June 1, 1971 H. ROTHENBERGER 3,582,433

LABEL APPLYING APPARATUS

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Fig.1

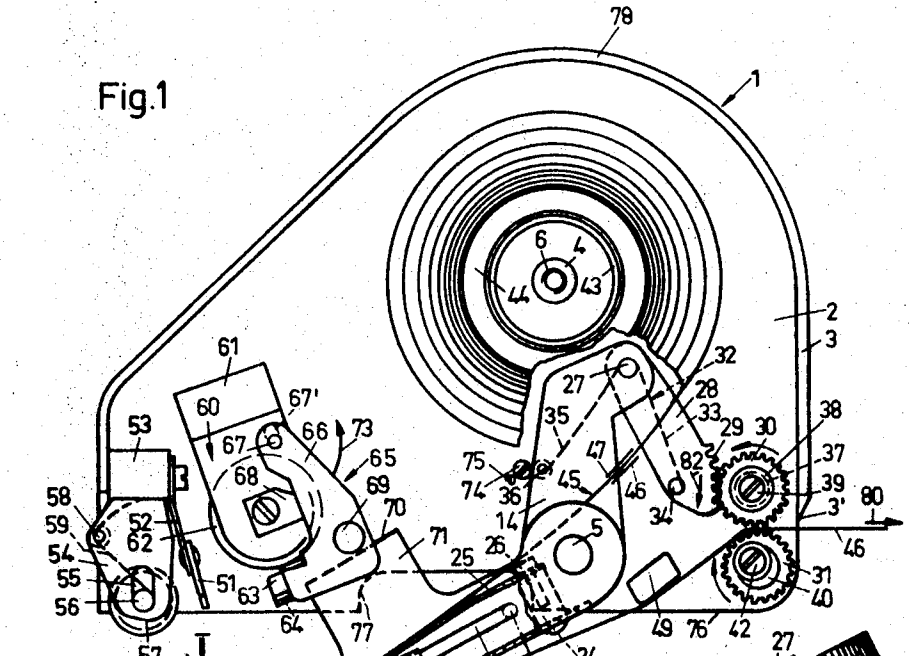


Fig.2

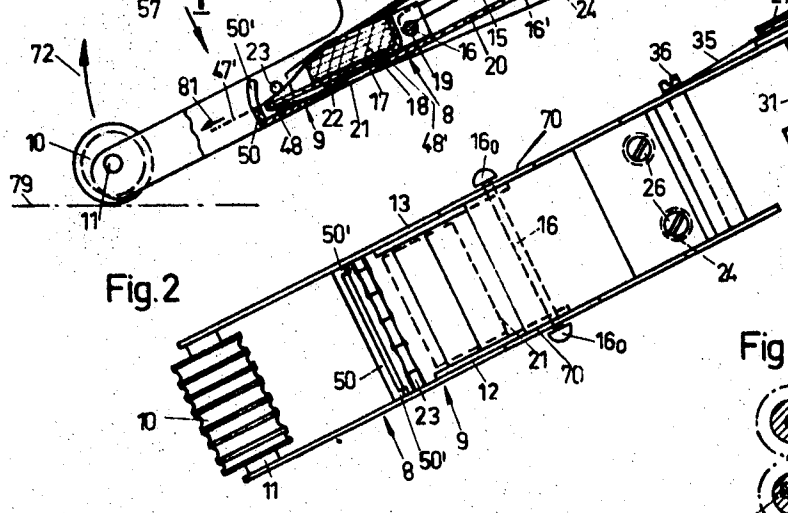
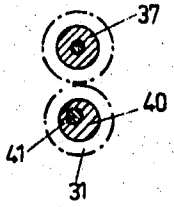


