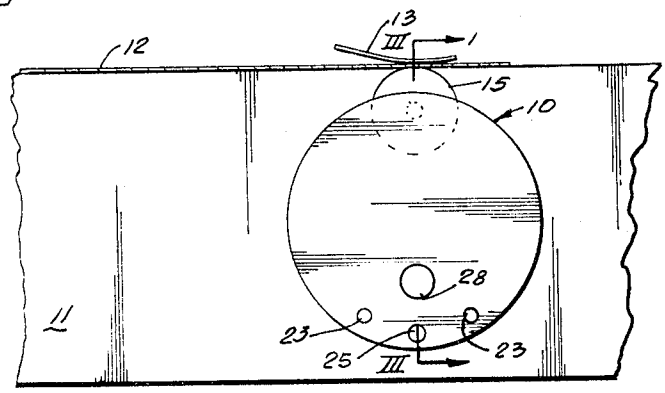
June 25, 1968 R. C. TALBOT 3,389,684

HOT MELT GLUE APPLICATOR

Original Filed June 14, 1965 3 Sheets-Sheet 1

Fig. 1



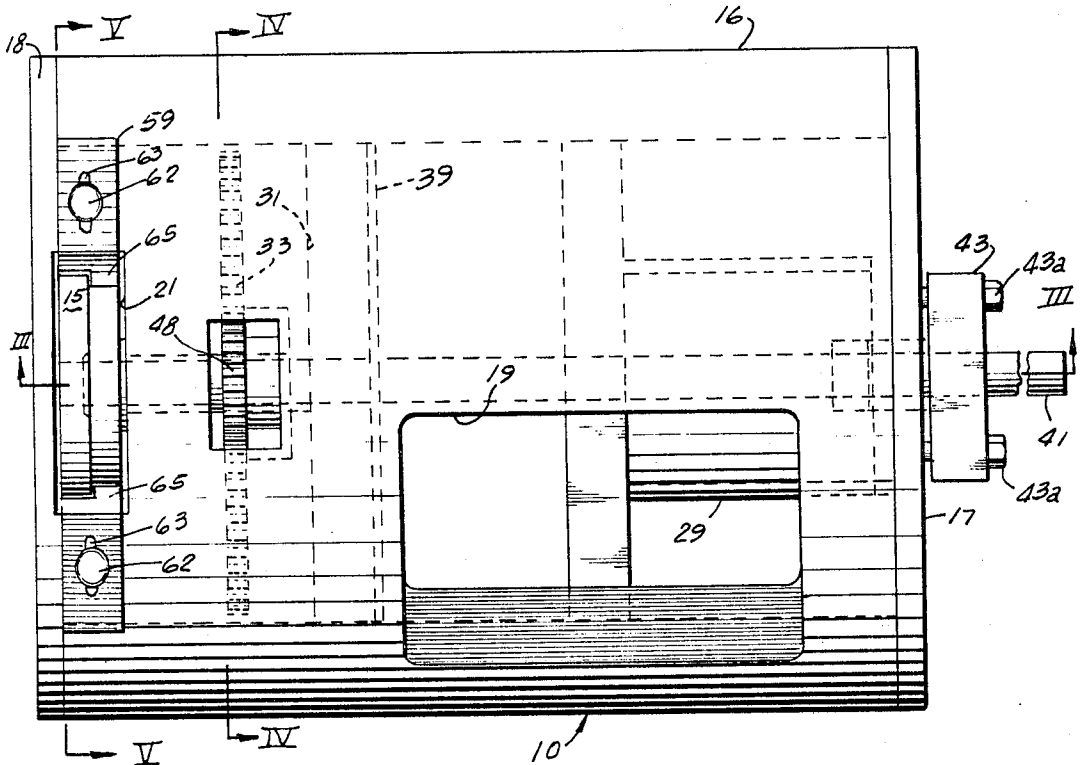


