United States Patent

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[54] **LABEL-FEEDING ATTACHMENT**
9 Claims, 13 Drawing Figs.

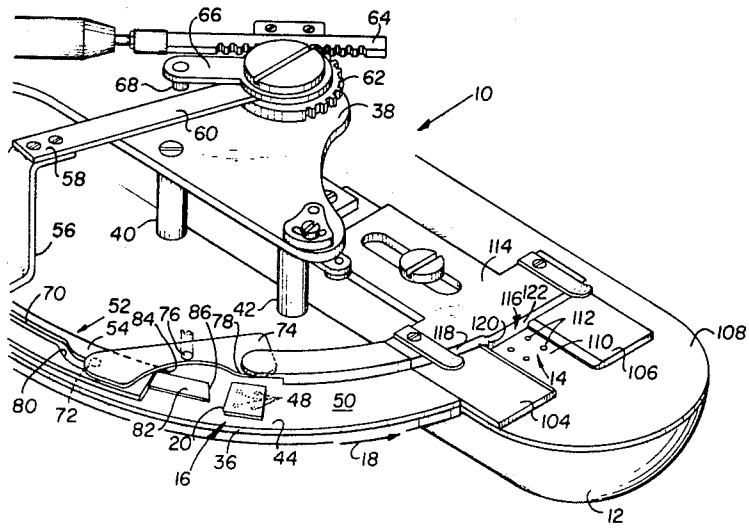
[52] **U.S. Cl.** **112/104**
[51] **Int. Cl.** **D05b 3/12,**
D05b 3/20
[50] **Field of Search** 112/104,
105, 265, 101, 88, 99, 100; 271/8, 10, 12, 45, 51,
69; 221/240, 156, 174

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ABSTRACT: A sewing machine attachment for working the bottom of a supply stack of labels so that the individual labels thereof are delivered, one at a time, to a sewing station. Each label is supplied folded in half and is delivered from an out-of-the-way supply station which, neither by obstruction nor otherwise, interferes with the sewing operation. Moreover, simultaneously with its delivery, an unfolding movement is produced in each label which greatly facilitates the placement of a garment or the like therein preparatory to sewing attachment thereof.