Fig.3



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LABEL APPLYING APPARATUS

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Fig. 4

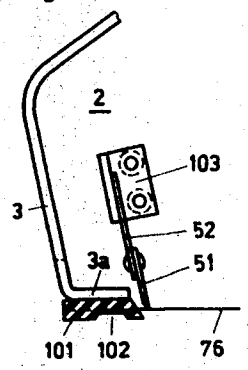


Fig. 5

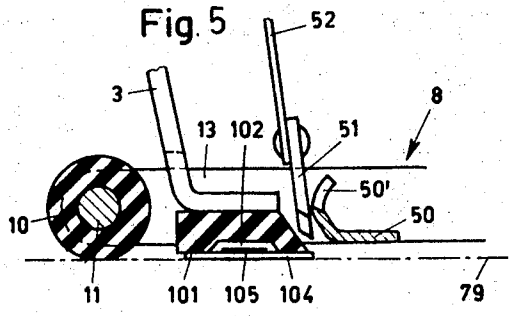


Fig. 6

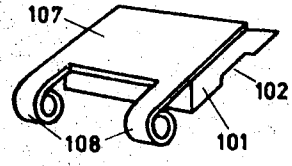


Fig. 7

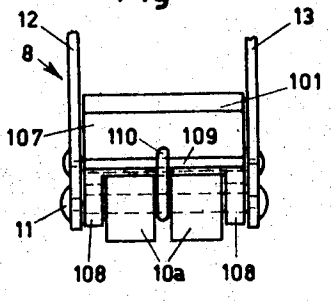


Fig. 8

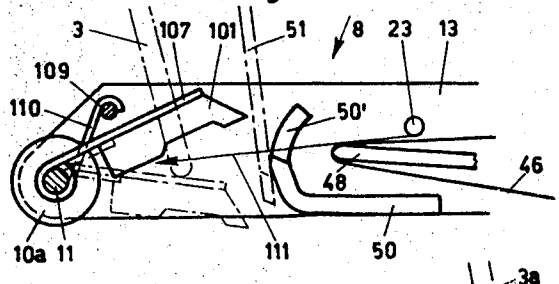


Fig. 9

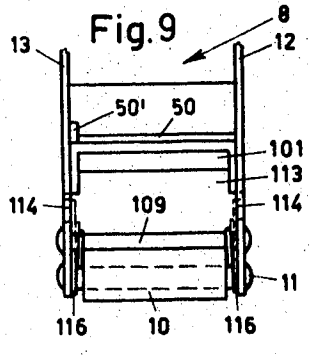


Fig. 11

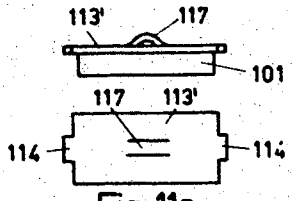
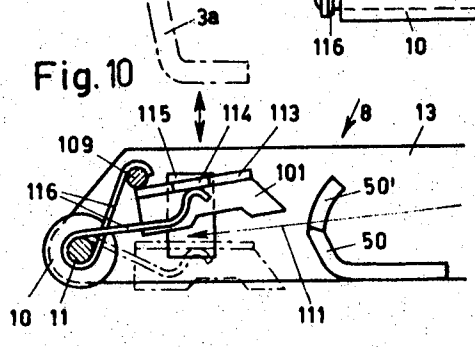


Fig. 11a

Fig. 10



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LABEL APPLYING APPARATUS

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Fig. 12

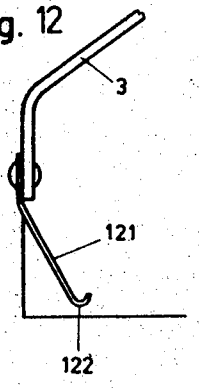


Fig. 13

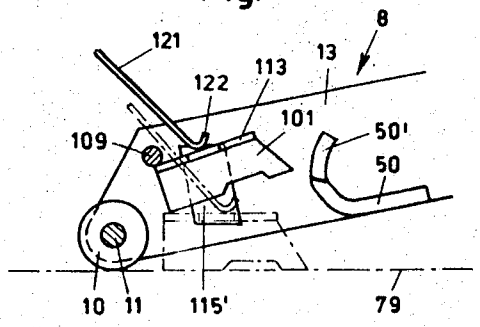


Fig. 14

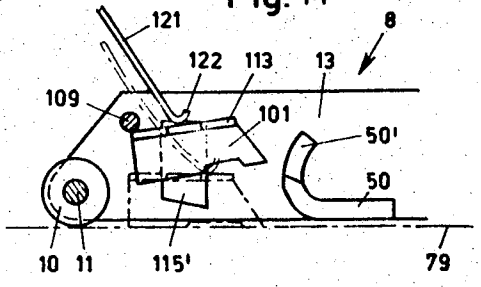
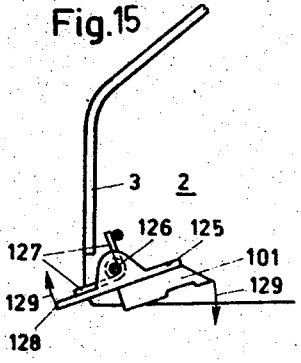


Fig. 15



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United States Patent Office 3,582,433 Patented June 1, 1971

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LABEL APPLYING APPARATUS

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Filed June 12, 1968, Ser. No. 736,344
Claims priority, application Switzerland, June 28, 1967, 9,145/67; Mar. 20, 1968, 4,172/68
Int. Cl. B32b *31/20, 31/10*
U.S. Cl. 156—384 12 Claims

ABSTRACT OF THE DISCLOSURE

A hand-held label applying apparatus has a feeding mechanism for a strand of labels which is actuated by the first phase of a relative movement of the apparatus housing and of a lever caused when an abutment on the lever engages the object to be labeled. The feed mechanism is released in the second phase of the movement so that the fed label stops and is applied to the object with a pressure increased when friction in the feeding mechanism no longer impedes relative movement of the lever and of the housing. Many details of construction are shown.

BACKGROUND OF THE INVENTION

This invention relates to label applying devices, and particularly to a self-contained apparatus carrying its own supply of labels in the form of a continuous strand, and also carrying necessary devices for sequentially applying the labels under pressure to suitable substrates.

The most commonly used known devices of this type require relatively great effort on the part of an operator and are inconvenient when a long series of objects has to be labeled in several hours of continuous work. One of the known devices has a handle consisting of two parts which are squeezed together against the restraint of a spring for feeding a strand of labels toward a pressure pad. After feeding, the label is applied to the object to be labeled by further manual pressure applied to the pad.

In another known device, the pressure pad is movable on the housing along the strand of labels. A terminal label of the strand which is located under the pad in the rest position of the latter is affixed to an object under pressure manually applied by means of the housing, and the housing is then retracted along the strand of labels while maintaining the pressure of the pad on the terminal label. The pad is moved thereby while the strand is pulled out of the housing. The applied label may then be cut off, and the next label is in position under the pad when the latter reverts to its rest position.

