Nov. 1, 1966 J. G. VERGOBBI 3,282,492

CARTON HAVING A HINGED END CLOSURE

Filed Dec. 2, 1963 5 Sheets-Sheet 1

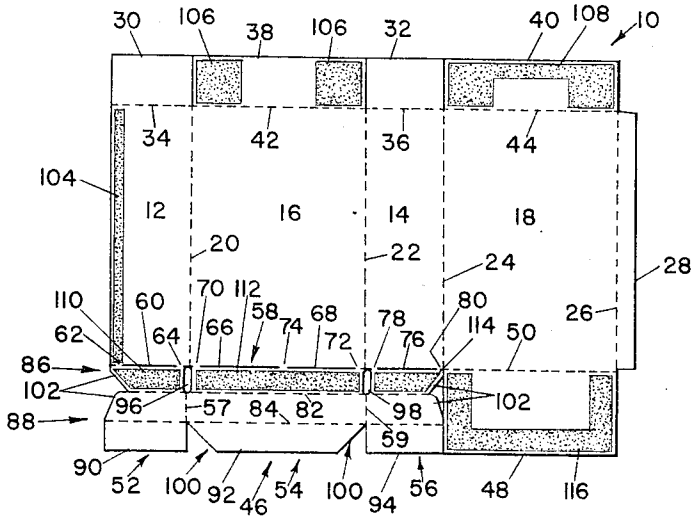


Fig. 1

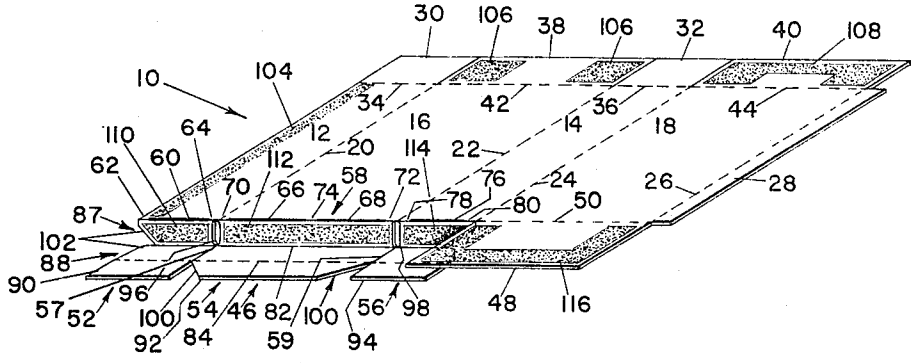


Fig. 2

INVENTOR.
John G. Vergobbi
BY Robert R. Churchill
ATTORNEY

Nov. 1, 1966 J. G. VERGOBBI 3,282,492

CARTON HAVING A HINGED END CLOSURE

Filed Dec. 2, 1963 5 Sheets-Sheet 2

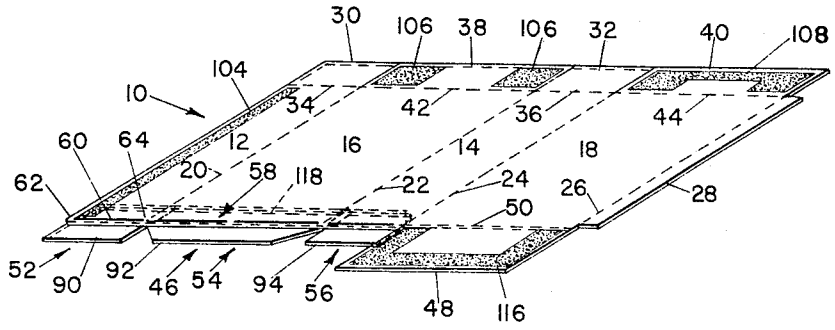


Fig. 3

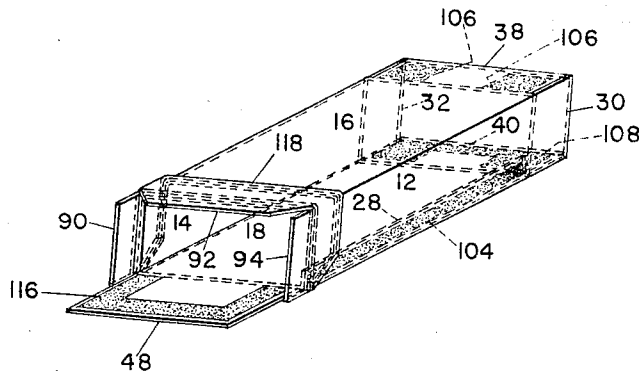


Fig. 4

INVENTOR.
John G. Vergobbi
BY
Robert R. Churchill
ATTORNEY

Nov. 1, 1966 J. G. VERGOBBI 3,282,492

CARTON HAVING A HINGED END CLOSURE

Filed Dec. 2, 1963 5 Sheets-Sheet 3

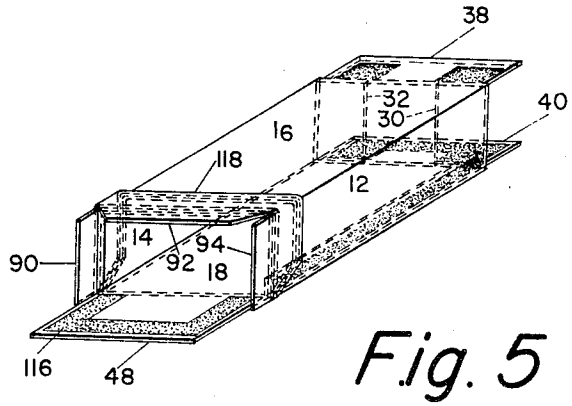


Fig. 5

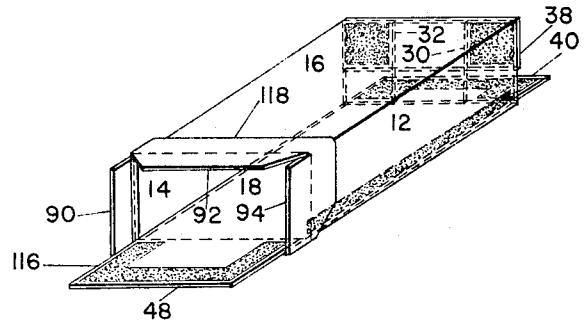


Fig. 6

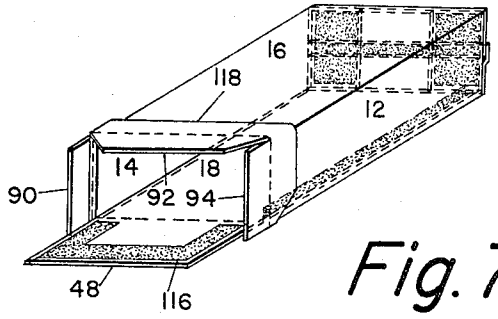


Fig. 7

INVENTOR.
John G. Vergobbi
BY Robert R. Churchill
ATTORNEY

Nov. 1, 1966 J. G. VERGOBBI 3,282,492

CARTON HAVING A HINGED END CLOSURE

