June 7, 1966 H. LERNER 3,254,468

METHOD OF PACKAGING ARTICLES

Filed Dec. 18, 1963 2 Sheets-Sheet 1

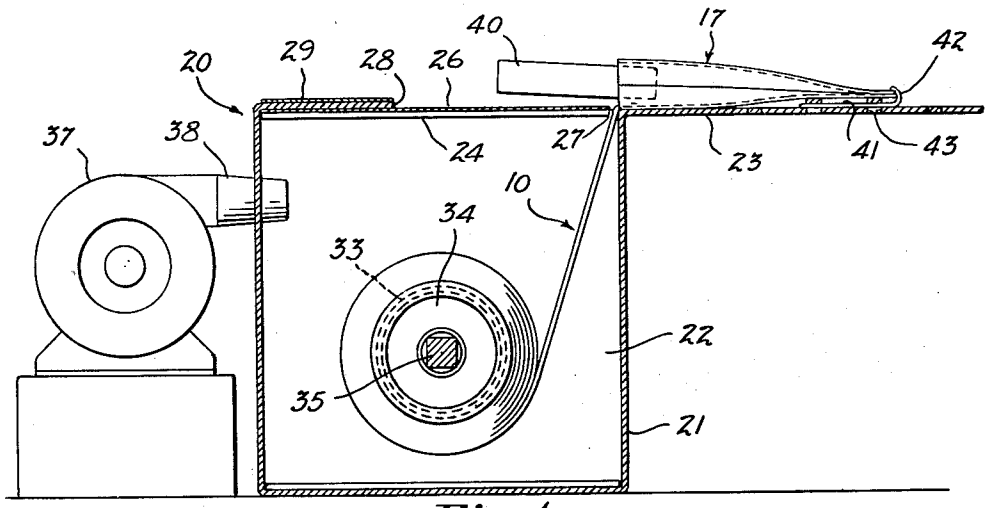


Fig. 1

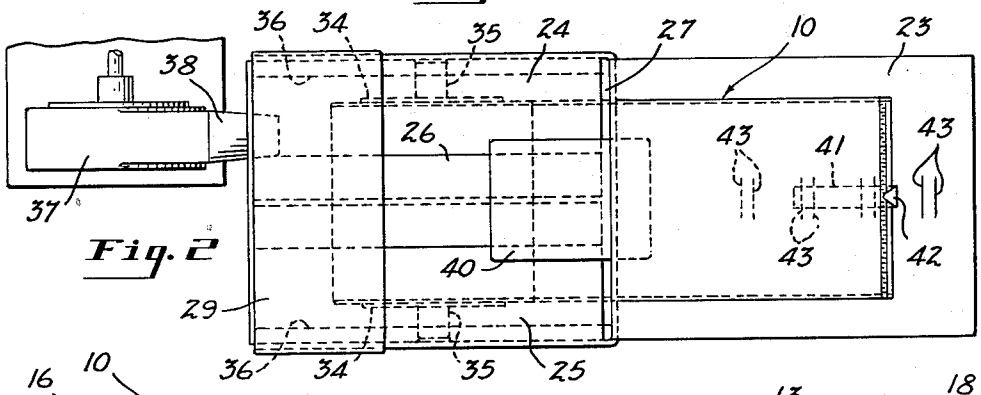


Fig. 2

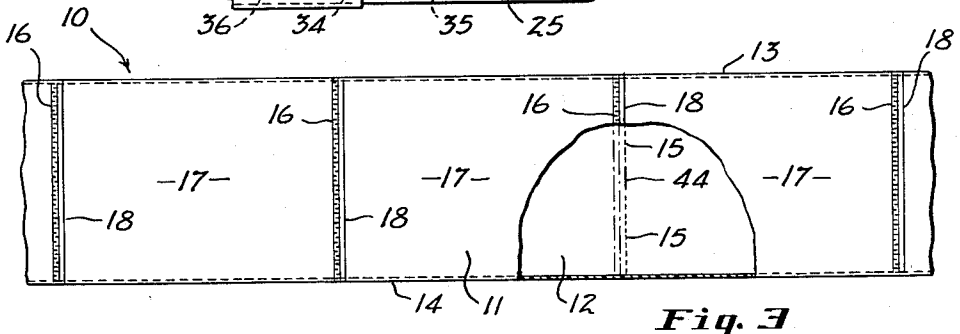


Fig. 3

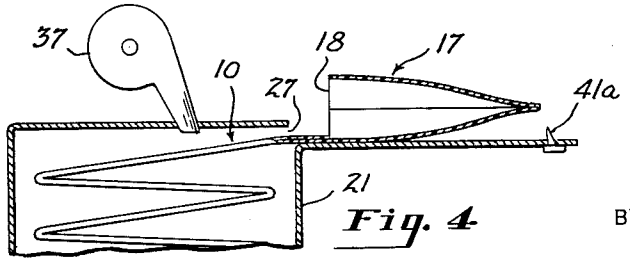


Fig. 4

INVENTOR
Hershey Lerner
BY Watts & Fisher
ATTORNEYS

June 7, 1966 H. LERNER 3,254,468

METHOD OF PACKAGING ARTICLES

Filed Dec. 18, 1963 2 Sheets-Sheet 2

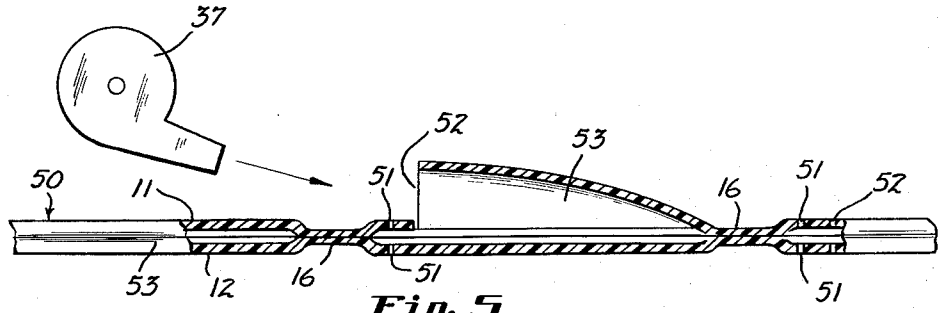


Fig. 5

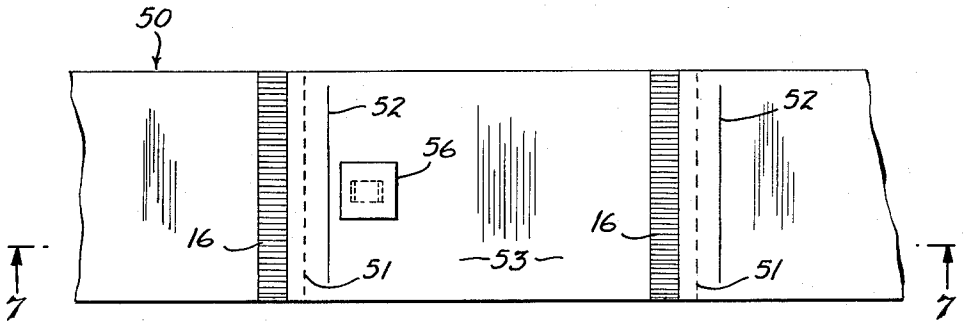


Fig. 6

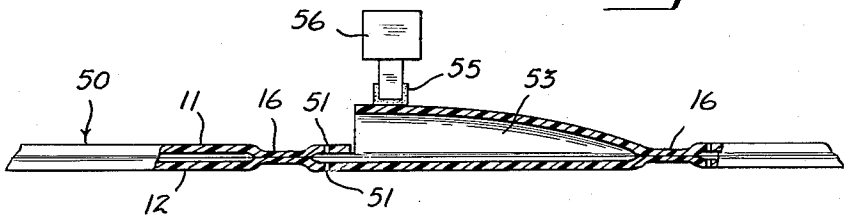


Fig. 7

INVENTOR.
HERSHEY LERNER

BY Watts & Fisher

ATTORNEYS

United States Patent Office

3,254,468

Patented June 7, 1966

3,254,468

METHOD OF PACKAGING ARTICLES

Hershey Lerner, Cleveland Heights, Ohio, assignor to Automated Packaging Corporation

Filed Dec. 18, 1963, Ser. No. 331,491
6 Claims. (Cl. 53—29)

This application is a continuation-in-part of application Serial No. 64,157 for "Container Strip, Method of Packaging Articles, and Container Delivery Device," filed October 21, 1960, now abandoned.