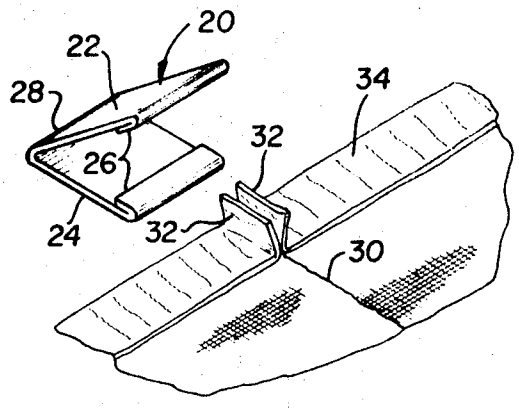


FIG. 2

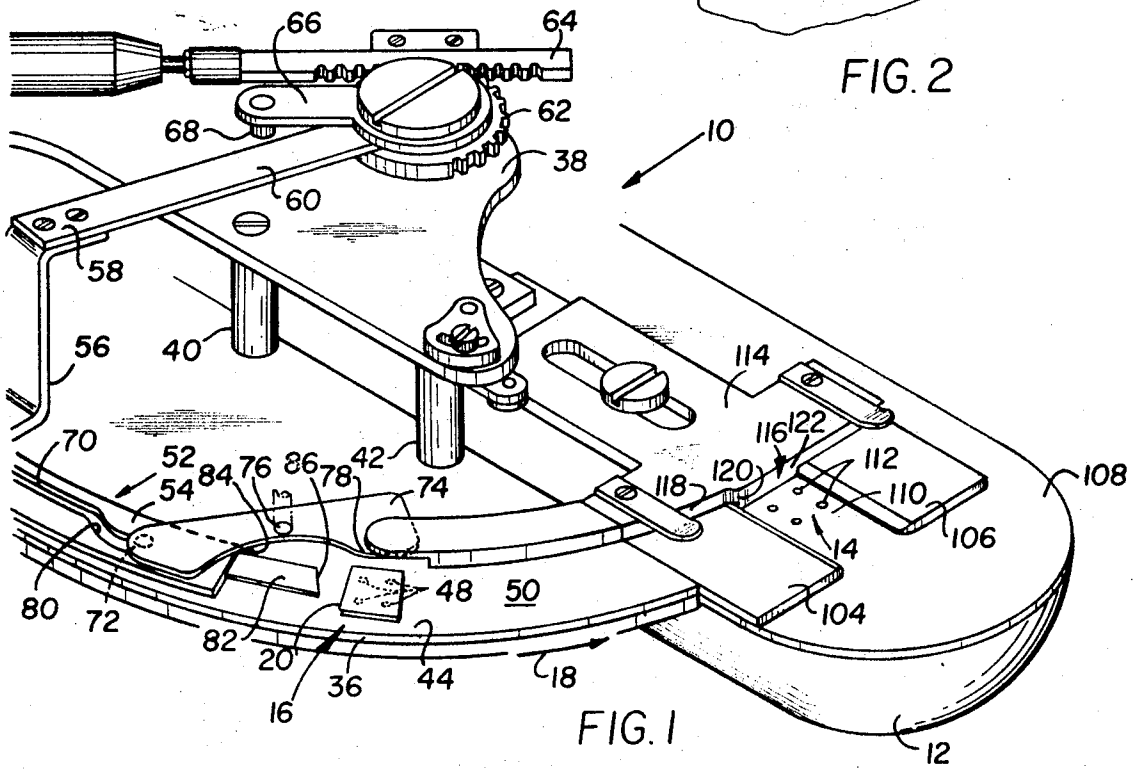


FIG. 1

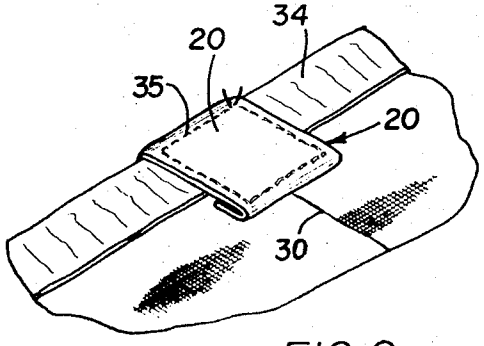


