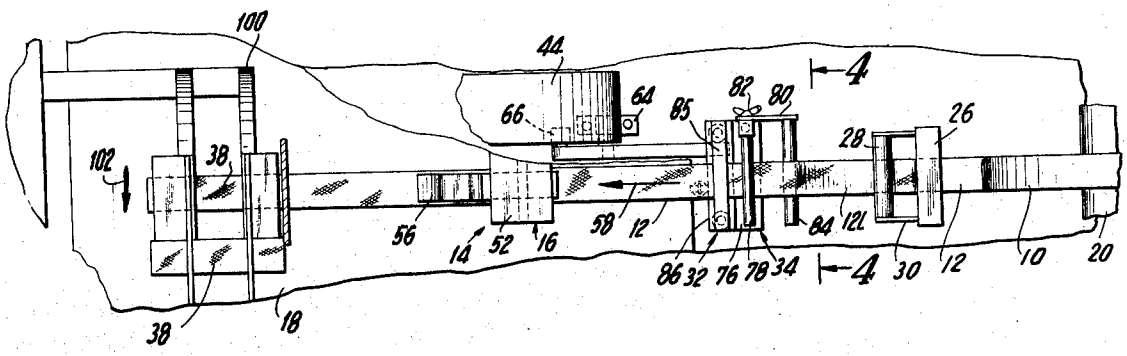
Primary Examiner—Allen N. Knowles

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[57] **ABSTRACT**

A device for facilitating the feed of strip material, particularly, a continuous length of labels which are to be cut away from the strip material and folded and packed into containers includes, a reel having a continuous winding of the strip material which is freely rotatably mounted. The strip material is guided through a guide element and over a table where it is advanced along a feed path by an oscillatable pusher finger which cyclically engages against the material and moves it along the feed path. The construction includes holding means located between the pusher and the reel supply for holding the label periodically in order to permit looping means to engage the label strip material, pull a length of it off the reel and form it into a loop between the holding means and the reel supply. The pulled off loop is subsequently fed by the pusher.

9 Claims, 4 Drawing Figures



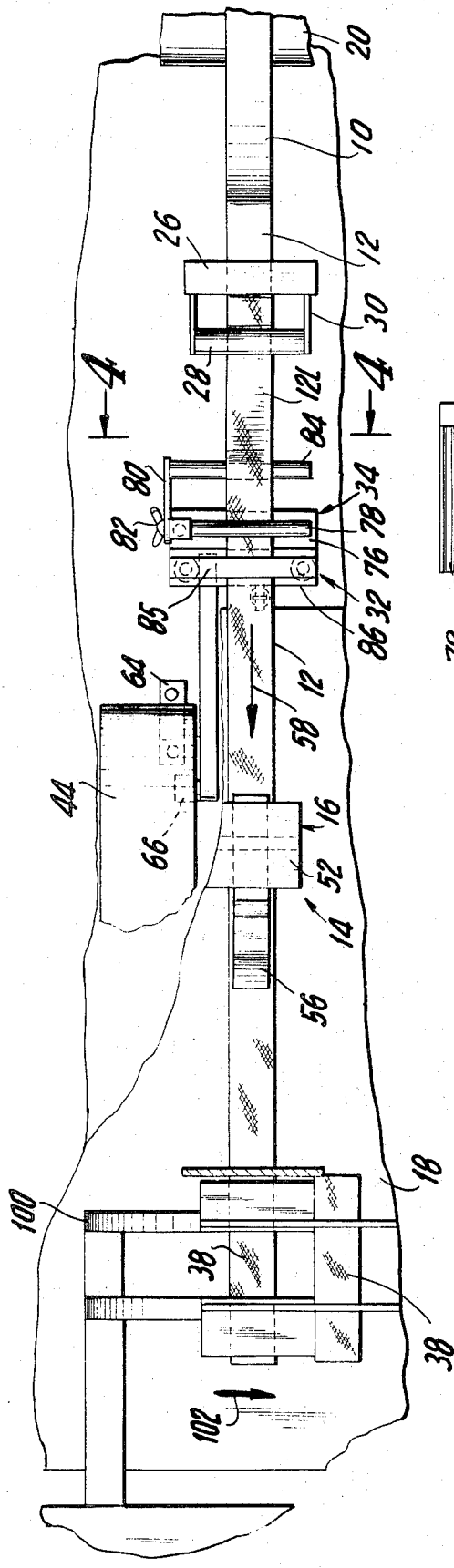

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80
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102