This invention relates generally to articles packaging, and more specifically to new and improved methods for packaging articles in flexible containers.

It has been proposed heretofore to package articles within flexible containers by feeding each individual container from a supply source into the hands of the operator. This prior method is generally unsatisfactory for modern high-speed operations that are required at the present time. More particularly, with conventional container packaging techniques considerable time is usually required to open each container so that the articles can be inserted therein. In addition, since the containers are separate, careless handling of a package of containers will cause them to fall out of alignment. When this occurs, the containers cannot be dispensed at all by automatic means until they are realigned and the cost of straightening the misaligned containers is frequently greater than the cost of the containers themselves. This condition also occurs when less than an entire carton of containers is used at one time and the remainder is to be used later.

It has also been proposed to provide containers which are initially connected in strip form. In general, the usual container strip is in the form of a continuous tube made of a suitable heat sealable plastic material. The conventional tube has spaced transverse sealing areas which define individual containers that are severed from the tube as they are desired for packaging. Since it is required to sever each individual container from the conventional strip as it is desired for use and to feed the individual containers to the operator, conventional container strips also do not lend themselves to economical high-speed operations.

The above-identified application Serial No. 64,157 and continuation-in-part application Serial No. 331,492 for "Flexible Container Strips," filed concurrently herewith, disclose improved container strips which avoid the difficulties of prior art containers. The container strips disclosed in these applications generally comprise first and second plies joined together along the sides of the strip. The plies are transversely sealed together at spaced intervals along the length of the strip so as to define containers having closed end portions and opposite end portions. The containers are uniquely oriented in the same direction with the opposite end portion of each container being connected by at least one of the plies to the closed end portion of an adjacent container. The connecting ply is preferably provided with a tearable portion so that the containers can be selectively severed from the strip after insertion of the packaged articles. The other of the plies is formed with transverse slit openings spaced along the length of the strip so as to provide access into each container, the slit opening of each container being located in its opposite end portion.

In accordance with the present invention, the individual containers of the improved construction generally described above are filled while still connected in strip form. Thus, handling of the containers is greatly improved over the prior art practice, since it is impossible for individual containers to get out of alignment before utilization. Further, as will hereinafter become apparent, the ability to handle the containers in strip form provides for improved techniques of opening and filling the containers which are superior to the methods heretofore required with conventional container strips.

It is also possible in accordance with this invention to leave the container strip in connected form after the articles have been packaged in the individual containers. Such a structure can be advantageously used in a vending machine, for example, or in other dispensing devices, thereby assuring proper feeding of the articles to be dispensed.

The preferred method contemplated by this invention may be briefly described as comprising the steps of providing a container strip having a plurality of containers which are oriented in the same direction in interconnected aligned relationship but selectively tearable from the strip with each container of the strip having an opening, selectively applying opening means adjacent the slit opening of each container of the strip, and then filling each opened container. The preferred method also includes the additional step of closing the slit opening of each container and the step of severing the container from the strip after filling.

As will hereinafter be made more apparent, the opening and filling of each container of the strip can be carried out quickly and easily. Another advantage of the invention is that the steps of manually aligning and opening each individual container for packaging of the articles are eliminated. Instead, each container of the flexible container strip may be automatically placed in registration with an opening mechanism simply by unrolling or otherwise withdrawing the strip from a suitable source.

Accordingly, an object of the invention is to provide new and improved packaging techniques.

A more specific object of the invention is to provide methods of packaging which facilitate handling, opening and filling of flexible container strips in a new and improved manner.

Another object of the invention is to provide a new and improved packaging method which facilitates opening and packaging of containers of flexible container strips while the containers are connected in strip form.

Other objects and advantages of the invention will become apparent from the following detailed description and the accompanying drawings.

In the drawings:

FIGURE 1 is a side elevational view, partially in cross-section, of a container delivery apparatus suitable for carrying out the method of the present invention;

FIGURE 2 is a top plan view of the apparatus shown in FIG. 1;

FIGURE 3 is a fragmentary plan view of a flexible container strip suitable for use in the packaging methods of this invention;

FIGURE 4 is a fragmentary, vertical cross-sectional view of a modified apparatus for carrying out the invention;

FIGURE 5 is a diagrammatical side view showing the preferred method of opening the containers while connected in strip form;

FIGURE 6 is a plan view, on an enlarged scale, il-

lustrating a modified method of opening a container of a container strip; and,

FIGURE 7 is a cross-sectional view taken on the line 7—7 of FIG. 6.