Fig. 2

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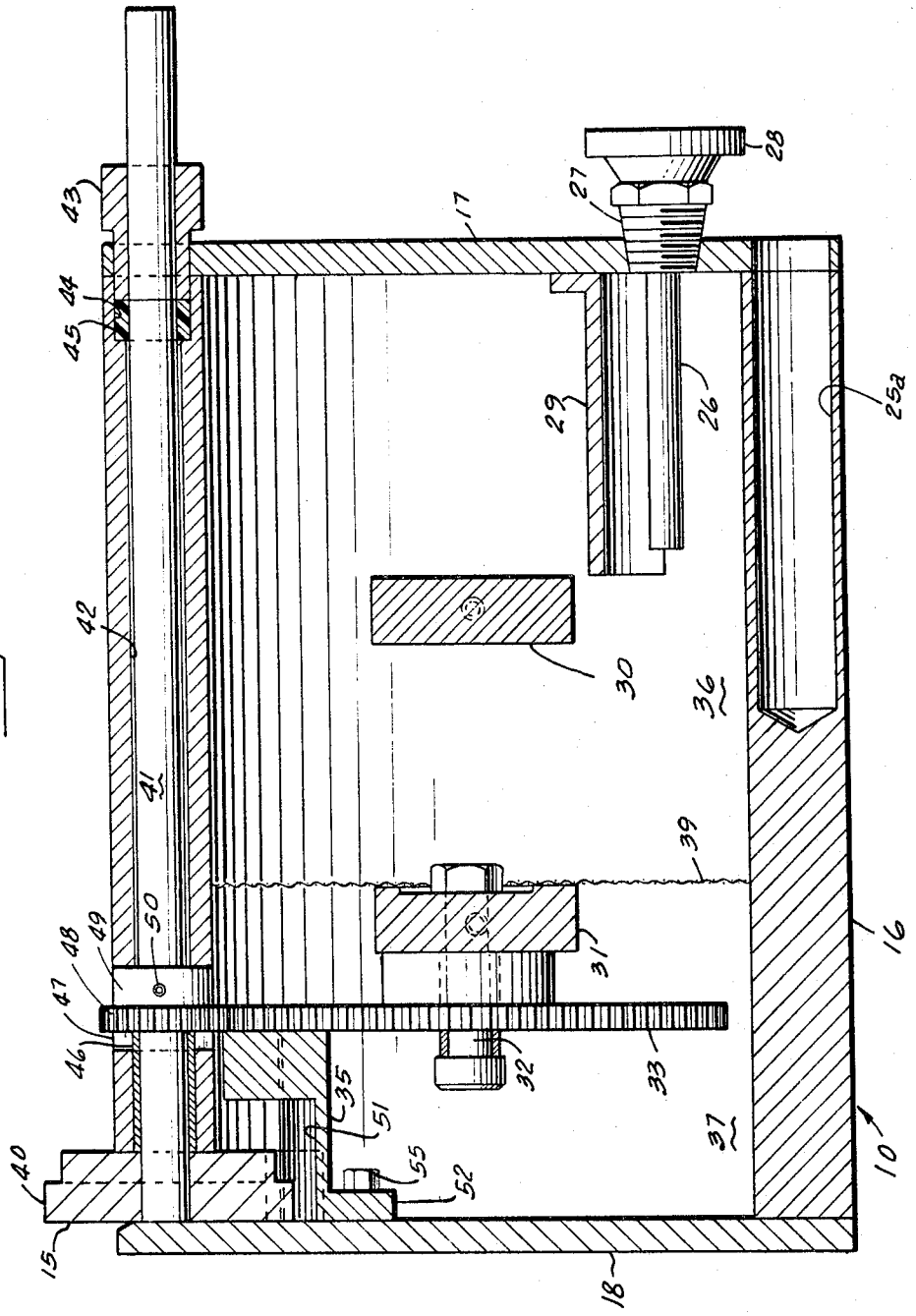
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HOT MELT GLUE APPLICATOR