Other known devices similarly require relatively complex and energy-consuming movements on the part of the operator. One of the principal objects of this invention is the provision of a label applying mechanism which may be operated manually in a simple manner requiring but a minimum of motion and of effort, and which affords similar advantages when mechanized or automatized in a manner conventional in itself.

SUMMARY OF THE INVENTION

With this object and others in view, as will hereinafter become apparent, the invention provides a label applying apparatus whose support structure has a pressure pad or its equivalent mounted thereon for pressing a label against an object when the support is moved toward the object. A feeding mechanism is also mounted on the support and sequentially feeds labels in a continuous strand to the pressure pad.

The support mainly consists of a housing and of a carrier mounted on the housing for movement between a normal or rest position and an operative position. An abutment on the carrier may be engaged with the aforementioned object for moving the carrier from its normal position toward the operative position when the housing is moved toward the object, and an actuating mechanism is operatively interposed between the housing and the carrier and connected to the feeding mechanism for actuating the same in response to movement of the carrier from its normal position toward its operative position.

One of the improvements contributed by the instant invention resides in a coupling device which is a part of the actuating mechanism. The coupling device responds to movement of the carrier from the afore-mentioned normal position to an intermediate position by actuating the feeding mechanism, and it responds to movement of the carrier from the intermediate position to the operative position by releasing the feeding mechanism. Frictionally engaged elements in the latter impede its actuation so that movement of the carrier from its normal position to the intermediate position is impeded by friction in the feeding mechanism whereas movement from the intermediate position to the operative position is unimpeded. The advantages of this feature will presently be described in more detail.

In a specific embodiment, the coupling device may include a rack on the pivotally mounted carrier and a pinion rotatable on the housing, the rack being resiliently biased into sequential engagement of its teeth with the pinion during movement of the carrier from the normal position into the intermediate position. When the last tooth of the rack passes the pinion in the intermediate position of the carrier, the rack releases the pinion. The pinion may constitute a portion of a toothed roller cooperating with another toothed roller to engage the strand of labels therebetween. The rollers thus constitute the feeding mechanism.

Other features, additional objects, and many of the attendant advantages of this invention will readily be appreciated as the same becomes better understood by reference to the following detailed description of preferred embodiments when considered in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

FIG. 1 shows a label applying apparatus of the invention without one of the side walls of its housing in side elevation, and partly in section;

FIG. 2 shows a portion of the apparatus of FIG. 1 in an oblique plan view taken in the direction of the arrow II:

FIG. 3 shows a detail of the device of FIG. 2 in section on the line III—III;

FIG. 4 shows a modified detail for use in the apparatus of FIG. 1 and in a corresponding view;

FIG. 5 shows the detail of FIG. 4 in its cooperation with other elements of the apparatus of FIG. 1 and on a larger scale;

FIG. 6 is a perspective view of one element of the device of FIG. 7;

FIG. 7 illustrates yet another modified detail for use in the apparatus of FIG. 1, the view being in front elevation;

FIG. 8 shows the cooperation of the device of FIG. 7 with other elements of the apparatus of FIG. 1 in a side-elevational, partly sectional view;

FIG. 9 shows a further modification of the device of FIG. 7 in a corresponding view;

FIG. 10 illustrates the cooperation of the modified device of FIG. 9 with other elements of FIG. 5;

FIG. 11 show a variation on one of the elements seen in FIG. 10, the element being shown in front elevation;

FIG. 11*a* illustrates the element of FIG. 11 in plan view;

FIG. 12 shows yet another modified detail for use in the apparatus of FIG. 8 or 10;

FIG. 13 illustrates the cooperation of the device of FIG. 12 with other elements seen in FIG. 10 in the normal or rest position.

FIG. 14 shows the apparatus of FIG. 13 in a position intermediate the normal and the operative position; and

FIG. 15 illustrates yet another modification of a portion of the apparatus of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawing in detail, and initially to FIGS. 1 to 3, there is seen a label applying apparatus of the invention whose normally hand held housing **1** has two flat, parallel side walls **2** of which one is removed in the view of FIG. 1 in order to reveal internal structure. The two side walls **2** are connected by a narrow cover **3** which forms the front, top, and back wall of the housing **1**. The housing **1** is normally held together mainly by a tubular spacer **4** between the side walls **2** and attached to the side walls by screws engaging threads **6** in the axial bore of the spacer **4**.

A pivot pin **5** on the illustrated side wall **2** near the open bottom of the housing **1** supports a carrier **8** which is a two armed lever of sheet metal construction. It is normally held in the illustrated position by a spring (not shown) which tends to turn the lever **8** on the pivot pin **5** in a counterclockwise direction. One arm **9** of the lever **8** has partly the U-shape of a channel consisting of a web **20** and flanges **12, 13** near the pin **5**. The flanges **12, 13** extend forward beyond the web **20**, and their free front ends carry therebetween a circumferentially corrugated rubber roller **10** on a shaft **11**. An integral portion **14** of the flange **13** projects beyond the pin **5** inward of the housing **1** to form the second arm of the lever **8**.

