Nov. 29, 1949 G. W. VON HOFE 2,489,836

LABELING MACHINE

Filed Dec. 28, 1944 2 Sheets-Sheet 1

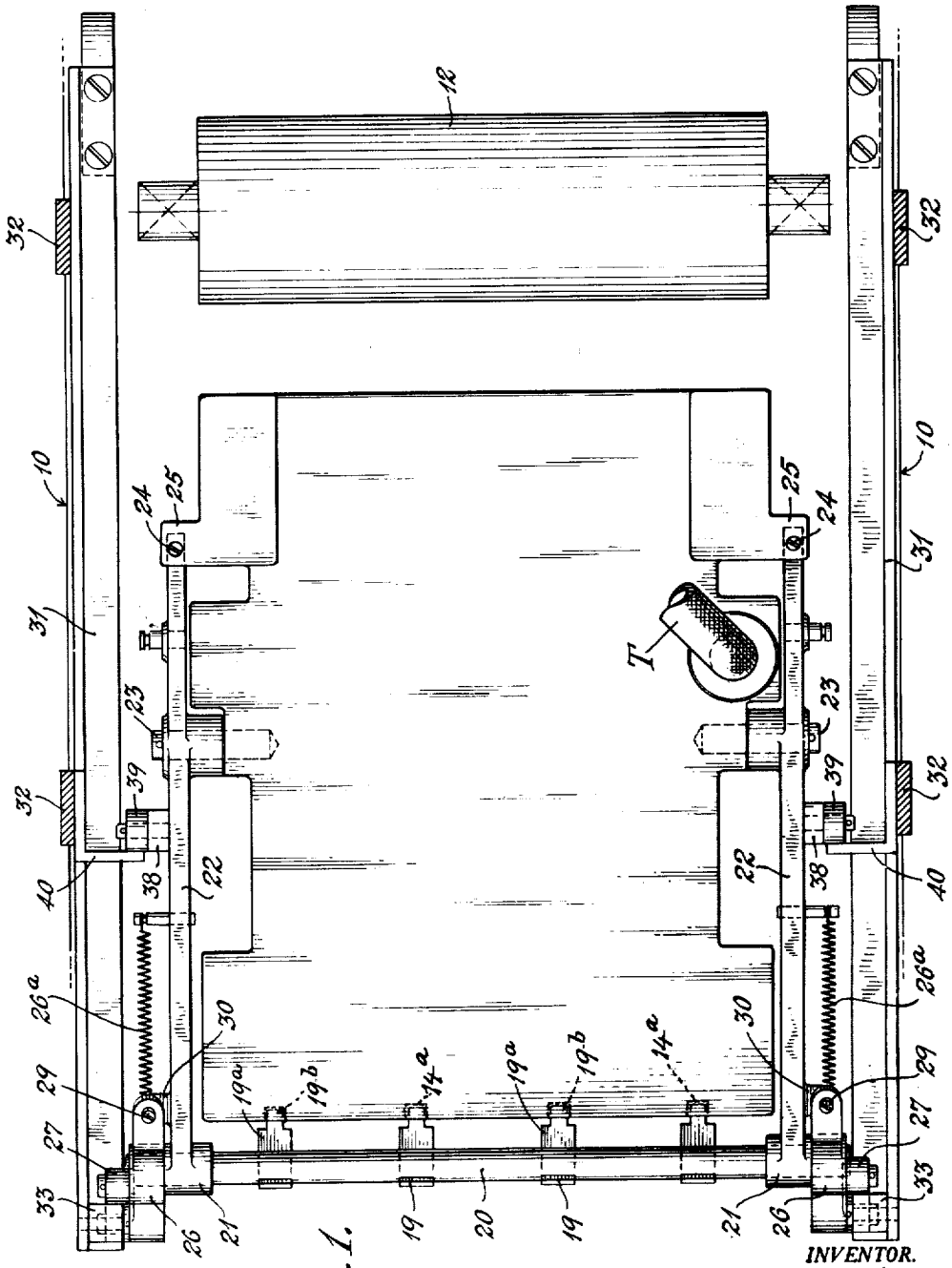


Fig. 1.