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FIG- 3



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HOT MELT GLUE APPLICATOR

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Fig- 4

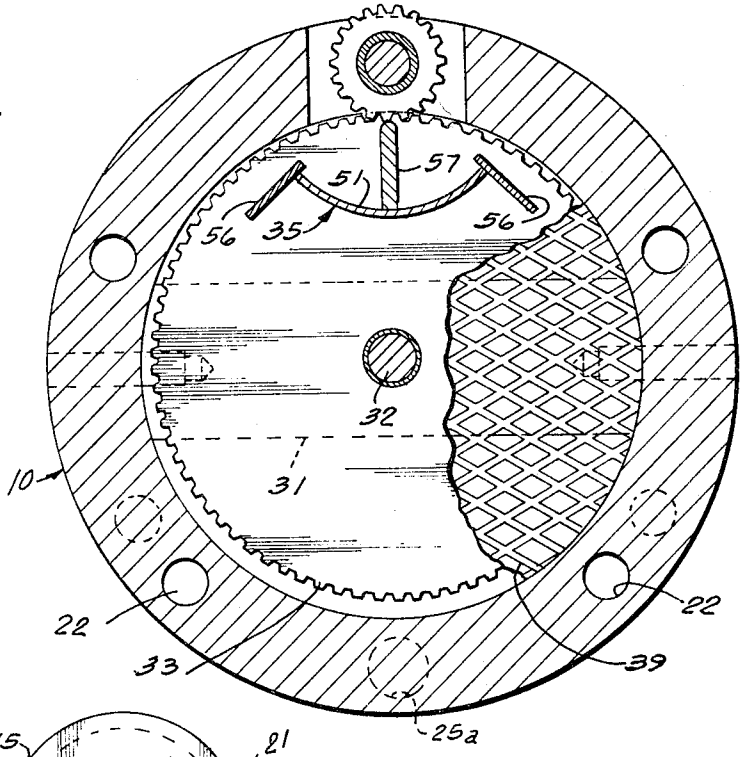
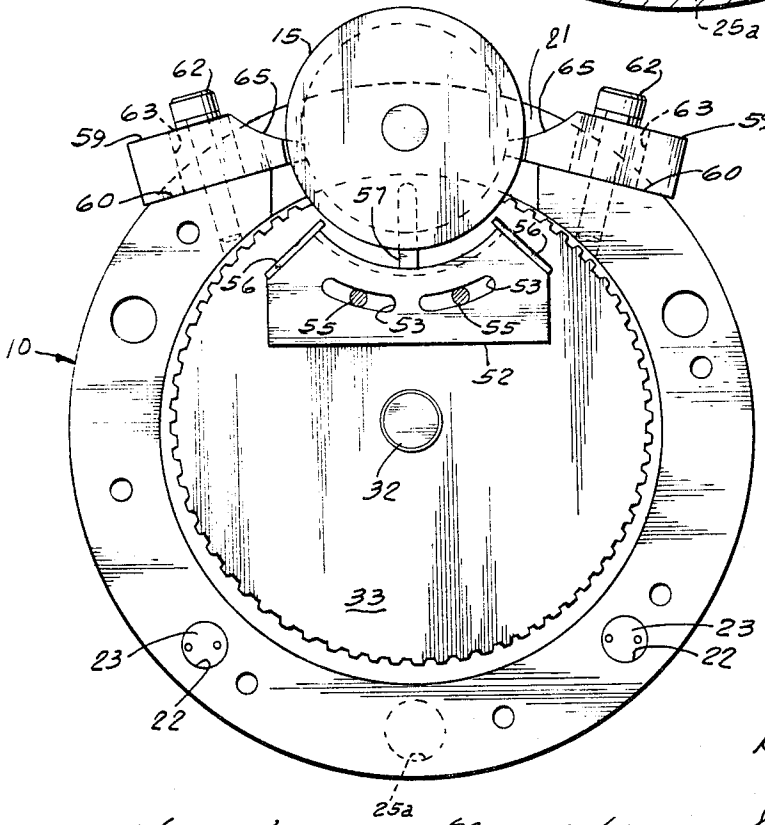


Fig- 5



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United States Patent Office

3,389,684

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HOT MELT GLUE APPLICATOR

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Continuation of application Ser. No. 463,807, June 14, 1965. This application Sept. 19, 1967, Ser. No. 669,363

17 Claims. (Cl. 118—202)

ABSTRACT OF THE DISCLOSURE

Glue applicator for applying hot melt glue to a succession of traveling articles. A thick walled barrel-like glue pot has a glue supply opening at its top to supply hot melt glue to the glue pot. Electric heating elements are recessed in and extend along the thick barrel-like wall of the glue pot at circumferentially spaced locations and a thermostat out of contact with the glue is recessed in the wall of the glue pot between the heating elements, to control the heating elements under the same conditions as the heating elements and to thereby prevent overheating of the glue. A glue trough is mounted in the glue pot on one end wall of the pot above the bottom of the pot and has a wiper on its inner side having wiping engagement with a pick-up gear rotatably driven about the axis of the barrel-like wall of the glue pot to pick up melted glue from the bottom of the glue pot, which is wiped from the side wall of the gear by the wiper. A glue applicator roll is rotatably driven by the means rotatably driving the pick-up gear to move its circumferential periphery into and out of the glue pot to apply glue supplied by the glue trough, to the traveling articles to be glued.

Summary of the invention and objects

This application is a continuation of U.S. application 463,807 now abandoned.

A principal object of the present invention is to provide a novel and improved form of applicator for applying a quick setting glue to certain parts of cartons and the like, so arranged as to apply and maintain the glue in condition for gluing and assure substantially instantaneous adhesion of the glued parts and thereby materially facilitate the closing or forming of cartons and other articles to be glued.

Another object of the invention is to provide a new and improved form of glue applicator particularly adapted to apply glue to a succession of traveling articles, which is particularly arranged for hot melt glue and supplies the hot melt glue to an applicator in a simple and improved manner.

Still another object of the invention is to provide a glue applicator for applying hot melt glue to succession of traveling articles, in which a rotatably driven applicator roller serves as the glue applying member and in which a rotatably driven pick up member picks up glue for application to the applicator roller and maintains a continuous circulation of glue in the glue pot.

A still further object of the invention is to provide an improved form of gluing apparatus for applying hot melt glue to a succession of traveling articles utilizing a glue pot for containing and melting the glue by electric heating

means, a glue trough spaced above the bottom of the glue port for supplying an applicator roller with glue and a pick up gear rotatably driven with the applicator roller and having wiping engagement with the glue trough and bringing melted glue from the bottom of the glue pot, and supply the glue to the glue trough by wiping engagement between the glue trough and pick up gear.

A still further object of the invention is to improve upon the gluing apparatus heretofore in use for gluing traveling articles by utilizing a thick walled cylindrical horizontally extending glue pot and recessing heating elements in the wall of the pot, by providing a glue trough above the bottom of the glue pot and maintaining a circulation of the glue in the pot and elevating the glue from the bottom of the pot to the glue trough by the glue circulating means.

A still further object of the invention is to provide an improved form of glue pot for hot melt gluing, in which an applicator roll is rotatably mounted at the top of the pot and extends above the top thereof and moves along a glue trough spaced above the bottom of the pot and supplied with glue by a pick up gear wiped by the inner edge of the glue trough, in which the trough is adjustable to vary the amount of glue supplied to the glue applicator roller and in which adjustable doctors are provided on each side of the applicator roller to control the supply of glue on the glue applicator roller and accommodate the application of glue in either direction of rotation of the glue applicator roller.

These and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

FIGURE 1 is a generally diagrammatic end view of a glue applicator constructed in accordance with the principles of the present invention, diagrammatically showing the applicator applying glue to the flap of a traveling carton;

FIGURE 2 is a top plan view of the glue applicator diagrammatically shown in FIGURE 1;

FIGURE 3 is a vertical sectional view of the glue applicator taken substantially along line III—III of FIGURE 1;

FIGURE 4 is a transverse sectional view taken substantially along line IV—IV of FIGURE 2; and

FIGURE 5 is an end view of the glue application shown in FIGURE 2 with one end cover removed and looking substantially along line V—V of FIGURE 2.

In the embodiment of the invention illustrated in the drawings, I have diagrammatically shown in FIGURE 1 a glue pot **10** for hot melt glue suitably mounted on the front face of a guide **11** of a carton closing machine. A flap **12** of a carton is movable along the top surface of the guide **11** and is shown as being pressed by a yieldable pressure finger **13** into engagement with a glue applicator roller **15**, rotatably driven by power to apply glue to the bottom of the flap **12** as the flap passes therealong.

A succession of cartons may continually pass along the inside of the guide **11** and the flaps thereof may have glue applied thereto in a continuous operation, and then may be folded downwardly along the front face of the carton and pressed into engagement with the front face of the carton, to seal the carton closed. The quick setting qualities of the hot melt glue used assure a tightly instan-

taneously closed carton as the glued flap is pressed into engagement with the front face of the carton by conventional pressure rollers or a like pressure means.

The glue pot **10** is shown as being in the form of a thick walled cylinder or tube **16**, which may be made from a good heat conducting material such as brass or aluminum, or from any other material having good heat conducting qualities. The cylinder **16** is closed at its outer end by an end closure plate **17** and is closed at its inner end by a similar end closure plate **18**. An opening **19** for the supply of glue opens through the top portion of the cylinder wall **16** and is disposed in the end portion of the cylinder wall **16** adjacent the outer end plate **17**. The glue supply opening **19** may be closed by a suitable cover (not shown). An opening **21** opening to the inner end plate **18** and to the inside of the cylinder **16** is provided in vertical alignment with the axial center of the cylinder and forms an opening for the glue applicator roller **15**, accommodating said glue applicator roller to extend within the glue pot.

The outer end plate **17** and cylinder **16** have spaced recesses or holes **22**, **22** on opposite sides of the vertical center of said cylinder and extending along said cylinder for a greater portion of the length thereof, and forming receptacles for heaters **23**, **23**. The heaters **23**, **23** may be electrically energizable heaters of the resistor type and form no part of the present invention, so need not herein be shown or described further.

The heaters **23**, **23** may be energized under the control of a conventional thermostat **25** fitting in a hole **25a** drilled or oherwise formed in the wall of the cylinder **16**, between the heaters **23**, **23**. The thermostat **25** being out of contact with glue in the glue pot is unaffected by cold glue dropped into the pot and controls the heating elements **23**, **23** by the temperature of the wall of the pot, and thus controls the heaters under conditions similar to the temperature environment of the heaters, giving a more accurate control of the temperature of glue in the pot.

A thermometer **26** is shown in FIGURE 6 as being mounted in a fitting **27** threaded within the outer end wall **17** of the glue pot and has a gauge head **28** on the outer end thereof, indicating the temperature of glue within the pot.

An arcuate shield **29** is suitably secured to the inside of the outer wall **17** and extends inwardly therefrom along the top of the thermometer **26**, to shield said thermometer and prevent inaccuracies in temperature readings which may be caused by dropping cold glue on the thermometer.

A heat conducting bar **30** extends across the inside of the cylinder **16** and is suitably secured thereto at its opposite ends. A heat conducting bar **31** is spaced inwardly of the bar **30** and extends across the cylinder wall **16** in parallel relation with respect to the bar **30**, and is suitably secured to said wall at its opposite ends. The bar **31** forms a support for a shaft **32** forming a bearing support for a pickup gear **33** picking up glue from the glue pot and transferring glue to an upwardly spaced glue trough **35**, as will hereinafter more clearly appear as this specification proceeds.

The glue supplied to the glue pot through the supply opening **19** may be of any commercial form of hot melt glue and may be in the form of flakes, pellets, sticks or like conventional forms, and in order to prevent unmelted glue feshly placed in the pot from getting to the pick-up wheel or gear **33** and glue trough **35** and applicator roller **15**, I have separated the interior of the glue pot into a pre-melt section **36** and a glue applicator section **37**, by a screen **39**, having a periphery formed to conform to the inner periphery of the cylindrical wall **16**, and forming a partition extending across said wall at the outer side of the brace **31**.

The glue applicator roller **15** is shown in FIGURE 3 as being a stepped roller having a large diameter peripheral applicator portion **40**, extending along the inner side of the inner end wall **18** and forming a glue carrying surface, for applying hot melt glue to the surface of an article passing along and pressed into engagement with the top of said roller. A drive shaft **41** extends along an axially drilled hole **42** in the wall of the cylinder **16** in vertical alignment with the axial center of said wall, and is journalled inwardly of its outer end in a bearing **43**. The bearing **43** may be made from brass or any other suitable bearing material and extends into the outer end plate **17** and into an enlarged diameter drilled portion **44** of the wall of the cylinder **16**, coaxial with the drilled portion **42** of said wall. The bearing member **43** abuts a packing or sealing ring **45** in the enlarged diameter drilled portion **44** and serves to retain said sealing ring in position in said enlarged drilled portion. Machine screws **43a** extending through the head of the bearing **43** on the outer side of the end plate **17** and threaded in said end plate are provided to retain said bearing in position. The shaft **41** forms a mounting and drive member at its inner end for the glue applicator roller **15** and is journalled adjacent the glue applicator roller in the bearing **46** extending from said roller into an opening **47** in the wall of the cylinder **16** and forming an opening for a drive pinion **48** for the pick-up gear **33**. The drive pinion **48** has a hub **49** secured to the shaft **41** to be driven from said shaft, as by a threaded pin **50**. The shaft **41** may be driven at its outer end by a suitable drive motor (not shown) through conventional reduction gearing, which is no part of the present invention, so need not herein be shown or described further.

The glue trough **35** is shown in FIGURES 4 and 5 as having an arcuate bottom **51** opening toward one side of the pick-up gear **33** and wiped thereby. The axis about which the arc of the arcuate bottom **51** is struck is shown in FIGURE 5 as being coaxial with the axis of rotation of the glue applicator roll **15**. The trough **35** also has an inner flange **52** depending from the arcuate bottom thereof and abutting the inside of the inner wall **18**. The flange **52** has spaced arcuate slots **53**, **53** extending therethrough, the arcs of which are struck from an axis coaxial of the axis of rotation of the glue applicator roll **15**. Machine screws **55** extend through the slots **53** and are threaded in the inner end wall **18** to secure the glue trough **35** in position. The arcuate slots **53**, **53** and machine screws **55**, **55** form a means for adjustably moving the glue applicator trough about the axis of the glue applicator roll **15**, and varying the depth of glue that may be contained therein. Extending along opposite ends of the trough **35** are retaining plates **56**, extending radially of the axis of rotation of the glue applicator roll **15** and toward said glue applicator roll, and serving as end dams for the glue trough and also serving to limit the quantity of glue that may be picked up from the trough by the glue applicator roll **15**.

A central upright wiper bar **57** extends radially upwardly of the arcuate bottom **51** of the glue trough **35** at the transverse center thereof toward the shaft **41**. The wiper bar **57** is shown in FIGURE 3 as being formed integrally with the trough **35** and is spaced outwardly of the glue applicator roller **15**, and has wiping engagement with the inner side of the pick-up gear **33**, and serves to wipe glue from said gear to flow to the arcuate bottom **51** of the glue trough **35** in each direction of rotation of the gear **33**.

A doctoring means is provided, having doctoring cooperation with opposite sides of the glue applicator roll **15**. The doctoring means is shown in FIGURES 2 and 5 as comprising a pair of doctor blocks **59**, **59** on opposite sides of the axis of rotation of the applicator roll **15**. As shown in FIGURE 5 the doctor blocks abut inclined faces **60**, **60** of recesses formed in the wall of the cylinder **16** and extending outwardly of opposite ends of the opening **21** and having communication therewith. The doctor blocks **59**, **59** are mounted on the faces **60**, **60**

for adjustable movement toward and from the glue applicator roll **15** by machine screws **62, 62** extending through elongated slots **63, 63** formed in said doctor blocks.

Each doctor block **59** converges at its inner end from the top of the block toward the face **60**, to a stepped doctor blade **65**, generally conforming to the stepped periphery of the glue applicator roller **15**, and adjustable with respect to the stepped periphery of said roll to maintain a predetermined thickness of glue on the enlarged diameter peripheral portion **50** of said glue applicator roll, to effect the application of a sufficient quantity of glue to the carton flap to effect an efficient seal between the flap and the end of its carton. With the two doctor blades at each side of the glue applicator roll **15**, the applicator roll may be rotatably driven in reverse directions in accordance with the travel of the articles to be glued and may operate as efficiently while rotating in one direction as in an opposite direction.

It may be seen from the foregoing that the glue pot is of a generally barrel-like thick walled form and that the barrel shape of the glue pot, with the center of the barrel parallel to the axis of rotation of the glue roller, not only enables the glue to be continually circulated by the pick-up gear **33**, but has the advantage of keeping heat in the pot, and to radiate the heat into the glue all the way around the inner wall of the barrel.

It may also be seen that the heaters and thermostat being recessed in the wall of the pot, are unaffected by the glue in the pot and maintain the glue in a melted condition by maintaining the wall of the pot at the required temperature.

It may further be seen that the pick-up gear **33** is of such a diameter as to pick up hot glue close to the bottom of the pot to enable operation of the applicator until the pot is substantially empty, and that the pick-up gear **33** may pick up glue in each direction of rotation thereof, and efficiently transfer the glue to the arcuate bottom **51** of the glue trough **35** and is separated from the heating portion of the pot by a mesh screen keeping the unmelted glue from contacting the glue transfer gear, and enabling the supply of glue to the pot to be replenished while the applicator is in continuous operation.

While I have herein shown and described one form in which the invention may be embodied, it may readily be understood that various variations and modifications in the invention may be attained without departing from the sprit and scope of the novel concepts thereof.

