July 15, 1969 H. LERNER 3,455,088

CONTAINER DELIVERY APPARATUS

Original Filed Dec. 18, 1963 2 Sheets-Sheet 1

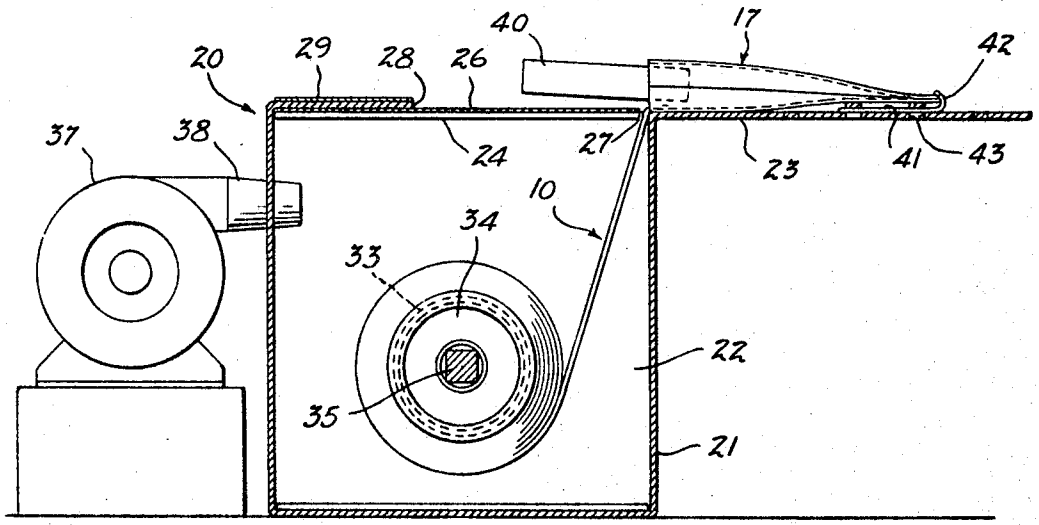


Fig. 1

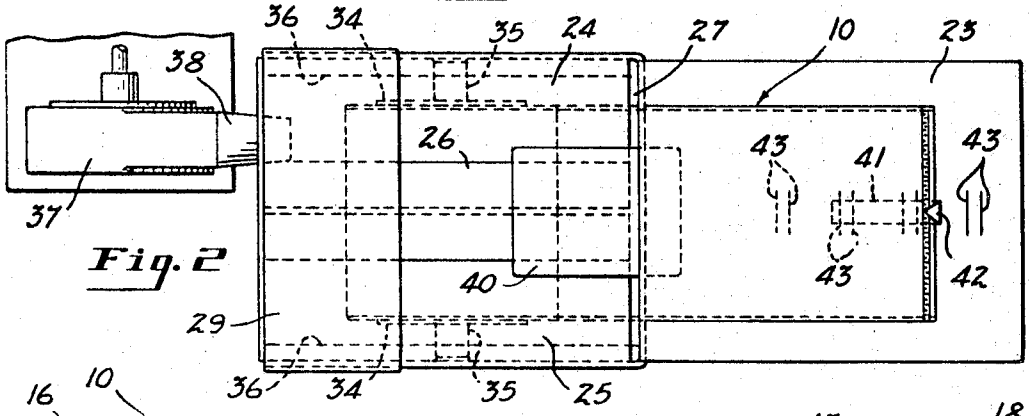


Fig. 2

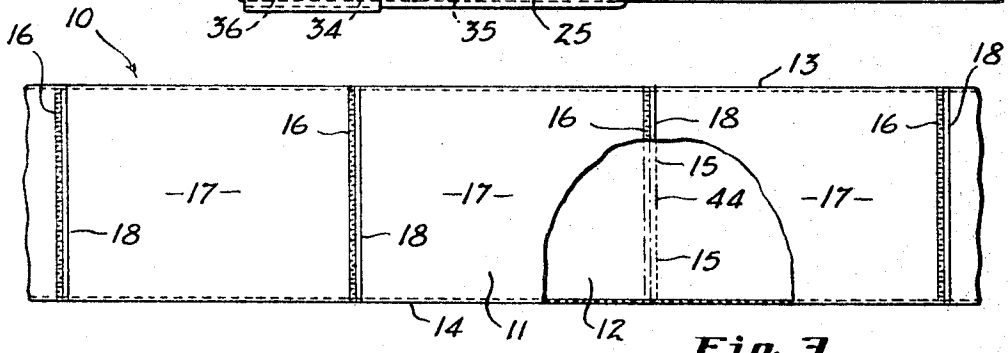