Filed Dec. 2, 1963 5 Sheets-Sheet 4

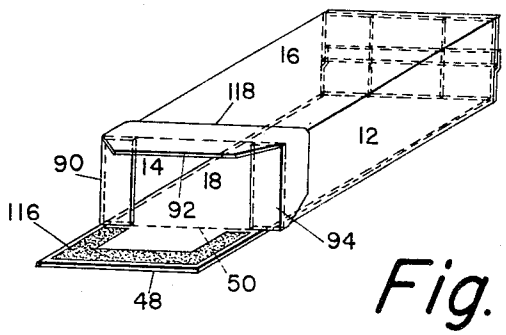


Fig. 8

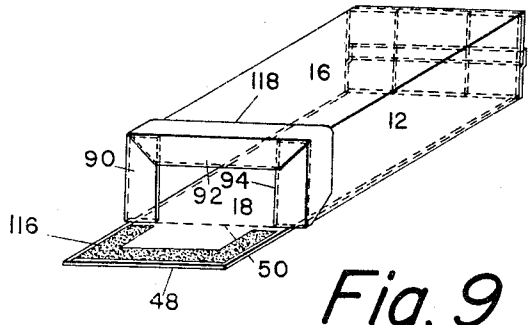


Fig. 9

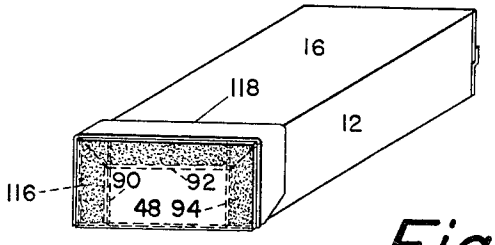


Fig. 10

INVENTOR.
John G. Vergobbi
BY Robert R. Churchill
ATTORNEY

Nov. 1, 1966 J. G. VERGOBBI 3,282,492

CARTON HAVING A HINGED END CLOSURE

Filed Dec. 2, 1963 5 Sheets-Sheet 5

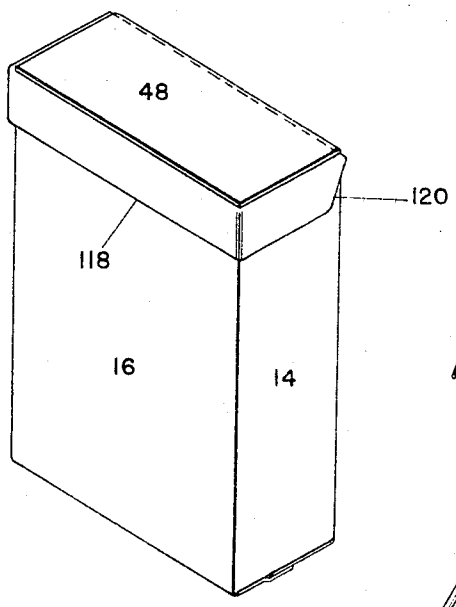


Fig. 11

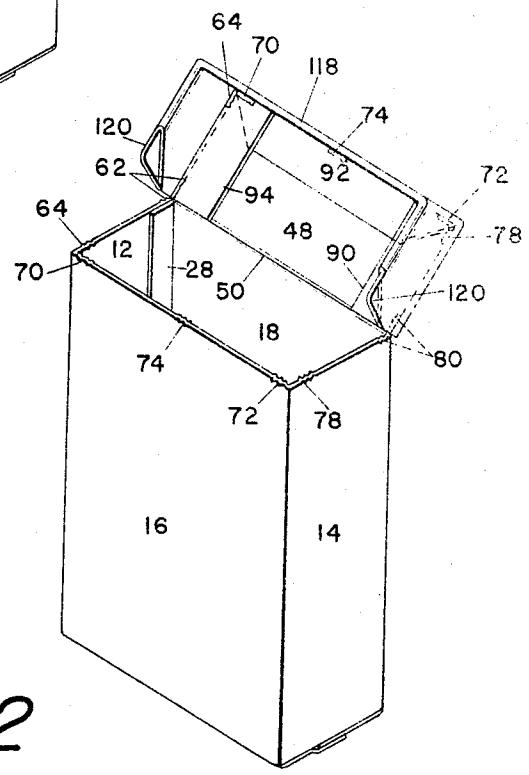


Fig. 12

INVENTOR.
John G. Vergobbi
BY Robert R. Churchill

ATTORNEY

United States Patent Office

3,282,492

Patented Nov. 1, 1966

3,282,492

CARTON HAVING A HINGED END CLOSURE

John G. Vergobbi, Quincy, Mass., assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass., a corporation of Massachusetts

Filed Dec. 2, 1963, Ser. No. 327,464

5 Claims. (Cl. 229—51)

This invention relates to a carton and particularly to a carton having a hinged end closure.

The invention has for an object to provide a novel and improved carton having a novel end closure providing a hinged cover which may be easily opened and closed.

The invention has for another object to provide a novel and improved carton of the character specified whose structure is such as to enable it to be efficiently and economically produced on a standard high speed packaging machine.

The invention has for a further object to provide a novel and improved carton of the character specified which uses no more material in the formation of the hinged end closure than a corresponding carton provided with conventional full length closure flaps whereby the present carton may be economically manufactured.

With these general objects in view and such others as may hereinafter appear, the invention consists in the carton having a hinged end closure as hereinafter described and particularly defined in the claims at the end of this specification.

