Aug. 23, 1966 W. ROSENBACH 3,268,221

AIR REMOVAL ROLLER FOR CLOTH LAYING MACHINES

Filed Nov. 27, 1964 2 Sheets-Sheet 1

Fig. 1

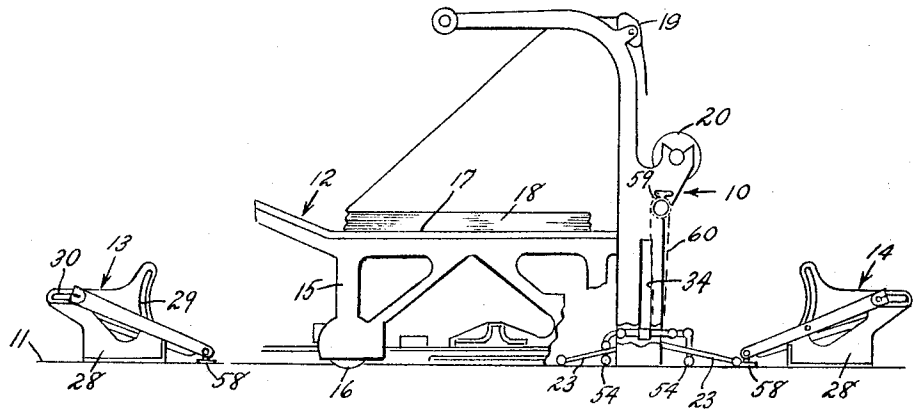
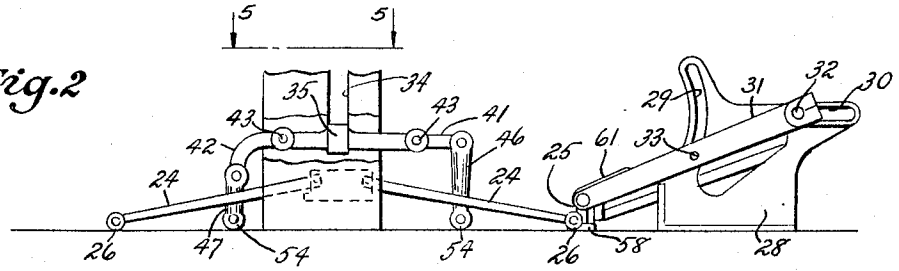


Fig. 2



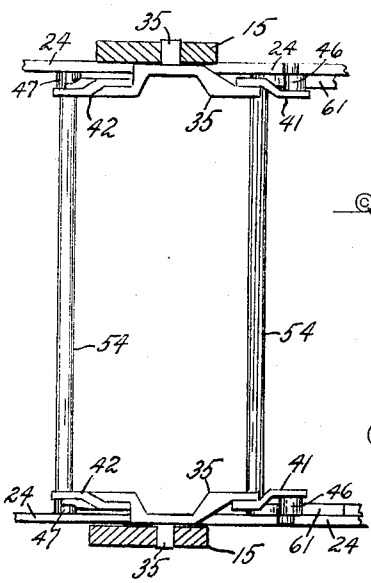


Fig. 5

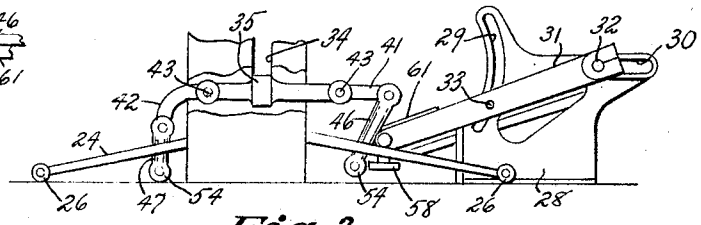


Fig. 3

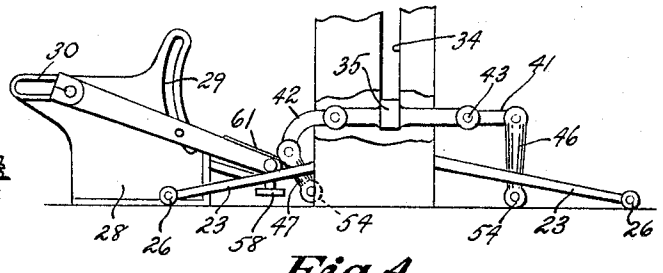


Fig. 4

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AIR REMOVAL ROLLER FOR CLOTH LAYING MACHINES

Filed Nov. 27, 1964 2 Sheets-Sheet 2

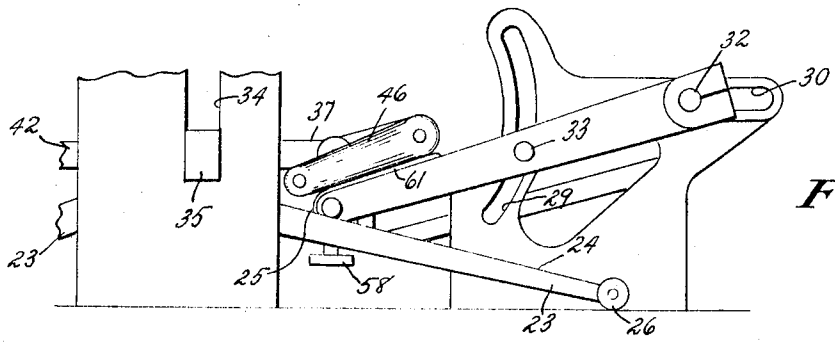


Fig. 6

Fig. 7

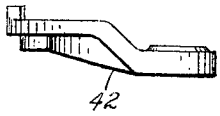


Fig. 8

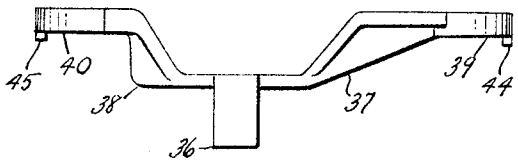


Fig. 9

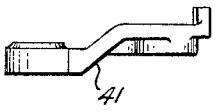


Fig. 10

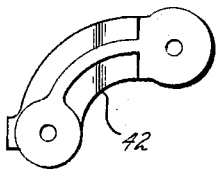


Fig. 11

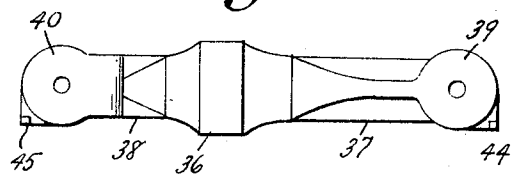


Fig. 12

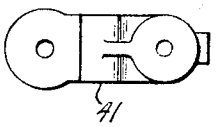


Fig. 13

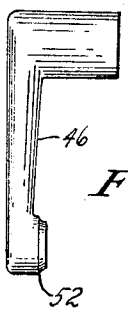


Fig. 14

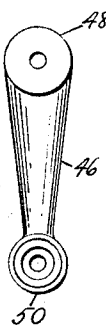


Fig. 15

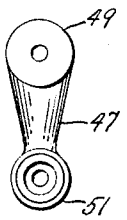


Fig. 16

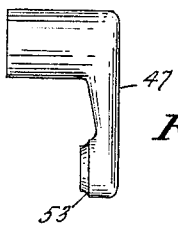


Fig. 17

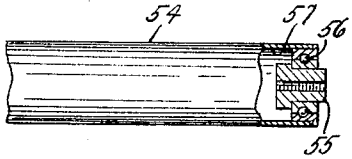
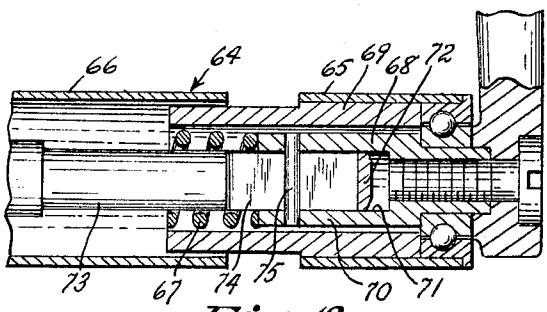


Fig. 18



United States Patent Office 3,268,221
Patented August 23, 1966

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3,268,221

AIR REMOVAL ROLLER FOR CLOTH LAYING MACHINES

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Filed Nov. 27, 1964, Ser. No. 414,175
2 Claims. (Cl. 270—31)

This invention relates generally to the field of cloth laying devices, and more particularly to a means for removing air entrapped between superimposed layers of material as the layers are dispensed from a continuous web.

The problem of air entrapment occurs principally with the dispensing of relatively tightly woven fabrics having a low degree of porosity, and almost always occurs when the cloth laying machine is used to dispense a continuous web of synthetic resinous planar material in which porosity is nonexistent. When entrapment occurs, the adjacent layers of material do not lie directly upon each other and have a tendency to shift laterally with respect to the principal axis of the table upon which the material is layed, making it difficult to maintain the juxtaposed edges of the individual layers in a common vertical plane. Where such shift does not occur immediately, if the air is not removed from between the layers, the shifting may occur when the layers of material are subsequently cut, resulting in the cutting of non-uniform pieces as an individual layer shifts with respect to the layer immediately therebeneath as the cutting edge penetrates the layers.

It is, of course, possible to manually smooth each layer of material as the same is layed, but this is a time consuming process, and necessitates the stopping of the cloth laying machine at the end of its path of movement.

It is therefore among the principal objects of the present invention to provide an improved means which may be mounted directly upon the carriage of a cloth laying machine which may exert a continuous travelling pressure upon the uppermost layer of material, immediately after the same is dispensed by the carriage upon the table for the purpose of automatically flattening the layer and removing any air which may be entrapped therebeneath.

Another object of the invention lies in the provision of an improved air deflating means as above described, in which the operative parts thereof are supported in such manner as to be automatically raised to the proper operating level as the number of cloth layers progressively increases.

Yet another object of the invention lies in the provision of an improved air deflating roller means which may be conveniently installed upon existing cloth laying devices with a minimum of modification.

A further object of the invention lies in the provision of an improved air deflating roller for cloth laying machines which may incorporate means to permit the same to be moved out of the way of cloth fold retaining means which are normally disposed at either end of a cloth laying table, as the carriage approaches the end of its travel, and automatically returned to operative position as the carriage moves in an opposite direction.

A feature of the invention lies in the face that the air deflating means may include a plurality of rollers, at least one of which is always in contact with the uppermost layer of material.

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Another feature of the invention lies in the fact that the deflating means is progressively cammed from operating position upon contacting a cloth fold retaining device much the same way that the cloth fold retaining means is cammed by the carriage, whereby a minimum of manual effort or mechanical power is consumed during the deflecting action.

These objects and features, as well as other incidental ends and advantages, will more fully appear in the progress of the following disclosure, and be pointed out in the appended claims.

In the drawing, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

FIGURE 1 is a side elevational view of a cloth laying machine embodying the invention.

FIGURE 2 is a fragmentary enlarged side elevational view, somewhat schematic in nature, corresponding to the lower right hand portion of FIGURE 1, and showing the position of the air deflating means just prior to engagement with a cloth fold retaining device.

FIGURE 3 is a similar fragmentary side elevational view, corresponding to that shown in FIGURE 2, but showing the progressive deflection of the air deflating means as the same is contacted by the cloth fold retaining device.

FIGURE 4 is a similar fragmentary side elevational view corresponding to the left hand portion of FIGURE 1, but showing the initial contact of the left hand air deflating roller with the left hand cloth fold device.

FIGURE 5 is a fragmentary horizontal sectional view as seen from the plane 5—5 in FIGURE 2.

FIGURE 6 is an enlarged fragmentary side elevational view, corresponding to that seen in FIGURE 2, but showing the air deflating means in a fully deflected condition.

FIGURE 7 is a top plan view showing one of the link members comprising a part of the air deflation means.

FIGURE 8 is a similar top plan view of a central mounting bracket comprising another part of the air deflating means.

FIGURE 9 is a similar top plan view showing a second link comprising a part of the air deflation means.

FIGURE 10 is a side elevational view as seen from the lower portion of FIGURE 7.

FIGURE 11 is a side elevational view corresponding to the lower portion of FIGURE 8.

FIGURE 12 is a side elevational view corresponding to the lower portion of FIGURE 9.

FIGURE 13 is a side elevational view of an air deflating roller supporting link, which in assembled condition is attached to the lower portion of the link shown in FIGURE 10.

FIGURE 14 is an end elevational view as seen from the right hand portion of FIGURE 13.

FIGURE 15 is an end elevational view as seen from the right hand portion of FIGURE 16.

FIGURE 16 is a side elevational view of a roller supporting link which in assembled condition is secured to the link shown in FIGURE 12.

FIGURE 17 is a fragmentary view in elevation, partly in section, of an air deflating roller.

FIGURE 18 is a fragmentary sectional view of a modified form of air deflating roller.

In accordance with the invention, a cloth laying machine, generally indicated by reference character **10** is illustrated in FIGURE 1 in the drawings. The specific details of said machine form no part of the present disclosure, and are described and illustrated in U.S. Patent No. 2,442,352, granted June 1, 1948, to H. W. Gilbert et al., and U.S. Patent No. 2,520,895 granted August 29, 1950, to H. W. Gilbert et al., both patents being assigned to the assignee of the instant application.

The cloth laying machine **10** includes a table having an upper surface **11** upon which successive layers of cloth are deposited, the surface **11** supporting a carriage element **12** for leftward and rightward movement as seen in FIGURE 1 between first and second cloth fold retaining elements **13** and **14**, as is well known in the art.

The carriage element **12** includes a pair of side frames, one of which is indicated by reference character **15**, supported by wheels, one of which is indicated by reference character **16**, to enable the same to be either manually pushed or electrically driven over the table surface **11**. Cloth supporting means **17** is illustrated in the form of a platform upon which a cloth supply **18** is disposed, but it will be understood by those skilled in the art that a cloth supply in the form of a roll (not shown) may also be employed. A web of cloth is trained over a roller **19**, subsequently over a powered roller **20** from whence it travels to a fold forming means of the type described in the above mentioned Patent No. 2,520,895 for disposition beneath one or the other of the cloth fold retaining elements **13** and **14**. Pivotally mounted at one end on the carriage element **12**, and rolling along the table surface **11**, are a plurality of cam members **23** which serve to periodically elevate the cloth fold retaining elements **13** and **14** at the end of cloth laying movement in either direction by the carriage element **12**. As is known in the art, the upper surface **24** of each of the cams **23** contacts the lower end **25** of the movable part of the elements **13** and **14** to raise the same to a degree wherein the folded cloth may be placed therebeneath. To reduce friction, the lower ends of the cams **23** are provided with rollers **26**.

The specific details of the first and second cloth fold retaining elements **13** and **14** are also illustrated in the above mentioned Patents Numbers 2,442,352 and 2,502,-895, and will, accordingly, be described only briefly herein. Each element **13–14** includes a pair of side plates, one of which is indicated by reference character **28**, each plate including a curved groove **29** forming a cam and a horizontally disposed guiding groove **30** which control the movement of a pair of elongated links **31**. The links **31** have end points **32** engaged within the groove **30**, and a median point **33** engaged with the curved groove **29**. The configuration of the groove **29** is such that the end **25** will execute movement in a vertical plane as the same are raised.

Referring to the carriage element **12**, the same is provided with a pair of slots **34** in which the fold forming means is mounted for vertical movement in accordance with the raising of the level of cloth upon the table source **11** as the carriage element **12** is reciprocated. Slidably disposed within the slot **34** are supporting frames one of which is indicated by reference character **35** (see FIGURES 8 and 11). The frame **35** is preferably of cast construction, and includes a mounting block **36**, a right hand supporting arm **37** and a left hand supporting arm **38**.

Each of the arms **37–38** includes a mounting member **39, 40**, respectively to which are attached a right hand pivotal link **41** and a left hand pivotal link **42** by means of bolts **43**. Stop members **44** and **45** prevent the links **41** and **42** respectively, from pivoting downwardly past the positions shown in FIGURES 2 and 3.

Pivotally mounted on the lewer ends of the links **41** and **42** are roller supporting links **46** and **47**, respectively,

and each including an upper end **48, 49**, respectively, and a lower end **50, 51**, respectively, which are provided with extensions **52** and **53** which support the air deflating roller **54**.

As best seen in FIGURE 17, the roller **54** includes oppositely disposed end portions, each having a mounting member **55** engaged in fixed relation on one of the lower ends **50–51**, and forming one race of ball bearings **56**. The oppositely disposed outer race is mounted on the inner surface of a hollow rotating sleeve **57** to permit the sleeve **57** to rotate smoothly as it passes over the exposed surface of a layer of cloth or other material.

Referring again to FIGURE 1, as more particularly shown in the Gilbert Patent No. 2,520,895, an elevating wheel **59** progressively elevates the frames **35** by means of a chain member **60** which is incrementally advanced with each reciprocation of the carriage element **12**, thus providing a means for maintaining the effective level of the roller **54** at the same height of the uppermost layer of cloth.

To avoid the possibility of scratching the outer surface of the rollers **54**, which is normally highly polished, the links **31** of the elements **13** and **14** are provided with protective pads **61** which may be of leather or other suitable material in those areas where contact is made during operation, as shown in FIGURES 3 and 6.

Referring to FIGURE 2, as the carriage element **12** is moved rightwardly, the cloth fold retaining element **13** is progressively lifted by the cams **23**, in order to permit a fold of cloth to be positioned therebeneath. With progressive rightward movement, as seen in FIGURE 3, the lower ends of the links **31** contact the side surface of the links **46** and **47**, which are free to pivot, at least 90 degrees in eiher direction from the vertical. With progressive rightward movement, the links are moved clockwise, until the upper ends **48** and **49** are contacted, at which time subsequent clearance is provided by a counterclockwise pivoting motion of the pivotal links **41**. As the frame **35** is always continuously elevated, it will always clear the cloth engaging bar **58**.

Referring to FIGURE 4, a similar movement takes place when the carriage element **13** is moved leftwardly, in which case the links **42** and **46** cooperate to produce a similar result.

Referring to the alternate form illustrated in FIGURE 18, the roller **64** is capable of limited axial expansion to accommodate for minor differences in the widths of the side frames **15** in previously manufactured existing machines. Thus the roller **64** includes a short tube section **65** and a long tube section **66** urged axially away from the short tube section **65** by a coil spring **67**. To permit free rotation as in the principal form, there is provided a roller bushing **68** on the short tube section **65** and a bar supporting bushing **69** rotatable with respect thereto. The roller bushing includes a sleeve portion **70** having a socket **71** accommodating the end **72** of an elongated bar **73**, the bar **73** being maintained within the socket **71** by the engagement of a pin **75** in a slot **74**, the bar **73** preventing collapse of the spring **67**. A similar arrangement of structure (not shown) is provided at the opposite end of the roller **64**.

I wish it to be understood that we do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the invention pertains.

I claim:

1. In a cloth laying machine, including a cloth laying table having an upwardly disposed surface, and a carriage element slideably carried by said table and having means dispensing a continuous web of material upon said table, the improvement comprising: means for squeezing air entrapped between adjacent layers of material as the same are laid upon the surface, said means including a

roller of a length at least equal to the width of said cloth web of material, and pivotally mounted link means yieldably supporting said roller transversely to the axis of movement of said carriage upon said table, at the level of the highest layer of material disposed upon said surface; said last mentioned means including first and second brackets mounted upon said means for dispensing said web, each of said brackets having a first link pivotally mounted for movement upwardly only from a horizontal disposition, and a second link pivotally mounted for free rotation on said first link, said roller being carried by said second link.

2. The cloth laying machine of claim **1** further characterized in having a cloth fold retaining means at each end of the table, the rollers being lifted up at each end by said retaining means when contacted therewith.

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