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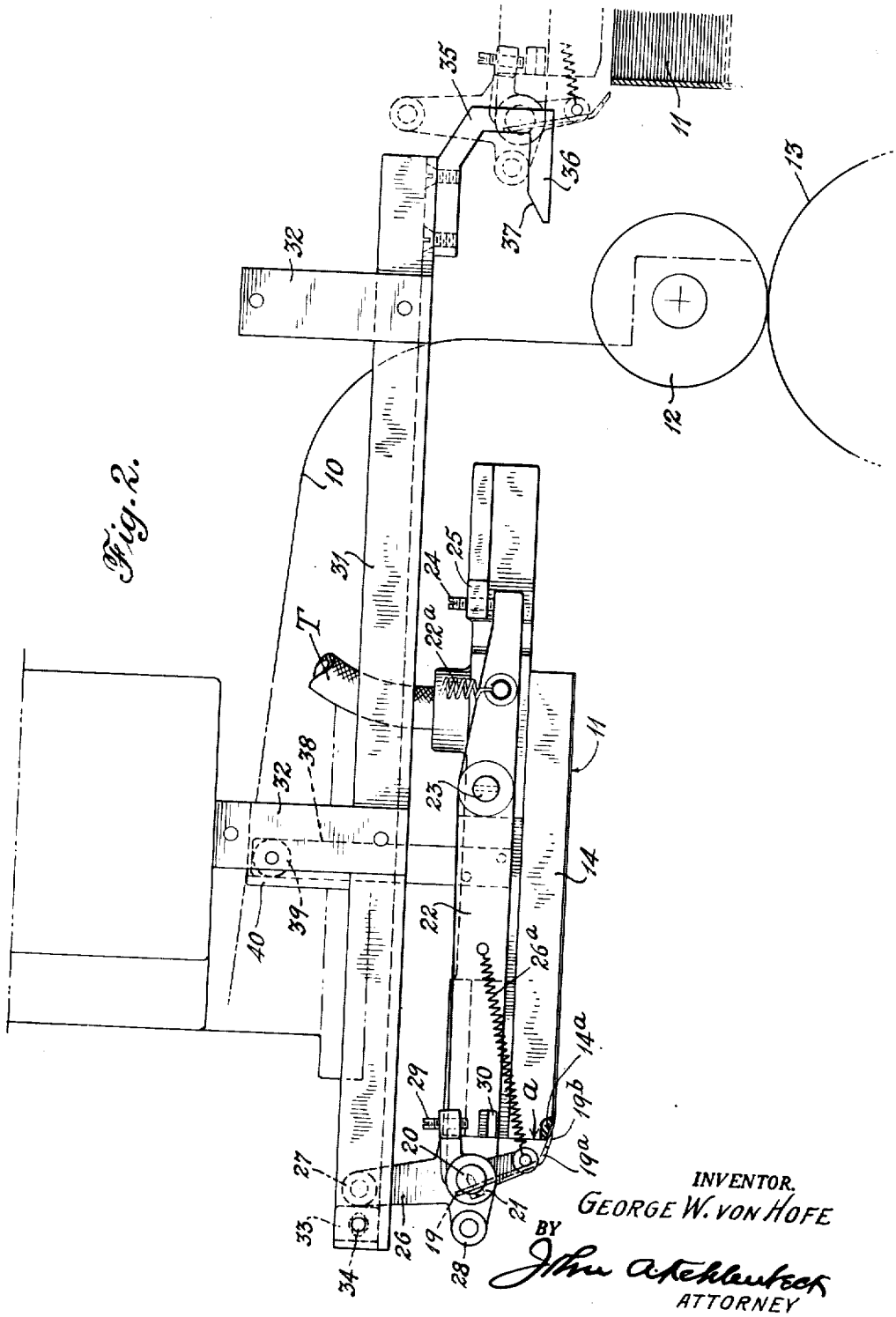


Fig. 2.

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UNITED STATES PATENT OFFICE

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LABELING MACHINE

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10 Claims. (Cl. 216—55)

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The invention relates to labeling machines and more particularly to that type of such machines in which the labels are carried by transfer means from one point or station in the machine to another point or station therein and in which the carried labels are subjected to a step in the operative cycle of the machine, during said transfer. Machines of the class under discussion are exemplified by those in which the labels, in transit between a pick-up station and an applying station, are provided with a coating of adhesive by means of an adhesive applicator.