Referring now to the drawings and to FIG. 3 in particular, a container strip suited for use in conjunction with the present invention is indicated by reference numeral **10**. As generally disclosed above, the strip **10** is formed by a first ply **11** and a second ply **12**. The plies **11, 12** are joined together along the side portions **13, 14** of the strip so that a channel portion intervenes the first ply and the second ply. The strip **10** may be formed of any suitable flexible material which can be made into a container, but is preferably formed of a flexible packaging material such as polyethylene, cellophane, vinyl films, pliofilms, cellulose acetate film, polystyrene, polypropylene, and the like.

The container strip **10** is provided with a plurality of transverse tearable portions **15** which are spaced along the length of the strip. In the embodiment shown, the tearable portions **15** are formed by perforating the ply **12**. The plies **11, 12** are transversely sealed together in zones spaced along the length of the strip **10** to provide a plurality of spaced sealed portions **16**.

Each tearable portion **15** is closely spaced from one of the sealed portions **16** so that the tearable portions and sealed portions cooperate to divide the container strip **10** into containers **17**. Each such container **17** has a closed end which is defined by a sealed portion **16** and an opposite end which is defined by the location of a tearable portion **15**. A plurality of transverse slit openings **18** are formed through the ply **11** along the length of the container strip so as to provide access into the end of each container opposite its closed end. As shown, the slit openings **18** are coincident with the tearable portions **15**. That is to say, the tearable portions **15** and the slits **18** are formed in the same locations along the length of the strip **10** so that the slits in the ply **11** directly overlie the perforations in the ply **12**.

As distinguished from prior art container strips, the illustrated strip **10** is characterized by the orientation of the containers **17** in the same direction. Thus, the end of each container having the slit opening is connected to the closed end of an adjacent container. Other container strips characterized by uniform orientation of the individual containers are disclosed in a copending application.

Reference is now made to the apparatus which is shown in FIGS. 1 and 2. The illustrated apparatus is indicated generally by reference numeral **20** and comprises a substantially closed housing **21** which defines a hollow chamber **22**. A container support portion **23** is disposed on the housing and projects therefrom in a generally horizontal plane.

According to the illustrated construction, the housing **21** is a box made of corrugated cardboard or other material suitable for shipping purposes. The container support portion **23** constitutes a flap hinged to a wall of the housing or box so that it can be turned to overlie the housing wthen the box is shipped to the customer for use. The upper wall of the housing or box **21** is shown to be formed by side flaps **24, 25** which are sealed closed by a piece of sealing tape **26**. The ends of the flaps **24, 25** terminate short of the side wall to which the flap **23** is attached so as to define an elongated outlet opening **27** through which the container strip **10** is adapted to pass. The opposite end flap **28** is folded across the side flaps **24, 25** and is sealed in position by a piece of sealing tape **29** which extends across the flap **28** in contact with the opposite sides of the housing **21**.

As shown in FIGS. 1 and 2, the container strip **10** is rolled on a drum **33** within the chamber **22**. Apertured discs **34** are inserted into the ends of the drum **33** and are rotatably mounted on an axle **35**. The ends of the axle **35** are mounted in cardboard support members **36** or the like. The support members **36** are engaged between the top, bottom and sides of the housing **21** in order to prevent untoward movement of the axle **35** and the rolled container strip **10** during shipment of the device and during use.

An air blowing mechanism, which may be a conventional electrically operated blower **37**, is operatively connected to the housing chamber **22** in position to blow air outwardly through the opening **27**. As shown, the nozzle **38** of the blower **37** extends through a hole in the side of the housing **21** opposite the side to which the flap **23** is attached.

The container strip **10** is rolled on the drum **33** so that each individual container of the strip can be disposed on the support portion **23** with the slit opening **18** of the container adjacent the housing opening **27** and the sealed end of the container spaced toward the distal end of the support portion. A container separating element **41** may be provided for holding each container in position on the support portion **23**. The illustrated container separating element **41** is in the form of a hook having a sharp, curved end **42**. The element **41** is spaced from the outlet opening **27** a distance such that the curved end **42** can be thrust through the perforations adjacent the sealed end of the container on the support portion while the slit opening in the opposite end of the container is adjacent the outlet **27**.

Preferably, the separating element **41** is removably attached to the support portion **23** so that the position of the element can be changed depending upon the length of the container to be filled. As shown, the element **41** is inserted through slits **33** formed in the support portion **23** and is held in position by portions of the support between the slits. A series of such slits **43** is provided so that the position of the element **41** can be selectively changed.

In accordance with the method of this invention, the strip **10** is drawn through the housing outlet opening **27** and a container of the strip is disposed on the support portion **23** in the manner shown so that the container opening is adjacent the housing opening **27**. When the blower **37** is turned on, the air issuing from the opening **27** impinges on the container strip and enters the adjacent slit opening of the container. This causes the container on the support portion to be inflated so that articles to be packaged, such as sponges **40**, for example, can be inserted easily into the opened container.

FIGURE 5 diagrammatically illustrates on an enlarged scale the manner in which each container of the strip is opened by operation of the air blower **37**. The strip **50** shown in FIG. 5 is similar to the container strip **10** of FIG. 3 except that both plies **11, 12** are perforated at **51** adjacent each sealed zone **16** and the slit opening **52** of each container **53** is closely spaced from the perforations instead of being coincident therewith. The manner in which the containers **53** are opened, however, is the same as with the containers **17** previously described. The air issuing from a blower **37** impinges upon the container strip and causes the container to open while attached to the container strip. As noted above, an article to be packaged then can be disposed within each of the opened containers through the slit opening.

After each container has been opened and filled in the manner described, the strip is simply pulled to unroll it further and bring the next container forwardly along the container support portion until the tearable portion adjacent its sealed end comes into contact with the container separating element **41**. At this point, the element **41** can be again inserted through the perforations to hold the strip **10** for the next inflating and article inserting operation. If desired, the tearable portions of the container strip **10** may include a centrally located cut **44** (FIG. 3) in the ply **12** in order to facilitate insertion of the curved end **42** of the element **41**.

When the container now in position on the support portion **23** has been filled, the previously filled container can be separated from the strip **10** by giving it a sharp downward pull. However, if it is desired to leave the containers of the container strip **10** in interconnected aligned relationship, the container separating element **41** may be eliminated from the apparatus and each filled container **17** merely moved along the support portion **23** and out of registration with the air blower **37**. The slit opening **18** into each container **17** can be sealed or left in an unsealed condition and placed into commerce.

As will be apparent from the foregoing, the movement of the container strip **10** as it is unrolled from the housing **21** produced alignment of each container **17** with the housing opening **27** so that the operations can be repeated quickly and efficiently. Thus, the invention provides efficient and improved methods of packaging articles in containers of flexible container strips. Handling of the individual containers is obviated, since the containers can be filled while in strip form, aligning problems also are overcome. Another important advantage is that the containers are automatically opened so that the articles to be packaged can be inserted easily into the containers.

FIGURE 4 schematically illustrates a modified apparatus for carrying out the method of this invention. As here shown, the housing **21**, the blower **37**, the container support portion **23**, and the element **41***a* cooperate in substantially the same manner as in the embodiment of FIGS. 1 and 2. In this modification, however, the blower **37** is shown extending through the top wall of the housing **21**. Further, the container strip **10** within the housing **21** is placed in accordian pleated relationship instead of being rolled. The container strip **10** is fed through the outlet **27** in the same way as in the preceding embodiment.

Reference is now made to FIGS. 6 and 7 which schematically illustrate a modified method of packaging articles in accordance with this invention. As here shown a container strip **50** is provided and is formed in the manner described in connection with FIG. 5. Alternatively, the container strip used in the embodiment of FIGS. 6 and 7 may be formed in the manner shown in FIG. 3 or in the above-identified application Serial No. 331,492.

The opening mechanism shown in FIGS. 6 and 7 comprises a pressure sensitive adhesive **55** on the end of a movable opening member **56**. In use, each container **53** of the strip **50** is sequentially brought into registration with the member **56** and the member actuated to engage the pressure sensitive adhesive **55** with the container adjacent its slit opening **52**. In this manner, each container is opened as illustrated in FIG. 7 for the insertion of an article. The opening mechanism also may be a vacuum means (not shown).