FIG. 2a

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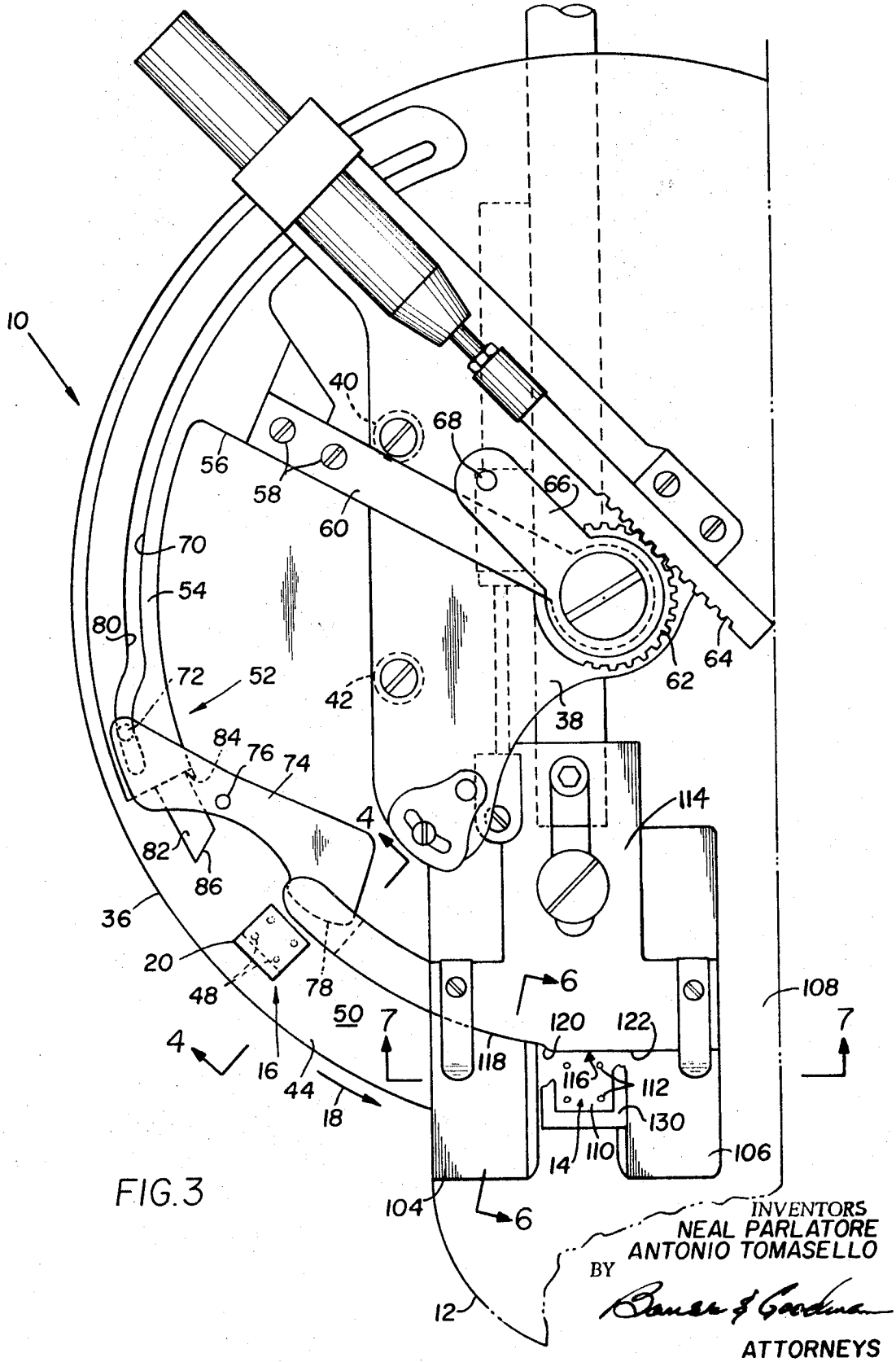


