Jan. 5, 1960 A. M. GARSON ET AL 2,919,530

WRAPPING MACHINE

Filed Feb. 20, 1959 2 Sheets-Sheet 1

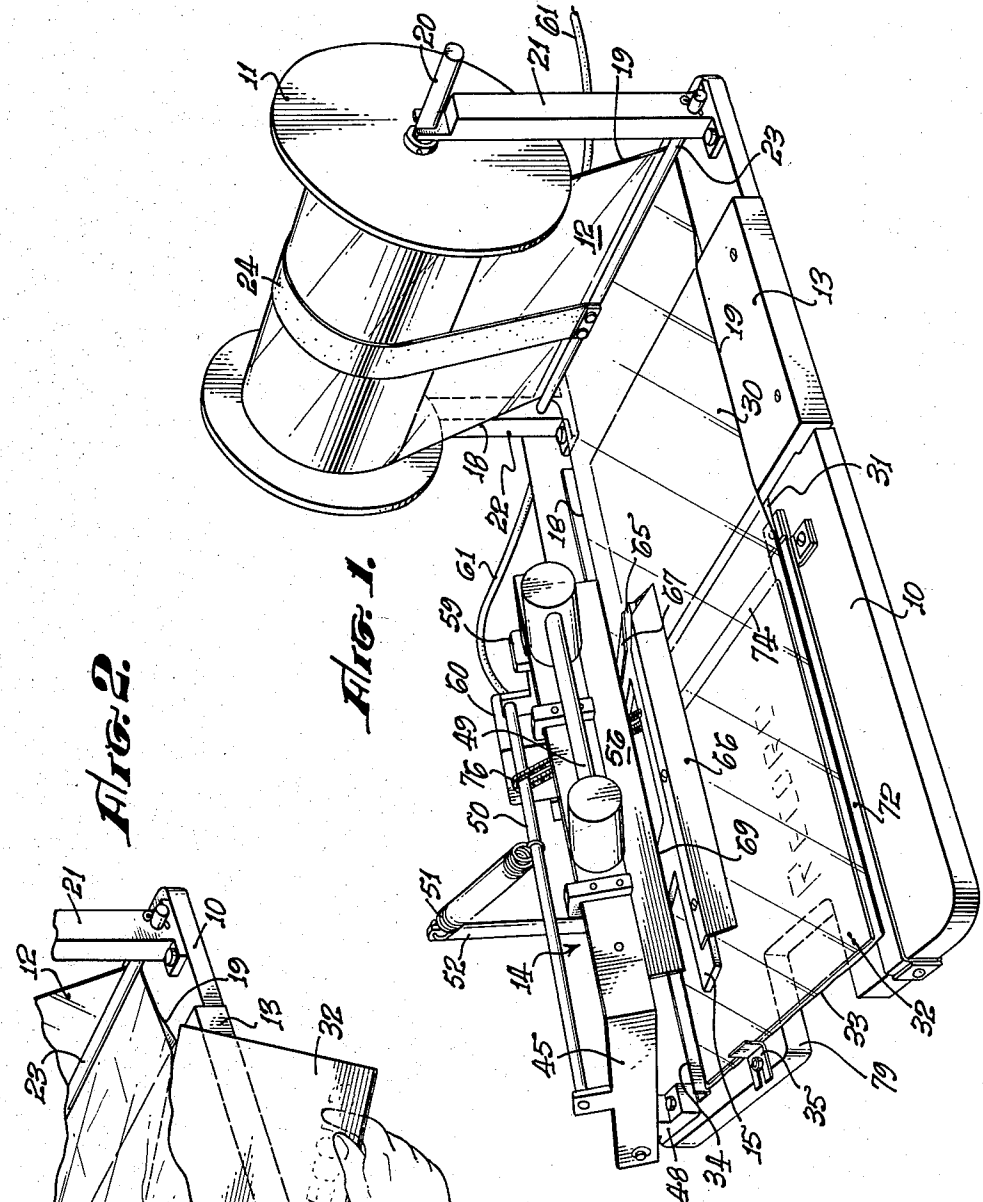


FIG. 1.