As in the embodiment of FIGS. 1 and 2, the member **56** and the adhesive **55** serve to open each container of the strip automatically for a packaging operation. The strip **50** is advanced endwise after each operation to bring each container in registration with the opening member **56**. Such movement of the strip **50** again eliminates misalignment and handling problems.

Many modifications and variations of the invention will be apparent to those skilled in the art in light of the foregoing detailed disclosure. Therefore, it is to be understood that, within the scope of the appended claims, the invention can be practiced otherwise than as specifically shown and described.

What is claimed is:

1. A method of packaging comprising providing a flexible container strip having a plurality of interconnected containers, each of said containers having a sealed end portion and an opposite end portion provided with a transverse opening, said containers being oriented in the same direction with the opposite end portion of one container connected to the sealed end portion of an adjacent container, advancing said strip endwise in the direction of the sealed end portions of said containers sequentially to position each container at an opening station, opening the positioned container while connected to said strip by introducing an air stream through its transverse opening, said air stream being introduced by causing it to impinge on said strip in the direction of endwise strip movement, filling said opened and positioned container through its transverse opening, and repeating said advancing, opening, and filling steps.

2. A method of packaging comprising providing a flexible container strip having a plurality of interconnected containers, each of said containers having a sealed end portion and an opposite end portion provided with a transversely slit opening, said containers being oriented in the same direction with the opposite end portion of one container connected to the sealed end portion of an adjacent container, placing said strip in a housing so that said strip can be pulled endwise of said housing in the direction of the sealed end portions of said containers, providing a container support, withdrawing said strip from said housing and positioning one container on said support with the slit opening of the positioned container oriented toward said housing and the sealed end oriented away from said housing, opening the positioned container by introducing an air stream through its slit opening, said air stream being introduced into the positioned container in the direction of endwise strip movement from said housing, filling the positioned container, and then withdrawing said strip further from said housing to position the next container on said support and repeating said opening and filling steps.

3. The method as claimed in claim **2** including the step of securing each container on said support prior to introducing the air stream.

4. The method as claimed in claim **3** including severing filled containers from said strip.

5. A method of packaging comprising providing a flexible container strip having a plurality of connected containers, each of said containers including a sealed end portion and an opposite end portion provided with a transverse slit opening, said containers being oriented in the same direction with the opposite end portion of one container connected to the sealed end portion of an adjacent container, providing a substantially closed housing having an outlet, rolling said strip in said housing so that said strip can be withdrawn endwise through said outlet in the direction of the sealed end portions of said containers, withdrawing said strip and supporting one container so that its slit opening is adjacent said outlet, opening the positioned container by directing a stream of air from within said housing through said outlet so as to enter the slit opening, filling the positioned container, further withdrawing said strip to place the slit opening of the next container adjacent said outlet, and repeating said opening and filling steps.

6. A method of packaging comprising the steps of:

(a) forming a flexible container strip including first and second plies joined together along their side portions to define a channel,

(b) transversely sealing said plies together in zones spaced along the length of said strip to form a plurality of containers,

(c) forming a plurality of transverse split openings through one of said plies with said openings spaced along the length of said strip,

(d) each of said openings being formed to provide access into one end portion of an associated container and so that each container has a closed end portion opposite said one end portion,

(e) said containers being interconnected by the other of said plies and oriented in the same direction with

said one end portion of each container being connected to said opposite closed end portion of an adjacent container,

(f) collapsing said container strip into a bundle so that said strip can be subsequently moved endwise in the direction of the closed end portions of said containers,

(g) thereafter advancing said strip in said endwise direction sequentially to position each container at an opening station,

(h) opening the positioned container while connected to said strip by introducing an air stream through its transverse opening, said air stream being introduced by causing it to impinge on said strip in the direction of endwise strip movement,

(i) filling said opened an positioned container through its transverse opening, and,

(j) repeating said advancing, opening and filling steps.

References Cited by the Examiner

UNITED STATES PATENTS

2,612,738	10/1952	Salfisberg	53—29
2,702,150	2/1955	Vogt	53—373 XR
2,759,648	8/1956	Piazze	53—29
2,770,084	11/1956	Ruderman.	
3,027,065	3/1962	Lindquist et al.	229—69 XR
3,112,586	12/1963	Luetzow	53—29

TRAVIS S. McGEHEE, *Primary Examiner.*

FRANK E. BAILEY, *Examiner.*