FIG. 3

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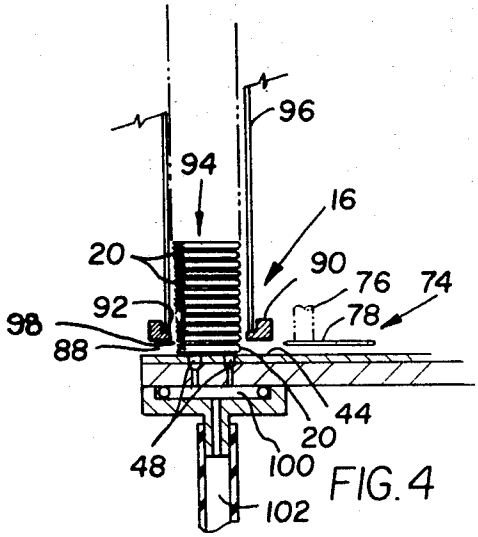


FIG. 4

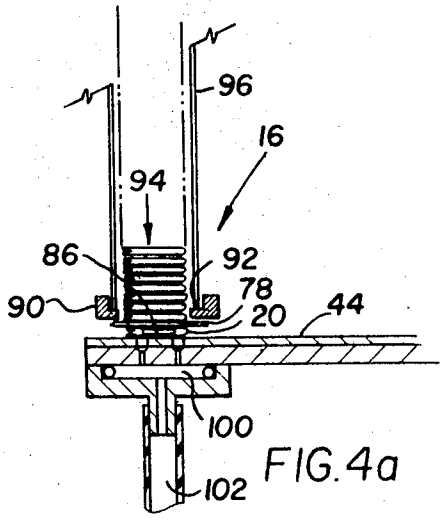


FIG. 4a

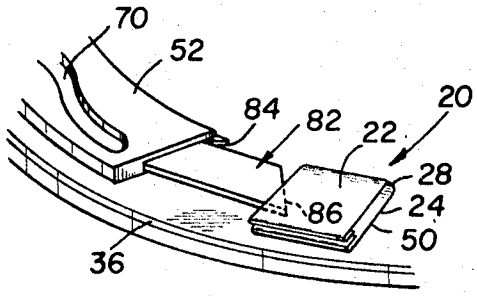


FIG. 5

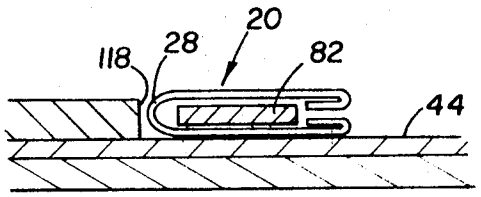


FIG. 6

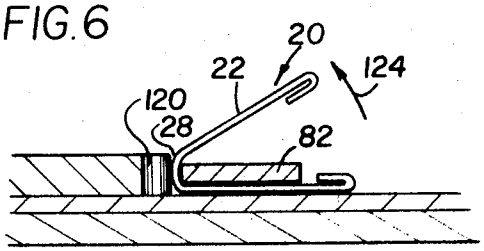


FIG. 6a

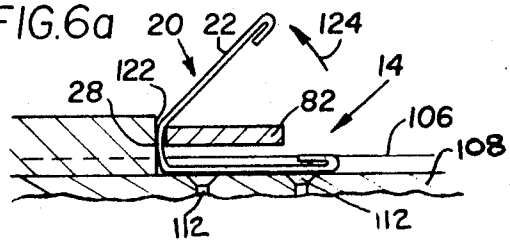


FIG. 6b

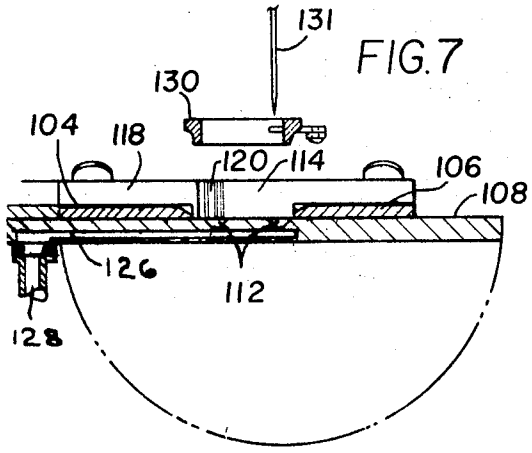


FIG. 7

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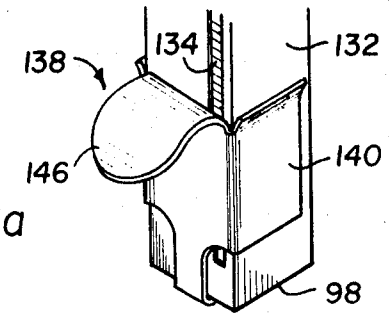
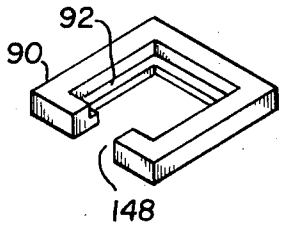


FIG. 8a



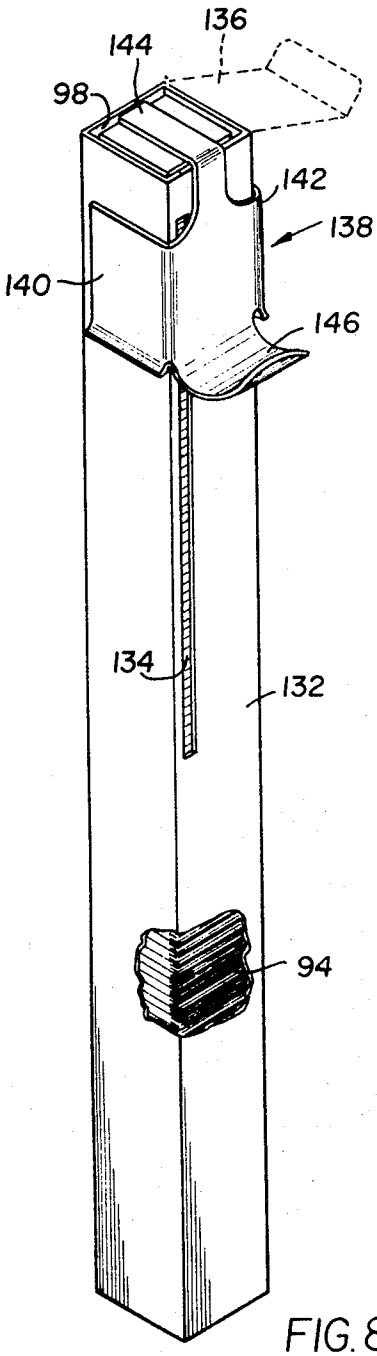


FIG. 8

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LABEL-FEEDING ATTACHMENT

The present invention relates generally to label-attaching procedures and equipment, and more particularly to an improved sewing machine label-feeding attachment.

The feeding of labels in coordinated relation to sewing machine operation is, in part, influenced by the type of label being handled. In the present situation, the involved label is one bodily folded upon itself along a side edge (as distinguished from an end edge) and adapted, in practice, to receive a garment or the like within its folded portions. Thus, at the sewing station, the free side edges of the label are in facing relation to the seamstress and consequently enable placement of the garment therebetween. This required orientation of the label at the sewing station, however, greatly complicates the label delivery problem and, in fact, renders inappropriate the label-feeding attachments now in prevalent use. These known attachments advantageously utilize gravity and feed in a generally vertically oriented chute or track, which is readily workable for an end-folded label, but not a side-folded embodiment.

With a side-folded label, a vertical feed path would, by and large, necessitate placement of the attachment in front of the sewing machine, thereby interfering with sewing operation, if only by visual obstruction. Thus, known label-feeding attachments, characterized by a vertical label feed path, are not entirely satisfactory.

Broadly, it is an object of the present invention to provide an improved sewing machine label-feeding attachment overcoming the foregoing and other shortcomings of the prior art. Specifically, it is an object to provide an efficiently operating horizontally oriented label feed, which can readily be located in an out-of-the-way side position, and which, without gravity feed, effectively delivers labels, in the desired orientation, to the sewing machine sewing station.

A label-feeding attachment demonstrating objects and advantages of the present invention includes label delivery means for transporting a side-folded label along a horizontal track into a sewing station, the fold of such label being rearwardly disposed during such transport so that at the sewing station the opposite free edges of the label face the seamstress. Moreover, during movement into place at the sewing station, the present invention contemplates producing an unfolding of the label parts which, in an obvious manner, facilitates the sewing attachment of the label to the portion of the garment or the like inserted within the label parts.

The above brief description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of a presently preferred, but nonetheless illustrative embodiment in accordance with the accompanying drawings, wherein:

FIG. **1** is a perspective view of a sewing machine sewing station to which individual labels are delivered by the label-feeding attachment hereof;

FIGS. **2** and **2***a* are perspective views illustrating the steps by which a typical garment is inserted in a label, and sewing attachment of such label to said garment is subsequently achieved;

FIG. **3** is a plan view illustrating structural features of the label-feeding attachment;

FIGS. **4** and **4***a* are side elevational views, in section taken on line **4**—**4** of FIG. **3**, illustrating the preparation of a label at a label supply station incident to the delivery thereof to said sewing station;

FIG. **5** is a partial perspective view illustrating the manner in which a label is engaged at the label supply station preparatory to being delivered to the sewing station;

FIG. **6** is a side elevational view, in section taken on line **6**—**6** of FIG. **3**, illustrating the condition of the label as it is being delivered into the sewing station;

FIGS. **6***a* and **6***b* are sectional views related to FIG. **6** and illustrating the progressive condition of the label during its delivery within the sewing station;

FIG. **7** is a front elevational view, in section taken on line **7**—**7** of FIG. **3**, illustrating structural details of the sewing station; and

FIGS. **8** and **8***a* are perspective views illustrating the loading of a supply stack of labels within the label-feeding attachment hereof.

Reference is now made to the drawings, and in particular to FIGS. **1**–**3**, in which the general overall construction and arrangement is illustrated of a sewing machine label-feeding attachment, generally designated **10**, demonstrating objects and advantages of the present invention. It will be understood that attachment **10** is part of auxiliary equipment for a sewing machine, the bed **12** of which is shown in FIGS. **1** and **3** and which, in a well-understood manner, defines a sewing station, as at **14**.

Operatively arranged in a laterally offset relation from the sewing station **14** is a label supply station, as at **16**, from which labels are individually delivered along a label feed path **18** into proper sewing position at the sewing station **14**. For clarity's sake, the magazine or housing for the supply stack of labels which is mounted at the supply station **16** is omitted from FIGS. **1** and **3** in order that the structural features and construction of the label delivery means can be better illustrated.

The labels which the attachment **10** is advantageously designed to handle are designated **20** in FIGS. **2** and **2***a* and is of the type having folded portions **22** and **24** which, in turn, each optionally has a folded inturned end **26**. Thus, each label **20** presents or has a fold like **28** along one edge thereof. Label **20**, as just described, is typically used to complete the construction of a garment back seam **30**, as by covering the abutting ends **32** of an elastic strip **34** sewn about the waist opening of the garment. As illustrated in FIG. **2***a*, label **20** is box stitched, as at **35**, in place at the top of the seam **30** in a manner concealing the elastic ends **32**. As can be readily appreciated, proper positioning of label **20** over the upper edge of the elastic **34** is facilitated by label **20** assuming an unfolded condition, as illustrated in FIG. **2**, which in an obvious manner enables the placement of the elastic **34** between the label-folded portions **22** and **24**. In accordance with the present invention, this favorable unfolded condition of label **20** is achieved simultaneously with the delivery thereof to the sewing station **14**.

The label-feeding attachment **10**, as clearly illustrated in FIGS. **1** and **3**, is advantageously supported by the sewing machine bed **12**. Specifically, attachment **10** includes a main support place **36** appropriately supported on the machine bed **12** and also an elevated support place **38** mounted on vertically oriented posts **40** and **42**. As already noted, for clarity's sake, the housing for the label supply stack which is located at the label supply station **16** has been omitted. It should be understood, however, that this housing is supported on the main support plate **36** at the label supply station **16**. Additionally, this magazine or housing, all as will be described in detail subsequently, includes a dispensing opening in facing relation to a label-receiving surface **44** which actually receives the bottom-positioned label **20** of the supply stack. Surface **44** includes four ports **48** machined therein through which a suction pressure is applied against the bottom label **20** for purposes of drawing this label firmly against the surface **44**. Thereafter, the bottom-positioned label **20** is transferred along a smooth surface portion of the plate **36** which herein serves as a track and which defines the previously noted label path of movement **18**. Specifically, label **20** is moved from station **16** along the path **18** into the sewing station **14**. The four ports **48** are closed by the lower surface of the label carrier **52** immediately after the label **20** has been removed from station **16**.

As may best be appreciated from a consideration of FIGS. **1** and **3**, the delivery of a label from label supply station **16** to the sewing station **14** is achieved by the pivotally mounted label carrier, generally designated **52**. Carrier **52** includes an arcuate member **54** which, at a medial location, has an upstanding bracket **56** which is connected, as at **58**, to the free end of a pivotally mounted actuating arm **60** connected to pinion gear **62**.

Pinion gear is journaled for rotation on the elevated support plate 38 and is in meshing engagement with an air-operated rack 64 so that a power stroke of the rack is effective in producing rotation in the gear 62 and corresponding rotation in the actuating arm 60. A member 66 is connected at one end, as at 68, to plate 38 and at its opposite end to a screw serving as a pivot axis of gear 62.

Arcuate member 54 includes a cam groove 70 which accommodates a depending cam follower 72 located on one end of a label separator blade 74 pivotally mounted, as at 76. At this point in the description, it is convenient to note in FIG. 3 that the opposite end or separator portion 78 of blade 74 is located rearwardly of the label supply station 16. As a consequence, movement of the member 54 in the direction 18 is effective in camming, when the follower 72 encounters the cam surface 80, the blade 74 through clockwise movement which projects the separator 78 over surface 44 of the label supply station 16. As will be pointed out subsequently, this movement of the separator portion 78 is effective in isolating the bottom-positioned label 20 from the remainder of the supply stack of labels to permit unimpeded movement of label 20. The bottom label 20 is moved from beneath the separator 78 on track 50 along the label path of movement 18 to the sewing station 14.

Each bottom-positioned label 20 is successively transported to the sewing station 14 on a label-holding or blade member 82 which projects from the front of the arcuate member 54 in the direction 18. Blade 82, as shown in FIG. 3, has a corner-receiving notch 84 machined along its back edge and also includes a tapered front edge 86 which facilitates entry of the blade body between the folded portions of the bottom-positioned label 20. This is clearly illustrated by progressive examination of FIGS. 4–6, to which reference is now made.

As clearly illustrated in FIG. 4, appropriately mounted with a clearance 88 above surface 44 of the label supply station 16 is a generally rectangular mounting bracket 90 having a bottom ledge 92 which supports a vertically oriented supply stack 94 of individual labels 20. Stack 94 is actually contained within a box 96, the lower edges of which bound a dispensing opening 98. Stack 94 thus moves under the influence of gravity and of the vibratory movement (derived from its connection with the sewing machine which vibrates during operation) through the opening 98 into contact with surface 44. As previously noted, surface 44 includes ports 48 which communicate via a network of passageways 100 with a source of suction pressure 102 which is thus applied against the bottom-positioned label 20. This label is thus drawn firmly against surface 44 so that movement of the separator portion 78 during pivotal movement of blade 74 about its pivot 76 results in the movement of the separator 78 within the clearance 88 and into the stack 94 at the juncture of the bottom-positioned label 20 and the label positioned directly above it. This interposed position of the separator portion 78 is illustrated in FIG. 4*a* wherein it can be seen that the bottom-positioned label 20 is effectively isolated by the separator 78 which positions the label 20, and also contributes to the support of the upper remaining portion of the label supply stack 94, which, therefore, enables unimpeded movement of the bottom-positioned label 20 from beneath the separator portion 78 and the transportation thereof to the sewing station 14. Separator 78 could be a wire or air jet which functions as a label-positioning means to position label 20 to enable unimpeded movement away from the label supply stack 94.

More specifically, once separator 78 is positioned above the bottom-positioned label 20, the mode of operation of the attachment 10 contemplates the termination of the application of suction pressure against the label 20 and the movement of blade 82 between the folds of the label, all as is clearly illustrated in FIG. 5.

As clearly illustrated in FIG. 5, movement of the blade 82 in the direction 18 results in the front edge 86 thereof being projected between the label folded portions 22 and 24. Ultimately, blade 82 is extended fully within the folds of the label 20 until the left-hand edge (as viewed in FIG. 5) of the fold line 28 seats in the notch 84. When this occurs, label 20 is then in a folded relation about the blade 82 and, of course, will be moved simultaneously with the movement of blade 82 along the track 50 to the sewing station 14.

As may best be appreciated from a consideration of FIG. 1 and FIGS. 6, 6*a*, and 6*b*, sewing station 14 includes a pair of spaced-apart plates 104 and 106 which cooperate with the upper surface 108 of the machine bed 12 to define a recess or nest 110 for the label 20 destined to be delivered to the sewing station 14. The portion of surface 108 coextensive with the nest 110, like surface 44 at the label supply station 16, is provided with suction ports 112 through which a suction pressure is applied to firmly draw the label 20 within the nest 110. Nest 110 is bounded at its remote edge by a slidable ejector plate 114 presenting a forward edge or wall, generally designated 116, which, by virtue of its advantageous location is utilized, in a manner which will now be described, for the favorable handling of the label 20 to facilitate the subsequent sewing operation.

Specifically, wall 116 has a first encountered section 118 which runs adjacent track 50 and has a slight forward inclination towards the sewing station 14. Just beyond section 118 there is an abrupt severely angularly inclined section 120 and then a substantially flat wall section 122 which actually borders or bounds the nest 110. As clearly shown in FIG. 6, during the delivery of label 20 to the nest 110, the label fold line 28 or, in any event, the area adjacent this fold line, actually moves in a clearance position past the wall section 118. However, the inclination of wall section 118 ultimately projects this wall section and, certainly, the severely angularly inclined wall section 120 into the path of movement of label 20 which results in physical contact of the label fold line 28 against the wall section 120 and the flattened section 122 which is a continuation thereof. This is depicted in FIGS. 6*a* and 6*b*As a consequence, the label fold line 28 assumes the flattened shape of the wall section 122 and results in unfolding movement 124 of the upper folded portion 22 of the label. This unfolded condition of the label 20, in an obvious manner, facilitates the placement of the portion of a garment of the like within the label preparatory to the sewing attachment of the label thereto, all as was previously described in connection with FIGS. 2 and 2*a*.

As in the case of the label supply station 16, at sewing station 14, a suction pressure is applied through the ports 112 via passageways 126 from an appropriate source 128 in order to firmly hold label 20 within the nest 110. Once this is accomplished, blade 82 is stripped or moved in the reverse direction from between the folded portions of the label 20 and is returned to its ready position of FIG. 1 preparatory to a next cycle of operation.

After removal of the blade 82, a garment or the like, as already noted, is inserted within the unfolded label 20 and a clamp or foot 130, as illustrated in FIG. 7, is lowered against and causes closing movement of the label portion 22 upon the garment. The sewing machine is then operated in a conventional manner during which there is simultaneous reciprocating vertical movement of the sewing needle 131 and movement of the foot 130 throughout a rectangular path which results in the already-noted corresponding rectangular stitch pattern 35. After completion of the sewn attachment of label 20 about the garment elastic 34, the operation of the sewing machine, again consistent with conventional operation, contemplates the lifting of the foot 130 and forward movement of the ejector 114 resulting in the ejection of the work from the machine bed 12.

In the foregoing description of operation, it was noted that a label-holding suction pressure is applied against the label both at the label supply station 16 and at the sewing station 14. This application of suction pressure is, of course, not required at the same time since it is required only when there is a label being handled at these respective stations. Accordingly, it is contemplated that the application of the suction pressure at the stations 16 and 14 be applied sequentially or in tandem

with the result that the previous operation can be readily achieved through the expedient of an ordinary air valve.

Further noteworthy features of the invention are shown in FIGS. **8** and **8***a* which illustrate the preferred manner of loading a supply stack of labels **94** within the attachment **10** hereof. The supply stack **94** is supplied to the user in an outer box **132** which can, in a preferred embodiment, have the elongated slot **134** which provides the user with an indication of the number of labels on hand. The container or box **132** has usual closure flaps at opposite ends, flap **136** being shown in FIG. **8**. Removal of flap **136** uncovers the previously noted dispensing opening **98** which, as previously described in connection with FIG. **4**, must be placed in an inverted position on the supporting lip **92** of the bracket **90**.

To obtain inversion or turning of the box **132** without spilling of labels therefrom, use is made of a loading aid or device, generally designated **138**. Device **138** includes opposite sidewalls **140** and **142** which slip about and engage the sidewalls of the container **132**. An L-shaped holding member **144** is so positioned on the device **138** as to project across and serve as a closure for the dispensing opening **98**, all as is clearly illustrated in FIG. **8**. Movement of the member **144** into the opening **98** is facilitated by the user pushing down on the curved handgrip **146**. The box **132** is then in condition to be inverted or turned 180° into the position illustrated in FIG. **8***a*. In this position, the lower or dispensing end **98** is then placed within the central opening of the bracket **90** until it is seated against the inwardly projecting supporting ledge **92**.

An opening **148** in the front wall of the mounting bracket **90** provides the necessary clearance for sliding removal of the holding member **144** from about the bottom of the container **132**. Upon removal of the holding device **138**, there is gravity movement of the label stack **94** into contact with the label supply station surface **44**.

From the foregoing, it should be readily appreciated that there has been described herein an efficiently operating label-feeding attachment **10** for working a supply stack of labels from its bottom and feeding labels thereof, one at a time, from a laterally offset location, as at **16**, to a sewing station **14** directly in front of the seamstress or sewing machine operator. Accordingly, there is no interference by the attachment **10** with sewing, either by obstructing the view of the seamstress or in any other way adversely effecting the operation of the sewing machine. Moreover, not only is a folded-type label **20** delivered to the sewing station **14**, but simultaneously with its delivery, the label is placed in an advantageously unfolded condition which facilitates the placement of the workpieces within its folded parts and thus significantly lessens the time, handling and expenses involved in this sewing operation. This small saving with each operation in turn results in a highly significant and substantial saving because of the highly repetitive nature of label-attaching procedures in the manufacture of most garments and the like.

A latitude of modification, change and substitution is intended in the foregoing disclosure, and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. In combination, a sewing machine having means defining a sewing station and a label-feeding attachment therefor, said attachment comprising a label supply station located in a laterally offset relation to said sewing station, storage means at said label supply station for plural labels of the type having folded portions representing a fold line defining one edge thereof, a track means defining a label path of movement from said label supply station to said sewing station, a label carrier operatively arranged for movement effective to transport a label along said track means, a holding member extending from said label carrier in said direction of said label path of movement effective to transport a label thereon in folded-over relation and with said fold line rearwardly disposed along said holding member, and label unfolding means located adjacent said track means at said sewing station effective to establish contact with said label fold line so as to produce unfolding movement in the upper of said label-folded portions, whereby there is facilitated positioning of a garment or the like within said unfolded label preparatory to the sewing attachment of said label.

2. A sewing machine label-feeding attachment as defined in claim **1** wherein said label-unfolding means comprises a surface operatively effective to cooperate with an adjacent surface of said label-carrier-holding member to engage said label therebetween in areas adjacent said fold line thereof so as to produce said unfolding movement in said one label portion.

3. A sewing machine label-feeding attachment as defined in claim **1** including a label-positioning means at said label supply station operatively arranged to coordinate with the movement of said label carrier to position the bottom label to permit unimpeded feeding movement of said bottom label away from said supply stack toward said sewing station.

4. A sewing machine label-feeding attachment as defined in claim **2** including label-holding means at said label supply station and at said sewing station effective to apply a suction pressure upon a cooperating label thereat.

5. A sewing machine label-feeding attachment as defined in claim **4** wherein said track means is horizontally oriented and said label storage means is vertically oriented.

6. A sewing machine label-feeding attachment as defined in claim **5** including a label-separating blade at said label supply station operatively arranged in response to movement of said label carrier to enter said supply stack of labels so as to position the bottom label to permit unimpeded movement of said bottom label away from said supply stack toward said sewing station.

7. A method of dispensing labels from a supply stack thereof to remote sewing station preparatory to the sewing attachment thereof, said labels being of the type having folded portions presenting a fold line defining one edge thereof, said method comprising the steps of orienting said label supply stack vertically, successively positioning the then bottom label of said label supply stack so as to permit unimpeded feeding movement of the bottom-positioned label, and causing said feeding movement of said bottom-positioned label into said sewing station while simultaneously causing flattening in the area of said label coincident with said fold line, whereby said dispensed label partakes of unfolding movement to thereby facilitate the placement of a garment or the like therein.

8. A method of dispensing labels as defined in claim **7** including the step of applying a suction pressure against said bottom-positioned label while it is a part of said supply stack to facilitate positioning said label so as to permit unimpeded feeding movement of said bottom-positioned label toward said sewing station.

9. A method of dispensing labels as defined in claim **8** including the further additional step of applying a holding suction pressure against said bottom-positioned label at the time of delivery thereof to said sewing station.