The flanges **12, 13** have opposite L-shaped slots **15**. The longer leg of each slot **15** extends longitudinally of the lever arm **9**. A shaft **16** parallel to the pin **5** is engaged in the shorter legs **19** in the position of the shaft shown in fully drawn lines in FIG. 1. Knobs 16_0 on the two ends of the shaft **16** which project outward from the flanges **12, 13** axially secure the shaft. It may be shifted to the far end of the long leg in the slot **15** as indicated in broken lines at **16'** in FIG. 1.

A slide **17** of folded sheet metal is attached to the shaft **16** and may pivot about the axis of the shaft and move with the same longitudinally of the lever arm **9** when the shaft is lifted from the short legs **19** which normally secure it against longitudinal movement. The slide **17** carries a backing pad **18** of rubber or the like and normally rests on the web **20**, covering a rectangular opening **21** in the latter. Short lugs **22** which project from the slide **17** downwardly into the opening **21** guide the slide **17** during its longitudinal movement and secure it laterally. The slide **17** is held in the illustrated position by a leaf spring **25** attached to the web **20** by means of two studs **24** riveted to the web and by the two screws **26** which attach the spring **25** to the free ends of the studs **24**.

A pin **27** pivotally attaches an arm **28** to the free end of the lever arm **14**. The free end of the arm **28** carries a row of teeth **29** which form a short rack and engage an axially terminal pinion portion of a toothed feed roller **30** in the illustrated position of the apparatus. The roller **30** loosely meshes with another feed roller **31** which is an idler. The arm **28** is biased toward the teeth of the roller **30** during pivotal movement of the lever **8** by a helical torsion spring **32** of thin spring wire. One of its straight ends **33** is hooked into a hole **34** of the arm **28**. The other end **35** is attached to the lever arm **14** by a screw **36**. The helical portion of the spring, not seen in detail, is wound about the pin **27** and tends to turn the arm **28** counterclockwise.

The feed roller **30** is rotatably mounted on a shaft **37** one end of which is attached to the side wall **2** whereas the other end carries a washer **38** and a screw **39** axially to secure the roller **30**. The roller **31** is similarly mounted on a shaft **40** provided with a threaded, eccentric, axial bore **41**, as best seen in FIG. 3. The shaft **40** is attached to the side wall **2** by a screw **42** engaging the bore **41**. When the screw is partly released, the shaft **40** may be turned to change the radial spacing of the rollers **30, 31**.

A short cylindrical sleeve **43** coaxial with the tubular spacer **4** and attached to the illustrated side wall **2** rotatably supports a spool **44** of a laminar tape **45**. As is indicated in FIG. 1 only over a short length of the composite tape **45**, it consists of a separating layer **46** of waxed paper and of a strip of label material whose face directed toward the separating layer **46** carries a pressure-sensitive adhesive coating too thin to permit pictorial representation in the instant drawing. The adhesive only weakly attaches the two other layers to each other, and the label strip can readily be peeled from the separating layer while the latter prevents the several turns of adhesive coated label material from sticking to each other in the spool **44**.

The laminar tape **45** runs from the spool **44** over the pad **18** and through a guide opening defined vertically by the front part of the slide **17** and a transverse pin **23** rotatably mounted in the side walls **2**. The separating layer **46** moves in an arc of almost 180° about the transverse front edge **48** of the slide **17**, and is thereby peeled from the label strip **47**. A free terminal strip portion **47'** is seen in FIG. 1 to project forward from the slide **17**. The separating layer **46** travels along the underside of a guide plate **49** on the side wall **2** to the nip of the rollers **30, 31** and outward of the housing as indicated by an arrow **80**. While the discharged separating layer is represented in FIG. 1 by a straight line for the sake of convenience, it actually emerges from the feed rollers **30, 31** with transverse corrugations whose depth can be adjusted by shifting the roller **31** toward and away from the roller **30**.

The front end of the web **20** carries a transverse shearing blade **50** which rises obliquely upward and forward from the web **20**, as is better seen in FIG. 5. The top of the blade **50** carries lateral guide horns **50'** which are bent obliquely backward for guiding another shearing blade **51** into proper cooperation with the blade **50**. The blade **51** is attached to the front wall **3** of the housing **1** by a bracket **53** and a leaf spring **52**. When the housing **1** and the carrier lever **8** are pivoted relative to each other about the pin **5**, the cutting edge of the blade **51** first engages the guide horns **50'** under the pressure of the spring **52**, and thereafter cooperates with the blade **50** to cut the strip end **47'**.

The bracket **53** also carries a U-shaped sheet metal support **54**, only one leg of the support **54** being visible in FIG. 1. Short vertical slots **55** in the legs of the support **54** receive the ends of a shaft **56** carrying a rubber pressure pad of generally cylindrical shape, but having a corrugated surface. Two torsion springs **59** of steel wire coiled about studs **58** on the legs of the support **54** bias the shaft **56** toward the illustrated lowermost position in the slots **55**.

An adjustable rubber stamp **60** of conventional construction is mounted on the side wall **2** by means of a bracket **61**. The stamp includes a stack of coaxial rubber rings **62** carrying integral type matter and angularly adjustable on a non-illustrated cylindrical support to print indicia on a portion of the label strip **47** in the printing station defined between the stamp **60** and the pad **18**. The illustrated device is particularly suitable for dispensing and applying price labels, and the type matter on the stamp **60** may thus consist of numerals, decimal points, dollar signs, and the like.