FIG. 2.

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FIG. 3.

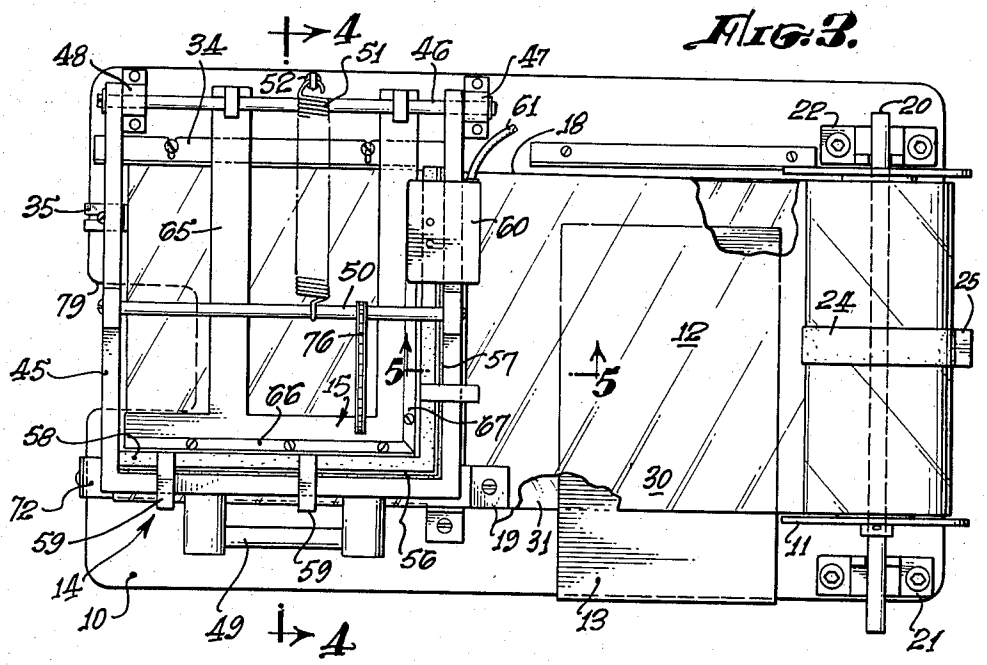


FIG. 4.

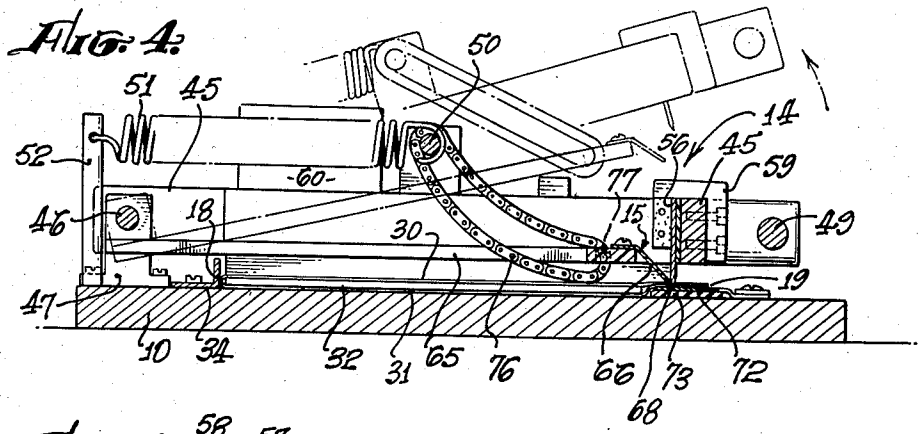
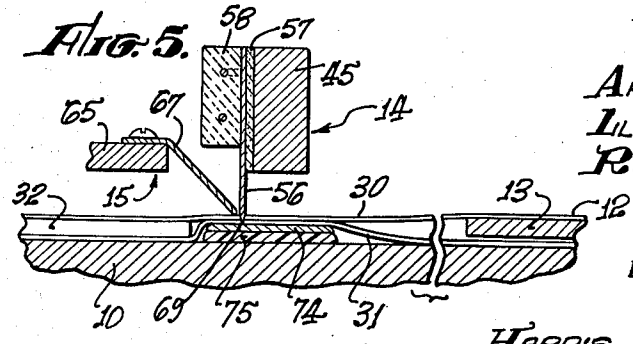


FIG. 5.