I claim:

1. A glue applicator for applying hot melt glue to cartons and the like, comprising:

a glue pot having a closed bottom, opposite end walls and a glue supplying opening in the top thereof,

a glue trough in said glue pot adjacent one end thereof and disposed above the bottom thereof,

said glue trough having an upwardly facing glue carrying surface,

a glue applicator roll rotatably mounted in said glue pot and having a peripheral surface movable into and along said glue trough in close proximity to said glue carrying surface and above the top of said glue trough and glue pot,

a drive shaft supporting and driving said glue applicator roller,

a pick-up gear rotatably mounted within said glue pot and having wiping engagement with an inner side of said glue trough, for picking up glue from the bottom of said glue pot and supplying glue to said glue trough,

a pinion on said support and drive shaft for said glue applicator roller meshing with and driving said pick-up gear,

means adjustably mounting said glue trough on an adjacent end wall of said glue pot for adjustable movement about the axis of said glue roller, to vary the quantity of glue in said trough,

and an upright wiper on the inner side of said glue trough and having wiping engagement with a side of said pick-up gear for wiping glue from the side of said pick-up gear to flow into said glue trough.

2. The structure of claim **1**,

wherein doctoring means are mounted on said glue pot for doctoring cooperation with said glue applicator roller for regulating the quantity of glue carried by the peripheral surface of said glue applicator roller,

and wherein the upright wiper on the inner side of said glue trough is at the center of said glue trough to wipe glue from the side of said pick-up gear in each direction of rotation thereof.

3. A glue applicator for applying hot melt glue to a succession of traveling articles, comprising:

a thick walled cylindrical glue pot having opposite closed ends and a glue supply opening in the top thereof,

a glue applicator roll having a peripheral glue applying portion and driven to move said glue applying portion into and out of said glue pot,

a glue trough mounted on one end wall of said glue pot within said glue pot and above the bottom thereof for supplying glue to said glue applicator roller,

means rotatably driving said glue applicator roller,

a gear extending along the inside of said glue trough and rotatable about a horizontal axis disposed adjacent the horizontal axis of said glue pot and movable from the bottom to the top of said glue pot for elevating glue to said glue trough,

wiper means on said glue trough having wiping engagement with an adjacent side of said gear for wiping glue from said gear into said glue trough,

at least two electrically energizable heating elements recessed in and extending along the barrel-like wall of said glue pot for a substantial portion of the length thereof,

and a thermostat recessed in and extending along the barrel-like wall of said glue pot between said heating elements for controlling the temperature of said glue pot in accordance with the temperature of the wall thereof.

4. A glue applicator in accordance with claim **3**,

wherein a thermometer extends within said glue pot above the bottom thereof and is mounted on the opposite end wall of said glue pot from said glue trough,

and wherein a shield extends over the top of said thermometer and is mounted on the wall supporting said thermometer beneath the glue supply opening, to shield said thermometer from cold glue deposited to said glue supply opening and thereby prevent inaccuracies in temperature readings.

5. In a glue applicator particularly adapted for applying hot melt to a succession of traveling articles,

a glue pot having a horizontally extending thick cylindrical wall and opposite inner and outer end walls closing the ends of said cylindrical wall,

a glue supply opening in the top of said cylindrical wall adjacent said outer end wall,

a second opening in the top of said cylindrical wall adjacent said inner end wall,

a support and drive shaft journalled in said cylindrical wall at the top thereof,

a glue applicator roller in said second opening and having a glue applying peripheral surface,

said glue applicator roll being mounted on and driven from said drive shaft and rotatably driven by said shaft to advance its peripheral glue applying surface into and out of said glue pot,

a glue trough mounted on said inner wall above the bottom thereof and extending into said glue pot inwardly of said inner wall,

a pick-up gear freely mounted in said glue pot and

having a side surface movable along the inner side of said glue trough,

a pinion on said support and drive shaft rotatably driving said pick-up gear,

a wiper extending vertically of said glue trough and having engagement with the side of said pick-up gear for wiping glue from the side of said pick-up gear and transferring glue to said glue trough,

doctor means having doctoring cooperation with said glue applicator roll for varying the amount of glue carried thereby for application to a surface to be glued,

at least two electrically energizable heating elements recessed in and extending along the thick cylindrical wall of said glue pot for a substantial portion of the length thereof,

and a thermostat recessed in and extending along the thick cylindrical wall of said glue pot between said heating elements and serving to control operation of said heating elements and thereby control the temperature of the glue within said pot by the temperature of the wall thereof.

6. The structure of claim **5**,

wherein a thermometer is mounted in said outer end wall and extends within said glue pot parallel to the horizontal axis thereof,

and wherein a shield is mounted on the inner side of said outer end wall and extends inwardly therefrom over the top of said thermometer to protect said thermometer from cold glue deposited in said glue pot.

7. The structure of claim **6**,

wherein a screen extends across said cylindrical wall between said pick-up gear and said thermometer and separates the glue freshly deposited in said glue pot from said pick-up gear until heated to a consistency to pass through said screen.

8. The structure of claim **7**,

wherein means are provided for mounting said glue trough on the inside of said inner end wall for adjustable movement about the axis of rotation of said glue applicator roller for varying the quantity of glue in said glue trough.

9. A glue applicator particularly adapted for applying hot melt glue to a succession of traveling articles, comprising:

a glue pot having a cylindrical wall struck about a horizontal axis and having an opening in the top of said wall for the supply of glue thereto,

a glue applicator roller rotatably journalled in said wall and extending above and below said wall into the interior of said glue pot,

a shaft journalled in said wall parallel to the axis about which said wall is struck and forming a mounting and drive member for said roller,

a glue trough disposed beneath said glue applicator roller, having an arcuate bottom disposed closely adjacent the periphery of said roller for supplying glue thereto,

means carrying glue to said trough comprising,

a pick-up gear having wiping engagement with the inner side of said glue trough and extending close to the bottom of said glue pot,

a pinion on said shaft for rotatably driving said gear,

heating means extending along the wall of said glue pot for melting and maintaining the glue therein in a melted condition, and

screen means separating said pick-up gear from said supply opening.

10. A glue applicator for applying hot melt glue to a succession of traveling articles comprising:

a glue pot having a cylindrical wall struck about a horizontal axis,

an opening in said wall adjacent one end thereof for the supply of hot melt glue thereto,

heating means for melting and maintaining the glue in a melted condition,

a glue applicator roller having a peripheral glue applying surface, and rotatably journalled in said cylindrical wall of said glue pot and extending above and below said cylindrical wall,

a shaft journalled in said wall and forming a mounting and drive member for said roll,

a glue trough disposed beneath said glue roller and having a bottom spaced beneath said glue roller in close proximity to the glue applying surface of said glue roller,

pick-up means for glue in said glue pot picking up and transferring glue to said glue trough including,

a pick-up gear journalled in said pot for rotation about a horizontal axis parallel to the axis about which the wall of said pot is struck,

a pinion on said shaft for driving said gear,

said pick-up gear having wiping engagement with the side of said glue trough, and

said glue trough having an upright wiper blade extending upwardly from said trough and having wiping engagement with said pick-up gear for wiping glue from the side of said pick-up gear and transferring the glue into said glue trough.

11. A glue applicator in accordance with claim **10**,

wherein the upright wiper extends upwardly from the bottom of the glue trough and extends radially of the glue applicator roller and centrally of the bottom of the glue trough, to wipe glue from said pick-up gear and transfer glue to said glue trough in each direction of rotation of said pick-up gear.

12. A glue applicator in accordance with claim **10**,

wherein the glue trough has opposite end walls extending from said bottom toward said peripheral glue applying surface of said glue roller generally radially of the axis of rotation of said glue applicator roller and is adjustable about the axis of rotation of said glue applicator roller, to vary the level of glue therein.

13. A glue applicator in accordance with claim **10**,

wherein a thermometer extends into said glue pot through an end wall thereof,

and wherein a shield extends over said thermometer, to prevent inaccuracies in temperature readings that may be caused by the dropping of cold glue on the thermometer.

14. A glue applicator in accordance with claim **13**,

wherein a screen forms a vertical partition in said glue pot and separates said pick-up gear from the supply opening and thermometer in said glue pot.

15. A glue applicator in accordance with claim **10**,

wherein a doctor is provided on each side of the axis of rotation of said glue applicator roller,

and wherein said doctors are adjustably mounted on said cylindrical wall in doctoring cooperation with said glue applicator roller, to vary the quantity of glue on said glue applicator roller in each direction of rotation thereof.

16. A glue applicator in accordance with claim **10**,

wherein a thermostat is recessed in and extends along the wall of the glue pot adjacent the bottom thereof and along said heating means, and serves to control operation of said heating means, and to thereby control the temperature of the pot by the temperature of the wall thereof.

17. A glue applicator in accordance with claim **10**,

wherein the heating means includes at least two electrically energizable heating elements recessed in and extending along the wall of the glue pot for a substantial portion of the length thereof, and

wherein a thermostat is recessed in and extends along the wall of the glue pot between said heating elements and serves to control operation of said heat-

elements and to thereby control the temperature of the glue pot by the temperature of the wall thereof.

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