The invention has for its object to provide such machines with novel means cooperating with the transfer means to prevent the labels carried thereby from being disturbed during transit, prior to their application to the articles for which they are intended.

The invention has for another object to provide said labeling machines with novel means cooperating with the transfer means to prevent the labels from adhering to the adhesive applicator during the adhesive-applying operation.

The invention contemplates further the provision of a novel arrangement associated with the label transfer means whereby a label carried by the latter is prevented from unintentionally being detached from said transfer means, for instance, as a result of adhering to the surface of the adhesive-applying roller as said label passes in adhesive-receiving relation therewith.

Another object of the invention is to provide a novel arrangement designed specially for increasing the operative efficiency of mechanism for applying labels of large dimensions.

Other objects will appear from the description hereinafter and the features of novelty will be pointed out in the claims.

In the accompanying drawings, which illustrate an example of the invention without defining its limits,

Fig. 1 is a sectional plan view of the labeling machine and the novel mechanism; and

Fig. 2 is an elevation of the novel mechanism in place in the labeling machine.

The labeling machine, as such, may be of any well-known type such as, for instance, includes adhesive-applying means and carrying or transfer means for carrying a label in adhesive-receiving relation with said applying means to receive a coating of adhesive therefrom, as shown, for instance, in my United States Patent No. 2,227,816 of January 7, 1941.

Such labeling machines comprise a suitable supporting frame 10 on which a supply of labels

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11, generally in the form of a stack, is supported at a pick-up station in operative relation to an adhesive-applying means which may include an adhesive-applying roller 12 and an adhesive distributing roller 13 or their equivalent, mounted on the frame in any convenient manner. At the label-applying station of the machine, provision is made for supporting the articles to be labeled in label-receiving position for instance on a suitable article support which in turn is located in operative relation to the adhesive-applying means and other cooperating instrumentalities of the machine.

The machine may further comprise transfer means whereby successive terminal labels 11 are removed from the supply stack and carried in traveling adhesive-receiving relation to the adhesive-applying roll 12 or its equivalent to progressively receive a coating of adhesive therefrom and subsequently to apply the adhesive-coated label at the applying station to the article for which it is designed.

In the illustrated example, the transfer means is of the suction operated type and comprises a suction head 14 connected by means of a tube T with a source of suction and mounted for vertical reciprocation on a carriage capable of being horizontally reciprocated on a guide rail by suitable mechanism which may include an arm carried by a rock-shaft as shown in my Patent No. 2,227,816. The arrangement is such that the shaft is rocked to thereby correspondingly oscillate the arm and thus reciprocate the carriage and with it the suction head 14 between the label pick-up station and the label applying station and vice versa.

At the pick-up station, the suction head 14 is vertically operated to pick up the terminal label 11 from the supply stack and to lift said label in surface engagement with the active face of said suction head 14 in the customary manner. The suction head 14 is then shifted to the left and carries the label 11, which is located on the active surface of the suction head 14 at the time, into traveling adhesive-receiving relation with the adhesive-applying roll 12 to progressively receive a coating of adhesive therefrom.

These operative steps finally bring the suction head 14 carrying the adhesive coated label 11 to the applying station. At this point, the suction head 14 is moved downwardly to apply the label 11 to the article on the support at the time.

At the proper moment, suction in the suction head 14 is relieved and the latter is raised to leave the applied label 11 on said article, and to

return, at a level above the adhesive-applying roll 12, to the pick-up station for another cycle of operations.

As the label 11 on the transfer means is carried in adhesive-receiving relation to the applying roll 12, said label 11 tends to adhere to said roll 12 and unless provision is made to prevent it, it is detached from the suction head 14 and wrapped about the surface of said roll 12 with obviously objectionable results.

Various arrangements have been provided for overcoming the aforesaid objection, such as, for instance, forming annular grooves at spaced intervals in the peripheral surface of the applying roll 12 for the reception of tangentially located stripping fingers to prevent adhesion of the label being coated, to said applying roll. The aforesaid grooves in the surface of the applying roll result in dry strips in the applied coating of adhesive or in other words, the coating of adhesive is interrupted and parts of the surface of the label remain uncoated with adhesive. In labels of large dimensions, the total dry or adhesive free area may be relatively large, and in any case, may prevent efficient adhesion of the label to the article.

The instant novel arrangement avoids the aforesaid disadvantages and efficiently maintains the carried labels against unintentional detachment from the transfer means throughout its travel from the pick-up station to the applying station or equivalent range of travel. In the illustrated example, the novel arrangement makes it possible to apply an unbroken overall coating of adhesive to the label regardless of its dimensions, in an efficient and uniform manner.

In the form shown in the drawings, the novel arrangement comprises gripping members 19 carried by a shaft 20 in tangential relation thereto and fixed thereon at spaced intervals in predetermined numbers dependent upon the dimensions of the suction head 14 and the type of labeling being done. The members 19 at their lower ends terminate in transverse members 19—*a* which in turn, as shown in Figure 1, are formed with relatively reduced gripping fingers 19—*b* arranged to cooperate with recesses 14—*a* formed in the active face of said suction head 14, to develope a clamping action on the label carried thereby, as will be more fully set forth hereinafter. In some cases, the arrangement may include a single gripping member 19 and its associated elements.

In the illustrated example, the shaft 20 extends lengthwise of the suction head 14 in contiguous relation to the leading edge *a* thereof, and is journalled in bearings 21 carried by rocking levers 22. The latter are pivotally mounted at 23 on the suction head 14 at opposite sides thereof, and are influenced by springs 22—*a* having one end attached to a lever 22, and the other end connected with the slide of the machine. At one end, said levers 22 each project beneath and in registry with a depending stop screw 24 adjustably mounted on a lug 25 forming part of the suction head 14 at opposite sides thereof as shown in Fig. 1.

The shaft 20, at its opposite ends, projects outwardly beyond the bearings 21, and on these projecting ends carries bell-crank levers 26, acted on by springs 26—*a* connected therewith and with pins on the levers 22. The arms of the bell-crank levers 26 are provided with rollers 27 and 28, respectively, as shown. Each bell-crank lever 26 includes a third arm on which a stop-screw 29 is adjustably mounted for cooperation with an associated stop-lug 38 projecting from the contiguous rocking lever 22 to arrest the pivotal movements of the bell-crank levers in one direction as will appear more fully hereinafter.

In the operation of the machine, the bell-crank levers 26 and their associated parts partake of the reciprocating movements of the suction head 14, with the rollers 27 each moving lengthwise of an angle-member 31 fixed in a stationary position on the frame 10 at opposite sides thereof in any convenient manner as by brackets 32. At its one end, or specifically in the instant arrangement, at its left hand end, each member 31 is provided with a stop device 33 located in the path of one of the rollers 27 and preferably adjustably mounted in place, for instance, by means of a screw and slot 34. At the other end, specifically the righthand end, a bracket 35 is fixed upon and depends from each of the angle members 31, said brackets each including a horizontal member 36 having a camming section comprising an inclined or bevelled surface 37 as shown in Fig. 2. Each surface 37 is located in the path of one of the rollers 28 when the latter occupy positions predetermined by the clamping positions of the gripping members 19. The stop-devices 33 and the horizontal members 36 with their bevelled surfaces 37 are located in contiguous operative relation to the termini of the reciprocating operative movements of the suction head 14, respectively, for the purpose of operating the gripping members 19 in proper timing in the operative cycle of the machine as will be more clearly set forth hereinafter.

In addition to the parts so far described, each lever 22 may be provided with an upwardly-extending member 38 provided near its upper end with a roller 39 adapted to cooperate with an angle iron 40 suitably fixed upon one of the brackets 32 as shown in Fig. 1.

As the suction head 14 approaches the terminus of its right hand movement toward the pick-up station for the purpose of picking up a terminal label 11 from the supply stack, the rollers 28 will engage the bevelled surfaces 37 and come to rest on the upper surface of the horizontal member 36 as shown by dotted lines at the right in Fig. 2. As this occurs, the surfaces 37 will develope a camming action on the rollers 28 whereby the levers 22 are rocked on their pivots 23 and the bell-crank levers 26 are pivotally actuated relatively to said levers 22 to rock the shaft 20 in a direction to shift the gripping members 19 to inoperative positions and thereby remove the gripping fingers 19—*b* out of the recesses 14—*a* and out of clamping engagement with the suction head 14, as shown by dotted lines in Fig. 2. This adjustment of the gripping fingers 19—*b* to inoperative positions is such as to avoid interference by said fingers 19—*b*, with the downward movement of the suction head 14 into contact with the supply stack of labels 11.