FIG.1

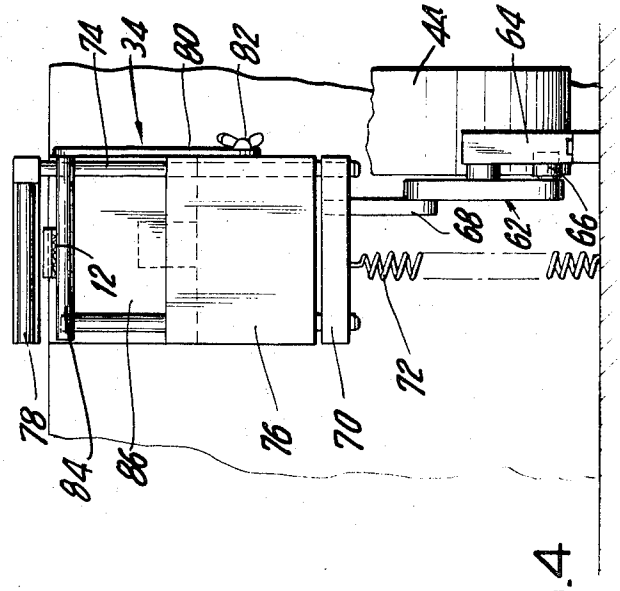

74
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FIG.4

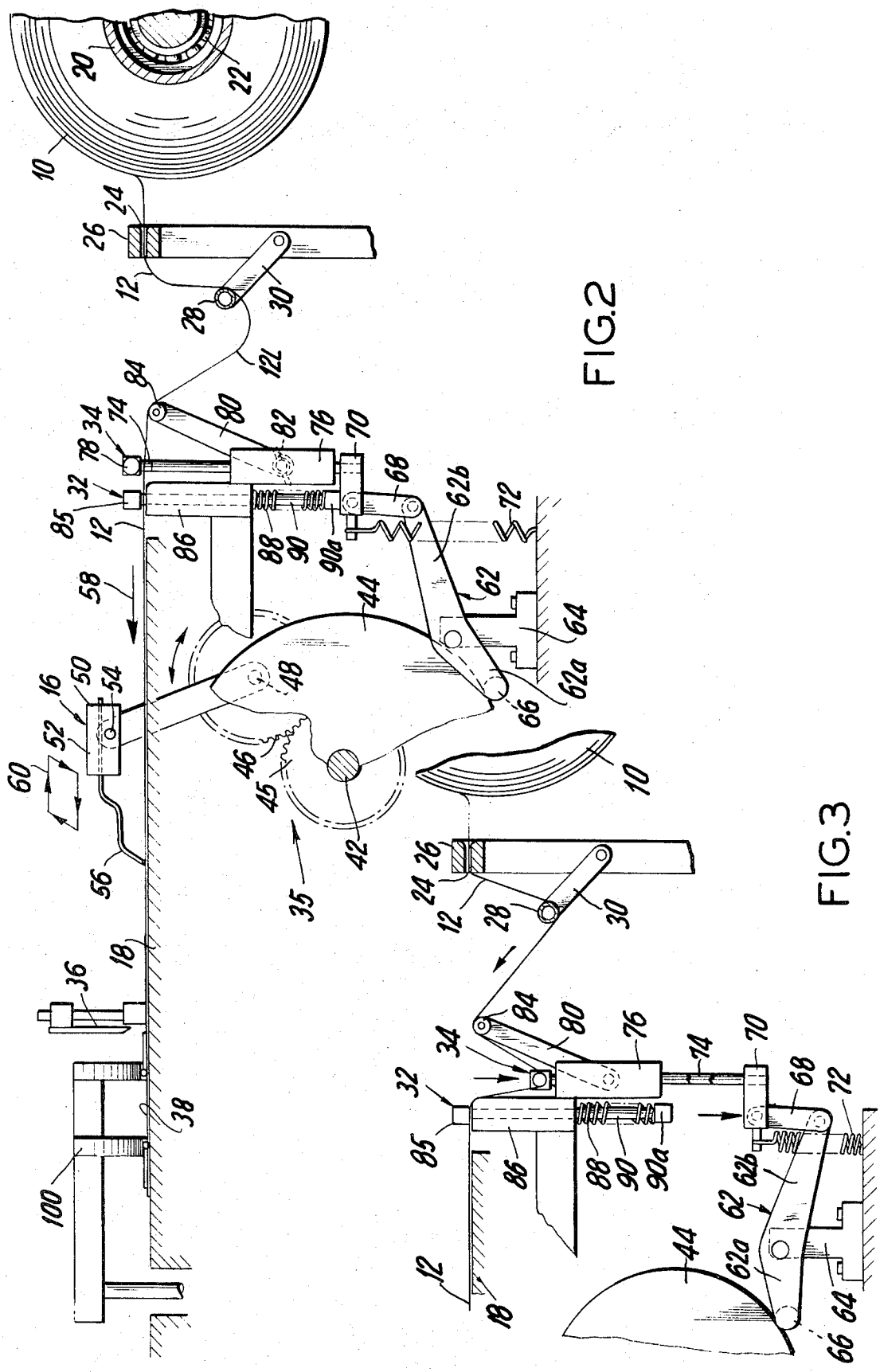

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86
88
90
90a
58
44
62
64
62a
66
16
50
54
48
52
60
46
45
42
35
56
18
36
38
100

FIG.2

FIG.3

STRIP MATERIAL FEEDING DEVICE

REFERENCE TO A PRIOR PATENT

This invention is an improvement over the device disclosed and described in U.S. Pat. No. 3,106,809 in the name of F.F. Forthmann, Jr., one of the inventors of the present case.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates in general to strip material feeding devices and, in particular, to a new and useful device for facilitating the feed-off of a continuous length of strip material such as interconnected labels from a reel supply thereof for further movement into association with means for cutting the labels from the strip material, folding the individual labels and packing the folded labels.

2. Description of the Prior Art

Prior to the present invention, a device for feeding a continuous strip of interconnected labels from a rotatable reel supply was known as disclosed by U.S. Pat. No. 3,106,809. Such a device included a movable engagement finger which was oscillated backwardly and forwardly and which periodically engaged the label strip material which was fed over a guide table and advanced a selected length thereof along the guide table in order to move it into association with cutting means for cutting away individual labels from the strip material. The device also included means for transferring the cut labels into association with a pressing mechanism and then into association with a packing mechanism for packing the individual cut and folded labels into containers. With devices of this nature, it is particularly important to have the mechanism operate at the highest possible speed in order that the largest possible number of labels may be cut away, folded and packed. One of the drawbacks in the attainment of a much higher speed of operation is the difficulty in regulating the feed of the strip material so that it will be fed evenly and rapidly off by the advancing mechanism.

SUMMARY OF THE INVENTION

In accordance with the present invention, there is provided a new and useful device for periodically engaging the label behind the mechanism for advancing the label in order to pull a selected length of the strip material off the reel supply and to form it into a loop which may be subsequently easily fed by the feeding mechanism.

Accordingly, it is an object of the invention to provide an improved device for controlling the feedout of a predetermined length of strip material from a reel supply in advance of a feeding mechanism for feeding the strip material.

A further object of the invention is to provide a device for feeding a continuous length of strip material, such as interconnected labels, into association with means for cutting and subsequently folding and packing the labels, which includes a movable pusher member which is engageable with the label in order to feed it along a path into association with the cutting means and including holding means disposed between the pusher and a reel supply of the labels which is periodically operable to engage the strip material while looping means are also engageable with the strip material between the holding means and the reel supply in order to pull off a loop of the material from the reel which is subsequently fed by the pusher means.

A further object of the invention is to provide a device for facilitating the feed of strip material which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings:

FIG. 1 is a partial top plan view of a device for feeding a strip of label material into association with knife means for cutting the label material into individual labels and for subsequently folding and stacking the labels and which includes a device for facilitating the feed thereof constructed in accordance with the invention;

FIG. 2 is a schematic elevational view partly in section of the operating mechanism for feeding the strip material;

FIG. 3 is a view similar to FIG. 2 showing an advanced stage of operation of the mechanism shown in FIG. 2; and

FIG. 4 is a section taken along the line 4—4 of FIG. 1.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, in particular, the invention embodied therein, comprises a device for cutting individual labels from a continuous strip thereof, folding the labels and subsequently packing them into containers which includes a rotatable reel supply **10** for a continuous strip of labels **12** and which is arranged adjacent feed means, generally designated **14.** The feed means **14** includes a pusher assembly, generally designated **16,** which engages the lebal strip material and moves it along a feed path overlying a table **18.** The reel supply **10** includes a continuous winding of interconnected labels and it includes a reel shaft **20** which is rotatably mounted on suitable bearing means **22.**

In accordance with the invention, the continuous strip of labels **12** is fed through a bore **24** of a fixed guide **26** and looped around a guide roller **28** of an adjustably positioned guide arm **30.** The strip material is passed into association with holding means, generally designated **32,** which is effective to periodically engage and hold the strip material **12** behind the feed means **16** in order to permit strip material loop-forming means, generally designated **34,** to engage the strip material **12** and move through its feed path in order to pull off a length of the strip material from the reel supply **10** and to form it into a loop **12L** at a location between the fixed guide **26** and the holding means **32.**

Drive means **35** are provided for driving the holding means and the loop-forming means such that the strip material is periodically engaged by the holding means **32** after the feed means **16** has fed a selected length thereof into association with a cutter, generally desig-

nated **36**, which forms the length fed into an individual label **38**. In addition, the drive means **35** is also effective to periodically move the loop-forming means **34** to effect the pull-out of a predetermined length of the strip material when the feed means moves back into a position at which it will engage the strip material for subsequent feeding of the strip material.

In the embodiment shown, the drive means **35** includes a rotatable shaft **42** which carries a cam **44**. The shaft **42** is also connected through suitable gearing **44** and **46** to operate a shaft **48** of a pusher **50** comprising the feed mechanism, generally designated **16**. The pusher **16** includes a block member **52** which is periodically oscillated or rocked about a pivot **54** and which carries a pusher finger **56** which advances the label material **12** in the direction of the arrow **58**. The pusher finger **56** moves through the parallelogram motion indicated at **60**. The finger **56** periodically lifts upwardly and moves backwardly and then moves downwardly into engagement with the strip material and advances it forwardly.

The drive means **35** which schematically indicates the drive connection **44, 46**, between the cam shaft **42** and the drive for the feed mechanism **16**, may of course by any type connecting mechanism for effecting the desired timed movement of the feeding mechanism **16**, the holding mechanism **32** and the looping mechanism **34** to carry out a looping and then subsequent feeding of the strip material **12**. In the arrangement shown, a lever follower **62** is pivotally mounted on a pedestal **64** and it includes a first arm portion **62*a*** having a follower **66** which is engaged with the cam **44** and is moved thereby to cause a second arm portion **62*b*** to oscillate upwardly and downwardly and move a connecting link **68** and a cross-member **70**. The cross-member **70** is guided for vertical upward and downward movement and it is biased in a downward direction by a tension spring **72**. The cross-member **70** is connected to a rod **74** which is guided in a fixed block member **76** and which carries a cross-member **78** at its top end which extends over the label strip material **12**. The spring **72** urges the rod member **76** and the cross-member **70** along with the top cross member **78** in a downward direction and it moves downwardly when the cam **44** is rotated to permit its downward movement to cause the top cross-member **78** to engage the strip material **12** and to pull it so that a length thereof feeds off the reel supply **10** and forms a loop **12L**. A guide arm **80** is pivoted on the block and it may be set in an adjusted angular position by a set screw **82** in order to selectively orient a guide pulley **84** thereof for engagement with the strip material **12**.

The loop-forming mechanism **34** operates in conjunction with the holding means **32** which includes a clamping member **84** which clamps the label over a fixed block **86** when the cross-member **84** is urged downwardly by a compression spring **88** which is coiled around an extension of a rod member **90** which reciprocates in the block **86** and which includes a widened end portion **90*a*** against which the compression spring **88** is engaged. The top holding member **84** is lifted upwardly to release the strip material when the cross-member **70** of the looping mechanism **34** is moved upwardly sufficiently to engage the widened end portion **90a** of the rod **90** and to move it upwardly against the spring force of the spring **88**.