In the drawings illustrating the preferred embodiment of the invention:

FIG. 1 is a plan view of a carton blank embodying the present invention;

FIG. 2 is a perspective view of the same showing the initial step in folding the blank to produce the present novel end closure;

FIG. 3 is a view similar to FIG. 2 showing a further folding step to prepare the carton blank in a condition to be folded around a forming block;

FIG. 4 is a perspective view of the carton folded into tubular form and provided with a side seam;

FIGS. 5, 6 and 7 are similar views showing the steps of folding and sealing the bottom flaps to provide a bottom closure;

FIGS. 8, 9 and 10 are perspective views showing the steps of folding and sealing the top closure flaps to produce the present hinged end closure;

FIG. 11 is a perspective view of the completed carton; and

FIG. 12 is a similar view showing the hinged top closure in its opened condition.

In general, the present invention contemplates a novel and improved carton having a novel hinged end closure, herein shown as a hinged top closure commonly known as a "flip top" closure which may be economically manufactured and which may be easily opened. In the illustrated embodiment of the invention, the top closure is formed by integral end closing portions which are folded and sealed to provide a hinged cover in the completed carton wherein the sides of the cover extend over and around three sides of the top of the body portion of the completed carton, the fourth side being hingedly connected thereto. The cover is secured in its closed position by partially slit or weakened portions along three of the top score lines of the body of the carton and which may be easily broken by the user to open the carton, the cover being joined to the fourth score line to provide a hinge.

An important advantage of the present carton is that it may be produced in a standard high speed carton forming machine. Another important feature resides in the fact that the present novel hinged cover may be produced

from integral end closure portions using no more material than would be used in producing a normal full flap conventional end closure whereby to enable economical production of the carton.

Referring now to the drawings, and particularly to FIG. 1, the carton blank indicated generally at **10** is provided with end wall panels **12**, **14** and side wall panels **16**, **18** forming the body portion of the carton and which are defined by prescored lines **20**, **22**, **24**, **26**, a side seam flap **28** being connected to the side wall panel **18** as shown.

The illustrated carton blank is provided with bottom closing flaps comprising end flaps **30**, **32** connected to end panels **12**, **14**, respectively, by prescored lines **34**, **36**, and side flaps **38**, **40** connected to the side wall panels **16**, **18**, respectively, by prescored lines **42**, **44**.

The top closing portions of the illustrated carton blank include an integral three-section portion **46** connected to the body panels **12**, **16** and **14**, which portion is adapted to be folded to form the three sides of the hinged cover fitted about the upper end of the body portion. The top closure further includes a side flap **48** hingedly connected to the side wall panel **18** by a prescored line **50** and which comprises the last folded flap to form the top of the hinged cover in the completed carton.

As herein shown, the three-section cover forming portion **46** comprises integral sections **52**, **54** and **56**, extending from the body panels **12**, **16** and **14**, respectively, and connected together by prescored lines **57**, **59** which are slightly offset outwardly from the longitudinal score lines **20**, **22**, respectively, of the body panels. The cover forming portion **46** is connected to the body panels along the top score line **58** which is provided with weakened portions, herein shown as comprising elongated spaced slits cut through the material leaving relatively small frangible connecting portions between the body panels and the integral cover forming portion **46**. As illustrated herein, the score line between the end wall panel **12** and the section **52** comprises an elongated slit **60** leaving relatively small unslit connecting portions **62**, **64** at the ends of the section **52**. The score line between the side wall panel **16** and the section **54** is provided with two elongated slits **66**, **68** leaving relatively small unslit portions **70**, **72** at the ends of the section and a relatively small central unslit portion **74**. The score line between the end wall panel **14** and the section **56** is also provided with an elongated slit portion **76** leaving small unslit end portions **78**, **80** as shown.

The integral cover forming portion **46** is also provided with two spaced transverse score lines **82**, **84** providing elongated transverse sections indicated at **86**, **88** of equal width adapted to be folded one upon the other to form two-ply side walls for the cover portion which extend about the top of the body portion in the completed carton leaving relatively short flaps **90**, **92**, **94** extending from the side walls. As shown in FIG. 1, the transverse section **86** is also provided with cutout portions **96**, **98** in alignment with the offset score lines **57**, **59**, respectively, to relieve the tension at the corners of the cover in the completed carton. The corners of the short cover flap **92** are cut off, as indicated at **100**, and the ends of the transverse sections **86**, **88** are also cut, as indicated at **102**, for a purpose to be described.