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WRAPPING MACHINE

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7 Claims. (Cl. 53—182)

This invention relates to wrapping machines and, in particular, to machines for wrapping flat packages such as phonograph albums and tape boxes, preferably using a transparent plastic as a wrapper.

It is an object of the invention to provide a wrapping machine adapted to use a continuous strip of wrapping material wherein the complete operation, including feeding of the wrapping material, is accomplished in the three steps of inserting the package to be wrapped, sealing the wrapper, and removing the wrapped package. A further object is to provide such a machine which is simple and inexpensive and one which is manually operated by a single operator.

It is an object of the invention to provide a wrapping machine which utilizes a folded strip of heat-sealable wrapping material having the leading edge sealed to form a pocket for receiving the package to be wrapped. A further object is to provide such a machine wherein insertion of the package into the pocket in the strip also serves to move the strip and package to the sealing space on the machine. A further object is to provide such a machine having a heat sealing edge which is movable into engagement with the folded strip when the strip and package are in the sealing space to seal the opposing layers around the package and also sever the sealed package from the strip, leaving the strip with a new sealed leading edge for receiving the next package.

It is an object of the invention to provide a wrapping machine having a presser plate carried by the sealing means with the presser plate being moved into engagement with the wrapping material prior to engagement by the sealing means so as to press the layers of wrapping material together around the package. A further object is to provide such a structure wherein the presser plate remains in engagement with the sealed package after the sealing means is raised so as to separate the sealing means from the sealed package. A further object is to provide such a machine wherein the presser plate and sealing means are pivoted on the same axis along the folded edge of the strip with the presser plate coupled to the sealing means by a flexible link permitting operation of both elements with a single handle on the sealing means.

It is a further object of the invention to provide such a wrapping machine which may use wrapping material in continuous rolls either folded or unfolded, i.e., the strip folding operation may be carried out prior to feeding the strip to the wrapping machine or the wrapping machine may be adapted to fold the strip.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. The drawings merely show and the description merely describes a preferred embodiment of the present invention which is given by way of illustration or example.

In the drawings:

Fig. 1 is an isometric view of the wrapping machine

of the invention showing a package in the sealing space prior to sealing;

Fig. 2 is a partial view similar to that of Fig. 1 showing a package being inserted into the wrapping strip;

Fig. 3 is a top view of the machine of Fig. 1;

Fig. 4 is an enlarged sectional view taken along the line 4—4 of Fig. 3; and

Fig. 5 is a partial enlarged sectional view taken along the line 5—5 of Fig. 3.

The preferred form of the wrapping machine of the invention shown in the drawings includes a work surface or table **10**, a reel **11** carrying a roll of heat-sealable wrapping material **12**, a separator plate **13** mounted on the work table, a sealing unit **14** and a presser unit **15**.

For most wrapping operations, it is preferred to use a transparent plastic wrapping material such as polyethylene, permitting visual inspection of the package within the wrapping. The reel **11** feeds a continuous strip of the wrapping material along the top of the work table, the material being folded along its center line providing a folded edge **18** and an open edge **19**. Of course, an unfolded reel of material can be used with a conventional folding device being provided on the work table. The separator plate **13** engages the edge. The reel **11** is mounted on a shaft **20** carried on vertical brackets **21**, **22**, the brackets being mounted on the work table **10**. A guide rod **23** is positioned between the brackets **21**, **22** and spaced slightly above the work table with the strip of wrapping material running under the guide rod. A flexible band **24** of rubber or the like is fixed at one end to the guide rod **23** and has a weight **25** (Fig. 3) attached to the other end, the band being placed over the reel of wrapping material to assure smooth feeding of the material.