Fig. 3

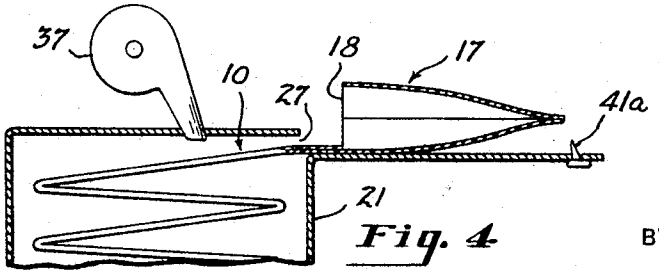


Fig. 4

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CONTAINER DELIVERY APPARATUS

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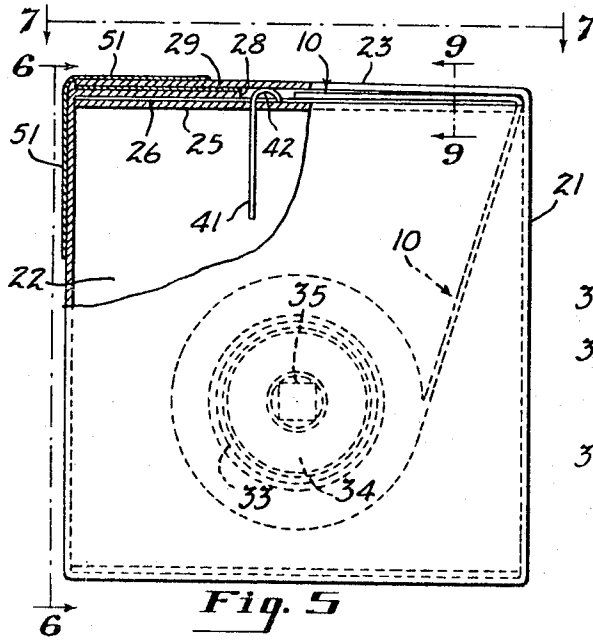