While the carton blank, as shown in FIG. 1, is still in its developed condition, selected areas of the inner face of the blank are provided with a coating of adhesive. Thus, a narrow strip of adhesive is applied to the marginal area of the end wall panel **12**, as indicated at **104**, for sealing the same to the side seam flap **28** in the formation of the carton. The bottom closure flap **38** is provided with rectangular areas **106** of adhesive, and the bottom closure flap **40** is also provided with an adhesively coated area **108**

as shown. The transverse section 86 of the cover forming portion 46 is provided with adhesively coated areas 110, 112, 114 for sealing the same to the transverse section 88 to form the two-ply side walls of the cover in the assembled carton. The side flap 48 is also provided with an adhesively coated area 116 along the marginal portions thereof as illustrated.

Prior to folding the carton blank into rectangular form the cover forming portion 46 is first folded to provide a two-ply side wall portion 118. As shown in FIGS. 2 and 3, the integral portion 46 is folded downwardly along the weakened score line 58 to present the same against the outer face of the body portion, and the portion 46 is then folded upwardly along the score line 82 to present the section 88 against the adhesively coated areas 110, 112, 114. Application of pressure will seal the sections together to provide the two-ply portion 118.

The carton blank thus prepared is then assembled into tubular form, as shown in FIG. 4, preferably by folding the same about a forming block, to present the adhesively coated area 104 in overlapping engagement with the side seam flap 28 and applying pressure to seal the side seam. This folding operation also folds the two-ply portion 118 to form, in effect, an unsealed band about three sides of the upper end of the body portion. The inner face of the two-ply portion which engages the adjacent side wall panels is free of adhesive and connected to the panels by said relatively small unslit portions only of the score line. It will be seen that the outwardly offset score lines 57, 59 provide clearance or extra width to permit the outer ply to be folded about the inner ply at the corners of the carton, and that the open portions 96, 98 occur at the corners to further relieve any undue strain or tension when folding the two-ply section about the corners.

In practice the bottom closing flaps are then folded in overlapping relation against the end of the forming block in the sequence illustrated in FIGS. 5, 6 and 7. The end flaps 30, 32 are first folded inwardly, and the side flap 38 is then folded over the end flaps to present the rectangular adhesive coated areas 106 against portions of the end flaps. The last folded flap 40 is then folded to present the adhesively coated portion 108 against the remaining portions of the end flaps and also in overlapping relation to the side flap 38 as shown. Pressure may then be applied to set the adhesive and complete the bottom closure. It will be understood that the bottom closure, herein shown, comprises what is known in the trade as an "economy" bottom closure wherein the closing flaps are shorter than the thickness of the carton and wherein the side flaps overlap along the center of the carton, as distinguished from a conventional bottom closure wherein both side flaps are of a full length equal to the thickness or narrower width of the carton.

It will also be understood that any usual or preferred adhesive may be used for sealing the flaps. In some instances a hot-melt adhesive may be used which quickly dries after application, and in such instances heat and pressure is applied to reactivate the adhesive and set the seal.

In practice, the carton with its adhesively secured bottom closure is removed from the forming block and filled with the material being packaged. It will be understood that the illustrated carton may be provided with an inner lining bag, not shown, and when the filling operation is completed the mouth of the lining bag may be closed and sealed.

After the filling operation the top closure is completed in the manner show in FIGS. 8, 9 and 10 wherein the short end flaps 90, 94 are first folded inwardly and the short side flap 92 is then folded inwardly on top of the end flaps. Thereafter, the hinged and adhesively coated side flap 48 is folded down on top of the underlying flaps and adhesively secured thereto, as shown in FIG. 10, to produce the "flip top" carton shown in FIG. 11.

It will be seen that the expedient of cutting off the corners of the short side flap 92 exposes a triangular area at the forward ends of the short side flaps 90, 94 to be adhesively secured to the last folded flap 48, thus providing less bulk at the adjacent corners and forming a more efficient seal.