The folded strip **12** is fed along the work table with an upper layer **30** above the separator plate **13** and a lower layer **31** passing between the separator plate and the work table. The separate plate **13** engages the work table only along an edge which is outside the open edge of the folded strip so that the remainder of the plate may project into the folded strip between the upper and lower layers, thus serving to separate the layers permitting easy insertion of the package to be wrapped, such as the phonograph record **32** of Fig. 2.

The upper and lower layers of the folded strip are sealed together at the leading edge **33** as a result of the wrapping of the preceding package. The package **32** is inserted into the pocket formed by the folded edge **18** and the sealed edge **33** (Fig. 2) and the package and strip are moved along the work surface to engage a guide bracket **34** and a stop bracket **35** (Fig. 1). The guide and stop brackets define two sides of the package wrapping space and receive and position the end of the folded strip with the package therein. These brackets are removably mounted on the base **10**, permitting changing of the size and shape of the package wrapping space to accommodate different sizes and shapes of packages.

The sealing unit **14** includes a U-shaped frame **45** mounted on a shaft **46** carried on brackets **47**, **48** on the table **10**, the frame being manually movable toward and away from the table by a handle **49**. A rod **50** is positioned between the arms of the U-frame **45** and a tension spring **51** is connected between the rod **50** and a boss **52** projecting upward from the base **10**, the spring normally maintaining the sealing unit in the raised position as shown in Fig. 1.

A metal knife edge or sealing plate **56** is mounted inside the frame **45** between a heat insulating strip **57** and a heater strip **58** by three clamp brackets **59**, the knife edge projecting below the frame as best seen in Fig. 5. In this embodiment of the invention, the knife edge **56**

is L-shaped and in conjunction with the guide bracket **34** and the stop bracket **35**, defines the rectangular package wrapping space. A temperature control unit **60** for the heater strip **58** is carried on the frame **45**, the control unit having a cord **61** for connection to a suitable power source.

The presser unit **15** includes a bifurcated frame **65** mounted on the shaft **46** for movement toward and away from the work table **10**. Presser plates **66**, **67** are carried on the frame **65**, each presser plate having a lower edge **68**, **69**, respectively, projecting below the frame for contacting the folded strip of wrapping material on the work table adjacent and inwardly of the knife edge **56**.

It is preferred to cover the work surface or table **10** in the area where it would be engaged by the sealing knife edge with a material to which the heat-sealable wrapping strip is not adherent. In the embodiment disclosed herein, a strip **72** of a fabric such as glass cloth is mounted on the table over a spacer strip **73** (Fig. 4) and another strip **74** of the fabric is mounted on the table over another spacer strip **75** (Fig. 5), the two strips **72**, **74** underlying the L-shaped knife edge **56**.

The presser unit **15** serves to press the two layers of the folded strip together on the strips **72**, **74** after the record and wrapping material have been positioned in the wrapping space as shown in Fig. 1. Means are provided for coupling the presser unit to the sealing unit so that a single manual operation will first lower the presser unit onto the wrapping material and then engage the heated knife edge with the wrapping material to seal the two layers together and then sever the sealed layers along the knife edge. After the sealing and severing operation is completed, the sealing unit is lifted to disengage the knife edge from the wrapped package while the presser unit remains in position, thereby preventing adherence of the wrapping material to the knife edge. As the sealing unit is raised further by the action of the spring **51**, the presser unit is also raised and the wrapped package is removed from the machine. A notch **79** in the work table provides access for grasping and lifting the wrapped package from the machine.

It is preferred to couple the presser unit and sealing unit by a flexible link or chain **76** with the chain looped around the rod **50** of the sealing unit and passing through an opening **77** in the frame **65** of the presser unit. The chain is shown taut in Fig. 1 and in phantom in Fig. 4, with the spring holding the sealing unit in the raised position and the chain holding the presser unit in the raised position. Fig. 4 in solid lines shows the chain in the slack position achieved by manually lowering the sealing unit against the action of the spring to first engage the presser unit with the wrapping material and then engage the sealing unit.