An ink pad **63** is mounted on the free lower end **64** of a sheet metal carrier **65** whose upper portion **66** carries two coaxial pins **67**. The pins movably engage short vertical slots **67'** in the housing of the stamp **60**, only one pin and associated elements being seen. A non-illustrated spring biases the carrier **65** downward and clockwise into the illustrated position in which further clockwise movement is prevented by engagement of the carrier **65** with an abutment **68** on the stamp housing. In the illustrated position, the inking pad **63** is downwardly spaced from the type matter of the rings **62**.

The carrier **65** also is provided with two coaxial abutment pins **69** which engage respective upper guide edges **70** on lugs **71** projecting from the flanges **12, 13**. When the lever **8** is pivoted from the illustrated position of FIG. 1 clockwise, as indicated by the arrow **72**, the edges **70** push the pins **69** upward, thereby first shifting the carrier **65** upward on the pins **67** until the inking pad **63** meets the type matter on the discs **62**, and thereafter pivoting the carrier **65** counterclockwise, as indicated by the arrow **73**, to wipe the ink pad **63** over the type matter. Ultimately, the carrier **65** and the pad **63** are swung out of the printing station, permitting the label strip **47** to be printed between the type matter and the backing pad **18**.

The carrier lever **8** is normally held in the rest position shown in FIG. 1 by the afore-mentioned non-illustrated spring which holds the screw **36** on the arm **14** in abutting engagement with the head of a screw **74** partly inserted in the side wall **2**. The side wall is provided with several tapped hole **75** for the screw **74** which permit the normal angular position of the carrier lever **8** on the housing **1** to be varied. As will presently become apparent, the position of the screw **74** also affects the length of the free end **47'** of the label strip **47** after each actuation of the feeding mechanism.

A recess **77** in the lower edge **76** of each side wall **2** provides clearance for the knobs 16_0 on the shaft **16** during movement of the lever **8** in the direction of the arrow **72**, and also permits the shaft **16** to be shifted into the position **16'** while the carrier lever **8** is in the non-illustrated operative position. The rear wall **3** of the housing **1** has a cutting edge **3'** for manual cutting of the separating layer **46**.

The afore-described apparatus is operated as follows:

The housing **1**, in the open condition of FIG. 1, is first charged with label material by placing a spool **44** of laminar tape **45** on the sleeve **43**. The separating layer **46** is peeled from the free end of the tape **45**. The knobs **16'** are shifted out of the short legs **19** of the slots **15** against the restraint of the spring **25**, and the shaft **16** is moved into the position **16'**, thereby providing access from above the opening **21**. The transverse front edge **48** of the slide **17** extends across the opening **21** as shown at **48'** in broken lines, thereby permitting the waxed paper band of the separating layer **46** to be pulled over the front edge of the slide **17**, down through the opening **21**, along the guide plate **49** and into the nip of the rollers **30, 31**. The correspondnig portion of the adhesive-coated label material **47**, also normally consisting of paper, is trimmed away. When the side wall **2** which is not shown in the drawing is installed, and the slide **17** is returned to its normal position, the apparatus is ready for dispensing and applying printed labels.

The operator takes the top **78** of the housing **1** in his hand and moves the housing toward the surface of a package **79** or other object to which the label is to be applied until the roller **10** engages the surface **79**, and further to pivot the lever **8** on the pin **5** in the direction of the arrow **72**. During the first phase of the lever movement, the teeth **29** of the arm **28** sequentially engage the teeth of the roller **30**, as indicated by the arrow **82**, and thereby turn the roller, the separating layer **46** of waxed paper being pulled off the spool **44** and discharged from the housing **1** in the direction of the arrow **80**. The last tooth

29 releases the roller **30** when the lever **8** reaches an intermediate angular position, not shown in the drawing. Movement of the lever **8** from the illustrated normal position to the intermediate position is impeded by friction in the feeding mechanism, particularly in the presence of the tape **45**. Aside from bearing friction, resistance to movement of the lever **8** is caused by the engagement of the teeth on the rollers **30, 31** with the interposed tape, by friction and other forces at the edge **48** of the slide **17**, and by friction between the sleeve **43** and the spool **44**.

When the rack **29** on the arm **28** releases the pinion on the roller **30**, the feeding movement of the tape **45** stops, and the frictional resistance to further angular displacement of the lever **8** ceases suddenly. Because of the normal reaction of the operator's muscles to the resistance offered by the housing **1** during the first phase of label application, the force applied during the subsequent second phase is approximately the same, and the lever **8** is therefore moved at a suddenly increased angular speed during the second phase from the afore-mentioned intermediate position to its ultimate operative position.

During the first phase, the tape **45** is fed forward to discharge some of the separating layer **46** and to project the free end **47'** beyond the shearing blade **50** in the direction of the arrow **81**. The inking mechanism on the carrier **65** wipes ink over the type matter on the rings **62** and is then swung out of the printing station. The cylindrical pressure pad **57**, the shearing blade **51**, and the stamp **60** approach the lever **8**, but do not yet operate.