It has been found that particularly when the feed mechanism **16** comprises a pusher of a type similar to the pusher finger **56** that the loop-forming means **34** facilitates the fast and accurate feedout of the strip material so that the individual labels which are defined on the strip material may be oriented selectively into association with the cutter means **36** in order to form the labels **38** precisely and rapidly. The finished labels **38** are moved by advancing means **100** in a separate feed direction **102** which extends at an angle to the first feed direction in order to perform successive operations on the label which has been cut away from the strip material to fold each end thereof and to subsequently move it into association with a packing mechanism where the labels are packed into containers.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A device for facilitating the feed of strip material from a reel having a continuous winding of the strip material, comprising a rotatable reel having a continuous length of strip material wound thereon, means mounting said reel for free rotation, guide means for guiding the strip material along a feed path, feed means overlying said guide means and engageable with the strip material periodically to advance it along said feed path by a predetermined amount, intermittently operable strip material holding means engageable with said strip material between said feed means and said reel, strip material loop-forming means engageable with said strip material and movable through the feed path thereof between said holding means and said reel to pull off a length of the strip material from said reel and form it into a loop, and drive means connected to said feed means, said holding means and said loop-forming means to cyclically hold said strip material as said loop-forming means pulls a length of strip material from said reel and forms it into a loop, to subsequently release the strip material and to move said feed means to advance at least a portion of the strip material which has been formed into a loop.

2. A device for facilitating the feed of strip material, according to claim **1**, wherein said feed means comprises a pusher, means mounting said pusher to move it through a path to engage the strip material and advance it forwardly along said feed path and to return out of engagement with said strip material for subsequent positioning back into engagement with the strip material for a subsequent feeding movement.

3. A device for facilitating the feed of strip material, according to claim **1**, wherein said loop-forming means comprises a member having a portion overlying said strip material, means mounting said member for vertical up and downward reciprocation, said drive means comprising a rotatable cam, and a lever arm follower engaged with said cam and having an arm portion connected to said member for moving said member upwardly and downwardly.

4. A device for facilitating the feed of strip material, according to claim **3**, wherein said loop-forming means includes a fixed supporting arm having a guide thereon engaged with said strip material and guiding said strip material between said holding means and said reel supply.

5. A device for facilitating the feed of strip material, according to claim 1, wherein said loop-forming means includes a fixed block, a member slidably mounted on said block for vertical up and downward movement, spring means biasing said member downwardly, said member having a portion overlying said strip material being engageable over said strip material to pull it downwardly when said member is moved downwardly, and cam means connected to said member for moving it upwardly and downwardly

6. A device for facilitating the feed of strip material, according to claim 5, wherein said holding means includes a rod member having a portion overlying said strip material and a fixed member on which said rod member is movable upwardly and downwardly, spring means biasing said rod member downwardly to engage the upper portion thereof on said strip material and hold it against said fixed member, said cam means being effective to move said holding member upwardly against said biasing means.

7. A device for facilitating the feed of strip material, according to claim 1, including a fixed member adjacent said reel supply having an opening therethrough through which said strip material is passed, said holding means being at a spaced location from said fixed guide, said loop-forming means being directly adjacent said holding means and including a member movable downwardly to the path of movement of said strip material to draw it through the opening of said fixed guide member and to form it into a loop.

8. A device for facilitating the feed of strip material, according to claim 7, including a guide arm, means mounting said guide arm for adjustable positioning adjacent said loop-forming means in a position to engage the strip material behind said loop-forming member and between said loop-forming member and said stationary guide.

9. A device for facilitating the feed of strip material, according to claim 1, wherein said feed means comprises a pusher for pushing the material along said guide means, said guide means comprising a table over which said material is fed, said holding means being located adjacent said table and having a member overlying the strip material which is movable relative to a fixed member to clamp the strip material therebetween, said loop-forming member including a loop member having a cross-part overlying the strip material and a vertical part which is movable upwardly and downwardly, spring means biasing said holding member downwardly and cam means for reciprocating said loop-forming member and for releasing said holding member by moving said holding member upwardly against said biasing means.

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