As the terminal label 11 is lifted from the stack by the suction head 14 and said suction head and label travel to the left toward the applying station, the roller 28 will leave the member 36 and travel downwardly on the bevelled surface 37 and enable the springs 22—*a* to rock the levers 22 on their pivots 23, and the bell-crank levers 26 to be actuated by the springs 26—*a* to rock

the shaft 20 in a direction to shift the gripping fingers 19—*b* back into the recesses 14—*a*, to clamp the advancing forward edge of the label 11 in place on the suction head 14.

In this condition, the label 11 is carried by the suction head 14 in adhesive-receiving relation to the adhesive applying roller 12 and receives an overall coating of adhesive therefrom. The clamping action of the gripping fingers 19—*b* on the advancing forward edge of the carried label 11, prevents the latter from adhering to the roller 12 and wrapping itself around the same. As a result, each label 11 carried by the suction head 14 is efficiently coated with adhesive and in the continued travel of the suction head 14 is transported toward the label applying station of the machine. As this station is approached, the rollers 27 finally will engage the stop devices 33, and, in proper operative sequence, the rollers 39 will contact the respective angle irons 40.

As the movement of the suction head 14 to the left continues subsequently to the aforesaid contact of the rollers 27 with the stop devices 33, corresponding movement of the rollers 27 will be arrested by said stop devices 33 to cause the latter to develop a force on said rollers 27 whereby the bell-crank levers 26 will be pivotally actuated to rock the shaft in a direction to swing the gripping members 19 and shift the gripping fingers 19—*b* out of the recesses 14—*a* of the suction head 14. In proper timing, the rollers 39, by engagement with the angle irons, will press the members 38 in a manner to pivotally actuate the levers 22 and supplement the operation of the levers 26. The fingers 19—*a* are thereby adjusted to inoperative positions to release the label carried by the suction head 14 at the time, from the gripping action thereof, and so as not to interfere with the application of the labels to the articles.

In proper timing, the suction head 14 with the adhesive-coated label supported on the active face thereof, is moved downwardly in any suitable manner as by means of the mechanism illustrated in my Patent No. 2,227,816 previously mentioned herein. As previously stated, the inoperative positions of the gripping members 19 and the gripping fingers 19—*b* thereof, are such as not to interfere with the proper deposit of said label on the article located in label-receiving relation at the time, on the support 13. At the proper moment, suction in the suction head 14 is relieved by mechanism, for instance, such as disclosed in my previously-mentioned patent, and the suction head is raised to leave the label 11 in adhesive connection with said article in an initial deposit thereon.

In proper timing, the suction head 14 is raised by suitable mechanism such as, for instance, illustrated in my previously-mentioned patent, to a level above the adhesive-applying roller 12 and then shifted to the right until said suction head 14 is again positioned above the stack of labels 11 whereupon the cycle of operations herein described is repeated.

In proper timing with the aforesaid operations, a suitable pressure member such as, for instance, illustrated in my previously-mentioned patent is caused to develop a pressure on the initially-deposited label whereby the adhesive application of said label to said article is completed.

The novel mechanism is simple in construction and provides means of maximum efficiency for preventing successive labels carried by the suction head 14 from being unintentionally detached therefrom during conveyance or specifically from adhering to the adhesive-applying roller 12 in the transfer of a coating of adhesive therefrom to said labels and being thereby detached from said suction head 14. The arrangement is such that in the illustrated example of the utility of the novel arrangement, an overall coating of adhesive is applied to each label, free from any dry spots, which is of importance particularly in labels of relatively large dimensions for which the novel mechanism is particularly adapted. As a result, the labels are adhesively attached to the articles for which they are designed in an efficient manner regardless of the external shape or dimensions of said articles.

The novel mechanism is capable of being readily introduced into existing labeling or other machines, and at the same time, may be combined with labeling and other machines of special design involving special operative cycles such as applying labels distinctive, for instance, in the matter of dimensions.

Although the present invention has been described in conjunction with a preferred embodiment, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such variations and modifications are considered to be within the purview and scope of the claims.

I claim:

1. In a machine having an operative cycle including the step of transferring sheet material from one point of said machine, past means for operating on said sheet material, to another distant point therein over a given path of movement, the combination of transfer means for picking up said sheet material in a given position at a predetermined point of said path and holding and carrying said sheet material through the field of action of said operating means, in said given position for delivery therein to another predetermined distant point of said given path, adjustable means movable with said transfer means and operating to prevent the rupture of its hold on said sheet material through such field of action and for maintaining said sheet material in said given position on said transfer means throughout said path of movement, and independent means operable respectively at said predetermined points of said path for shifting said adjustable means to an inoperative position thereat to enable said sheet material to be picked up in said given position and delivered therein at said another point of said path.

2. In a labeling machine including a supply stack of labels, an adhesive-applying roller, and a reciprocating suction head for removing successive terminal labels from said stack and carrying each label in traveling adhesive-receiving relation to said adhesive-applying roller to progressively receive a coating of adhesive therefrom, that improvement which comprises a rock-shaft journalled on said suction head and partaking of the movements thereof, a gripping member mounted on said rock-shaft for clamping a label on said suction head to prevent said label from adhering to said adhesive-applying roller in the application of said coating of adhesive, a bell-crank lever fixed on said rock-shaft, rollers mounted on the respective arms of said bell-crank lever, a cam member located in associated relation with one end of the reciprocating movements of said suction head for engagement by one of said rollers to operate said rock-shaft and shift

said gripping member to an inoperative position to enable said suction head to remove the terminal label from said stack, and a stop device located in associated relation with the other end of said reciprocating movements of said suction head for engagement by the other of said rollers to operate said rock-shaft and shift said gripping member to an inoperative position to avoid interference with the deposit of the label on an article by said suction head.

3. In a machine for applying adhesively coated sheet material to articles, movable means having a sheet supporting surface for transferring such sheet material from one point on said machine to a point spaced therefrom, a rock-shaft, means on said transfer means for rotatably supporting said shaft, said supporting means being mounted for pivotal movement on said transfer means to enable said shaft to be shifted as a whole away from the sheet supporting surface of said transfer means, means including a yieldable member for normally maintaining said shaft and said supporting means in predetermined positions relative to said transfer means, a gripping member mounted on said rock-shaft for clamping the sheet material to said transfer means, means carried by said transfer means for normally maintaining said gripping member in clamping position, operable means fixed to said rock-shaft, means at said first mentioned point in the travel of said transfer means constructed and arranged to coact with said operable means to rotate said shaft so as to shift said gripping member to an unclamping position, and means spaced from said first mentioned point and constructed and arranged to coact with said operable means to rotate said shaft so as to shift said gripping member to an unclamping position and to pivotally move said shaft supporting means so as to shift said shaft with the gripping member held in unclamping position away from the sheet supporting surface of said transfer means.

4. In a labeling machine, a vertically movable and horizontally translatable suction head having a label carrying surface capable of picking up a label and carrying the same from a point of label supply, past means for operating on such label, to a place for deposit of such label, a gripping finger located adjacent to the label carrying surface of said head, means movable horizontally with said head and supporting said finger for pivotal movement relative to said head, said finger being adapted in one position to have a portion thereof in cooperating relation with a portion of the label carrying surface of said suction head to prevent rupture of the latter's hold on a label in the field of action of the operating means, and in another position thereof to have such portion withdrawn from such surface and from the path of the vertical movement of such surface, and means operable independently of said place of deposit and controlled by the movement of said head for affecting movement of the finger from the said one position to the other during movement of said head and prior to the arrival of said head at said place of deposit.

5. In a labeling machine, a vertically movable and horizontally translatable suction head having a label carrying surface capable of picking up a label and carrying the same from a point of label supply, past means for operating on such label, to a place for deposit of such label, a gripping finger located adjacent to the label carrying surface of said head, means movable horizontally with said head and supporting said finger for

pivotal movement relative to said head, said finger being adapted in one position to have a portion thereof in cooperating relation with a portion of the label carrying surface of said suction head to prevent rupture of the latter's hold on a label in the field of action of the operating means, and in another position thereof to have such portion withdrawn from such surface and from the path of vertical movement of such surface, and means controlled by the movement of the head relative thereto and operable at an end of the horizontal movement of such head and prior to the arrival of the latter at said place of deposit for effecting movement of the finger from the said one position to the other, whereby such label is carried solely by said suction head during the remainder of the latter's movement to said place of deposit.

6. In a labeling machine, a vertically movable and horizontally translatable suction head having a label carrying surface, a gripping finger located adjacent to the label carrying surface of said head, means movable horizontally with said head and supporting said finger for pivotal movement relative to said head, said finger being adapted in one position to have a portion thereof in cooperating relation with a portion of the label carrying surface of said suction head to hold a label on the latter and in another position thereof to have such portion withdrawn from such surface and from the path of vertical movement of such surface, resilient means normally urging pivotal movement of said finger to one of said positions, and integral operating means associated with said head for moving the finger during movement of said head to said other position against the action of said resilient means, said resilient means being operable on said finger independently of said last mentioned means.

7. In a labeling machine, a supply stack of labels, adhesive applying means, an article support, a movable transfer means capable of independently removing successive labels from said stack and carrying each label in adhesive receiving relation to said adhesive applying means and into applying relation with an article on said support, said transfer means being vertically movable at the supply stack and article support and horizontally movable in its travel intermediate the latter, a plurality of associated spaced gripping members located lengthwise of said transfer means in spaced relation for clamping an edge portion of a label carried by said transfer means in place thereon at spaced intervals against being stripped from said transfer means by the action of the adhesive applying means, and integral operating means associated with said transfer means for concurrently adjusting all of said associated gripping members to inoperative positions where they will be removed from the path of the label carrying surface of said transfer means prior to the removal of each label from said stack and prior to its deposit on an article, respectively.

8. In a labeling machine, a supply stack of labels, an adhesive applying roller, an article support, a reciprocating suction head for removing successive labels from said stack and carrying each label in adhesive receiving relation to said applying roller and into applying relation with an article on said support, said transfer means being vertically movable at the supply stack and article support and horizontally movable in its

travel intermediate the latter and while bringing the label carried thereby into engagement with said adhesive applying roller, a rock shaft journalled on said suction head and extending linearly thereof, a gripping member fixed on said rock shaft for clamping an edge of a label carried by said suction head in place thereon against being stripped from said suction head by the action of the adhesive applying roller, and integral opening means associated with said suction head and operable at predetermined points in the travel of said head to move said rock shaft and thereby to shift said gripping member to an inoperative position where it will be removed from the path of the label carrying surface of said suction head prior to the removal of each label from said stack and prior to its deposit on an article, respectively.

9. In a labeling machine, an article support, a suction head having a label carrying surface and having one direction of movement in carrying a label from a source of label supply to said article support and another direction of movement at said article support to deposit a label carried by such surface upon a face of an article, a gripping finger located adjacent to the label carrying surface of said head, means movable horizontally with said head and supporting said finger for pivotal and translatory movement relative to said head, said finger being adapted during the said one direction of movement of said head to have a portion thereof in cooperating relation with a portion of the label carrying surface of said suction head to hold a label on the latter, and means operative to pivot said finger so as to withdraw the said portion thereof from the label carrying surface of said suction head and to withdraw said finger bodily from the plane of such label carrying surface, whereby said finger is completely withdrawn from the path of movement of such label carrying surface and is positioned in back of the plane of such surface during the movement of the latter

in said other direction to apply the label to an article.

10. In a labeling machine, an article support, a suction head having a label carrying surface and having one direction of movement in carrying a label from a source of label supply to said article support and another direction of movement at said article support to deposit a label carried by such surface upon a face of an article, a gripping finger located adjacent to the label carrying surface of said head, means movable horizontally with said head and supporting said finger for translatory movement relative to said head, said finger being adapted during the said one direction of movement of said head to have a portion thereof in cooperating relation with a portion of the label carrying surface of said suction head to hold a label on the latter, and means operative to withdraw said finger bodily from the plane of such label carrying surface, whereby said finger is completely withdrawn from the path of movement of such label carrying surface and is positioned in back of the plane of such surface during the movement of the latter in said other direction to apply a label to an article.

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