During the second phase of movement of the carrier lever **8**, a portion of the now stationary tape **45** is engaged under pressure between the type matter on the rings **62** and the backing pad **18**. The blades **50, 51** cooperate to sever the end portion **47'** of the label strip **47** from the remainder of the latter, and the pressure pad **57** urges the front part of the severed label against the surface **79**. The operative or terminal position of the lever **8** is defined by the abutting cooperation of the stamp **60** and the pad **18**. The resistance to further movement of the housing **1** toward the surface **79** is readily perceived by the operator who thereafter moves the roller **10** a short distance backward over the surface **79**, thereby rolling the pad **57** over the freshly affixed label and attaching the label to the surface **79** over practically its entire surface.

When the housing **1** thereafter is lifted from the surface **79**, the carrier lever **8** is returned to the illustrated normal position by its non-illustrated spring. The teeth **29** on the lever **28** ratchet over the teeth of the roller **30** without engaging the same because the direction of movement of the arm **28** is approximately tangential to the roller **30**, the row of teeth **29** is somewhat convexly arcuate, and the teeth themselves have obliquely sloping flanks which tend to cause disengagement of the teeth under the applied force of the lever return spring which is much stronger than the force of the wire spring **35**. The teeth **29** engage the roller **30** only after the arm **28** is again stopped by abutting engagement of the screws **36** and **74**. The return movement of all other operating elements of the illustrated device is believed too obvious to require further description. The apparatus now is ready for the next label applying cycle.

The pad **18** and stamp **60** are located sufficiently behind the blades **50, 51** to print indicia on a portion of the strip **47** which will be affixed as a label in the second cycle after that in which printing took place, thereby permitting the applied ink to dry somewhat. Smearing of the freshly applied ink impression is further minimized by the corrugations on the surface of the cylindrical pressure pad **57** which do not touch every portion of the printed surface, yet apply adequate pressure to the label for activating the adhesive layer.

The length of the strip portion **47'** which determines the length of the label applied in each operating cycle can be adjusted in steps by shifting the screw **74** between the several tapped holes **75**, thereby changing the effective

length of the row of teeth **29**. Fine continuous adjustment of the label length is provided by the eccentric mounting of the roller **31**. At constant circumferential travel of the rollers **30, 31** the length of the strip portion **47'** is determined by the depth of the creases formed in the separating layer **46** by the teeth of the rollers **30, 31**.

The apparatus illustrated may be employed not only with a continuous strip **47** of label material, but also with discrete labels sequentially attached to the continuous separating layer **46** in a known manner, and automatically peeled from the layer **46** when the latter travels in a sharp angle over the front edge **48**. The apparatus is readily adjusted to labels of different length in the direction of feed. If the labels are printed prior to being inserted in the housing **1**, the printing mechanism and the shearing blades **50, 51** may be removed. The bracket **61** is adjustable in a conventional manner, not shown, to permit the impression site to be shifted along the tape **45** as needed for printing labels of different length.

If labels are to be dispensed at a very high rate, the apparatus illustrated in FIGS. 1 to 3 is preferably modified as shown in FIGS. 4 to 15. The modified devices make it unnecessary to move the apparatus along the surface **79** fully to fasten an applied label, and they permit the use of relatively slow-drying ink without smearing the printed indicia.

Referring to FIGS. 4 and 5, there is seen the front wall **3** of the housing **1** which carries an integral bracket **3***a* formed by downwardly extending the wall **3** and bending the free edge portion rearward and parallel to the bottom edge **76**. A rubber pad **101** is adhesively affixed to the bottom surface of the bracket **3***a* to replace the cylindrical pad **57** shown in FIG. 1. The bracket **53** no longer being required to hold the pressure pad, it is replaced by an angular bracket **103** which fastens the leaf spring **52** and the upper shearing blade **51** to the side wall **2**. As is best seen in FIG. 5, the bottom face of the pressure pad **101** is recessed, and the recess **102** receives the imprint **105** on the severed label **104** while the label is being pressed against the surface **79** by the pad **101**, thus preventing smearing of the imprint if it is still wet during the pressing step.

The rear portion of the pad **101** beveled to prevent interference with the shearing blade **50** while permitting the severed label **104** to be applied to a precisely predictable portion of the surface **79**. Because of the sloping configuration of the blade **50**, the freshly severed rear edge of the label **104** moves toward the surface **79** in a straight path under the pressure of the relatively soft beveled portion of the pad **101**.

Foam rubber or resilient foam plastic having closed pores is the preferred material of construction for the pad **101**, and may also be employed to advantage in the other pressure pads described.

The apparatus of FIGS. 1 to 3, when modified in the manner described with reference to FIGS. 4 and 5 is operated by moving the housing **1** in a straight line toward the surface **79** to which a label is to be applied, and by removing the housing after resistance to the applied pressure indicates that the carrier lever **8** has reached its operative position shown in FIG. 5. The single motion necessary can be repeated in quick succession to label a long series of objects with a minimum of effort. The labels are firmly affixed because of the relatively high velocity at which the pad **101** approaches the surface **79** during the second phase of the operation, as described above.

The pad **101** may also be mounted on the carrier lever **8** if provisions are made to move the pad on the lever from a retracted to an active position as the lever approaches its operative position, and to retract the pad when the apparatus is lifted from the labeled surface.