Fig. 5

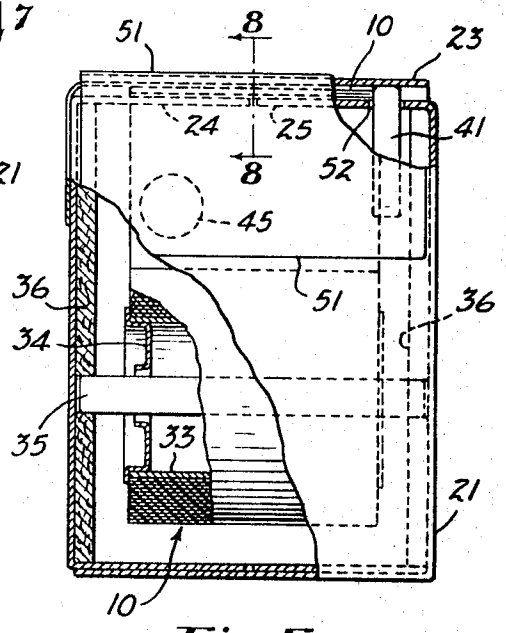


Fig. 6

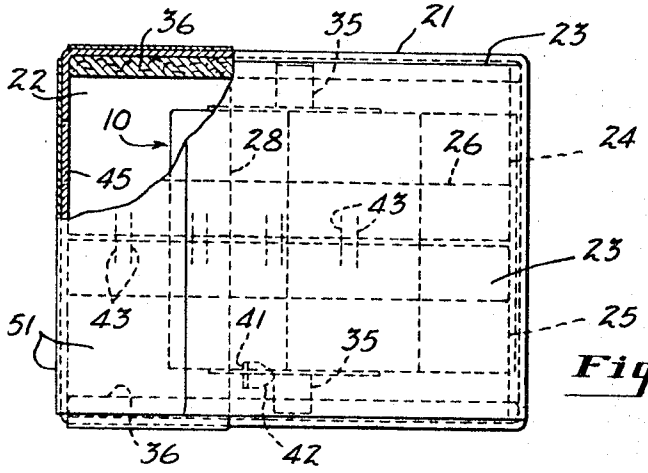


Fig. 7

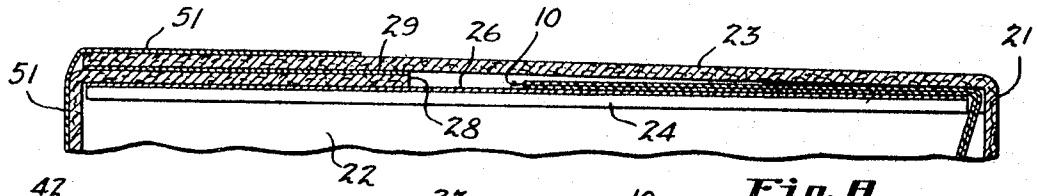


Fig. 8

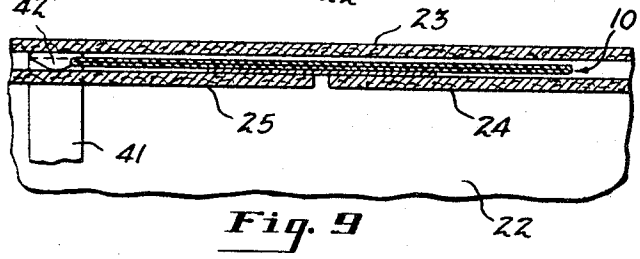


Fig. 9

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CONTAINER DELIVERY APPARATUS

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Continuation of application Ser. No. 331,493, Dec. 18, 1963. This application Aug. 10, 1967, Ser. No. 659,815

Int. Cl. B65b *43/36*

U.S. Cl. 53—385

19 Claims

ABSTRACT OF THE DISCLOSURE

A housing having an opening through which connected containers forming a container strip are withdrawn. A blower connected to the housing blows air into the housing and out the opening, inflating containers of the strip after they are withdrawn.

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation of copending application Ser. No. 331,493 filed Dec. 8, 1963, now abandoned, which in turn is a continuation-in-part of application Ser. No. 64,157 filed Oct. 21, 1960, now abandoned and Ser. No. 331,492 now Patent No. 3,254,828.

DISCLOSURE

This invention relates generally to article packaging, and more specifically to container delivery apparatus adapted for use in conjunction with flexible container strips of the type including a plurality of connected containers.

With the advent of flexible packaging, it has been proposed to provide containers which are initially connected in strip form. The usual container strip is a continuous tube made of suitable heat-sealable plastic material, the tube being provided with spaced, transverse sealing areas which define individual containers. In use, it has been proposed heretofore to package articles within the containers by feeding each individual containers. In use, it has been proposed heretofore to package articles within the containers by feeding each individual container from a supply source into the hands of the operator. This prior method is unsatisfactory for efficient, modern high-speed operations.

When conventional container feeding and delivery devices are used, considerable time is required in order to open each container to insert the article therein. In addition, since the containers are separate, careless handling of the 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 often 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.

The above-identified application, Ser. No. 64,157 and continuation-in-part application Ser. No. 331,492 for "Flexible Container Strips," filed Dec. 18, 1963, now U.S. Patent No. 3,254,828 disclose improved container strips which avoid the difficulties of prior art containers. The container strips disclosed in those 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 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 the 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 into each container being located adjacent its opposite end portion.

Among other advantages, the individual containers of the improved construction described above can be 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.

In the preferred form, the container delivery apparatus of the present invention may be generally described as comprising a housing provided with an outlet opening and with a container opening mechanism which is operatively connected at the housing. Preferably, a container opening element also is connected to the housing. The container opening mechanism and separating element are applicable to a container strip having a plurality of containers in interconnected but separable relationship with one another, the strip being suitably disposed within the housing.

When the container delivery apparatus generally described above is utilized to package articles, the first container of the strip is advanced through the outlet opening and placed in registration with the opening mechanism which operates to open the container through its slit opening. The article to be packaged is then disposed within the opened container, the opening mechanism rendered inoperative, and the strip advanced endwise to bring the next adjacent container into registration with the opening mechanism. If desired, each filled container may be severed from the strip by use of the container separating element.

It is also possible to place articles within each container composing the container strip and leave the filled containers in interconnected relationship. Such a structure can be advantageously used in a vending machine, for example, or in other dispensing devices, thereby assuring proper feeding of the article to be dispensed.

The preferred embodiment of the invention contemplates a construction in which the housing is formed from a container shipping box. The flexible container strip of desired length is suitably disposed in the box so that the strip can be withdrawn endwise and the containers sequentially filled in the manner generally described above. When the shipping box containing the flexible container strip has been received by the user, it is easily converted into a container delivery apparatus by opening a flap at one end of the box and extending the flap in a generally horizontal plane to define a container support portion. When the flap is opened, an outlet opening for the con-

tainer strip is formed at the connected end of the flap.

The container opening mechanism preferably comprises an air blower which is operatively connected to the box or housing so as to blow air into the top of the box and then out of the outlet opening. The container strip is disposed within the box or housing so that the containers can be sequentially disposed on the container support portion in such a position that the air issuing from the outlet of the box impinges on the container strip and enters the slit opening of the container on the container support portion so as to inflate the container. Thus inflated, an article to be packaged can be easily inserted through the slit opening into the container, whereupon the strip is advanced to bring the next container into position. After each article has been inserted into a container, the slit openings of the containers can be sealed if desired. The filled containers either can be severed from the strip along the tearable portions or the strip can be left intact for reshipment and subsequent use.

As will be apparent from the foregoing, the preferred form of the invention is relatively inexpensive and advantageously serves as a shipping box which is easily convertible into a container delivery apparatus. Another advantage is that the invention eliminates manual opening of each container for packaging of articles. Each container is automatically positioned for opening simply by unrolling or otherwise withdrawing the flexible container strip from within the housing. Still further, the container delivery apparatus serves as a convenient means for storing the flexible container strip when less than the entire strip is used at one time and the remainder is to be used later.

Accordingly, an object of the invention is to provide a new and improved container delivery apparatus.

A more specific object of the invention is to provide a container delivery apparatus which facilitates 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 container delivery apparatus which facilitates opening and packaging of articles in the containers of flexible container strips while the containers are connected in strip form.

A further object of the invention is to provide a new and improved device which can be utilized both as a shipping box for flexible container strips and thereafter as a container delivery apparatus.

Still another object of the invention is to provide a new and improved device having all of the advantages described above which is of relatively simple and inexpensive construction.

Other objects and advantages of the invention will become apparent from the following detailed description when taken in conjunction with the accompanying drawings.

In the drawings:

FIGURE 1 is a side elevational view, partially in cross-section, of the preferred container delivery apparatus comprising this 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 with the present invention;

FIGURE 4 is a fragmentary, vetrical cross-sectional view of a modified form of the container delivery apparatus;

FIGURE 5 is a side elevational view, with portions broken away and in cross-section, showing the preferred construction utilized as a shipping box;

FIGURE 6 is an end elevational view, with portions broken away and in cross-section, taken on the line **6—6** of FIG. 5;

FIGURE 7 is a top plan view, with portions broken away and in cross-section, taken on the line **7—7** of FIG. 5;

FIGURE 8 is a fragmentary, cross-sectional view taken on the line **8—8** of FIG. 6; and

FIGURE 9 is a fragmentary, cross-sectional view taken on the line **9—9** of FIG. 5.

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, polypropolene, 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 location along the length of the strip **10** so that the slits in the poly **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 the copending application Ser. No. 331,492.

Reference is now made to the preferred form of the container delivery apparatus comprising this invention which is shown in FIGS. 1 and 2. The preferred container delivery device 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.

In the preferred construction contemplated by the invention, 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 when the box is shipped to the customer for use. The upper wall of the housing **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 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 16 of the container spaced toward the distal end of the support portion. In use, the strip 10 is drawn through the housing opening 27 and a container of the strip is disposed on the support portion 23 in the manner shown. When the blower 37 is turned on, the air issuing from the opening 27 impinges on the container strip and enters the slit opening of the container on the support portion 23. This causes the container on the support portion to be inflated so that the articles to be packaged, such as sponges 40, for example, can be inserted easily through the slit opening 18.

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 into position on the support portion 23. This movement of the container strip 10, as previously discussed, results in alignment of the next container 17 of the strip with the air-blowing mechanism 37 so that the operations can be repeated quickly and efficiently.

In the embodiment shown in FIGS. 1 and 2, a container separating element 41 is provided. 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 23, while the opposite end of the container having the slit opening is adjacent the outlet 27. To this end, the element 41 may be removably attached to the support portion 23 so that the position of the element can be changed depending upon the length of the container. As shown, the element 41 is inserted through slits 43 formed in the support portion 23 and is held in position by the portions of the support portion between the slits. A series of such slits 43 is provided so that the position of the element 41 can be selectively changed.

The element 41 serves to hold each container on the support portion 23 for the inflating and article inserting operations. Further, the element 41 serves to hold the strip so that each filled container can be pulled away from the strip after the strip has been advanced to place the next container on the support portion. If desired, the tearable portions 15 of the container strip 10 may include a centrally located cut 44 (FIG. 3) in order to facilitate insertion of the curved end 42 through the lower ply 12 of the container strip.

If it is desired to leave the containers of the container strip in interconnected relationship, the container separating element 41 can be eliminated from the apparatus and each container, after being filled with the article merely moved along the portion 23 out of registration with the air-blowing mechanism.

It will thus be apparent that the invention provides an apparatus which can be used in an efficient and improved manner to package articles in the containers of a flexible container strip. Handling of individual containers is obviated, since the containers can be filled while still connected in strip form. Concomitantly, 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 easily inserted into the containers. It will also be appreciated that the new container delivery apparatus is relatively inexpensive and compact and that it serves as a convenient storage receptacle for the strip when it is not used up at a single time.

FIGURE 4 schematically illustrates an embodiment of the invention similar to that of FIGS. 1 and 2. As here shown, the housing 21, the blower 37, the container support portion 23, and the element 41 cooperate in substantially the same manner. 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 accordion pleated relationship instead of being rolled. The container strip 10 feeds through the outlet 27 in the same way as in the preceding embodiment.

Reference is now made ot FIGS. 5–9 which show the container strip 10 and housing 21 arranged for shipment to the customer. As described above, the side flaps 24, 25 are folded toward each other to cover the top of the housing 21 and are secured together by sealing tape 26 which extends along their adjacent edges. The end flap 28 is folded over the side flaps 24, 25 and is secured by sealing tape 29 which extends across the end flap in contact with the sides of the housing. The opposite end flap which forms the support portion 23 is folded to overlie the side flaps 24, 25 and the end flap 28. The support-forming flap 23 is secured by sealing tape 51.

As also described above, the roll supports 36 are disposed within the housing chamber 22 against opposite sides thereof and serve to hold the rolled flexible strip 10 against movement during shipment. In order that the flexible container strip 10 can be conveniently withdrawn from the housing by the customer for use, the end of the flexible container strip is preferably extended through the outlet opening 27. The container at the end of the strip overlies the side flaps 24, 25 and is beneath the support-forming flap 23.

A slit 52 may be provided in one of the side flaps, such as the side flap 25, for receiving the container separating element 41. The shank of the support element extends vertically through the opening 52 so that the curved end 42 of the element is between the support-forming flap 23 and the side flaps 24, 25.

The housing 21 is prepared for use simply by removing the sealing tape 51 and extending the support-forming flap 23 in the position shown in FIGS. 1 and 2. When the flap 23 is unfolded in this manner, the end container of the container strip 10 is revealed and is in position to be grasped by the operator and disposed on the support-forming flap for the first packaging operation. The container separating element 41 is withdrawn from the hole 52 and inserted through a selected series of slits 43 so that the element is properly positioned in relation to the length of the containers.

The wall of the housing 21 opposite the wall to which the flap 23 is attached is shown provided with a knock-out portion 45 which may be defined by perforations, score lines, or the like. This knock-out portion is removed for insertion of the nozzle 38 of the blower 37. The end flap 28 and side flaps 24, 25 are left untouched so that during operation the air introduced into the chamber 22 cannot escape through the top of the housing and, instead, is forced to issue from the outlet 27.

Thus, in addition to the advantages described above, it will be seen that the construction provided by this invention conveniently serves as a shipping box for the containers in the strip. The box can be quickly converted into a container delivery device with minimum effort. Further, the container strip is disposed in the box and is arranged so that it can be quickly placed in position for packaging operations.

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.

I claim:

1. A container delivery device comprising a hollow housing provided with an outlet opening, a forwardly projecting container support portion adjacent said outlet opening, an axle within said housing for supporting a roll of containers each having an opening and being disposed in interconnected but separable relationship with one another, said axle being disposed so that the containers can be serially withdrawn from said housing through said outlet opening and each container disposed on said support portion with its opening adjacent said outlet opening, a blower communicating with the interior of said housing for forcing air outwardly through said outlet opening, and projection means on said container support portion spaced from said outlet opening.

2. In combination, a substantially closed housing, said housing having an outlet opening in one wall, means communicating with the interior of said housing for forcing air through said outlet opening, and a flexible container strip extending from within said housing through said outlet opening, said strip being formed by attached containers having openings oriented in the same direction so that each container can be withdrawn from the housing with the opening of the container adjacent said outlet opening, whereby air issuing from said outlet opening is caused to open the container after it is withdrawn from the housing.

3. The combination as claimed in claim **2** wherein said strip is rolled within said housing.

4. The combination as claimed in claim **2** wherein the containers of said strip are disposed in accordion pleated relationship within said housing.

5. The combination as claimed in claim **2** wherein said means for forcing air comprises an air blower.

6. In combination, a substantially closed housing, said housing having an outlet opening in one wall, means defining a work station adjacent said opening, means communicating with the interior of said housing for forcing air through said outlet opening across said work station, and a flexible container strip extending from within said housing through said outlet opening, said strip being formed by attached containers having openings oriented in the same direction so that each container can be disposed at said work station with the opening of the container adjacent said outlet opening, whereby air issuing from said outlet opening is caused to open the container at said work station.

7. In combination, a substantially closed housing, said housing having an outlet opening in one wall, support means extending from said one wall adjacent said opening, means communicating with the interior of said housing for forcing air through said outlet opening across said support portion, and a flexible container strip extending from within said housing through said outlet opening, said strip being formed by attached containers having openings oriented in the same direction so that each container can be disposed on said support means with the opening of the container adjacent said outlet opening, whereby air issuing from said outlet opening is caused to open the container on said support means.

8. The combination as claimed in claim **7** wherein said housing is in the form of a box, and wherein said support means is formed by an outwardly turned flap of said box.

9. In combination, a substantially closed box, said box having one end formed by inwardly folded side flaps sealed together along adjacent edges and by an inwardly folded end flap, a container support extending from a wall of said box at said one end, said support being formed by an outwardly folded end flap, said side flaps terminating short of said one wall to define an outlet opening, a flexible container strip extending from said box through said outlet opening, said strip being formed by attached containers having openings oriented in the same direction so that each container can be disposed on said support with the opening of the container adjacent said outlet opening, and an air blower mounted through the wall of said box opposite said one wall in position to blow air through said outlet opening, whereby each container of said strip can be sequentially disposed on said support to be opened by air issuing from said outlet opening.

10. The combination as claimed in claim **9** including means on said support for holding each container in position to be opened, said holding means being engageable with said strip between adjacent containers.

11. The combination as claimed in claim **10** wherein said holding means is adjustably connected to said support so that the position of said holding means can be changed relative to said outlet opening to accommodate containers of different lengths.

12. In combination, a container delivery device comprising a box, said box including inwardly folded side flaps at one end, means sealing said side flaps together along adjacent edges so that said one end is substantially closed, said box having an outlet opening between one wall thereof and adjacent edges of said side flaps, an end flap hingedly connected to said one wall at said one end of said box, said end flap being movable between a first position in which it is folded in contact with said side flaps and the second position in which it projects outwardly of said box from said one wall to form a support, a container strip disposed in said box, said strip having an end portion projecting through said outlet opening, said end flap being disposed in said second position with said strip end portion being supported on said end flap, said strip end portion including a container opening adjacent said outlet opening, and means operatively associated with the interior of said box for forcing air through said outlet opening into said container opening.

13. A container delivery device comprising a box, said box including inwardly folded side flaps at one end, means sealing said side flaps together along adjacent edges so that said one end is substantially closed, said side flaps terminating short of a wall of said box to define a container outlet opening, an outwardly folded end flap connected to said one wall at said one end, said end flap defining a container support, and air blowing means mounted into said box in position to blow air through said opening.

14. A container delivery device comprising a box, said box including first and second flap means at one end, said first flap means being inwardly folded and sealed closed, said second flap means being outwardly folded to define a container support, said box further including a container outlet opening in said one end adjacent said support, and air blowing means mounted into said box in position to blow air through said opening.

15. A container delivery device comprising a hollow box, said box having an interior space in which a strip of interconnected containers can be disposed and a container outlet opening communicating with said space to permit the strip of containers to be withdrawn from said box, a container support portion adjacent said outlet opening, and air blowing means operatively connected with said box space for forcing air outwardly of said box through said outlet opening, said box including first and second flap means at one end, said flap means being inwardly folded and sealed closed, and said second flap means being outwardly folded to form the said container support portion adjacent the outlet opening.

16. In combination, a substantially closed housing in the form of a box having an outwardly turnable cover flap, said housing having an outlet opening in one wall, support means including said flap turned outwardly of said box extending from said one wall adjacent said opening,

and means communicating with the interior of said housing for forcing air through said outlet opening across said support means.

17. The combination as claimed in claim 7 wherein said strip is rolled within said housing.

18. The combination as claimed in claim 7 wherein the containers of said strip are disposed in accordion pleated relationship within said housing.

19. The combination as claimed in claim 7 wherein said housing is in the form of a box, and wherein said support means is formed by an outwardly turned flap of said box.

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U.S. Cl. X.R.

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