While the machine described herein is adapted for wrapping a rectangular package such as a phonograph record or a tape box, it is understood that the same principle can be utilized in making a machine to wrap packages having other outlines, it merely being necessary to properly dispose the stop bracket and shape the heated knife edge to define the desired package space.

Although an exemplary embodiment of the invention has been disclosed and discussed, it will be understood that other applications of the invention are possible and that the embodiment disclosed may be subjected to various changes, modifications and substitutions without necessarily departing from the spirit of the invention.

We claim as our invention:

1. In a wrapping machine for flat packages, the combination of: means defining a work surface; means for feeding a folded strip of heat-sealable material along said work surface, said work surface including a guide element parallel to the direction of movement of said strip and adjacent the folded edge thereof and a stop element transverse to said guide element for blocking movement of said strip, said elements defining two sides of a space

corresponding in shape to that of the package to be wrapped for receiving the end of said strip with a package for sealing therein; a metal edge mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said metal edge toward and away from said work surface, said metal edge cooperating with said stop and guide elements to enclose said space; and means for heating said edge to seal opposing layers of the folded strip together and sever the strip along said seal when said edge is moved toward said work surface into engagement with said strip.

2. In a wrapping machine for flat packages, the combination of: means defining a work surface; means for feeding a folded strip of heat-sealable material along said work surface, said work surface including a guide element parallel to the direction of movement of said strip and adjacent the folded edge thereof and a stop element transverse to said guide element for blocking movement of said strip, said elements defining two sides of a space corresponding in shape to that of the package to be wrapped for receiving the end of said strip with a package for sealing therein; a metal edge mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said metal edge toward and away from said work surface, said metal edge cooperating with said stop and guide elements to enclose said space; a presser plate mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said presser plate toward and away from said work surface, said presser plate having the same outline as said metal edge for engaging said work surface a small distance inside said metal edge for pressing the layers of said material together over the package therebetween; and means for heating said edge to seal opposing layers of the folded strip together and sever the strip along said seal when said edge is moved toward said work surface into engagement with said strip.

3. In a wrapping machine for flat packages, the combination of: means defining a work surface; means for feeding a folded strip of heat-sealable material along said work surface, said work surface including a guide element parallel to the direction of movement of said strip and adjacent the folded edge thereof and a stop element transverse to said guide element for blocking movement of said strip, said elements defining two sides of a space corresponding in shape to that of the package to be wrapped for receiving the end of said strip with a package for sealing therein; a metal edge mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said metal edge toward and away from said work surface, said metal edge cooperating with said stop and guide elements to enclose said space; a presser plate mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said presser plate toward and away from said work surface, said presser plate having the same outline as said metal edge for engaging said work surface a small distance inside said metal edge for pressing the layers of said material together over the package therebetween; flexible coupler means for coupling said presser plate to said metal edge for lifting said presser plate from said work surface with said metal edge whereby, with downward movement of said metal edge, said presser plate contacts said work surface before said metal edge and, with upward movement, said metal edge is raised from said work surface a distance before said presser plate is lifted from said work surface; and means for heating said edge to seal opposing layers of the folded strip together and sever the strip along said seal when said edge is moved toward said work surface into engagement with said strip.

4. In a wrapping machine for flat packages, the combination of: means defining a work surface; means for feeding a folded strip of heat-sealable material along

said work surface, said work surface including a guide element parallel to the direction of movement of said strip and adjacent the folded edge thereof and a stop element transverse to said guide element for blocking movement of said strip, said elements defining two sides of a space corresponding in shape to that of the package to be wrapped for receiving the end of said strip with a package for sealing therein; a metal edge mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said metal edge toward and away from said work surface, said metal edge cooperating with said stop and guide elements to enclose said space; a presser plate mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said presser plate toward and away from said work surface, said presser plate having the same outline as said metal edge for engaging said work surface a small distance inside said metal edge for pressing the layers of said material together over the package therebetween; a flexible link coupling said presser plate to said metal edge for lifting said presser plate from said work surface with said metal edge whereby, with downward movement of said metal edge, said presser plate contacts said work surface before said metal edge and, with upward movement, said metal edge is raised from said work surface a distance before said presser plate is lifted from said work surface; and means for heating said edge to seal opposing layers of the folded strip together and sever the strip along said seal when said edge is moved toward said work surface into engagement with said strip.