One suitable mounting arrangement for the pad **101** on the lever **8** is shown in FIGS. 6, 7, and 8. The abutment roller **10** is replaced by an axially split roller **10***a* on the shaft **11** which also rotatably supports a sheet metal carrier **107** by means of integral hinge barrels **108** on the carrier. The latter extends readward from the shaft **11**, and a pressure pad **101** is cemented to its underside. A pin **109** transversely connects the flanges **12, 13** of the carrier lever **8**, and one end of a helical torsion spring **110** wound around the shaft **11** is hooked over the pin **109**. The other end of the spring **110** engages the carrier **107** and normally holds the pad **101** in the retracted position shown in fully drawn lines in FIG. 8, thereby permitting free forward feeding of a tape end **47'** during the first phase of operation as indicated by the arrow **111**. The front wall **3** of the housing **1** engages the carrier **107** during movement of the lever **8** from the intermediate to the operative position, and swings the pad **101** about the axis of the shaft **11** toward a label severed simultaneously by the shearing blades **50, 51**, and toward the surface **79** of the object which is to be labeled until the pad projects downward beyond the flanges **12, 13** of the lever **8**.

When the pressure pad is mounted on the carrier lever **8** while the ink pad **63** is mounted on the housing **1**, the pressure pad cannot be soiled with ink by a careless operator while the pad **63** is being re-inked or replaced as is conventional in printing devices of the type shown in FIG. 1.

FIGS. 9 and 10 illustrate yet another mounting arrangement for the pressure pad **101** on the carrier lever **8**. The apparatus which is identical with that illustrated in FIGS. 1 to 3 as far as not indicated otherwise hereinafter, has a carrier plate **113** of generally rectangular shape and provided with integral, projecting lugs **114** on its narrower sides. The lugs are received in rectangular guide slots **115** of the flanges **12, 13** which are elongated at right angles to the direction of elongation of the lever **8**, and locate the plate **113** between the contact roller **10** and the shearing blade **50**.

The front ends of the flanges **12, 13** are connected by a pin **109**, and one end of each of two helical torsion springs **116** coiled about the shaft **11** of the roller **10** is hooked over the pin **109**. The other end of each coil abuts from below against an associated lug **114**, thereby normally pressing the plate **113** against the top walls of the slots **115** and against the pin **109** so that the plate **113** slopes obliquely in a forward and downward direction when in the retracted position seen in FIG. 10 in fully drawn lines. The pressure pad **101** is cemented to the underside of the plate **113** and permits free discharge of label material as indicated by the arrow **111** until the pad is moved into the active position shown in chain-dotted lines by engagement with a bracket **3***a* on the front wall of the housing. The flat bottom face of the bracket is shaped so as to pivot the plate **113** into a position approximately parallel to the bottom edge of the flange **13**, and then to move the plate downward toward a surface **79** and a label arranged thereon as seen in FIG. 5, but not explicity shown in FIGS. 9 and 10.

If it is desired to operate the apparatus of FIG. 10 with a single spiral spring on the shaft **11**, a split roller **10***a* is employed as shown in FIG. 7, and the single spring provided centrally on the shaft **11** is hooked into a modified carrier plate **113'** from above, the plate **113'** being provided for this purpose with an integral, central eye (FIG. 11).

The label applying apparatus of the invention must be modified further if it is desired to affix labels to the top of a can whose cylindrical wall projects outward beyond the circular top wall, or to other surfaces which cannot be approached closely by the portion of the lever **8** which carries the pressure pad **101**. A suitable modification is illustrated in FIGS. 12 to 14.

As is seen in FIG. 12, the front wall **3** of the housing **1** carries a leaf spring **121** on its bottom end. The spring is obliquely inclined relative to the bottom edge **76** of the side wall **2** in a rearward direction, and its lowermost portion **122** is bent to present a convexly arcuate bottom

face. The spring **121** is stiff enough to overcome the resistance of the spring **116** omitted from FIGS. 13 and 14 for the sake of clarity, the spring **116** normally holding the plate **113** in the retracted position seen in FIG. 13 in fully drawn lines. The spring **121**, however, can readily be deformed by manual pressure applied by the operator to the housing **1**.

The spring **121** is long enough to press the pad **101** on the plate **113** out of the carrier lever **8** and into engagement with the object to be labeled even if the object is shaped to prevent movement of the lever **8** entirely into its usual operative position, as indicated in FIG. 13 by the angular relationship of the lever **8** and the surface **79**. The spring **121** also tilts the carrier **113** in the manner described with reference to FIGS. 9 and 10, and such tilting is facilitated by the rhomboidal shape of the modified guide slots **115'** in the flanges **12, 13**.

Because of the flexibility of the spring **121**, the same apparatus may also be employed on objects which are to be labeled on a fully accessible surface, as is seen in FIG. 14. The relationship of the pressure pad **101** and of elements moving with the pad to other portions of the apparatus is seen in FIG. 14 in the retracted and active positions of the pad which are represented by fully drawn and chain-dotted lines respectively.

The pressure pad **101** may also be mounted on the housing portion **1** of the label applying apparatus to replace the cylindrical pad **57**, and FIG. 15 shows as much of the otherwise unchanged apparatus of FIGS. 1 to 3 as is necessary for an understanding of this modification.

A rocker plate **125** is mounted on a shaft **126** between the side walls **2** near the bottom end of the front wall **3**. The plate **125** carries the pad **101** on its underside and is normally held by a torsion spring **127** in the obliquely tilted position seen in the drawing. When the carrier lever **8**, not itself seen in FIG. 15, approaches its operative position, it strikes the front edge **128** of the plate **125**, and swings the plate in the direction of the arrows **129** on the shaft **126** to place the pad **101** in its active position.

The modifications of the apparatus of FIG. 1 illustrated in FIGS. 6 to 15 are operated in the manner described above with reference to FIGS. 4 and 5. While the illustrated label applying devices offer outstanding advantages when operated manually, they may be incorporated in automatically operating machinery in an obvious manner. In such devices, the housing **1** may be fixedly mounted, and the carrier lever **8** may be swung about the pin **5** by engagement with an object to be labeled which is moved toward the housing.

Other modifications will readily suggest themselves to those skilled in the art on the basis of the foregoing teachings since only preferred embodiments have been illustrated and described.

What I claim is:

1. In a label applying apparatus having a support, pressure means on said support for pressing a label against an object when said support is moved toward said object, feeding means on said support for sequentially feeding labels in a continuous strand to said pressure means, said support having a housing portion and a carrier portion pivotally mounted on said housing portion for movement between a normal position and an operative position, abutment means on said carrier portion engageable with said object for moving the carrier portion from said normal position thereof toward said operative position when said housing portion is moved toward said object, and actuating means operatively interposed between said portions and connected to said feeding means for actuating the same during movement of the carrier portion from said normal position toward said operative position, the improvement which comprises:

(a) a rack member mounted on one of said portions for movement therewith, said rack member having a plurality of teeth arranged in a row;

(b) a pinion member mounted on the other portion for rotation by meshing engagement with said rack member during movement of said carrier portion from said normal position of said carrier member to a position intermediate said normal and operative positions,

(1) the length of said row being such that said pinion member engages the last tooth of said row in said intermediate position of said carrier portion and is disengaged from said rack member during movement of said carrier member from said intermediate position to said operative position; and

(c) connecting means operatively connecting said pinion member to said feeding means for operating the same while said pinion member is rotated by said rack member, friction in said feeding means being sufficient to substantially prevent rotation of said pinion member when disengaged from said rack member,

(1) whereby movement of said carrier portion from said normal position to said intermediate position is impeded by said friction, while movement of said carrier portion from said intermediate position to said operative position is unimpeded.

2. In an apparatus as set forth in claim **1**, said feeding means including two toothed rollers cooperating to engage said strand of labels therebetween, a portion of one of said rollers constituting said pinion member.

3. In an apparatus as set forth in claim **2**, means for varying the spacing of said rollers from each other and for thereby varying the feeding rate of said feeding means.

4. In an apparatus as set forth in claim **1**, type matter on one of said portions and a yieldable backing pad on the other portion, said type matter and said pad defining a printing station therebetween, said feeding means feeding said strand of labels through said printing station for engagement of said labels under pressure between said type matter and said pad during movement of said carrier portion from said intermediate position to said operative position.

5. In an apparatus as set forth in claim **4**, inking means for inking said type matter, said inking means including an ink pad normally spacedly interposed between said type matter and said backing pad in said printing station, and operating means responsive to movement of said carrier portion from said normal position to said intermediate position for wiping said inking pad on said type matter and for thereafter removing the inking pad from the printing station.

6. In an apparatus as set forth in claim **1**, cooperating shearing means on said housing portion and on said carrier portion for shearing a terminal label from said strand of labels in response to movement of said carrier portion into said operative position.

7. In an apparatus as set forth in claim **6**, said shearing means including a resilient mounting member on said housing portion and a first shearing blade on said mounting member, a second shearing blade on said carrier portion, and guide means on said carrier portion for guiding said first blade into shearing cooperation with said second blade during relative movement of said housing portion and said carrier portion.

8. In an apparatus as set forth in claim **1**, said pressure means including a pressure pad having a pressure face formed with a recess therein, printing means on said housing portion for printing indicia on said strand of labels prior to said feeding thereof to said pressure means, said feeding means including means feeding each label of said strand to said pressure means in a position in which said indicia are aligned with said recess in the direction of movement of said carrier portion from said intermediate position to said operative position.

9. In an apparatus as set forth in claim 3, said pressure means including a pressure pad mounted on said support for movement between a retracted position in which said pressure pad is retracted from the path in which said strand of labels is fed by said feeding means and an active position in which the pressure pad engages a label in said path, and operating means responsive to the movement of said carrier portion from said normal position to said operative position for moving said pressure pad from said retracted position to said active position.

10. In an apparatus as set forth in claim 9, said pad being mounted on said carrier portion for movement between said retracted position and said active position.

11. In an apparatus as set forth in claim 9, yieldably resilient means biasing said pressure pad toward said retracted position, said pressure pad being mounted on one of said portions of said support, and said operating means including an abutment on the other portion of said support engaging said pressure pad and moving the same against the restraint of said yieldably resilient means during said movement of said carrier portion.

12. In an apparatus as set forth in claim 1, yieldably

resilient means biasing said rack member into sequential engagement of said teeth thereof with said pinion member during movement of said carrier portion from said normal position to said intermediate position.

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U.S. Cl. X.R.

156—505, 523, 530, 577