From the above description it will be seen that in the completed carton the top closure is hingedly secured along the score line 50, and the three two-ply sides 118 of the cover extending around the top of the body portion are connected to the body portion by the relatively small unslit portions 62, 64, 70, 72, 74 and 78, 80 only of the score line 58 which comprise frangible portions between the slits 60, 66, 68 and 76. Thus, in operation, to open the carton it is merely necessary to pull upwardly against the lower front edge of the cover with sufficient force to break the frangible connections whereupon the closure will swing back on its hinge score line 50, as shown in FIG. 12, wherein the broken away portions are indicated adjacent the corners and at the center of the side wall panel. The hinged top closure may now be conveniently closed to its original position. As illustrated in FIG. 12, it will be seen that the particular configuration of the cutout portions 102 provide two-ply cutoff corner portions 120, the outer ply being rounded as shown to facilitate closing of the carton. While the weakened portions along the score line are herein illustrated and described as formed by elongated slits leaving spaced frangible portions, it will be understood that the weakened portions may comprise closely spaced perforations along the score line 58. It will be seen that another important advantage of the present structure of hinged end closure resides in the fact the weakened portions along the score line 58 are entirely concealed and protected from inadvertent damage by the overfolded portions of the closure, as shown.

As above described, the present hinged enclosure carton may be economically produced in a standard automatic packaging machine wherein the prescored carton blank is folded about a forming block. While a preferred manner of assembling the carton, as herein described, contemplates folding of the bottom closure flaps against the end of the forming block and then removing the carton to be filled through the top, it will be understood that the present invention also contemplates forming the top closure against the end of the block. When thus formed, the carton is removed from the block and filled through the bottom whereupon the bottom closure is folded and sealed and the carton turned upright.

From the above description it will be seen that the present carton is provided with a hinged end closure of novel structure which may be economically produced with a minimum of carton material and which may be manufactured in a standard automatic packaging machine to produce an efficient and easily opened hinged closure.

While the preferred embodiment of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. A hinged upper end closure for a rectangular carton having a body portion closed at its lower end and comprising front and rear side wall panels connected along their side edges to a pair of end wall panels, said hinged end closure being formed by integral extensions from the top edges of said wall panels, and including: an integral three-section extension portion extending from said rear and said end wall panels and connected to the top edges thereof by weakened lines providing frangible connecting portions, said top edges lying in a common plane, and said three-section portion being folded downwardly and upwardly to provide a two-ply band about the upper portion of said front and side wall panels, the confronting surfaces of said two-ply band being integral and uninterrupted by weakened lines throughout the extent thereof and being adhesively secured together, and there being relatively short, separate front and end flaps pro-

jecting upwardly from said two-ply band which are folded inwardly, said three-section portion being provided with parallel vertical score lines connecting the sections thereof, said score lines being offset outwardly from the side edges of said front wall panel just sufficiently to allow clearance for folding the two-ply band about the front corners of the upper portion of the carton without effecting bowing of said front wall panel; and on inwardly folded flap hingedly connected to the top edge of said rear wall panel and adhesively secured to said relatively short, inwardly folded front and end flaps to provide a hinged cover connected to the top edge of said front and end wall panels by said frangible connecting portions.

2. A hinged end closure for a carton as defined in claim 1 wherein the integral extensions from said wall panels which form the hinged cover are of an initial length no greater than the narrower cross sectional dimension of the carton.

3. A hinged closure as defined in claim 1 wherein the

underlying ply of said two-ply band is provided with cutouts in alignment with said score lines to relieve the tension at the corners.

4. A hinged closure as defined in claim 1 wherein the ends of said two-ply band are cut off at the corners to facilitate reclosing of the hinged cover.

5. A hinged closure as defined in claim 4 wherein the outer ply of the cutoff ends of the two-ply band are curved to facilitate said reclosing.

References Cited by the Examiner

UNITED STATES PATENTS

3,191,848 6/1965 Meyers ---------- 229—51

JOSEPH R. LECLAIR, *Primary Examiner.*

GEORGE O. RALSTON, *Examiner.*

J. F. McNULTY, D. T. MOORHEAD,

Assistant Examiners.

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,282,492 Dated November 1, 1966

Inventor(s) JOHN G. VERGOBBI

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 1, line 9, change "rear" to --front--.

Signed and sealed this 4th day of March 1975.

(SEAL)
Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks