

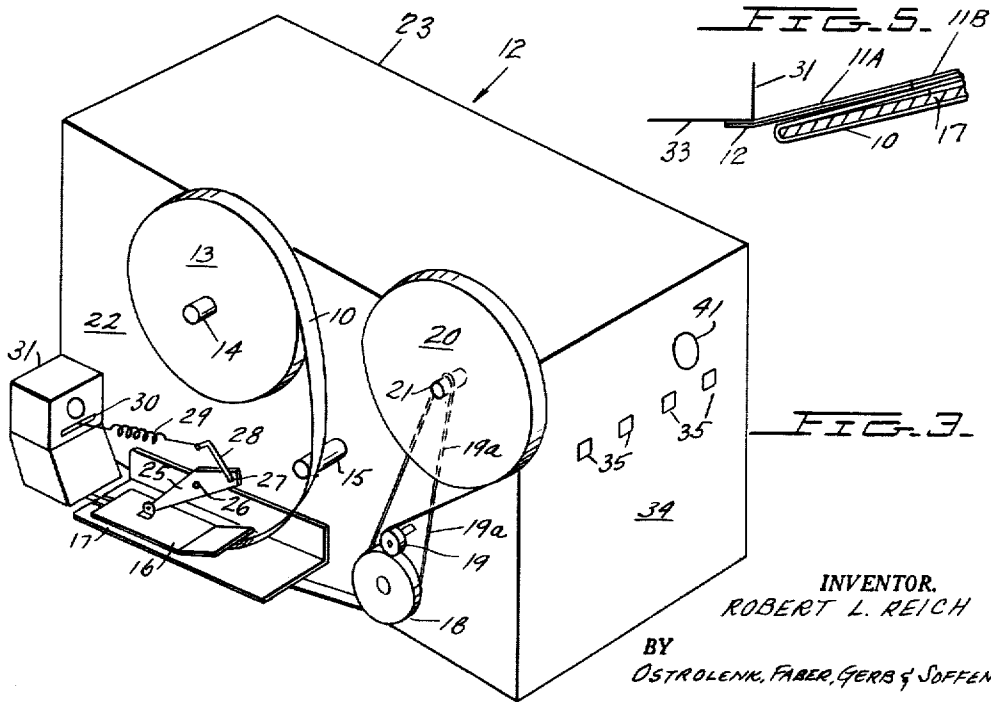
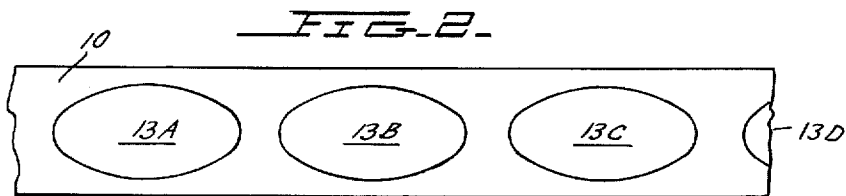
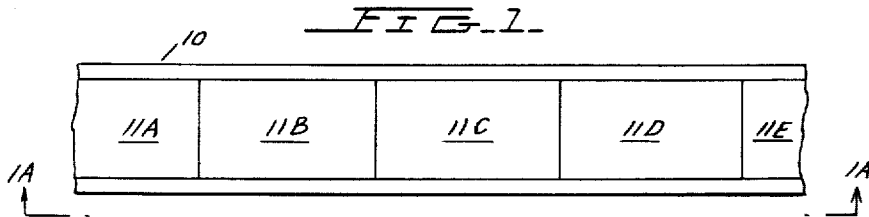
June 11, 1963

R. L. REICH
LABEL APPLYING MEANS

3,093,528

Filed July 28, 1960

3 Sheets-Sheet 1



INVENTOR.
ROBERT L. REICH
BY
OSTROLENN, FABER, GERB & SOFFEN
ATTORNEYS

June 11, 1963

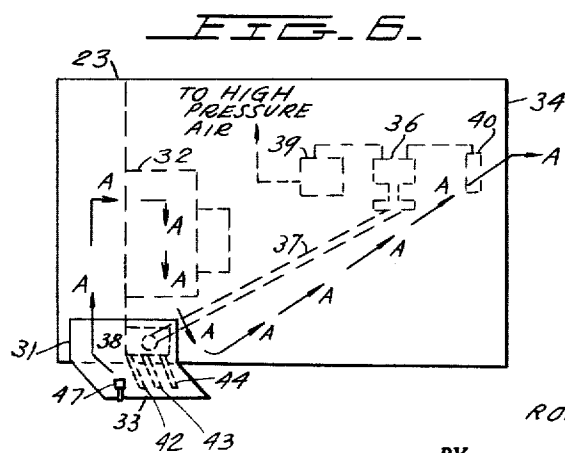
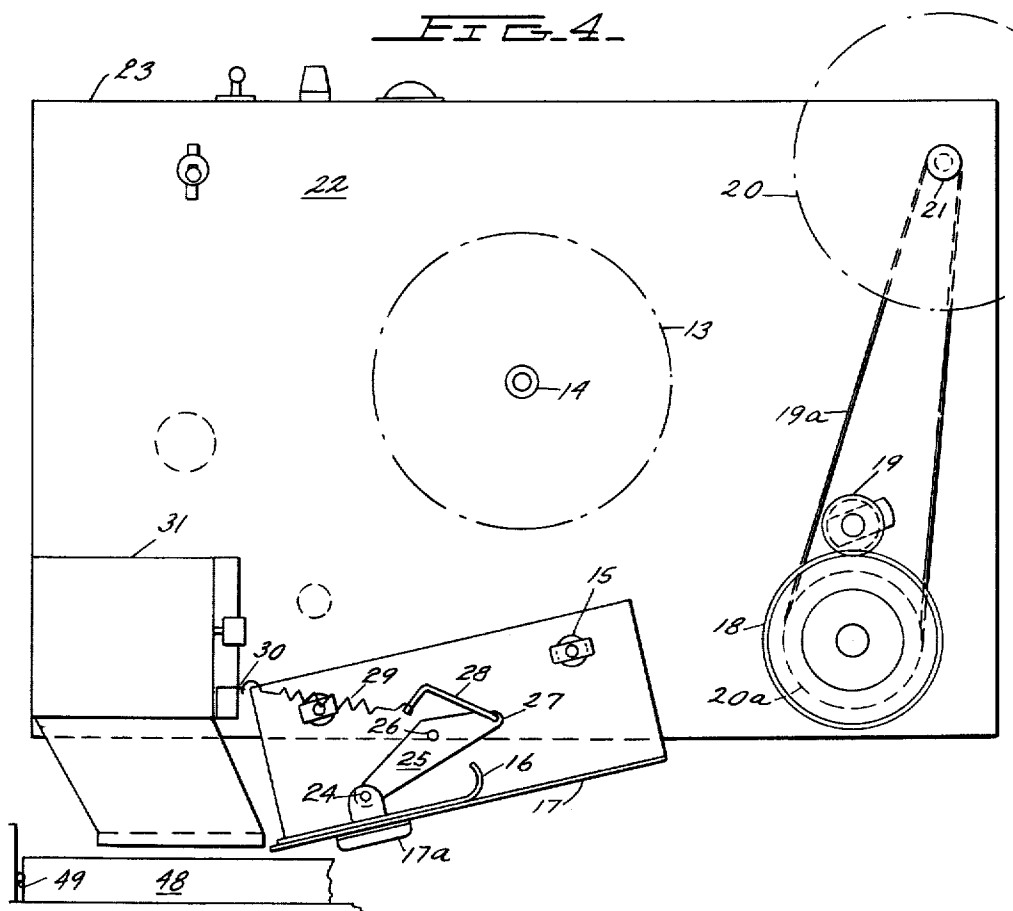
R. L. REICH

3,093,528

LABEL APPLYING MEANS

Filed July 28, 1960

3 Sheets-Sheet 2



INVENTOR.
ROBERT L. REICH

BY

OSTROLENK, FABER, GERS & SUTTEN
ATTORNEYS

June 11, 1963

R. L. REICH

3,093,528

LABEL APPLYING MEANS

Filed July 28, 1960

3 Sheets-Sheet 3

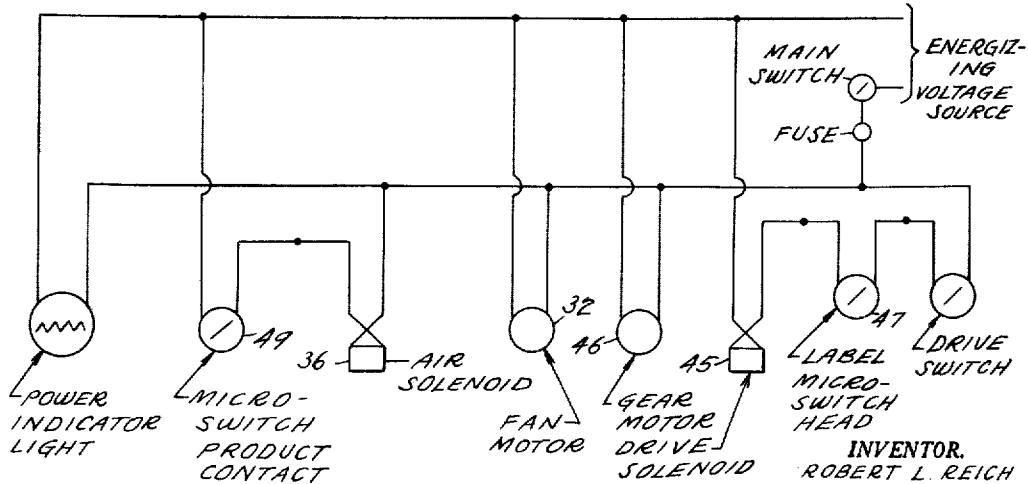
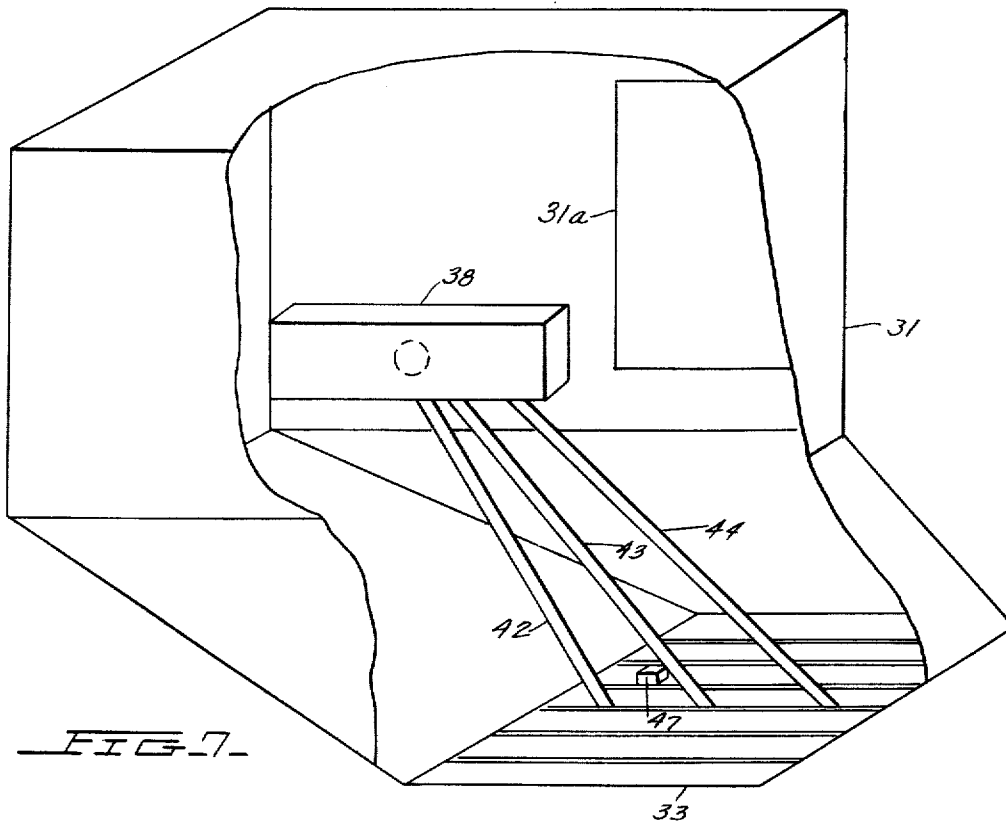


FIG. 8

BY

OSTROLENY, FABER, GERB & SOFFEN

ATTORNEYS

1

3,093,528

LABEL APPLYING MEANS

Robert L. Reich, Forest Hills, N.Y., assignor to Kleen Stik Products Inc., Chicago, Ill., a corporation of Illinois

Filed July 28, 1960, Ser. No. 45,914

18 Claims. (Cl. 156-285)

This invention relates to a device for stripping labels having a pressure sensitive adhesive coating thereon from a backing strip and applying the stripped labels to articles by utilizing a blast of high pressure air.

Label applying devices of the prior art usually employ a mechanical device to force the label against the article being labeled. The device is usually reciprocated so that precise mechanical adjustments are required in order that the articles will not be damaged. The reciprocating mechanism is susceptible to rapid wear and in addition mechanical moving parts inherently limit speed of operation.

The device of the instant invention overcomes the deficiencies of similar prior art devices by applying labels solely by means of a blast of high pressure air which is directed against the label whereby it is driven against an article with sufficient force to adhere thereto.

Briefly, the device of this invention comprises a support reel for a backing strip having labels thereon, a take-up reel for receiving the backing strip, means for guiding the backing strip between the support and take-up reels with this means including means for stripping labels from the backing strip whether these labels be butt cut or waste removed, and means for receiving the stripped labels and thereafter applying same to an article.

The last recited means is a grid-like structure where a slight vacuum is present with this vacuum holding the stripped labels to the grid-like structure. This vacuum is continuously applied.

Upon placing the article to be labelled in proper position the label held by the vacuum at the grid-like structure is subjected to a blast of high pressure air. This blast is of sufficient magnitude to override the effect of the vacuum and drive the label away from the grid-like structure into contact with the article with great enough force to cause the label to adhere to the article by virtue of the pressure sensitive adhesive coating on the former.

The backing strip is moved between the support and take-up reels by power driven means. A micro-switch actuated each time a label reaches the grid-like structure is effective to automatically stop movement of the backing strip.

With the construction hereinbefore outlined extremely fast operating speeds are obtained in that stripping of labels is automatically stopped as each label is removed from the backing. Further, applying the labels by means of a blast of high pressure air acting directly upon the labels means that no mechanical moving parts are required for label application.

Accordingly, a primary object of this invention it to provide a novel power operated label applying device which is faster, more reliable, and less expensive than similar devices of the prior art.

Another object is to provide a device of this kind in which labels are applied by utilizing a blast of high pressure air acting directly upon the labels so as to furnish the sole label applying force.

Still another object is to provide a device of this kind which utilizes a simple fan to produce a vacuum which holds the label in place prior to application thereof.

A further object is to provide a device of this kind which utilizes a grid-like structure to receive labels removed from a backing strip and a continuously applied vacuum to hold the labels prior to application thereof

2

by a blast of high pressure air which overrides the holding effect of the vacuum.

A still further object is to provide a novel power operated label applying device wherein the guide means between the support and take-up wheels includes a portion which causes the backing strip to abruptly change direction so that the relatively stiff labels will be removed therefrom.

These as well as other objects of the instant invention shall become readily apparent after reading the following description of the accompanying drawings in which:

FIGURE 1 is a plan view of a backing strip having butt cut labels mounted thereto.

FIGURE 1A is a side elevation of the strip of FIGURE 1 looking in the direction of arrows 1A-1A.

FIGURE 2 is a plan view of a backing strip having waste removed labels mounted thereto.

FIGURE 3 is a perspective of a label applying device constructed in accordance with the teachings of the instant invention.

FIGURE 4 is a side elevation of the device of FIGURE 3.

FIGURE 5 is an enlarged fragmentary view illustrating the label stripping process.

FIGURE 6 is a schematic illustrating the high pressure air system and the flow of air which produces the label holding vacuum.

FIGURE 7 is a perspective view of the label receiving and applying station with the housing partially broken away.

FIGURE 8 is an electrical schematic diagram of the device illustrated in FIGURES 3-6.

Now referring to the figures and more particularly to FIGURES 1-2, backing strip 10 is an elongated ribbon constructed of extremely flexible material having mounted thereto in a tandem relationship a plurality of labels 11A-11E otherwise known as butt cut. Each of the labels 11A-11E is provided with a coating of pressure sensitive adhesive 12' which adheres more firmly to labels 11A-11E than to backing strip 10 so that upon removal of labels 11A-11E from backing strip 10 adhesive layer 12 remains upon the stripped labels. In FIGURE 2 waste removed labels 13A-13D are shown mounted in tandem relationship to backing strip 10 by means of a pressure sensitive adhesive layer.

Now referring more particularly to FIGURES 3-7, label applying device 12 comprises supply reel 13 rotatable about shaft 14 as an axis. Backing strip 10 with labels thereon is rolled upon reel 13. Strip 10 is fed off to the rear of supply reel 13 downward and to the rear of guide roller 15, below tension clamp 16, around the forward edge of stripping bar 17, along the bottom surface of stripping bar 17 to the rear of drive roller 18, upwardly around the forward side of depressor roll 19 to take-up reel 20 which is mounted for rotation upon shaft 21 as an axis.

All of the elements hereinbefore recited are mounted to the side 22 of device housing 23. Tension clamp 16 is pivotally mounted at 24 to one end of crank 25 which is pivotally mounted intermediate the ends thereof to pin 26. The other end of crank 25 is pivotally mounted at 27 to one end of link 28 whose other end is secured to one end of tension spring 29. The other end of tension spring 29 is anchored at 30 to housing 31 of the label receiving and applying station.

Fan type blower 32 is disposed within housing 23 and, as best seen in FIGURE 6 directs a flow of air through housing 23 along the path indicated by arrows A. That is, the air flow caused by blower 32 enters housing 31 through the grid-like bottom cover 33 thereof, then through side opening 31a in housing which is aligned

3

with an opening of substantially equal size in housing 23, through the blade of blower 32 against the bottom of housing 23, and thence out through rear end 34 of housing 23 at openings 35. The movement of air caused by blower 32 generates a low magnitude vacuum in the region of grid-like structure 33 with this vacuum being of sufficient magnitude to cause labels removed from backing strip 10 at the leading edge of stripping bar 17 to be held against the bottom of grid-like structure 33.

Also disposed within housing 23 is a solenoid operated air controlled valve 36 which is connected by means of conduit 37 to manifold 38. Valve 36 is also connected to a compressor or other source of high pressure air through pressure regulator 39. Pressure gauge 40 also mounted within housing 23 is connected to valve 36 and is viewable through opening 41 in housing wall 34. When valve 36 is open a blast of high pressure air is directed through conduit 37 into manifold 38 where the blast is distributed by nozzles 42-44 and directed through grid-like structure 33.

As backing strip 10 moves between supply reel 13 and take-up reel 20, strip 10, as best seen in FIGURE 5, is subjected to an abrupt change of direction as it passes around the forward edge of stripping bar 17. Strip 10 being constructed of extremely flexible material readily negotiates this abrupt change of direction. However, label 11A is constructed of material which is a good deal more stiff than the material comprising backing strip 10. Thus, label 11A continues to move forward of stripping bar 17. The stripping operation is assisted by the vacuum at grid-like structure 33.

Backing strip 10 is driven each time drive solenoid 45 is actuated. When this occurs pressure roll 19 moves downwardly forcing backing strip 10 against roll 18. The latter is continuously rotated by gear motor 46 in a manner well known to the art of tape drive mechanisms. Similarly, take-up reel 20 is rotated as required to wind up strip 10 through the action of spring belt 19a which is driven by side pulley 20a on roll 18. Belt 19a applies slight tension at all times to drive reel 20, yet allows slippage to permit slower rotation of reel 20 as it fills with label removed strip 10.

As label 11A moves forward along the bottom of structure 33 label 11A strikes micro-switch 47 causing it to open. This interrupts the energizing circuit for drive solenoid 45 and enables a return spring (not shown) to move depressor roll 19 away from drive roll 18. Micro-switch 47 is so oriented that label 11A is held against grid-like structure 33 in the proper position opposite nozzles 42-44.

When the article 48 to be labelled is in proper position one or more micro-switches 49 is closed thereby. These switches 49 are serially connected in the energizing circuit (see FIGURE 8) for solenoid operated valve 36. Thus, when all of the switches 49 are closed this closes the energizing circuit for the solenoid operated valve 36 which in turn causes a blast of high pressure air to be directed through nozzles 42-44 against label 11A forcing the latter against article 48 with sufficient force to cause label 11A to adhere to article 48. The force generated by the blast of high pressure air is sufficient to readily override the vacuum caused by the air flow indicated by arrows A. Thus, fan 32 is continuously operated thereby eliminating the necessity for one or more control valves as well as expensive equipment ordinarily required to produce a vacuum.

While no description has hereinbefore been included, it is to be understood that the position of micro-switch 47 may readily be adjusted as may the positions of reels 13 and 20 upon axes 14 and 21, respectively, and the position of tape guide 17a. Further, it is to be understood that the shape of grid-like structure 33 as well as the number and particular configuration of the high pressure air nozzles may be changed to best suit a particular application.

4

Thus, this invention provides a high speed device which removes labels from a backing strip and automatically applies these labels. Labels removed from the backing strip are held by a vacuum in position to be applied and label application is accomplished solely by a blast of high pressure air which overrides the vacuum holding force.

Although I have here described preferred embodiment of my novel invention, many variations and modifications will now be apparent to those skilled in the art, and I therefore prefer to be limited, not by the specific disclosure herein, but only by the appending claims.

I claim:

1. A device for stripping labels having a pressure sensitive adhesive coating from a backing strip and applying the stripped labels to articles, said device comprising a supply means adapted to store a backing strip having mounted thereto in tandem labels with pressure sensitive coatings thereon, a take-up means for receiving a backing strip from said supply means, first means for guiding a backing strip between said supply means and said take-up means, said first means including a second means for stripping labels from a backing strip, a third means for receiving labels stripped from a backing strip and applying these labels to articles, said third means including fourth means for directing high pressure air against a label to apply same to an article; said third means remaining mechanically stationary during the reception and application of labels.

2. A device for stripping labels having a pressure sensitive adhesive coating from a backing strip and applying the stripped labels to articles, said device comprising a supply means adapted to store a backing strip having mounted thereto in tandem labels with pressure sensitive coatings thereon, a take-up means for receiving a backing strip from said supply means, first means for guiding a backing strip between said supply means and said take-up means, said first means including a second means for stripping labels from a backing strip, a third means for receiving labels stripped from a backing strip and applying these labels to articles, said third means including fourth means for directing high pressure air against a label to apply same to an article; said third means including fifth means for directing the application of a vacuum to stripped labels as they leave said second means whereby stripped labels are held by said third means until application thereof to articles.

3. A device for stripping labels having a pressure sensitive adhesive coating from a backing strip and applying the stripped labels to articles, said device comprising a supply means adapted to store a backing strip having mounted thereto in tandem labels with pressure sensitive coatings thereon, a take-up means for receiving a backing strip from said supply means, first means for guiding a backing strip between said supply means and said take-up means, said first means including a second means for stripping labels from a backing strip, a third means for receiving labels stripped from a backing strip and applying these labels to articles, said third means including fourth means for directing high pressure air against a label to apply same to an article; said third means including fifth means for directing the application of a vacuum to stripped labels as they leave said second means whereby stripped labels are held by said third means until application thereof to articles; a vacuum producing means operatively positioned in direct connection with said fifth means, a high pressure air producing means and selective means for operatively connecting same to said fourth means; said vacuum producing means operating even while said high pressure air producing means is connected to said fourth means.

4. A device for stripping labels having a pressure sensitive adhesive coating from a backing strip and applying the stripped labels to articles, said device comprising a supply means adapted to store a backing strip having mounted thereto in tandem labels with pressure sensitive

5

coatings thereon, a take-up means for receiving a backing strip from said supply means, first means for guiding a backing strip between said supply means and said take-up means, said first means including a second means for stripping labels from a backing strip, a third means for receiving labels stripped from a backing strip and applying these labels to articles, said third means including fourth means for directing high pressure air against a label to apply same to an article; said third means including fifth means for directing the application of a vacuum to stripped labels as they leave said second means whereby stripped labels are held by said third means until application thereof to articles; a vacuum producing means operatively positioned in direct connection with said fifth means, a high pressure air producing means and selective means for operatively connecting same to said fourth means; said vacuum producing means operating even while said high pressure air producing means is connected to said fourth means; the high pressure air produced by the high pressure air producing means being of sufficient pressure to override the effect of the vacuum produced by said vacuum producing means.

5. A device for stripping labels having a pressure sensitive adhesive coating from a backing strip and applying the stripped labels to articles, said device comprising a supply means adapted to store a backing strip having mounted thereto in tandem labels with pressure sensitive coatings thereon, a take-up means for receiving a backing strip from said supply means, first means for guiding a backing strip between said supply means and said take-up means, said first means including a second means for stripping labels from a backing strip, a third means for receiving labels stripped from a backing strip and applying these labels to articles, said third means including fourth means for directing high pressure air against a label to apply same to an article; said third means including fifth means for directing the application of a vacuum to stripped labels as they leave said second means whereby stripped labels are held by said third means until application thereof to articles; a vacuum producing means operatively positioned in direct connection with said fifth means, a high pressure air producing means and selective means for operatively connecting same to said fourth means; said vacuum producing means operating even while said high pressure air producing means is connected to said fourth means; the high pressure air produced by the high pressure air producing means being of sufficient pressure to override the effect of the vacuum produced by said vacuum producing means; said vacuum producing means comprising a continuously operating fan.

6. A device for stripping labels having a pressure sensitive adhesive coating from a backing strip and applying the stripped labels to articles, said device comprising a supply means adapted to store a backing strip having mounted thereto in tandem labels with pressure sensitive coatings thereon, a take-up means for receiving a backing strip from said supply means, first means for guiding a backing strip between said supply means and said take-up means, said first means including a second means for stripping labels from a backing strip, a third means for receiving labels stripped from a backing strip and applying these labels to articles, said third means including fourth means for directing high pressure air against a label to apply same to an article; said third means including fifth means for directing the application of a vacuum to stripped labels as they leave said second means whereby stripped labels are held by said third means until application thereof to articles; a vacuum producing means operatively positioned in direct connection with said fifth means, a high pressure air producing means and selective means for operatively connecting same to said fourth means; power operated means for driving a backing strip from said supply means to said take-up means, and means positioned in the path of a stripped

6

label and operable upon passage of a label thereby to deactivate said power operated means.

7. A device for stripping labels having a pressure sensitive adhesive coating from a backing strip and applying the stripped labels to articles, said device comprising a supply means adapted to store a backing strip having mounted thereto in tandem labels with pressure sensitive coatings thereon, a take-up means for receiving a backing strip from said supply means, first means for guiding a backing strip between said supply means and said take-up means, said first means including a second means for stripping labels from a backing strip, a third means for receiving labels stripped from a backing strip and applying these labels to articles, said third means including fourth means for directing high pressure air against a label to apply same to an article; said third means including fifth means for directing the application of a vacuum to stripped labels as they leave said second means whereby stripped labels are held by said third means until application thereof to articles; a vacuum producing means operatively positioned in direct connection with said fifth means, a high pressure air producing means and selective means for operatively connecting same to said fourth means; power operated means for driving a backing strip from said supply means to said take-up means, a first switch positioned in the path of a stripped label and operable upon engagement by a label to deactivate said power operated means; a second switch operable by an article to be labeled and operatively connected to said selective means for actuation thereof when an article is properly positioned, said selective means when actuated connecting said high pressure air producing means to said fourth means.

8. A power operated label applying device comprising a supply reel for a backing strip, a take-up reel to receive a backing strip from said supply reel, first means for guiding a backing strip from said supply reel to said take-up reel, said first means including stripping means for removing from a backing strip labels having a coating of pressure sensitive adhesive thereon, a second means for receiving labels removed by said stripping means and applying these labels to articles, said second means including means for directing a blast of high pressure air against a label whereby same is driven against an article with sufficient force to adhere thereto; a vacuum producing means continuously connected to said second means to produce a vacuum for holding labels thereat prior to application of a high pressure air blast.

9. A power operated label applying device comprising a supply reel for a backing strip, a take-up reel to receive a backing strip from said supply reel, first means for guiding a backing strip from said supply reel to said take-up reel, said first means including stripping means for removing from a backing strip labels having a coating of pressure sensitive adhesive thereon, a second means for receiving labels removed by said stripping means and applying these labels to articles, said second means including means for directing a blast of high pressure air against a label whereby same is driven against an article with sufficient force to adhere thereto; a vacuum producing means continuously connected to said second means to produce a vacuum for holding labels thereat prior to application of a high pressure air blast; said high pressure air blast being of sufficient intensity to override the effect of said vacuum.

10. A power operated label applying device comprising a supply reel for a backing strip, a take-up reel to receive a backing strip from said supply reel, first means for guiding a backing strip from said supply reel to said take-up reel, said first means including stripping means for removing from a backing strip labels having a coating of pressure sensitive adhesive thereon, a second means for receiving labels removed by said stripping means and applying these labels to articles, said second means including means for directing a blast of high pressure air

7

against a label whereby same is driven against an article with sufficient force to adhere thereto; a vacuum producing means continuously connected to said second means to produce a vacuum for holding labels thereat prior to application of a high pressure air blast; said high pressure air blast being of sufficient intensity to override the effect of said vacuum; said vacuum producing means comprising a continuously operating fan.

11. A power operated label applying device comprising a supply reel for a backing strip, a take-up reel to receive a backing strip from said supply reel, first means for guiding a backing strip from said supply reel to said take-up reel, said first means including stripping means for removing from a backing strip labels having a coating of pressure sensitive adhesive thereon, a second means for receiving labels removed by said stripping means and applying these labels to articles, said second means including means for directing a blast of high pressure air against a label whereby same is driven against an article with sufficient force to adhere thereto; a vacuum producing means continuously connected to said second means to produce a vacuum for holding labels thereat prior to application of a high pressure air blast; power operated means for movement of said backing strip from said supply reel to said take-up reel; and a first switch operable to halt movement of said backing strip upon successive removals of labels therefrom.

12. A power operated label applying device comprising a supply reel for a backing strip, a take-up reel to receive a backing strip from said supply reel, first means for guiding a backing strip from said supply reel to said take-up reel, said first means including stripping means for removing from a backing strip labels having a coating of pressure sensitive adhesive thereon, a second means for receiving labels removed by said stripping means and applying these labels to articles, said second means including means for directing a blast of high pressure air against a label whereby same is driven against an article with sufficient force to adhere thereto; a vacuum producing means continuously connected to said second means to produce a vacuum for holding labels thereat prior to application of a high pressure air blast; power operated means for movement of said backing strip from said supply reel to said take-up reel, a first switch operable to halt movement of said backing strip upon successive removals of labels therefrom; a second switch operable to initiate said high pressure air blast when an article is positioned to receive a label.

13. A power operated label applying device comprising a supply reel for a backing strip, a take-up reel to receive a backing strip from said supply reel, first means for guiding a backing strip from said supply reel to said take-up reel, said first means including stripping means for removing from a backing strip labels having a coating of pressure sensitive adhesive thereon, a second means for receiving labels removed by said stripping means and applying these labels to articles, said second means including means for directing a blast of high pressure air against a label whereby same is driven against an article with sufficient force to adhere thereto; a vacuum producing means continuously connected to said second means to produce a vacuum for holding labels thereat prior to application of a high pressure air blast; said high pressure air blast being of sufficient intensity to override the effect of said vacuum; said vacuum producing means comprising a continuously operating fan; power operated means for movement of said backing strip from said supply reel to said take-up reel, a first switch operable to halt movement of said backing strip upon successive removals of labels therefrom; and a second switch operable to initiate said high pressure air blast when an article is positioned to receive a label.

14. A power operated label applying device comprising a supply means for a backing strip, a take-up means to receive a backing strip from said supply means, power

8

operated means for moving a backing strip from said supply means to said take-up means, first means for guiding a vacuum strip from said supply means to said take-up means, said first means including a plate operatively positioned to subject a backing strip to an abrupt change of direction as it moves toward said take-up means whereby labels having a pressure sensitive adhesive coating are removed from the backing strip; a vacuum holding means operatively positioned to receive labels as they are removed from the backing strip and means for transferring labels from said holding means to an article.

15. A power operated label applying device comprising a supply means for a backing strip, a take-up means to receive a backing strip from said supply means, power operated means for moving a backing strip from said supply means to said take-up means, first means for guiding a backing strip from said supply means to said take-up means, said first means including a plate operatively positioned to subject a backing strip to an abrupt change of direction as it moves toward said take-up means whereby labels having a pressure sensitive adhesive coating are removed from the backing strip; a vacuum holding means operatively positioned to receive labels as they are removed from the backing strip and means for transferring labels from said holding means to an article; said last recited means comprising a device for directing high pressure air against a label to remove it from the holding means and force the removed label against an article with sufficient force to cause adhesion thereto; said holding means remaining active during activation of said last recited means.

16. A method of applying a pressure sensitive adhesive coated label to an article from a backing strip on which a plurality of said labels are removably supported, which comprises feeding said strip containing said labels along a given path and then guiding the tape away from said path at an angle to permit the labels to be removed from said backing strip and to project said labels away from said backing strip, each said label as removed from its said backing strip being held by vacuum against a grid surface with its pressure sensitive adhesive side away from said grid surface, and then directing air under pressure through said grid and against said label to drive it into contact with said article whereby to cause said label to adhere to said article.

17. In a method of applying pressure sensitive adhesive coated labels to articles from a backing strip on which a plurality of said labels are removably supported which comprises feeding said strip containing said labels along a given path and then guiding the tape away from said path at an angle to permit the labels to be removed from said backing strip and to project said labels away from said backing strip, the improvement which comprises advancing said labels as removed from said backing strip into contact with a grid surface and holding said labels by vacuum against said grid surface with the pressure sensitive adhesive side thereof away from said grid surface, and then directing air under pressure through said grid and against said labels to drive them into contact with said articles whereby to cause said labels to adhere to said articles.

18. In a device for applying pressure sensitive adhesive coated labels to articles from a backing strip on which said labels are removably supported, said device having a label applying station to which the articles to be labeled are sequentially delivered, said device including means for feeding said backing strip carrying said labels supported thereon and means for automatically stripping said labels from said backing strip, the improvement which comprises a stationary grid surface in the path of movement of said labels after they are stripped from said backing strip, said grid being located at said label applying station immediately adjacent to the location of the label-receiving surface of an article delivered to said

station, means for holding said stripped labels by vacuum against said grid surface, and means for projecting air under pressure through said grid and against said label to project said label against said articles to cause said labels to adhere thereto.

References Cited in the file of this patent

UNITED STATES PATENTS

2,565,975 Lissimore ----- Aug. 28, 1951

2,878,953
2,920,780
2,939,599
3,039,516

Mitchell ----- Mar. 24, 1959
Houschild et al. ----- Jan. 12, 1960
Schluter ----- June 7, 1960
Vinal ----- June 19, 1962

OTHER REFERENCES

Avery: Labeler Model 100, Avery Adhesive Co., 1 page, November 10, 1958.