5. In a wrapping machine for flat packages, the combination of: means defining a work surface; means for feeding a folded strip of heat-sealable material along said work surface, said work surface including a guide element parallel to the direction of movement of said strip and adjacent the folded edge thereof and a stop element transverse to said guide element for blocking movement of said strip, said elements defining two sides of a space corresponding in shape to that of the package to be wrapped for receiving the end of said strip with a package for sealing therein; a flat plate carried at one edge on said work surface with the remainder of said plate spaced above said work surface for projecting from the open edge of said folded strip between the layers thereof toward said folded edge; a metal edge mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said metal edge toward and away from said work surface, said metal edge cooperating with said stop and guide elements to enclose said space; a presser plate mounted on said work surface for pivoting along an axis parallel to and adjacent said guide element for moving said presser plate toward and away from said work surface, said presser plate having the same outline as said metal edge for engaging said work surface a small distance inside said metal edge for pressing the layers of said material together over the package therebetween; flexible coupler means for coupling said presser plate to said metal edge for lifting said presser plate from said work surface with said metal edge whereby, with downward movement of said metal edge, said presser plate contacts said work surface before said metal edge and, with upward movement, said metal edge is raised from said work surface a distance before said presser plate is lifted from said work surface; and means for heating said edge to seal opposing layers of the folded strip together and sever the strip along said seal when said edge is moved toward said work surface into engagement with said strip.

6. In a wrapping machine for flat packages, the combination of: a work table; means for feeding a folded strip of heat-sealable material along said work table, said table including a guide element parallel to the direction of movement of said strip and adjacent the folded edge thereof and a stop element transverse to said guide element for blocking movement of said strip, said elements defining two sides of a rectangle for receiving the end of said strip with a package for sealing therein; a flat plate carried at one edge on said work table with the remainder of said plate spaced above said table for projecting from the open edge of said folded strip between the layers thereof toward said folded edge; an L-shaped metal edge mounted on said table for pivoting along an axis for moving said metal edge toward and away from said table, said metal edge cooperating with said stop and guide elements to enclose said space; a presser plate mounted on said table for pivoting along said axis toward and away from said table, said presser plate having the same outline as said metal edge for engaging said table a small distance inside said metal edge for pressing the layers of said material together over the package therebetween; a flexible link coupling said presser plate to said metal edge for lifting said presser plate from said work table with said metal edge whereby with downward movement of said metal edge, said presser plate contacts said work table before said metal edge and, with upward movement, said metal edge is raised from said work table a distance before said presser plate is lifted from said table; and means for heating said edge to seal opposing layers of the folded strip together and sever the strip along said seal when said edge is moved toward said work table with said strip therebetween.

7. In a wrapping machine for flat packages, the combination of: means defining a work surface; means for feeding a folded strip of heat-sealable material along said work surface, said strip having a sealed, transversely disposed edge, said work surface including a guide for positioning the end of said strip on said work surface with a package for sealing therein; a metal edge mounted for movement toward and away from said work surface, said metal edge cooperating with said folded and sealed edges of said strip to define a package enclosing space; a presser plate mounted for movement toward and away from said work surface, said presser plate having substantially the same outline as said metal edge for engaging said work surface a small distance inside said metal edge for pressing the layers of said material together over the package therebetween; flexible coupler means for coupling said presser plate to said metal edge for lifting said presser plate from said work surface with said metal edge whereby, with downward movement of said metal edge, said presser plate contacts said work surface before said metal edge and, with upward movement, said metal edge is raised from said work surface a distance before said presser plate is lifted from said work surface; and means for heating said metal edge to seal opposing layers of the folded strip together when said metal edge is moved toward said work surface into engagement with said strip.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,919,530 January 5, 1960

Arthur M. Garson et al.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 24, strike out "The separator plate 13 engages the"; same line, after "table" strike out the period and insert -- to produce the strip with the folded --.

Signed and sealed this 7th day of June 1960.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents